CASSAVA RESEARCH IN AFRICA

A BIBLIOGRAPHY SUPPLEMENT 1988

Centro Internacional de Agricultura Tropical

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INTRODUCTION

A joint agro-economic study of cassava in Sub-Saharan Africa was initiated in 1988 by the two International Agricultural Research Centers with mandate for this crop, i.e. the International Institute of Tropical Agriculture (IITA, Nigeria) and the Centro Internacional de Agricultura Tropical (CIAT, Colombia). The results are expected to provide a sound information base for decision making on the planning and implementation of cassava research and development projects.

As an input to the project, the document collection in CIAT's Cassava Information Center was scanned for its content of African origin, and the outcome was published in 1986, in the way of a bibliography on cassava production in Africa with 1051 references. From this survey it became clear that much additional information had to be sought, and consequently IITA and CIAT embarked on a joint information collecting venture.

Three specialists travelled extensively for this purpose in Africa and Europe where they visited ministries, experiment stations, universities, libraries, and information centers. By this innovative approach a large mass of documents -particularly of non-conventional literature- was put together, thanks to the generous cooperation of scientists, librarians, government officers, in short, of all those approached with the request to help in this endeavor.

The corresponding bibliography is now presented as this supplement to the earlier publication.

Its 1302 references are organized by country, and within country, by title, corporate author, and individual author, all in alphabetical order.

Author and subject indexes are provided. In the alphabetically arranged author index all authors and co-authors responsible for the publications are listed; and the number or numbers besides each author refer to the consecutive order of the corresponding reference in the body of the bibliography, where these numbers appear in the center above each reference.

The subject index presents an alphabetical list of major descriptors; combinations of these may be used to search for more specific topics.

All documents cited are available in CIAT's Cassava Information Center, and copies may be requested therefrom. For this, reference should be made to the corresponding retrieval code number printed in the upper left-hand corner of each reference.

The quest for literature on cassava, of course, continues; and in this regard CIAT's Cassava Information Center invites authors worldwide to keep it informed on their bibliographic production on cassava or, better still, to contribute copies of their new publications to the Center's collection. Thus it will be possible to ensure worldwide awareness of the documents' existence -through CIAT's journal Abstracts on Cassava-, and to allow equally widespread access to them by means of the Center's documentation service.

AFRICA

0001

28102 AFRICAN CASSAVA THREATENED. SPORE NO.4:1-3. 1986. EN., IL.

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; XANTHOMONAS CAMPESTRIS PV. CASSAVAE; PREDATORS AND PARASITES; DISEASE CONTROL; MITE CONTROL; INSECT CONTROL; AFRICA.

THE WAY INTERNATIONAL RESEARCH EFFORTS AND AFRICAN NATIONS ARE FACING THEBIOTIC FACTORS THREATENING CASSAVA IN AFRICA IS DISCUSSED. SEVERE DISEASES CAUSED BY XANTHOMONAS CAMPESTRIS AND CAMV ARE BEING CONTROLLED BY DEVELOPING RESISTANT CASSAVA VAR. SEVERE INSECT PESTS, SUCH AS PHENACOCCUS MANIHOTI ANDMONONYCHELLUS TANAJOA, ARE BEING CONTROLLED THROUGH INTEGRATED CONTROL MEASURES AND THE USE OF NATURAL BIOLOGICAL CONTROLS, WHICH ARE BEING MASS-REARED AND RELEASED IN AFRICA. (CIAT)

0002

27682 CASSAVA ROOT PRODUCTION. 1984. WORLD FOOD TRADE AND U.S. AGRICULTURE, 1960-1983. AUGUST 1984:18. EN.

CASSAVA; TRADE; PRODUCTION; MARKETING; FOOD SECURITY; AMERICA; AFRICA; ASIA; OCEANIA; EUROPE.

CASSAVA WORLD TRADE IS BRIEFLY ANALYZED FOR 1983. CASSAVA PRODUCTION FIGURES ARE GIVEN FOR THE MAJOR PRODUCING COUNTRIES FROM 1979 THROUGH 1983. BRAZIL, THAILAND, INDONESIA, ZAIRE, AND NIGERIA APPEAR AS THE LARGEST CASSAVA PRODUCERS. (CIAT)

0003

27689 CASSAVA ROOT PRODUCTION. 1982. WORLD FOOD TRADE AND U.S. AGRICULTURE 1960-1982:16-17. EN.

CASSAVA; TRADE; STATISTICAL DATA; SOCIOECONOMIC ASPECTS; ECONOMICS; PRODUCTION; AMERICA; AFRICA; ASIA; OCEANIA; EUROPE.

CASSAVA WORLD TRADE IS BRIEFLY ANALYZED AND PRODUCTION FIGURES ARE GIVEN FOR THE PERIOD 1972-82 AND FORECASTS FOR 1983. RECORD CASSAVA PRODUCTION IN 1982 HAS CAUSED SLIGHTLY INCREASED COMPETITION IN WORLD GRAIN MARKETS. CASSAVA PRODUCTION IS EXPECTED TO DECREASE SLIGHTLY (3 PERCENT) IN 1983 COMPARED WITH 1982 FIGURES. (CIAT)

0004

30521 SEMINAIRE LA RECHERCHE SUR LE MANIOC EN AFRIQUE. Compte rendu. (Seminar on cassava research in Africa. Report). Bruxelles. 1986. Paris, France, Institut Francais de Recherche pour le Développement en Coöperation. 22p. 1987. Fr.

CASSAVA; RESEARCH; EUROPE; AFRICA; CIAT-2.

The background and objectives of the seminar carried out in 1986 in Brussels, Belgium, on cassava research in Africa are briefly mentioned. Participants are listed. The situation of cassava research in the different countries and organizations represented was reported, and the relevant research priorities were defined. Research priorities for Africa should consider production, crop protection, and plant breeding for disease and pest resistance. The creation of a cassava network was also discussed; 2 types of network were proposed: cooperative and associative. The structure and the role of each is detailed. (CIAT)

0005

29335 COMMITTEE ON WORLD FOOD SECURITY, 11TH. ROME. Role of roots, tube and plantains in food security in Sub-Saharan Africa. 1986. Rome, Italy Food and Agriculture Organization of the United Nations. 21p. 1986. En.

CASSAVA; FOOD SECURITY; ROOT PRODUCTIVITY; CONSUMPTION; TRADE; PRICES; MARKETING; SOCIOECONOMIC ASPECTS; CASSAVA PROGRAMS; AFRICA.

The role of roots (including cassava), tubers, and plantains in food security in Sub-Saharan Africa is reviewed. Trends in cassava consumptio production, and trade are discussed. Constraints for development are discussed particularly regarding production: CAMD, CBB, Mononychellus tanajoa, Phenacoccus manihoti, lack of suitable var., use of infected planting material, low soil fertility levels, soil degradation, labor shortage, inadequate credit, agrarian structures, socioeconomic problems women, inadequate research and extension programs. Constraints in marke (perishability, costly transport systems, difficult collection, no marke organizations, unstandardized marketing units), and storage and processi (inadequate on-farm storage facilities) are also discussed, and their economic consequences are analyzed. Resource productivity and socioecono aspects related to expanding root crop and plantain cultivation in the region are discussed. In view of the potential contribution of root crop and plantains to food security in Sub-Saharan Africa, action is essentia overcome constraints for expansion of their production and consumption; recommendations in order to meet this goal are given. (CIAT)

0006

27677 COMMONWEALTH INSTITUTE OF BIOLOGICAL CONTROL. 1985. CASSAVA PESTS. IN--------. ANNUAL REPORT 1984-85. SLOUGH, UNITED KINGDOM, COMMONWEALTH AGRICULTURAL BUREAUX. PP.6-7. EN., IL.

CASSAVA; PHENACOCCUS MANIHOTI; INJURIOUS MITES; PREDATORS AND PARASITES; RESEARCH; UNITED KINGDOM; AFRICA.

THE RESEARCH WORK CARRIED OUT BY THE COMMONWEALTH INSTITUTE OF BIOLOGICAL CONTROL DURING 1984-85 ON CASSAVA PESTS IS BRIEFLY REPORTED. CULTURES OF NATURAL ENEMIES OF PHENACOCCUS MANIHOTI WERE MAINTAINED TO SUPPLY MATERIAL TO THE INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE (IITA) IN NIGERIA. A NEW HYMENOPTEROUS PARASITE, ALLOTROPA SP., WAS RECEIVED. WITH THE COLLABORATION OF CIAT AND THE GLASSHOUSE CROPS RESEARC INSTITUTE (UNITED KINGDOM), SPECIES OF PREDATORY MITES WERE SENT TO IITA TRIALS AGAINST THE MITES MONONYCHELLUS SPP. PHASE IV OF THE PROJECT SPONSORED BY THE INTERNATIONAL DEVELOPMENT RESEARCH CENTER ON MONONYCHELL SPP. WAS INITIATED TO QUANTIFY LOSSES IN DIFFERENT CASSAVA VAR. IN EASTI AFRICA. (CIAT)

0007

28565 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1983. CASSAVA. FAO PRODUCTION YEARBOOK 37:128-129. EN., FR., ES.

CASSAVA; STATISTICAL DATA; PRODUCTION; YIELDS; AFRICA; AMERICA; ASIA; OCEANIA.

DATA ARE INCLUDED ON AREA (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF CASSAVA FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD 1974 AND FOR EACH YEAR OF THE PERIOD 1981-83. (CIAT)

0008

28567 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1985. CASSAVA. FAO PRODUCTION YEARBOOK 39:130-131. EN., FR., ES.

CASSAVA; STATISTICAL DATA; PRODUCTION; PRODUCTIVITY; ECONOMICS; AFRICA; AMERICA; ASIA; OCEANIA; EUROPE.

DATA ON AREA HARVESTED, YIELD, AND PRODUCTION OF CASSAVA IN THE WORLD, BY REGIONS (AFRICA, NORTH AND CENTRAL AMERICA, SOUTH AMERICA, ASIA, AND OCEANIA), AND BY COUNTRIES ARE PRESENTED IN TABLE FORM FOR THE YEARS 1979-81, 1983, 1984, AND 1985. (CIAT)

0009

28566 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1984. CASSAVA. FAO PRODUCTION YEARBOOK 38:130-131. EN., FR., ES.

CASSAVA; STATISTICAL DATA; PRODUCTION; PRODUCTIVITY; ECONOMICS; AFRICA; ASIA; AMERICA; OCEANIA; EUROPE.

DATA ON AREA HARVESTED, YIELD, AND PRODUCTION OF CASSAVA IN THE WORLD, BY REGIONS (AFRICA, NORTH AND CENTRAL AMERICA, SOUTH AMERICA, ASIA, AND OCEANIA), AND BY COUNTRIES ARE PRESENTED IN TABLE FORM FOR THE YEARS 1974-76, 1982, 1983, AND 1984. (CIAT)

0010

28564 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1982. CASSAVA. FAO PRODUCTION YEARBOOK 36:128-129. EN., FR., ES.

CASSAVA; STATISTICAL DATA; PRODUCTION; PRODUCTIVITY; ECONOMICS; AFRICA; ASIA; AMERICA; OCEANIA; EUROPE.

DATA ON AREA HARVESTED, YIELD, AND PRODUCTION OF CASSAVA IN THE WORLD, BY REGIONS (AFRICA, NORTH AND CENTRAL AMERICA, SOUTH AMERICA, ASIA, AND OCEANIA), AND OCEANIA), AND BY COUNTRIES ARE PRESENTED IN TABLE FORM FOR THE YEARS 1974-76, 1981, 1982, AND 1983. (CIAT)

0011

28563 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1981. CASSAVA. FAO PRODUCTION YEARBOOK 35:116-117. EN., FR., ES.

CASSAVA; STATISTICAL DATA; PRODUCTION; PRODUCTIVITY; ECONOMICS; AFRICA; ASIA; AMERICA; OCEANIA; EUROPE.

DATA ON AREA HARVESTED, YIELD, AND PRODUCTION OF CASSAVA IN THE WORLD, BY REGIONS (AFRICA, NORTH AND CENTRAL AMERICA, SOUTH AMERICA, ASIA, AND OCEANIA), AND BY COUNTRIES ARE PRESENTED IN TABLE FORM FOR THE YEARS 1969-71, 1979, 1980, AND 1981. (CIAT)

0012

28562 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1980. CASSAVA. FAO PRODUCTION YEARKBOOK 34:117-118. EN., FR., ES.

CASSAVA; STATISTICAL DATA; PRODUCTION; PRODUCTIVITY; ECONOMICS; AFRICA; ASIA; AMERICA; OCEANIA; EUROPE.

DATA ON AREA HARVESTED, YIELD, AND PRODUCTION FOR CASSAVA IN THE WORLD, BY REGIONS (AFRICA, NORTH AND CENTRAL AMERICA, SOUTH AMERICA, ASIA, AND OCEANIA), AND BY COUNTRIES ARE PRESENTED IN TABLE FORM FOR THE YEARS 1969-71, 1978, 1979, AND 1980. (CIAT)

0013

30539 FRANCE. MINISTERE DE LA RECHERCHE ET DE LA TECHNOLOGIE. 1986. Etude des priorités en matière de cultures vivrières annuelles. 7. Le manioc. (Study of priorities regarding annual food crops. 7. Cassava). France, 24p. Fr.

CASSAVA; RESEARCH; CASSAVA PROGRAMS; FRANCE; AFRICA; SOUTH AMERICA; CIAT-2.

The ecological requirements and geographical distribution of cassava are described; the world situation of the crop in 1982 is also analyzed (production decreased by 2 percent during 1982-83). Physiological and nutritional characteristics, uses, and production constraints are detailed. Areas of research should be plant physiology, plant breeding, improvement of production, crop protection, and postharvest technology. CIAT's cassava collection and techniques for fresh root conservation and transformation are highlighted. (CIAT)

0014

30540 FRANCE. MINISTERE DE LA RECHERCHE ET DE LA TECHNOLOGIE. 1986. Les priorités francaises en matiere de recherche sur les cultures vivrieres tropicales: rapport de synthese. (Research priorities regarding tropical food crops in France: a synthesis). France, 51p. Fr., Il.

CASSAVA; RESEARCH; CASSAVA PROGRAMS; PLANT PHYSIOLOGY; CULTIVATION; SOCIOECONOMIC ASPECTS; PLANT BREEDING; TECHNOLOGY; CULTIVATION SYSTEMS; SOUTH AMERICA; AFRICA; FRANCE; CIAT-2.

Background information is given on the research on several food crops (among them cassava) in France where major institutions are devoted to cooperative research. Main criteria to define research priorities involve local demands and needs, production constraints, and feasibility of finding solutions. For cassava, the ecological environment considered covered South America and Central and Western Africa. Research priorities for this tuber crop involved studies on plant physiology, plant breeding, cultural practices, crop protection, and socioeconomic aspects. The role of CIAT in plant breeding is highlighted. Recommendations are given on research strategies, with particular emphasis on international cooperation, training courses, and research networks. (CIAT)

0015

32073 INSTITUT FRANCAIS DE RECHERCHE SCIENTIFIQUE POUR LE DEVELOPPEMENT EN COOPERATION. 1986. Relations hote-parasite. Unité de recherche 506. (Host-parasite relationship. Research Unit 506). In Institut Francais de Recherche Scientifique pour le Développement en Coopération. Département E: indépendance alimentaire. Abidjan, Cote d'Ivoire, pp.34-36. Fr., 6 Ref.

CASSAVA; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; CASSAVA AFRICAN MOSAIC VIRUS; AFRICA.

Several aspects of cassava pests in Africa were studied. They included pathogenicity of CBB, identification of hyperparasites and predators of the cassava mealybug, epidemiology of CAMV, and biological control of the cassava mealybug in Central Africa. (CIAT)

0016

29338 INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE. 1982. Economic and social importance of root and tuber crops in Africa. In International Institute of Tropical Agriculture. Tuber and root crops production manual. Ibadan, Nigeria, Manual Series no.9 pp.1-7. En., 4 Ref.

CASSAVA; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; SOCIOECONOMIC ASPECTS; LABOR; AFRICA.

The economic and social importance of root and tuber crops in Africa is analyzed. Africa's status in the world is reported on the basis of 1980 figures on area harvested, yield, production, and per capita production for root and tuber crops considered as a whole. Cassava is considered 100

percent more labor-intensive than maize based on a study conducted in Nigeria. The area for cassava cultivation in Africa is greater than the combined area planted to cassava in the rest of the world, but African cassava production is less than half that of the world. The future of cassava in Africa is discussed. (CIAT)

0017

25526 WORKSHOP ON PROCESSING TECHNOLOGIES FOR CASSAVA AND OTHER TROPICAL ROOTS AND TUBERS IN AFRICA, ABIJDAN, IVORY COAST. 1981. PROCEEDINGS. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.1,82P. V.2,PP.83-510. EN., FR., IL.

AFRICA; ALCOHOL; ANIMAL NUTRITION; BAKERY PRODUCTS; CASSAVA PRODUCTS; CASSAVA STARCH; COMPOSITE FLOURS; CULTIVATION; DEVELOPMENT; ECONOMICS; FERMENTED PRODUCTS; FOOD PRODUCTS; GARI; INDUSTRIALIZATION; PROCESSED PRODUCTS; PROCESSING; TECHNOLOGY; TRADE; USES.

A WORKSHOP WAS HELD ON THE TECHNOLOGIES OF PROCESSING CASSAVA AND OTHER TROPICAL ROOTS AND TUBERS IN AFRICA. THE OBJECTIVES WERE (1) TO BRING TOGETHER AND DISSEMINATE RECENTLY ACQUIRED KNOWLEDGE AND EXPERIENCE IN STORAGE AND IN SMALL-SCALE MECHANIZED AND INDUSTRIAL PROCESSING OF CASSAVA AND OTHER AFRICAN TROPICAL ROOTS AND TUBERS, AS WELL AS TO ASCERTAIN THE ECONOMIC PROFITABILITY OF THESE PROCESSING TECHNIQUES; (2) TO DEFINE APPROPRIATE TECHNOLOGIES FOR THE INDUSTRIAL PRODUCTION OF LOCAL CULINARY PREPARATIONS IN ORDER TO OBTAIN EASIER-TO-USE PRODUCTS; (3) TO DEFINE THE NEEDS FOR TRANSFER OF TECHNOLOGY AT THE VILLAGE OR INDUSTRIAL LEVEL; (4) TO STUDY THE USE OF TUBER/ROOT FLOUR AND STARCH IN COMPOSITE FLOURS FOR BAKERY PURPOSES. (CIAT)

0018

26785 WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE. 1985. MAIN ISSUES AND POSSIBLE FOLLOW-UP ACTION. IN --------. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.1,PP.96-99. EN.

CASSAVA; MARKETING; PRODUCTION; SOCIOECONOMIC ASPECTS; CONSUMPTION; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; AFRICA.

CONCEPTS ON MAIN CONSTRAINTS TO ROOT, TUBER, AND PLANTAIN PRODUCTION IN TROPICAL AFRICA ARE DISCUSSED. AMONG THEM, THE LAG BETWEEN FOOD PRODUCTION AND POPULATION GROWTH, THE HIGH RATE OF MIGRATION TOWARD URBAN CENTERS, AND THE RISE IN CEREAL IMPORTS (MORE THAN 11 PERCENT PER ANNUM) ARE HIGHLIGHTED. MAJOR PRODUCTION CONSTRAINTS ARE PESTS AND DISEASES AND SOCIOECONOMIC FACTORS RELATED TO THE TRADITIONAL ROLE OF WOMEN, WHO ARE RESPONSIBLE FOR PRODUCING THESE STAPLE FOODS. MAJOR MARKETING CONSTRAINTS ARE POOR TRANSPORTATION FACILITIES AND PROBLEMS IN THE RECOLLECTION, CONSERVATION, AND DISTRIBUTION OF SUPPLIES. THE ECONOMIC CONSEQUENCES OF THESE LIMITATIONS ARE ANALYZED AND SOME GENERAL REMEDIAL ACTIONS ARE SUGGESTED. AMONG THESE, INTERCROPPING AND SEQUENTIAL CROPPING WOULD PROTECT FARMERS FROM THE RISK OF FAILURE DUE TO CLIMATIC FACTORS AND, AT THE SAME TIME, MAKE IT POSSIBLE TO EXPAND LABOR DEMAND TO COVER MOST OF THE YEAR. A FURTHER DIMENSION TO FOOD SECURITY LIES IN THE FLEXIBILITY OF CASSAVA WITH RESPECT TO THE HARVESTING PERIOD. (CIAT)

0019

26783 WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE. 1985. MARKETING, PROCESSING AND PRICES OF TUBERS AND PLANTAINS IN HUMID TROPICAL AFRICA. IN --------. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.1,PP.46-69. EN., SUM. EN.

CASSAVA; MARKETING; PRICES; STORAGE; DISTRIBUTION; PROCESSING; PROCESSED PRODUCTS; CASSAVA FLOUR; GARI; SOCIOECONOMIC ASPECTS; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; AFRICA.

THE SITUATION ON ROOT CROP MARKETING IN TROPICAL AFRICA, WHERE CASSAVA CONSUMPTION PREVAILS, IS ASSESSED AND DIFFERENT MARKETING ASPECTS (SUPPLY, DEMAND, MARKETING SYSTEMS, PRICES, STORAGE AND PROCESSING PROBLEMS) ARE SUMMARIZED. PRODUCTION APPEARS TO BE RELATIVELY STABLE, WITH A GROWTH RATE OF2 PERCENT PER ANNUM, MOSTLY FOR HOUSEHOLD CONSUMPTION. THE AV. MARKETING RATEFOR CASSAVA REACHES 40-50 PERCENT NEAR THE CITIES. THE CHANGES IN THE MIGRANTS' EATING HABITS ARE DESCRIBED AND THE OBSERVATION IS MADE THAT URBAN CONSUMPTION DEPENDS ON THF COMPARATIVF PRICES OF STARCHY STAPLES AND THEIR SUBSTITUTES. IN MOST COUNTRIES, A DECREASED URBAN CONSUMPTION OF CASSAVA IS OBSERVED. ON THE OTHER HAND, THIS CROP IS THE LEAST MARKETED, PROBABLY BECAUSE IT CAN BE STORED IN THE GROUND. CASSAVA IS MARKETED IN PROCESSED FORMS SUCH AS STICKS, CHICKWANGUE, GARI, PASTE, OR DRY CHIPS. SOME CHARACTERISTICS OF THE NONFORMAL MARKETING CHANNELS, OFTEN VERY ORGANIZED ANDWITH A HIGH DEGREE OF ADAPTABILITY, ARE DISCUSSED. THE LIMITATIONS IN THE DISTRIBUTION, STORAGE, AND CONSERVATION OF THESE STAPLE FOODS ARE ANALYZED. ALTHOUGH THE PRICE OF CASSAVA IS SIMILAR TO THAT OF IMPORTED CEREALS, ITS PRICE/CALORIE IS 100 PERCENT HIGHER. FINALLY, SEVERAL INTERVENTION STRATEGIESARE PROPOSED AT THE PRODUCTION, PRICE-FIXING, AND MARKETING SYSTEMS LEVELS. (CIAT)

0020

26781 WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE. 1985. REPORT. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.1,104P. V.2,270P. EN., FR., IL.

CASSAVA; SOCIOECONOMIC ASPECTS; PRODUCTION; MARKETING; COSTS; PRICES; CONSUMPTION; LABOR; CULTIVATION SYSTEMS; INTERCROPPING; MALNUTRITION; SECONDARY CROPS; STORAGE; PROCESSING; DRYING; PROCESSED PRODUCTS; STATISTICAL DATA; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; PESTS; DISTRIBUTION; DISEASES AND PATHOGENS; ROOT PRODUCTIVITY; LEGAL ASPECTS; AFRICA.

PRODUCTION CONSTRAINTS, MARKETING, AND CONSUMPTION OF ROOT, TUBER, AND PLANTAIN CROPS IN 23 COUNTRIES OF TROPICAL HUMID AFRICA, WHERE THESE ARE STAPLE FOODSTUFFS, ARE EXAMINED IN ORDER TO (1) PROMOTE IMPROVED NATIONAL STRATEGIES FOR THESE CROPS; (2) DEVELOP A BASIS FOR NATIONAL AND/OR SUBREGIONAL DEVELOPMENT PROGRAMS; (3) PROMOTE TECHNICAL COOPERATION AMONG COUNTRIES; AND (4) COLLECT BASIC DATA FOR THE COMMITTEE ON WORLD FOOD SECURITY TO BE HELD IN 1986. IT WAS CONCLUDED THAT THESE PRODUCTS WILL CONTINUE TO PLAY AN IMPORTANT ROLE IN THE DIETS OF MOST AFRICAN COUNTRIES, ESPECIALLY IN THE HUMID ZONES; THEY ARE CONSIDERED A HEALTHY OPTION FOR A BALANCED DIET SINCE THEY ARE USUALLY EATEN WITH OTHER HIGH-PROTEIN, HIGH-VITAMIN FOODS. THEIR CULTIVATION IS BENEFICIAL FOR AGRICULTURAL REASONS, AND TO GENERATE MARKETABLE SURPLUSES, TO COMPETE WITH IMPORTED CEREALS THAT DRAINOUT FOREIGN EXCHANGE RESERVES, AND TO STIMULATE AGROINDUSTRIES. THE MAIN LIMITATIONS AND RECOMMENDATIONS ON GENERAL POLICIES, MARKETING, AND PROCESSING ARE LISTED. (CIAT)

0021

26784 WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE. 1985. TECHNICAL, ECONOMIC AND SOCIAL CONSTRAINTS TO THE INCREASED PRODUCTION OFROOTS, TUBERS AND PLANTAINS IN AFRICA AND RELATED RESEARCH PROGRAMMES. IN--------. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.1,PP.70-95. EN.

CASSAVA; PRODUCTION; DISEASES AND PATHOGENS; RESISTANCE; PLANT BREEDING; ROOT PRODUCTIVITY; DISTRIBUTION; CASSAVA PROGRAMS; SOCIOECONOMIC ASPECTS; DEVELOPMENTAL RESEARCH; AFRICA.

THE LIMITATIONS TO THE PRODUCTION OF CASSAVA AND OTHER FOOD CROPS IN TROPICAL AFRICA ARE ANALYZED. THE HIGHEST PRODUCING CROP, CASSAVA, YIELDS FROM 5 T/HA IN NIGERIA TO 10-25 T/HA IN ZAIRE, WHICH IS ALSO THE MAJOR CASSAVA PRODUCER (14.6 MILLION T IN 1983), FOLLOWED BY NIGERIA AND TANZANIA. THE PRIMARY GOAL OF CASSAVA BREEDING SHOULD BE THE OBTAINMENT OF HIGH YIELDING VAR. WITH RESISTANCE TO PESTS SUCH AS PHENACOCCUS MANIHOTI, MONONYCHELLUS TANAJOA, M. PROGRESSIVUS, MELOIDOGYNE INCOGNITA, M. JAVANICA, AND ZONOCERUS VARIEGATUS, AND TO DISEASES SUCH AS CAMD, CBB, ANTHRACNOSE, ANDBROWN LEAF SPOT. IT WOULD ALSO BE DESIRABLE TO OBTAIN VAR. WITH LOW HCN CONTENT, HIGH QUALITY AND ACCEPTABILITY AND, FOR EASY HARVESTING, SHALLOW ANDCOMPACT ROOTING HABITS. THE MAIN ECONOMIC AND SOCIAL CONSTRAINTS ARE IDENTIFIED AS LABOR SCARCITY (LABOR REQUIREMENTS VARY FROM 100 TO 300 MEN/DAY/HA/YR) AND OTHER SOCIAL FACTORS RELATED TO THE PARTICULAR LIMITATIONSOF THE HOUSEWIFE-PRODUCER. RESEARCH AND DEVELOPMENT PROJECTS BY DIFFERENT INSTITUTIONS, REGIONAL AND INTERNATIONAL RESEARCH NETWORKS, AND NATIONAL PROGRAMS ARE REVIEWED. FINALLY, RESEARCH AND DEVELOPMENT PRIORITIES ARE IDENTIFIED FOR THESE FOOD CROPS. (CIAT)

0022

26782 WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE. 1985. TRENDS IN PRODUCTION AND CONSUMPTION OF ROOTS AND PLANTAINS IN AFRICA ANDTHEIR CONTRIBUTION TO FOOD SECURITY. IN--------. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.1,PP.23-45. EN., SUM. EN.

CASSAVA; SOCIOECONOMIC ASPECTS; PRODUCTION; CONSUMPTION; STATISTICAL DATA; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; AFRICA.

THE PRODUCTION/CONSUMPTION PATTERNS OF TRADITIONAL CROPS IN 23 AFRICAN COUNTRIES DURING THE LAST DECADE ARE EXAMINED. CASSAVA IS THE ROOT CROP MOST CONSUMED AND DOMINATES THE PRODUCTION/CONSUMPTION PATTERNS IN ANGOLA, CENTRALAFRICAN REPUBLIC, CONGO, MOZAMBIQUE, TANZANIA, AND ZAIRE. ALTHOUGH IT IS CONSUMED IN OTHER AFRICAN COUNTRIES, CROPS LIKE YAM AND CEREALS ARE MORE IMPORTANT. FROM 1969 TO 1983, THE CONSUMPTION OF ROOT CROPS DECREASED FROM 46TO 41 PERCENT AND THE PER CAPITA CONSUMPTION DECREASED AT A RATE OF 1.7 PERCENT PER ANNUM ESPECIALLY IN URBAN AREAS, MAINLY ATTRIBUTABLE TO FOOD AVAILABILITY. IN 1981-83, PRODUCTION OF THESE CROPS AVERAGED APPROX. 98 MILLION T/YR, CASSAVA ACCOUNTING FOR 50 PERCENT OF THIS TOTAL. OVERALL PRODUCTION OF CASSAVA INCREASED AT A RATE OF 2 PERCENT/YR AND AV. YIELDS WERE6.9 T/HA, FOR THE SAME PERIOD. IN GENERAL, PRODUCTION GROWTH HAS LAGGED BEHIND POPULATION GROWTH IN THE REGION AS A WHOLE. IN THE AFOREMENTIONED COUNTRIES, CASSAVA SHOWS A MORE FAVORABLE TREND AND A CERTAIN DEGREE OF PRODUCTION STABILITY. THE DEMAND OF CASSAVA FOR FOOD PURPOSES MAY GROW AT APPROX. 60 PERCENT/YR TO REACH 63 MILLION T IN 1995. TO DATE, THE ANALYSIS OFCONSUMPTION AND PRODUCTION DATA SUGGESTS THAT THE STRATEGY OF TECHNOLOGICAL PACKAGES FOR THESE COUNTRIES HAS FAILED. (CIAT)

0023

30834 AIDOO, K.E. 1986. Lesser-known fermented plant foods. Review. Tropical Science 26(4):249-258. En., Sum. En., 29 Ref. (Dept. of Bioscience & Biotechnology, Applied Microbiology Division, Univ. of Strathclyde, 204 George Street, Glasgow G1 1XW, United Kingdom)

CASSAVA; HUMAN NUTRITION; FERMENTED PRODUCTS; CASSAVA BEER; CASSAVA MEAL; DRIED ROOTS; NUTRITIVE VALUE; AFRICA; AMAZONS; BRAZIL; PERU; ECUADOR.

Some of the less familiar fermented foods which are important in the diet of people in the developing countries are reviewed. The following cassava-based products are covered: farinha puba (a coarse, cream-colored flour) consumed in the Amazonian regions of Brazil, Peru, and Ecuador; kokonte, consumed in savannah Africa; and masato (cassava beer), produced in the Amazons. Methods of preparation, microbiology, biochemical changes, and also the nutritional values of these fermented products, among others, are presented. (AS)cat H01

0024

32283 ARNOLD, M.H.; AESCHLIMANN, J.P.; COAKER, T.H.; MURPHY, H.T.; NORGAARD, R.B.; RACHIE, K.O. 1987. Africa-Wide Biological Control Program of the International Institute for Tropical Agriculture. Midterm review. Morrilton, Arkansas, Winrock International. 105p. En., 17 Ref., Il.

CASSAVA; CASSAVA PROGRAMS; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; BIOLOGICAL CONTROL; DEVELOPMENT; DEVELOPMENT COSTS; PREDATORS AND PARASITES; RESEARCH; ECONOMICS; AFRICA.

The conclusions and recommendations of a comprehensive midterm review of the Africa-wide Biological Control Program (ABCP) of the International Institute for Tropical Agriculture (IITA) are presented. Emphasis is placed on biological control programs for Phenacoccus manihoti and Mononychellus tanajoa. While the success of the biological control of P. manihoti was widely recognized, the effectiveness of the biological control methods for M. tanajoa could not be estimated. A benefit:cost ratio of approx. 200:1 was calculated for the establishment of Epidinocarsis lopezi for the control of P. manihoti. Scientific and technical considerations are discussed regarding exploration of natural enemies, quarantine, mass rearing of beneficials, quality control of mass-reared beneficials, release methods, prospects of the widespread control of cassava pests, and other institutional-related aspects. Training, organization and management, and financial and administrative considerations are discussed. Topics are presented dealing with the benefits and costs of establishing E. lopezi for P. manihoti control in Africa and collaborative programs in Eastern and Southern Africa. Other topics dealt with the role of the Commonwealth Institute for Biological Control, the IITA/ABCP for cassava pests in Africa, and ICIPE (International Centre for Insect Physiology and Ecology) activities associated with ABCP. (CIAT)

0025

31669 ARRAUDEAU, M. 1973. La situation actuelle du manioc. (Current situation of cassava). Montpellier, France, Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres. 18p. Fr., Sum. Fr., 12 Ref., Il.

CASSAVA; PRODUCTION; STATISTICAL DATA; PRICES; INDUSTRIALIZATION; COMPOSITION; CASSAVA STARCH; CASSAVA CHIPS; CASSAVA MEAL; TRADE; ANIMAL NUTRITION; HUMAN NUTRITION; TOXICITY; GENETICS; PLANT ANATOMY; EUROPE; AMERICA; ASIA; AFRICA.

Statistics on worldwide cassava production for different countries in 1970 are given; general remarks on cassava prices are presented. Data given also show the variations in human consumption of this tuber in several countries. A scheme on the uses and processing of cassava before its consumption in Zaire is included. The composition of this tuber is compared with that of other foodstuffs. Starch (the major industrial cassava product) and cassava trade (chips, pellets, and meal) for animal feed in the EEC are highlighted. Data on imports of these products are given for 1962, 1966, and 1970. Estimates on the evolution of cassava production for 1980 and prospects on starch, CM, and cassava for animal feeding are also given. Finally, general

information on cassava genetics, morphology and morphogenesis, toxicity (HCN content), and diseases (mosaic and bacterial blight) is presented. (CIAT)

0026

32240 BELLOTTI, A.C.; VARELA, A.M.; REYES, J.A. 1986. Observations on the biology and behavior of Phenacoccus herreni and P. gossypii on cassava. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. pp.116-127. En., Sum. En., 7 Ref., Il. (CIAT, Apartadc Aéreo 6713, Cali, Colombia)

CASSAVA; PHENACOCCUS HERRENI; PHENACOCCUS GOSSYPII; PEST DAMAGE; INSECT BIOLOGY; AFRICA; CIAT-1.

The biology and ecology of Phenacoccus herreni, a major pest of cassava in certain areas of South America, are reported. Additional notes are given on P. gossypii of minor importance, occurring in low populations or very sporadically. P. herreni has the potential to cause severe cassava crop damage in areas where prolonged dry periods exist. Life cycle studies show that P. herreni is bisexual. Oviposition will not occur unless there is copulation with the male. The female passes through 3 instars before reaching the adult stage; the total duration of the female life cycle is 49.5 days. The male has 4 nymphal instars before the winged, adult stage. No feeding, however, takes place after the 2nd instar; the 3rd and 4th instars are the prepupal and pupal stages. Female oviposition is initiated 3 days after copulation; an av. of 773 eggs were oviposited during an 18-day period. Indications are that P. herreni populations can increase rapidly under favorable environmental conditions and in an abundance of host plants. Dispersal is primarily by wind and by the carrying of infested plant parts by man. Susceptible cv. react to infestation by becoming stunted; the growing shoot tip takes on a cabbage-like appearance. Heavy infestations will result in plant stunting, defoliation, deformation of the growing shoot, shortening of the internodes, and distortion of stes. Plant recuperation is stimulated with the onset of the rainy season, but persistent severe deformations of stems and branches can be noted. The presence of a toxin is indicated. (AS)

0027

32232 BENNETT, F.D. 1986. Biological control of mealybugs: past successes and safety records. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. pp.15-24. En., 17 Ref. (Commonwealth Inst. of Biological Control, Gordon Street, Curepe, Trinidad & Tobago)

CASSAVA; PHENACOCCUS MANIHOTI; BIOLOGICAL CONTROL; PREDATORS AND PARASITES; AFRICA.

A review of attempts to biologically control mealybugs (Pseudococcus, Phenacoccus, and Planococcus) attacking different crop species is presented. Examples are given of successful biological control of mealybugs in crops different from cassava. Based on these examples and records from others crops, it is concluded that there should be no concern as to the safety of introducing into Africa Epidinocarsis lopezi and other primary parasites (Anagyrus, Psedaphycus, Acerophagus, Aenasius) of Phenacoccus manihoti from South America. (CIAT)

0028

32231 BENNETT, F.D. 1986. Biological control of Phenacoccus manihoti and Mononychellus tanajoa: why and how. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. pp.6-14. En., 6 Ref. (Commonwealth Inst. of Biological Control, Gordon Street, Curepe, Trinidad & Tobago)

CASSAVA; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; BIOLOGICAL CONTROL; PREDATORS AND PARASITES; AFRICA.

The questions on why and how Phenacoccus manihoti and Mononychellus tanajoa should be controlled through biological agents in Africa are addressed. Several reasons are given for the 1st question: (1) both pests are introduced so they are logical targets for biological control; (2) chemical control would not be practical since cassava is mostly grown as a subsistence or small-farmer crop; (3) both are indirect pests; (4) cassava harvesting and planting schedules are prolonged and overlap which favors biological control; (5) there is evidence of natural enemies for both pests; and (6) successful attempts have been made to control these pests biologically. Different approaches are discussed for the biological control of both pests namely, introduction of natural enemies, inoculation, augmentation, flooding, and conservation of populations of existing natural enemies. The steps to be followed in implementing a biological control program include location of the center of origin of the pest; surveillance of the center of origin for natural enemies; introduction of the natural enemies with quarantine precautions; rearing and release of the natural enemies and evaluation of their effectiveness. (CIAT)

0029

28537 BENNISON, H. 1987. CASSAVA. ITS DEVELOPING IMPORTANCE. COURIER NO.101:69-71. EN., SUM. EN., IL.

CASSAVA; CASSAVA PROGRAMS; ECOSYSTEMS; CULTIVATION; HISTORY; FOOD SECURITY; PLANT BREEDING; AFRICA.

THE FACTORS THAT HAVE CONTRIBUTED TO THE INCREASING IMPORTANCE OF CASSAVA IN THE TROPICS AS A STAPLE FOOD CROP DURING THIS CENTURY, ESPECIALLY IN AFRICA WHERE IT HAS SUBSTITUTED OTHER ROOT CROPS AND CEREALS, ARE DISCUSSED. ATTRIBUTES OF CASSAVA, ATTRACTIVE TO THE FARMER, ARE ITS STEADY INCREMENT IN YIELD OVER SEVERAL SEASONS, DROUGHT TOLERANCE, AND ABILITY TO GROW UNDER A WIDE RANGE OF SOIL FERTILITY CONDITIONS. BREEDING EFFORTS IN AFRICA OVER THE LAST YEARS ARE MENTIONED, ESPECIALLY REGARDING RESISTANCE TO MOSAIC, CBB, AND BIOLOGICAL CONTROL OF MEALYBUGS AND THE GREEN SPIDER MITE, MAJOR CASSAVA PESTS IN THE REGION. (CIAT)

0030

24074 CASADEI, E.; JANSEN, P.; RODRIGUEZ, A.; MOLIN, A.; ROSLING, H. 1981. MANTAKASSA: AN EPIDEMIC OF SPASTIC PARAPARESIS ASSOCIATED WITH CHRONIC CYANIDE INTOXICATION IN A CASSAVA STAPLE AREA OF MOZAMBIQUE. 2. NUTRITIONAL FACTORS AND HYDROCYANIC ACID CONTENT OF CASSAVA PRODUCTS. BULLETIN OF THE WORLD HEALTH ORGANIZATION 62(3):485-492. EN., SUM. EN., FR., 18 REF., IL. ALSO IN REVISTA MEDICA DE MOCAMBIQUE 2(1):1-34. 1984.

AFRICA; ANALYSIS; BIOCHEMISTRY; BITTER CASSAVA; CASSAVA PRODUCTS; COMPOSITION; CYANIDES; DETOXIFICATION; DETOXIFICATION PROCESSES; DRYING; HCN CONTENT; HUMAN HEALTH; HUMAN NUTRITION; METABOLISM; MOZAMBIQUE; PROCESSING; SOLAR DRYING; TOXICITY.

AN OUTBREAK OF SPASTIC PARAPARESIS WHICH MOSTLY AFFECTED WOMEN AND CHILDREN OCCURRED IN A NORTHERN PROVINCE OF MOZAMBIQUE IN 1981. THE EPIDEMIC WAS RELATED TO CHRONIC CYANIDE INTOXICATION ASSOCIATED WITH A DIET CONSISTING ALMOST EXCLUSIVELY OF CASSAVA. A PROLONGED DROUGHT IN THE AREA HAD EXHAUSTED ALL FOOD RESOURCES EXCEPT CASSAVA, ESPECIALLY THE BITTER VAR. A NUTRITIONAL, TOXICOLOGICAL, AND BOTANICAL INVESTIGATION WAS CARRIED OUT IN 2 OF THE 5 DISTRICTS AFFECTED. THE MAIN FINDINGS WERE THAT CYANIDE LEVELS WERE UNUSUALLY HIGH IN THE CASSAVA PLANT AS A CONSEQUENCE OF THE DROUGHT WITH DAILY INTAKES ESTIMATED AT 15.0-31.5 MG HCN. DETOXIFICATION OF THE BITTER VAR. BY SUN DRYING WAS INADEQUATE BECAUSE OF THE GENERAL FOOD SHORTAGE, AND METABOLIC DETOXIFICATION WAS PROBABLY REDUCED OWING TO THE ABSENCE OF S-CONTAINING AMINO ACIDS IN THE DIET. THE RAW AND DRIED UNCOOKED CASSAVA WAS EATEN MOSTLY BY WOMEN AND CHILDREN., THE NUTRITIONAL STATUS OF THE POPULATION, HOWEVER, WAS NOT VERY POOR AND SYMPTOMS OF ADVANCED UNDERNUTRITION WERE RARELY SEEN.

0031

26396 CHAPMAN, R.F.; PAGE, W.W.; MCCAFFERY, A.R. 1986. BIONOMICS OF THE VARIEGATED GRASSHOPPER (ZONOCERUS VARIEGATUS) IN WEST AND CENTRAL AFRICA. ANNUAL REVIEW OF ENTOMOLOGY 31:479-505. EN., 127 REF. (DEPT. OF ENTOMOLOGY, UNIV. OF CALIFORNIA, BERKELEY, CA 94720, USA)

CASSAVA; ZONOCERUS VARIEGATUS; INSECT BIOLOGY; RESISTANCE; HCN CONTENT; INSECTICIDES; AFRICA.

THE BIONOMICS OF THE POLYPHAGOUS ZONOCERUS VARIEGATUS IN WEST AND CENTRAL AFRICA, WHICH ATTACKS CASSAVA, IS REVIEWED REGARDING LIFE HISTORY AND PHENOLOGY, BEHAVIOR, RELATIONS WITH PLANTS, POPULATION DYNAMICS, DETERMINANTS OF ITS GEOGRAPHICAL AND SEASONAL DISTRIBUTION, CHANGING IMPORTANCE AS A PEST, AND DAMAGE AND CONTROL. ALL STAGES OF Z. VARIEGATUS, EXCEPT THE 1ST INSTAR, ARE KNOWN TO BE INFECTED BY THE FUNGUS ENTOMOPHAGA GRYLLI, WHICH IS THE PRINCIPAL CAUSE OF MORTALITY AMONG NYMPHS. ONLY IN THE DRY SEASON, WHEN THE INFECTIVITY OF THE FUNGUS IS LOW, IS IT POSSIBLE FOR DENSE Z. VARIEGATUS AGGREGATIONS TO SURVIVE. CASSAVA TOLERANCE TO 1ST LARVAL INSTARS OF Z. VARIEGATUS APPEARS TO BE RELATED TO THE HCN CONTENT; INSTARS IV TO VI, HOWEVER, SEEM TO BE TOLERANT TO THE HCN CONTENT, PARTICULARLY IN GROUP FEEDING. THE INCREASING AREA PLANTED TO CASSAVA IN THE REGION HAS UNDOUBTEDLY CONTRIBUTED TO INCREASE THE ABUNDANCE OF THE PEST; THE SPREAD OF THE WEED CHROMOLAENA ADORATA, NATIVE TO TROPICAL AMERICA, IS ALSO SUGGESTED TO BE A CAUSAL FACTOR. CHEMICAL CONTROL IS THE MOST EFFECTIVE MEANS AVAILABLE, BUT Z. VARIEGATUS EGG DESTRUCTION CAN BE PRACTICED BY SUBSISTENCE FARMERS. (CIAT)

0032

30496 CHARRIER, A.; LEFEVRE, F. 1987. Evaluation and exploitation of cassava genetic variability. In Séminaire International La Mosaique Africaine du Manioc et son Controle, Cote d'Ivoire, 1987. Résumés. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Cooperation. p.36. En., 5 Ref. (ORSTOM, BP V51 Abidjan, Cote d'Ivoire)

CASSAVA; GENETICS; AFRICA.

Some biological and genetical themes important for the progress of research work on cassava in Africa are mentioned: importance of genetic resources of Manihot spp., cassava var. cultivated in Afri-ca, description of cassava variability by biochemical markers, genetic exchanges between M. esculenta and wild species, and influence of biotechnology on cassava improvement. (CIAT)

0033

30452 CHUZEL, G.; GRIFFON, D. 1987. Le gari: un produit traditionnel fermenté a base de manioc: aspects fermentation-détoxification. (Gari: a traditional fermented cassava product: aspects of fermentation-detoxification). Montpellier, Centre d'Etudes et d'Experimentation du Machinisme Agricole Tropical. 13p. Fr., 23 Ref., Il.

CASSAVA; GARI; FERMENTATION; TOXICITY; HCN CONTENT; DETOXIFICATION; COMPOSITION; AFRICA.

Traditional gari processing is briefly described, and organoleptic characteristics and uses of the end product are mentioned. The cyanogenetic character of cassava is explained as well as the mechanism of degradation of cyanogenetic compounds. The procedure used to detoxify cassava is mentioned and the neurological and metabolic troubles in humans due to the presence of HCN in cassava roots are listed. Microorganisms involved in the fermentation process are reviewed and comments are included on the role of fermentation in cassava detoxification. The need to improve traditional technologies, in particular fermentation, is highlighted. (CIAT)

0034

28136 COBB, E.L., ED. 1987. PREDATORS FOR PLENTY. PROTECTING CROPS THROUGH BIOLOGICAL CONTROL. DEVELOPMENT INTERNATIONAL 1(2):38-39. EN., IL.

CASSAVA; PREDATORS AND PARASITES; BIOLOGICAL CONTROL; MONONYCHELLUS TANAJOA; LATIN AMERICA; AFRICA; ASIA.

THE BENEFITS OF BIOLOGICAL CONTROL AS A COMPONENT OF AN INTEGRATED PEST MANAGEMENT PROGRAM ARE OUTLINED. THE TECHNIQUE CAN BE APPLIED USEFULLY IN DEVELOPING COUNTRIES UNDER 2 CONDITIONS: (1) WHEN THE VALUE OF THE CROP IS LOW RELATIVE TO THE COST OF PESTICIDES OR OTHER CONTROL MEASURES (E.G., CASSAVA IN AFRICA) AND (2) WHEN THE OVERUSE OF PESTICIDES HAS RENDERED THEM INEFFECTIVE. BIOLOGICAL CONTROL OF INSECTS WORKS BEST IF THE PEST HAS A MODERATE-TO-LOW REPRODUCTIVE RATE, IS NONMIGRATORY, AND IS "INDIRECT" (DAMAGES A PART OF THE CROP OTHER THAN THAT HARVESTED); LIKEWISE, THE CROPPING SYSTEM SHOULD BE STABLE. THE INTRODUCTION OF A WASP TO AFRICA FROM LATIN AMERICA TO CONTROL THE CASSAVA MEALYBUG IS GIVEN AS AN EXAMPLE, INDICATING THAT THERE IS NO DANGER IN INTRODUCING PARASITES AND PREDATORS FROM ELSEWHERE IF THE PROCEDURE EXPLAINED IS FOLLOWED. (CIAT)

0035

32007 DAVIE. 1981. Collection de maintien de manioc. Résultats 1981. (Current cassava collection. 1981 results). 2p. Fr., Dat.num.

CASSAVA; STATISTICAL DATA; ROOT PRODUCTIVITY; CULTIVARS; CASSAVA AFRICAN MOSAIC VIRUS; RESISTANCE; STARCH CONTENT; AFRICA.

Data are given on the performance of the African cassava collection for 1981 regarding CAMV tolerance, yields (t/ha), and starch content (percentage). The origin of each tested cv. is also included. (CIAT)

0036

32233 DELUCCHI, V. 1986. Plant-pest-natural enemy interactions. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biologieal Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. pp.25-31. En., 12 Ref. (Inst. fur Phytomedizin, ETH, CH-8092 Zurich)

CASSAVA; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; PREDATORS AND PARASITES; PHENOLOGY; RESEARCH; AFRICA.

Basic concepts on plant-pest-natural enemy interactions are briefly discussed. To understand the interactions involved in cassava-Phenacoccus manihoti/Mononychellus tanajoa-natural enemies, it is necessary to gather information on the characteristics of species and their relationships with the other elements of the system. This will allow the development of phenological and population models. (CIAT)

0037

30031 DOROSH, P. 1987. Economics of cassava in Africa: an overview. Washington, D.C, International Food Policy Research Institute. 46p. En., 30 Ref., Il. Paper prepared for Workshop on Trends andProspects of Cassava in the Third World, Washington, D.C., 1987.

CASSAVA; PRODUCTION; CASSAVA PROGRAMS; RESEARCH; PRODUCTIVITY; ECONOMICS; LABOR; CONSUMPTION; STATISTICAL DATA; SOCIOECONOMIC ASPECTS; FOOD PRODUCTS; CASSAVA PRODUCTS; FOOD SECURITY; USES; ECOSYSTEMS; HUMAN NUTRITION; ANIMAL NUTRITION; DEVELOPMENT; AFRICA.

Economic aspects of cassava production and utilization are explored to assess the future role of cassava in Africa and to aid in setting research priorities. Statistical information on cassava production and utilization aspects is summarized, and major production systems and constraints are discussed. A description is given on major consumption forms and an analysis is presented on major factors influencing consumption (population growth, urbanization, storability, ease of processing, income level, prices); the role of cassava in enhancing food security; and prospects for other end uses in Africa. Major factors influencing production and issues related to the spread of cassava are highlighted. Prospects of cassava cultivation in major production systems (forest and derived savanna of West Africa, Guinea savanna, forest and savanna of Central Africa, highlands of Rwanda Burundi, Zaire and Uganda, and East and Southern Africa) and implications for research are discussed. (CIAT)

0038

30488 FAUQUET, C. 1987. Presentation of the International Seminar on African cassava mosaic disease and its control. In Seminaire International La Mosaique Africaine du Manioc et son Controle, Cote d'Ivoire, 1987. Résumés. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Cooperation. pp.27-28. En. (ORSTOM, Laboratoire de Phytovirologie, BP. V51 Abidjan 01, Cote d'Ivoire)

CASSAVA; RESEARCH; CASSAVA AFRICAN MOSAIC VIRUS; AFRICA; CIAT-1.

Participating research institutes and entities in the organization of international seminar on CAMD and its control are listed. Seminar objectives are also given and participants belonged to 3 categories: national representatives from African cassava producing countries (24 in total), scientific researchers concerned with CAMD or related areas, and representatives of national and international organizations. (CIAT)

0039

30484 FURSCH, H. 1987. Neue afrikanische scymnini-arten (Coleoptera Coccinellidae) als frebetafeinde von Manihot-Schadlingen. (New African Scymnini species (Coleoptera:Coccinellidae) as predators of Manihot pests). Revue de Zoologie Africaine 100(4):387-394. De., Sum. De., En., 14 Ref., Il. (Universitat Passau, Postfach 25 40, D-8390 Passau, West Germany)

CASSAVA; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; BIOLOGICAL CONTROL; AFRICA.

Three new Scymnini species are described as predators of the Manihot pests: Nephus phenacoccophagus, Diomus hennesseyi, and Clitostethus neuenschwanderi. Determination is made easier by differential diagnoses and numerous figures. All known facts about the biology of Clitostethus sp. were taken into account (AS)

0040

29591 GEBREMESKEL, T.; HAHN, S.K.; NGAMBEKI, D.S.; EZUMAH, H.C.; ALMAZAN, A.M. 1986. Cassava research and production. Ibadan, Nigeria, International Institute of Tropical Agriculture. 41p. En., 42 Ref., Il. IITA-UNICEF Consultation on Promotion of HouseholdFood Production and Nutrition.

CASSAVA; CASSAVA PROGRAMS; PRODUCTION; COSTS; CULTIVATION; CULTIVATION SYSTEMS; PRODUCTIVITY; LABOR; MAPS; TECHNOLOGY EVALUATION; STATISTICAL DATA; DEVELOPMENTAL RESEARCH; SOCIOECONOMIC ASPECTS; WOMEN; AFRICA.

Aspects of cassava production and research in Sub-Saharan Africa are reviewed: importance of the crop in Africa; environmental requirements; cultural practices; technology, productivity, production costs and value; major areas of production; yield trends; and production and utilization constraints. Recent advances in cassava research for the region are illustrated in the fields of var. improvement, rapid multiplication techniques, biological control of the cassava mealybug, plant densities, harvesting, and the development of national cassava research programs. The effects of urbanization in the region on food crop production and of government policies on regional cassava production are discussed. (CIAT)

0041

28397 GROUSSON, F. 1986. VARIABILITE DE XANTHOMONAS CAMPESTRIS PATHOVAR MANIHOTIS. (VARIABILITY OF XANTHOMONAS CAMPESTRIS PATHOVAR MANIHOTIS). THESE DOCTEUR ING. FRANCE, L'INSTITUT NATIONAL AGRONOMIQUE PARIS-GRIGNON.152P. FR., SUM. FR., EN., 235 REF., IL.

CASSAVA; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CASSAVA BACTERIAL BLIGHT; CULTIVARS; LABORATORY EXPERIMENTS; RESISTANCE; SOUTH AMERICA; AFRICA; FRANCE.

THE VARIABILITY OF 54 STRAINS OF XANTHOMONAS CAMPESTRIS PV. MANIHOTIS (CAUSAL AGENT OF CBB) FROM SOUTH AMERICA, 5 AFRICAN COUNTRIES, AND VARIOUS PARTS OF CONGO WAS STUDIED. LEAF AND STEM INOCULATIONS ON 2 CASSAVA CV. ALLOWED THE REPRODUCTION OF THE DIFFERENT SYMPTOMS OBSERVED IN THE FIELD. THEDIFFERENCE OF SUSCEPTIBILITY BETWEEN BOTH CV. WAS CLEAR ON THE LEAVES BUT LESS ON THE STEMS. FOUR PATHOGENIC GROUPS OF STRAINS WERE DEFINED ON THE BASIS OF INOCULATION RESULTS. THE INFLUENCE OF GEOGRAPHICAL ORIGIN VARIED FORCERTAIN COUNTRIES OR AREAS. IN VITRO, STRAINS OF X. CAMPESTRIS PV. MANIHOTIS WERE RELATIVELY HOMOGENEOUS. NEVERTHELESS, A STUDY OF THEIR GROWTH ON DIFFERENT SUBSTRATES, THEIR RESPONSE TO SEVERAL ANTIBIOTICS, AND PHAGE TYPINGSHOWED VARIABILITY, NOT RELATED TO THE GEOGRAPHICAL ORIGIN. EACH CHARACTERISTIC ALLOWED A STABLE PARTITION FROM THE SET OF STRAINS TO BE DEFINED. FINALLY, THE SYNTHESIS OF ALL THE RESULTS IN VIVO AND IN VITRO BY A MULTIPLE FACTORIAL ANALYSIS SHOWED THE EXISTENCE OF A COMMON FACTOR TO THE DIFFERENT STUDIED CHARACTERISTICS. A LINK EXISTS BETWEEN STRAIN PATHOGENICITYAND ITS IN VITRO BEHAVIOR. (AS)

0042

32234 GUTIERREZ, A.P.; YANINEK, J.S. 1986. An ecological perspective of plant breeding. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical

Agriculture. pp.32-46. En., Sum. En., 12 Ref., Il. (Division of Biological Control, Univ. of California, Berkeley 94720, USA)

CASSAVA; PLANT BREEDING; RESISTANCE; AFRICA.

The interplay between the genetics for energy allocation strategy and population ecology is illustrated, and the importance of interdisciplinary research for solving plant breeding problems is shown. Possible constraints to yield maximization are also indicated. Short-term solutions have often caused more harm than good: when breeders maximize yields by breeding out the crops' ability to compensate for pests, this lost ability is replaced with pesticides. In the case of cassava, massive inputs of pesticides do not appear to be economical; hence, biological control and breeding for horizontal resistance appears more reliable. An understanding of cassava's energy allocation strategies is essential to understand the interaction of this crop with its introduced herbivores, natural enemies, and any resistance breeding program. (AS (extract))

0043

30826 GUTIERREZ, J. 1987. The cassava green mite in Africa: one or two species? (Acari: Tetranychidae). Experimental and Applied Acarology 3(2):163-168. En., Sum. En., 24 Ref., Il. (ORSTOM c/o I.A.M., 3191, Route de Mende, 34060 Montpellier Cedex, France)

CASSAVA; MONONYCHELLUS PROGRESIVUS; AFRICA.

Parallel courses of research in South America and Africa with respect to the Mononychellus complex, in particular the cassava green mite (Acari: Tetranychidae), are examined. Strong arguments indicate that a single taxonomic unit corresponding to the species Mononychellus progresivus Doreste, 1981, was introduced in 1971 to Africa from South America. (AS)

0044

27605 HAHN, S.K.; KEYSER, J. 1985. CASSAVA: A BASIC FOOD OF AFRICA. OUTLOOK ON AGRICULTURE 14(2):95-99. EN., SUM. EN., 17 REF. (INTERNATIONAL INST. OF TROPICAL AGRICULTURE, P.M.B. 5320, IBADAN, NIGERIA)

CASSAVA; CULTIVATION; CASSAVA PROGRAMS; RESEARCH; AFRICA.

THE IMPORTANCE OF CASSAVA AS A STAPLE FOOD FOR ONE-EIGHTH OF THE WORLD'S POPULATION IS BRIEFLY HIGHLIGHTED AND THE FACTORS THAT MILITATE AGAINST THE WIDESPREAD MARKETING OF CASSAVA ARE DISCUSSED. THE PER CAPITA CONSUMPTION OF FRESH CASSAVA IS GREATEST IN AFRICA, AVERAGING 102 KG/YR. IN THE CENTRAL AFRICAN REPUBLIC, CONGO, GABON, AND ZAIRE, CONSUMPTION EXCEEDS 300 KG/PERSON/YR. CASSAVA IS GROWN IN 31 AFRICAN COUNTRIES, STRETCHING IN A WIDE BELT FROM MADAGASCAR IN THE SE TO SENEGAL IN THE NW. SINCE ITS FOUNDATION IN 1967, THE INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE (NIGERIA) HAS DEVOTED A GREAT DEAL OF EFFORT TO THE DEVELOPMENT OF IMPROVED CASSAVA VAR. AND BETTER METHODS OF CULTIVATION AND DISEASE CONTROL. PRIORITY HAS BEEN GIVEN TO THE DISEASES AND PESTS THAT CAUSE THE GREATEST LOSSES IN THE CROP: CAMD, CBB, AND THE INTRODUCED PESTS MONONYCHELLUS TANAJOA AND PHENACOCCUS MANIHOTI. OTHER ASPECTS REVIEWED INCLUDE AGRONOMIC PRACTICES, HCN CONTENT, INTERSPECIFIC CROSSES, AND OUTREACH ACTIVITIES. (CIAT)

0045

29577 HAHN, S.K. 1984. Tropical root crops; their improvement and utilization. Ibadan, Oyo State, Nigeria, International Institute of Tropical Agriculture. 30p. En., Sum. En., 38 Ref., Il. Based on a paper presented at ConferenceonAdvancing Agricultural Production in Africa, Arusha, Tanzania, 1984.

CASSAVA; PRODUCTION; PLANT BREEDING; CULTIVATION; CASSAVA PROGRAMS; INTERCROPPING; CASSAVA PRODUCTS; HCN CONTENT; GARI; ROOT PRODUCTIVITY; AFRICA.

A general review is given of the production constraints of different tropical root crops (cassava, yam, sweet potato (Colocasia and Xanthosoma)) in Africa, and the advances in this field are presented. The main biological factors limiting cassava production are diseases (CAMD and CBB) and pests (cassava mealybug and green spider mite). Advances are reported on the var. improvement carried out at the International Institute of Tropical Agriculture (Nigeria), directed toward (1) the production of plants with lower HCN content, high yield potential, and disease resistance; (2) the introduction of natural enemies for biological pest control, particularly Apoanagrus lopezi; (3) management of cultural practices such as: land preparation, use of shade, fertilization, planting material, intercropping systems (cassava/maize, cassava/peanuts, and cassava/cowpea), leaf harvest, weed control, and continuous cassava production on the same field. Finally, cassava processing systems used to reduce HCN content are reviewed. (CIAT)

0046

32230 HERREN, H.R. 1986. Distribution and economic importance of Phenacoccus manihoti and Mononychellus tanajoa in Africa. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. pp.3-5. En. (International Inst. of Tropical Agriculture, P.M.B. 5320, Ibadan, Nigeria)

CASSAVA; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; PEST DAMAGE; PRODUCTIVITY; ECONOMICS; AFRICA.

The distribution and economic importance of Phenacoccus manihoti and Mononychellus tanajoa in Africa is briefly discussed. The total area infested with either pest is approx. 7.5 million ha, that is 75 percent of the cassava area in Africa. In late rainy season plantings, yield losses up to 84 percent have been recorded. Leaf and planting material losses are also caused by both pests. The total direct losses by both pests are estimated. (CIAT)

0047

32229 HERREN, H.R.; HENNESSEY, R.N., eds 1986. Proceedings. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa. Ibadan, Nigeria. 1982. Ibadan, Nigeria, International Institute of Tropical Agriculture. 159p. En., 164 Ref., Il.

CASSAVA; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; PREDATORS AND PARASITES; BIOLOGICAL CONTROL; INSECT CONTROL; INSECTICIDES; INSECT BIOLOGY; ROOT PRODUCTIVITY; AFRICA.

The proceedings of an international workshop on biological control and host plant resistance to control the cassava mealybug and green mite in Africa are presented. The workshop took place in Ibadan, Nigeria, in 1982. General topics include distribution, economic importance, and biological control of both Phenacoccus manihoti and Mononychellus tanajoa. Taxonomy, biology, natural enemies, host plant resistance, and potential biocontrol of both pests are also covered. (CIAT)

0048

32013 HIEBSCH, C.; O'HAIR, S.K. 1986. Major domesticated food crops. In Hansen, A.; McMillan, D.E., eds. Food in Sub-Saharan Africa. Boulder, USA, Lynne Rienner Publications Inc. pp.117-206. En., 16 Ref., Il.

CASSAVA; PLANT GEOGRAPHY; MAPS; PRODUCTION; CONSUMPTION; COMPOSITION; ANALYSIS; CULTIVATION; HCN CONTENT; PROCESSING; USES; AFRICA.

The nutritional characteristics, geographical distribution, and production requirements and constraints of the major food crops in Africa are reviewed, both by category (cereal grains, farinaceous crops, and legume grains) and by individual species. Cassava is among the specific food crops discussed; over 1/3 of the world distribution is now in Africa, the largest producing country being Zaire followed by Nigeria and Tanzania. General cultural practices and processing are briefly described. Several food products are mentioned. The geograhical distribution of these crops was found to depend on cultural preferences and adaptation of the crop to ecological zones (rainfall, temp., and soils). Root crops, principally cassava, and bananas and plantains are the major staples in the wetter regions. (CIAT)

0049

26881 HODGES, R.J. 1986. THE BIOLOGY AND CONTROL OF PROSTEPHANUS TRUNCATUS (HORN) (COLEOPTERA: BOSTRICHIDAE). A DESTRUCTIVE STORAGE PEST WITH AN INCREASING RANGE. JOURNAL OF STORED PRODUCTS RESEARCH 22(1):1-14. EN., SUM. EN., 87 REF. (TROPICAL DEVELOPMENT & RESEARCH INST., STORAGE DEPT., LONDON ROAD, SLOUGH, BERKSHIRE SL3 7HL, ENGLAND)

CASSAVA; PROSTEPHANUS TRUNCATUS; INSECT BIOLOGY; STORAGE; DRIED ROOTS; AFRICA.

A COMPREHENSIVE REVIEW IS PRESENTED ON THE BIOLOGY AND CONTROL OF PROSTEPHANUS TRUNCATUS, A MAJOR PEST OF FARM-STORED MAIZE AND DRIED CASSAVA. ORIGINALLY INDIGENOUS TO MEXICO AND CENTRAL AMERICA, P. TRUNCATUS HAS RECENTLY BEEN INTRODUCED AND BECOME ESTABLISHED IN PARTS OF EAST AND WEST AFRICA WHERE IT HAS CAUSED SEVERE DAMAGE TO FARM-STORED MAIZE. IT CAN CAUSE FAR GREATER LOSSES THAN THOSE ASSOCIATED WITH TRADITIONAL STORAGE PESTS. BIOLOGICAL DATA SHOW THAT P. TRUNCATUS HAS THE POTENTIAL TO SPREAD STILL FURTHER IN AFRICA AND TO OTHER TROPICAL AND SUBTROPICAL REGIONS. EVERY EFFORT SHOULD BE MADE TO PREVENT THIS HAPPENING. (AS)

0050

31680 IVY, P. 1987. Technical and environmental limitations to increasing food crop production under sub-humid and semi-arid East and Southern African environments and possible solutions. In Holmes, J.C., ed. Improving food crop production on small farms in Africa. Rome, Food and Agriculture Organization of the United Nations. pp.86-99. En., Sum. En., Il.

CASSAVA; CULTIVATION; CULTIVATION SYSTEMS; HARVESTING; TIMING; ECOLOGY; SOIL REQUIREMENTS; CLIMATIC REQUIREMENTS; WATER REQUIREMENTS (PLANT); TECHNOLOGY EVALUATION; PRODUCTIVITY; COSTS; AFRICA.

Technical and environmental limitations to increasing food crop production under sub-humid and semi-arid East and Southern African environments are discussed, and possible solutions proposed. Major technical problems are limited application of manure and fertilizers and inadequate plowing depth and planting dates; environmental constraints are inadequate growing season length, drought periods during the growing season, soil erosion and fertility. Estimated yield ranges (with constraints) according to the length of the growing period and under low and high input levels are given for 7 of the more important food crops in the region, including cassava. General feasible solutions discussed for increasing food crop production in

the region include breeding for drought resistance; intercropping/alley cropping; use of manure, compost, and inorganic fertilizers; mechanical and vegetative protection of arable land; soil moisture conservation; and fully integrated farming systems. (CIAT)

0051

30506 JENNINGS, D.L. 1987. Host-virus relationships of resistant cassava and ACMV, and some implications for breeding and disease control ldp Abidjan, Cote d'Ivoire. In Séminaire International La Mosaique Africaine du Manioc et son Controle, Cote d'Ivoire, 1987. Résumés. Institut Francais de Recherche Scientifique pour le Développement en Cooperation. p.48. En. (Scottish Crop Research Inst., Invergowrie, Dundee DD2 5DA, UK)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; RESISTANCE; SELECTION; PLANT BREEDING; AFRICA.

Conclusions drawn with regard to the implications of host-virus relationships of resistant cassava and CAMV are given. A component of host plant resistance to the virus was the ability to localize the virus in basal parts of the plant. Symptom-free infected plants were almost impossible to be distinguished from uninfected plants. The possibility also exists that a cutting from a symptom-free plant exposed to infection could give symptom-bearing plants. Abnormal differentiation within the plant could contribute to low yields associated with plants raised from infected planting material. Screening for yield could result in tolerant selections. The importance of an adequate management of newly bred cassava cv. is stressed. (CIAT)

0052

31670 JUMAH, A. 1988. Prospects for cassava in domestic and international markets. Laxenburg, Austria, International Institute for Applied Systems Analysis. 22p. En., 26 Ref., Il. (Inst. of Agricultural & Nutritional Economics, Agricultural Univ. of Vienna, Peter Jordan-Strasse 82, A-1190 Vienna, Austria)

CASSAVA; MARKETING; TRADE; ECONOMICS; TECHNOLOGY TRANSFER; PRODUCTION; MAPS; STATISTICAL DATA; USES; CONSUMPTION; AFRICA; SOUTH AMERICA; NORTH AMERICA; CARIBBEAN; ASIA; OCEANIA.

The role of cassava in both developing and developed countries and the implications for technological development in cassava producing countries are reviewed, so as to serve as a policy guide for both the agricultural and industrial sectors of the developing producing countries. It is concluded that cassava cultivation should be encouraged through the provision of economic incentives in countries where the crop has a comparative advantage, with major investments in infrastructure and appropriate technology as well as new initiatives by commercial traders and bankers. Domestic marketing, distribution, and processing would have to be supported financially. The role of technology in cassava production cannot be overemphasized, as it would improve the efficiency of labor involved in cassava production as well as cassava yield and quality. Cassava export prospects exist both in the EEC with the recent entry of Spain and Portugal, and in the USSR where grain production is erratic due to climatic reasons, in Japan and in the newly industrialized countries of South Korea and Taiwan. (CIAT)

0053

26858 KWATIA, J.T. 1986. CASSAVA: STORAGE, PROCESSING AND UTILIZATION. IBADAN, NIGERIA, INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE. 34P. EN., 20 REF., IL. PAPER PRESENTED AT IITA-UNICEF CONSULTATION THE PROMOTION OFHOUSEHOLD FOOD PRODUCTION AND NUTRITION, IBADAN, NIGERIA, 1986.

CASSAVA; SMALL-SCALE PROCESSING; SMALL-SCALE EQUIPMENT; DRYING; CASSAVA FLOUR; COSTS; FACTORIES; LABOR; SOCIOECONOMIC ASPECTS; PRICES; AFRICA.

THE PROSPECTS FOR THE SUCCESSFUL STORAGE, PROCESSING, AND UTILIZATION OF CASSAVA IN AFRICAN COUNTRIES ARE ANALYZED. THE PRESENT INDIGENOUS PROCESSINGTECHNOLOGIES AVAILABLE TO PREVENT POSTHARVEST LOSSES ARE DESCRIBED REGARDING DRYING AND DRY PRODUCTS (CF) WITH OR WITHOUT FERMENTATION, PRODUCTS BASED ON FERMENTED CASSAVA DOUGH (E.G., GARI), AND MINOR PROCESSING TECNOLOGIES (E.G., STARCH AND TAPIOCA). THE MAJOR PROBLEM IN THE PRODUCTION OF CF AND GARI USING TRADITIONAL METHODS IS THE ABSENCE OF IMPROVED TECHNOLOGY FOR DRYING THE CHIPPED OR RASPED MATERIAL. IMPROVED DRYING TECHNOLOGIES ARE BRIEFLY DESCRIBED AND ILLUSTRATED. THESE INCLUDE SOLAR DRYERS AND CONVECTION DRYERS. THE EXPANSION OF CASSAVA UTILIZATION TO NONTRADITIONAL AREAS IS DISCUSSED. ITS USE FOR HUMAN CONSUMPTION, ANIMAL FEED, AND INDUSTRIAL PRODUCTS IS CONSIDERED. THE USE OF CASSAVA THROUGH INTRODUCTION OF IMPROVED TECHNOLOGIES INTO THE INFORMAL INDUSTRIAL SECTOR AND THE ROLE WOMEN PLAY IN THIS PROCESS ARE DISCUSSED. A CASE STUDY OF SMALL-SCALE CF PRODUCTION IN GHANA IS DESCRIBED. RECOMMENDATIONS ARE GIVEN PERTAINING TO CASSAVA PROCESSING AND UTILIZATION IN THE MAIN CASSAVA-PRODUCING COUNTRIES IN AFRICA. (CIAT)

0054

29437 MACFARLANE, D. 1984. KEY TO SPIDER MITES (TETRANYCHIDAE) RECORDED ON CASSAVA IN AFRICA, WITH A NOTE ON SLIDE PREPARATION. IN GREATHEAD, A.H.; MARKHAM, R.H.; MURPHY, R.J.; MURPHY, S.T.; ROBERTSON, I.A.D., EDS. INTEGRATED PEST MANAGEMENT OF CASSAVA GREEN MITE; REGIONAL TRAINING WORKSHOP IN EAST AFRICA, 1984. PROCEEDINGS. ASCOT, UNITED KINGDOM, COMMONWEALTH INSTITUTE OF BIOLOGICAL CONTROL. PP.31-35. EN., 2 REF., IL.

CASSAVA; INSECT BIOLOGY; INJURIOUS MITES; EUTETRANYCHUS OLIGONYCHUS; MONONYCHELLUS; TETRANYCHUS; AFRICA.

A TAXONOMICAL KEY THAT ALLOWS THE DIFFERENTIATION OF AFRICAN SPIDER MITES, RECORDED IN CASSAVA, FROM OTHER COMMON SPECIES THAT PROBABLY ALSO INFEST THIS CROP IN AFRICA IS PRESENTED. SPIDER MITES INCLUDE SPECIES OF THE FOLLOWING GENERA: EUTETRANYCHUS, OLIGONYCHUS, MONONYCHELLUS, AND TETRANYCHUS. SPECIMEN PREPARATION PROCEDURES FOR EXAMINATION ARE GIVEN. (CIAT)

0055

25527 MICHE, J.C. 1981. FAO MISSION ON THE HARVESTING, PROCESSING AND USE OF CASSAVA IN THAILAND AND IN AFRICA. IN WORKSHOP ON PROCESSING TECHNOLOGIES FOR CASSAVA AND OTHER TROPICAL ROOTS AND TUBERS IN AFRICA, ABIDJAN, IVORY COAST, 1983. PROCEEDINGS. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.1,PP.15-32. EN., SUM. FN.

AFRICA; ALCOHOL; ASIA; CAMEROON; CASSAVA CHIPS; CASSAVA FLOUR; CASSAVA MEAL; CASSAVA PASTES; CASSAVA PRODUCTS; CASSAVA STARCH; CONGO; CULTIVARS; CULTIVATION; DEVELOPMENT; DRIED ROOTS; ETHANOL; FEEDS AND FEEDING; FERMENTED PRODUCTS; FOOD PRODUCTS; FOOFOO; GARI; GHANA; IVORY COAST; MARKETING; MECHANIZATION; PELLETS; PROCESSED PRODUCTS; PROCESSING; PRODUCTION; RESEARCH; STORAGE; THAILAND; TOGO; TRADE; USES.

INFORMATION ON PROBLEMS EXISTING IN THE CASSAVA SECTOR IN THAILAND AND IVORY COAST, GHANA, TOGO, CAMEROON, AND CONGO IS GIVEN. PROBLEMS RELATED TO PRODUCTION, UTILIZATION, PROCESSING, MARKETING, RESEARCH, AND DEVELOPMENT OF CASSAVA PRODUCTS IN THAILAND ARE REVIEWED. IN IVORY COAST, THERE IS AN AGROINDUSTRIAL COMPLEX FOR THE PROCESSING OF DRY ATIEKE AND CF. THE MECHANIZATION PROBLEMS OF THE INDUSTRIAL CULTIVATION AND HARVESTING OF CASSAVA SEEM TO HAVE BEEN RESOLVED. THE PROBLEMS OF SMALL MATERIAL FOR MECHANIZED CASSAVA PROCESSING IN GHANA AND TOGO ARE DISCUSSED; THESE ARE

ATTRIBUTED TO THE SHORTAGE OF CASSAVA DURING THAT TIME OF THE YEAR DUE TO DROUGHT, BUSHFIRES, AND DISEASES. SHORTAGE OF CASSAVA WAS ALSO OBSERVED IN CAMEROON; HOWEVER, TRADITIONAL FOOD PRODUCTS (GARI AND CASSAVA STICKS) ARE BEING PROCESSED ON A SEMI-INDUSTRIAL LEVEL. A COMPREHENSIVE DESCRIPTION IS GIVEN ON THE FOOFOO FLOUR PRODUCTION PLANT IN MANTSOUMBA, CONGO, WHICH HAS A PRODUCTION CAPACITY OF 400 KG FLOUR/H. FINALLY, CONCLUSIONS AND RECOMMENDATIONS ARE GIVEN.

0056

25528 MICHE, J.C. 1981. POTENTIAL IMPROVEMENTS OF CASSAVA PROCESSING TECHNOLOGIES IN AFRICA. IN WORKSHOP ON PROCESSING TECHNOLOGIES FOR CASSAVA AND OTHER TROPICAL ROOTS AND TUBERS IN AFRICA, ABIDJAN, IVORY COAST, 1983. PROCEEDINGS. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.1,PP.33-40. EN., SUM. EN.

AFRICA; CASSAVA MEAL; CASSAVA PASTES; CASSAVA PRODUCTS; DEVELOPMENT; FOOD PRODUCTS; FOOFOO; GARI; INDUSTRIALIZATION; PROCESSED PRODUCTS; PROCESSING; SMALL-SCALE PROCESSING; USES.

THE POSSIBILITIES OF IMPROVING THE TRADITIONAL TECHNOLOGIES OF CASSAVA PROCESSING, AT THE VILLAGE AND INDUSTRIAL LEVELS, IN AFRICA, ARE DISCUSSED AND ANALYZED. SOME RECOMMENDATIONS ARE GIVEN.

0057

29495 MYERS, N. 1986. ECONOMICS AND ECOLOGY IN THE INTERNATIONAL ARENA: THE PHENOMENON OF LINKED LINKAGES. AMBIO 15(5):296-300. EN., 36 REF., IL.

CASSAVA; ECONOMICS; ECOLOGY; TRADE; DEVELOPMENT COSTS; CASSAVA PROGRAMS; EROSION; AMERICA; AFRICA; ASIA; OCEANIA; EUROPE.

ILLUSTRATIVE EXAMPLES OF HOW ECONOMIC PHENOMENA EXERT ECOLOGICAL EFFECTS IN REMOTE SITES (LINKED LINKAGES) ARE PRESENTED. THE CASE OF CASSAVA IS BRIEFLY COVERED TO EXPLAIN HOW THAILAND'S SIGNIFICANT SHARE IN CASSAVA EXPORTS TO THE EEC IS AFFECTING THE ECOLOGY OF THE COUNTRY IN PLACES WHERE A RAPID DECLINE IN THE FOREST COVER IS OCCURRING DUE TO EXPANDING CASSAVA CULTIVATION, AND WHERE ENVIRONMENTAL REPERCUSSIONS, SUCH AS SOIL EROSION AND NUTRIENT IMPOVERISHMENT AND DISRUPTION OF WATER SYSTEMS, ARE MOST SEVERE. (CIAT)

0058

32015 NAIGEON, C. 1983. Foufou amer ou foufoudou: deux produits, deux procédés, des arbitrages difficiles. (Bitter foofoo or foofoodou: two products, two procedures, a difficult choice). Inter Tropiques Agriculture 1983:10-11. Fr., Il.

CASSAVA; INDUSTRIALIZATION; FOOFOO; SWEET CASSAVA; AFRICA.

Steeping is considered a suitable method for moist conservation of cassava. The procedure for foofoo obtention (usually from bitter var.) is described and its disadvantages (i.e. smell and color problems with time) are mentioned. Foofoo from sweet var. does not show these problems; however, its handling is difficult and its yields are low, 2 constraints for the development of sweet cassava crops. Research results indicated that sweet var. Ombété was suitable for foofoo obtention; no steeping but just the addition of monoglycerides was necessary. In spite of these results, the establishment of a factory for the production of monoglycerides raises the problem of substituting industrial complexes such as Mantsumba in Congo and others in Cameroon and the Central African Republic. (CIAT)

0059

30806 NEUENSCHWANDER, P.; HENNESSEY, R.D.; HERREN, H.R. 1987. Food web of insects associated with the cassava mealybug, Phenacoccus manihoti Matile-Ferrero (Hemiptera: Pseudococcidae), and its introduced parasitoid, Epidinocarsis lopezi (De Santis) (Hymenoptera:Encyrtidae), in Africa. Bulletin of Entomological Research 77(2):177-189. En., Sum. En., 39 Ref., Il. (International Inst. of Tropical Agriculture, P.M.B. 5320, Ibadan, Nigeria)

CASSAVA; PHE' COCCUS MANIHOTI; PREDATORS AND PARASITES; MAPS; AFRICA.

About 130 species of parasitoids and predators are reported, most of them for the 1st time, to be associated directly or indirectly with the cassava pest Phenacoccus manihoti and its parasitoid, Epidinocarsis lopezi, newly introduced into Africa as a biological control agent. About 20 species are common. The species are grouped in 11 guilds, which include the indigenous hyperparasitoids, which originally attacked parasitoids of other mealybugs, the predators with which E. lopezi competes for the same food source, and their antagonists. (AS)

0060

32006 NUSBAUM, S.J. 1973. Projects d'ensemble de développement du manioc . (Joint projects on cassava development). Bulletin d'Information du Centre de Conjuncture Africaine et Malgache no.129:1-3. Fr.

CASSAVA; CASSAVA PROGRAMS; AFRICA.

The importance of cassava in both human and animal feeding and industry as well as Thailand's achievement in exporting important amounts of such product to Europe are highlighted. General remarks on the reasons for failure of other producing countries to introduce cassava in the European market are given and discussed. The different components of a program oriented towards cassava development and commercialization are suggested and explained. Finally, some recommendations on other aspects to be taken into account for successful cassava plans in almost every developing country are given. (CIAT)

0061

25531 NYANIN, O.O. 1981. ECONOMIC FEASIBILITY OF CASSAVA IN COMPOUND ANIMAL FEEDS IN AFRICA. IN WORKSHOP ON PROCESSING TECHNOLOGIES FOR CASSAVA AND OTHER TROPICAL ROOTS AND TUBERS IN AFRICA, ABIDJAN, IVORY COAST, 1983. PROCEEDINGS. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.1,PP.51-55. EN., 3 REF.

AFRICA; ANIMAL NUTRITION; COSTS; ECONOMICS; FEEDS AND FEEDING; PRICES; STORAGE; USES.

THE USE OF CASSAVA IN ANIMAL FEEDING IS BRIEFLY REVIEWED AND AN ECONOMIC ANALYSIS OF THE FEASIBILITY OF CASSAVA REPLACEMENT FOR MAIZE IN COMPOUND FEEDS IN AFRICA IS MADE. THE POTENTIAL EXISTS, BUT ONLY COUNTRY-SPECIFIC FEASIBILITY STUDIES WITH UPDATED RELEVANT DATA CAN TRULY ASCERTAIN THE FEASIBILITY SINCE THE AVAILABILITY AND PRICES OF CASSAVA, OTHER CEREAL SUBSTITUTES, AND MAJOR PROTEIN SOURCES VARY FROM ONE COUNTRY TO THE OTHER.

0062

30471 OTENG-GYANG, K.; MBACHU, J.I. 1987. Changes in the ascorbic acid content of some tropical leafy vegetables during traditional cooking and local processing. Food Chemistry 23(1):9-17. En. Sum. En., 11 Ref., Il. (CESTAM International, 2 Res. Chateau de Courcelle, 160 Avenue de General Leclerc, 91190 Gif-Sur-Ivette, France)

CASSAVA; CASSAVA LEAVES (VEGETABLE); ASCORBIC ACID; COOKING; PROCESSING; AFRICA.

The ascorbic acid content of 6 tropical leafy vegetables (Vernonia amygdalina, Pterocarpus soyauxii, Manihot esculenta, Xanthosoma sagittifolium, Colocasia esculenta, and Amaranthus hybridus) and changes in the vitamin content during traditional West African cooking were measured. Cassava ascorbic acid content ranged from 32.9 to 35.0, 27.7 to 28.1, 18.4 to 22.0, and 5.8 to 7.5 mg/100 g fresh wt. for 0, 5, 10, and 15 min cooking time. Ascorbic acid loss during cooking is also recorded. (CIAT)

0063

31340 PRIOUL, C. 1960. Notes sur la diffusion du manioc dans la partie centrale du territoire Centrafricain. (Notes on cassava dissemination in the central part of the Central African territory). Bangui, Central African Republic, 9p. Fr., 5 Ref.

CASSAVA; HISTORY; AFRICA.

A bibliographic review on the development of cassava cultivation in the central part of the Central African territory and the role played by the different ethnic groups on its dissemination are presented. Two hypotheses on the precolonial spreading of the crop in the area are presented, analyzed, and discussed. The 1st concerns cassava introduction by commercial relationships and the 2nd, cassava introduction by means of mass migration. Finally, it is stated that this tuber crop has become an important staple since the 20th century, and has played an important role in conjunction with cotton. (CIAT)

0064

28598 RUSSEL, N. 1984. BIOTECHNOLOGY IN ACTION: THE CASE OF CASSAVA. CERES NO.102:20-22. EN., IL.

CASSAVA; TECHNOLOGY TRANSFER; TISSUE CULTURE; GERMPLASM; CASSAVA PROGRAMS; RESEARCH; AFRICA.

A BRIEF ACCOUNT IS PRESENTED ON HOW CASSAVA INTERNATIONAL AND NATIONAL RESEARCH AND TECHNOLOGY TRANSFER EFFORTS IN AFRICA HAVE EVOLVED SINCE 1971. STRATEGIES USED BY THE INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE (NIGERIA) TO ALLEVIATE AFRICA'S FOOD CRISIS (TRANSFER OF IMPROVED CASSAVA GERMPLASM THROUGH TISSUE CULTURE AND STRENGTHENING OF NATIONAL CASSAVA IMPROVEMENT PROGRAMS) ARE STRESSED. (CIAT)

0065

25533 SAKUBU, J. 1981. POINT SUR LES PLANTES A RACINES ET TUBERCULES AMYLACEES AU BURUNDI. (STARCHY ROOT AND TUBEROUS PLANTS IN BURUNDI). IN WORKSHOP ON PROCESSING TECHNOLOGIES FOR CASSAVA AND OTHER TROPICAL ROOTS AND TUBERS IN AFRICA, ABIDJAN, IVORY COAST, 1983. PROCEEDINGS. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.95-111. FR.

AFRICA; CASSAVA CHIPS; CASSAVA FLOUR; CASSAVA MEAL; CASSAVA PASTES; CASSAVA PRODUCTS; CULTIVARS; DRIED ROOTS; ECONOMICS; FEEDS AND FEEDING; FERMENTATION; FOOD PRODUCTS; HUMAN NUTRITION; POSTHARVEST LOSSES; PROCESSED PRODUCTS; PROCESSING; PRODUCTION; PRODUCTIVITY; PROTEIN ENRICHMENT; RESEARCH; ROOT CROPS; STORAGE; USES.

THE SITUATION OF ROOT AND TUBER CROPS IN BURUNDI IS PRESENTED. THEIR PRODUCTION, YIELD, POSTHARVEST LOSSES, PRICES, AND NUTRITIVE CONTRIBUTION TO HUMAN NUTRITION (30, 11, AND 9 PERCENT OF THE CALORIES, PROTEIN, AND FAT INTAKE, RESP.) ARE DISCUSSED IN RELATION TO CEREALS, LEGUMES, OILSEEDS, BANANAS, AND OTHERS. CASSAVA TECHNOLOGY IS ANALYZED, AND THE PROCESSES FOR

THE PRODUCTION OF CHIPS, FLOUR, AND PASTES ARE DESCRIBED. RESEARCH PRIORITIES REGARDING CASSAVA AND SWEET POTATO ARE INDICATED AND THE PROJECT FOR THE PROTEIN ENRICHMENT OF CASSAVA AND ITS USE IN HUMAN AND ANIMAL NUTRITION IS PRESENTED.

0066

32023 SCHMIDT-LEPLAIDEUR, M.A. 1986. Le manioc en danger. (Cassava in danger). Inter Tropiques no.18:14-17. Fr., Sum. Fr., 4 Ref., Il.

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; RESISTANCE; RESEARCH; AFRICA; CIAT-2.

Various aspects of cassava cultivation in Africa are reviewed, namely its origin and importance as a food crop, uses and processed products, adaptation, cultivation methods, cultural practices, cultivation systems, attempts at mechanization and industrialization, and yields. Diseases (CAMD and CBB) and pests (Phenacoccus manihoti and Mononychellus tanajoa) were found to be the major constraints to cassava production in Africa. Research carried out by some institutes (among them CIAT) to solve these problems are mentioned. (CIAT)

0067

26873 SMITH, N. 1985. A PLAGUE ON MANIOC. GEOGRAPHICAL MAGAZINE 57(10):539-540. EN., IL.

CASSAVA; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; APOANAGYRUS LOPEZI; DIOMUS; INJURIOUS MITES; AFRICA.

TWO THREATS TO CASSAVA, PHENACOCCUS MANIHOTI AND MONONYCHELLUS TANAJOA, IN AFRICA, WHERE THIS CROP IS A STAPLE FOOD FOR 200 MILLION PEOPLE, ARE REPORTED. MEALYBUGS MAY REDUCE TUBER YIELDS BY UP TO 80 PERCENT AND CAUSE REDUCTION OF THE LEAF COVER, A VALUABLE SOURCE OF PROTEIN. THE GREEN SPIDER MITE HAS LED TO AN AV. 30 PERCENT YIELD DROP IN CASSAVA FIELDS ACROSS THE CONTINENT. TRIAL RELEASES OF THE INTRODUCED PREDATORS APOANAGYRUS LOPEZI AND DIOMUS SP. HAVE BEEN ENCOURAGING AND A MULTINATIONAL PROGRAM OF BIOLOGICAL CONTROL HAS BEEN LAUNCHED. THE DEVELOPMENT OF GENETIC RESISTANCE HAS BEEN SUCCESSFUL: A NO. OF CLONES WITH PUBESCENT LEAVES, A PHYSIOLOGICAL DEFENSE MECHANISM, HAVE BEEN IDENTIFIED. THE INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE HAS DEVELOPED A CASSAVA VAR. THAT RESISTS MEALYBUGS AND SPIDER MITES, PRODUCES GOOD QUALITY FLOUR, AND IS HIGH YIELDING. SOON IT WILL BE RELEASED TO FARMERS. THE CRUCIAL ROLE OF GENE BANKS FOR THE IMPROVEMENT OF CROPLAND YIELD AND STABILITY IS STRESSED. (CIAT)

0068

28535 WALTERS, P.R. 1987. INDUSTRIAL USES OF CASSAVA. COURIER NO.101:74-77. EN., SUM. EN., IL. (MARKETING & ECONOMIC DEPT. OF THE TROPICAL DEVELOPMENT & RESEARCH INST., LONDON, ENGLAND)

CASSAVA; INDUSTRIALIZATION; STATISTICAL DATA; TRADE; CASSAVA STARCH; FEEDS AND FEEDING; FRUCTOSE; AMERICA; AFRICA; ASIA; OCEANIA; EUROPE.

THE MAIN INDUSTRIAL USES OF CASSAVA IN THE WORLD ARE DESCRIBED, WITH INDICATIONS ON THE WORLD TRADE OF THESE PRODUCTS. THE BALANCE OF CASSAVA PRODUCTION IS PROCESSED AND USED INDUSTRIALLY FOR THE MANUFACTURE OF COMPOUND ANIMAL FEED, ESPECIALLY IN THE EEC (MAINLY IMPORTED FROM THAILAND), AND OF CASSAVA STARCH (THE MAIN PRODUCERS BEING INDONESIA AND THAILAND FOLLOWED BY BRAZIL) FOR USE IN THE FOOD, TEXTILE, AND PAPER INDUSTRIES. CASSAVA STARCH IS ALSO USED IN THE MANUFACTURE OF PLYWOOD, VENEER, ADHESIVES, GLUCOSE, AND DEXTRINE. OTHER USES BRIEFLY DISCUSSED ARE THE PRODUCTION OF ETHANOL, SCP, AND HIGH FRUCTOSE SWEETENERS. (CIAT)

0069

32235 WILLIAMS, D.J. 1986. Mealybugs (Homoptera: Pseudococcidae) on cassava with special reference to those associated with wild and cultivated cassava in the Americas. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. pp.49-56. En., 6 Ref. (Commonwealth Inst. of Entomology, c/o British Museum (Nat. Hist.) Cromwell Road, London, U.K)

CASSAVA; PHENACOCCUS MANIHOTI; PHENACOCCUS; MANIHOT; ENTOMOLOGY; AMERICA; AFRICA.

A review of mealybug species found on cassava is presented with special reference to those associated with wild and cultivated cassava in the Americas. The mealybug species collected in different countries and Manihot species include Phenacoccus manihoti, P. herreni, P. madeirensis, Phenacoccus sp. near gossyppii, Ferrisia virgata, Ferrisia sp., and Nipaecoccus nipae. Others were Nipaecoccus sp., Hypogeococcus sp., Paracoccus sp., Pseudococcus elisae, P. longispinus, P. obscurus, Pseudococcus sp. near obscurus, a genus near Pelicoccus, Puto sp., Dysmicoccus brevipes, D. bispinosus, Maconellicoccus hirsutus, and Planococcus citri. (CIAT)

0070

27655 WODAGENEH, A. 1985. CASSAVA AND CASSAVA PESTS IN AFRICA. FAO PLANT PROTECTION BULLETIN 33(3):101-108. EN., SUM. EN., FR., ES., 28 REF., IL. (IITA, OYO ROAD, P.M.B., IBADAN, NIGERIA)

CASSAVA; PLANT GEOGRAPHY; PESTS; PEST CONTROL, BIOLOGICAL CONTROL; TECHNOLOGY TRANSFER; PHENACOCCUS MANIHOTI; AFRICA.

THE ORIGIN, DISTRIBUTION, ADAPTATION, AND USES OF CASSAVA AND ITS BY-PRODUCTS ARE OUTLINED, AS WELL AS FIELD PROBLEMS ASSOCIATED WITH THE CROP, SUCH AS WEEDS, BACTERIA, FUNGI, AND NEMATODES, IN AFRICA. THE PROBLEM OF THE CASSAVA MEALYBUG, A MAJOR PEST, IS DISCUSSED AND ITS EFFECT ON YIELD LOSSES INDICATED. REMEDIAL INTERNATIONAL AND COOPERATIVE ACTION NOW IN PROGRESS AND THE PRESENT STATUS OF BIOLOGICAL CONTROL AND TRAINING NEEDS ARE DESCRIBED. A SCHEDULE FOR ACHIEVING CONTROL TARGETS IS INDICATED. (AS)

0071

31672 ZOLTY, A. 1986. L'agro alimentaire en Afrique. La croisée des chemins. (Food and agricultural industry in Africa. Crossroads). Marchés Tropicaux et Méditerranéens 42(2144):3159-3164,3167-3169. Fr., Il.

CASSAVA; INDUSTRIALIZATION; GARI; AFRICA.

Due to the inexistence of factories for processing locally produced raw material a domestic food and agricultural industry in Africa is promoted by a partnership between French and African managers. The Groupe Recherche Industrie pour le Développement de l'Agro-alimentaire Méditérranéen et Tropical (GRIMADET) designed a pilot program for the semi-industrial processing of cassava into gari in Togo. General characteristics of the program are described and the interest of several countries such as Benin, Ghana, and Nigeria is highlighted. Factors involved in the success of this project are also mentioned. A partnership between another French enterprise and the Institut de Technologie Tropicale of Ivory Coast developed procedures for the processing of CF. (CIAT)

ANGOLA

0072

30449 A MANDIOCA no mercado alemao. (Cassava in the German market). Gazeta do Agricultor 13(149):311. 1961. Pt.

CASSAVA; CASSAVA FLOUR; STATISTICAL DATA; TRADE; FEDERAL REPUBLIC OF GERMANY.

Statistical data on Germany imports of cassava roots and flour during 1960 are given. From the 21,000 t of cassava roots imported, 17,400 came from Angola and 300 from Portugal, representing almost 85 percent of total imports. Regarding to supply of CF, Thailand and Indonesia were the 2 major providers, with 115,700 and 112,000 t, resp., from a total of 302,000 t imported. Zaire, Tanzania, Zimbabwe, Angola, and Kenya accounted for 31,000, 10,500, 900, 500, and 200 t, resp. The value of such imports is also included. (CIAT)

0073

31087 EXPORTACAO DOS principais produtos originários da agricultura (Janeiro-Setembro): farinha e fuba de mandioca. (Export of the main agricultural products (January-September): cassava flour and cassava meal). Boletim Trimestral (Angola) no.53:20. 1971. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; TRADE; CASSAVA FLOUR; CASSAVA MEAL; ANGOLA.

Data on total amount and value of CF and CM, among other products, exported by Angola during 1969 and 1970 are given. Exports of these products amounted to 5279 and 3773 t, resp. (CIAT)

0074

31456 MANDIOCA. (Cassava). Gazeta do Agricultor 22(250):221. 1970. Pt.

CASSAVA; TRADE; STATISTICAL DATA; ANGOLA; THAILAND; INDONESIA; FEDERAL REPUBLIC OF GERMANY.

Data on total value of cassava imported by the Federal Republic of Germany during 1969 are given. Roots were imported from Angola, pellets from Thailand, and chips from Indonesia. (CIAT)

0075

30432 INSTITUTO DE INVESTIGAÇAO AGRONOMICA DE ANGOLA. 1972. Seccao da mandioca. (Cassava section). In Instituto de Investigacao Agronómica de Angola. Relatoria de 1972. Angola, p.116. Pt.

CASSAVA; RESEARCH; CASSAVA PROGRAMS; ANGOLA.

The most important research work carried out on cassava at the Instituto de Investigacao Agronómica de Angola is summarized: importation and harvesting of propagation materials from the best local var.; establishment of a cassava collection at the Centro de Estudos de Chianga; harvesting time trial; and reinstallment of the collection at the Centro de Estudos do Gangassol. (CIAT)

0076

30431 INSTITUTO DE INVESTIGACAO AGRONOMICA DE ANGOLA. 1966. Mandioca . (Cassava). In Instituto de Investigacao Agronomica de Angola. Relatorio de 1966. Angola, p.33. Pt.

CASSAVA; RESEARCH; ANGOLA.

Trials carried out in Angola during the 2nd semester of 1966 are mentioned. One dealt with the effects of NPK fertilization on cassava root starch, protein, and HCN contents and another compared 16 cassava var. to determine those with the best qualities and productivity. (CIAT)

0077

30326 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1970. Epocas de sementeiras, e de colheitas, zonas e áreas das principais producoes agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1970. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.117. Pt., Fr., Dat.num.

CASSAVA; PLANTING; HARVESTING; TIMING; ANGOLA.

0078

30176 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1964. Epocas de sementeiras, e de colheitas, zonas e áreas das principais producoes agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1964. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.105. Pt., Fr., Dat.num.

CASSAVA; PLANTING; HARVESTING; TIMING; ANGOLA.

0079

30336 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1951. Epocas de sementeiras, e de colheitas, zonas e áreas das principais producoes agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1950-1951. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.380. Pt., Fr., Dat.num.

CASSAVA; PLANTING; HARVESTING; TIMING; ANGOLA.

0080

30316 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1955. Epocas de sementeiras, e de colheitas, zonas e áreas das principais producoes agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1955. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.100. Pt., Fr., Dat.num.

CASSAVA; PLANTING; HARVESTING; TIMING; ANGOLA.

0081

30319 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1957. Epocas de sementeiras, e de colheitas, zonas e áreas das principais producoes agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1957. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.87. Pt., Fr., Dat.num.

CASSAVA; PLANTING; HARVESTING; TIMING; ANGOLA.

0082

30322 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1954. Epocas de sementeiras, e de colheitas, zonas e áreas das principais producoes agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola.

Anuário Estatístico 1954. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.220. Pt., Fr., Dat.num.

CASSAVA; PLANTING; HARVESTING; TIMING; ANGOLA.

0083

30334 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1956. Epocas de sementeiras, e de colheitas, zonas e áreas das principais producoes agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1956. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.105. Pt., Fr., Dat.num.

CASSAVA; PLANTING; HARVESTING; TIMING; ANGOLA.

0084

30386 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1963. Epocas de sementeiras, e de colheitas, zonas e áreas das principais producoes agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1963. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.92. Pt., Fr., Dat.num.

CASSAVA; PLANTING; HARVESTING; TIMING; ANGOLA.

0085

30376 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1959. Epocas de sementeiras, e de colheitas, zonas e áreas das principais producoes agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1958. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.98. Pt., Fr., Dat.num.

CASSAVA; PLANTING; HARVESTING; TIMING; ANGOLA.

0086

30359 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1972. Epocas de sementeiras, e de colheitas, zonas e áreas das principais producoes agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1972. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.119. Pt., Fr., Dat.num.

CASSAVA; PLANTING; HARVESTING; TIMING; ANGOLA.

0087

30349 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1971. Epocas de sementeiras, e de colheitas, zonas e áreas das principais producoes agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1971. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.119. Pt., Fr., Dat.num.

CASSAVA; PLANTING; HARVESTING; TIMING; ANGOLA.

0088

30383 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1965. Epocas de sementeiras, e de colheitas, zonas e áreas das principais producoes agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola.

Anuário Estatístico 1965. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.105. Pt., Fr., Dat.num.

CASSAVA; PLANTING; HARVESTING; TIMING; ANGOLA.

0089

30371 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1967. Epocas de sementeiras, e de colheitas, zonas e áreas das principais producoes agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1967. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.135. Pt., Fr., Dat.num.

CASSAVA; PLANTING; HARVESTING; TIMING; ANGOLA.

0090

30354 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1968. Epocas de sementeiras, e de colheitas, zonas e áreas das principais producoes agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1968. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.126. Pt., Fr., Dat.num.

CASSAVA; PLANTING; HARVESTING; TIMING; ANGOLA.

0091

30391 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1969. Epocas de sementeiras, e de colheitas, zonas e áreas das principais producoes agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1969. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.126. Pt., Fr., Dat.num.

CASSAVA; PLANTING; HARVESTING; TIMING; ANGOLA.

0092

30364 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1966. Epocas de sementeiras, e de colheitas, zonas e áreas das principais producoes agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1966. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.135. Pt., Fr., Dat.num.

CASSAVA; PLANTING; HARVESTING; TIMING; ANGOLA.

0093

30172 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1961. Exportacao agrícola. (Agricultural exports). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1961. Luanda. pp.174-175. Pt., Dat.num.

CASSAVA; DRIED ROOTS; STATISTICAL DATA; TRADE; PRICES; MOZAMBIQUE; FEDERAL REPUBLIC OF GERMANY; BELGIUM; LUXEMBURG; CONGO; USA; FRANCE; AFRICA; UNITED KINGDOM; NETHERLANDS; ANGOLA.

Statistical data are given on the total amounts and values of different commodities (among them cassava) exported by Angola to different countries during 1952-61. (CIAT)

0094

30169 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1960. Exportacao agrícola. (Agricultural exports). In Instituto Nacional de Estatística. Angola.

Anuário Estatístico 1960. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.154-155. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; DRIED ROOTS; TRADE; PRICES; MOZAMBIQUE; FEDERAL REPUBLIC OF GERMANY; BELGIUM; LUXEMBURG; CONGO; USA; FRANCE; AFRICA; UNITED KINGDOM; NETHERLANDS; ANGOLA.

Statistical data are given on the total amounts (t) and values of different commodities (among them dried cassava) exported by Angola to different countries during 1951-60. (CIAT)

0095

30335 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1951. Exportacao agrícola. (Agricultural exports). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1950-1951. Luanda. pp.440-443. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; CASSAVA MEAL; STATISTICAL DATA; TRADE; PRICES; CAPE VERDE; SAO TOME AND PRINCIPE; MOZAMBIQUE; BELGIUM; LUXEMBURG; ZAIRE; SOUTH AFRICA; FEDERAL REPUBLIC OF GERMANY; FRANCE; CONGO; NETHERLANDS; ANGOLA.

Statistical data are given on the total amounts and values of different commodities (among them cassava roots, CF, and CM) exported by Angola to different countries during 1942-51. (CIAT)

0096

30321 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1954. Exportacao agrícola. (Agricultural exports). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1954. Luanda, Direccao Provincial dos Servicos de Economía e Estatística Geral. pp.322-323,326-327. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; CASSAVA FLOUR; DRIED ROOTS; CASSAVA MEAL; TRADE; PRICES; CAPE VERDE; SAO TOME AND PRINCIPE; BELGIUM; LUXEMBURG; ZAIRE; FEDERAL REPUBLIC OF GERMANY; USA; FRANCE; CONGO; UNITED KINGDOM; NETHERLANDS; ANGOLA.

Statistical data are given on the total amounts and values of different commodities (among them cassava roots, CF, and CM) exported by Angola to different countries during 1945-54. (CIAT)

0097

30318 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1957. Exportacao agrícola. (Agricultural exports). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1957. Luanda, Direccao Provincial dos Servicos de Economía e Estatística Geral. pp.146-147. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; DRIED ROOTS; TRADE; PRICES; FEDERAL REPUBLIC OF GERMANY; BELGIUM; LUXEMBURG; ZAIRE; USA; FRANCE; CONGO; UNITED KINGDOM; NETHERLANDS; ANGOLA.

Statistical data are given on the total amounts and values of different commodities (among them cassava roots) exported by Angola to different countries during 1948-57. (CIAT)

0098

30315 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1955. Exportacao agrícola. (Agricultural exports). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1955. Luanda, Direccao Provincial dos Servicos de Economía e Estatística Geral. pp.168-169. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; DRIED ROOTS; TRADE; PRICES; FEDERAL REPUBLIC OF GERMANY; BELGIUM; LUXEMBURG; ZAIRE; USA; FRANCE; CONGO; UNITED KINGDOM; NETHERLANDS; ANGOLA.

Statistical data are given on the total amounts and values of different commodities (among them cassava roots) exported by Angola to different countries during 1946-55. (CIAT)

0099

30333 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1956. Exportacao agrícola. (Agricultural exports). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1956. Luanda, Direccao Provincial dos Servicos de Economía e Estatística Geral. pp.172-173. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; DRIED ROOTS; TRADE; PRICES; FEDERAL REPUBLIC OF GERMANY; BELGIUM; LUXEMBURG; ZAIRE; USA; FRANCE; CONGO; UNITED KINGDOM; NETHERLANDS; ANGOLA.

Statistical data are given on the total amounts and values of different commodities (among them cassava roots) exported by Angola to different countries during 1947-56. (CIAT)

0100

30366 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1960. Exportacao agrícola. (Agricultural exports). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1959. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.158-159. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; DRIED ROOTS; TRADE; PRICES; FEDERAL REPUBLIC OF GERMANY; BELGIUM; LUXEMBURG; ZAIRE; USA; FRANCE; UNITED KINGDOM; NETHERLANDS; AFRICA; ANGOLA.

Statistical data are given on the total amounts (t) and values of different commodities (among them dried cassava) exported by Angola to different countries during 1950-59. (CIAT)

0101

30373 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1959. Exportacao agrícola. (Agricultural exports). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1958. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.180-181. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; DRIED ROOTS; TRADE; PRICES; MOZAMBIQUE; FEDERAL REPUBLIC OF GERMANY; BELGIUM; LUXEMBURG; CONGO; USA; FRANCE; UNITED KINGDOM; NETHERLANDS; AFRICA; ANGOLA.

Statistical data are given on the total amounts (t) and values of different commodities (among them dried cassava) exported by Angola to different countries during 1953-62. (CIAT)

0102

30385 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1963. Exportacao agrícola. (Agricultural exports). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1963. Luanda, Direccao Provincial dos Servicos de Economía e Estatística Geral. pp.174-175. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; DRIED ROOTS; TRADE; PRICES; MOZAMBIQUE; FEDERAL REPUBLIC OF GERMANY; BELGIUM; LUXEMBURG; CONGO; USA; FRANCE; UNITED KINGDOM; NETHERLANDS; ANGOLA.

Statistical data are given on the total amounts and values of different commodities (among them cassava roots) exported by Angola to different countries during 1954-63. (CIAT)

0103

30341 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1955. Exportacao agrícola. (Agricultural exports). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1952-1953. Luanda, Direccao Provincial dos Servicos de Economía e Estatística Geral. pp.424-425. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; DRIED ROOTS; TRADE; PRICES; FEDERAL REPUBLIC OF GERMANY; BELGIUM; LUXEMBURG; ZAIRE; USA; FRANCE; UNITED KINGDOM; NETHERLANDS; ANGOLA.

Statistical data are given on the total amounts and values of different commodities (among them cassava roots) exported by Angola to different countries during 1944-53. (CIAT)

0104

30378 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1962. Exportacao agrícola. (Agricultural exports). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1962. Luanda, Direccao Provincial dos Servicos de Economía e Estatística Geral. pp.150-151. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; DRIED ROOTS; TRADE; PRICES; FEDERAL REPUBLIC OF GERMANY; BELGIUM; LUXEMBURG; ZAIRE; USA; FRANCE; UNITED KINGDOM; NETHERLANDS; ANGOLA.

Statistical data are given on the total amounts and values of different commodities (among them cassava roots) exported by Angola to different countries during 1949-58. (CIAT)

0105

30342 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1955. Exportacao agrícola. (Agricultural exports). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1952-1953. Luanda, Direccao Provincial dos Servicos de Economía e Estatística Geral. pp.420-421. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; CASSAVA FLOUR; CASSAVA MEAL; TRADE; PRICES; CAPE VERDE; SAO TOME AND PRINCIPE; BELGIUM; LUXEMBURG; ZAIRE; ANGOLA.

Statistical data are given on the total amounts and values of different commodities (among them CF and CM) exported by Angola to different countries during 1944-53. (CIAT)

0106

30175 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1964. Exportacao agrícola, segundo os países de consumo. (Agricultural exports according to consumer countries). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1964. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.172-173. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; CASSAVA ROOTS (VEGETABLE); TRADE; PRICES; MOZAMBIQUE; FEDERAL REPUBLIC OF GERMANY; BELGIUM; LUXEMBURG; CONGO; USA; FRANCE; AFRICA; UNITED KINGDOM; NETHERLANDS; ANGOLA.

Statistical data are given on the total amounts and values of different commodities (among them cassava roots) exported by Angola to different countries during 1955-64. (CIAT)

0107

30363 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1966. Exportacao agrícola, segundo os países de consumo. (Agricultural exports according to consumer countries). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1966. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.218-219. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; CASSAVA ROOTS (VEGETABLE); TRADE; PRICES; MOZAMBIQUE; FEDERAL REPUBLIC OF GERMANY; BELGIUM; LUXEMBURG; CONGO; USA; FRANCE; AFRICA; UNITED KINGDOM; NETHERLANDS; ANGOLA.

Statistical data are given on the total amounts and values of different commodities (among them cassava roots) exported by Angola to different countries during 1957-66. (CIAT)

0108

30382 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1965. Exportacao agrícola, segundo os países de consumo. (Agricultural exports according to consumer countries). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1965. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.176-177. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; CASSAVA ROOTS (VEGETABLE); TRADE; PRICES; MOZAMBIQUE; FEDERAL REPUBLIC OF GERMANY; BELGIUM; LUXEMBURG; CONGO; USA; FRANCE; AFRICA; UNITED KINGDOM; NETHERLANDS; ANGOLA.

Statistical data are given on the total amounts and values of different commodities (among them cassava roots) exported by Angola to different countries during 1956-65. (CIAT)

0109

30370 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1967. Exportacao agrícola, segundo os países de consumo. (Agricultural exports, according to consumer countries). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1967. Luanda, Direccao Provincial dos Servicos de Economía e Estatística Geral. pp.220-221. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; CASSAVA ROOTS (VEGETABLE); TRADE; PRICES; MOZAMBIQUE; FEDERAL REPUBLIC OF GERMANY; BELGIUM; LUXEMBURG; CONGO; USA; FRANCE; UNITED KINGDOM; NETHERLANDS; ANGOLA.

Statistical data are given on the total amounts and values of different commodities (among them cassava) exported by Angola to different countries during 1958-67. (CIAT)

0110

30330 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1970. Precos médios de retalho de produtos alimentares, de produtos para aquecimento, de iluminacao e de higiene, na cidade de Luanda. (Mean retail prices of food produts, heating, lights, and sanitation products in the city of Luanda). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1970. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.248. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; PRICES; ANGOLA.

0111

30387 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1969. Precos médios de retalho de produtos alimentares de produtos para aquecimento de iluminacao e de higiene na cidade de Luanda. (Mean retail prices of food products, heating, lights, and sanitation products in the city of Luanda). In

Instituto Nacional de Estatística. Angola. Anuário Estatístico 1969. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.256-257. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; PRICES; TAPIOCAS; ANGOLA.

0112

30347 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1971. Precos médios de retalho de produtos alimentares, de produtos para aquecimento, de iluminacao e de higiene, na cidade de Luanda. (Mean retail prices of food products, heating, lights, and sanitation products in the city of Luanda). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1971. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.250. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; PRICES; ANGOLA.

0113

30346 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1971. Precos médios de retalho de produtos alimentares, de produtos para aquecimento, de iluminacao e de higiene, na cidade de Luanda. (Mean retail prices of food products, heating, lights, and sanitation products in the city of Luanda). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1971. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.251. Pt., Fr., Dat.num.

CASSAVA; STATISTICAL DATA; PRICES; TAPIOCAS; ANGOLA.

0114

30356 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1972. Precos médios de retalho de produtos alimentares, de produtos para aquecimento, de iluminacao e de higiene, na cidade de Luanda. (Mean retail prices of food products, heating, lights, and sanitation products in the city of Luanda). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1972. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.243-244. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; PRICES; TAPIOCAS; ANGOLA.

0115

30173 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1964. Precos médios de retalho de produtos alimentares e de higiene na cidade de Luanda. (Mean retail prices of food and sanitation products in the city of Luanda). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1964. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.216. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; PRICES; TAPIOCAS; ANGOLA.

0116

30170 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1961. Precos médios de retalho de produtos alimentares e de higiene na cidade de Luanda. (Mean retail prices of food and sanitation products in the city of Luanda). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1961. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.238. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; PRICES; TAPIOCAS; ANGOLA.

0117

30351 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1968. Precos médios de retalho de produtos alimentares e de higiene na cidade de Luanda. (Mean retail prices of food and sanitation products in the city of Luanda). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1968. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.252-253. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; PRICES; TAPIOCAS; ANGOLA.

0118

30380 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1965. Precos médios de retalho de produtos alimentares e de higiene na cidade de Luanda. (Mean retail prices of food and sanitation products in the city of Luanda). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1965. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.221. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; PRICES; TAPIOCAS; ANGOLA.

0119

30384 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1963. Precos médios de retalho de produtos alimentares e de higiene na cidade de Luanda. (Mean retail prices of food and sanitation products in the city of Luanda). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1963. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.213. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; PRICES; TAPIOCAS; ANGOLA.

0120

30368 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1967. Precos médios de retalho de produtos alimentares e de higiene na cidade de Luanda. (Mean retail prices of food and sanitation products in the city of Luanda). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1967. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.265. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; PRICES; TAPIOCAS; ANGOLA.

0121

30361 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1966. Precos médios de retalho de produtos alimentares e de higiene na cidade de Luanda. (Mean retail prices of food and sanitation products in the city of Luanda). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1966. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.263. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; PRICES; TAPIOCAS; ANGOLA.

0122

30372 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1959. Precos médios de retalho de produtos alimentares e de higiene na cidade de Luanda. (Mean retail prices of food and sanitation products in the city of Luanda). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1958. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.219. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; PRICES; TAPIOCAS; ANGOLA.

0123

30355 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1972. Precos médios de retalho nas principais cidades e vilas. (Mean retail prices in the main cities and villages). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1972. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.247-250. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; PRICES; TAPIOCAS; ANGOLA.

0124

30177 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1964. Precos médios de retalho nas principais cidades e vilas da Província. (Mean retail prices in the main cities and villages of the Province). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1964. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.219-222. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; PRICES; TAPIOCAS; ANGOLA.

0125

30331 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1970. Precos médios de retalho nas principais cidades e vilas da Província. (Mean retail prices in the main cities and villages of the Province). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1970. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.252-255. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; PRICES; TAPIOCAS; ANGOLA.

0126

30360 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1966. Precos médios de retalho nas principais cidades e vilas da Província. (Mean retail prices in the main cities and villages of the Province). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1966. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.266-267. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; PRICES; TAPIOCAS; ANGOLA.

0127

30379 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1965. Precos médios de retalho nas principais cidades e vilas da Província. (Mean retail prices in the main cities and villages of the Province). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1965. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.224-227. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; PRICES; TAPIOCAS; ANGOLA.

0128

30350 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1968. Precos médios de retalho nas principais cidades e vilas da Província. (Mean retail prices in the main cities and villages of the Province). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1968. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.256-259. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; PRICES; TAPIOCAS; ANGOLA.

0129

30367 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1967. Precos médios de retalho nas principais cidades e vilas da Província. (Mean retail prices in the main cities and villages of the Province). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1967. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.268-271. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; PRICES; TAPIOCAS; ANGOLA.

0130

30345 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1971. Precos médios de retalho nas principais cidades e vilas: produtos alimentares. (Mean retail prices in the main cities and villages: food products). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1971. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.254-257. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; PRICES; TAPIOCAS; ANGOLA.

0131

30375 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1959. Principais produtos importados e exportados, segundo as estancias aduaneiras da Província. (Main imported and exported products, according to provincial customhouses). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1958. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.167. Pt., Fr., Dat.num.

CASSAVA; DRIED ROOTS; STATISTICAL DATA; TRADE; PRICES; ANGOLA.

0132

30329 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1970. Produtos transaccionados nos mercados rurais. (Products traded in the rural markets). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1970. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.247. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; CASSAVA MEAL; CASSAVA FLOUR; CASSAVA ROOTS (VEGETABLE); DRIED ROOTS; FERMENTED PRODUCTS; MARKETING; PRICES; ANGOLA.

Statistical data are given on the total amounts (kg) and values of the different products (among them cassava roots and by-products) traded in the rural markets of Angola during 1968-70. (CIAT)

0133

30174 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1964. Produtos transaccionados nos mercados rurais. (Products traded in rural markets). In

Instituto Nacional de Estatística. Angola. Anuário Estatístico 1964. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.214. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; MARKETING; PRICES; ANGOLA.

0134

30352 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1968. Produtos transaccionados nos mercados rurais. (Products traded in the rural markets). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1968. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.251. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; CASSAVA MEAL; CASSAVA ROOTS (VEGETABLE); CASSAVA FLOUR; DRIED ROOTS; FERMENTED PRODUCTS; MARKETING; PRICES; ANGOLA.

Statistical data are given on the total amounts (kg) and values of the different products (among them cassava roots and by-products) traded in the rural markets of Angola during 1966-68. (CIAT)

0135

30388 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1969. Produtos transaccionados nos mercados rurais. (Products traded in the rural markets). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1969. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.255. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; CASSAVA MEAL; CASSAVA ROOTS (VEGETABLE); CASSAVA FLOUR; DRIED ROOTS; FERMENTED PRODUCTS; MARKETING; PRICES; ANGOLA.

Statistical data are given on the total amounts (kg) and values of the different products (among them cassava roots and by-products) traded in the rural markets of Angola during 1967-69. (CIAT)

0136

30348 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1971. Produtos transaccionados nos mercados rurais. (Products traded in the rural markets). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1971. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.249. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; CASSAVA MEAL; CASSAVA FLOUR; DRIED ROOTS; FERMENTED PRODUCTS; MARKETING; PRICES; ANGOLA.

Statistical data are given on the total amounts (kg) and values of the different products (among them cassava roots and by-products) traded in the rural markets of Angola during 1969-71. (CIAT)

0137

30357 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1972. Produtos transaccionados nos mercados rurais. (Products traded in the rural markets). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1972. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.242. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; CASSAVA MEAL; CASSAVA FLOUR; DRIED ROOTS; FERMENTED PRODUCTS; MARKETING; PRICES; ANGOLA.

Statistical data are given on the total amounts (kg) and values of the different products (among them cassava roots and by-products) traded in the rural markets of Angola during 1970-72. (CIAT)

0138

30362 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1966. Produtos transaccionados nos mercados rurais. (Products traded in the rural markets). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1966. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.261. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; CASSAVA MEAL; CASSAVA FLOUR; DRIED ROOTS; MARKETING; PRICES; ANGOLA.

Statistical data are given on the total amounts (kg) and values of the different products (among them cassava roots and by-products) traded in the rural markets of Angola during 1964-66. (CIAT)

0139

30369 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1967. Produtos transaccionados nos mercados rurais. (Products traded in the rural markets). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1967. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.263. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; CASSAVA FLOUR; CASSAVA MEAL; DRIED ROOTS; FERMENTED PRODUCTS; MARKETING; PRICES; ANGOLA.

Statistical data are given on the total amounts (kg) and values of the different products (among them cassava roots and by-products) traded in the rural markets of Angola during 1965-67. (CIAT)

0140

30381 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1965. Produtos transaccionados nos mercados rurais. (Products traded in rural markets). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1965. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.219. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; CASSAVA ROOTS (VEGETABLE); DRIED ROOTS; STATISTICAL DATA; MARKETING; PRICES; ANGOLA.

0141

30328 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1970. Produtos transaccionados nos mercados rurais, por distritos. (Products traded in the rural markets, per districts). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1970. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.243. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; CASSAVA MEAL; DRIED ROOTS; CASSAVA ROOTS (VEGETABLE); FERMENTED PRODUCTS; CASSAVA FLOUR; MARKETING; PRICES; ANGOLA.

Statistical data are given on the total amounts (kg) and values of the different products (among them cassava roots and by-products) traded in the rural markets of Angola during 1968-70 on a per district basis. (CIAT)

0142

30327 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1970. Produtos transaccionados nos mercados rurais, por distritos. (Products traded in the rural markets, per districts). In Instituto Nacional de Estatística.

Angola. Anuário Estatístico 1970. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.245. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; CASSAVA MEAL; CASSAVA FLOUR; DRIED ROOTS; MARKETING; PRICES; ANGOLA.

Statistical data are given on the total amounts (kg) and values of the different products (among them cassava roots and by-products) traded in the rural markets of Angola during 1968-70 on a per district basis. (CIAT)

0143

30353 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1968. Produtos transaccionados nos mercados rurais, por distritos. (Products traded in the rural markets, per districts). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1968. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.247-249. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; CASSAVA MEAL; CASSAVA ROOTS (VEGETABLE); CASSAVA FLOUR; DRIED ROOTS; FERMENTED PRODUCTS; MARKETING; PRICES; ANGOLA.

Statistical data are given on the total amounts (kg) and values of the different products (among them cassava roots and by-products) traded in the rural markets of Angola during 1966-68 on a per district basis. (CIAT)

0144

30389 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1969. Produtos transaccionados nos mercados rurais, por distritos. (Products traded in the rural markets, per districts). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1969. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.251-253. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; CASSAVA MEAL; CASSAVA FLOUR; DRIED ROOTS; CASSAVA ROOTS (VEGETABLE); FERMENTED PRODUCTS; MARKETING; PRICES; ANGOLA.

Statistical data are given on the total amounts (kg) and values of the different products (among them cassava roots and by-products) traded in the rural markets of Angola during 1967-69 on a per district basis. (CIAT)

0145

30343 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1971. Produtos transaccionados nos mercados rurais, por distritos. (Products traded in the rural markets, per districts). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1971. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.247-248. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; CASSAVA MEAL; CASSAVA FLOUR; DRIED ROOTS; MARKETING; PRICES; ANGOLA.

Statistical data are given on the total amounts (kg) and values of the different products (among them cassava roots and by-products) traded in the rural markets of Angola during 1969-71 on a per district basis. (CIAT)

0146

30344 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1971. Produtos transaccionados nos mercados rurais, por distritos. (Products traded in the rural markets, per districts). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1971. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.245-246. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; CASSAVA MEAL; CASSAVA FLOUR; DRIED ROOTS; FERMENTED PRODUCTS; MARKETING; PRICES; ANGOLA.

Statistical data are given on the total amounts (kg) and values of the different products (among them cassava roots and by-products) traded in the rural markets of Angola during 1969-71 on a per district basis. (CIAT)

0147

30358 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1972. Produtos transaccionados nos mercados rurais, por distritos. (Products traded in the rural markets, per districts). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1972. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.239-240. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; CASSAVA MEAL; CASSAVA FLOUR; DRIED ROOTS; FERMENTED PRODUCTS; MARKETING; PRICES; ANGOLA.

Statistical data are given on the total amounts (kg) and values of the different products (among them cassava roots and by-products) traded in the rural markets of Angola during 1970-72 on a per district basis. (CIAT)

0148

30340 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1955. Quantidades e valores das principais mercadorias exportadas: 1944 a 1953. (Amounts and values of the main commodities exported: 1944-53). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1952-1953. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.453-454. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; TRADE; PRICES; ANGOLA.

0149

30320 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1954. Quantidades e valores das principais mercadorias exportadas: 1945 a 1954. (Amounts and values of the main commodities exported: 1945-54). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1954. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.355-356. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; TRADE; PRICES; ANGOLA.

0150

30314 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1955. Quantidades e valores das principais mercadorias exportadas: 1946 a 1955. (Amounts and values of the main commodities exported: 1946-55). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1955. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.195. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; CASSAVA MEAL; STATISTICAL DATA; TRADE; PRICES; ANGOLA.

0151

30332 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1956. Quantidades e valores das principais mercadorias exportadas: 1947 a 1956. (Amounts and values of the main commodities exported: 1947-56). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1956. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.199. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; CASSAVA MEAL; STATISTICAL DATA; TRADE; PRICES; ANGOLA.

0152

30317 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1957. Quantidades e valores das principais mercadorias exportadas: 1948 a 1957. (Amounts and values of the main commodities exported: 1948-57). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1957. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.73. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; CASSAVA MEAL; STATISTICAL DATA; TRADE; PRICES; ANGOLA.

0153

30377 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1962. Quantidades e valores das principais mercadorias exportadas: 1949 a 1958. (Amounts and values of the main commodities exported: 1949-58). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1962. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.117. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; CASSAVA MEAL; STATISTICAL DATA; TRADE; PRICES; ANGOLA.

0154

30365 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1960. Quantidades e valores das principais mercadorias exportadas: 1950 a 1959. (Amounts and values of the main commodities exported: 1950-59). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1959. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.185. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; TRADE; PRICES; ANGOLA.

0155

30168 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1960. Quantidades e valores das principais mercadorias exportadas: 1951 a 1960. (Amounts and values of the main commodities exported: 1951-60). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1960. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.181. Pt., Fr., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA MEAL; STATISTICAL DATA; TRADE; PRICES; ANGOLA.

0156

30171 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1961. Quantidades e valores das principais mercadorias exportadas: 1952 a 1961. (Amounts and values of the main commodities exported: 1952-61). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1961. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.185. Pt., Fr., Dat.num.

CASSAVA; DRIED ROOTS; STATISTICAL DATA; TRADE; PRICES; ANGOLA.

0157

30374 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1959. Quantidades e valores das principais mercadorias exportadas: 1953 a 1962. (Amounts and values of the main commodities exported: 1953-62). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1958. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.173. Pt., Fr., Dat.num.

CASSAVA; DRIED ROOTS; STATISTICAL DATA; TRADE; PRICES; ANGOLA.

0158

30441 FIGUEIREDO, A.B.R.S. DE 1974. Relatório da actividade do aluno estagiário do curso de engenheiro agrónomo. (Student activity report of an

agricultural engineering course). Lisboa, Portugal, Instituto Superior de Agronomia. 42p. Pt., 39 Ref., Il.

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; CUTTINGS; DISEASE CONTROL; HOT WATER TREATMENTS; MAPS; TEMPERATURE; ANGOLA.

A comprehensive bibliographic review is given on the importance of cassava as a food crop in Angola; the importance of its major disease, CAMV, is also stressed. Results of trials comparing the effectivity of cutting treatments with hot air or with hot wa-ter (immersion) to control the disease are given. The cuttings used came from the basal, middle, and upper parts of the plant. Hot air treatments consisted in moderate temp. (44-46 degrees Celsius) for long periods (2-12 days) and high temp. (70 degrees Celsius) for short periods (10-150 min). In hot water treatments, the immersion time for cuttings was 30 min at temp. ranging from 40 to 60 degrees Celsius. Cuttings were then planted and observations were made on disease symptoms over a 3- to 4-mo. period. Cassava was found to be more sensitive to hot water than to hot air treatments; however, the latter technique is not recommended as a control measure since a great variability in disease symptoms was observed. (CIAT)

0159

32271 PEREIRA, A.R. 1957. L'économie de l'Angola et du Mozambique. (Economics of Angola and Mozambique). Marchés Tropicaux no.587:426-436. Fr., Il.

CASSAVA; TRADE; STATISTICAL DATA; PRODUCTION; TAPIOCAS; CASSAVA MEAL; CASSAVA STARCH; PRICES; MOZAMBIQUE; ANGOLA.

Statistics on the evolution of exports for various Angolese products (including cassava) from 1951 to 1955, are presented. Cassava is mainly grown by aboriginal farmers and consumed in the form of meal, starch, and tapioca. The role of the aboriginal population in the production of the major foodstuffs is highlighted. Data are also given on the value of exports for cassava chips from 1946 to 1955. Regarding agricultural economy, aboriginal farmers from Mozambique produced 14,721,954 kg dry cassava in 1951-52. (CIAT)

0160

30450 PINHEIRO, M.F. 1972. A cultura da mandioca: regras práticas. (Cassava cultivation: practical norms). Gazeta Agrícola de Angola 17(9):677,679,681-682. Pt., Il.

CASSAVA; SOIL REQUIREMENTS; LAND PREPARATION; PLANTING; CUTTINGS; FERTILIZERS; WEEDING; HARVESTING; ROTATIONAL CROPS; ANGOLA.

General recommendations are given on the following aspects of cassava cultivation in Angola: soil characteristics and preparation, cultivation and planting distances, selection and preparation of cuttings, planting, fertilization according to soil type, weeding, harvesting, and crop rotation. (CIAT)

0161

30434 SERAFIM, F.D.; SERAFIM, M.C. 1982. Annotated list of plant diseases in Angola. García de Orta, Série Estacao Agronomica Journal 9(1-2):321-332. En., Sum. En., Pt., 7 Ref.

CASSAVA; GLOMERELLA CINGULATA; ERWINIA CASSAVAE; CERCOSPORIDIUM HENNINGSII; ARMILLARIELLA; BOTRYODIPLODIA THEOBROMAE; FUSARIUM; CASSAVA BACTERIAL BLIGHT; SPHAEROSTILBE REPENS; RHIZOPUS NIGRICANS; ANGOLA.

Results from a disease survey carried out by the Instituto de Investigacao Agronómica de Angola (Huambo, Angola) up to 1975 are summarized in an annotated list of main crop diseases caused by fungi and bacteria. Withertip (Colletotrichum gloeosporioides f. sp. manihotis), leaf spot and blight (Erwinia cassavae and Xanthomonas sp.), leaf spot (Cercospora henningsii), soft rot (Rhizopus nigricans), root rot (Armillaria mellea), stem rot (Botryodiplodia theobromae), root rot (Sphaerostilbe repens), and stem rot (Fusarium semitectum) were found to be the major cassava diseases. The geographical distribution of each of the abovementioned diseases is also included. (CIAT)

0162

30427 SERAFIM, F.J.D.; SERAFIM, M.C.D. 1968. Mandioca (Manihot utilissima Pohl). (Cassava). In Serafim, F.J.D.; Serafim, M.C.D. Lista das doencas de culturas de Angola. Nova Lisboa, Angola, Instituto de Investigacao Agronómica de Angola. Série Técnica no.2. p.9. Pt.

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; CERCOSPORIDIUM HENNINGSII; GLOMERELLA MANIHOTIS; FUSARIUM; RHIZOPUS; SYMPTOMATOLOGY; ANGOLA.

The major diseases affecting cassava in Angola are listed. General symptoms are briefly described and the causal agents are mentioned. (CIAT)

0163

30440 WAHNON, J.S. 1926. Breves nocoes sobre a preparacao da fécula e da farinha de mandioca: relatorio final. (Brief notes on the preparation of cassava starch and cassava flour: final report). Angola, Instituto Superior de Agronomia. 90p. Pt.

CASSAVA; CASSAVA STARCH; CASSAVA FLOUR; TRADE; STATISTICAL DATA; PROCESSING; HUMAN NUTRITION; ANIMAL NUTRITION; USES; COMPOSITION; NUTRITIVE VALUE; ANGOLA; MOZAMBIQUE; CAPE VERDE; PORTUGAL.

The origin of cassava, botanical characteristics of the plant, toxicity, economic importance, and commercialization are reviewed. The different steps of cassava starch and flour processing are detailed, and the different equipment used are also described. The main characteristics and uses (starch and flour) are given. Data are included on the composition of several starch samples from Angola, Mozambique, and Cape Verde; these indicated that the nutritive value of cassava starch is very low and the use of starches with higher nutritive values is recommended. (CIAT)

BENIN

0164

31631 L'AGRICULTURE: objectif no.1: produire pour parverir a l'autosuffisance. (Agriculture: objective no.1: to produce in order to reach self-sufficiency). Europe Outremer 54(566):20-23. 1977. Fr., 11.

CASSAVA; FOOD SECURITY; PRODUCTION; STATISTICAL DATA; BENIN.

General characteristics of agriculture in Benin are described and government policies to increase agricultural production since 1975 are explained. Data are presented on production (t) of the main food crops (among them cassava) for 1972-73, 1973-74, and 1974-75. Cassava is grown in both Central and Southern Benin and was the main food crop during 1974-75 (770,000 t). (CIAT)

0165

31350 BENIN. DEPARTEMENT DE LA RECHERCHE AGRONOMIQUE. 1979. Manioc. (Cassava). In Benin. Département de la Recherche Agronomique. Plan

indicatif national des programmes de recherche agronomique (1980-1982). Bénin, Ministere des Enseignements Technique et Supérieur. pp.80-85. Fr.

CASSAVA; STATISTICAL DATA; PRODUCTION; CULTIVATION; CASSAVA PROGRAMS; ECONOMICS; PLANT BREEDING; ROOT PRODUCTIVITY; RESEARCH; BENIN.

The importance of cassava cultivation in Benin is highlighted and statistics are given on the evolution of area planted (ha), production (t), and yields (t/ha) in different producing regions for 1967, 1972, and 1977. Reasons for the marked decrease and low productivity trends are mentioned. General considerations are given on cassava cultivation and the research program at Niaouli expt. station. A foreseen budget for the cassava program is also included for 1980, 1981, and 1982. (CIAT)

0166

31351 BENIN. MINISTERE DU DEVELOPPEMENT RURAL ET DE L'ACTION COOPERATIVE. 1987. Evolution de la superficie, du rendement et de la production du manioc (tubercules): statistiques de production. (Evolution of area, yield, and production of cassava (tubers): production statistics). Benin, Direction des Etudes et de la Planification. 7p. Fr., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; BENIN.

Statistical data are given on area planted (ha) to cassava, yields (kg/ha), and production (t) in different regions of Benin for 1960-87. (CIAT)

0167

30879 BENIN. MINISTERE DU DEVELOPPEMENT RURAL ET DE L'ACTION COOPERATIVE. 1986. Section racines et tubercules. Rapport d'activités de la campagne 1985/2. (Root and tuber crop section. Activity report of the 1985/2 season). In Bénin. Ministere du Développement Rural et de l'Action Coopérative. Project de développement rural du Zou: résultats preliminaires campagne 1985, 2eme cycle. Benin, Station de Recherches Agronomiques de Niaouli. Fr., Dat.num.

CASSAVA; CUTTINGS; PLANTING; TIMING; ROOT PRODUCTIVITY; STARCH CONTENT; HARVEST INDEX; BENIN.

A trial was carried out in Niaouli (Benin) to determine the effect of different planting dates (March 23, April 23, May 29, June 22, July 23, Aug. 23, and Sept. 24) and harvesting times (8, 10, 12, 14, 16, and 18 mo. after planting) on the evolution of agronomic characters (tuber yields, starch content, no. of roots harvested, tuber size, etc.) of cassava clone 1495. The best results were obtained when cuttings were planted in March and higher yields when harvesting took place 18 mo. after planting. However, the best economic values were found with harvesting at 12 mo. Conducting this trial in another locality such as Sékou is recommended. (CIAT)

0168

31387 BENIN. MINISTERE DU DEVELOPPEMENT RURAL ET DE L'ACTION COOPERATIVE. 1985. Section tubercules et racines. (Tuber and root crop section). In Benin. Ministere du Développement Rural et de l'Action Cooperative. Rapport d'activites de la campagne 1985: 1er cycle: resultats preliminaires. Benin, Direction de la Recherche Agronomique. Station de Recherches Agronomiques de Niaouli. Projet de Développement Rural du Zou. v.3,pp.70-86. Fr., Dat.num.

CASSAVA; CUTTINGS; PLANTING; TIMING; ROOT PRODUCTIVITY; STARCH CONTENT; BENIN.

Preliminary results of trials carried out from March to Sept. 1984 in Niaouli, Benin, with disease-resistant cassava clone 1945 (from Ivory Coast) are presented. Data are given on yields (t/ha), starch content (percentage), and no. of plants at harvest. Rainfall data for 1984-85 are also included. Better yields were obtained when cuttings were planted in March, resulting in a higher no. of plants at harvest. In this case, harvest should be done 12 mo. after planting because after this time starch content begins to decrease. (CIAT)

0169

31329 INSTITUT NATIONAL DE LA STATISTIQUE ET DE L'ANALYSE ECONOMIQUE. BENIN. 1983. Les prix en République Populaire du Bénin en 1982. (Prices in People's Republic of Benin in 1982). Cotonou, Bénin, Ministere du Plant et de la Statistique. 96p. Fr., Dat.num.

CASSAVA; STATISTICAL DATA; PRICES; CASSAVA ROOTS (VEGETABLE); GARI; TAPIOCAS; BENIN.

Statistics are presented on annual and monthly av. prices for the consumer for various food products (including cassava roots, gari, and tapioca) in the different provinces (Atacora, Atlantic, Borgou, Mono, Oueme, and Zou) of Benin, during 1982. (CIAT)

0170

31622 ADAM, K.S.; BOKO, M. 1983. Les activités rurales: agriculture. (Rural activities: agriculture). In Adam, K.S.; Boko, M. Le Benin. Paris, France, EDICEF. pp.46-50. Fr., Il.

CASSAVA; MAPS; STATISTICAL DATA; PRODUCTION; BENIN.

The importance of agriculture in Benin is highlighted and the main food crops grown (among them cassava) are mentioned. In Lower Benin, maize is intercropped with cassava or beans or groundnut while in Central Benin maize or millet are intercropped with cassava. A map showing the regions where this tuber, among other crops, is grown is included. Data on area and production for 1977-78 indicate that 179,951/ha were planted to cassava and 700,000 t of cassava produced. (CIAT)

0171

32242 ATACHI, P. 1986. Report on cassava mealybug and cassava green mites in some African countries: Benin. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. p.135. En. (Projeet de Defense des Cultures, c/o PNUD, B.P. 506, Cotonou, Benin)

CASSAVA; PHENACOCCUS MANIHOTI; BENIN.

The production of cassava in Benin in 1980 was 971,000 t. Phenacoccus manihoti was 1st observed in 1978 near Dangbo and Sakété (Ouémé Province), and it rapidly spread throughout almost all of the country. Damage is now most severe in the southern provinces of Ouémé, Mono, Atlantic, and Zou, where cassava is most important. (Full text)

0172

26786 GBEDOLO, Y.M.; FAVI, F. 1985. POINTS SUR LA SITUATION DES PLANTES A RACINES ET TUBERCULES EN REPUBLIQUEPOPULAIRE DU BENIN. (SOME ASPECTS OF THE SITUATION OF ROOT AND TUBER CROPS IN BENIN). IN WORKSHOP ON PRODUCTION AND

MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE, 1985. REPORT. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.1-12. FR., IL.

CASSAVA; CULTIVATION; PRODUCTION; STORAGE; ROOT PRODUCTIVITY; DISTRIBUTION; PRICES; WEEDS; MARKETING; PROCESSING; STATISTICAL DATA; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; BENIN.

THE SITUATION OF CASSAVA AND OTHER STARCHY CROPS IN BENIN DURING 1969-81 IS EXAMINED. CASSAVA IS AN IMPORTANT CROP DUE TO ITS ADAPTABILITY AND LOW TILLAGE AND WATER REQUIREMENTS; IT IS GROWN IN THE SOUTHERN PART OF THE COUNTRY WITH YIELDS OF 266,180, 104,940, AND 73,520 T/YR, RESP., IN OUME, ATLANTIQUE, AND MONO; IT IS ALSO CULTIVATED IN THE NORTH WITH YIELDS OF 26,920 AND 29.950 T/YR, RESP., IN BORJOU AND ATACORA, AND IN THE CENTRAL ZONEWITH 158,830 T/YR IN ZOU. CASSAVA YIELDS, HOWEVER, ARE LOW (6.31 AND 6.58 T/HA IN 1976 AND 1981, RESP.), ATTRIBUTABLE TO PESTS, DISEASES, AND WEEDS. THIS FACT, TOGETHER WITH THE RAPIDLY INCREASING POPULATION AND THE LOW CROP PRODUCTION (660,340 T/YR IN THE WHOLE COUNTRY), CAUSE THE DEMAND AND PRICES OF BY-PRODUCTS, ESPECIALLY THAT OF GARI, TO RISE. FRESH CASSAVA IS HARDLY MARKETED BECAUSE OF CONSERVATION, STORAGE, AND TRANSPORTATION CONSTRAINTS. (CIAT)

0173

31636 GIRARD, J.C. 1979. Rapport de mission en République Populaire du Bénin sur les problemes phytosanitaires du manioc 23 avril-7 mai 1979. (People's Republic of Benin mission report on cassava phytosanitary problems, April 23-May 7, 1979). Montpellier, France, Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres. 31p. Fr., 32 Ref., Il.

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; SYMPTOMATOLOGY; ETIOLOGY; DISEASE CONTROL; GLOMERELLA CINGULATA; CERCOSPORIDIUM HENNINGSII; RESISTANCE; CULTIVARS; CUTTINGS; ZONOCERUS VARIEGATUS; BENIN.

A survey was conducted in 1979 to determine the main phytosanitary problems of problems of cassava cultivation in Benin. CAMV and CBB were found to be the major diseases, followed by anthracnose and Cercospora. Mealybugs, mites, and Zonocerus variegatus were occasionally observed. Detailed information is presented on various aspects (distribution, economic importance, etiology, symptomatology, diagnosis, factors influencing dissemination and severity, generalities on control measures) of the 2 major diseases detected. Control measures against CAMV, including vector control, sanitary selection, and var. resistance, are explained in detail. For CBB control measures include cultural practices, sanitary selection, control of cutting movement, and var. resistance. (CIAT)

0174

30447 GODO, G. 1987. Synthese generale des rapports nationaux sur la mosaique africaine du manioc et son controle. (General synthesis of national reports on cassava African mosaic virus and its control). Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Coopération. 111p. Fr., 4 Ref., Il. (Centre ORSTOM d'Adiopodoumé, BP V51, Abidjan, Cote d'Ivoire)

CASSAVA; SURVEYS; QUESTIONNAIRES; CASSAVA AFRICAN MOSAIC VIRUS; DISEASE CONTROL; PRODUCTIVITY; HUMAN NUTRITION; INTERCROPPING; DISEASES AND PATHOGENS; INJURIOUS INSECTS; CULTIVATION, MAPS; RESISTANCE; CULTIVARS; BENIN; BURUNDI; CONGO; IVORY COAST; GHANA; KENYA; LIBERIA; MALAWI; NIGERIA; CENTRAL AFRICAN REPUBLIC; RWANDA; TOGO; ZAIRE.

The responses of the following 13 African countries to questionnaires for an international seminar on cassava African mosaic virus and its control are included: Benin, Burundi, Congo, Ivory Coast, Ghana, Kenya, Liberia, Malawi, Nigeria, Central African Republic, Rwanda, Togo, and Zaire. Aspects covered were: the relative importance of cassava compared with other food crops; parts of the plant consumed and methods of preparation; production and constraints to increased produc-tion; crops cultivated in association with cassava; major diseases and pests; eco-nomic importance and distribution of CAMD; and fluctuations of whitefly populations. The most cultivated clones, existing clone collections and tolerance to CAMD, and disease control strategies were also determined. (CIAT)

0175

32297 HODONOU, J-C. 1979. Développement régional intégré et milieu paysan: le cas de la région du Mono (République Populaire du Bénin). (Integrated rural development and farmer's environment: the case of Mono (Benin)). In Office de la Recherche Scientifique et Technique Outre-Mer. Maitrise de l'espace agraire et développement en Afrique tropicale; logique paysanne et rationalité technique: actes du colloque de Ouagadougou, 1978. Paris, France, Mémoires ORSTOM no.89 pp.347-356. Fr., Sum. Fr., En.

CASSAVA; DEVELOPMENTAL RESEARCH; BENIN.

Information is presented about the Centre d'Action Régional pour le Développement Rural (CADER) and its role the regional development of Mono, Benin. The administrative, technical, and financial organization of CADER is explained in detail. Bopa showed suitable pedologic and climatic conditions for the development of cassava cultivation; however, the lack of factories for industrial processing and a commercialization network have lead to neglecting development policies. Data are given on area planted to this crop for 1970-71, 1971-72, 1972-73, and 1973-74. (CIAT)

0176

32207 LEIHNER, D.E. 1988. Proyecto de siembra de yuca en franjas en Benin, Africa Occidental. (Strip cassava planting project in Benin, West Africa). Yuca Boletín Informativo 12(1):12-13. Es., Il.

CASSAVA; CULTIVATION SYSTEMS; BENIN; CIAT-1.

A project to plant cassava in alternate strips with Leucaena leucocephala or Cajanus cajan in Benin is briefly described. The project aims at developing crop management practices that provide mulch for the crop, preserve soil moisture, reduce water stress, provide nutrients, and control weeds. (CIAT)

0177

32052 ROESCH, M. 1988. Zou: une recherche-développement au Bénin. (Zou: research development in Benin). Recherche Développement no.7:5-8. Fr., 2 Ref., Il. (Projet RD Zou BP 884 Cotonou, Bénin)

CASSAVA; DEVELOPMENTAL RESEARCH; GARI; INDUSTRIALIZATION; BENIN.

Major achievements of activities conducted by the research-development team in Benin in 1987 are reported. It is highlighted that the cassava processing cooperative supplied 1.2 of the 20.0 t of gari delivered to a French distributor. (CIAT)

BURKINA FASO

0178

29594 BENDOW, Z.K. 1986. Burkina Faso. Ibadan, Nigeria, Consultation on Household Food Production and Nutrition IITA/UNICEF. 27p. Fr., Il.

CASSAVA; STATISTICAL DATA; PRODUCTION; WOMEN; SOCIOECONOMIC ASPECTS; MAPS; BURKINA FASO.

General information on the resources, population, social organization, agricultural production, and the role of women in rural development of Burkina Faso is compiled. Planted area and yields are given for the main cereal, root, industrial, legume, and fruit crops in the periods 1980/81 through 1984/85. Cassava area, production, and yield have remained fairly stable throughout the entire period (6200-6300 ha, 40,000-44,000 MT, and 6.45-6.98 MT/ha, resp.) for the whole country. The participation of tuber crops in the use of agricultural lands was below 1 percent and in overall agricultural production was below 6 percent. (CIAT)

0179

31699 DUMONT, R. 1978. Programme tubercules (Haute-Volta). (Tuber program (Burkina Faso)). Paris, France, Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres. 42p. Fr.

CASSAVA; PRODUCTION; BURKINA FASO.

The main research activities on cassava conducted by the Programme Tubercules (Burkina Faso) in 1977-78 are reported. Results of a survey to identify the major producing regions for different tuber crops and determine their resp. importance are also presented. Research on cassava dealt with ecologic requirements, cultivated var., cultural practices, crop importance, yields, and income. Cassava is mainly planted in eastern Burkina Faso and is eaten fresh. The development of this tuber crop towards the production of processed products such as gari or CM is suggested. (CIAT)

BURUNDI

0180

30476 DAUBRESSE, P.; NTIBASHIRWA, S.; GHEYSEN, A.; MEYER, J.A. 1987. A process for protein enrichment of cassava by solid substrate fermentation in rural conditions. Biotechnology and Bioengineering 29(8):962-968. En., Sum. En., 37 Ref., Il. (Burundi Agricultural Sciences Inst., B.P. 795, Bujumbura, Burundi)

CASSAVA; PROTEIN ENRICHMENT; FERMENTATION; FERMENTED PRODUCTS; PROTEIN CONTENT; AMINO ACIDS; STARCH CONTENT; FIBER CONTENT; ASH CONTENT; MINERAL CONTENT; SUGAR CONTENT; TECHNOLOGICAL PACKAGE; BURUNDI.

An artisanal static process for protein enrichment of cassava by solid-state fermentation, developed in lab. and tested on pilot units in Burundi, provides enriched cassava containing 10.7 percent of DM protein vs. 1 percent before fermentation. Cassava chips, processed into granules of 2 to 4 mm in diameter, are moistened (40 percent water content) and steamed. After cooling to 40 degrees Celsius, cassava is mixed with a nutritive solution containing the inoculum (Rhizopus oryzae, strain MUCL 28627) and providing the following per 100 g DM: 3.4 g urea, 1.5 g KH_2PO_4, 0.8 g $MgSO_4.7H_2O$, and 22.7 g citric acid. For the fermentation, cassava, with ca. 60 percent MC, is spread in a thin layer (2-3 cm thick) on perforated trays and slid into an aerated humidified enclosure. The incubation lasts approx. 65 h. The production of protein-enriched cassava is 3.26 kg DM/square meter of tray. The effects of the variation of the nutritive solution composition and the inoculum conservation period on the protein production are also discussed. (AS)

0181

28872 GERARD, T.R. 1986. Détermination des besoins en eau des plantes, des doses d'irrigation et des fréquences d'arrosage (AM 8301). (Determination of

plant water requirements, irrigation rates and frequencies (AM 8301)). In Institut des Sciences Agronomiques du Burundi. Rapport Annuel 1986. (Septembre 1985-Aout 1986). Bujumbura, v.3,pp.AM52-AM61. Fr., Il.

CASSAVA; IRRIGATION; WATER REQUIREMENTS (PLANT); BURUNDI.

In trials conducted in Burundi over a 3-yr period (1983-85) to determine water requirements and irrigation rates and frequencies in cassava plants, it was observed that this crop responds favorably to the supply of irrigation water in dry seasons, provided this supply is 50 or 75 percent of the optimum rate. (CIAT)

0182

28877 JOSIS, P.; LECLERCQ, D.; NTIBASHIRWA, S.; RURADUMA, C. 1986. ENRICHISSEMENT EN PROTEINES DU MANIOC PAR FERMENTATION SOLIDE. (PROTEIN ENRICHMENT OF CASSAVA BY SOLID FERMENTATION). IN INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI. RAPPORT ANNUEL 1986. (SEPTEMBRE 1985-AOUT 1986). BUJUMBURA. V.3,PP.221-241. FR., IL.

CASSAVA; INDUSTRIAL MICROBIOLOGY; FERMENTATION; NUTRITIVE VALUE; PROTEIN ENRICHMENT; DRYING; CASSAVA FLOUR; MINERAL CONTENT; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; BURUNDI; UGANDA; BELGIUM.

A BRIEF DESCRIPTION IS GIVEN OF TECHNIQUES TO ANALYZE THE NUTRITIVE VALUE OF FOODS, USED IN THE FOOD TECHNOLOGY LAB. OF THE INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI. A DETAILED DESCRIPTION IS ALSO GIVEN OF THE PROCEEDINGS OF THE COLLABORATIVE PROJECT OF THE ADMINISTRATION GENERALE BELGE POUR LA COOPERATION AU DEVELOPPEMENT AND UGANDA CREAMERIES LTD. FOR PROTEIN ENRICHMENT OF CASSAVA THROUGH SOLID FERMENTATION. THEY ARE: QUANTIFICATION OF THE GROWTH PARAMETERS OF RHIZOPUS ORYZAE DURING FERMENTATION; STUDY OF THE CONDITIONING, PURITY, AND VIABILITY OF THE INOCULANT; CASSAVA DRYING; STUDY OF FERMENTATIONS; PROBLEMS OF SELECTING FRESH, GRATED, AND DRIED CASSAVA AND ANALYSIS OF CF; AND SANITARY ASPECTS OF FERMENTATION IN A CONTROLLED MEDIUM. (CIAT)

0183

29371 JOSIS, P.; LECLERCQ, D.; RURADUMA, C. 1987. Qualites et utilisations du manioc enrichi en proteines par fermentation fongique. (Quality and uses of protein-enriched cassava by fungal fermentation). Bujumbura, Institut des Sciences Agronomiques du Burundi. Service de Biotechnologie Alimentaire. 31p. Fr., Sum. En., Fr., 15 Ref. Project Technologie Manioc (ConventionAGCD-UCLD24-92).

CASSAVA; PROTEIN ENRICHMENT; FERMENTATION; INDUSTRIAL MICROBIOLOGY; NUTRITIVE VALUE; TOXICITY; ANALYSIS; COMPOSITION; PROCESSING; HUMAN NUTRITION; BURUNDI.

Since 1982 the Institut des Sciences Agronomiques du Burundi has studied protein enrichment of cassava through controlled fungal fermentation. A simple technique, based on traditional cassava fermenting methods in Burundi, Rwanda, and Zaire, is described; CF with 10-11 percent protein is produced. Protein enrichment is based on the ability of the soil fungus Rhizopus oryzae to turn inorganic N (urea) into fungal protein N when mixed with the cassava substratum and then fermentation. Dried cassava chips with 40 percent MC were steamed at 80 degrees Celsius for 1.5 h. After cooling down to 40 degrees Celsius, a solution containing R. oryzae spores, 30 g urea, 13 g KH_2PO_4, 7 g $MgSO_4$, and 20 g citric acid was added per kg dry cassava. Cassava, spread in layers approx. 2 cm thick on perforated trays, was allowed to ferment for about 45 h. The nutritive value and toxic side effects of the CF were investigated in chemical analyses and expt. with

animals in Belgium and Burundi. Results indicated a remarkable nutritive value and no risks. (CIAT)

0184

27618 NDAYIRAGIJE, P. 1985. L'ACARIOSE (MONONYCHELLUS TANAJOA) DU MANIOC . (GREEN CASSAVA MITE (MONONYCHELLUS TANAJOA)). IN INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI. RAPPORT DES RECHERCHES AGRONOMIQUES 1985. BUJUMBURA, BURUNDI. PP.125-128. FR., IL.

CASSAVA; MONONYCHELLUS TANAJOA; CULTIVARS; TIMING; PRODUCTIVITY; PLANTING; TETRANYCHUS; OLIGONYCHUS; AMBLYSEIUS FUSTIS; IPHISEIUS DEGENERANS; OLIGOTA; STETHORUS; NEOSEIULUS ANONYMUS; ADAPTATION; PREDATORS AND PARASITES; CLIMATIC REQUIREMENTS; BURUNDI.

THE METHODOLOGY USED AND THE RESULTS OF TRIALS CARRIED OUT IN BURUNDI IN 1985 ON THE GREEN CASSAVA MITE (MONONYCHELLUS TANAJOA) ARE PRESENTED. IN THE SCREENING TRIAL FOR VAR. TOLERANT TO THIS MITE, THE MOST OUTSTANDING WERE MUGARAGANZA, TMS 40160/DB, BILLAN, A LOCAL VAR., ZAYMETI, MUTAKORORA, AND KABUMBEKIGOMA. IN THE TRIAL EVALUATING THE INCIDENCE OF THE MITE ON PRODUCTION AND THE EFFECT OF PLANTING DATE ON CASSAVA VAR. NAKARASI AND CRIOLINHA, AV. YIELD REDUCTION WAS FOUND TO BE MUCH GREATER AS THE PLANTING DATE WAS DELAYED; ON THE OTHER HAND, PLOTS PLANTED IN FEB., RECEIVING 250.5 MM OF RAINFALL, YIELDED BETTER THAN THOSE PLANTED IN APRIL, RECEIVING ONLY 44MM OF RAINFALL DURING THE 1ST 3 MO. THE PRODUCTION OF THE LATTER CROPS DECREASED BY 42-49 PERCENT IN RELATION TO THOSE PLANTED IN FEB. FINALLY, MONITORING STUDIES CONFIRMED THAT M. TANAJOA IS THE PREDOMINANT MITE IN CASSAVA; LESS IMPORTANT MITES ARE TETRANYCHUS SP. AND OLIGONYCHUS SP. TWO PHYTOSEIIDAE PREDATOR MITES (AMBLYSEIUS FUSTIS AND IPHISEIUS DEGENERANS) WEREIDENTIFIED AND 2 PREDATOR COLEOPTERA (OLIGOTA SP. AND STETHORUS SP.) WERE OBSERVED. TWO OTHER EXOTIC PHYTOSEIIDAE (A. IDAEUS AND NEOSEIULUS ANONYMUS) WERE INTRODUCED TO IMPROVE THE NATURAL REGULATION OF POPULATIONS. (CIAT)

0185

28876 NDAYIRAGIJE, P.; NKUBAYE, E. 1986. PROGRAMME DE RECHERCHES SUR L'ACARIOSE (MONONYCHELLUS TANAJOA) DU MANIOC. (RESEARCH PROGRAM ON CASSAVA GREEN MITE (MONONYCHELLUS TANAJOA). IN INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI. RAPPORT ANNUEL 1986. (SEPTEMBRE 1985-AOUT 1986). BUJUMBURA. V.3,PP.176-193. FR., IL.

CASSAVA; MONONYCHELLUS TANAJOA; CULTIVARS; PREDATORS AND PARASITES; PRODUCTIVITY; RESISTANCE; ADAPTATION; BURUNDI.

RESULTS ARE PRESENTED OF VARIOUS TRIALS CONDUCTED BY THE RESEARCH PROGRAMON THE CASSAVA GREEN MITE, INITIATED BY THE INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI IN MID-NOV. 1983. THE TRIALS DEAL WITH THE EVALUATION OF LOSSES IN IMBO (LOW ALT.), MOSO (INTERMEDIATE ALT.), AND GITEGA(HIGH ALT.); EVALUATION OF VAR. PERFORMANCE IN A CASSAVA COLLECTION IN IMBO; AND THE INVENTORY OF LOCAL PREDATORS OF THE GREEN MITE AND OF THE 1ST RELEASES OF EXOTIC PREDATORS IN THIS COUNTRY. IN IMBO, VAR. MPAMBAYABASHENGARA REGISTERED THE LOWEST YIELD LOSS, FOLLOWED BY CRIOLINHA AND NAKARASI, AND IN MOSO, THE LATTER VAR. SHOWED THE BEST PERFORMANCE. RESULTS OF THE GITEGA TRIAL WERE NOT SIGNIFICANT DUE TO UNFAVORABLE CONDITIONS. CASSAVA VAR. OF THE INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE (NIGERIA) WERE SUSCEPTIBLE TO THE GREEN MITE; HOWEVER, THEY YIELDHIGHER THAN THE LOCAL VAR. VAR. YONGWE 1 GAVE THE HIGHEST YIELDS, PRESENTINGA COEFFICIENT OF ATTACK OF 3; TMS 4(2)0847DB, WITH A COEFFICIENT OF 5, PRODUCED MORE THAN 5 KG/PLANT, WHILE VAR. WITH COEFFICIENTS OF 0-2 YIELDED LESS THAN 5 KG/PLANT. FINALLY, VARIOUS PREDATOR SPECIES OF THE GREEN MITE WERE IDENTIFIED AND OBSERVATIONS CONTINUE ON THE PERFORMANCE OF AMBLYSEIUS IDAEUS IN RELATION TO THE CONTROL OF THIS PEST. (CIAT)

0186

28104 NDAYIRAGIJE, P. 1984. PROGRAMME DE RECHERCHES SUR L'ACARIOSE (MONONYCHELLUS TANAJOA) DU MANIOC. (RESEARCH PROGRAM ON THE GREEN CASSAVA MITE (MONONYCHELLUS TANAJOA)). IN INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI. RAPPORT ANNUEL 1984. BUJUMBURA, BURUNDI. V.1,PP.107-108. FR.

CASSAVA; MONONYCHELLUS TANAJOA; TIMING; HARVESTING; MITE CONTROL; CULTIVARS; PLANTING; BURUNDI.

THE MAIN OBJECTIVES OF THE RESEARCH PROGRAM ON THE GREEN CASSAVA MITE OF THE INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI DURING 1984 ARE PRESENTED. THE METHODOLOGY AND PRELIMINARY RESULTS OF AN EVALUATION TRIAL ON THE INCIDENCE OF GREEN MITES ON HARVEST, IN RELATION TO PLANTING TIMES OF CASSAVAVAR. NAKARASI (SHORT CYCLE) AND CRIOLINHA (LONG CYCLE), ARE INCLUDED. (CIAT)

0187

28878 NTIBASHIRWA, S. 1986. ETUDE DU CONDITIONNEMENT DU MANIOC FRAIS . (STUDY ON THE CONDITIONING OF FRESH CASSAVA). IN INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI. RAPPORT ANNUEL 1986. (SEPTEMBRE 1985-AOUT 1986). BUJUMBURA. V.3,PP.242-257. FR., 8 REF., IL.

CASSAVA; CASSAVA ROOTS (VEGETABLE); SOLAR DRYING; PRESSING; PEELING; RASPING; BITTER CASSAVA; CULTIVARS; HCN CONTENT; DRY MATTER; BURUNDI.

IN THE INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI, VARIOUS STUDIES AND TRIALS WERE CARRIED OUT ON THE CONDITIONING OF FRESH CASSAVA. THE METHODOLOGY USED IN THE 1ST EXPT. ON CONDITIONING IS DESCRIBED, AND THE RESULTS OF PRELIMINARY TRIALS OF FRESH ROOT REDUCTION AND OF THE REDUCTION OF MC IN FRESH CASSAVA ARE GIVEN AS WELL AS THOSE OF A STUDY OF PRESSING, PEELING, AND GRATING FRESH CASSAVA. ANOTHER SIMILAR STUDY OF COMPARATIVE CHEMISTRY WAS CARRIED OUT ON 2 BITTER CASSAVA VAR., NAKARASI AND CRIOLINA, TO DETERMINE DM AND CYANIDE LEVELS. FINALLY, THE METHODOLOGY AND RESULTS OF VARIOUS FERMENTATION TRIALS OF FRESH CASSAVA ARE INCLUDED: PRELIMINARY TRIALS; FOLLOW-UP OF THE TRIALS WITHOUT MODIFYING THE PARAMETERS; FERMENTATION TRIALS WITH AND WITHOUT ADDITION OF STARCH; EFFECT OF AMBIENT TEMP. ON FERMENTATION; FERMENTATION TRIAL WITH ADDITION OF SUGAR; AND FERMENTATION TRIAL OF FRESH, GRATED, PRESSED, AND SUN-DRIED CASSAVA FOR 2 H. (CIAT)

0188

27674 SAKUBU, J. 1985. MANIOC (MANIHOT ESCULENTA). (CASSAVA). IN INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI. RAPPORT DES RECHERCHES AGRONOMIQUES 1985. BUJUMBURA, BURUNDI. PP.44-46. FR.

CASSAVA; DEVELOPMENT; PROTEIN ENRICHMENT; POSTHARVEST TECHNOLOGY; CULTIVARS; CASSAVA PROGRAMS; TECHNOLOGY TRANSFER; ADAPTATION; BURUNDI.

THE MAIN OBJECTIVES OF THE CASSAVA PROGRAM OF THE INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI DURING 1985 ARE GIVEN. THE ONGOING PROJECTS DEALING WITH PROTEIN ENRICHMENT OF CASSAVA, POSTHARVEST TRANSFORMATIONS, AND SELECTION TRIALS ARE ALSO MENTIONED. IN A CASSAVA HARVEST TRIAL DURING 2 PERIODS, IN LOCALITIES AT DIFFERENT ALT., TUBERIZATION WAS CONFIRMED TO INCREASE TO A LESSER EXTENT BETWEEN THE 1ST AND 2ND HARVEST DATES IN LOW-ALT.REGIONS THAN IN MEDIUM-ALT. OR HIGH-ALT. REGIONS. VAR. CRIOLINHA, BITAMISI, ZAYIMETI, AND MPAMBAYABASHENGERA HAVE BEEN NOMINATED FOR RELEASE. (CIAT)

0189

27675 SAKUBU, J.; BAERT, T.; JANSSENS, M. 1984. MANIOC (MANIHOT ESCULENTA). (CASSAVA). IN INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI. RAPPORT DES RECHERCHES AGRONOMIQUES 1984. BUJUMBURA, BURUNDI. PP.43-47. FR.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; PRODUCTIVITY; TECHNOLOGY TRANSFER; ADAPTATION; SELECTION; CLONES; BURUNDI.

THE MAIN OBJECTIVES OF THE CASSAVA PROGRAM OF THE INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI DURING 1984 ARE PRESENTED. TWO ONGOING PROJECTS ARE MENTIONED: (1) PEDIGREE SELECTION BASED ON SWEET TASTE, LONG CONSERVATION IN THE SOIL, PRODUCTIVITY, TOLERANCE TO THE GREEN MITE, AND ADAPTATION TO HIGH ALT.; (2) CASSAVA PROTEIN ENRICHMENT. ALSO, THE OBJECTIVES OF A SURVEY ON CASSAVA CROPPING ARE SUMMARIZED. FINALLY, RESULTS OF SCREENING AND YIELD TRIALS, CARRIED OUT IN LOCALITIES AT DIFFERENT ALT. WITH LOCAL AND NIGERIAN VAR., ARE INCLUDED. IN THE SCREENING TRIAL, THE LOCAL VAR. ZAYIMETI AND SAGARARA PERFORMED BETTER IN MEDIUM-ALT. TO LOW- ALT. ZONES WHILE SAGARARA ANDRUBOAN WERE THE MOST PRODUCTIVE IN HIGH-ALT. ZONES; MOREOVER, YIELDS DECREASED NOTABLY WITH ALT. IN THE YIELD TRIALS, IT WAS OBSERVED THAT AS THEALT. INCREASES, EARLINESS AND YIELD DECREASE; FOR ZONES BETWEEN 800-1300 M, THE YIELD INCREASE RATE BETWEEN 15-18 MO. IS VERY LOW AND FOR ZONES AT 1800 M, THE DIFFERENCE IN YIELD BETWEEN MO. 18 AND 21 IS NOTORIOUS. (CIAT)

CAMEROON

0190

32026 4EME PLAN quinquennal 1976-1977/1980-1981 de la République Unie du Cameroun. 2. L'agriculture. (Fourth quinquennial plan 1976-77/1980-81 of the United Republic of Cameroon. 2. Agriculture). Bulletin de l'Afrique Noire no.883:17223-17226. 1976. Fr.

CASSAVA; STATISTICAL DATA; CASSAVA PROGRAMS; INDUSTRIALIZATION; PRODUCTION; CAMEROON.

Data are presented on cassava production (t) in 1967-68 and 1974-75 in Cameroon and estimates for 1975-76 and 1980-81 are also included. A study carried out 1976-77 on an agro-industrial cassava complex and its establishment in Bertoua in 1977-78 are mentioned. Such a complex was planned to manufacture cassava starch, cassava chips, CM, and cassava paste. (CIAT)

0191

32022 EXCEPTIONNEL DEVELOPPEMENT des cultures vivriéres. (Exceptional development of food crops). Marchés Tropicaux et Méditerranéens Octobre 1976:2913-2915. 1976. Fr.

CASSAVA; STATISTICAL DATA; PRODUCTION; PRODUCTIVITY; TRADE; CAMEROON.

Statistics are presented on area planted (ha) to cassava (among other crops), yields (kg/ha), total production (t), and amount sold (t) in 1974-75 in Cameroon. A project of the Fonds National de Développement Rural to manufacture cassava chips and CM in the area of Bembarang is mentioned. (CIAT)

0192

31548 CAMEROON. MINISTRY OF AGRICULTURE. NATIONAL DIRECTORATE OF CENSUS. 1986. Cassava planted. In Cameroon. Ministry of Agriculture. National Directorate of Census. 1984 agricultural census in Cameroon. Final draft. Cameroon, v.1,pp.130-137. En., Dat.num.

CASSAVA; STATISTICAL DATA; FARM SIZE; PRODUCTION; PRODUCTIVITY; ECONOMICS; CAMEROON.

Statistical data, obtained in Cameroon's 1984 agricultural census, is provided on area planted to cassava by regions, no. of farms and farm size, area harvested, production, yields, and sales. The largest 16 Cameroon

departments are ranked based on cassava production, with Ndian producing the most. (CIAT)

0193

30900 CAMEROON NATIONAL ROOT CROPS IMPROVEMENT PROGRAMME. 1985. Cassava. In Cameroon National Root Crops Improvement Programme. Annual Technical Report 1985 Njombé, Cameroon, Institut de la Recherche Agronomique. Programme National d'Amélioration des Plantes a Tubercules. pp.13-67. En.

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; CULTIVARS; RESISTANCE; PHENACOCCUS MANIHOTI; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; MONONYCHELLUS TANAJOA; ROOT PRODUCTIVITY; INTERCROPPING; CUTTINGS; GERMINATION; MAPS; CASSAVA FLOUR; PALATABILITY; LAND PREPARATION; CAMEROON.

Cassava research conducted by the Programme National d'Amélioration des Plantes a Tubercules (Cameroon) in 1984 is reported. Plant breeding focussed on the obtainment of disease- and pest-resistant var. seedling nurseries, clonal evaluations, preliminary, advanced, and uniform yield trials, and evaluation of local clones in different agroecological areas. Agronomy studies were concerned with crop association with maize and cowpeas, weeding frequency, N fertilization in cassava intercropped with maize, cultivation systems in several agroecological areas, and incidence of cutting age on yields. Regarding plant pathology, the causal agent of cassava root rot in Central Province was isolated as well as the CBB pathogen from different areas. A national survey on cassava pests was also conducted. Viscographic studies on soybean- enriched CF were carried out along with acceptability tests of fresh and boiled tubers from different clones. Finally, on-farm trials on land preparation and on the effect of cutting type and land preparation on cassava yields were conducted. Data on yields and resistance of the best clones to the cassava mealybug, CBB, and green mite are given. Results of trials on cultivation systems (cassava associated with groundnut or sole cropped, in fertilized and nonfertilized plots are presented. Information on yields, disease and pest incidence, and plant development is included. Growers are advised to plant straight mature cuttings (germination rate 97 percent). Maps are included showing the distribution of the 2 major cassava pests (cassava mealybug and cassava green mite) in Cameroon. Further studies are recommended to confirm the variation of the viscosity of soybean-enriched CF as a function of the different percentages of the mixture. Results from acceptability tests are given. Finally, ridging is considered suitable for obtaining of higher cassava yields. (CIAT)

0194

30899 CAMEROON NATIONAL ROOT CROPS IMPROVEMENT PROGRAMME. 1981. Cassava. In Cameroon National Root Crops Improvement Programme. Annual Technical Report 1981. Njombé, Cameroon, Institut de la Recherche Agronomique. Programme National d'Amelioration des Plantes a Tubercules. pp.5-41. En., Il.

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; SELECTION; BRANCHING; CULTIVARS; ROOT PRODUCTIVITY; PLANTING; CUTTINGS; WEEDING; HERBICIDES; INTERCROPPING; MAIZE; COWPEA; PRUNING; LEAVES; FERTILIZERS; N; P; K; INJURIOUS INSECTS; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BACTERIAL BLIGHT; COLLETOTRICHUM MANIHOTIS; DISEASES AND PATHOGENS; PROCESSING; FOOFOO; ORGANOLEPTIC EXAMINATION; CAMEROON.

Cassava research activities in carried out in 1981 by the Cameroon National Root Crops Improvement Program are reported. Data on yield, CAMD, CBB, and anthracnose incidence, and several plant characteristics are given for selected cassava clones and local cv. evaluated in different nurseries and

yield trials (preliminary and advanced) at the locations of Mujuka, Babungo, Mbankomo, Garoua, and Meiganga. A red- and a white-skinned var. were tested in various agronomic trials; no differences in yields occurred between 4 planting methods (slanted at 45 degrees, upright, horizontal completely buried, crossed double). Weed control trials (chemical vs. manual) showed that chemical control may be more economical with similar results in root yields but further studies are needed. Significant yield differences were found between the red- and white- skinned var. planted at 3 different planting distances (1.0 x 0.5, 1.0 x 1.0, and 1.0 x 1.5 m). Yields of the white-skinned var. decreased as density increased while the contrary was true for the red-skinned var. The white-skinned var. intercropped better with maize and cowpea. When the red-skinned var. was intercropped with either maize, macabo, or sweet potato no differences in yield were detected. Most detopping treatments gave higher root yields than the control (no detopping). Preliminary results of a cassava NPK fertilization trial are also presented. Breeding and agronomic research approaches that should be followed in 3 ecosystems (forest, lowlands, and highlands) are presented. Among cassava diseases, CBB, CAMV, Colletotrichum manihotis, and Cercospora spp. were considered as the most serious, and among the pests Mononychellus tanajoa and Phenacoccus manihoti. The results of a panel evaluation of protein- enriched foofoo are presented. (CIAT)

0195

31328 CAMEROON NATIONAL ROOT CROPS IMPROVEMENT PROGRAMME. 1983. Cassava. In Cameroon National Root Crops Improvement Programme. Annual Technical Report 1983. Njombé, Cameroon, Institut de la Recherche Agronomique. Programme National d'Amelioration des Plantes a Tubercules. pp.16-66. Fr., 11.

CASSAVA; CULTIVARS; CASSAVA PROGRAMS; ROOT PRODUCTIVITY; PLANT BREEDING; SELECTION; HCN CONTENT; PLANTING; TIMING; CUTTINGS; WEEDING; HERBICIDES; INTERCROPPING; MAIZE; COWPEA; SWEET POTATOES; INJURIOUS INSECTS; DISEASES AND PATHOGENS; PEST DAMAGE; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BACTERIAL BLIGHT; CERCOSPORIDIUM HENNINGSII; PROCESSING; POSTHARVEST TECHNOLOGY; DRYING; SMALL-SCALE EQUIPMENT; CAMEROON.

Cassava research activities carried out in 1983 by the Cameroon National Root Crops Improvement Program are reported. Data on yield, CAMD and CbB incidence, and other aspects such as HCN content are given for selected cassava clones and local cv. evaluated in different nurseries and yield trials (preliminary, advanced, and uniform) at the locations of Mujuka, Ekono, Babungo, Minkomeyos, Ntui, Hondole, Bertoua, and Meiganga. A red- and a white-skinned var. were teated in various agronomic trials showing that June and Aug. plantings gave the highest yields, but results are yet to be confirmed. Weed control trials (chemical vs. manual) showed that chemical control was more profitable with similar results in root yields; the integration of both practices is recommended. A density of 6666 plants/ha favored root yields of the white-skinned var. and 10,000 plants/ha those of the red-skinned var. In intercropping trials with maize, the white-skinned var. gave higher returns than the red-skinned var.; the latter showed significantly depressed yields. Intercropping cassava with maize or macabo was profitable but not with sweet potato; 10,000 cassava plants/ha intercropped wit 20,000 maize plants/ha was found as a suitable combination for max. yields and returns. A density of 20,000-30,000 plants/ha of a locally improved sweet cassava clone was found suitable in Meiganga. Cercosporidium henningsii reduced marketable root yields significantly in 12 of 25 clones tested. Mononychellus tanajoa and Zonocerus variegatus were the most important pests that year. The results of a survey on traditional methods of processing and preserving root and tuber crops in Cameroon are discussed. A combined solar/fire dryer for cassava pulp is also briefly described. (CIAT)

0196

30895 CAMEROON NATIONAL ROOT CROPS IMPROVEMENT PROGRAMME. 1982. Cassava. In Cameroon National Root Crops Improvement Programme. Annual Technical Report 1982. Njombé, Cameroon, Institut de la Recherche Agronomique. Programme National d'Amelioration des Plantes a Tubercules. pp.7-59. En., Il.

CASSAVA; CULTIVARS; CASSAVA PROGRAMS; ROOT PRODUCTIVITY; PLANT BREEDING; SELECTION; MAIZE; COWPEA; SWEET POTATOES; PLANTING; SPACING; HARVESTING; TIMING; CUTTINGS; HERBICIDES; INTERCROPPING; PRUNING; LEAF AREA; MONONYCHELLUS TANAJOA; PHENACOCCUS MANIHOTI; CASSAVA AFRICAN MOSAIC VIRUS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; GLOMERELLA MANIHOTIS; PROCESSING; FOOFOO; FERMENTATION; DRYING; HCN CONTENT; CAMEROON.

Cassava research activities carried out in 1982 by the Cameroon National Root Crops Improvement Program are reported. Data on yield and CAMD and CBB incidence are given for selected cassava clones and local cv. evaluated in different nurseries and yield trials (preliminary and advanced) at the locations of Mujuka, Babungo, Mbankomo, Bertoua, and Meiganga. A red- and a white-skinned var. were tested in various agronomic trials; June and Aug. plantings gave the highest yields. No significant yield differences were found between plant densities of 6666 and 10,000 plants/ha, but yields were lower for 20,000 plants/ha. No differences in yields occurred between 4 planting methods (planted at 45 degrees; upright; horizontal completely buried; crossed double). Yields increased as harvesting time increased from 9 to 15 mo. after planting, but then began to decline at 18 mo. Weed control trials (chemical vs. manual) showed that chemical control was more profitable with similar results in root yields. Cassava intercropped with maize and cowpea showed that the white-skinned var. gave the highest returns; the red-skinned var. intercropped with macabo was the most profitable treatment compared with intercropping with maize or sweet potato. A density of 20,000 maize plants/ha was the best population to intercrop with cassava. Detopping clone 1 at a 5-wk. interval increased farmer incomes by more than 50 percent. Preliminary results of a cassava NPK fertilization trial are also presented. Among cassava diseases, CBB, CAMV, Colletotrichum manihotis, and Cercospora spp., were considered as the most serious and among pests, Mononychellus tanajoa. The proximate composition of protein-enriched foofoo is presented. Cassava fermentation time was reduced by using roots reduced to small particles and prefermented liquor. For prolonged shelf life of foofoo, its MC should be reduced to 12 percent. Oven drying of cassava pulp was more efficient and hygienic than solar drying. The HCN content of breeder-selected cv. are presented. (CIAT)

0197

31301 CAMEROON NATIONAL ROOT CROPS IMPROVEMENT PROGRAMME. 1984. Cassava (Manihot esculenta). In Cameroon National Root Crops Improvement Programme. Annual Technical Report 1984. Njombé, Cameroon, Institut de la Recherche Agronomique. Programme National d'Amelioration des Plantes a Tubercules. pp.7-50. En., Il.

CASSAVA; CULTIVARS; CASSAVA PROGRAMS; SELECTION; PLANT BREEDING; ROOT PRODUCTIVITY; PLANTING; TIMING; HARVESTING; INTERCROPPING; MAIZE; COWPEA; MONONYCHELLUS TANAJOA; PHENACOCCUS MANIHOTI; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BACTERIAL BLIGHT; CASSAVA FLOUR; PACKAGING; MAPS; CAMEROON.

Cassava research activities carried out in 1984 by the Cameroon National Root Crops Improvement Program are reported. Data on yield, CAMD, CBB, and Mononychellus tanajoa incidence, and other relevant aspects are given for selected cassava clones and local cv. evaluated in different nurseries and yield trials (preliminary, advanced, and uniform) at the locations of Mujuka, Nkolbisson, Njombe, Ekona, Foumbot, Oschang, Babungo, Meiganga, Minkomeyos, Bertoua, Hondole, Ntvi, and Mbe. A red- and a white-skinned var.

were tested in various agronomic trials; root yields were found to increase significantly between 9-12 mo. April plantings gave the highest overall yields. Planting the white-skinned cassava clone in association with maize and cowpea was advantageous (LER = 1.5). The results of observations of Mononychellus tanajoa and Phenacoccus manihoti infestation and severity in cassava fields in different regions of Cameroon are presented. Protein-enriched CF was packed in plastic bags and tested for shelf life; the product retained its quality characteristics for up to 7 mo. (CIAT)

0198

31346 CAMEROUN. MINISTERE DE L'AGRICULTURE. 1986. L'agriculture Camerounaise en Chiffres 1986. Cameroun, Direction des Etudes et Projets. Division de la Statistique. 30p. Fr., Dat.num., Il.

CASSAVA; STATISTICAL DATA; PRODUCTION; PRICES; MARKETING; CAMEROON.

Data are given on production (t) and area planted (ha) to various food crops (among them cassava) in different regions of Cameroon in 1984. The commercialization (no. of exploitations, percentage of the production sold, and av. prices) of the main agricultural products, including cassava, are also given. Additional data are included on total country surface and population, cultivated area, place of agriculture within the national economy, climate, agricultural population and labor in the traditional sector, use of manures, pesticides, and insecticides, land use, major crops and exports. (CIAT)

0199

31609 CAMEROUN. MINISTERE DE L'ECONOMIE ET DU PLAN. 1986. Ve plan quinquenal de développement économique, social et culturel 1981-1986. (1981-1986 Fifth quinquennial plan for economic, social, and cultural development). Cameroun, pp.7-8,33-34,37,53-58,61-69,77-79,81,89-90,96-97,293-296,385-387. Fr.

CASSAVA; STATISTICAL DATA; PRODUCTION; DEVELOPMENTAL RESEARCH; CAMEROON.

Statistics are presented on the production and availability of various crops (including cassava) for consumption in Cameroon in 1980. Estimates for 1985 are also given as well as the evolution of production deficits and surplus. Within the framework of the 1981-86 5th quinquennial plan for economic, social, and cultural development, the deficit in cassava production is expected to reach 22,000 t; however, the introduction of cassava in most integrated development and agro-industrial projects would alleviate this deficit. (CIAT)

0200

31581 CAMEROUN. MINISTERE DU COMMERCE ET DE L'INDUSTRIE. 1986. Etude de la commercialisation des produits vivriers: rapport principal. (Study on the commercialization of food products: main report). Cameroun, 41p. Fr., Il.

CASSAVA; MARKETING; MAPS; CASSAVA ROOTS (VEGETABLE); DRIED ROOTS; CASSAVA PASTES; STATISTICAL DATA; PRICES; CONSUMPTION; CAMEROON.

A census of commodity sellers was carried out in both rural and urban markets in Cameroon. Maps showing the location of the surveyed markets are included as well as a table with data on the no. of selling points and the percentage of cassava sellers (for fresh and dry roots, and for cassava pastes). Statistics on the evolution of av. cassava prices/calorie in Yaounde are given for 1968, 1976, 1978, 1980, 1982, and 1984 as well as estimates on the demand for the same product for 1985-90. Data are also given on the amount of commercialized cassava and its unitary price in different regions of the country. Projects were designed for the

establishment of a network of market places and wholesale markets to guarantee the supply for large cities and the regular flow of commodities from the main rural zones. The main objectives of each project are mentioned and the conditions necessary for their accomplishment are presented. (CIAT)

0201

31356 CAMEROUN. MINISTERE DU PLAN ET DE L'AMENAGEMENT DU TERRITOIRE. 1983. Résultats de 1982. (1982 results). In Cameroun. Ministere du Plant et de l'Amenagement du Territoire. Annuaire Statistique du Cameroun 1983. Cameroun, Direction de la Statistique et de la Comptabilité Nationale. pp.17,23-29,183-184,245-246,252,257. Fr., Dat.num.

CASSAVA; STATISTICAL DATA; FRODUCTION; CASSAVA MEAL; TAPIOCAS; CASSAVA ROOTS (VEGETABLE); CASSAVA LEAVES (VEGETABLE); PRICES; CAMEROON.

Statistical data are given on area planted (ha) and production (t) of the main food crops (among them cassava) in Cameroon for 1970-81. Consumer retail prices of different foodstuffs, including several cassava by-products (roots, leaves, tapioca), in the localities of Yaounde and Bamenda are included. General information is also given on physical characteristics of the country, and data on av. temp. (degrees Celsius) and rainfall (mm) for various localities are included for 1970-80. (CIAT)

0202

30499 NATIONAL DIRECTORATE OF CENSUS. CAMEROON. 1986. 1984 agricultural census in Cameroon. 1. Traditional sector. Cameroon, Ministry of Agriculture. v.1,285p. En., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; PRICES; CAMEROON.

Results of the 1984 agricultural census in the traditional sector of Cameroon are summarized. Regarding cassava, statistics are presented on area planted (per farm by province and by size), production (farm area harvested, estimated total annual production, av. production/harvested farm area, and av. yield/ha by province), and sales (commercial farms, estimated annual amount and av. amount sold/commercial farm by province. Additional statistical information is included on production/sales (farm area harvested and sales, amount harvested and sold, av. amount sold/harvested farm area by province and by amount of cassava harvested), production/farms (rank of departments by total cassava production with total cassava farms, a total of 16 departments), and value of sales (estimated total value of sales, av. value of sales/commercial farm and av. prices by province). (CIAT)

0203

30897 AMBE-TUMANTEH; AGUEGUIA, A., eds 1980. Cassava. In Cameroon National Root Crops Improvement Programme. Annual Technical Report 1980. Njombé, Cameroon, Institut de la Recherche Agronomique. Programme National d'Amelioration des Plantes a Tubercules. pp.6-19. En.

CASSAVA; CULTIVARS; CASSAVA PROGRAMS; PLANT BREEDING; IDENTIFICATION; BRANCHING; STEMS; ROOT PRODUCTIVITY; PLANTING; CUTTINGS; INTERCROPPING; MAIZE; CASSAVA AFRICAN MOSAIC VIRUS; CAMEROON.

0204

26877 AQUARON, R.; NGUESSI, P.; BEN ENO, L.; RIVIERE, R. 1985. LA GOITRE ENDEMIQUE AU CAMEROUN (PROVINCES DE L'EST ET DU NORD- OUEST). (ENDEMIC GOITER IN CAMEROON; EASTERN AND NORTHWESTERN PROVINCES). REVUE FRANCAISE D'ENDOCRINOLOGIE CLINIQUE NUTRITION ET METABOLISME 26(6):537-546. FR., SUM. FR., EN., 24 REF., IL. (LABORATOIRE DE BIOCHIMIE MEDICALE ET INSERM U 38, FACULTE DE MEDICINE, 27, BD JEAN-MOULIN, 13385, MARSEILLE CEDEX 5, FRANCE)

CASSAVA; TOXICITY; CLINICAL MANIFESTATIONS; ENDEMIC GOITER; MAPS; HUMAN PHYSIOLOGY; IODINE; ROOTS; LEAVES; HCN CONTENT; CAMEROON.

A SURVEY ON 142 AND 358 GOITROUS SUBJECTS, CONDUCTED RESP., IN EASTERN AND NORTHWESTERN PROVINCES OF CAMEROON, SHOWED THAT THE LOW I INTAKE WAS THE MAIN FACTOR IN ENDEMIC GOITER DEVELOPMENT IN THESE 2 ENDEMIC AREAS BY MEASURING URINARY I EXCRETION IN 43 GOITROUS SUBJECTS. DETERMINATION OF I IN WATER AND IN SOME FOODS (CASSAVA, SALT) GAVE AN ESTIMATE OF THE DAILY I INTAKE BETWEEN 40-80 MICROGRAMS, VALUES LOWER THAN NORMAL DAILY I INTAKE (100-150 MICROGRAMS) RECOMMENDED BY THE WORLD HEALTH ORGANIZATION IN 1979. THE FAVORABLE EFFECT ON SCN, WHICH ARE PRODUCED FROM HEPATIC DETOXICATION OF CYANIDE (CASSAVA), HAS BEEN SHOWN BY THE DETERMINATION OF SALIVARY SCN. (AS)

0205

30474 AQUARON, R. 1977. Urinary, salivary and plasma levels of thiocyanate in goitrous and non goitrous areas of Cameroon after cassava diet. Annales d'Endocrinologie 38:80a. En.

CASSAVA; THIOCYANATES; ENDEMIC GOITER; FERMENTED PRODUCTS; ANALYSIS; CAMEROON.

The influence of unfermented and fermented cassava diets on urinary, salivary, and plasma SCN levels in patients of goitrous and nongoitrous areas was investigated. The possible role of cassava as the cause of endemic goiter in goitrous areas was determined in patients receiving fermented and unfermented cassava diets. SCN levels were significantly higher in patients receiving an unfermented and fermented cassava diet than in those who only received a fermented cassava diet: salivary SCN, 3042 plus or minus 1353 vs. 1933 plus or minus 1267 micromoles/liter; plasma SCN, 125 plus or minus 91 vs. 61 plus or minus 29 micromoles/liter; urinary SCN, 230 plus or minus 204 vs. 105 plus or minus 34 micromoles/liter, resp. A comparison between individuals from goitrous and non-goitrous areas where the diet was fermented cassava showed a salivary SCN level significantly higher only in the 1st. group. Salivary SCN level appears to be a better index to determine the amount of unfermented and fermented diet. These observartions are compatible with the concept that unfermented and fermented cassava diets give high salivary SCN levels and that, at least partially, they can be responsible for endemic goiter in this area. (CIAT)

0206

30876 AY, P.; FOAGUEGUE, A.; NOUNAMO, L.; BIDZOGO, O. 1985?. Report on exploratory survey and establishment of IRA-IITA-IDRC on-farm research work in villages of Yaounde and Bikok areas: special report on cassava. Yaounde, Cameroon, Centre de Recherche Agronomique de Nkolbisson. 16p. En., Il.

CASSAVA; CASSAVA PROGRAMS; ON-FARM RESEARCH; CULTIVARS; CULTIVATION SYSTEMS; PROCESSING; USES; FOOD PRODUCTS; CAMEROON.

The results of a survey on the role of cassava in the local farming systems of Yaounde and Bikok, Cameroon, where cassava is the dominant root crop, are presented. Information is also given on the production and use of different var. Selected characteristics of cassava var. commonly used by farmers are given, as well as data on the general use of cassava in mixed cropping (groundnut, maize, plantain). Important characteristics of cassava and utilization criteria mentioned by farmers include taste and texture of roots (sweet var. preferred), storability of roots in the ground, flexibility in planting time, variability in food production, and adaptation to different cropping systems. Root rot was identified as the major production constraint followed by scale insects. A diagram of cassava processing into different intermediate and end products for consumption and marketing is provided. The future role of bitter var. in the region, and particularly in on-farm

research, is discussed. The importance of time to maturity as a specific selection parameter is stressed. (CIAT)

0207

29596 KAMAJOU, E.; KNIPSCHEER, H. 1979. Prices (1966-1978) of major food crops in Cameroon (Yaounde): (rice, maize, cocoyam, cassava, yam and plantain). Ibadan, Nigeria, International Institute of Tropical Agriculture. Agricultural Economics Information Bulletin no.6 23p. En., Il.

CASSAVA; STATISTICAL DATA; PRICES; CAMEROON.

Urban retail prices for the main food crops, including cassava, produced in the area of Yaounde, Cameroon, are provided in table form on a monthly basis/yr and quarterly basis/yr for the period 1966-78. Cassava retail prices are given separately for fresh and dried roots. A histogram of price trends of dried cassava during the study period is included; data is given on a quarterly basis/yr. (CIAT)

0208

26787 LEUMASSI, P. 1985. SITUATION DU SECTEUR DES RACINES, TUBERCULES ET PLANTAINS AU CAMEROUN. (SITUATION OF ROOTS, TUBERS, AND PLANTAINS IN CAMEROON). IN WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE, 1985. REPORT. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.13-26. FR.

CASSAVA; TRADE; PRICES; COSTS; PRODUCTION; SOCIOECONOMIC ASPECTS; STATISTICAL DATA; DEVELOPMENTAL RESEARCH; CASSAVA PROGRAMS; CAMEROON.

THE SITUATION OF CASSAVA AND OTHER STARCHY CROPS IN CAMEROON IS EXAMINED;THERE, FOOD PRODUCTION IS AFFECTED BY RUDIMENTARY METHODS OF CULTIVATION, TRANSFORMATION, AND CONSERVATION, REGIONAL CALORIC DEFICIENCIES, INADEQUATE DISTRIBUTION, STORAGE, AND PRICE STRUCTURES, AND RURAL MIGRATION. CASSAVA ACCOUNTS FOR 20.12 PERCENT OF THE TOTAL FOOD PRODUCTION WITH 1938 T/HA AND 45.7 KG PER CAPITA/YR; IT IS CONSUMED FRESH OR PROCESSED. CHANNELS OF DISTRIBUTION AND MARKETING ARE CHARACTERIZED BY ATOMIZATION AND LACK OF EQUIPMENT. PRICE POLICIES, SYSTEMS AND MARGINS, POSTHARVEST LOSSES, AND OFFICIAL INTERVENTION ARE DISCUSSED. TOTAL CASSAVA PRODUCTION HAS DECREASED FROM 719,000 T (1972) TO 625,000 T (1981), AND AREA PLANTED TO CASSAVA FROM 507,747 HA (1976) TO 401,954 HA (1980). (CIAT)

0209

32222 NGEVE, J.M. 1987. Performance of improved cassava clones in the sandy, lateritic soils of the southern lowlands of Cameroon (Abstract). In Terry, E.R.; Akoroda, M.O.; Arene, O.B., eds. Triennial Symposium of the International Society for Tropical Root Crops- Africa Branch, 3d, Owerri, Nigeria, 1986. Tropical root crops; root crops and the African food crisis: proceedings. Ottawa, Canada, International Development Research Centre. p.35. En. (Inst. de la Recherche Agronomique, Nkolbisson, B.P. 2067, Yaoundé, Cameroon)

CASSAVA; CULTIVARS; SOIL REQUIREMENTS; LEAVES; ROOT PRODUCTIVITY; CAMEROON.

Cassava yield trials conducted in 3 environments in the Central Province of Cameroon showed that superior clones performed best, yielding over 20 t/ha at each location. These clones outyielded local cv. Higher yields appeared to be associated with tolerance to CAMD. In Ntui, a severe outbreak of CBB in 1985 drastically reduced the yields of most clones, possibly because these clones were developed in Nkolbisson, an area free of CBB. The need to test improved clones for their tolerance to major diseases and pests before their release is stressed. Of the 8 clones tested in farmers' fields, clone

1005 had the highest root and leaf yields and was preferred by all growers participating in the trial. (Full text)

0210

30446 NUMFOR, F.A.; AY, P. 1987. Postharvest technologies of root and tuber crops in Cameroon: a survey. Yaounde, Cameroon, Ministere de L'enseignement Superieur et de la Recherche Scientifique. Institut de la Recherche Agronomique. 60p. En., 30 Ref., Il.

CASSAVA; POSTHARVEST TECHNOLOGY; STORAGE; PROCESSING; MARKETING; CASSAVA PRODUCTS; SURVEYS; QUESTIONNAIRES; CAMEROON.

Results of a survey on postharvest technologies of root and tuber crops (among them cassava) in Cameroon are given. Data were collected on harvesting frequencies and methods, storage techniques and problems encountered, processing techniques, use of products, and commercialization and marketing. Information was also obtained during field visits. The following cassava-based food products, ranked according to importance, are described: foofoo, foofoo balls, water foofoo, pounded cassava foofoo, gari, myondo, tobolo, mentoumba, cooked chips, cassava doughnuts, cassava starch, saboulou, arki (alcoholic beverage), and processed cassava leaves. Their processing and commercialization is briefly discussed. Possible future research fields are mentioned, grouped as follows: storage techniques and structures, improved processing techniques, industrial products, fast foods, and animal feeds. A sample survey questionnaire is included as well as the data obtained on frequency distribution of responses. A list of common local names of some traditionally processed cassava products is given. A brief report on the Cameroon national root crops improvement program is also included. (CIAT)

0211

32216 NUMFOR, F.A.; LYONGA, S.N. 1987. Traditional postharvest technologies of root and tuber crops in Cameroon: status and prospects for improvement. In Terry, E.R.; Akoroda, M.O.; Arene, O.B., eds. Triennial Symposium of the International Society for Tropical Root Crops- Africa Branch, 3d, Owerri, Nigeria, 1986. Tropical root crops; root crops and the African food crisis: proceedings. Ottawa, Canada, International Development Research Centre. p.135-139. En., Sum. En., 16 Ref. (Ministry of Higher Education & Scientific Research, P.O. Box 1457, Yaundé, Cameroon)

CASSAVA; POSTHARVEST TECHNOLOGY; SURVEYS; RESEARCH; CAMEROON.

To outline priority research areas in root crop postharvest technology in Cameroon, a survey of existing root crop handling and processing techniques was undertaken. The cultivation of cassava, cocoyams, yams, and sweet potatoes was found to be widespread in all regions of the country: however, large-scale commercial production or processing units were rare. Farm holdings are generally small and harvesting patterns range from single harvest to harvest as needed. Elaborate storage structures are lacking. Relative to cereals, root crop losses to pests are minimal; the greater proportion of postharvest losses are due to poor handling, physiological factors, and pathological factors. Only cassava is traditionally transformed into numerous products; the other root crops are generally consumed as basic vegetables. The young leaves of cassava, cocoyams, and sometimes sweet potatoes are used as human food, but only sweet potato vines and tubers are fed to animals. This survey indicated that postharvest technology research on root crops in Cameroon should emphasize the development of simple efficient storage techniques, the improvements of existing handling and processing methods with special regard to hygiene and quality standards, the development of animal feeds, and the collection of more scientific data on root crops with respect to var. and environmental factors. (AS)

0212

32243 PFEIFFER, H.J. 1986. Report on cassava mealybug and cassava green mites in some African countries: Cameroon. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. pp.135-137. En., Il. (IRA Nkolbisson, B.P. 2067, Yaoundé, Cameroon)

CASSAVA; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; ROOT PRODUCTIVITY; CULTIVARS; RESISTANCE; PEST DAMAGE; CAMEROON.

A brief report is presented on detection, damage, and cassava var. evaluation for resistance to Phenacoccus manihotis and Mononychellus tanajoa in Cameroon. From 180 cassava clones evaluated for resistance to M. tanajoa only 7 showed no obvious damage. Fifteen showed a few chlorotic spots on some leaves (damage ratings 1 and 2, resp.) for which they were considered resistant. Resistant outstanding clones were 0445, 0438, 0090, 0857, 0750, and 0801. (CIAT)

0213

25562 TCHIENGUE, E. 1981. TRANSFORMATION INDUSTRIELLE OU ARTISANALE DU MANIOC ET AUTRES TUBERCULES AU CAMEROUN. (INDUSTRIAL OR SMALL-SCALE (BY ARTISANS) TRANSFORMATION OF CASSAVA AND OTHER TUBERS IN CAMEROON). IN WORKSHOP ON PROCESSING TECHNOLOGIES FOR CASSAVA AND OTHER TROPICAL ROOTS AND TUBERS IN AFRICA, ABIDJAN, IVORY COAST, 1983. PROCEEDINGS. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.445-446. FR.

AFRICA; CAMEROON; PRICES; PROCESSING; SMALL-SCALE PROCESSING.

THE PROCESSING OF CASSAVA IN CAMEROON IS PRESENTED. MOST OF THE PROCESSING IS UNDERTAKEN BY SMALL ARTISANS. THE CENTRE NATIONAL D'ETUDES ET D'EXPERIMENTATION DU MACHINISME AGRICOLE AND THE CENTRE D'ASSISTANCE AUX PETITES ET MOYENNES ENTREPRISES ARE WORKING ON THE STUDY AND DESIGN OF ADAPTED MACHINES.

CENTRAL AFRICAN REPUBLIC

0214

31344 CENTRAL AFRICAN REPUBLIC. MINISTERE DU DEVELOPPEMENT RURAL. 1984. Présentation de l'enquête. (Survey introduction). In Central African Republic. Ministere du Développement Rural. Rapport Annuel: statistique agricole, campagne agricole 1983-1984. Bangui, Service de Statistique et de la Documentation. pp.1-4,6-11,55-60. Fr., Dat.num.

CASSAVA; STATISTICAL DATA; SURVEYS; PRODUCTION; ROOT PRODUCTIVITY; FARM SIZE; CENTRAL AFRICAN REPUBLIC.

Statistics are presented on several aspects of various crops (among them cassava) in different regions of the Central African Republic in 1983-84. Data are given on no. of exploitations, no. of cultivated exploitations, no. of plots, area, production, and yields. Rainfall data for 1983 are also included as well as data on the characteristics of land occupation, demography, and active agricultural population of surveyed zones. (CIAT)

0215

31357 CENTRAL AFRICAN REPUBLIC. MINISTERE DU DEVELOPPEMENT RURAL. 1985. Situation de l'agriculture et de l'élevage en République Centrafricaine de 1981 a 1985. (Agriculture and livestock situation in Central African Republic from 1981 to 1985). Bangui, Central African Republic, pp.1-2,8-11,17-19,21,23. Fr.

CASSAVA; DEVELOPMENT; PRODUCTION; ECONOMICS; CASSAVA CHIPS; INTERCROPPING; CENTRAL AFRICAN REPUBLIC.

Activities of the agriculture-livestock sector in Central African Republic before 1981 are summarized and the situation of this sector up to 1985 is analyzed. The importance of cassava planted in association with other food crops is mentioned. Finally, data are presented on production estimates for cassava chips in 1985 and 1990. (CIAT)

0216

31339 CENTRAL AFRICAN REPUBLIC. MINISTERE DU PLAN, DES STATISTIQUES ET DE LA COOPERATION ECONOMIQUE ET FINANCIERE. 1987. Cultures vivrieres: manioc. (Food crops: cassava). In Central African Republic. Ministere du Plan, des statistiques et de la Coopération Economique et Financiere. Annuaire Statistique période 1979-1985. Central African Republic, Direction de la Statistique Generale et des Etudes Economiques. pp.71-74. Fr., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; PRICES; CENTRAL AFRICAN REPUBLIC.

Statistics are presented on production (t), area planted (ha), av. yields (kg/ha), and official prices for the major agricultural crops (including cassava) in Central African Republic from 1978 to 1985. (CIAT)

0217

31355 CENTRAL AFRICAN REPUBLIC. MINISTERE DU PLAN, DES STATISTIQUES ET DE LA COOPERATION ECONOMIQUE ET FINANCIERE. 1976?. Manioc: industrie alimentaire et mécanisation agricole. (Cassava: food industry and agricultural mechanization). Bangui, Central African Republic. pp.2-4,10. Fr.

CASSAVA; INDUSTRIALIZATION; CASSAVA MEAL; CASSAVA PROGRAMS; CENTRAL AFRICAN REPUBLIC.

The importance of cassava as a food crop in Central African Republic is highlighted and data are given on area planted (ha) and production of cassava chips (t) in 1975-76. The main characteristics of a project for an agro-industrial complex in the region of Boali, located 65 km from Bangui, are briefly described. This complex was designed to obtain CM and other cassava by-products. (CIAT)

0218

31345 PROJET DE DEVELOPPEMENT RURAL DE L'OMBELLA-MPOKO. CENTRAL AFRICAN REPUBLIC. 1984. Etude sociologique. (Sociological study). Fonds International pour le Développement Agricole. Central African Republic, pp.1,4-7,35,39-40,45,48-55,77-79,109-110,147-156. Fr., Sum. Fr., Il.

CASSAVA; SOCIOECONOMIC ASPECTS; WOMEN; MAPS; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; PRODUCTION; CULTIVATION; LABOR; STATISTICAL DATA; CENTRAL AFRICAN REPUBLIC.

Current socioeconomic trends are determined for the Ombella-Mpoko rural development project area in Central African Republic. Aspects studied were family and social organization of food crop production, place of food crop activities within the production system, constraints and potential influences on the peasant's reality, and perspectives for the 1st operations. Statistics are given on the percentage of farms cultivating the major food crops (cassava included), total area planted, and av. plot area. These data are compared with those from the rest of the Central African Republic. (CIAT)

0219

31588 PROJET DE DEVELOPPEMENT RURAL DE L'OMBELLA-M'POKO. CENTRAL AFRICAN REPUBLIC. 1985. Sur l'état d'avancement du projet, Janvier a Septembre 1985. (Project progress report January-September 1985). Central African Republic, Ministere du Développement Rural. Rapport no.1 pp.1-4,17-25,49-56. Fr.

CASSAVA; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; PLANTING; CUTTINGS; PHENACOCCUS MANIHOTI; CASSAVA AFRICAN MOSAIC VIRUS; CENTRAL AFRICAN REPUBLIC.

A balance was made of on the accomplishments of the Ombella-M.Poko's rural development project (Central African Republic) regarding cassava. Aspects evaluated were obtention of healthy cuttings, planting distances in monocropping, and period for cutting obtention. The presence of the cassava mealybug and CAMV is highlighted. Complementary research on this crop is suggested; possible participating institutions in these research projects are mentioned. (CIAT)

0220

31343 PROJET DE DEVELOPPEMENT RURAL DE L'OMBELLA-M'POKO. CENTRAL AFRICAN REPUBLIC. 1985. Volet recherche appliquée. (Applied research). In Projet de Développement Rural de l'Ombella-M'poko. Central African Republic. Programme 1986. Bangui, Central African Republic, Ministere du Développement Rural. pp.1-3,15-19. Fr.

CASSAVA; RESEARCH; CULTIVATION SYSTEMS; CENTRAL AFRICAN REPUBLIC.

Future research projects to be carried out by the Projet de Développement Rural de l'Ombella-M'poko in Central African Republic are mentioned, namely, effect of cassava planting date on groundnut yields, comparative var. (local and introduced) trials, effect of cover plants on cassava, and effectiveness of parasitoids to control the cassava mealybug. (CIAT)

0221

31625 SICAGRI-GMD. CENTRAL AFRICAN REPUBLIC. 1978. Complexe agro-industriel du manioc en empire Centrafricain. (Cassava agroindustrial complex in Central African Republic). Bangui, Bureaux d'Etudes. 17p. Fr., Sum. Fr., Il.

CASSAVA; INDUSTRIALIZATION; DEVELOPMENTAL RESEARCH; CASSAVA PROGRAMS; CASSAVA FLOUR; ECONOMICS; STATISTICAL DATA; CASSAVA CHIPS; PRODUCTION; CONSUMPTION; PROCESSING; CENTRAL AFRICAN REPUBLIC.

The CF agroindustrial complex, a project designed within the framework of the 3rd quinquennial plan for the economic and social development of Central African Republic (1976-80), is described. The main characteristics of each of its components (area to be planted, factory, and complementary infrastructure) are presented; financial results are also calculated. The current situation of cassava in Central African Republic is explained in detail and statistics are presented on cassava chip production in the different producing regions for 1975-76. Difficulties for the cassava postharvest management are mentioned indicating that CF and dry chips are the best for storage. Data are given on the demand for cassava estimated for Bangui for 1980 and 1985. The main reasons for cassava shortage are listed as well as possible solutions to regulate the cassava market in this country. Factors favoring the establishment of an agroindustrial complex are mentioned and the consequences of establishing this complex are analyzed and discussed. A flowchart of the cassava processing procedure is included. (CIAT)

0222

31309 ASSAS M., G.G. 1985. Les maladies et ravageurs du manioc: enquete dans l'Ouham-Pendé. (Cassava diseases and pests: survey in Ouham-Pende). Central African Republic, Agence Centrafricaine de Développment de l'Ouham-Pende. pp.1-2,4,20. Fr., Sum. Fr.

CASSAVA; GLOMERELLA CINGULATA; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CASSAVA AFRICAN MOSAIC VIRUS; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; CENTRAL AFRICAN REPUBLIC.

Results and recommendations of a survey carried out to determine the major cassava diseases and pests in Ouhan-Pende, Central African Republic, are summarized. Anthracnose and CBB were found to be the main constraints for cassava development, followed by CAMV. Mealybugs and green mites were determined as the main cassava pests. (CIAT)

0223

26797 ATO, B.F.; TOLOYE, M.J. 1985. EXPOSE DE LA DELEGATION CENTRAFRICAINE. (REPORT ON CENTRAL AFRICAN REPUBLIC). IN WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE, 1985. REPORT. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.172-181. FR.

CASSAVA; PRODUCTION; MARKETING; PROCESSING; PRICES; POSTHARVEST LOSSES; SOCIOECONOMIC ASPECTS; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; LEGAL ASPECTS; CENTRAL AFRICAN REPUBLIC.

THE SITUATION OF ROOT AND TUBER CROPS IN THE CENTRAL AFRICAN REPUBLIC IS DESCRIBED. IN THIS COUNTRY, 80 PERCENT OF THE POPULATION IS ENGAGED IN AGRICULTURE AND FOOD SHORTAGES EXIST DUE TO THE PRESENCE OF GROUPS OF REFUGEES. ROOT AND TUBER CROPS ARE OF PRIMARY IMPORTANCE IN DROUGHT-STRICKEN REGIONS, ESPECIALLY IN SOUTHERN SAHARA. CASSAVA IS CULTIVATED THROUGHOUT THE COUNTRY AND IT IS PROCESSED AS GARI, FOOFOO, CHIPS, FLOUR, AND CHICKWANGUE; IT IS ALSO USED AS ANIMAL FEED. NO REGULATED COMMERCIALIZATION SYSTEM FOR ROOTS AND TUBERS EXISTS; GENERALLY THE COMMERCE OF THESE PRODUCTS IS THE WOMEN'S RESPONSIBILITY (GALI WALA), CHARACTERIZED BY FAULTY ORGANIZATION, CONTROL OF SMALL VOL. (EXCEPT IN THE CASE OF CASSAVA CHIPS), AND NONPROMOTION OF PRODUCTION. UNSCHEDULED HARVESTS, LACK OF CREDIT AND OF TRUSTWORTHY PROCESSING SYSTEMS ARE OTHER CONSTRAINTS. SHIFTING CULTIVATION IS ALSO PRACTICED AND THERE IS A HIGH INCIDENCE OF PESTS AND DISEASES. SOME RESEARCH WORKS ARE DESCRIBED. (CIAT)

0224

30864 CASTEX, P. 1982. Systemes de production-distribution des produits vivriers en République Centrafricaine: diagnostic de blocages et politique de déblocage. (Food products production-distribution systems in Central African Republic: blocking diagnosis and unblocking policy). Paris, France, Recherche Agronomique et Production de Semences Vivrieres et Maraicheres. Project P.N.U.D.-F.A.O. CAF 77/003. pp.1-5,13-15,19-20,39,49,61,65,68, 87,94,97,158-160,170-171. Fr., Sum. Fr., Il. Rapport de la mission de consultation F.A.O.effectuée du 25 novembre 1981 au 8 janvier 1982.

CASSAVA; CASSAVA CHIPS; DISTRIBUTION; CONSUMPTION; STATISTICAL DATA; CULTIVATION SYSTEMS; PRODUCTION; PRICES; CASSAVA LEAVES (VEGETABLE); CASSAVA ROOTS (VEGETABLE); CASSAVA FLOUR; CENTRAL AFRICAN REPUBLIC.

Results from a survey to analyze the production-distribution systems of various food crops (including cassava) in Central African Republic in 1981 are discussed. Statistics are presented on the annual consumption/person of the main commodities (cassava leaves and flour included) in Bangui in 1975. Projections for 1980 and 1985 are also included. A table with the

production evolution of the main food products (including cassava chips) for 1970-71 and 1980-81 is included as well as a graph comparing agricultural production and population during 1970-80. A scheme is presented with the cassava cultivation systems in the savanna Information on the evolution of purchase prices to growers from 1966 to 1980, the influence of distance on cassava prices, and the price of a 10-liter bucket of cassava (1975) is presented in a table, a graph, and a map, resp. A graph is presented with seasonal variations of retail price indexes of cassava chips in 1981. Statistics are also given on monthly consumption/person of cassava leaves, fresh cassava, and CF, and on the no. of cassava chips and flour sellers in the public markets of Bangui in July-Aug., 1975. Finally, data are included on the evolution of retail prices of cassava chips in Bangui in 1981. (CIAT)

0225

31589 COUMANCI-MALO, D. 1987. Analyse de la situation de la Mere et de l'enfant Centrafricains: nutrition, alimentation, santé. (Analysis of the mother/child situation in Central African Republic: nutrition, diets, and health). Bangui, Central African Republic, Organisation des Nations Unies pour l'Enfance. 27p. Fr., 15 Ref.,

CASSAVA; HUMAN NUTRITION; MALNUTRITION; CENTRAL AFRICAN REPUBLIC.

Based on available data the mother/child nutritional situation of Central African Republic was studied. Cassava supplies 76-86 percent of the calory intake; along with meat, it is highlighted as a major staple. Causes of malnutrition are mentioned and actions aiming at improving the mother/child situation are presented and described. (CIAT)

0226

31342 DADANT, M.R. 1983. Cultures vivrieres: manioc. (Food crops: cassava). In Société Centrafricaine de Développement Agricole. Rapport Annuel 1983. Central African Republic, Ministere du Développement Rural. Département des Recherches. pp.93-94. Fr.

CASSAVA; INJURIOUS INSECTS; CASSAVA BACTERIAL BLIGHT; SYMPTOMATOLOGY; CENTRAL AFRICAN REPUBLIC.

The symptomatology of 2 problems (slow wilting and rapid death of stem tips) observed in cassava crops during a survey in the Central African Republic is briefly described. Mealybugs were determined as possible causal agents of the 1st problem while the symptoms observed in the 2nd case resembled a typical bacterial wilt. (CIAT)

0227

31621 DECOUDRAS, P-M. 1984. Agriculture. (Agriculture). Atlas de la République Centrafricaine. Paris, France, Editions Jeune Afrique. pp.35-41. Fr., Il.

CASSAVA; MAPS; INTERCROPPING; GROUNDNUT; MAIZE; BEANS; PRODUCTION; STATISTICAL DATA; USES; SAVANNAS; CENTRAL AFRICAN REPUBLIC.

General characteristics of agriculture in Central African Republic are described. The role of the rural community in traditional agrieultural activities is detailed and common cultivation techniques are described. Cassava, the major food crop, is grown both as a sole crop and in association with groundnut, maize, sesame, squash, or beans. It is transformed into chips or during the rainy season, into chickwangue. The production trend of cassava chips, among other products, for the 1973-82 period is detailed. A map showing cassava growing regions and different intercropping systems is included as well as a table with production data and income returns of the main agricultural products in areas planted to the

2 main commercial crops: cotton and coffee. Finally, general characteristics of the Pouyamba (savanna) and Bobua (forest) regions are described. Maps of these 2 regions showing the areas planted to the different crops are included. (CIAT)

0228

31354 DEVROEDE, R. 1969. Rapport de mission: période 5 mai 1969 4 aout 1969. (Mission report: May 5-August 4, 1969). Bangui, Central African Republic, United Nations Development Program. 6p. Fr.

CASSAVA; INDUSTRIALIZATION; MARKETING; CASSAVA FLOUR; CENTRAL AFRICAN REPUBLIC.

Conclusions from a mission to analyze the situation of cassava cultivation in Central African Republic in 1969 are presented. Items evaluated involve the feasibility of industrialization for the production of cassava starch and flour, conditions for its success, and possible location; suggested regions for this crop; production and consumption estimates; income; and commercialization. (CIAT)

0229

31325 GBIANZA, T. 1982. Manioc (Manihot utilissima). (Cassava). In Gbianza, T. Rapport Annuel 1981. Resultats et commentaires campagne 1981. Central African Republic, Recherche Agronomique et Multiplication de Semences de Cultures Vivrieres Légumieres et Fruitieres. pp.80-81. Fr.

CASSAVA; CULTIVARS; PRODUCTIVITY; CENTRAL AFRICAN REPUBLIC.

Results of 2 comparative clonal trials carried out on cassava in Bambari (Central African Republic) are reported and discussed. Var. Kimeno and Kizemba were among the best in both trials (27 and 26 t/ha, resp., in the 1st trial and 20 and 19 t/ha, resp., in the 2nd); however, var. Violet Maurice (30 t/ha) and Six mois D (25 t/ha) gave the highest yields in the 1st and 2nd trials, resp. (CIAT)

0230

31604 HEWER, U. 1985. Mémorandum economique. (Economic memorandum). Central African Republic, Banque Mondiale. 41p. Fr.

CASSAVA; PRODUCTION; ROOT PRODUCTIVITY; STATISTICAL DATA; ECONOMICS; CENTRAL AFRICAN REPUBLIC.

A Central African Republic economic report for the 1970-84 period is presented, analyzed, and discussed. The importance of food crops (including cassava) in the agricultural sector is highlighted. A 9-yr rotation cycle is established by farmers. Cassava is planted in association with groundnut and harvested in the 3rd year. The quality of cassava seeds and the cv. from the previous harvest are deficient. Tables are presented on production estimates (t), area planted (ha), and av. yields (kg/ha) for the major crops for the 1970-84 period. (CIAT)

0231

32244 MALIBOUNGOU, J.C. 1986. Report on cassava mealybug and cassava green mites in some African countries: Central African Republic. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. p.137. En. (ISDR, Bombaiki, B.P. 909, Bangui, Central African Republic)

CASSAVA; PHENACOCCUS MANIHOTI; CENTRAL AFRICAN REPUBLIC.

The cassava mealybug was discovered in Central African Republic in 1976 near the Zairian border. It has since spread throughout the savanna regions in the east and the west of the country, and it has also spread through a part of the southwestern corner. Although precise information on damage is not available, it is clear that yield losses have been severe and that in the affected regions the price of cassava consequently has doubled. Cassava green mites are also present, but no details on yield losses are available yet. (Full text)

0232

31347 MINH, B.Q. 1977. Projet enquete budget et consommation des ménages en empire Centrafricain: rapport final. (Domestic budget and consumption project in Central African Republic: final report). Bangui, Central African Republic, Bureau de la Coopération Technique des Nations Unies. pp.1,5-6,26-28,115-119,126,129,132,135,138,141,144,147,159,167,170. Fr., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; PRICES; CASSAVA LEAVES (VEGETABLE); CASSAVA ROOTS (VEGETABLE); CASSAVA MEAL; CONSUMPTION; COMPOSITION; CHICKWANGUE; CENTRAL AFRICAN REPUBLIC.

Statistics are given on the production (t) and sales value of the main food crops (among them cassava) in Central African Republic in 1975. For different foodstuffs (among them cassava leaves, cassava roots, CM, and chickwangue), additional data are given on global annual consumption (t), av. monthly consumption per capita (g), composition and caloric supply of daily ration per capita, and av. prices/kg in 1975-76. (CIAT)

0233

31327 MKOUNGA, L. 1986. Manioc: variation saisonniere des prix de détail. (Cassava: seasonal variations of retail prices). In Mkounga, L. L'approvisionnement de la Ville de Bangui en manioc. Mémoire de licence en geographie. Bangui, Central African Republic, Université de Bangui. pp.46,57. Fr., Il.

CASSAVA; CASSAVA CHIPS; PRICES; MARKETING; CENTRAL AFRICAN REPUBLIC.

A diagram showing the seasonal fluctuation of cassava-chip retail prices in Bangui (Central African Republic) is included. Problems related to its commercialization are also discussed. (CIAT)

0234

25534 N'BONGUE, R.; BAYOGO, A.J. 1981. TRANSFORMATION DU MANIOC ET AUTRES TUBERCULES ET RACINES EN REPUBLIQUE CENTRAFRICAINE. (TRANSFORMATION OF CASSAVA AND OTHER TUBERS AND ROOTS IN THE CENTRAL AFRICAN REPUBLIC). IN WORKSHOP ON PROCESSING TECHNOLOGIES FOR CASSAVA AND OTHER TROPICAL ROOTS AND TUBERS IN AFRICA, ABIDJAN, IVORY COAST, 1983. PROCEEDINGS. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.113-118. FR.

AFRICA; BACTERIOSES; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA CHIPS; CASSAVA FLOUR; CASSAVA PRODUCTS; CENTRAL AFRICAN REPUBLIC; COSTS; CULTIVATION; DEVELOPMENT; DISEASES AND PATHOGENS; DRIED ROOTS; ECONOMICS; GENETICS; INDUSTRIALIZATION; INJURIOUS INSECTS; INJURIOUS MITES; NOXIOUS ANIMALS; PESTS; POTATOES; PROCESSED PRODUCTS; PROCESSING; PRODUCTIVITY; ROOT PRODUCTIVITY; STARCH CROPS; STEEPING; SWEET POTATOES; VIROSES; YAMS.

THE SITUATION OF THE CASSAVA, YAM, SWEET POTATO, AND POTATO CROPS IN THE CENTRAL AFRICAN REPUBLIC IS PRESENTED. CASSAVA IS THE MOST IMPORTANT FOOD CROP (50-60 PERCENT OF THE CALORIE INTAKE); IT IS GROWN ALONE OR IN ASSOCIATION WITH AN AV. YIELD OF 7 T/HA, ALTHOUGH THE IMPROVED VAR. PRODUCE UP TO 35 T/HA. THE PRODUCTION IS AFFECTED BY CAMV, MEALYBUGS, MITES, AND

BACTERIOSES. THE DIFFERENT CASSAVA PRODUCTS ARE (1) "COSSETTES" OR CHIPS THAT ARE STEEPED TO BE SOFTENED AND THEN CONVERTED INTO SMALL BALLS THAT ARE DRIED ON THE GROUND; (2) CHIKOUANG OR STEEPED ROOTS MOLDED INTO CANES (10-15 X 2-5 CM) AND COOKED IN BOILING WATER; (3) NGOU-KASSA OR A CASSAVA, YAM, AND SWEET POTATO SOUP; AND (4) CF FROM THE STEEPED CHIPS. THE PROJECT PROPOSED BY THE GOVERNMENT FOR THE INDUSTRIALIZATION OF CASSAVA IS DESCRIBED.

CONGO

0235

31361 CONFERENCE DES ENTREPRISES D'ETAT, 1. BRAZZAVILLE, CONGO. 1980. Programme de redressement de la ferme manioc de Mantsoumba. (Modified Mantsoumba's cassava farm program). Brazzaville, Congo, Commission V Economic Rurale. 123p. 1980. Fr.

CASSAVA; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; PRODUCTION; CULTIVATION; CONGO.

Background information is presented on the establishment of the 3 state farms for cassava production in Congo. The current situation of cassava supply to urban centers is also analyzed and discussed. Due to the problems detected, a plan was designed for modifying the initial objectives of the Mantsoumba farm. The first step was to diagnose its current situation in terms of production, maintenance, supply and its commercial, financial, and administrative state. A new organizational chart was designed and a new budget was assigned for operations and investments for 1981 and for the 1981-86 period. (CIAT)

0236

31615 CONSUMPTION STATISTICS. Brazzaville, Congo, 8p. s.f. Fr., Dat.num.

CASSAVA; CONSUMPTION; STATISTICAL DATA; FOOFOO; CASSAVA FLOUR; CHICKWANGUE; FOOD ENERGY; CASSAVA ROOTS (VEGETABLE); HUMAN NUTRITION; PROTEIN CONTENT; FAT CONTENT; CONGO.

Statistical data are given on the consumption patterns of several foodstuffs (among them chickwangue and foofoo) in different districts of Congo. Data on the consumption of various cassava products, prepared in different ways, and on their nutrient content in the regions of Inkala-Matiba and Oka-Bambo are also included. Cassava was found to be one of the main starchy foods consumed. Daily consumption percentages/family are given for different foodstuffs in the cities of Brazzaville and Kinkala. In Brazzaville, cassava is consumed at noon and at night by 46 and 47 percent of the families, resp., and foofoo by 53 percent at night. In Kinkala, cassava is consumed in the morning, at noon, and at night by 31, 85, and 81 percent of the families, resp. Foofoo is consumed at noon and at night by 20 and 17 percent, resp. (CIAT)

0237

32002 L'AGRICULTURE n'occupe que 0.6 pourcent de l'étendue du territoire national. (Agriculture covers but 0.6 percent of the national territory). Marchés Tropicaux et Méditerranéens no.1912:1779-1783,1785. 1982. Fr., Il.

CASSAVA; PRODUCTION; STATISTICAL DATA; CASSAVA PROGRAMS; COSTS; CONGO.

The Congolese agricultural situation until 1981 is presented and analyzed. Statistics on the evolution of several food crops (cassava included) for the 1969-79 period and estimates on area planted (ha) and production (t) for 1980 and 1986 are given. Cassava cultivation was found to be mainly at the small-farmer level. The establishment of 3 state farms (Makoua, Mantsoumba,

and Mbé) within the frame of a quinquennial plan (1982-86) is highlighted. Data on investments prospected for each farm are included. (CIAT)

0238

32036 L'AGRO-INDUSTRIE des perspectives de développement encore limitées. (Prospects for agroindustrial development are still limited). Afrique Agriculture no.9:46-47. 1976. Fr., Il.

CASSAVA; INDUSTRIALIZATION; CASSAVA CHIPS; CONGO.

The establishment of an agroindustrial complex for cassava processing in Congo in May 1975 is mentioned. A production capacity of 6000 t/yr cassava chips is expected; 1500 ha planted to cassava are needed to supply the raw material for the complex. (CIAT)

0239

32033 LES OBSTACLES nombreux, ils freinent encore le développement de l'agriculture Congolaise. (Many obstacles still restrain agricultural development in Congo). Afrique Agriculture no.9:44. 1976. Fr., Il.

CASSAVA; RESEARCH; CONGO.

Infrastructure and communication routes are pointed out as the major constraints to agricultural development in Congo. Since a marked drop in agricultural production in the 1960's, agronomic research was reactivated in 1974. With regard to cassava, a plant breeding program was designed to introduce improved material and to study var. potential and simple cultural practices. (CIAT)

0240

32032 LES PRINCIPALES productions agricoles et animales produit par produit. (Main agricultural and animal products, item per item). Afrique Agriculture no.9:39-44. 1976. Fr., Il.

CASSAVA; PRODUCTION; ROOT PRODUCTIVITY; CASSAVA PROGRAMS; CASSAVA MEAL; CASSAVA CHIPS; CONGO.

General information is given on the importance of cassava as a food crop in Congo and estimates are included on area planted, production, and yields for 1975 and 1980. As a result of a cassava plan designed in 1970 to manufacture CM and cassava chips for export, state farms were established in Mantsoumba, Makoua, and M'bé. The deficit of area planted, the time-consuming procedures for the utilization of credit and investments, and markedly high maintenance costs were found to be the major difficulties for the accomplishment of initial objectives in the state farms. (CIAT)

0241

31578 CONGO. MINISTERE DE L'AGRICULTURE ET DE L'ELEVAGE. 1983. Manioc. (Cassava). In Congo. Ministere de l'Agriculture et de l'Elevage. Agriculture Congolaise 1982 faits et chiffres. Brazzaville, Congo, Secrétariat Général a l'Agriculture a l'Elevage. pp.312-336. Fr., Il.

CASSAVA; STATISTICAL DATA; CHICKWANGUE; FOOFOO; CASSAVA LEAVES (VEGETABLE); PRODUCTION; ROOT PRODUCTIVITY; CASSAVA CHIPS; MECHANIZATION; CULTIVARS; CONSUMPTION; PRICES; DEVELOPMENTAL RESEARCH; CASSAVA PROGRAMS; CONGO.

The importance of cassava as a food crop in Congo is highlighted indicating the different forms in which it is eaten: ckickwangue, foofoo, and cassava leaves. Data are given on no. of farms, area planted, yields, and production of cassava from 1966 to 1969 and from 1972 to 1973. A production deficit is observed. Statistics are also presented on cassava production in

state farms from 1976 to 1986. A cropping schedule is provided for cultural practices according to producing region and recommendations are given for a semimechanized crop. The major agronomic characteristics of the most common cassava var. are described. Data are also presented on the different forms of cassava commercialization. Prices for cassava products are given and analyzed for 1981. Recipes for preparing chickwangue and cassava chips are included. A short definition of other cassava by-products is included. Generalities on the Mantsoumba agroindustrial complex are presented. In spite of the increase in cassava yields, this state farm has a still low income-- yield. A list of different projects designed within the framework of the quinquennial plan (1982-86) is given. (CIAT)

0242

31605 CONGO. MINISTERE DE L'AGRICULTURE ET DE L'ELEVAGE. 1984. Résultats du mini-recensement agricole 1982. (Results of the 1982 agricultural mini-census). Brazzaville, Congo, 35p. Fr., Dat.num., Il.

CASSAVA; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; SOCIOECONOMIC ASPECTS; MONOCROPPING; INTERCROPPING; CONGO.

Data are given on cassava production/region (percentage) and on density/ha and potential yields of cassava as a sole crop and in association with other crops in different regions of Congo. General information is also included on aspects such as geographic location, physical characteristics, climate, vegetation, soils, and administrative organization of the country. (CIAT)

0243

31551 CONGO. MINISTERE DU PLANT ET DE L'ECONOMIE. 1986. Role du manioc et autres racines et tubercules et plantains dans l'alimentation en République Populaire du Congo. (Nutritional role of cassava, plantain, and other root and tuber crops in the People's Republic of Congo). Brazzaville, Congo, Organisation des Nations Unies pour l'Alimentation et l'Agriculture. pp.5-11,17-21,28,32,43,49,51,58- 69,74-76. Fr., Il.

CASSAVA; HUMAN NUTRITION; PRODUCTION; PROCESSING; MARKETING; CASSAVA ROOTS (VEGETABLE); CHICKWANGUE; FOOFOO; DEVELOPMENTAL RESEARCH; ECONOMICS; INDUSTRIALIZATION; CONGO.

A study was conducted to determine the role of various food crops (cassava included) in Congolese nutrition. Aspects studied were production (area planted, yields, cultural practices, major diseases and pests, processing), commercialization (background, circuits and forms), and consumption (fresh cassava, chickwangue, and foofoo). Some recommendations are given regarding future research on agronomic aspects agroindustrial complexes, food technology, nutrition, and economics. A table is included with the trends of cassava production from 1972 to 1982. Schemes are also included for traditional cassava processing techniques, indicating end products, and for industrial cassava processing. (CIAT)

0244

32071 INSTITUT FRANCAIS DE RECHERCHE SCIENTIFIQUE POUR LE DEVELOPPEMENT EN COOPERATION. 1986. Les nématodes en relation avec la plante et le sol. Unité de recherche 504. (Nematode-plant-soil relationships. Research Unit 504). In Institut Francais de Recherche Scientifique pour le Développement en Coopération. Département E: indépendance alimentaire. Abidjan, Cote d'Ivoire, pp.24-26. Fr., 4 Ref.

CASSAVA; NEMATODES; CONGO.

Current research on nematodes conducted in African countries is mentioned. Regarding cassava, a study on the Meloidogyne genus in Congo is highlighted. (CIAT)

0245

32072 INSTITUT FRANCAIS DE RECHERCHE SCIENTIFIQUE POUR LE DEVELOPPEMENT EN COOPERATION. 1986. Parasites et ravageurs des productions alimentaires. Unité de recherche 505. (Parasites and pests of food crops. Research Unit 505). In Institut Francais de Recherche Scientifique pour le Développement en Coopération. Département E: indépendance alimentaire. Abidjan, Cote d'Ivoire, pp.28-32. Fr., 12 Ref.

CASSAVA; STORAGE; INJURIOUS INSECTS; CONGO; IVORY COAST.

Research activities on pests of stored cassava in Ivory Coast and Congo are mentioned. (CIAT)

0246

31362 PROGRAMME NATIONAL DE RECHERCHE SUR LE MANIOC. CONGO. 1984. Rapport d'activité 1984. (1984 activity report). Congo, Ministere de la Recherche Scientifique. 111p. Fr., 26 Ref., Il.

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; FERTILIZERS; CASSAVA AFRICAN MOSAIC VIRUS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; GLOMERELLA CINGULATA; PHENACOCCUS MANIHOTI; TECHNOLOGY; CONGO.

Results of research activities on cassava conducted by the Programme National Manioc (Congo) in 1983-84 are presented. Aspects studied include plant breeding and selection, soil fertility, and mineral nutrition. Aspects on phytopathology (CBB, CAMV, and anthracnose), entomology (cassava mealybug), and technology (industrialization and toxicity) are also included. (CIAT)

0247

31382 SOCIETE D'ETUDES ET DE PROMOTION DU DEVELOPPEMENT RURAL. CONGO. 1982. Etude de marché et évaluation de la consommation des produits glucidiques de base en R.P.C. en vue de l'implantation des petites unités de transformation du manioc en farine de foufou. (Market study and evaluation of glucidic staple products consumption in People's Republic of Congo, in view of the establishment of small-scale cassava processing units to obtain foofoo). Brazzaville, Congo, 217p. Fr., Il.

CASSAVA; SMALL-SCALE PROCESSING; INDUSTRIALIZATION; FOOFOO; CHICKWANGUE; CONSUMPTION; TECHNOLOGY; SOCIOECONOMIC ASPECTS; PRODUCTION; QUESTIONNAIRES; CONGO.

Justifications for the establishment of small-scale cassava processing units for foofoo obtention in Congo are explained in detail. Information is added on the social consequences of the project such as transformation of national consumption patterns, foreseen market trends, and management of technologies for cassava processing into foofoo. A study of carbohydrate consumption (foofoo included) was conducted in various markets to determine the feasibility of establishing processing units for foofoo obtention according to needs and production estimates and on the basis of the available cassava production of each region. The methodology used for data collection is described and questionnaires are included. Results indicate that cassava plays an important role as a food crop; it is eaten mainly as chickwangue. An increase in wheat imports resulted in more wheat consumption and less cassava consumption. The advantages of processing cassava into foofoo are analyzed and discussed. Mill installation is suggested. (CIAT)

0248

30889 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1983. Structure des prix des produits vivriers (2o. trimestre 1983). (Price structure of food products. 2nd quarter of 1983). Zaire, Direction des Marchés, Prix et Crédit de Campagne. 8p. Fr., Il.

CASSAVA; STATISTICAL DATA; PRICES; CASSAVA CHIPS; COSTS; MARKETING; CONGO.

Data on av. prices, costs, and margins are presented for several food products (including cassava chips) in 9 markets of Kinshasa (Congo) for the 2nd quarter of 1983. Differences are analyzed and compared with data for the 1st quarter. (CIAT)

0249

30891 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1983. Structure des prix des produits vivriers (3o. trimestre 1983). (Price structure of food products (3rd quarter of 1983)). Zaire, Direction des Marchés, Prix et Crédit de Campagne. 10p. Fr., Il.

CASSAVA; STATISTICAL DATA; PRICES; CASSAVA CHIPS; COSTS; MARKETING; CONGO.

Data on av. prices, costs, and margins are presented for several food products (including cassava chips) in 9 markets of Kinshasa (Congo) for the 3rd quarter of 1983. Differences are compared and analyzed with data for the 1st quarter. (CIAT)

0250

30863 BABASSANA, H. 1983. Couts de production et systeme des prix dans l'agriculture paysanne. (Production costs and price system in peasant agriculture). Brazzaville, Congo, Ministere de l'Agriculture et de l'Elevage. pp.42,50-53,64,66,68-69,164,174-175,179,181-185,190-199. Fr.

CASSAVA; STATISTICAL DATA; LABOR; CHICKWANGUE; FOOFOO; CASSAVA CHIPS; PRICES; MARKETING; CONGO.

Data on working time for a cassava crop are given and analyzed for different ecological conditions in the Pool and Plateau regions of Congo. Data are also provided on time expenditures for the preparation of chickwangue and cassava chips. Production costs were also analyzed for cassava cultivation, chickwangue, and foofoo. Production costs and purchase prices for chickwangue and foofoo were compared as well as purchase prices from the producer and sale prices to the consumer. The commercialization of chickwangue and foofoo is analyzed and the role of transportation is explained. Finally, some recommendations concerning production and price policies are presented and discussed. (CIAT)

0251

30866 BABASSANA, H. 1986. Etude sur les prix, couts et marges et commercialisation pour les racines, tubercules et bananes plantains. Etude de cas République Populaire du Congo. (Study on prices, costs, and commercialization margins for roots, tubers, and plantains. Case study: People's Republic of Congo). Rome, L'Organisation des Nations Unies pour l'Alimentation et l'Agriculture. pp.1,3,8,10-19,22-25,28-32,34-37. Fr., 6 Ref.

CASSAVA; PRICES; CHICKWANGUE; FOOFOO; CONSUMPTION; MARKETING; ECONOMICS; CULTIVATION; PROCESSING; PRODUCTION; CONGO.

A price analysis of producer, production costs, and commercialization margins for various commodities (cassava included) in Congo was made. Required working time for the different cultural practices is given for

cassava cultivation and for the obtention of chickwangue and foofoo. Purchase prices for the producer were compared with sale prices to the consumer for chickwangue and foofoo. Constraints identified for cassava commercialization are discussed and recommendations on how to overcome them are given. Tables are included with the evolution of cassava production for 1973-79 and 1985, the evolution of purchase prices for the producer from 1975 to 1984, and the evolution of retail prices in Brazzaville, Congo, from 1980 to 1985 for chickwangue and foofoo. (CIAT)

0252

30885 BANI, G. 1985. Le criquet puant, Zonocerus variegatus dans la region du Kouilou. (Zonocerus variegatus in the region of Kouilou). Brazzaville, Congo, Office de la Recherche Scientifique et Technique Outre-Mer. 4p. Fr. Rapport de la mission effectuée du 29-10 au 7 nov. 85.

CASSAVA; ZONOCERUS VARIEGATUS; INSECT CONTROL; INSECTICIDES; CONGO.

The economic importance of Zonocerus variegatus, a cassava pest reported since 1983, in the region of Kouilou, Congo, is discussed. Pest behavior and the origin of harmful attacks are mentioned. Delayed planting and insecticide treatments with fenitrothion are suggested as possible solutions to this problem; however, further studies are needed to determine the biological cycle of Z. variegatus in this region. (CIAT)

0253

31366 BANI, G. 1984. Programme dissemination de la bacteriose vasculaire du manioc par les insectes. (Program on cassava bacterial blight dissemination by insects). In Programme National de Recherche sur le Manioc. Congo. Rapport d'activité 1984. Congo, Ministere de la Recherche Scientifique. pp.45-47. Fr. (Laboratoire d'Entomologie Agricole, ORSTOM, B.P. 181, Brazzaville, Congo)

CASSAVA; CASSAVA PROGRAMS; ZONOCERUS VARIEGATUS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; DISEASE TRANSMISSION; CONGO.

Studies on the feeding habits of Zonocerus variegatus were carried out in 1983 to determine the influence of developmental stages on the dissemination of CBB causal agent. Samples of Z. variegatus were taken from cassava fields in Kombé (Congo) and analyzed. The presence of an antagonistic bacteria of Xanthomonas campestris pv. manihotis was detected in the alimentary canal of Z. variegatus. The same plants at different developmental stages were not eaten by the insect. (CIAT)

0254

30867 BANI, G. 1985. Répartition géographique et nuisance de Zonocerus variegatus (Orth. Pyrgomorphidae) au Congo. (Geographic distribution and injuries caused by Zonocerus variegatus (Orth. Pyromorphidae) in Congo). Brazzaville, Congo, Office de la Recherche Scientifique et Technique Outre-Mer. 15p. Fr., Sum. Fr., 27 Ref., Il.

CASSAVA; ZONOCERUS VARIEGATUS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; MAPS; CONGO.

A survey was carried out in Congo for 3 consecutive years on the ecology of Zonocerus variegatus. This insect pest attacks a wide var. of plant species and is thought to play an important role in the dissemination of Xanthomonas campestris pv. manihotis, is presented showing where Z. variegatus was detected. A table describing the flora from the various localities and the habitat or localization sites of Z. variegatus is also included. Cassava was the main host plant. Injuries caused to the plant species were

important. Hypotheses on the distribution and abundance of the insect are discussed. (CIAT)

0255

26746 BIASSANGAMA, A. 1984. ETUDE DU PARASITISME DES COCHENILLES PSEUDOCOCCIDAE PAR LES HYMENOPTERES ENCYRTIDAE; APPLICATION A LA LUTTE BIOLOGIQUE CONTRE LA COCHENILLE DU MANIOC PHENACOCCUS MANIHOTI EN REPUBLIQUE POPULAIRE DU CONGO. (STUDY ON PARASITISM OF PHENACOCCUS CITRI AND PHENACOCCUS MANIHOTI BY THE HYMENOPTERANS ENCYRTIDAE; THEIR USE IN THE BIOLOGICAL CONTROL OF PHENACOCCUS MANIHOTI IN CONGO). THESE DOCTORAT. RENNES, FRANCE, UNIVERSITE DE RENNES I. 199P. FR., SUM. FR., 187 REF., IL.

CASSAVA; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; APOANAGYRUS LOPEZI; INSECT CONTROL; TIMING; MAIS; CONGO.

PARASITISM OF PHENACOCCUS CITRI BY LEPTOMASTIX DACTYLOPII AND OF P. MANIHOTI BY APOANAGYRUS LOPEZI WAS STUDIED IN DETAIL UNDER LAB. CONDITIONS. THE TAXONOMY, BIOLOGY, REPRODUCTION, AND LONGEVITY OF A. LOPEZI AND L. DACTYLOPII ARE DESCRIBED, AND THE ECOLOGY OF PARASITISM BY THESE 2 MICROHYMENOPTERANS IS ANALYZED AS TO THEIR SPECIFICITY, EXPLOITATION OF HOST, HOST IMMUNOLOGICAL REACTIONS, AND HOST-PARASITE INTERACTIONS. ALSO THE POSSIBILITY OF USING A. LOPEZI IN THE FIGHT AGAINST P. MANIHOTI IS DISCUSSED, AND THE RESULTS OF SEVERAL STUDIES CARRIED OUT IN CONGO ON THE POPULATION DYNAMICS OF P. MANIHOTI ON A CASSAVA CROP ARE GIVEN. DURING THE DRY SEASON (5-6 MO.) P. MANIHOTI POPULATIONS REACH MAX. VALUES (500- 1000 INSECTS DURING THE 1ST YR AND 1500-2000 INSECTS DURING THE 2ND) CAUSING ENORMOUS DAMAGES. DURING THE RAINY SEASON (6-7 MO.) THE POPULATION IS CONTROLLED BY THE MECHANICAL ACTION OF RAINS. IN PRELIMINARY OBSERVATIONS WITH 400 A. LOPEZI INDIVIDUALS, ITS ACCLIMATIZATION AND EFFICACY WERE CONFIRMED, WITH A 3.25 PERCENT RATE OF PARASITISM. HOWEVER, THIS PARASITE IS, IN TURN, ALREADY HYPERPARASITIZED (7.8 PERCENT) BY PROCHILONEURUS POLIVARI, AN AUTOCHTHONOUS ENCYRTIDAE, WHICH INDICATES THE PROGRESSIVE ESTABLISHMENT OF AN INDIGENOUS BIOCENOSIS AROUND P. MANIHOTI. IN SPITE OF THE OCCURRENCE OF THE HYPERPARASITE, A. LOPEZI IS SEEN AS A USEFUL TOOL FOR THE BIOLOGICAL CONTROL OF P. MANIHOTI. (CIAT)

0256

30861 BOHER, B. 1986. Estimation de la tolérance à l'agent causal de la bacteriose vasculaire Xanthomonas campestris pathovar manihotis (Arthaud-Berthet) Starr chez le manioc (Manihot esculenta Crantz). (Estimate of cassava tolerance to Xanthomonas campestris pv. manihotis). Brazzaville, Congo, Office de la Recherche Scientifique et Technique Outre-Mer. 17p. Fr., Sum. Fr., 2 Ref., Il.

CASSAVA; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; RESISTANCE; CONGO.

The extent of angular spots as well as xylem contamination were studied at different levels of the leaf and stem of young cassava plants from various cv. after inoculation with a strain of Xanthomonas campestris pv. manihotis. Results were compared with field observations in a highly contamined area. This method was effective in evaluating cv. tolerance to Xanthomonas campestris pv. manihotis. (CIAT)

0257

30875 BOHER, B.; DANIEL, J.F. 1982. Etude de la localisation de Xanthomonas campestris pathovar manihotis agent de la bactériose vasculaire, dans les tiges du manioc (Manihot esculenta Crantz). (Study on the localization of Xanthomonas campestris pv. manihotis, causal agent of bacterial blight, on cassava stems). Brazzaville, Congo, Office de la Recherche Scientifique et Technique Outre-Mer. 11p. Fr., Il.

CASSAVA; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; ISOLATION; ANALYSIS; NIGERIA; CONGO; CIAT-2.

The distribution of Xanthomonas campestris pv. manihotis was studied to determine the reliability of a method for sanitary screening of cuttings. Results indicated that immunofluorescence was not a reliable method for screening healthy cuttings. The tissue culture technique offers promising results as highlighted by CIAT, the International Institute of Tropical Agriculture (Nigeria), and the Office de la Recherche Scientifique et Technique d'Outre-Mer (Congo). (CIAT)

0258

30862 BOHER, B.; BOHER, D. 1986. Guide pour la détermination des principales maladies du manioc en République Populaire du Congo. (Guide to determine major cassava diseases in People's Republic of Congo). Brazzaville, Congo, Office de la Recherche Scientifique et Technique d'Outre-Mer. 14p. Fr., Il.

CASSAVA; MYCOSES; BACTERIOSES; VIROSES; PHENACOCCUS MANIHOTI; MONONYCHELLUS PROGRESIVUS; SYMPTOMATOLOGY; TETRANYCHUS; PEST CONTROL; INSECT CONTROL; MITE CONTROL; PEST DAMAGE; CONGO.

Guidelines are presented for rapid determination of major cassava diseases and pests in People's Republic of Congo. Symptoms were classified in 6 groups: leaf spots, leaf wilting, shoot wilting, leaf distortion, modification of stem appearance, and root rot. General remarks are also given on etiology, dissemination, and control measures; some drawings are included. (CIAT)

0259

31326 BOHER, B.; GROUSSON, F. 1986. Lutte chimique contre la bactériose vasculaire du manioc. Expériences préliminaires in vitro et in vivo. (Chemical control of cassava bacterial blight. Preliminary in vitro and in vivo experiences). Brazzaville, Congo, Office de la Recherche Scientifique et Technique Outre-Mer. 8p. Fr., 14 Ref., Il. (Laboratoire de Phytopathologie, Centre ORSTOM, BP 181, Brazzaville, Congo)

CASSAVA; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; DISEASE CONTROL; CONGO.

In vitro and in vivo expt. were carried out to determine the effectiveness of several compounds in reducing the development of Xanthomonas campestris pv. manihotis in cassava. The best results were obtained with copper hydroxide at 50 percent. (CIAT)

0260

26707 BOHER, B.; DANIEL, J.F.; NDONGO, P. 1985. RECHERCHE DES SITES D'EXPRESSION DE LA TOLERANCE VIS- A-VIS DE XANTHOMONAS CAMPESTRIS PATHOVAR MANIHOTIS (ARTHAUD-BERTHET) STARR CHEZ CERTAINS CULTIVARS DE MANIOC (MANIHOT ESCULENTA CRANTZ). (IDENTIFICATION OF SITES OF EXPRESSION OF TOLERANCE TO XANTHOMONAS CAMPESTRIS PATHOVAR MANIHOTIS IN SOME CASSAVA CULTIVARS). AGRONOMIE 5(8):677-683. FR., SUM. FR., EN., 15 REF., IL.

CASSAVA; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; RESISTANCE; INOCULATION; CULTIVARS; LEAVES; STEMS; CONGO.

THE BEHAVIOR OF CBB-TOLERANT AND CBB-SUSCEPTIBLE CASSAVA CV. AFTER ARTIFICIAL INOCULATION WAS STUDIED, INDICATING THAT DISEASE TOLERANCE IS RELATED TO THE EXISTENCE OF PARTICULAR SITES ON THE PLANT. THESE SITES ARE ANATOMICAL AND PHYSIOLOGICAL BARRIERS, WHICH ACT DURING INFECTION (BY RAISING THE INOCULUM THRESHOLD AND ACCELERATING THE HEALING OF WOUNDS ON THE LAMINA) OR DURING COLONIZATION OF PLANT TISSUES (BY DELAYING THE MIGRATION OF THE PARASITE THROUGH THE XYLEM). THE MULTIPLICATION RATE OF THE BACTERIA

IN THE INTERCELLULAR SPACES OF THE MESOPHYLL WAS SIMILAR IN TOLERANT AND SUSCEPTIBLE CV. (AS)

0261

32004 CHEVREAU, M.R. 1984. Quelques réflexions sur les possibilités de renforcement des activités de recherche pour le développement de la culture du manioc en République Populaire du Congo. (Reflections on the possibilities of reinforcing research activities for cassava development in People's Republic of Congo). Paris, France, Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres. 12p. Fr., 14 Ref.

CASSAVA; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; TISSUE CULTURE; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; CASSAVA AFRICAN MOSAIC VIRUS; GLOMERELLA CINGULATA; ZONOCERUS VARIEGATUS; PEMISIA; MONONYCHELLUS TANAJOA; CULTIVARS; WEEDING; SOIL AMENDMENTS; PLANTING; TIMING; MECHANIZATION; ADAPTATION; CONGO.

The importance of cassava as a staple food in Congo and central Africa is highlighted and the major constraints for cassava production are mentioned. Main results of research on cassava conducted since 1978 are also reported. Aspects studied were diseases and pests: CBB and in vitro culture, biological control of the cassava mealybug, CAMV, anthracnose and root rots, and Zonocerus elegans, Z. variegatus, whiteflies, and green spider mites. Additionally, var. collections (local and introduced plant material) were studied along with improved cultural practices (early planting of cuttings, use of improved var., weed control, and soil amendments). The major actions identified for reinforcing cassava research were organization of production of healthy seed for distribution in infested regions, feasibility studies for semimechanized and mechanized intensive cultivation, and genetic diversity and potential adaptation of cassava cv. in Central Africa. General and specific objectives for every activity are described and requirements for their accomplishment are listed. (CIAT)

0262

31619 CODOU, A.; LA COGNATA, G. 1977. Agriculture. (Agriculture). In Atlas de la République Populaire du Congo. Paris, France, Editions Jeune Afrique. pp.30-39. Fr.

CASSAVA; MAPS; PRODUCTION; CONGO.

General characteristics of agriculture in the People's Republic of Congo are described. Cassava is highlighted as the major food crop, with production estimates of 577,000 t in 1972. There are 3 state farms for the production of this crop. A map is included showing cassava growing regions and percentages of area planted to this crop. Characteristics of the regions in which the country is divided (Enkou, Noussanda, and Boutazab) are also briefly described; the role of cassava in each is explained. Maps of the regions are included. (CIAT)

0263

26751 DANIEL, J.F.; BOHER, B. 1985. ETUDE DES MODES DE SURVIE DE L'AGENT CAUSAL DE LA BACTERIOSE VASCULAIRE DU MANIOC, XANTHOMONAS CAMPESTRIS PATHOVAR MANIHOTIS. (STUDY ON THE SURVIVAL MECHANISMS OF THE CAUSAL AGENT OF CASSAVA BACTERIAL BLIGHT, XANTHOMONAS CAMPESTRIS PATHOVAR MANIHOTIS). AGRONOMIE 5(4):339-346. FR., SUM. FR., EN., 16 REF., IL.

CASSAVA; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; SEED; INJURIOUS INSECTS; CONGO.

ANALYSIS OF THE MECHANISMS ENSURING PERSISTENCE OF XANTHOMONAS CAMPESTRIS PV. MANIHOTIS EXPLAINS THE FACT THAT THIS DISEASE IS ENDEMIC IN NUMEROUS

REGIONS AND CAUSES SUDDEN OUTBREAKS IN HEALTHY ZONES. TWO MECHANISMS ARE ESSENTIAL: (1) THE CAPACITY OF THE PATHOGEN TO HAVE AN EPIPHYTIC PHASE AND (2) ITS CONSERVATION IN HOST TISSUES. DEBRIS, SOIL, AND WEEDS ARE NOT OF MAJOR IMPORTANCE FOR THE SURVIVAL OF THE PATHOGEN, BUT THE ROLE OF INSECTS SHOULD NOT BE NEGLECTED. (AS)

0264

31365 DANIEL, J.F.; BOHER, B. 1984. Travaux de recherche sur la bacteriose vasculaire du manioc causée par Xanthomonas campestris pathovar manihotis. (Research work on cassava bacterial blight caused by Xanthomonas campestris pathovar manihotis). In Programme National de Recherche sur le Manioc. Congo. Rapport d'activité 1984. Congo, Ministere de la Recherche Scientifique. pp.38-44. Fr., 3 Ref. (Laboratoire de Phytopathologie, Centre ORSTOM, B.P. 181, Brazzaville, Congo)

CASSAVA; CASSAVA PROGRAMS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; RESISTANCE; TISSUE CULTURE; CONGO.

Activities carried out on CBB in Congo in 1983-84 are reported. Aspects studied include tolerance level of certain cv. to the disease, relationship between the host and the pathogen, and creation of a cassava tissue culture unit. Other aspects are the initiation of research on the causal agent of CBB and surveys. Current and future activities are mentioned and publications are listed. (CIAT)

0265

31367 DENIS, M.R. 1970. Note pédologique concernant les zones susceptibles de convenir à une culture industrielle du manioc. (Pedologic remarks on adequate areas for setting up an industrial cassava crop). In Van Ruymbeke, M. Possibilités de développement de la production du manioc. Brazzaville, Congo, Bureau pour le Développement de la Production Agricole. pp.78-86. Fr.

CASSAVA; INDUSTRIALIZATION; SOIL REQUIREMENTS; SOIL PHYSICAL PROPERTIES; SOIL FERTILITY; CONGO.

Results of a pedologic study to determine the suitability of 3 Congolese regions for the establishment of industrial cassava crops are given and discussed. Mahe plain was found to be the most suitable; Livouba plain and the zone to the left of the Brazzaville-Pointe Noire road were similar. Further research, however, is needed regarding other factors involved (mainly water supply and transportation). (CIAT)

0266

31367 DIANGANA, J.P. 1984. Etude de la cochenille du manioc. (Studies on the cassava mealybug). In Programme National de Recherche sur le Manioc. Congo. Rapport d'activité 1984. Congo, Ministere de la Recherche Scientifique. pp.48-49. Fr., 2 Ref. (Laboratoire d'Entomologie Agricole, Centre ORSTOM, B.P. 181, Brazzaville, Congo)

CASSAVA; CASSAVA PROGRAMS; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; MANIHOT GLAZIOVII; CONGO.

Results of studies on biological control of the cassava mealybug carried out in the region on Kombé, Congo, in 1982-83 showed that Exochomus flaviventris was the most abundant predator. Apoanagyrus lopezi, a parasite released 2 yr before, and Apoanagyrus sp. established well together. Further studies are recommended for other ecological regions. Results from studies on the influence of the host plant on the developmental parameters of the cassava mealybug showed that Manihot glaziovii is an important reservoir of local and exotic species of parasites. (CIAT)

0267

31373 DONGALA B., E.; BADILA S., C.; MALOUMBI, M.G. 1984. La toxicité cyanhydrique du manioc. (Cassava hydrocyanic acid toxicity). In Programme National de Recherche sur le Manioc. Congo. Rapport d'activité 1984. Congo, Ministere de la Recherche Scientifique. pp.104-106. Fr.

CASSAVA; CASSAVA PROGRAMS; HCN CONTENT; CULTIVARS; CASSAVA ROOTS (VEGETABLE); FOOFOO; ANALYSIS; STEEPING; CONGO.

A method was tested to determine HCN content in 2 cassava var. (Moudouma and Oumbété). Fresh roots and foofoo (prepared 48 and 72 h after retting, and 48 h after ensilage) were analyzed. Both retting and ensilage improved cassava quality, as shown by var. Moudouma: HCN content in fresh roots was 59.85 mg/kg and only traces were detected in foofoo. (CIAT)

0268

31364 DZABA, D. 1984. Fertilité du sol et nutrition minérale du manioc . (Soil fertility and mineral nutrition of cassava). In Programme National de Recherche sur le Manioc. Congo. Rapport d'activité 1984. Congo, Ministere de la Recherche Scientifique. pp.26-36. Fr.

CASSAVA; CASSAVA PROGRAMS; P; LABORATORY EXPERIMENTS; NUTRIENT UPTAKE; AL; CONGO.

Results of greenhouse expt. carried out in 1982-83 to determine the performance of cassava with synthetic phosphates showed that this tuber crop is capable of uptaking Al-bounded P. Research activities for the 1983-84 period dealt with the influence of lime amendments on P dynamics, fertilization dose recommended for cassava var. MM 78, and identification of microflora and microfauna associated with the cassava rhizosphere. (CIAT)

0269

30577 FABRES, G.; KIYINDOU, A. 1985. Comparaison du potentiel biotique de deux coccinelles (Exochomus flaviventris et Hyperaspis senegalensis hottentotta, Col. Coccinellidae) predatrices de Phenacoccus manihoti (Hom. Pseudococcidae) au Congo. (Compared biotic potential of two coccinellid species, Exochomus flaviventris and Hyperaspis senegalensis hottentotta (Col. Coccinellidae), predators of Phenacoccus manihoti (Hom. Pseudococcidae) in Congo). Acta Oecologica Oecologia Applicata 6(4):339-348. Fr., Sum. En., Fr., 15 Ref., Il. (IBEAS, Campus Universitaire, Avenue de l'Universite, 64000 Pau, France)

CASSAVA; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; INSECT BIOLOGY; BIOLOGICAL CONTROL; CONGO.

Cultures of Exochomus flaviventris and Hyperaspis senegalensis hottentotta, the 2 main coccinellid predators associated with the cassava mealybug Phenacoccus manihoti in Congo, were used in the lab. to study their biotic potential. Data on life cycle, duration of development instars, sex ratio, fecundity, and length of female life are given. The Laughlin's capacity for increase was calculated for each species: 0.05 for E. flaviventris and 0.07 for H. senegalensis hottentotta, with net reproductive rates, resp., of 66.6 and 123.7. The variations of the abundance of the predators were followed in a cassava field and compared with the population dynamics of the mealybug throughout the dry season of 1979. The 2 species show great differences in their fecundity, duration of adult life, and time of their intervention during the pest outbreak. Several hypothesis are discussed to explain the low biotic potential of E. flaviventris and the failure of H. senegalensis hottentotta to increase its population soon enough to play a role in the regulation of the pest. (AS)

0270

30859 FABRES, G. 1982?. Recherches sur la cochenille du manioc au Congo. (Research on the cassava mealybug in Congo). Brazzaville, Congo, Office de la Recherche Scientifique et Technique Outre-Mer. 3p. Fr., En.

CASSAVA; PHENACOCCUS MANIHOTI; FIELD EXPERIMENTS; LABORATORY EXPERIMENTS; CONGO.

A short bibliography review is given of research carried out on the cassava mealybug since 1978 in Congo. Aspects studied were bionomics of the pest (life cycle, female fecundity and longevity, intrinsic rate of increase, mean length of a generation, and net reproductive rate at a given temp. and humidity), population dynamics (percentage of plants infested, infestation rate, mean no. of insects/apex, and factors involved in the regulation of the mealybug abundance), and associated natural enemies. (CIAT)

0271

31336 GANGA, T. 1986. Les composantes du complexe parasitaire de Phenacoccus manihoti Mat. Fen. (Hom. Pseudococcidae), cochenille nuisible au manioc en République Populaire du Congo. (Components of the Phenacoccus manihoti (Hom. Pseudococcidae) parasite complex, an injurious cassava pest in Congo). In Seminaire sur l'Entomologie l'Insecte et l'Homme au Congo, Brazzaville, Congo, 1986. Proceedings. Brazzaville, Congo, Office de la Recherche Scientifique et Technique Outre-Mer. pp.194-205. Fr., Sum. Fr., 26 Ref., Il.

CASSAVA; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; INSECT BIOLOGY; CONGO.

Studies on the ability of Epidinocarsis lopezi to acclimatize were carried out in Congo in 1985. Samples parasitized mealybugs were taked from M. glaziovii plants every 15 days and kept from eclosion through the emergence of imagos. Once identified they were released at their site of origin. From Jan. to Aug., the parasite complex of Phenacoccus manihoti was formed mainly by E. lopezi (60- 100 percent) and from Sept. to Nov. by secondary parasites (57-63 percent) identified as Tetrastichus sp., Prochilonenrus spp., Chartocerus spp., and Pacyneuron sp. General information on the performace and major characteristics of each is given. Further studies were recommended to analyze the impact of these species on the effectiveness of E. lopezi. (CIAT)

0272

31369 GANGA, T. 1984. Lutte biologique contre la cochenille. (Biological control of the cassava mealybug). In Programme National de Recherche sur le Manioc. Congo. Rapport d'activité 1984. Congo, Ministere de la Recherche Scientifique. pp.53-56. Fr., 2 Ref. (Laboratoire d'Entomologie Agricole, Centre ORSTOM, B.P. 181, Brazzaville, Congo)

CASSAVA; CASSAVA PROGRAMS; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; CONGO.

Different aspects of 2 natural enemies of the cassava mealybug (Hyperaspis sp. and Apoanagyrus lopezi) have been studied in Congo since 1982. Hyperaspis largely contributed to the control of the pest, but it showed a close dependence on the host and thus on the environmental conditions. Therefore, this natural enemy should be used in an integrated pest control program. Although a great ecological stability was observed in populations of A. lopezi, 2 disadvantages were found: (1) a very effective hyperparasitism by Signiphoridae species and (2) an interspecific competition with a Tetrastichidae. Finally, activities proposed for 1984 are listed and publications are mentioned. (CIAT)

0273

31579 GANGA, T. 1984. Possibilités de régulation des populations de la cochenille du manioc Phenacoccus manihoti Mat. Ferr. (Hom. Pseudococcidae) par un entomophage exotique Apoanagyrus lopezi de Santis (Hym. Encyrtidae) en Republique Populaire du Congo. (Possibilities of regulating cassava mealybug populations by an exotic entomophagous insect, Apoanagyrus lopezi (Hym. Encyrtidae), in the People's Republic of Congo). Brazzaville, Congo, Office de la Recherche Scientifique et Technique Outre-Mer. 29p. Fr., Sum. En., 24 Ref., Il.

CASSAVA; PHENACOCCUS MANIHOTI; INSECT BIOLOGY; PREDATORS AND PARASITES; INSECT CONTROL; MAPS; CONGO.

The mass breeding of Epidinocarsis (Apoanagyrus) lopezi, an exotic parasite of the cassava mealybug, is described in detail. Some biological parameters (life cycle duration, no. of offspring/female, sex ratio, and rate of parasitism) of this parasite are given. Results of studies on the impact of E. lopezi on Phenacoccus manihoti and on its establishment and distribution in 3 localities (Kombé, Mantsoumba, and M'bé) where it was released are also reported and analyzed. Secondary parasites (Tetrastichus sp., Prochiloneurus bolivari, and some Signiphoridae) were also found to be effective against P. manihoti; however, the parasitism of E. lopezi ranged between 60-100 percent, indicating that the occurrence of the aforementioned hyperparasites do not restrict the establishment and distribution of E. lopezi. (CIAT)

0274

31580 GANGA, T. 1983. Possibilités de régulation des populations de la cochenille du manioc Phenacoccus manihoti Mat. Ferr. (Hom. Pseudococcidae) par un entomophage exotique Hyperaspis sp. (Col. Coccinellidae) en Republique Populaire du Congo. (Possibilities of regulating cassava mealybug populations by an exotic entomophagous insect, Hyperaspis sp., in the People's Republic of Congo). Brazzaville, Congo, Office de la Recherche Scientifique et Technique Outre-Mer. 25p. Fr., Sum. En., 19 Ref., Il.

CASSAVA; PHENACOCCUS MANIHOTI; INSECT CONTROL; PREDATORS AND PARASITES; INSECT BIOLOGY; CONGO.

The mass breeding of Hyperaspis sp., an exotic predator of the cassava mealybug, is described in detail. The following biological parameters of Hyperaspis sp. and H. senegalensis are given and compared: life cycle duration, feeding habits of the active stages (larvae and adults), sex ratio, and no. of offspring/female. Results of studies on the effectivity and adaptation of Hyperaspis sp. are also reported and analyzed. (CIAT)

0275

32029 ITADI, J. 1976. Les objectifs et les moyens: la promotion coopérative est le seul cadre indiqué pour le développement de la paysannerie congolaise. (Objectives and resources: cooperative promotion is the only appropriate plan for peasant development in Congo). Afrique Agriculture no.9:31-32. Fr., Il.

CASSAVA; DEVELOPMENT; SOCIOECONOMIC ASPECTS; PRODUCTION; CONGO.

An interview with the Head of Planning of the Congolese Ministry of Rural Economy is transcribed. Regarding the effort for developing agricultural production, an increase for cassava is foreseen: from 593,000 t in 1974, before the triennial program, to 619,354 t in 1977, at the end of the program. (CIAT)

0276

29570 IZIQUEL, Y. 1985. Le parasitisme de la cochenille du manioc Phenacoccus manihoti par l'Encyrtidae Apoanagyrus lopezi (= Epidinocarcis lopezi): induction, modalités, et conséquences agronomiques. (Parasitism of the cassava mealybug Phenacoccus manihoti by the Encyrtidae Apoanagyrus lopezi (= Epidinocarcis lopezi): induction, characteristics, and agronomic consequences). Rennes, France, 46p. Fr., 27 Ref., Il.

CASSAVA; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; INSECT BIOLOGY; LABORATORY EXPERIMENTS; CONGO; IVORY COAST.

A lab. study was conducted to determine the effectiveness of Apoanagyrus lopezi to control the cassava mealybug (Phenacoccus manihoti). Aspects studied were the cassava mealybug-parasitoid complex, physical marking of the host by the parasite, analysis of parasitism, and sex ratio at emergence. Cassava cuttings used came from Congo and Ivory Coast. It was found that eggs of A. lopezi, compared with the known species of Encyrtidae, did not differ in any characteristic, except the presence of a chorionic colored ring on the pedicel, whose function is unknown. The species may perform 3 types of puncture: effective (in which an egg is laid), puncture without egg laying (nonlethal for the host), and puncture for feeding (the longest, which generally causes host death). The female also lacked an ability to discriminate between its own egg laying and that of another female of the same species, a situation that led to superparasitism and consequently reduced oviposition (15 percent). Finally, qualities of the parasitoid are mentioned, namely specificity toward the cassava mealybug, noticeable fecundity (200 eggs), female longevity (40 days), rapid development (15 days), and good field dispersal. (CIAT)

0277

31368 KIYINDOU, A. 1984. Bioécologie de deux coccinelles prédatrices locales de la cochenille du manioc. (Bioecology of two local predators of the cassava mealybug). In Programme National de Recherche sur le Manioc. Congo. Rapport d'activité 1984. Congo, Ministere de la Recherche Scientifique. pp.50-52. Fr. (Laboratoire d'Entomologie Agricole, Centre ORSTOM, B.P. 181, Brazzaville, Congo)

CASSAVA; CASSAVA PROGRAMS; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; LABORATORY EXPERIMENTS; INSECT BIOLOGY; CONGO.

Different bioecological parameters of Exochomus flaviventris and Hyperaspis senegalensis hottentotta, 2 local predators of the cassava mealybug, have been studied in Congo since 1979. H. senegalensis hottentotta reached the adult stage faster than E. flaviventris (33.07 and 40.8 days, resp.). Egg-laying began 1st in H. senegalensis hottentotta than in E. flaviventris (8 and 15 days after female emergence, resp.). Sex ratio was lower for H. senegalensis hottentotta than for E. flaviventris (43.5 and 58.9 percent of females, resp.). Female longevity and fecundity were lower in E. flaviventris than in H. senegalensis hottentotta (112.2 and 172.3 days, resp., for longevity, and 125.4 and 289.3 laid eggs, resp.). Growth rates were different (0.05 and 0.07 for E. flaviventris and H. senegalensis hottentotta, resp.). The latter performed best in lab. conditions but its appearance in the field is late and its disappearance, rapid. Further studies are recommended to determine the performance of these predators in field conditions. (CIAT)

0278

30572 KIYINDOU, A.; FABRES, G. 1987. Etude de la capacité d'accroissement chez Hyperaspis raynevali (Col.: Coccinellidae) prédateur introduit au Congo pour la régulation des populations de Phenacoccus manihoti (Hom.:Pseudococcidae). (Capacity for increase in Hyperaspis raynevali (Col.:

Coccinellidae), a predator introduced to Congo for biological control of Phenacoccus manihoti (Hom.: Pseudococcidae)). Entomophaga 32(2):181-189. Fr., Sum. Fr., En., 18 Ref., Il. (ORSTOM-DGRS, Brazzaville, BP 181, Congo)

CASSAVA; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; INSECT BIOLOGY; CONGO.

The effect of thermohygrometric conditions on the length of the different developmental stages of the coccinellid Hyperaspis raynevali, predator of the cassava mealybug Phenacoccus herreni in French Guyana, was studied under lab. conditions to determine its ability to control mealybug populations prior to field releases. H. raynevali was introduced into Congo for the control of P. manihoti. The Laughlin's capacity for increase (rc) is higher than the rc of the local species Exochomus flaviventris and Hyperaspis senegalensis hottentotta. Under lab. conditions (temp. 26 degrees Celsius, moisture 70 percent), rc equalled 0.081 with Ro = 271.7 and Tc = 69. The development rate is much lower at temp. lower than 25 degrees Celsius and a high embryonic mortality is recorded at temp. ranging from 20 to 30 degrees Celsius. (AS)

0279

30482 LE RU, B.; FABRES, G. 1987. Influence de la temperature et de l'hygrometrie relative sur la capacite d'accroissement et le profil d'abondance des populations de la cochenille du manioc, Phenacoccus manihoti (Hom., Pseudococcidae), au Congo. (Influence of temperature and relative humidity on the growth rate and incidence of mealybug populations, Phenacoccus manihoti (Hom., Pseudococcidae) in Congo). Acta Oecologica Oecologia Applicata 8(2):165-174. Fr., Sum. Fr., En., 21 Ref., Il. (ORSTOM, B.P. 181 Brazzaville, R.P. du Congo)

CASSAVA; PHENACOCCUS MANIHOTI; INSECT BIOLOGY; INJURIOUS INSECTS; CONGO.

Demographic parameters of the cassava mealybug (Phenacoccus manihoti) were estimated at different temp. (20, 25, and 30 degrees Celsius) and RH regimes (50, 75, and 100 percent). Temp. appears to be the factor that most influences development time and capacity for increase. Simulations of the increase of mealybug populations were derived from exptl. results and compared with the gradation profiles observed during 3 yr at the same site of Congo. Variations of size seem to be primarily related to the thermic conditions prevailing during the outbreak. An early pullulation, starting under the influence of low temp. (July), will increase slowly, with well-defined steps between the 1st generations; whereas a late pullulation, occurring under the effect of higher temp., will develop more steeply, with a rapid succession of generations. (AS)

0280

30500 LE RU, B. 1986. The role of Neozygites fumosa in regulation of cassava mealybug populations. In International Colloquium of Invertebrate Pathology, 4th., Veldhoven, The Netherlands, 1986. Proceedings. Veldhoven, The Netherlands, pp.163-166. En., Il. (Centre ORSTOM, B.P. 181, Brazzaville, Republique du Congo)

CASSAVA; PHENACOCCUS MANIHOTI; BIOLOGICAL CONTROL; PREDATORS AND PARASITES; CONGO.

Results from observations made in 1985 on Phenacoccus manihoti population regulation by the fungus Neozygites fumosa and rains in cassava fields in Congo are discussed. RH levels higher than 90 percent, min. temp. greater than 20 degrees Celsius, and a high P. manihoti population density were confirmed as conditions favoring the disease in P. manihoti. The role of the developmental stage of P. manihoti was also confirmed; females were attacked

more by the pathogen than larvae during almost the entire study period. The mechanical role of the rains to eliminate the diseased fraction of P. manihoti populations was demonstrated for the 1st time. (CIAT)

0281

31601 MABANZA, J. 1986. Amélioration du manioc (M. esculenta Grantz) par la culture in vitro. (In vitro culture for cassava plant breeding). In Mabanza, J. Publications du laboratoire de sélection, amélioration et culture in vitro du manioc. Brazzaville, Congo, Direction Générale de la Recherche Scientifique et Technique. pp.123-129. Fr., 6 Ref., Il.

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; TISSUE CULTURE; RESISTANCE; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; MANIHOT GLAZIOVII; CONGO.

Tissue culture is highlighted as a technique for the introduction of improved var. The Congolese program of cassava selection developed var. resistant to CBB for their multiplication and distribution among growers. Research on isolation and culture techniques of mesophyllic protoplasts of Manihot esculenta and M. glaziovii indicated that M. esculenta can be easily handled in in vitro culture. This is shown by techniques such as cauline meristem culture, cotyledon culture, isolation of M. esculenta protoplasts, isolation of M. glaziovii protoplasts, cell fusion, obtention of organogeny and embryogeny, and protoplast culture in a selective medium. (CIAT)

0282

32224 MABANZA, J. 1987. Improvement of cassava (Manihot esculenta) by in vitro culture (Abstract). In Terry, E.R.; Akoroda, M.O.; Arene, O.B., eds. Triennial Symposium of the International Society for Tropical Root Crops-Africa Branch, 3d, Owerri, Nigeria, 1986. Tropical root crops; root crops and the African food crisis: proceedings. Ottawa, Canada, International Development Research Centre. p.35. En. (Direction Generale de la Recherche Scientifique et Technique, B.P. 2499, Brazzaville, Congo)

CASSAVA; PLANT TISSUES; TISSUE CULTURE; CONGO.

Since cassava was introduced to Africa, it has adapted and become broadly diversified. The Congolese program for the selection of bacteria-resistant cassava has recorded a wide range of genetically rich material, indicating that national research programs should conserve or improve the well-adapted local vegetable resources. In this study, in vitro culture expt. were performed on cassava. Results showed that cassava could easily be manipulated in vitro. It was demonstrated that entire cassava plants could be produced from young tissues such as stem meristems and cotyledons. Cellular fusions were also achieved with cells and protoplasts (cassava cells are highly allofusive). A somatic embryogenesis can now be obtained from protoplasts. It was shown that in vitro culture techniques can be used to improve local cassava var. (Full text)

0283

31593 MABANZA, J. 1986. La collection des cultivars locaux de manioc (Campagne 1976-77). (Local cassava cultivar collection (1976-77 campaign) in Mabanza, J). Publications du laboratoire de sélection, amélioration et culture in vitro du manioc. Brazzaville, Congo, Direction Générale de la Recherche Scientifique et Technique. pp.11-19. Fr.

CASSAVA; CASSAVA PROGRAMS; SELECTION; CULTIVARS; RESISTANCE; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; GLOMERELLA CINGULATA; ROOT PRODUCTIVITY; DRY MATTER; CONGO.

The performance of local cassava var. with CBB and anthracnose was tested at the Maléla and M'bé exptl. stations (Congo) in 1976- 77. Var. were harvested

12 mo. after planting. A table listing the var. tested and including data on no. of plants, no. of tubers, wt. at harvest, av. wt./tuber, av. wt./plant, yields, and DM content is presented. At the Maléla exptl. station var. Pierre BAMBI, Invoutoulou 2, Mgoubou-Mgoubou 2 were outstanding in terms of phytosanitation. Var. Poumako, Mumbili, Nsilou, Zanaga 2, Kopana, Ontsaon, and Zanaga 1 performed best at the M'bé exptl. station. (CIAT)

0284

31596 MABANZA, J. 1986. La collection nationale de manioc. (The national cassava collection). In Mabanza, J. Publications du laboratoire de sélection, amélioration et culture in vitro du manioc. Brazzaville, Congo, Direction Générale de la Recherche Scientifique et Technique. pp.53-58. Fr.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; GERMPLASM; RESISTANCE; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CONGO.

A table showing the performance of the cassava collection at the Odziba exptl. station (Congo) regarding its resistance to CBB is given. Only cv. recommended for the regions of Lékoumou and Niari are mentioned. Tolerance to the disease was observed in 1/5 of the cv. The collection sheet used by the Programme National Manioc is also included. (CIAT)

0285

30873 MABANZA, J. 1984. La culture in vitro des protoplastes de manioc (Manihot esculenta Crantz). Etude des possibilités d'induction d'une résistance a la bactériose provoquée par le Xanthomonas manihotis. (In vitro culture of cassava protoplasts. Study on the possibilities of inducing resistance to cassava bacterial blight caused by Xanthomonas manihotis). These Docteur Sc. Montpellier, France, Université des Sciences et Techniques du Languedoc. 207p. Fr., 289 Ref., Il.

CASSAVA; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; PLANT TISSUES; PROTOPLASTS; TISSUE CULTURE; RESISTANCE; LABORATORY EXPERIMENTS; MANIHOT GLAZIOVII; PROPAGATION; CULTURE MEDIA; CONGO.

The economic importance of Xanthomonas campestris pv. manihotis in Congo is highlighted. The feasibility of obtaining CBB-resistant cassava plants by means of in vitro protoplast culture was studied. Manihot esculenta, M. glaziovii, and a hybrid of both were used. A complete bibliographic review of the different methods used by other researchers for rapid obtention of cassava plants is presented. The procedure tested for in vitro protoplast culture is described in detail. Results indicate that regeneration of cassava plants from protoplasts is possible with the technique described. A scheme is included with the major results obtained. (CIAT)

0286

31600 MABANZA, J.; JONARD, R. 1986. La régéneration de plantes de manioc (M. esculento Grantz) par néoformation de bourgeons a partir de cotylédons extraits de semences mures et immatures (Regeneration of cassava plants by new formation of buds from cotyledons removed from mature and immature seeds). In Mabanza, J. Publications du laboratoire de séléction, amélioration et culture in vitro du manioc. Brazzaville, Congo, Direction Générale de la Recherche Scientifique et Technique. pp.100-105. Fr., Sum. Fr., En., 13 Ref., Il.

CASSAVA; CASSAVA PROGRAMS; SEED; CULTURE MEDIA; PLANT REPRODUCTION; MATURATION; PLANT GROWTH SUBSTANCES; PLANT BREEDING; CONGO.

Morphologically normal cassava plantlets were obtained from cotyledon segments removed from cassava seeds at various stages of maturity. Cultured

on Murashige and Skoog basal medium supplemented with BAP, NAA, and GA (4.4, 5.3, and 0.2 millimolar/liter, resp.), mature seeds, seeds just before maturity, and seeds with a pasty content resulted in 90-95, 50, and 20 percent, resp., of viable cassava plantlets 1 mo. later. This technique is recommended for rapid obtention of a great no. of individuals from the best var. (CIAT)

0287

30887 MABANZA, J. 1987. La sélection du manioc au Congo. (Cassava selection in Congo). Brazzaville, Congo, Programme National de Recherche sur le Manioc au Congo. 5p. Fr. Paper presented at Séminaire sur la Plante et l'Homme,Brazzaville, 1987.

CASSAVA; SELECTION; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CULTIVARS; RESISTANCE; CONGO; CIAT-2.

The importance of cassava as a food crop in Congo is highlighted. Phenacoccus manihoti and Xanthomonas campestris pv. manihotis were found to be the major constraints to cassava production in the 1970's, therefore research efforts were directed toward selection for resistance. Programs carried out by several institutions (among them CIAT) are mentioned. Biological and environmental factors affecting disease and pest incidence in Congo and other factors affecting selection quality are analyzed and discussed. Cassava var. MM 78, MM 79, MM 85, and MM 86 were found to be resistant to X. campestris pv. manihotis. It was concluded that selection constitutes the best way to improve agricultural production. (CIAT)

0288

31598 MABANZA, J. 1986. La sélection du manioc pour la résistance a la bactériose: bilan de 10 années de travaux (1976-1986). (Cassava selection for resistance to cassava bacterial blight: balance of 10 years work (1976-86)). In Mabanza, J. Publications du laboratoire de sélection, amélioration et culture in vitro du manioc. Brazzaville, Congo, Direction Générale de la Recherche Scientifique et Technique. pp.65- 81. Fr., Il.

CASSAVA; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; RESISTANCE; CULTIVARS; PLANT BREEDING; EPIDEMIOLOGY; CASSAVA PROGRAMS; TISSUE CULTURE; CHICKWANGUE; FOOFOO; CASSAVA ROOTS (VEGETABLE); CONSUMPTION; CONGO.

Cassava is highlighted as a staple in Congo. Since CBB was reported as the major disease in 1976, cassava selection aimed at obtaining resistant var. Selection is briefly defined and general objectives of the cassava selection program are presented. The organization of research projects is described in detail. Topics deal with CBB epidemiology in Congo, collection sites, and project accomplishments (collection, var. characterization, and screening). Difficulties encountered are mentioned and the major results from 1976 to 1986 are reported. Results deal mainly with personnel training, selected crosses, and in vitro culture. An example of city supply of various cassava products (chickwangue, foofoo, retted cassava, and fresh roots) during a 5-mo. period is also included. Local tolerant var. (MM 78, MM 79, Koussakanandi, Is, and Langourou), a resistant var. (MM86), and other introduced var. (MA 433, MA 391, MB 27, and MB 38) were selected. Advantages of in vitro culture are highlighted for rapid obtention of healthy plants. Prospects are presented on research activities to be carried out by the cassava selection program in Congo. (CIAT)

0289

31594 MABANZA, J. 1986. La sélection et amélioration du manioc: les deux premieres années. (Selection and plant breeding in cassava: the first two years). In Mabanza, J. Publications du laboratoire de sélection,

amélioration et culture in vitro du manioc. Brazzaville, Congo, Direction Générale de la Recherche Scientifique et Technique. pp.20-39. Fr.

CASSAVA; PLANT BREEDING; CASSAVA PROGRAMS; CULTIVARS; SELECTION; RESISTANCE; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CASSAVA AFRICAN MOSAIC VIRUS; GLOMERELLA CINGULATA; CERCOSPORIDIUM HENNINGSII; PHENACOCCUS MANIHOTI; CONGO.

General considerations are given on the cassava selection program in Congo and the different activities performed are mentioned. The different objectives designated for the periods 1976-77, 1977-78, 1978-79, and 1979-80 are enumerated. The main results of research carried out in 1976-77 and 1977-78 are reported. Tables are given with the performance of var. tested for their resistance to CBB, CAMV, anthracnose, Cercospora, and mealybugs. Activities planned for 1978-79 are also listed. (CIAT)

0290

30860 MABANZA, J. 1986. Le bouturage et la multiplication in vitro du manioc (Manihot esculenta Crantz). (In vitro multiplication of cassava cuttings). Sciences and Technologies no.4:63-68. Fr., Sum. Fr., 10 Ref., Il.

CASSAVA; PROPAGATION; TISSUE CULTURE; CULTIVARS; HYBRIDS; CONGO.

The methodology for rapid in vitro multiplication of cassava is described in detail and results are given and discussed. Three Manihot esculenta clones (MM 78, Malela 1, and CB), 1 M. glaziovii clone, and a hybrid of these 2 species (MA 255) were tested. From 5 to 10 healthy plants were obtained per cutting in 24 days. (CIAT)

0291

31597 MABANZA, J. 1986. Le manioc face aux grands fléaux au Congo. (Cassava vs. major pests in Congo). In Mabanza, J. Publications du laboratoire de sélection, amélioration et culture in vitro du manioc. Brazzaville, Congo, Direction Générale de la Recherche Scientifique et Technique. pp.59-63. Fr.

CASSAVA; CASSAVA PROGRAMS; PHENACOCCUS MANIHOTI; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; MONONYCHELLUS TANAJOA; PEST CONTROL; PLANT INJURIES; PREDATORS AND PARASITES; CONGO.

Cassava mealybug (Phenacoccus manihoti), CBB (Xanthomonas campestris pv. manihotis), and cassava green mite (Mononychellus tanajoa) are reported as the major pests of this crop in Congo. General information is given on injuries caused to the plant, commonly used control measures, and research work carried out to overcome the situation. The use of natural enemies for the control of mealybug populations is highlighted, along with other cultural practices such as early planting. The use of resistant var. was found to be the unique control measure against CBB. (CIAT)

0292

31595 MABANZA, J. 1986. Les performances du manioc du Nigéria introduit sous forme de semences. (Performance of cassava introduced from Nigeria in the form of seeds). In Mabanza, J. Publications du laboratoire de sélection, amélioration et culture in vitro du manioc. Brazzaville, Congo, Direction Générale de la Recherche Scientifique et Technique. pp.40-52. Fr.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; SELECTION; RESISTANCE; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; GLOMERELLA CINGULATA; CASSAVA AFRICAN MOSAIC VIRUS; PHENACOCCUS MANIHOTI; CERCOSPORIDIUM HENNINGSII; ROOT PRODUCTIVITY; NIGERIA; CONGO.

The performance of cassava material introduced from Nigeria in the form of seeds was assessed in 1976-77 and 1977-78 regarding CBB, CAMV, anthracnose, Cercospora, and the mealybug. Trials were carried out at the Centre de Recherches Agronomiques and the M'bé state farm. Cassava material introduced from Nigeria adapted well to Congo's ecological conditions. Tables are included with the var. tested and their performance regarding major pests. Data are also given on the no. of plants, no. of tubers, wt. at harvest, av. wt./tuber, av. wt./plant, and yields. (CIAT)

0293

31599 MABANZA, J. 1986. Les varietés élites et les possibilités actuelles de leur utilisation. (The best varieties and current possibilities for their use). In Mabanza, J. Publications du laboratoire de sélection, amélioration et culture in vitro du manioc. Brazzaville, Congo, Direction Générale de la Recherche Scientifique et Technique. pp.82-86. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; SELECTION; RESISTANCE; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; STARCH PRODUCTIVITY; TIMING; CONGO.

The best cassava var. selected for their tolerance to CBB in Congo are listed and grouped in 3 categories: (1) highly tolerant (MM 86); (2) moderately tolerant (MM 78, MM 81, MM 82, MM 83, MM 87, MM 88, MM 89, and MM 90); and (3) tolerant (MM 79, MM 80, MM 84, and MM 85). In trials carried out at the Odziba exptl. station to determine starch yields of 4 var. at 12, 14, 16, and 18 mo. after planting, several var. were found to give highest yields at 12 mo.; however, cycle duration for almost all var. tested was 14 mo. Finally, conditions for the use of CBB-resistant cassava var. are discussed. (CIAT)

0294

31592 MABANZA, J. 1986. Programme manioc. (Cassava program). In Mabanza, J. Publications du laboratoire de sélection, amélioration et culture in vitro du manioc. Brazzaville, Congo, Direction Générale de la Recherche Scientifique et Technique. pp.7-10. Fr.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; SELECTION; DEVELOPMENTAL RESEARCH; CONGO.

The main objectives of the Congolese cassava program, begun in 1976, are presented and research activities planned for 1976-77, 1977-78, 1978-79, and 1979-80 are listed. General considerations on the strategy to assure the success of the program and the main results expected are mentioned. (CIAT)

0295

31591 MABANZA, J. 1986. Publications du laboratoire de sélection, amélioratio[illegible] culture in vitro du manioc. (Publications from the cassava selection, p[illegible] breeding, and in vitro culture laboratory). Brazzaville, Congo, Direction Générale de la Recherche Scientifique et Technique. 133p. Fr., 19 Ref., Il.

CASSAVA; DEVELOPMENTAL RESEARCH; PLANT BREEDING; CASSAVA PROGRAMS; CULTIVARS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; TISSUE CULTURE; RESISTANCE; CONGO.

Publications from the lab. for cassava selection, plant breeding, and in vitro culture (Brazzaville, Congo) up to May 1986 are presented. Topics covered were the cassava program, collection of local cassava cv. (1976-77) and the 1st 2 yr of screening trials, plant breeding, performance of cv. introduced from Nigeria in the form of seeds, and the national cassava collection. out during 10 yr (1976-86) on screening cassava for resistance to CBB is reviewed and the best var. and current possibilities for their use

are discussed. Finally, the regeneration of cassava plants by new formation of buds from cotyledons removed from mature and immature seed, and in vitro culture for cassava plant breeding are discussed. (CIAT)

0296

31371 MAKAMBILA, C. 1984. Etude epidémiologique de l'anthracnose et des pourridiées. (Epidemiologic study of anthracnose and root rots). In Programme National de Recherche sur le Manioc. Congo. Rapport d'activité 1984. Congo, Ministere de la Recherche Scientifique. pp.75-98. Fr., 5 Ref., Il.

CASSAVA; CASSAVA PROGRAMS; LABORATORY EXPERIMENTS; EPIDEMIOLOGY; SYMPTOMATOLOGY; ARMILLARIELLA; PHAEOLUS MANIHOTIS; ROOTS; GLOMERELLA CINGULATA; CONGO.

Lab. studies on the epidemiology of cassava anthracnose showed that punctures of Pseudotheraptus devastans and a high humidity were necessary for the development of anthracnose symptoms on cassava stems. Lignification also played an important role in the development of disease symptoms. An optimum development was observed in an intermediate region where lignification was in course. Results of a survey on cassava root rot in Congo are also reported. The causal agents of the disturbances were Armillariella mellea, Sahaerestilbe repens, and Phaeolus manihotis. Cultural practices recommended to reduce root rot incidence are listed. Research work proposed for 1984 is mentioned and a list of publications is included. (CIAT)

0297

31337 MAKAMBILA, C. 1986. Interaction entre une punaise (Pseudotherapus devastans) et un champignon (Colletohichum manihotis Henn.) sur la formation des symptomes de l'anthracnose du manioc. (Interaction between Pseudotheraptus devastans and Colletotrichum manihotis on the development of cassava anthracnose symptoms). In Séminaire sur l'Entomologie l'Insecte et l'Homme au Congo, Brazzaville, Congo, 1986. Proceedings. Brazzaville, Congo, Office de la Recherche Scientifique et Technique Outre-Mer. pp.206-216. Fr., 5 Ref.

CASSAVA; GLOMERELLA CINGULATA; STEMS; CULTIVARS; RESISTANCE; PLANT INJURIES; TEMPERATURE; TIMING; CONGO.

An artificial inoculation method was used to study the role of injuries caused by Pseudotheraptus devastans on the infection process of cassava stems by Colletotrichum manihotis. The effect of some factors (type, age, and size of the injury) on disease development and the sensitivity of cassava cv. to insect puncture were also studied. Cassava stems were injured with a previously red-hot thin needle. A conidiophore suspension was placed in the lesion; then, stems were heated at 26 degrees Celsius and high RH (80-90 percent) to favor the development of anthracnose symptoms. No disease symptoms developed when stems were inoculated 72 h after injury; after inoculation a direct ratio was observed between symptoms and the size of tissue injured with the needle. The lowest sensitivity to P. devastans punctures was found in cv. Mpembe. The presence of a puncture was absolutely essential for disease development since it stimulated the differentiation between the infectious filament and the appressorium. (CIAT)

0298

30140 MAKAMBILA, C.; BAKALA, L. 1986. Les pourridies a Armillaria sp., Sphaerostilbe repens B. et Br. et Phaeolus manihotis Heim sur le manioc (Manihot esculenta Crantz). (Cassava root rot diseases caused by Armillaria sp., Sphaerostilbe repens, and Phaeolus manihotis). Agronomie Tropicale

41(3-4):258-264. Fr., Sum. Fr., En., Es., 25 Ref., Il. (Dept. of Biologie et Physiologie Vegetales, Univ. Marien Ngouabi, B.P. 69, Brazzaville, Congo)

CASSAVA; ARMILLARIA; SPHAEROSTILBE REPENS; PHAEOLUS MANIHOTIS; CONGO.

Armillaria sp., Sphaerostilbe repens, and Phaeolus manihotis, the principal causal organisms of the root rot diseases found on cassava in the Congo People's Republic, were studied. The differentiation of a no. of organs by the pathogens was observed on an infected section of cassava root placed in an exptl. device consisting of a transparent plexiglass box containing water. Armillaria sp. differentiated carpophores, "subterranea" rhizomorphs, and other unidentified organs. S. repens differentiated rhizomorphs and coremia. These organs were not observed in P. manihotis. Carpophore production by Armillaria sp. from infected roots is important for the systematic study of root rot pathogens, particularly Armillaria sp., in the Congo People's Republic and Central Africa where it remains the principal causal organism of root rot diseases. (AS)

0299

30490 MASSALA, R. 1987. African cassava mosaic disease in Congo: importance, distribution and methods of control. In Séminaire International La Mosaïque Africaine du Manioc et son Controle, Cote d'Ivoire, 1987. Résumés. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Cooperation. p.30. Fr. (Faculté des Sciences, Université M. Ngouabi, BP 69 Brazzaville, Congo)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; TISSUE CULTURE; CONGO.

The importance of cassava as a basic food crop in Congo is emphasized; CAMD, present throughout the country, is mentioned as one of the major production constraints. In vitro cultures of plant tissues were developed to obtain healthy plants from local diseased clones and then multiply rapidly. Tests such as ELISA are applied for the sanitary control of these in vitro plants. (CIAT)

0300

31370 MASSALA, R. 1984. Etude de la mosaïque africaine du manioc (Mars 1983 - Avril 1984). (Study on cassava African mosaic virus (March 1983 - April 1984)). In Programme National de Recherche sur le Manioc. Congo. Rapport d'activité 1984. Congo, Ministère de la Recherche Scientifique. pp.57-74. Fr., 14 Ref., Il.

CASSAVA; CASSAVA PROGRAMS; CASSAVA AFRICAN MOSAIC VIRUS; MAPS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; PLANT INJURIES; CERCOSPORIDIUM HENNINGSII; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; RESISTANCE; CULTIVARS; CONGO.

General information is presented on the origin and geographic distribution of CAMV; injuries caused to plant are briefly described. A bibliographic review on the causal agent and the forms of dissemination of the disease is included. The importance and distribution of CAMV in Congo is analyzed and discussed. Tables are included for the performance of several cassava var. regarding major diseases (CBB, CAMV, Cercosporidium henningsii) and pests (cassava mealybug and green mite). Finally, a map is included showing the surveyed zones, mainly the Cuvette and Bouenza regions. The technique for scoring CAMV symptoms is explained. (CIAT)

0301

31359 MASSALA, R.; MVILA, A. 1981?. Obtention et multiplication des plants de manioc sains par la technique de la culture in vitro. (Obtainment and

multiplication of healthy cassava plants by means of the in vitro culture technique). Brazzaville, Congo, Office de la Recherche Scientifique et Technique Outre-Mer. 5p. Fr., 3 Ref.

CASSAVA; TISSUE CULTURE; ANALYSIS; LABORATORY EXPERIMENTS; CONGO.

The methodologies of 2 in vitro culture techniques (micropropagation by cuttings and meristem culture) to obtain healthy cassava plants are described in detail. From trials carried out in Congo using the aforementioned techniques, it was concluded that tissue culture constitutes a more suitable way to obtain healthy plants from virus-infected plants; however, the ELISA test should be used to detect virus. General considerations are given on this test. (CIAT)

0302

31363 MBAMA, V. 1984. Amélioration et sélection. (Plant breeding and selection). In Programme National de Recherche sur le Manioc. Congo. Rapport d'activité 1984. Congo, Ministere de la Recherche Scientifique. pp.5-25. Fr.

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; CULTIVARS; RESISTANCE; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; GLOMERELLA CINGULATA; CASSAVA AFRICAN MOSAIC VIRUS; ROOT PRODUCTIVITY; STARCH CONTENT; PALATABILITY; CULTIVARS; CONGO.

Activities dealing with cassava collection and hybridization carried out in Congo in 1982-83 are reported. A table is included with the performance of cv. tested regarding resistance to CAMV, CBB, and anthracnose. Var. MA 433 and MA 446 showed resistance to CAMV; MA 446 and MA 147 were resistant to anthracnose and CBB. Other agronomic characteristics such as yields (t/ha), root size and shape, peduncle length, starch percentage, and tuber flavor were also determined. Ngono 2 and Kinsidi gave av. yields of 31.4 and 27.3 t/ha, resp. for the 1978-79, 1979-80, 1980-82, and 1981-83 periods, however, they did not show resistance to CAMV or CBB. Regarding hybridization, major crossings are listed and no. of seeds obtained are given. The introduction of 2 improved var. (TMS 30572 and TMS 30555) from the International Institute of Tropical Agriculture (Nigeria) is highlighted. The activities to be conducted at Loudima expt. station are also mentioned. At Odziba exptl. station cassava cv. ODZ 27, MB 38, Langourou, Epi, and Owando were taken into account for further multilocal trials. (CIAT)

0303

31372 MIAKABA, R.; GOUMBA, P. 1984. Complexe agro-industriel de Mantsoumba, section expérimentale de l'usine. (Mantsoumba's agro-industrial complex, experimental section of the factory). In Programme National de Recherche sur le Manioc. Congo. Rapport d'activité 1984. Congo, Ministere de la Recherche Scientifique. pp.100-103. Fr.

CASSAVA; CASSAVA PROGRAMS; FACTORIES; STEEPING; FOOFOO; WASTE UTILIZATION; FEEDS AND FEEDING; CONGO.

Mantsoumba's factory is highlighted as unique in the world for cassava industrialization and transformation. Results from studies on the improvement of cassava steeping are reported. The advantages of ensilage as a procedure to replace steeping are mentioned; the major characteristics of foofoo from this factory are described and compared with traditionally obtained foofoo. Studies on the revaluation of cassava residues were also conducted. Possible uses of various residues are suggested, mainly for animal feeding. (CIAT)

0304

26841 NENON, J.-P. 1985. LA COCHENILLE DU MANIOC. (THE CASSAVA MEALYBUG). PHYTOMA NO.367:54-55. FR., SUM. FR., IL.

CASSAVA; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; APOANAGYRUS LOPEZI; CONGO.

A BRIEF REPORT IS GIVEN ON THE CASSAVA MEALYBUG (PHENACOCCUS MANIHOTI), WHICH SINCE 1973 HAS CAUSED SUBSTANTIAL LOSSES TO THIS CROP IN CENTRAL AND EAST AFRICAN COUNTRIES. IN CONGO, PERIODIC OUTBREAKS OF THE INSECT POPULATIONS OCCUR DURING THE DRY SEASON. MAJOR ASPECTS OF THE DAMAGE CAUSED, INSECT BIOLOGY, AND BIOLOGICAL CONTROL MEASURES ARE SUMMARIZED. THE MEALYBUG PARASITE APOANAGYRUS LOPEZI, INTRODUCED INTO THE CONGO IN 1952, IS WELL ESTABLISHED NOW BUT PRESENTS 2 SERIOUS DRAWBACKS: IT CAN REPRODUCE ITSELF BY ARRHENOTOKY AND IS, IN TURN, HYPERPARASITIZED BY ANOTHER ENCYRTIDAE, THE INDIGENOUS SPECIE PROCHILONEURUS BOLIVARI. (CIAT)

0305

31568 PAYCHENG, M.C. 1970. Analyse du manioc. (Cassava analysis). In Van Ruymbeke, M. Possibilités de développement de la production du manioc. Brazzaville, Congo, Bureau pour le Développement de la Production Agricole. pp.87-90. Fr., Il.

CASSAVA; ASH CONTENT; WATER CONTENT; HCN CONTENT; STARCH CONTENT; CONGO.

Contents of water, starch, HCN, and strange material were determined for cassava. Results were 14.8 percent water, 82.1 percent starch, 1.2 percent strange material, and 0.003 percent HCN. Max. rates allowed for each analysis are given in a decree. (CIAT)

0306

31308 PITON, M.P. 1980. Complexe agro-industriel d'état de Mantsoumba: rapport d'exécution 1979-1980. (Mantsoumba state agro-industrial complex: 1979-80 performance report). Paris, France, Bureau pour le Développement de la Production Agricole. 118p. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; INDUSTRIALIZATION; ECONOMICS; PRODUCTION; CULTIVATION; CROPS; CULTIVARS; ROOT PRODUCTIVITY; CONGO.

Background information on the project for establishing the Mantsoumba agro-industrial complex in Congo is presented; general information is given on its main objectives, organization, and financing. The major results of cassava yield trials conducted in 1979-80 are summarized. The current situation of the complex is analyzed in detail in terms of financial aspects, production, storage, and commercialization. A proposal for the orientation and reactivation of this complex was designed. Actions are focused on aspects such as farm size, organizational chart, crops, buildings, vehicles, agricultural machinery, management, production policies, fire, storage, commercialization, and poultry husbandry. All these aspects are analyzed in detail. (CIAT)

0307

32031 TCHIKAYA 1976. Les principales productions: un accent particulier est mis sur la satisfaction des besoins alimentaires du peuple Congolais. (Major productions: particular attention is paid to satisfy the food requirements of the Congolese population). Afrique Agriculture no.9:36-38. Fr., Il.

CASSAVA; PRODUCTION; HUMAN NUTRITION; CONGO.

An interview with the Head of Agriculture of the Congolese Ministry of Rural Economy is transcribed. With regard to the evolution of food crop production in the next years, an increase is foreseen for cassava from 599,000 t in 1974 to 650,000 t in 1977. (CIAT)

0308

31566 VAN RUYMBEKE, M. 1970. Possibilités de développement de la production du manioc. (Possibilities for the development of cassava production). Brazzaville, Congo, Bureau pour le Développement de la Production Agricole. 90p. Fr., Sum. Fr., Il.

CASSAVA; STATISTICAL DATA; TRADE; PRODUCTION; PRICES; ECONOMICS; INDUSTRIALIZATION; CULTIVATION; PROCESSING; COSTS; INCOME; CONGO; EUROPE.

General information is presented on the cassava market: worldwide situation (production, consumption, and trade) and the feed market for livestock within the EEC. Other topics deal with price structure (evolution in time and price variation according to quality and origin as well as according to transportation means), incidence of freight on final price, and conclusions and conditions to market cassava in the EEC. Current supply and production, production increases, and industrial production units in Congo are discussed as well as cassava cultivation and processing, proposed processing installation, location of production units. A project of an industrial production unit for cassava roots is presented and investments and income-yield capacity are given. (CIAT)

0309

31627 ZOLTY, A. 1986. Menaces sur le manioc. (Threats for cassava). Marchés Tropicaux et Méditerranéens 42(2137):2670. Fr.

CASSAVA; CASSAVA BACTERIAL BLIGHT; CASSAVA AFRICAN MOSAIC VIRUS; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; CONGO; NIGERIA; IVORY COAST; CIAT-2.

The importance of cassava as a food crop in Africa is highlighted and general information is given on the major cassava diseases (CBB and CAMV) and pests (cassava mealybug and cassava green spider mite). Current work carried out in collaboration with different research institutes (among them CIAT) are mentioned. (CIAT)

GABON

0310

32024 TABLEAU ECONOMIQUE du Gabon à fin 1975. (Economic data of Gabon at the end of 1975). Bulletin de l'Afrique Noire no.877:17108. 1976. Fr.

CASSAVA; STATISTICAL DATA; PRODUCTION; GABON.

Data are given on production (t) of several food crops (among them cassava) in Gabon in 1975. The production of this root crop (118,845 t) represented approx. 40 percent of total tonnage collected. (CIAT)

0311

31358 GABON. MINISTERE DE LA PLANIFICATION ET DE L'AMENAGEMENT DU TERRITOIRE. 1985. Agriculture, production animale. (Agriculture, animal production). In Gabon. Ministere de la Planification et de l'Aménagement du Territoire. 5e Plan de développement économique et social 1984-1988. Gabon, pp.103-109,124-126,313-316. Fr.

CASSAVA; STATISTICAL DATA; PRODUCTIVITY; CONSUMPTION; PRODUCTION; DEVELOPMENT; GABON.

A 5-yr plan (1984-88) proposed for agriculture and livestock development in Gabon is described in detail. Regarding food crops, cassava and taro are considered as a whole. Statistics are presented on consumption (t) in 1982, annual growth rate, demand (t) for 1988, complementary demand (excluding losses), corresponding gross production (t), yields (t/ha), and area needed (ha). (CIAT)

0312

26789 GABON. MINISTERE DE L'AGRICULTURE, DE L'ELEVAGE ET DE L'ECONOMIE RURALE. 1985. OBSTACLES A LA PRODUCTION ET A LA COMMERCIALISATION DES RACINES, TUBERCULES ET PLANTAINS EN AFRIQUE. (PRODUCTION AND MARKETING CONSTRAINTS OF ROOTS, TUBERS, AND PLANTAINS IN AFRICA). IN WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE, 1985. REPORT. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.76-88. FR.

CASSAVA; PRODUCTION; CULTIVATION; PLANT BREEDING; CULTIVARS; MARKETING; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; LEGAL ASPECTS; GABON.

PRODUCTION AND MARKETING CONSTRAINTS OF ROOTS, TUBERS, AND PLANTAINS IN GABON ARE ANALYZED; A TRADITIONAL SUBSISTENCE ECONOMY PERSISTS, TOGETHER WITHTHE MODERN EXPLOITATION OF MINING AND FORESTRY. THE PROBLEMS FACED ARE DISCUSSED AND POSSIBLE SOLUTIONS ARE GIVEN. THE RESULTS OF VAR. IMPROVEMENT IN CASSAVA ARE GIVEN AS WELL AS SELECTED VAR. AND THEIR CHARACTERISTICS. (CIAT)

0313

31586 GABON. MINISTERE DE L'AGRICULTURE, DE L'ELEVAGE ET DE L'ECONOMIE RURALE. 1985. Rapport d'activités 1981-1985. (1981-1985 Activities report). Gabon, 143p. Fr.

CASSAVA; STATISTICAL DATA; TRADE; CASSAVA FLOUR; CASSAVA CHIPS; CASSAVA ROOTS (VEGETABLE); GARI; TAPIOCAS; PRODUCTION; CULTIVARS; CONGO; GUINEA; CAMEROON; GABON.

Research activities conducted by the Gabon Ministere de l'Agriculture, de l'Elevage et de l'Economie Rurale from 1981 to 1985 are reported. Cassava clones ME 79-6, 79J-5, 79J-10, 79J-16, 79J-24, and 79J-25 were selected from comparative trials. The 6310 cuttings planted in Dec. 1984 showed good development. Statistics are presented on amount of cassava commercialized in the form of chips and fresh roots for 1982-85. Statistical data on imports of CF in 1984 and 1985 are presented as well as for no. of sellers of cassava chips and fresh roots for 1981-85. Statistics are also presented on amount of cassava chips and fresh roots supplied by the different provinces for the same period, and exports of various cassava products (chips, fresh roots, tapioca, and CF) to Congo, Guinea, and Cameroon for 1981-85. Statistics on the evolution of cassava production in Gabon are also included for the same period. (CIAT)

0314

28197 BOUSSIENGUET, J. 1986. LE COMPLEXE ENTOMOPHAGE DE LA COCHENILLE DU MANIOC, PHENACOCCUS MANIHOTI (HOM. COCCOIDEA PSEUDOCOCCIDAE) AU GABON. 1. INVENTAIRE FAUNISTIQUE ET RELATIONS TROPHIQUES. (THE ENTOMOPHAGOUS INSECT COMPLEX OF THE CASSAVA MEALYBUG, PHENACOCCUS MANIHOTI (HOM. COCCOIDEA PSEUDOCOCCIDAE) IN GABON. 1. FAUNISTIC REVIEW AND TROPHIC RELATIONSHIPS). ANNALES DE LA SOCIETE ENTOMOLOGIQUE DE FRANCE 22(1):35-44. FR., SUM. FR., EN., 26 REF., IL. (FACULTE DES SCIENCES, LABORATOIRE DE ZOOLOGIE ET DE LUTTE BIOLOGIQUE, UNIV. O. BONGO, B.P. 1886, LIBREVILLE, GABON)

CASSAVA; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; GABON.

A REVIEW OF THE KNOWN NATURAL ENEMIES OF PHENACOCCUS MANIHOTI IN EQUATORIAL AFRICA IS PRESENTED. THE INDIGENOUS ENTOMOPHAGOUS INSECTS OF THISCASSAVA PEST WERE COLLECTED IN GABON DURING 3 YR. THE OCCURRENCE OF 2 PRIMARYPARASITES, 4 HYPERPARASITES, 9 PREDATORS, AND 8 PARASITES OF PREDATORS IS REPORTED AND THEIR RELATIONSHIPS ARE DEFINED. DATA ARE GIVEN ON THEIR RELATIVE ABUNDANCE AS WELL AS ON THEIR PERIOD OF OCCURRENCE AND RATES OF PARASITISM. THE ABUNDANCE AND THE IMPORTANCE OF HYPERPARASITES AND OF PARASITES OF PREDATORS ARE REPORTED. (AS)

0315

31322 CARLI, C. 1986. Cultures vivrieres: rapport de fin de mission 29.03.83 - 30.10.86. (Food crops: Final mission report 3/29/83-10/30/86). Gabon, Ministere de l'Agriculture, de l'Elevage et de l'Economie Rurale. Projet FAO-CIAM. 105p. Fr., Il.

CASSAVA; CULTIVARS; GERMPLASM; ROOT PRODUCTIVITY; RESISTANCE; GLOMERELLA CINGULATA; CERCOSPORIDIUM HENNINGSII; CASSAVA AFRICAN MOSAIC VIRUS; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; LAND PREPARATION; SOIL AMENDMENTS; PLANTING; TIMING; CUTTINGS; HERBICIDES; HARVESTING; ECONOMICS; GABON.

General characteristics of the N'Toum exptl. station of Gabon are described as well as cultural practices adopted. Main constraints to production of the major crops (cassava included) and possible solutions are also presented. Results of research conducted at N'Toum and other provincial exptl. stations are summarized. Cassava clones and local var. forming the N'Toum exptl. station collection are listed including their major agronomic characteristics. High yielding clones are also listed. Most cassava material selected showed resistance to major diseases (root rot, anthracnose, Cercospora, CAMV) and pests (mealybugs and green mites). A fact sheet is included with some recommendations on various aspects of cassava cultivation such as land preparation (amendments, herbicides), planting (date and cutting treatment), weed control, harvesting, and conservation. Data are also given on production costs. Finally, the procedure for collection of local plant material is described in detail. (CIAT)

0316

30869 EVERS, G. 1984. Cultures vivrieres: manioc. (Commodities: cassava). In Evers, G. Stations provinciales CIAM: 1980-1984. Gabon, Ministere de l'Agriculture, de l'Elevage et de l'Economie Rurale. Projet FAO-CIAM. pp.27-37,85-88. Fr., Il.

CASSAVA; CULTIVARS; RESISTANCE; CASSAVA AFRICAN MOSAIC VIRUS; ROOT PRODUCTIVITY; HERBICIDES; TOXICITY; PLANT BREEDING; WEED CONTROL; GABON.

The main results of research on cassava conducted in 1980-84 at the exptl. stations of the Centre d'Introduction, d'Adaptation et de Multiplication du Matériel Végétal Vivrier, Fruitier et Maraicher (CIAM) in Libreville, Gabon, are reported. From a clone evaluation, 76/7, 76/13, and 76/33 outstood as the best clones yielding 20-30 t/ha in 12 mo. The 1st 2 were also CAMV resistant. The phytosanitary problems observed were the fungus Periconia manihoticola and glyphosate spraying toxicity. Symptoms of both are briefly described. Recommendations concerning plant breeding and phytosanitation of cassava are also included, and a diagram is presented showing a weeding procedure adapted to the different constraints of each exptl. station. Finally, definite recommendations are given for the Booué, Lamabarene, Lastourville, Leconi, Oyem, and Tchibanga stations. The role of each station in experimentation, selection/plant breeding, multiplication, and demonstration is described. (CIAT)

0317

30870 EVERS, G.; CARLI, C. 1984. Manioc (Manihot esculenta). (Cassava). In Evers, G.; Carli, C. Evaluation des cultures vivrieres au Gabon. Note technique. Gabon, Ministere de l'Agriculture, de l'Elevage et de l'Economie Rurale. Projet FAO-CIAM. pp.6-14. Fr.

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; GLOMERELLA MANIHOTIS; CERCOSPORIDIUM HENNINGSII; PERICONIA MANIHOTICOLA; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; PHENACOCCUS MANIHOTI; INJURIOUS MITES; PHYTOPHTHORA; PEST DAMAGE; GABON.

The aspects that should be taken into account when evaluating cassava are presented, with particular reference to Gabon. The evaluation should include area planted (in square meters), no. of harvested plants, av. no. of roots/plant, wt. of harvested roots (kg), yields (t/ha), rot percentage, percentage of plants with CAMV symptoms and intensity of these symptoms, presence of diseases (Cercospora spp., anthracnose, leaf spot caused by Periconia manihoticola) and pests (cassava mealybug and cassava green mite), lodging, and mulching. Guidelines as to when these parameters should be evaluated are also included; the symptoms of the main cassava diseases and pests are briefly described. (CIAT)

0318

31623 EVERS, G. 1984. Rapport de fin de mission: annexes. (Final mission report: annexes). Gabon, Ministere de l'Agriculture, de l'Elevage et de l'Economie Rurale. 70p. Fr., Il.

CASSAVA; CULTIVARS; IDENTIFICATION; PLANT BREEDING; CUTTINGS; INSECTICIDES; FUNGICIDES; GABON.

A list is presented with the main characteristics of the cassava clones identified in 1984 at the Centre d'Introduction, d'Adaptation et de Multiplication du Matériel Végétal, Vivrier, Fruitier et Maraicher (Libreville, Gabon). The different research activities on cassava conducted at the exptl. stations of Tchibanga, Oyem, Lambarene, Booue, and Lastourville are also mentioned. Trials were carried out on var. and plots for multiplication and collections were evaluated. Finally, specific recommendations are given regarding cutting disinfection before planting for disease and pest prevention. (CIAT)

0319

32245 MANSER, P.D. 1986. Report on cassava mealybug and cassava green mites in some African countries: Gabon. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. pp.137-139. En. (Service de Protection des Vegetaux, Project CIAM, c/o PNUP B.P. 2183, Libreville, Gabon)

CASSAVA; PHENACOCCUS MANIHOTI; ROOT PRODUCTIVITY; CULTIVARS; RESISTANCE; PREDATORS AND PARASITES; BIOLOGICAL CONTROL; GABON.

A brief report on detection, yield losses, and cassava var. evaluation for resistance to Phenacoccus manihoti in Gabon is presented. Dry conditions in Gabon favor cassava P. manihoti infestations. Cassava var. 7, 13, and 33 from International Institute of Tropical Agriculture gave higher yields than local var. under P. manihoti infestation conditions in Tchibanga. These var. were selected for multiplication and extension. In north Gabon, var. 6, 13, and 33 showed no infestation. Hyperaspis sp., Cydonia sp. and Alesia sp. were found predating P. manihoti in Tchibanga. (CIAT)

GAMBIA

0320

22246 MANNEH, E. 1986. Report on cassava mealybug and cassava green mites in some African countries: Gambia. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. pp.140-141. En. (Senegabian Secretariat, Marina, P.O. Box 624, Banjul, Gambia)

CASSAVA; PHENACOCCUS MANIHOTI; CULTIVARS; RESISTANCE; GAMBIA.

A brief report is presented on detection, distribution, economic losses, and cassava var. evaluation for resistance to Phenacoccus manihoti in Gambia. During a 10-mo. test in 1981, cassava var. TMS 30555, TMS 30786, TMS 30572, and TMS 30395 were tested for resistance to P. manihoti. Although TMS 30395 showed increased growth and vigor despite P. manihoti attack, roots were very fibrous. (CIAT)

GHANA

0321

30054 ACTION PROGRAMME for biological control of cassava pests: cassava mealybug (Phenacoccus manihoti) and green spider mites (Mononychellus tanajoa). Accra, Ghana, 7p. 1985. En. Paper Meeting of Root and Tuber Crop Committee.

CASSAVA; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; BIOLOGICAL CONTROL; PREDATORS AND PARASITES; GHANA.

The objectives and work plans of a biological control program against the most devastating cassava pests in Ghana, namely Phenacoccus manihoti and Mononychellus tanajoa, are described. Ground and aerial releases of the parasitoid Epidinocarsis lopezi and the predators Diomus spp., Hyperaspis notata, H. jucunda, Sympherobium maculipanis, and Phytoseiid mites were made since 1984 in different locations and regions of the country, for which postrelease monitoring schedules are presented. (CIAT)

0322

29579 DISTRIBUTION OF cassava based foods in Ghana. Accra, Ghana, 2p. 1986. En.

CASSAVA; CASSAVA LEAVES (VEGETABLE); FOOFOO; GARI; AMPESI; AGBLEMA; YAKE YAKE; AKPLE; CASSAVA FLOUR; GHANA.

A list of cassava-based foods in probable order of importance in Ghana is presented. A brief explanation is given on methods of preparation, and the distribution of these foods in the different regions (Volta, Greater Accra, Central and Eastern, Western, Ashanti and Brong Akafo, and Northern and Upper) is indicated. In order of importance these foods are gari, foofoo, kakonte, ampesi, agblema, yake yake, akple/banku, roasted or fried, tapioca, and cassava leaves. Sweet var. are strongly preferred throughout the country. (CIAT)

0323

30123 GHANA. MINISTRY OF AGRICULTURE. 1985. Agricultural statistics (Food crops). Accra, 17p. En., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; PRODUCTIVITY; FOOD BALANCE; ECONOMICS; CONSUMPTION; GHANA.

Statistical data on total production, area, and yields of major food cro including cassava, for 1970-85 in Ghana are provided in table form. Supply/demand balance analyses for the periods 1979/80, 1980/81, 1981/82 1982/83, and 1983/84 are also included; these indicate that the cassava balance was negative except in 1982/83 when a surplus of 102,700 t occur: Area and production of cassava in 1980 are given per region (Western, Central, Eastern, Volta, Ashanti, Brong Ahafo, Greater Accra, Northern, a Upper). (CIAT)

0324

29581 GHANA. MINISTRY OF AGRICULTURE. DEPARTMENT OF ECONOMIC RESEARCH ANI PLANNING SERIVICE. 1986. Ghana: cassava production forecast by district 1985. Accra, Ghana, 2p. En., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; GHANA.

Cassava production and area forecasts in Ghana for 1985 are given per province (Western, Central, Eastern, Greater Accra, Votal, Ashanti, Northern, and Brong Ahafo) and corresponding districts (35 in total). (CI

0325

29580 AMOAKOH, K.; KISSIEDU, A.F.K. 1986. Ghana: cassava in the farming systems. Accra, Ghana, 3p. En.

CASSAVA; CULTIVATION SYSTEMS; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BACTERIAL BLIGHT; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; ZONOCERUS VARIEGATUS; GHANA.

Cassava cultivation in farming systems in 3 major regions of Ghana (coast: savanna, forest, and Guinea savanna) is briefly described. Aspects of maj pest and disease distribution and cassava genetic variation distribution a also reviewed. Approx. 60 percent of the cassava is intercropped, mainly with maize, cowpeas, and vegetables, in the coastal savanna zone. Cassava tends to be the last crop planted in the multiple cropping patterns used i the forest zone, but some monocrops are also found, especially in savanna patches within this zone. Cassava has not yet evolved a clear place in the cropping systems of the Guinea savanna zone since its introduction is relatively recent (1983). CAMD and Phenacoccus manihoti are most important in the coastal savanna zone. CBB is also serious in this latter zone as we as in the forest/savanna transitional zone. Mononychellus tanajoa can be found throughout the country and Zonocerus variegatus causes most damage i the forest zone and the forest/savanna transitional zone. The forest zone considered to be the main source of cassava variability. (CIAT)

0326

30040 ANKRAH, E.K. 1980. Studies on post-harvest weight losses in stored cassava (Manihot esculenta) root tubers. Accra, Ghana, Food Research Institute. Council for Scientific and Industrial Research. 6p. En., Sum. En., 3 Ref., Il.

CASSAVA; STORAGE; ROOTS; POSTHARVEST LOSSES; TIMING; GHANA.

Freshly harvested roots of cassava var. Ankra were exposed in the field (Accra, Ghana) under a shaded tree for 4 days in April, July, and Oct. 198(and the wt. losses were recorded. The results showed that the roots had mea wt. losses of 1.5 and 7.5 percent after the 1st and 4th day of storage in April and July, resp. It was estimated that in Ghana between 31,000-160,00(t harvested root wt. might be lost annually due to respiratory and desiccation factors. (AS)

0327

30043 ANKRAH, E.K.; EYESON, K.K.; LARTEY, B.L.; ATA, J.K.B.A.; AMOA-AWUA, W.; OSEI-YAW, A. 1979. The shelf life of cassava root tubers coated with lime suspension; report of Group B Storage Project on Rootcrops. Accra, Ghana, Food Research Institute. Council for Scientific and Industrial Research. 6p. En., Sur. En., 8 Ref.

CASSAVA; STORAGE; ROOTS; TEMPERATURE; COMPOSITION; DETERIORATION; TIMING; GHANA.

Roots of cassava var. Ankra were coated with 20, 30, and 40 percent concn. of lime suspension and stored at ambient temp. (30 degrees Celsius and 90 percent RH). On the 3rd day of storage, primary deterioration was observed and on the 9th day o. storage, secondary on both the control sample and the treated roots, with the appearance of Aspergillus, Penicillium, and Rhizopus. No significant changes were observed in moisture and starch contents but there was an increase in the level of reducing sugars. Acidity decreased at the end of the storage period. Results indicate no visible difference in spoilage rate between treated and control samples. (AS)

0328

30044 ANKRAH, E.K.; OSEI-YAW, A. 1981. The storage of cassava (Manihot esculenta) root tubers in sawdust medium contained in matted coconut palm fronds. Accra, Ghana, Food Research Institute. Council for Scientific and Industrial Research. 9p. En., Sum. En., 4 Ref., Il.

CASSAVA; STORAGE; ROOTS; FOOFOO; GARI; ORGANOLEPTIC EXAMINATION; SMALL-SCALE EQUIPMENT; GHANA.

A cassava storage structure was designed and constructed from matted coconut palm fronds. The structure remained in good condition in the field (Legon, Ghana) for about 6 mo. The structure was used to evaluate the storage performance of cassava roots in moist sawdust medium. Roots stored for about 60 days. Organoleptic tests showed that the roots were not suitable for making fufu and a local dish 'ampesi' made with cooked vegetable, but were useful for gari and dough. (AS)

0329

30042 ANKRAH, E.K. 1984. The transformation of cassava in West Africa. Accra, Ghana, Food Research Institute. Council for Scientific and Industrial Research. 10p. En., Sum. En., Il.

CASSAVA; PROCESSING; SMALL-SCALE EQUIPMENT; PEELING; GRINDING; PRESSING; ROASTING; FOOD PRODUCTS; GARI; TAPIOCAS; ATIEKE; CHICKWANGUE; GHANA; AFRICA.

Processing procedures traditionally used to transform cassava into other food products in West Africa are briefly reviewed. The basic processing steps described are peeling, grating, dewatering, and roasting. The methods for manufacturing gari, tapioca, atieke, and cassava sticks (baton du manioc) are briefly described and illustrated in flow charts. (CIAT)

0330

30041 ANKRAH, E.K. 1980. Underground storage trials of cassava root tubers. Accra, Ghana, Food Research Institute. Council for Scientific and Industrial Research. 7p. En., Sum. En., 7 Ref.

CASSAVA; ROOTS; STORAGE; GHANA.

The traditional system of storing harvested cassava roots underground in Ghana was evaluated in 2 exptl. trials. In the 1st trial the roots of cassava var. Ankrah stored for about 18 days in sandy soil with 14 percent

moisture compared with 5 days for the control. In the 2nd trial the roots stored for about 10 days in a sandy soil which became waterlogged after 2 days of rain. Recommendations for successful cassava root storage are that (1) the storage site be cool, shaded, and free of termites and (2) buried roots should be covered with a mound to avoid percolation of rain water. (AS)

0331

30045 ANKRAH, J.A.A. 1982. An assessment of the traditional methods of storing cassava. B.Sc. Thesis. Legon, Accra, University of Ghana. 73p. En., Sum. En., 28 Ref., Il.

CASSAVA; STORAGE; ROOTS; TECHNOLOGY EVALUATION; DETERIORATION; TIMING; ORGANOLEPTIC EXAMINATION; STARCH CONTENT; PALATABILITY; GHANA.

A study was conducted to assess the traditional methods used in Ghana of storing cassava. Three methods were used: (1) reburial, (2) reburial using straw, and (3) blanching followed by reburial. Var. Asram asia (a 6-mo. var.) was used. Physical characteristics of the roots (during the storage period) were assessed in terms of primary and secondary deterioration, presence of white fungal hyphae (Fomes lignosus), molds and fungi, cuts or bruises. Organoleptic tests on color, texture, flavor, and sweetness of roots were done during the storage period. Starch content and MC were also determined. Evaluations were carried out after every 2 wk. of storage and the results analyzed using analysis of variance. Results from the organoleptic tests showed that both the type of storage system (treatment) and the storage period had significant effects on color, flavor, and sweetness of samples. Although the type of treatment affected the texture significantly, the storage period did not. Method 2 had the longest storage period (8 wk.), followed by methods 1 (6 wk.) and 3 (2 wk.). Results from starch and moisture determinations showed an inverse relationship between the variables. Generally there was a rise in starch content confirmed by the sweetness of the samples (from taste panel). (AS)

0332

29595 ATAYI, E.A. 1981. Ghana national foodcrop wholesale prices 1970-1980 Ibadan, Nigeria, International Institute of Tropical Agriculture. Agricultural Economics Information Bulletin no.1 19p. En. Il.

CASSAVA; STATISTICAL DATA; PRICES; GHANA.

Figures of wholesale prices for the main food crops produced in Ghana, including cassava, are provided in table form on a monthly basis per year for the period 1970-80. Annual av. prices are also given for each crop and price trends are illustrated in graphs. (CIAT)

0333

32035 DALTON, G.E.; AMANKWA, E.H.U. 1973. Tobacco production in South-east Ghana. In Dalton, G.E.; Parker, R.N. Agriculture in Southeast Ghana. 2. Special studies. Berkshire, England, University of Reading. Department of Agricultural Economics and Management. Development Study no.13 v.2, pp.78-86. En.

CASSAVA; ECONOMICS; LABOR; PRICES; GHANA.

The tobacco industry in Ghana is analyzed; factors affecting its production and its economic attraction relative to other crops, particularly maize and maize/cassava, are discussed. Returns from tobacco in 1970 are compared with those from maize and maize/cassava in 2 villages of SE Ghana, Wute and Tadzewu, showing that at current prices tobacco is less attractive than

maize/cassava. Labor requirements and net returns to labor are detailed for each cropping system. (CIAT)

0334

32247 DJOKOTO, L.K.; BHATIA, J.S.; TIBO, C.K. 1986. Report on cassava mealybug and cassava green mites in some African countries: Ghana. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. pp.141-143. En., Il. (VORADEP, Ministry of Agriculture, Box 165, Ho, Ghana)

CASSAVA; PHENACOCCUS MANIHOTI; INSECT CONTROL; INSECTICIDES; GHANA.

A brief report on detection, distribution, damage, and chemical control of Phenacoccus manihoti in Ghana is presented. Insecticides pirimphos-methyl, Aldrex 40, fenitrothion, and dimethoate were used to spray cassava fields in Southern Volta region, at concn. of 500 and 250 ml a.i./liter water. Control of P. manihoti was estimated at less than 10 percent. (CIAT)

0335

30046 DOKU, E.V. 1985. Root and tubers crops research in Ghana. Legon, Accra, University of Ghana. 9p. En.

CASSAVA; CASSAVA PROGRAMS; RESEARCH; GHANA.

The background, research priorities, regional and national interinstitutional collaboration links, and objectives/strategies of the root and tuber crops programs of Ghana, including that of cassava, are described. The cassava research program envisages the execution of coordinated var. trials across the country for selection of high root and starch yielding, early maturing, pest- and disease-resistant germplasm; the rapid multiplication and distribution of released var. to farmers; research on climatic conditions favoring cassava pests and diseases; and the establishment of a permanent pest and disease monitoring and surveying team. (CIAT)

0336

29590 DOVLO, F.E. 1985. Utilization of food crops in Ghana. In Country Statement for Consultation on Home Economics and Agricultural Research, Ibadan, Nigeria, 1985. Summary report and recommendations on food crops utilization. Ibadan, Nigeria, International Institute of Tropical Agriculture. Home Economics Association of Africa. pp.59,64-65. En.

CASSAVA; PROCESSING; USES; CASSAVA CHIPS; GARI; DRIED ROOTS; BAKERY PRODUCTS; CASSAVA STARCH; CASSAVA FLOUR; FOOFOO; TECHNOLOGY EVALUATION; STORAGE; GHANA.

The various uses given to cassava in Ghana are briefly described. In Ghana cassava is consumed fresh, boiled, as gari, CF, foofoo, or grilled or fried as chips. Processing involves grating, pressing, drying, fermentation, screening, shaping, and frying. Brief decriptions are given on how gari and kokonte are prepared and used; uses of starch and tapioca are also indicated. Research efforts have developed instant foofoo powder and improved uncontaminated kokonte. Wet sawdust was used to store fresh cassava for 6 mo., keeping its fresh qualities. (CIAT)

0337

28580 HANSEN, E. 1984. THE FOOD CRISIS IN GHANA: NATIONAL POLICIES AND ORGANIZATIONS. TRENTON, N.J., AFRICA RESEARCH AND PUBLICATIONS PROJECT. WORKING PAPERS SERIES NO.10. 32P. EN., 41 REF.

CASSAVA; CASSAVA PROGRAMS; DEVELOPMENT; DEVELOPMENT COSTS; FOOD SECURITY; HISTORY; ECONOMICS; GHANA.

IN TERMS OF THE CURRENT STRUCTURE OF FOOD PRODUCTION AND DISTRIBUTION IN GHANA, THE EVOLUTION OF ITS FOOD POLICIES UNDER THE COLONIAL PERIOD, AND THE 1ST AND 2ND REPUBLICS, IS REVIEWED AND THE EXTENT TO WHICH THESE POLICIES RESPOND TO THE FOOD NEEDS OF THE COUNTRY IS EXAMINED. OPERATION FEED YOURSELF, LAUNCHED IN 1972, IS DISCUSSED AND A GENERAL ANALYSIS IS MADE OF THE FOOD SITUATION SINCE INDEPENDENCE TO DATE. THE POLICIES OF THE 3RD REPUBLIC, WHICH RESTORED CIVILIAN RULE IN 1979, ENCOURAGE TRANSNATIONAL CORPORATION INVOLVEMENT IN GHANAIAN AGRICULTURE. ALTHOUGH THE POLICY OF EMPHASIZING A FEW SELECTED CROPS (MAIZE, CASSAVA, AND RICE) IS CONSIDERED SOUND, NO INNOVATIONS OR POLICY INITIATIVES HAVE BEEN INTRODUCED. A CONTINUOUS AND SUSTAINED ATTACK ON THE FOOD PROBLEM IS RECOMMENDED, WITH A COMPREHENSIVE NATIONAL FOOD POLICY WHICH WILL INTEGRATE AND COORDINATE PRODUCTION, DISTRIBUTION, MARKETING, EXTENSION, STORAGE, AND RESEARCH IMPLEMENTED. (CIAT)

0338

30047 KISSIEDU, A.F.K. 1976. Improving the rotational system in the southern savanna zone of Ghana. 1. The effect of preceding cropping on yield of some major field crops. Accra, Ghana. Crops Research Institute. Council for Scientific and Industrial Research. 10p. En., Sum. En., 8 Ref.

CASSAVA; ROTATIONAL CROPS; SOIL FERTILITY; MAIZE; COWPEA; TOBACCO; ROOT PRODUCTIVITY; GHANA.

The effect of preceding cropping on the yields of maize, cassava, cowpea, and tobacco was examined in sequencial trials conducted in Ohawu and Pokuase (Ghana). A split-plot design, replicated 3 times, was used with 1st-yr cropping as the main plot and 2nd yr cropping as subplots. The effect of the various 1st-yr crops on the yield of the 2nd-yr crops differed significantly at both sites except with maize in Pokuase. In Ohawu, maize and cassava tended to be sequencially compatible, each being suitable to the other as preceding crop. Cowpea yield was suboptimal but yields of succeeding maize and cassava were significantly high. There was a significant interaction between the effects of 1st- and 2nd-yr crops on the yield of 3rd-yr maize in Ohawu. At this location 1st-yr cropping of tobacco-fallow and 2nd-yr cassava tended to be the best preceding cropping sequence for 3rd-yr maize; whereas 1 yr previous cropping of cassava favored maize that followed, 2 yr successive cassava lowered the yield of maize that succeeded. (AS)

0339

30048 KISSIEDU, A.F.K. 1976. Intercropping of cassava with maize. Accra, Ghana, Crops Research Institute. Agricultural Experimental Station. 5p. En., Sum. En., 6 Ref.

CASSAVA; INTERCROPPING; PLANTING; ROOT PRODUCTIVITY; TIMING; MAIZE; GHANA.

Studies on cassava-maize intercropping were carried out on the savanna land in Kpeve, Ghana. The LER of the various treatments indicated that this intercropping could be more efficient then growing maize or cassava as a sole crop. This suggests that maize and cassava are compatible components for a mixed cropping system. Generally, higher yields of either maize or cassava were obtained from the pure culture treatments but except where maize was sown 4 wk. after cassava, yields from the monoculture treatments were not significantly higher than the mean yields from the other intercropping treatments. The effects of interrow and intrarow methods of intercropping on the mean yields of cassava and maize in the mixed cropping treatments were not significantly different. Growth of cassava plants was retarded by the shading effect of their maize counterparts in the mixed

cropping treatments but started to improve after the maize harvest. By varying the planting sequence of maize and cassava in the mixed cropping treatments the mean yield of any of the 2 crops was significantly higher when planted 4 wk. before the other than when planted 4 wk. later. No significant yield advantage was observed between planting 4 wk. before the other component crop and planting the 2 crops the same day; however, the total yield advantage of the mixtures declined from an av. of 38 percent for simultaneous planting to 34 percent when maize preceded cassava and further down to 17 percent when cassava preceded maize. Simultaneous planting for cassava-maize mixtures is recommended, but if for any reason one of the component crops is to be planted 1st, that should be maize. (CIAT)

0340

30052 KISSIEDU, A.F.K. 1978. The effect of age at harvesting and fertilizer NPK application on tuber yield of cassava (Manihot esculenta Crantz) under southern savanna conditions in Ghana. Accra, Ghana, Crops Research Institute. Council Scientific and Industrial Research. 13p. En., Sum. En., 13 Ref., Il.

CASSAVA; HARVESTING; TIMING; FERTILIZERS; SAVANNAS; N; P; K; ROOT PRODUCTIVITY; GHANA.

The effect of age at harvesting and fertilizer NPK application on root yield of 2 cassava cv. (Ankra and Katawia) was examined in a double split-plot design expt. in Chawu and Kpeve in the southern savanna zone of Ghana. Cv. Ankra outyielded Katawia at both sites of the expt. Yield levels at the various stages at harvesting for the 2 cv. were irregular but yield trends exhibited tendencies for increase in yield with increasing age. The yield of cv. Ankra was max. at the age of 15 mo. and declined immediately thereafter while cv. Katawia attained its max. root yield at 17 mo. and appeared to maintain an almost uniform yield up to 20 mo. Apart from cv. and age of the crop, marked seasonal variations might influence the food quality of cassava roots. The results also showed that the general trend of fertilizer effect on yield tended to be negative beyond the age of 15 mo. (AS)

0341

30529 KREAMER, R.G. 1986. Cassava, the food of the urban poor. In Kreamer, R.G. Gari processing in Ghana: a study of entrepreneurship and technical change in tropical Africa. Ithaca, New York, Cornell University. Department of Agricultural Economics. International Agricultural Economics Study Series. A.E. Research 86-30. pp.5-12. En., Il.

CASSAVA; PRODUCTION; COSTS; GHANA.

An overview is presented of cassava as a crop in Ghana, with a discussion of: yields of cv. Ankra; adaptability to soil and moisture conditions; production costs (labor and other inputs), with returns to labor compared with those of sweet potato, maize, and millet; storage and processing (for gari and konkonte); uses and demand in the country. In 1955, cassava constituted 38 and 46 percent of the urban diet in Kumasi and Secondi-Takoradi, a situation that is still prevalent. (CIAT)

0342

30532 KREAMER, R.G. 1986. Gari processing: improved technology. In Kreamer, R.G. Gari processing in Ghana: a study of entrepreneurship and technical change in tropical Africa. Ithaca, New York, Cornell University. Department of Agricultural Economics. International Agricultural Economics Study Series. A.E. Research 86-30. pp.41-66. En., Il.

CASSAVA; GARI; PROCESSING; TECHNOLOGY EVALUATION; MECHANIZATION; WOMEN; MARKETING; PRICES; INCOME; SOCIOECONOMIC ASPECTS; GHANA.

The effects of improved technology on the gari industry in the Ashanti and Brong-Ahafo regions (Ghana) are analyzed. The mechanical cassava grater used in these areas is described as well as a high-vol. technology system in Accra. Two case studies of these technologies, in Ayigya-Kumasi and Anloga-Kumasi, are compared. Details of these women-managed organizations to process gari are given. The various steps from the arrival of raw material to fermentation and roasting are also discussed. Socioeconomic production factors, related to the adoption of new technology and quality considerations, and the operating costs and revenue of Anloga-Kumasi processors are also presented. (CIAT)

0343

30528 KREAMER, R.G. 1986. Gari processing in Ghana: a study of entrepreneurship and technical change in tropical Africa. Ithaca, New York, Cornell University. Department of Agricultural Economics. International Agricultural Economics Study Series. A.F. Research 86-30. 138p. En., 56 Ref., Il.

CASSAVA; GARI; TECHNOLOGY EVALUATION; MARKETING; SMALL-SCALE PROCESSING; CASSAVA PROGRAMS; GHANA.

The manner in which Ghanaian entrepreneurs have increased food availability through improvements in cassava processing, eliminating many of the bottlenecks associated with organizing the delivery of fresh cassava to processing centers and improving cassava processing technology, is examined. The focus is on the gari industry of Ghana, particularly in the area of Kumasi, and the impact of 2 technological innovations: the mechanical cassava grater and the manual screw press, built locally. Samples, case studies, and surveys of the cassava marketing and processing chain and of Kumasi's informal industrialists were used to collect socioeconomic data. Policy implications for promoting small-scale technological change are discussed. (CIAT)

0344

30531 KREAMER, R.G. 1986. Gari processing: the traditional method. In Kreamer, R.G. Gari processing in Ghana: a study of entrepreneurship and technical change in tropical Africa. Ithaca, New York, Cornell University. Department of Agricultural Economics. International Agricultural Economics Study Series. A.F. Research 86-30. pp.29-40. En., Il.

CASSAVA; GARI; PROCESSING; TECHNOLOGY EVALUATION; GHANA.

The traditional method of gari processing in Ghana, as well as the use of improved technology such as the mechanized cassava grater and the wingnut screw press, are discussed. Case studies of 2 processing enterprises managed by women in Bonwire, an Ashanti village near Kumasi, and Ayeasu, near Techiman, are given. In each case study, the choice of technology, types of gari made, supply of cassava, and gari marketing are discussed. A concluding analysis of the industry's future is also made. (CIAT)

0345

30530 KREAMER, R.G. 1986. Production and consumption of cassava in Ghana. In Kreamer, R.G. Gari processing in Ghana: a study of entrepreneurship and technical change in tropical Africa. Ithaca, New York, Cornell University. Department of Agricultural Economics. International Agricultural Economics Study Series. A.F. Research 86-30. pp.13-27. En., Il.

CASSAVA; PRODUCTION; CONSUMPTION; GARI; PRICES; STATISTICAL DATA; MAPS; GHANA.

The production and consumption of cassava in the Ashanti (Kumasi) and Brong-Ahafo (Techiman) regions of Ghana are discussed in detail. Data on production, area, and yields from 1950 to 1984 are presented as well as the national av. wholesale price (1980- 85). Recommendations on soil preparation, planting (time, material, and spacing), and harvesting are given. Gari consumption in the regions is discussed and the marketing structures in Kumasi and Techiman are indicated. (CIAT)

0346

30535 KREAMER, R.G. 1986. The government's role in promoting small-scale entrepreneurship. In Kreamer R.G. Gari processing in Ghana: a study of entrepreneurship and technical change in tropical Africa. Ithaca, New York, Cornell University. Department of Agricultural Economics. International Agricultural Economics Study Series. A.E. Research 86- 30. pp.107-115. En.

CASSAVA; GARI; SMALL-SCALE PROCESSING; DEVELOPMENT; CASSAVA PROGRAMS; TECHNOLOGY; GHANA.

The role of the Ghana Government in promoting small-scale entrepreneurship related to gari processing is discussed. Future demand for improved technology is analyzed. The activities of the Technology Consultancy Centre (U. of Science and Technology) are described; its main focus is on the development of intermediate technology. The Center has had considerable impact on Kumasi's small-scale industrial sector. From 1972 to 1983, 21 lathes and 44 other machine tools were introduced. Firms such as SIS and AGRICO were found to be capable of manufacturing any scale of processing system. (CIAT)

0347

30534 KREAMER, R.G. 1986. Transformation of the gari industry: impact of new technology on small- scale equipment manufacturers. In Kreamer, R.G. Gari processing in Ghana: a study of entrepreneurship and technical change in tropical Africa. Ithaca, New York, Cornell University. Department of Agricultural Economics. International Agricultural Economics Study Series A.E. Research 86-30. pp.91-105. En.

CASSAVA; GARI; SMALL-SCALE EQUIPMENT; SMALL-SCALE PROCESSING; TECHNOLOGY EVALUATION; SOCIOECONOMIC ASPECTS; GHANA.

The contribution of small-scale equipment manufacturers to the development of Ghana's gari industry was assessed. Data were collected in Kumasi's 3 informal industrial areas (Suame Magazine, Anloga Light Industrial Area, and Asafo) during June-Oct. 1985. The characteristics, products, and equipment of these manufacturers were compared, as well as methods of pricing and payment, bottlenecks to production, aspects of credit, and sales. The case studies of an Asafo workshop owner and of SIS Engineering Ltd. in Kumasi are discussed. The latter produced its 1st cassava grater in 1975 and the screw press in 1983. The reasons for SIS's success and the demand for food processing equipment are discussed in detail. (CIAT)

0348

30533 KREAMER, R.G. 1986. Transformation of the gari industry: impact of new technology on the marketing chain. In Kreamer, R.G. Gari processing in Ghana: a study of entrepreneurship and technical change in tropical Africa. Ithaca, New York, Cornell University. Department of Agricultural Economics. International Agricultural Economics Study Series. A.E. Research 86- 30. pp.67-89. En., Il.

CASSAVA; GARI; TECHNOLOGY; PROCESSING; MARKETING; MAPS; PRICES; COSTS; SOCIOECONOMIC ASPECTS; INCOME; INDUSTRIALIZATION; GHANA.

The evolution of the gari marketing systems in Anloga-Kumasi and Techiman (Ghana) due to technical innovations is reviewed. The origin and development of the Kumasi processing center are discussed and the reasons for the emergence of the industry in Techiman are given. Criteria for organizing a center are included. The delivery system is described and marketing costs are analyzed. At 42 percent, transportation costs are more than twice the percentage contribution of the contractor's net margin, and 50 percent greater than the producer's price. Data on contractor's net income from cassava deliveries are also included. Tuobodum and Asuoyi, 2 villages in the Techiman area, are used as examples of organized processing centers. Furthermore, the impact of technology on traditional and new markets and on marketing returns is analyzed. (CIAT)

0349

26791 KWAME, A.A. 1985. COUNTRY PAPER ON SITUATION OF ROOTS, TUBERS AND PLANTAINS IN GHANA. IN WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE, 1985. REPORT. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.94-103. EN., IL.

CASSAVA; PRODUCTION; MARKETING; PRICES; PROCESSING; POSTHARVEST LOSSES; SOCIOECONOMIC ASPECTS; ROOT PRODUCTIVITY; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; GHANA.

THE SITUATION OF STARCHY FOOD CROPS IN GHANA IS DESCRIBED. AN ESTIMATED 19 PERCENT OF CROPPED LAND IS PLANTED TO ROOT AND TUBER CROPS. CASSAVA IS CULTIVATED ALMOST ALL OVER THE COUNTRY WITH 315,000 AND 290,000 HA PLANTED TOTHE CROP IN 1980 AND 1985, RESP. EXPECTED PRODUCTION OF CASSAVA FOR 1985 IS 290,100 MT. FOOD PRODUCTION IS CHARACTERIZED BY SMALL FARMS, LACK OF RESOURCES, LOW INCOMES, AND RUDIMENTARY TECHNOLOGIES. MARKETING AND PRICE POLICIES ARE DESCRIBED, WHICH, IN THE CASE OF SUBSISTENCE FOODS, ARE IN THE HANDS OF A LARGE NO. OF MIDDLEMEN. THE ONLY GOVERNMENT AGENCY, GHANA FOOD DISTRIBUTION CO., HANDLES, AT THE MOST, ABOUT 10 PERCENT OF THIS TRADE. PRICES ARE UNFAVORABLE TO PRODUCERS, INCREASED BY DEFICIENT TRANSPORTATION AND STORAGE, HIGH RATES OF PRODUCT DETERIORATION, ABSENCE OF CREDIT, AND INEFFECTIVE GOVERNMENTAL INTERVENTION. (CIAT)

0350

30049 KWAMIE, A.; OSEI-OPARE, F. 1985. Simplier methods of storing fresh cassava roots--basket and wood-shavings storage system. Legon, Accra, University of Ghana. Faculty of Agriculture. 11p. En., 7 Ref., Il.

CASSAVA; STORAGE; CASSAVA ROOTS (VEGETABLE); TIMING; TECHNOLOGY EVALUATION; PROCESSING; FOOFOO; AMPESI; ORGANOLEPTIC EXAMINATION; GHANA.

A simple method of storing both cured and uncured, bruised and unbruised cassava roots in baskets (10-kg capacity), lined with plantain leaves and filled with moist sawdust, was evaluated. Roots were stored for periods of 4, 8, and 10 wk. and 6 mo., and ampesi and foofoo dishes prepared from them were scored by a trained panel. Ampesi and foofoo prepared from fresh roots were rated, resp., as good to very good and very good for quality characteristics (color, elasticity, odor, smoothness, and eating quality). All roots stored on the shelf (control) were completely spoiled by 2 wk. of storage, thus no sensory evaluation was conducted. Both cured and uncured roots kept in baskets with sawdust were found to be in good condition after 6 mo. of storage, but some reduction in the quality characteristics of ampesi and foofoo occurred. It is highly recommended to store whole unbruised roots; however, cured bruised roots are recommended to be used within 2 mo. of storage. Whole unbruised roots can be kept for up to 6 mo., while treating with wood ash will provide extra protection. (CIAT)

0351

30053 LARSEN, R.E. 1975. Root cassava and its by-products in livestock and poultry feeding. Accra, University of Ghana. 11p. En.

CASSAVA; ANIMAL NUTRITION; FEEDS AND FEEDING; SWINE; POULTRY; CATTLE; NUTRITIVE VALUE; TOXICITY; HCN; DETOXIFICATION; SILAGE; GHANA.

The nutritional value, toxicity (HCN), and use of cassavain swine, poultry, and bovine feeding is reviewed. It is concluded that adequate evidence is available indicating that cassava can be used in diets for practically all species and classes of livestock, but the optimum or max. level for each species and production objectives is not clear. Cassava silage has excellent potential as a livestock feed, but there are several limitations to the use of cassava as an animal feed, such as (1) the balance of nutrients in cassava is not equivalent to cereal grains, thus more proteins, minerals, and vitamins from other sources should be included in cassava-based diets; (2) while HCN levels can be high in some var., HCN can be released through proper treatments; and (3) raw cassava storage is a problem, but roots can be dried and stored or silage could be made for certain animal feeds. (CIAT)

0352

25538 LARTEY, B.L. 1981. COUNTRY PROFILE. IN WORKSHOP ON PROCESSING TECHNOLOGIES FOR CASSAVA AND OTHER TROPICAL ROOTS AND TUBERS IN AFRICA, ABIDJAN, IVORY COAST, 1983. PROCEEDINGS. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.139-146. EN.

AFRICA; CASSAVA CHIPS; CASSAVA PRODUCTS; CASSAVA STARCH; CIAT-2; CULTIVARS; CULTIVATION; DRIED ROOTS; ECONOMICS; FOOD PRODUCTS; GARI; GHANA; INJURIOUS INSECTS; NOXIOUS ANIMALS; PESTS; PLANT ANATOMY; PROCESSED PRODUCTS; PROCESSING; PRODUCTION; RESEARCH; ROOT CROPS; ROOTS; SMALL-SCALE PROCESSING; STORAGE; TAPIOCAS; USES; ZONOCERUS VARIEGATUS.

BASIC DATA ON GHANA'S ECONOMY AND AGRICULTURE ARE GIVEN. THE MAIN ROOT CROPS ARE CASSAVA, YAMS, COCOYAMS, AND SWEET POTATOES, CASSAVA BEING PRODUCED AND UTILIZED THE MOST. A BRIEF ACCOUNT OF CASSAVA CULTIVATION IS PRESENTED; THE MOST COMMON VAR. ARE GARI, QUEEN, WILLIAMS, AND ANKRA. THE METHODS USED TO STORE THE ROOTS ARE INDICATED. THE MOST IMPORTANT PRODUCTS ARE GARI, TAPIOCA, STARCH, KONKONTE, AND CASSAVA CHIPS; PROCESSING IS MOSTLY DONE IN THE RURAL COMMUNITIES. RESEARCH IS BEING CARRIED OUT ON ROOT STORAGE AND THE DEVELOPMENT OF CASSAVA PROCESSING MACHINES.

0353

28123 LEMAIRE, H. 1986. PRODUCTION OF ETHYL ALCOHOL FROM CASSAVA STARCH; A PROJECT WORK IN CHEMISTRY. GHANA, UNIVERSITY OF CAPE COAST. 35P. EN., SUM. EN., 36 REF., IL.

CASSAVA; ETHANOL; INDUSTRIAL STARCHES; LABORATORY EXPERIMENTS; HYDROLYSIS; FERMENTATION; BIOCHEMISTRY; CASSAVA STARCH; GHANA.

THE METHODS USED IN THE CONVERSION OF CASSAVA STARCH TO GLUCOSE AND ITS SUBSEQUENT CONVERSION TO ETHYL ALCOHOL WERE STUDIED, AND A LAB.-SCALE PRODUCTION PROCEDURE WAS DEVISED. THE EFFECT OF VARIOUS FACTORS (BASE AND MINERAL ACID USED IN HYDROLYSIS) ON THE YIELD OF ETHYL ALCOHOL WAS STUDIED. RESULTS INDICATED THAT YIELDS OF ETHYL ALCOHOL FROM HYDROLYSATES OF HCL WERE HIGHER THAN YIELDS FROM H_2SO_4 HYDROLYSATES. LIKEWISE, YIELDS FROM HYDROLYSATES WITH PHS ADJUSTED WITH $CaCO_3$ PRIOR TO FERMENTATION WERE HIGHER THAN YIELDS FROM HYDROLYSATES WITH PHS ADJUSTED WITH Na_2CO_3. FURTHERMORE, THE ADDITION OF PASTEUR SALT SOLUTION SLIGHTLY INCREASED THE YIELD FROM HYDROLYSATES WITH PHS ADJUSTED WITH $CaCO_3$ AND CONSIDERABLY DECREASED THE YIELD FROM HYDROLYSATES WITH PHS ADJUSTED WITH Na_2CO_3. (AS)

0354

30050 OSEI-OPARE, F.A. 1978. Preservation of cassava by freezing. Legon, Accra, University of Ghana. 9p. En.

CASSAVA; ROOTS; STORAGE; CRYOPRESERVATION; COOKING; FOOFOO; ORGANOLEPTIC EXAMINATION; PALATABILITY; GHANA.

Blanched (3 or 5 min) and unblanched, peeled and unpeeled, 6- to 8-cm cassava (cv. Ankrah) root sections were stored in thick polyethylene bags in a household chest freezer for 3 mo. to determine the best conditions to store frozen cassava for foofoo preparation. The best method for cooking frozen cassava for foofoo preparation was also investigated, particularly the effects of thawing prior to cooking of peeled and unpeeled frozen cassava and the use of steam or hot or cold water for cooking peeled frozen cassava. A 15-member trained panel rated the final products for quality attributes (appearance, texture, tenderness, smoothness, flavor, smell, and overall eating quality). Peeling and freezing was found to be a good method for storing cassava roots. Blanching prior to freezing of peeled samples had adverse effects on foofoo quality, as well as 5-min blanching prior to freezing of both peeled and unpeeled cassava. Flavor and smell of foofoo prepared from unpeeled cassava roots were rated slightly low. Thawing of peeled frozen cassava before cooking and unthawing of both peeled and unpeeled frozen cassava had no adverse effect on foofoo quality, but thawing of unpeeled frozen cassava did, especially on texture and overall eating quality. The best quality foofoo was obtained from cooking in steam. Cooking unthawed cassava should be done in steam or boiling water rather than in cold water, since the latter produced poor quality foofoo. (CIAT)

0355

26790 TETEBO, R. 1985. WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN GHANA. IN WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE, 1985. REPORT. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.89-93. EN.

CASSAVA; PRODUCTION; CULTIVATION; RAINFALL DATA; DEVELOPMENTAL RESEARCH; CASSAVA PROGRAMS; GHANA.

BASIC INFORMATION IS PRESENTED ON CLIMATE, ECOLOGICAL ZONES, SOIL TYPES, LAND USE PATTERNS, AND AGRICULTURAL PRODUCTION AREAS OF GHANA, WHERE ROOT CROPS ARE THE BASIC STAPLE FOODS. CASSAVA IS CULTIVATED THROUGHOUT THE COUNTRY, ESPECIALLY IN THE TRANSITION ZONES AND SAVANNAS, AND ITS IS HARVESTED THE YEAR-ROUD. MAJOR PRODUCTION CONSTRAINTS OF THESE FOODS ARE THE GROWING FOOD SHORTAGE, HIGH COSTS OF AGRICULTURAL LABOR AND INPUTS, LOW PRICES PAID FOR PRODUCTS, POOR CONDITIONS OF HIGHWAYS, AND THE LACK OF FOREIGN CURRENCY, PLANTING MATERIALS, AND WELL-ACCEPTED VAR. THE PRODUCTION OF STARCHY CROPS DECREASED FROM 8.0 TO 4.4 MILLION T. THE PRODUCTION OF CASSAVA AND CASSAVA BY-PRODUCTS HAS INCREASED DUE TO ITS ADAPTABILITY. ON THEOTHER HAND, PROCESSING METHODS FOR CASSAVA ARE RUDIMENTARY. ALTHOUGH SOME BREEDING AND SELECTION WORK HAS BEEN DONE SINCE 1930, DISEASES AND PESTS CAUSE SUBSTANTIAL LOSSES TO THIS CROP. (CIAT)

0356

29582 WARREN, A., comp. 1987. Ghana: distribution of cassava production. En., 1 map, sc. 1:2,000,000.

CASSAVA; PRODUCTION; MAPS; GHANA.

0357

30882 GUINEE. MINISTERE DU DEVELOPPEMENT RURAL. 1986. Etude de restructuration des services agricoles et de schémas directeurs régionaux de développement rural: synthese. (Study on the reorganization of agricultural services and regional rural development schemes: synthesis). Guinée, pp.1-30,45-54,63,67-70,83-84,97-98,104-111. Fr., Il.

CASSAVA; STATISTICAL DATA; PRODUCTION; CONSUMPTION; GARI; INDUSTRIALIZATION; DEVELOPMENTAL RESEARCH; GUINEA.

The relative importance of cassava in relation to other food crops in Guinea is mentioned and statistics are presented on area planted and production for 1981 and 1985. Consumption estimates for 1995 were also calculated for this crop. The major characteristics of a cassava processing unit for gari obtention are described and possible reasons for its low production are mentioned. Some measures to overcome limitations are presented. Rice is highlighted as the main component of the different developmental projects for the 1986-95 period. (CIAT)

0358

31314 GUINEE. MINISTERE DU DEVELOPPEMENT RURAL. 1986. Etude de restructuration des services agricoles et de schémas directeurs régionaux de développement rural: Guinée forestiere. (Reorganization study of agricultural services and schemes of regional rural development leaders: forestal Guinea). Guinée.pp.1-10,19-20,22-23,55-58. Fr., Il.

CASSAVA; STATISTICAL DATA; PRODUCTION; FORESTRY; FARM SIZE; GUINEA.

Statistics are presented for the major food crops (cassava included) in forestal Guinea on area planted (ha) and production (t) for 1981; av. size of exploitation (ha) and production (kg/ha); and no. of persons/exploitation. General information is also included on physical and demographic characteristics of the different regions involved in forestal Guinea, developmental strategies and proposed projects, and foreseen effects. (CIAT)

0359

31315 GUINEE. MINISTERE DU DEVELOPPEMENT RURAL. 1986. Etude de restructuration des services agricoles et de schémas directeurs régionaux de développement rural: Guinée maritime. (Reorganization study of agricultural services and schemes of regional rural development leaders: coastal Guinea). Guinée, pp.1-11,22-24,27-28. Fr., Il.

CASSAVA; STATISTICAL DATA; PRODUCTION; FARM SIZE; GUINEA.

Statistics are presented for the major food crops (cassava included) in coastal Guinea on area planted (ha) and production (t) for 1981; av. size of exploitation (ha) and production (kg/ha); and no. of persons/exploitation. General information is also included on physical and demographic characteristics of the different regions involved in coastal Guinea, developmental strategies and proposed projects, and foreseen effects. (CIAT)

0360

31316 GUINEE. MINISTERE DU DEVELOPPEMENT RURAL. 1986. Etude de restructuration des services agricoles et de schémas directeurs régionaux de développement rural: Haute Guinée. (Reorganization study of agricultural

services and schemes of regional rural development leaders: Upper Guinea). Guinée, pp.1-12,27-30,33-34,64-67. Fr., Il.

CASSAVA; STATISTICAL DATA; PRODUCTION; FARM SIZE; GUINEA.

Statistics are presented for the major food crops (including cassava) in Upper Guinea on area planted (ha) and production (t), av. size of exploitation (ha), yields (kg/ha), and no. of persons/exploitation for 1981. General information is also included on physical and demographic characteristics of the different regions involved in Upper Guinea, developmental strategies and proposed projects, and foreseen effects. (CIAT)

0361

31389 GUINEE. MINISTERE DU DEVELOPPEMENT RURAL. 1986. Etude de restructuration des services agricoles et de schémas directeurs régionaux de développement rural: Moyenne Guinée. (Reorganization study of agricultural services and schemes of regional rural development leaders: Central Guinea). Guinée, pp.1-12,21-24,27-28,58-59. Fr., Il.

CASSAVA; STATISTICAL DATA; PRODUCTION; FARM SIZE; GUINEA.

Statistics are presented for the major food crops (including cassava) in central Guinea on area planted (ha) and production (t), av. size of exploitation (ha), yields (kg/ha), and no. of persons/exploitation for 1981. General information is also included on physical and demographic characteristics of the different regions involved in central Guinea, developmental strategies and proposed projects, and foreseen effects. (CIAT)

0362

31348 GUINEE. MINISTERE DU DEVELOPPEMENT RURAL. 1987. Programme de recherche sur les cultures vivrieres autres que le riz (fonio-mais-arachide-blé-manioc). (Research program on food crops other than rice (fonio, maize, groundnut, wheat, cassava)). In Guinée. Ministere du Développement Rural. Deuxieme projet d'appui aux services agricoles: recherche agronomique. Guinée, pp.66-77. Fr.

CASSAVA; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; GUINEA.

A research program for various crops (cassava included) in Guinea is proposed. Aspects such as evaluation of the major diseases and pests, studies on marketing and transformation, var. studies (collection and evaluation), cultural practices (planting density, weed control, soil preparation, crop rotation, and intercropping), and on-farm and demonstration trials are included. (CIAT)

0363

31642 DENIS, P.Y. 1976. Réalisations récentes et perspectives de développement en Guinée. (Recent accomplishments and prospects for development in Guinea). Cahiers d'Outre-Mer 29(116):321-347. Fr., Sum. Fr., En., 31 Ref., Il.

CASSAVA; PRODUCTION; STATISTICAL DATA; GUINEA.

Cassava, rice, and maize are mentioned as the major food crops planted in Guinea. Statistics are presented on the evolution of production for the 1960-71 period. (CIAT)

0364

26792 YARADOUNO, B.R.; CONDE, L. 1985. SITUATION DU SECTEUR DES TUBERCULES, RACINES ET PLANTAINS EN REPUBLIQUE DE GUINEE. (THE SITUATION OF ROOT, TUBER, AND PLANTAIN CROPS IN GUINEA). IN WORKSHOP ON PRODUCTION AND MARKETING

CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE, 1985. REPORT. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.104-111. FR.

CASSAVA; PRODUCTION; MARKETING; PRICES; SOCIOECONOMIC ASPECTS; STATISTICAL DATA; DEVELOPMENTAL RESEARCH; CASSAVA PROGRAMS; GUINEA.

THE SITUATION OF ROOTS, TUBERS, AND PLANTAIN CROPS IN GUINEA IS DESCRIBED. LARGE AREAS OF LAND ARE PLANTED TO THESE CROPS BUT YIELDS ARE POOR(AV. CASSAVA YIELDS, 7 T/HA). THESE PRODUCTS ARE SUBSISTENCE FOODS AND PRESENT A HIGH LEVEL OF SELF-CONSUMPTION IN RURAL AREAS. PROCESSING FACTORIESFOR THESE PRODUCTS OPERATE BELOW THEIR OUTPUT CAPACITY, MAINLY BECAUSE OF INSUFFICIENT SUPPLY, AND PRICES ARE FIXED ON A REGIONAL MARKET LEVEL. GOVERNMENT POLICIES ARE DESCRIBED AND PRODUCTION CONSTRAINTS ARE ANALYZED: LOW YIELDS, TRADITIONAL CULTURAL PRACTICES, DISEASES AND PESTS, POOR SOILS, INADEQUATE CROPPING SYSTEMS, UNFAVORABLE RAINFALL CONDITIONS, AND LACK OF INFRASTRUCTURE, TECHNICAL ASSISTANCE, EQUIPMENT, SKILLED LABOR, INFORMATION ON PRODUCTION SYSTEMS, AND LOGISTIC MEANS FOR RESEARCH AND VULGARIZATION. (CIAT)

INDONESIA

0365

32030 WARGIONO, J. 1985. Effect of N, P and K fertilizer on yield of continously cropped cassava. Contributions Central Research Institute for Food Crops Bogor no.74:14-24. En., Sum. En., In., 11 Ref., Il.

CASSAVA; FERTILIZERS; N; P; K; PRODUCTIVITY; MINERAL CONTENT; INDONESIA.

Expt. were conducted on Latosol soil in Gunung Kidul (Yogyakarta) and Wonogiri (Central Java) during the 1976/77-1978/79 growing season to: (1) clarify the effect of N, P, and K fertilizer on the yield and yield stability of continously cropped cassava, (2) determine plant N, P, and K contents, and (3) determine the removal of these nutrients from the soil. P fertilizer had no significant effect on root yield at both locations during the 3 seasons. Application of 50 kg K/ha increased root yields significantly in all 3 seasons in Gunung Kidul where the initial K soil content was lower than 40 ppm. In Wonogiri, where the initial K soil content exceeded 40 ppm, K applications had no significant effect on root yield during the 1st 2 seasons. K fertilizer increased the efficiency of N fertilizer on root yield. N fertilizer increased root yield significantly at both locations in all 3 seasons. yield decreased each season indicating that applying inorganic N, P, and K fertilizers was unable to maintain yield stability of continously cropped cassava. Applying N and K increased plant nutrient levels but K fertilizer decreased root N content. Cassava, with an av. yield of 25 t/ha, removed, on av., 102 kg N, 35 kg P, and 170 kg K. (AS)

IVORY COAST

0366

31330 LE PLAN manioc Ivoirien. (The cassava developmental plan in Ivory Coast). Exportateur Ivoirien no.34:12-29. 1983. Fr., Il.

CASSAVA; INDUSTRIALIZATION; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; HUMAN NUTRITION; ANIMAL NUTRITION; INDUSTRIAL STARCHES; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; CONSUMPTION; MARKETING; GARI; ATIEKE; CASSAVA ROOTS (VEGETABLE); CASSAVA CHIPS; CASSAVA FLOUR; CASSAVA PASTES; TRADE; IVORY COAST.

The importance of cassava in Ivory Coast is analyzed; interest in the crop lies mainly with farmers and the feed industry. The possibilities offered by the crop from the viewpoint of agricultural industry are explored: starch for human and animal nutrition, industrial obtention of alcohol from sugar, and protein-enriched cassava). Taking this potential into account, a developmental plan was designed. The Toumodi's cassava project is the 1st stage of the plan; its main objectives are given and the role of its 5 components is explained. Preliminary results are given. Difficulties encountered and efforts to overcome them are mentioned. Major accomplishments are enumerated and some suggestions are presented for a research plan. 1 Statistics are given on cassava production in Ivory Coast from 1970 to 1982, av. yields, uses and commercialization (roots, atieke, gari, chips, CF, and paste), industrial crops, and deficit trends of cassava production for 1985 and 1990. production (the main producing countries) listing the cassava producing African countries. Comments on cassava world consumption are presented as well as data on world cassava imports for 1975-77, 1978, 1979, and 1980. (CIAT)

0367

31628 LE PLAN quinquennal de développement économique, social et culturel de la Cote d'Ivoire (1981-1985). (Quinquennial plan for the economic, social, and cultural development of Ivory Coast (1981-85)). Bulletin de l'Afrique Noire 1165:4-8. 1983. Fr., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; IVORY COAST.

Statistical data are given on urban and rural per capita consumption of cassava, among other crops, during 1980 and production trends (t) for different crops (among them cassava) in Ivory Coast for 1980, 1985, and 1990. Data on cassava production deficit and total production value for 1985 and 1990 are also included. Finally, data on annual increase rates of global and commercial cassava production are given for 1980-85 and 1985-90. The main strategies suggested to solve the predicted deficit are listed and discussed. (CIAT)

0368

31590 MANIOC: LA transformation en semi-fini. (Cassava: transformation in a half-finished product). Fraternité-Matin Agri 80 Mai 1980:33-37. 1980. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; INDUSTRIALIZATION; MECHANIZATION; ATIEKE; CASSAVA FLOUR; GARI; CASSAVA STARCH; CASSAVA CHIPS; FOOFOO; INDUSTRIAL STARCHES; TRADE; CONSUMPTION; IVORY COAST.

General considerations are presented on a mechanization project for cassava designed to regulate urban market supplies in the region of Baoulé (Ivory Coast). Var. selected should be tested for their adaptation, disease resistance, and suitability for mechanization, technology, and industrial transformation. In spite of the technical constraints to mechanization, preliminary results are encouraging. The development of an industrial unit for the transformation of cassava is also highlighted. Processed cassava products (atieke, CF, gari, starch, industrial starches, chips, foofoo) are also mentioned. The possibilities for commercializing these products in both African and foreign countries were also studied. (CIAT)

0369

31321 PROJET MANIOC - ovins de Toumodi. (Toumodi's cassava-sheep project). Terre et Progres no.63:17-19. 1985. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; SHEEP; ANIMAL NUTRITION; IVORY COAST.

The importance of cassava in human and animal nutrition and in industries in Ivory Coast is highlighted. The objectives and different stages of Toumodi's cassava project are briefly described. The role of each component involved is explained and major results obtained from 1977 to 1984 are reported. Statistics are presented on industrial and village plantings (area planted to cassava, area 1 harvested, production, and yields) and on the evolution of the sheep flock. (CIAT)

0370

31602 COTE D'IVOIRE. MINISTERE DE L'AGRICULTURE ET DES EAUX ET FORETS. 1984. Annuaire des statistiques agricoles et forestieres. (Yearbook of agricultural and forestry statistics). Cote d'Ivoire, Direction de la Programmation de la Budgetisation et du Controle de Gestion. 18p. Fr., Dat.num., Il.

CASSAVA; STATISTICAL DATA; PRICES; PRODUCTION; ROOT PRODUCTIVITY; CASSAVA CHIPS; IVORY COAST.

Statistics on monthly retail prices of cassava in Ivory Coast in 1980-84 are presented both for rural and urban markets. Data on area planted (ha) to cassava, production (t), and available production (t) for 1984 are also given for the different departments. Comparative data on area planted to cassava and cassava production are given for 1975, 1980, and 1980-84. Statistics are also included on area planted to cassava for industrial purposes in 1984, the evolution of production and harvested area, and utilization (cassava chips) for 1977-84. (CIAT)

0371

31390 COTE D'IVOIRE. MINISTERE DE L'ECONOMIE ET DES FINANCES. DIRECTION DE LA STATISTIQUE. 1984. Les tubercules et féculents. (Tuber and starch crops). In Cote d'Ivoire, Ministere de L'Economie et des Finances. Direction de la Statistique. Enquete budget consommation 1979. Résultats généraux sur la consommation alimentaire des ménages africains de Cote d'Ivoire. Cote d'Ivoire, Enquete Budget Consommation no.1. pp.18-19,37,41-43,66,89, 104,127,129- 130,135,146,155,188. Fr.

CASSAVA; FRESH PRODUCTS; CASSAVA MEAL; ATIEKE; STATISTICAL DATA; CONSUMPTION; IVORY COAST.

Results of a survey conducted in 1979 to determine the consumption of various foodstuffs (fresh cassava, CM, and atieke, among others) in Ivory Coast are given and analyzed. Statistics are presented on consumption (t) at both the rural and urban levels, importance of cassava consumption/stratum (percentage), and consumption (kg/capita/yr) at both rural and urban levels according to socioprofessional categories. Additional information is included on self-consumption rates (percentage), form of consumption of the different tuber and starch crops, and calorie supply. Statistical data are also presented for total calorie consumption/product according to stratum, total consumption of proteins supplied by the different foodstuffs/stratum, and protein supply for tuber and starch crops. (CIAT)

0372

31386 COTE D'IVOIRE. MINISTERE DE L'EDUCATION NATIONALE ET DE LA RECHERCHE SCIENTIFIQUE. 1984. Production du manioc en Cote d'Ivoire. (Cassava production in Ivory Coast). Bouaké Cote d'Ivoire, Institut des Savanes. Note Technique no.5. 9p. Fr.

CASSAVA; PRODUCTION; PRODUCTIVITY; CASSAVA PROGRAMS; CULTIVARS; PLANT BREEDING; DRY MATTER; LAND PREPARATION; SOIL REQUIREMENTS; CUTTINGS; PLANTING; FERTILIZERS; WEEDING; HARVESTING; TIMING; IVORY COAST.

Cassava is highlighted as the 2nd major food crop in Ivory Coast with an annual production of 1,200,000 t and an av. yield of 6 t/ha. A plan for the improvement and development of this crop began in 1977. The main results of research activities carried out are reported. Cassava var. Kataoli and 833 are highlighted for their high yields and DM contents. A fact sheet is included with recommendations on soil selection and preparation, planting material (improved var. and selection and preparation of cuttings), planting, fertilization, weed control, and harvesting. (CIAT)

0373

31379 COTE D'IVOIRE. MINISTERE DE L'EDUCATION NATIONALE ET DE LA RECHERCHE SCIENTIFIQUE. 1985. Protocole pour le test de la collection de Bouaké pour la résistance a la bactériose du manioc. Annexe 1. Campagne 1982. (Procedure to assess the Bouaké collection for resistance to cassava bacterial blight. Annex 1. 1982 Campaign). In Cote d'Ivoire. Ministere de l'Education Nationale et de la Recherche Scientifique. Recherche d'accompagnement manioc. Bouaké, Institut des Savanes. Rapport Semestriel d'Exécution Technique no.12. p.53. Fr.

CASSAVA; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; RESISTANCE; IVORY COAST.

A procedure to test the resistance of the Bouaké cassava collection to CBB is described in detail. This procedure consists of the establishment of the collection in the field, artificial inoculation of var. with a bacterial solution, and remarks on disease evolution. (CIAT)

0374

31380 COTE D'IVOIRE. MINISTERE DE L'EDUCATION NATIONALE ET DE LA RECHERCHE SCIENTIFIQUE. 1985. Recherches d'accompagnement manioc-Mars 1983. Problemes phytosanitaires. Annexe 2. (Complementary research work on cassava - March 1983. Phytosanitary problems. Annex 2). In Cote d'Ivoire. Ministere de l'Education Nationale et de la Recherche Scientifique. Recherche d'accompagnement manioc. Bouaké, Institut des Savanes. Rapport Semestriel d'Exécution Technique no.12. pp.54-58. Fr., Il. También en Rapport Semestriel d'Exécution Technique no.7.

CASSAVA; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; MAPS; RESISTANCE; CULTIVARS; IVORY COAST.

Results of a survey to determine the major phytosanitary problems of cassava in Ivory Coast indicated that CBB was a serious disease. It has been reported in this country since 1979. A map is included showing the distribution of the disease in 1981 and 1982. The use of resistant var. seems to be the best control measure. A part of the cassava collection of the Institut des Savanes in Bouaké was assessed for resistance to CBB. The inoculation technique used is described in detail and major results are presented. The most resistant var. were Agba Pouca, Hin Gbéri, Katiola no. 6, TA 42, TA 49, TA 54, 257, and CB. The rest of var. tested are listed according to their degree of resistance to CBB. (CIAT)

0375

31312 COTE D'IVOIRE. MINISTERE DU DEVELOPPEMENT RURAL. BUREAU DES STATISTIQUES. 1987. Recueil des statistiques du Ministere du Développement Rural. (Summary of statistics from the Rural Development Ministry). Abidjan, Cote d'Ivoire, 27p. Fr., Dat.num., Il.

CASSAVA; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; IVORY COAST.

Data are presented on production (t), area planted (ha), and yields (t/ha) of various food crops (among them cassava) in Ivory Coast on an annual basis for 1980-86. Data on production (t) and area planted (ha) to cassava in the

different departments of Ivory Coast are also given for the following periods: 1979-80, 1980-81, 1981-82, 1982-83, and 1983-84. Finally, a diagram showing the production curve for cassava from 1970 to 1986 is included. (CIAT)

0376

32296 COTE D'IVOIRE. MINISTERE DU PLAN. 1967. Région du Sud-Est. Etude socio-économique: l'agriculture. (Socioeconomic study of Southeastern Ivory Coast: agriculture). Paris, France, Société d'Etudes pour le Développement Economique et Social. v.1,286p.;v.2,157p. Fr., 50 Ref., Il.

CASSAVA; PRODUCTION; ROOT PRODUCTIVITY; SOCIOECONOMIC ASPECTS; MAPS; FARM SIZE; WOMEN; LABOR; COSTS; FARMING SYSTEMS; INTERCROPPING; STATISTICAL DATA; IVORY COAST.

The agricultural situation of SE Ivory Coast is described and analyzed in detail. Regarding cassava, information is presented on no. of plots and area planted according to type of association; no. of plots and their resp. area/strata; importance (percentage) in comparison to other food crops; area distribution by association and soil type; av. plot size; av. planting density as a function of associated cropping; av. yield/strata; and area distribution according to the category of the person in charge of the crop. (CIAT)

0377

31574 COTE D'IVOIRE. MINISTERE DU PLAN ET DE L'INDUSTRIE. 1985. Autres plans sectoriels: le plan manioc. (Plans for other sectors: cassava plan). In Cote d'Ivoire. Ministere du Plan et de l'Industrie. Plan quinquennal de développement économique, social et culturel 1981- 1985. 2. Planification sectorielle. Cote d'Ivoire, v.1,p.326. Fr.

CASSAVA; CASSAVA PROGRAMS; INDUSTRIALIZATION; ATIEKE; CASSAVA STARCH; INDUSTRIAL STARCHES; ROOT PRODUCTIVITY; IVORY COAST.

The major characteristics of the Ivory Coast cassava plan are described. The plan is divided into: culture mechanization and processing in a small-scale industrial unit (atieke, starch for human consumption, and industrial starches). Problems and possible solutions are presented. Statistics on the cassava production estimated for 1985 and 1990 are also included. (CIAT)

0378

31573 COTE D'IVOIRE. MINISTERE DU PLAN ET DE L'INDUSTRIE. 1985. Le bilan et la politique vivriers. (Balance and food policy). In Cote d'Ivoire. Ministere du Plan et de l'Industrie. Plan quinquennal de développement économique, social et culturel 1981-1985. 2. Planification sectorielle. Cote d'Ivoire, v.1,pp.314-324. Fr.

CASSAVA; PRODUCTION; CASSAVA PROGRAMS; IVORY COAST.

Current and future situations of various food crops (including cassava) in Ivory Coast are described and analyzed. Statistics are given on consumption (kg/capita/yr) and production (t) in 1980 for the different regions and on the production estimated for 1985 and 1990. Cassava deficits were 8.7 and 20.0 percent for 1985 and 1990, resp. Production statistics and commercialization objectives for 1985 and 1990 are also presented and strategies for their accomplishment are described. (CIAT)

0379

32014 GARD-MOUZON-DELFOSSE, S.A. 1980. Recherche manioc en Cote d'Ivoire. Mise au point de la plantation mécanique. (Cassava research in Ivory Coast. Improving mechanical planting). Abidjan, Cote d'Ivoire, 6p. Fr.

CASSAVA; PLANTING; HARVESTING; MECHANIZATION; IVORY COAST.

Results of mechanization trials on cassava carried out in Ivory Coast from 1978 to 1980 are given and analyzed. One planter and 2 types of harvester were evaluated. Mechanical failures of these implements are described and suggestions are included to overcome their limitations. (CIAT)

0380

28111 INSTITUT DE RECHERCHES AGRONOMIQUES TROPICALES ET DES CULTURES VIVRIERES. 1983. LES TUBERCULES ET RACINES: MANIOC. (TUBERS AND ROOTS: CASSAVA). IN---------. RAPPORT ANNUEL 1983. PARIS, FRANCE. PP.137-150. FR.

CASSAVA; CULTIVATION SYSTEMS; PLANTING; TIMING; FERTILIZERS; WEEDING; CULTIVARS; CLONES; ADAPTATION; PRODUCTIVITY; SOIL PHYSICAL PROPERTIES; HARVESTING; XANTHOMONAS MANIHOTIS; IVORY COAST; FRENCH GUIANA; FRENCH POLYNESIA; NEW CALEDONIA.

THE RESULTS OF RESEARCH ON CASSAVA, CONDUCTED BY THE INSTITUT DE RECHERCHES AGRONOMIQUES TROPICALES ET DES CULTURES VIVRIERES DURING 1983, IN IVORY COAST, FRENCH GUIANA, FRENCH POLYNESIA, AND NEW CALEDONIA, ARE DISCUSSED. IN IVORY COAST, WORK WAS DONE ON CULTIVATION TECHNIQUES (PLANTING METHODS, FERTILIZATION, WEED CONTROL, AND PLANTING DATES), CROP PROTECTION, AND QUALITY OF PRODUCTION. THE VAR. B 33 AND TABOUCA WERE THE BEST; THE POSITION OF THE CUTTINGS DID NOT AFFECT PRODUCTION, WHILE PLANTING IN RIDGES INCREASED IT SIGNIFICANTLY. THE PLACING OF CUTTINGS AT A DEPTH OF 5 CM GAVE THE BEST RESULTS AND THERE WAS A RESPONSE TO FERTILIZATION WITH NPK. IN FRENCH GUIANA, APPLIED BOTANIC ASPECTS OF THE CROP WERE DEALT WITH. THE CLONES THAT ADAPTED BEST TO THE DIFFERENT CONDITIONS WERE M 10, M 15, M 22, M23, AND M 33 AND THE LAST 3 INCREASED THEIR PRODUCTION WITH FERTILIZERS; OXYFLUORFEN AND DALAPON IN DOSES OF 1.26 AND 3.91 KG/HA WERE EFFECTIVE IN THECONTROL OF WEEDS. IN FRENCH POLYNESIA, THE EXPT. FOCUSSED ON INTENSIVE PRODUCTION AND IN NEW CALEDONIA, CASSAVA MATERIALS WERE EVALUATED. IN FRENCH POLYNESIA, COLOMBIAN VAR. SELECTED AT CIAT SHOWED THE BEST BEHAVIOR, AND IN NEW CALEDONIA, OF THE 48 MATERIALS EVALUATED, 9 YIELDED MORE THAN 40 T/HA AND4 EXCEEDED 60 T/HA. (CIAT)

0381

31697 INSTITUT DE RECHERCHES AGRONOMIQUES TROPICALES ET DES CULTURES VIVRIERES. 1974. Manioc. (Cassava). In Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres. Rapport analytique 1974. Cultures diverses. Abidjan, Cote d'Ivoire, pp.29-41. Fr.

CASSAVA; GERMPLASM; CULTIVARS; HARVESTING; ROOT PRODUCTIVITY; TIMING; STARCH CONTENT; DRY MATTER; IVORY COAST.

The main results of research activities on cassava conducted by the Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres in Ivory Coast, are reported. Work dealt with var. collection and 2 comparative yield trials. In the 1st trial, cassava var. CB performed best when harvested at 10, 15, and 20 mo. after planting. In the 2nd trial, cassava var. Kataoli performed like var. CB; however, its starch and DM contents were higher than those of var. CB. (CIAT)

0382

32266 INSTITUT DE RECHERCHES AGRONOMIQUES TROPICALES ET DES CULTURES VIVRIERES. 1976. Manioc. (Cassava). In Institut de Recherches Agronomiques

Tropicales et des Cultures Vivrieres. Rapport Analytique 1975. Cultures diverses. Bouaké, Cote d'Ivoire, pp.21-27. Fr.

CASSAVA; CULTIVARS; ROOT PRODUCTIVITY; DRY MATTER; STARCH CONTENT; MATURATION; IVORY COAST.

Research on cassava conducted by the Institut de Recherches Agronomiques Tropicales et de Cultures Vivrieres (Bouaké, Ivory Coast) is reported and the main results are presented. Var. collection and comparative yields trials were conducted. The major characteristics of the cassava collection are listed and data are given on yields, percentage of DM and starch, and starch yields (at 10, 15, and 20 mo. after planting) for the var. compared. Cassava var. CB and Kataoli performed best; however, the former is considered a late maturing var. while the latter, an early one. Va

0383

31635 INSTITUT DE RECHERCHES AGRONOMIQUES TROPICALES ET DES CULTURES VIVRIERES. 1970. Manioc. (Cassava). In Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres. Rapport Annuel 1970 exploitation et cultures diverses. Bouaké, Cote d'Ivoire, pp.82-98. Fr.

CASSAVA; CASSAVA PROGRAMS; GROWTH; ROOT PRODUCTIVITY; CULTIVARS; IDENTIFICATION; PLANT HEIGHT; LEAVES; LODGING; STEMS; COLOMBIA; IVORY COAST.

Trials on cassava conducted by the Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres (Bouaké, Ivory Coast) during 1970 are described and preliminary results are reported. Studies dealt with the growth rate of 6 high yielding var., comparative yield trials of var. CB with var. introduced from Madagascar, multiplication of introduced var., and the introduction of 9 new var. (including Llanera from Colombia). In the comparative yield trials, var. H 57 and CB outyielded (19,759 and 18,390.3 kg/ha, resp.) the other var., confirming the good performance of the latter var. A table is included that gives data on av. yields, resistance to lodging, color of stems, leaves, and petiole, and av. plant height for 15 cassava var. (CIAT)

0384

31313 INSTITUT DES SAVANES. COTE D'IVOIRE. 1983. Filiere plantes a racines et tubercules (igname, manioc, taro). (Root and tuber crops section (yam, cassava, taro)). In Institut des Savanes. Cote d'Ivoire. Programmes et operations de recherche. Bouake, Ministere de l'Education Nationale et de la Recherche Scientifique. pp.19-21. Fr.

CASSAVA; RESEARCH; CASSAVA PROGRAMS; IVORY COAST.

Research programs carried out on cassava in Ivory Coast are briefly mentioned. They dealt with aspects such as plant breeding, cultural practices, and crop protection. (CIAT)

0385

31334 INSTITUT DES SAVANES. COTE D'IVOIRE. 1983. Filiere: plantes a racines et tubercules (igname, manioc, taro, etc.). (Root and tuber crops section (yam, cassava, taro, etc.)). In Institut des Savanes. Cote d'Ivoire. Les orientations et les actions de recherche des filieres. Bouake, Ministere de l'Education Nationale et de la Recherche Scientifique. pp.22-27. Fr.

CASSAVA; CASSAVA PROGRAMS; MECHANIZATION; ROOT PRODUCTIVITY; IVORY COAST.

General information is given on the Institut des Savannes (Bouake, Ivory Coast) cassava program. Research work dealt with agronomic aspects and var. improvement. A cassava root harvester was highlighted as a suitable

solution for reducing harvest losses. A table showing the cassava production potential (t/ha) in the different regions is also included. (CIAT)

0386

32070 INSTITUT FRANCAIS DE RECHERCHE SCIENTIFIQUE POUR LE DEVELOPPEMENT EN COOPERATION. 1986. Dynamique des systemes de production. Unité de recherche 503. (Dynamics of production systems. Research Unit 503). In Institut Francais de Recherche Scientifique pour le Développement en Coopération. Département E: indépendance alimentaire. Abidjan, Cote d'Ivoire, pp.20-22. Fr., 7 Ref.

CASSAVA; CASSAVA PROGRAMS; IVORY COAST.

The study of cassava yields, food crop systems, and production systems in the forest zone are highlighted as the major research activities conducted in lower Ivory Coast by agronomists and economists from the Research Unit. (CIAT)

0387

32075 INSTITUT FRANCAIS DE RECHERCHE SCIENTIFIQUE POUR LE DEVELOPPEMENT EN COOPERATION. 1986. Influence des systemes d'exploitation sur le milieu. Unité de recherche 509. (Influence of exploitation systems on the environment). In Institut Francais de Recherche Scientifique pour le Développement en Coopération. Département E: indépendance alimentaire. Abidjan, Cote d'Ivoire, pp.50-53. Fr., 14 Ref.

CASSAVA; CULTIVATION; IVORY COAST.

The effect of the different cultural techniques used in cassava cultivation in Ivory Coast, Burkina Faso, Congo, and Mauritius is studied. (CIAT)

0388

31319 INSTITUT FRANCAIS DE RECHERCHE SCIENTIFIQUE POUR LE DEVELOPPEMENT EN COOPERATION. 1985. Le manioc. (Cassava). Abidjan, Cote d'Ivoire, Laboratoire de Génétique. 4p. Fr.

CASSAVA; PLANT BREEDING; HYBRIDS; GERMPLASM; CULTIVARS; IVORY COAST.

A table showing the origin of the current cassava clone collection in Adiopodoume, Ivory Coast, is given. Most of the cv. (314) came from different African countries, 3 from India, and 6 from South America. Materials are assessed as to morphological and enzymatic characters, root quality, and disease and pest resistance. (CIAT)

0389

31318 INSTITUT FRANCAIS DE RECHERCHE SCIENTIFIQUE POUR LE DEVELOPPEMENT EN COOPERATION. 1980. Travaux sur manioc. (Research work on cassava). Abidjan, Cote d'Ivoire, 4p. Fr.

CASSAVA; RESEARCH; CASSAVA PROGRAMS; IVORY COAST.

Research work on cassava carried out since 1981 in Ivory Coast by the Office de la Recherche Scientifique et Technique d'Outre-Mer (ORSTOM) is mentioned; general information is included on the origin, objectives, prospects, and budget and staffing of the different studies. An organizational chart showing the relationships between cassava programs and activities related to cassava at ORSTOM is also included. (CIAT)

0390

32074 INSTITUT FRANCAIS DE RECHERCHE SCIENTIFIQUE POUR LE DEVELOPPEMENT EN COOPERATION. 1986. Valorisation agricole de l'eau. Unité de recherche 508.

(Appraisal of the importance of water in agriculture. Research Unit 508). In Institut Francais de Recherche Scientifique pour le Développement en Coopération. Département E: indépendance alimentaire. Abidjan, Cote d'Ivoire, pp.44-48. Fr., 10 Ref.

CASSAVA; SOIL WATER; IVORY COAST.

A water balance model for a cassava crop at the plot level in Ivory Coast is presented. (CIAT)

0391

32019 ARRAUDEAU, M. 1982. Rapport de mission Cote d'Ivoire. Développement de la culture du manioc 25-31 Janvier 1982. (Expansion of cassava cultivation in Ivory Coast. Mission report. January 25-31, 1982). Paris, France, Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres. 11p. Fr.

CASSAVA; ROOT PRODUCTIVITY; PLANT BREEDING; VIROSES; BACTERIOSES; INJURIOUS INSECTS; INJURIOUS MITES; IVORY COAST.

Results of research on different aspects of cassava cultivation in Ivory Coast are reported. Aspects dealt with were yield potential in large-scale plantations in Toumodi, diseases and pests, plant breeding, multilocal trials and crop development, and crop diversification. The yield potential of cassava cv. CB was found to exceed 40 t/ha. CAMV, CBB, nematodes, mites, and mealybugs were found to be the major constraints to cassava production in this country. The creation of a polyclonal breeding program involving 5 or 6 clones of distinct genetic origin is suggested. With regard to multilocal trials, it is recommended to reduce the no. of trial sites and concentrate on planting date, fertilization, and var. Finally, groundnut was found to be a useful rotational crop. (CIAT)

0392

31617 BERRON, H.; VENNETIER, P.; ARNAUD, J.C.; MONNIER, Y. 1983. Agriculture. (Agriculture). In Atlas de la Cote d'Ivoire. Paris, France, Editions Jeune Afrique. 2ed. pp.38-48. Fr., Il.

CASSAVA; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; MAPS; IVORY COAST.

General characteristics of agriculture in Ivory Coast are described and statistics are given on area planted (ha), production (t), and yield (t/ha) estimates for various food crops (including cassava) for 1980. Maps are included showing the importance of this tuber crop in relation to other crops and the cassava growing regions. (CIAT)

0393

31396 BIARNES, A.; COLIN, J.F 1985. Les systemes de culture vivriers dans un village de basse Cote d'Ivoire. Premieres réflexions. (Food crop cultivation systems in a lower Ivory Coast town. Preliminary remarks). Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Coopération. 54p. Fr., Il.

CASSAVA; INTERCROPPING; YAMS; POTATOES; MAIZE; GROUNDNUT; IVORY COAST.

The major characteristics of food crop cultivation systems in Djimini-Koffikro, Ivory Coast, were studied and their constraints were analyzed. Cassava is the 2nd most important food crop; outlines on its cultivation are given. Cultivation systems involving cassava were yam-cassava (intercropped or as a rotational system), cassava-fallow land, and potato-cassava. More complex cultivation systems were maize-cassava (intercropped or as a rotational system), maize-yam-cassava, and

maize-potato-cassava. Legumes were also involved in several cultivation systems: cassava- groundnut and maize-cassava-groundnut. Both systems and their objectives (self-consumption or sale) are detailed. The main advantages of cassava cultivation are mentioned. Several strategies for the accomplishment of a successful cultivation system such as yam-cassava are mentioned. (CIAT)

0394

32038 BOISSEZON, P. DE; BONZON, B. 1986. Effets de l'apport de fumier sur les caractéristiques chimiques d'un sol ferrallitique ivoirien. (Effects of manuring on the chemical characteristics of a ferrallitic soil in the Ivory Coast). Cahiers ORSTOM (Serie Pedologie) 22(3):329-355. Fr., Sum. Fr., En., 8 Ref., Il. (ORSTOM, Centre de Bondy, 70-74, route d'Aulnay, 93140 Bondy, France)

CASSAVA; NUTRITIONAL REQUIREMENTS; DUNG; PLOWING; LAND PREPARATION; SOIL ANALYSIS; FALLOWING; SOIL REQUIREMENTS; SOIL PHYSICAL PROPERTIES; IVORY COAST.

The effects of 4 rates of FYM and 3 plowing depths on the chemical characteristics of a ferrallitic soil planted to cassava in Ivory Coast were studied. Plowing had contrary effects on the organic and mineral CEC of the plowed soil layer. After harvesting cassava, 17 mo. after fallowing and manuring with 30 t/ha, the enrichment in OM and exchange bases was still significant, particularly in the soil layers which were plowed. A mathematical model of 1st-order kinetics was fitted for OM evolution and humification in the plowed layer and subsoil. Increased organic C content in the plowed layer was short-lived and 1/6 of the humus resulting from the decayed plant matter went to the subsoil. Mineral losses due to leaching and cassava were higher than the input resulting from the fallow-Panicum maximum incorporation, except for K. To maintain the initial level of exchange bases, 12 t manure/ha seem necessary. An accurate evaluation of the changes in N levels due to the different amounts of manure was not possible. Likewise, the inaccurate measurement of CEC concealed the effect of manuring on the no. of exchange sites in the plowed layer. (AS (extract))

0395

32016 BONO, M. 1982. Manioc. (Cassava). In Bono, M., Rapport de mission en Cote d'Ivoire (23.03.82 au 8.04.82). Production de semences sélectionnées de cultures vivrieres. Paris, France, Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres. pp.18,54. Fr., Dat.num.

CASSAVA; PRODUCTION; CULTIVARS; CASSAVA AFRICAN MOSAIC VIRUS; RESISTANCE; ROOT PRODUCTIVITY; STATISTICAL DATA; IVORY COAST.

Estimated area planted to cassava and production in 1980 in Ivory Coast were 219,000 ha and 1,153,000 t, resp. The possibility of controlling CBB by thermotherapy is mentioned and cassava cv. CB, Bonua, and Kataouli are reported to be resistant to the CAMD strain present in Ivory Coast. Finally, estimates are also presented on no. of plants/ha, harvested area (ha), yields, and production of fresh cassava roots in 1980 for the different departments. (CIAT)

0396

31632 BONO, M. 1984. Quelques aspects actualisés du probleme vivrier Ivoirien: rapport de synthese. (Current situation of commodities in Ivory Coast: synthesis report). Cote d'Ivoire, Ministere du Développement Rural. 221p. Fr., 27 Ref., Il.

CASSAVA; CASSAVA PROGRAMS; STATISTICAL DATA; PRODUCTION; CONSUMPTION; INDUSTRIALIZATION; ATIEKE; CASSAVA FLOUR; GARI; HUMAN NUTRITION; MAPS; IVORY COAST.

Updated information from different sources on the situation of food crops in Ivory Coast is presented and analyzed. The role played by cassava as a staple food crop is highlighted. Statistics are given on production, consumption, and variation for different regions and years; projections were also made for 1985 and 1990. Suggestions to improve the food crop potential are presented and discussed as well as the different research and development programs designed for that purpose including their major achievements. Regarding cassava, aspects studied were processing for flour, atieke, and gari obtention. The main results of the Toumodi's project are highlighted as well as the difficulties encountered. (CIAT)

0397

32020 CHABALIER, P.F.; LE BUANEC, B. 1976. Etude de reconnaissance morphopédologique pour l'implantation de cultures industrielles de manioc dans 2 sites de Cote d'Ivoire. (Study on a morphopedologic survey for the establishment of industrial cassava croppings in two sites of Ivory Coast). Bouaké, Cote d'Ivoire, Institut des Savanes. Département des Cultures Vivrieres. 17p. Fr., 10 Ref.

CASSAVA; SOIL REQUIREMENTS; SOIL PHYSICAL PROPERTIES; IVORY COAST.

Results are reported of a morphopedologic survey carried out at 2 sites (the zone of Guiglo and NE Bouaké) of SW Ivory Coast to determine their suitability for the establishment of industrial cassava crops. Main characteristics such as climate, hydrography, vegetation, geology, land occupation, and soils are described for both regions. (CIAT)

0398

31634 CHEVAUGEON, J. 1957. Sur l'existence chez des plantes arbustives d'affections cryptogamiques a temps de latence indéfini. (Existence of cryptogamic diseases of indefinite latency in shrubby plants). Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences 244(20):2549-2551. Fr.

CASSAVA; GLOMERELLA CINGULATA; ETIOLOGY; SYMPTOMATOLOGY; IVORY COAST.

The causal agent of cassava anthracnose, Glomerella cingulata (imperfect stage of Colletotrichum gloeosporioides), is reported as a fungus capable of penetrating internal tissues of the host plant, remaining dormant until environmental conditions favor disease appearance. Tests carried out in a moderately fertile soil in Ivory Coast revealed no visible anthracnose symptoms in cassava clone Kokossokro, whereas clone Agba Kokoré showed 16.9 percent of branches necrotic 7 mo. after planting. Results of lab. expt. with apparently healthy 7-mo.-old stem fragments of clone Kokossokro indicated that only fungus hyphae, developed within internal stem tissues, could survive to disinfection originating external fructifications; thus, 15 days later acervulus of C. gloeosporioides were observed on 67 percent of apparently healthy branches. This percentage was found to be markedly high compared with that observed in field conditions. Continuous darkness resulted in anthracnose expression in leaves at 14 days, and in necrosis of tips at 27-40 days. When plants were kept at 38 degrees Celsius during 2 wk. with a high RH, symptoms of foliar anthracnose appeared since the 7th day, resulting in plant death at 20-27 days. When soil pH was 4.5 more or less 1.0, similar results were obtained. (CIAT)

0399

32272 CHEZE, B. 1983. Etude de la mécanisation intégrale de la récolte du manioc. (Study on total mechanization of cassava harvesting). Antony, France, Groupement d'Etudes et de Recherches pour le Développement de l'Agronomie Tropicale. Centre d'Etudes et d'Expérimentation du Machinisme Agrícole Tropical. 78p. Fr., Sum. Fr., 25 Ref., Il.

CASSAVA; HARVESTING; MECHANIZATION; AGRICULTURAL EQUIPMENT; ROOT PRODUCTIVITY; IVORY COAST; CIAT-2.

Research on the mechanization of cassava harvesting in Africa is briefly reported including a short description of the machines tested and the major results obtained. Expt. with a harvesting chain with crushers (for canopy removal) and a cassava harvester- lifter were conducted in France and Ivory Coast in 1982. The main characteristics of the machines tested are given and their advantages and disadvantages are indicated. Photographs are also included. Results regarding stem removal are highlighted. Modifications should be introduced to improve the performance of the cassava harvester-lifter. A table is presented showing statistics on cassava world production, area harvested, and yields for 1969-71, 1979, 1980, and 1981. Reports and remarks from meetings held in France on cassava mechanization are presented as well as reports on trials carried out in Ivory Coast with 2 kinds of silo fillers and a cassava harvester-lifter. (CIAT)

0400

31375 COULIBALY, N. 1985. Amélioration variétale du manioc. (Plant breeding in cassava). In Cote d'Ivoire. Ministere de l'Education Nationale et de la Recherche Scientifique. Recherche d'accompagnement manioc. Bouaké, Institut des Savanes. Rapport Semestriel d'Exécution Technique no.12 pp.7-21. Fr., 8 Ref.

CASSAVA; PLANT BREEDING; CULTIVARS; SELECTION; ROOT PRODUCTIVITY; DRY MATTER; IVORY COAST.

The main objectives of cassava plant breeding and the steps followed for the obtention of improved var. are explained and described. Research activities carried out during the 1st semester of 1985 in Bouaké and Toumodi (Ivory Coast) are reported and the major results presented in a table. Work dealt with hybrid screening and preliminary, and comparative yield trials. (CIAT)

0401

31376 COULIBALY, N. 1985. Phytotechnie du manioc. (Cassava agronomy). In Cote d'Ivoire. Ministere de l'Education Nationale et de la Recherche Scientifique. Recherche d'accompagnement manioc. Bouaké, Institut des Savanes. Rapport Semestriel d'Exécution Technique no.12 pp.22-25. Fr.

CASSAVA; LAND PREPARATION; SPACING; WEEDING; FERTILIZERS; IVORY COAST.

Currrent research activities on cassava conducted by the agronomy program of the Institut des Savanes (Bouaké, Ivory Coast) in 1984-95 are described in detail. Work dealt with land preparation, planting systems, plant density, weed control, fertilization in continuous and industrial crops, and cropping schedules at different sites. (CIAT)

0402

31310 COULIBALY, N. 1985. Recherche d'accompagnement manioc. (Complementary research on cassava). Bouaké, Cote d'Ivoire, Ministere de l'Education National et de la Recherche Scientifique. Institut des Savanes. Rapport Semestriel d'exécution Technique no.11. 20p. Fr. 3 Ref., Il.

CASSAVA; LAND PREPARATION; ROOT PRODUCTIVITY; HERBICIDES; SOIL IMPOVERISHMENT; DRY MATTER; CULTIVARS; MAPS; SELECTION; IVORY COAST.

Research conducted by the Institut des Savanes (Bouaké, Ivory Coast) in 1984 is summarized. Agronomic studies focussed on the effect of 3 land preparation methods on yields, effect of cutting position at planting on yields, plant density, cultural practices, fertilization, and cropping schedules. Plant breeding considered var. introduction, obtention of new var., screening, preliminary yield trials, var. trials, performance of industrial crops in Toumodi, and the phytosanitary situation of cassava crops. Tillage on a sandy-clay soil resulted in increased av. root wt. and yields while ridging resulted in lodging. Oxyfluorfen (510 g a.i./ha) was an effective cassava selective herbicide. Mineral deficiencies were observed 4 yr after an accelerated soil exhaustion and decreases in fertility were reported in industrial crops. DM content in cassava roots was lower during the rainy season and after canopy pruning. In Adiopodoumé production was higher when cassava was planted in May. Among the var. released, Kataoli and H3 were appropriate for most cultivators. CBB, the cassava mealybug, and mites were reported in this country. (CIAT)

0403

32018 DAGATIGUY, F. 1962. Emmagasinage des produits alimentaires en milieu rural Africain de Cote d'Ivoire. (African rural storage of food products in Ivory Coast). Nogent sur Marne, France, Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres. 9p . Fr.,5 Ref.

CASSAVA; STORAGE; CASSAVA CHIPS; INJURIOUS INSECTS; PESTS; IVORY COAST.

The way different food crops (among them cassava) are stored in rural areas of Ivory Coast is briefly described. Cassava is generally stored in the form of chips, which are sun dried in clean areas avoiding dust or rains, and then stored in bags, granaries, or in hampers. Sitophilus oryzae, Tribolium castaneum, Rhizopertha dominica, Ephestia cautella, and Pyralis manihotalis are reported as the major pests of stored cassava chips. (CIAT)

0404

30516 FARGETTE, D.; FAUQUET, C.; LECOUSTRE, R.; THOUVENEL, J.C. 1987. Contaminations primaire et secondaire de l'ACMV. (Primary and secondary contaminations of cassava African mosaic virus). In Fauquet, C.; Fargette, D. Epidémiologie de la mosaique africaine du manioc: résumé. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Coopération. pp.17-19. Fr., 3 Ref., Il. (Laboratoire de Phytovirologie, ORSTOM, BP V51, Abidjan 04, Cote d'Ivoire)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; DISEASE TRANSMISSION; EPIDEMIOLOGY; IVORY COAST.

Three different methods were used to determine both external and internal contaminations (primary and secondary contaminations, resp.) of CAMV in Ivory Coast. The 1st method (disease spread from a source plant) showed that diseased plants in a field contaminate healthy ones; then, contamination of external sources may lead to internal sour-ces, which in turn contribute to a higher spread. With the 2nd method (distribution of diseased plants; randomized aggregation or distribu-tion), the distribution of diseased plants was found to be randomized. Finally, the 3rd method (disease development curves) showed that seconda-ry contamination does not contribute to the contamination of the entire plot; on the other hand, the rate varies from month to month, and both spreads depend on the importance of whitefly population 6 wk. befo-re. It was concluded that primary contamination prevailed, accounting for more than 70 percent of the disease

incidence in the field; how-ever, eradication of diseased 1 plants is not enough to keep the crop virus- free. (CIAT)

0405

30514 FARGETTE, D.; FAUQUET, C.; THOUVENEL, J.C. 1987. Disposition spatiale de la mosaique africaine du manioc. (Spatial distribution of cassava African mosaic). In Fauquet, C.; Fargette, D. Fpidémiologie de la mosaique africaine du manioc: résumé. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Coopération. pp.13-14. Fr., 2 Ref. (Laboratoire de Phytovirologie, ORSTOM, BP V51, Abidjan 01, Cote d'Ivoire)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; DISEASE TRANSMISSION; BEMISIA; FIELD EXPERIMENTS; IVORY COAST.

Field expt. were carried out in Ivory Coast during 1981-86 to determine the vector distribution of CAMD in relation to the wind direction. A higher disease incidence was observed on the south and west borders, exposed to wind, than on the north and east borders and in the center of the field. The same trend was observed in vector distribution: more whiteflies were caught on the borders exposed to wind than in the center of the field and on the borders under the wind. Results indicate that whiteflies carried out by the dominant south-west wind preferably settle on the borders under the wind, because of reduced wind speed. Considering the move-ment of whiteflies and the field's position, it seems that virus and vector hosts are located upwind, many kilometers from the field. (CIAT)

0406

30518 FARGETTE, D.; FAUQUET, C.; NOIROT, M.; RAFFAILLAC, J.P.; THOUVENEL, J.C. 1987. Dissémination temporelle de la mosaique africaine du manioc. (Temporal spread of cassava African mosaic disease). In Fauquet, C.; Fargette, D. Epidémiologie de la mosaique africa ne du manioc: résumé. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Coopération. pp.23-25. Fr., 2 Ref., Il. (Laboratoire de Phytovirologie, ORSTOM, BP V51, Abidjan 01, Cote d'Ivoire)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; PLANT DEVELOPMENT; DISEASE TRANSMISSION; VECTORS; CLIMATIC REQUIREMENTS; TIMING; TEMPERATURE; IVORY COAST.

Factors that influence CAMD spread over time were analyzed. Such factors are planting site, field location, clone, and planting date. According to the results obtained in a 5-yr trial, there appeared to be an annual inoculum fluctuation involving the following different variables: inoculum pressure (high from March to July, low from Aug. to Nov.), whitefly population (high from Feb. to June, low from July to Oct.), cassava foliage growth (high from Feb. to May, low from June to -Sept.), and temp. (higher from Feb. to May, lower from June to Oct.). A figure summarizing the relationships between virus, vector, plant, and environment is included. Based on the close relationships between cliratic conditions and the contamination rates, it was found that contamination can be predicted both for a 1-yr period (r = 0.77) and for a 2-mo. period (r = 0.98). (CIAT)

0407

31624 FARGETTE, D. 1987. Epidémiologie de la mosaique africaine du manioc en Cote d'Ivoire. (Epidemiology of cassava African mosaic disease in Ivory Coast). Paris, France, Institut Francais de Recherche Scientifique pour le Développement en Coopération. 206p . Fr., Sum. Fr., En., 234 Ref., Il.

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; EPIDEMIOLOGY; DISEASE CONTROL; IVORY COAST.

Aspects of Ivory Coast CAMV epidemiology (research on infection sources, disease development within space and time, and control prospects) were studied. Objectives and methodology are described in detail and major results are given and discussed. General information on cassava cultivation, the disease, its causal agent, transmission, and ecology are also given. (CIAT)

0408

30512 FARGETTE, D.; FAUQUET, C.; THOUVENEL, J.C. 1987. La mosaique africaine du manioc: virus, vecteur, plante et réservoirs. (Cassava African mosaic: virus, vector, plant, and hosts). In Fauquet, C.; Fargette, D. Epidémiologie de la mosaique africaine du manioc: résumé. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Coopération. pp.7-9. Fr., 4 Ref., Il. (ORSTOM, BP V51 Abidjan, Cote d'Ivoire)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; ROOT PRODUCTIVITY; IVORY COAST.

Cassava production losses caused by CAMD were estimated according to mode of infection: virus-infected cuttings or Bemisia tabaci. used, disease symptoms appeared 45 days after planting and when inoculations with whiteflies were used, symptoms appeared later. Yield losses were greater when virus-infected cuttings were used; however, 120 days after planting, the production of both diseased and healthy plants was almost the same. Manihot glaziovii and Jatropha multifida were identified as hosts of CAMV. The relationships of the virus and the vector with the plant were also studied. The max. virus concn. was found in the youngest leaf (named F1), while no virus was detected in the oldest leaves. On the other hand, adult whiteflies were observed to gather on the younger leaves (F1 to F3), while very few adults were found on the older ones. Finally, young developing cassava leaves were sensitive to the disease but mature ones were not. The prevalence of the vector on young leaves facilitates both the acquisition and inoculation, and consequently, CAMV dissemination in the field. The percentage of viruliferous whiteflies, however, was very low (0.18-0.67 percent). (CIAT)

0409

30151 FARGETTE, D.; THOUVENEL, J.C.; FAUQUET, C. 1987. Virus content of leaves of cassava infected by African cassava mosaic virus. Annals of Applied Biology 110(1):65-73. En., Sum. En., 22 Ref., Il. (Laboratoire de Virologie Vegetale, Inst. Francais de Recherche Scientifique pour le Developpement en Cooperation (ORSTOM), B.P. V51, Abidjan, Cote d'Ivoire)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; LEAVES; ANALYSIS; SYMPTOMATOLOGY ; ALEYRODIDAE; IVORY COAST.

CAMV was detected in cassava leaves by ELISA. Some normal constituents of cassava leaves interfered with virus detection but leaf extracts of Nicotiana benthamiana did not. The symptom pattern was determined early in the growth of a leaf and subsequently changed little. CAMV was found only in the yellow or yellow green areas of the mosaic pattern. Virus content of the leaves increased with increasing symptom intensity, but decreased with leaf age and CAMV was not detected in mature leaves. Most whiteflies were found on young growing cassava leaves and the no. decreased progressively with leaf age. This distribution will aid both the acquisition and inoculation of the virus. (AS)

0410

30513 FAUQUET, C.; FARGETTE, D.; VAN HELDEN, M.; VAN HALDER, I.; THOUVENEL, J.C. 1987. Comportement de Bemisia tabaci, vecteur de la mosaique africaine du manioc dans un champ de manioc. (Performance of Bemisia tabaci, vector of cassava African mosaic, in a cassava field). In Fauquet, C.; Fargette, D.

Epidémiologie de la mosaique africaine du manioc: résumé. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Coopération. pp.10-12. Fr., 2 Ref., Il. (ORSTOM, BP V51, Abidjan 01, Cote d'Ivoire)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; BEMISIA; INSECT BIOLOGY; FIELD EXPERIMENTS; IVORY COAST.

The different movements of whiteflies were determined in a cassava field. The expt. was established at the beginning of the dry season to obtain a higher rate of insect multiplication. Different kinds of traps were used and located at various sites both inside and outside the field. The wind speed was also recorded. Influx (whiteflies that settle), innerflux (movement inside the field and insect multiplication), and outflux (whiteflies that leave the field) were the movements identified. The innerflux includes the following parameters: population dynamics, vertical and horizontal distribution of vec-tors, flight direction of vectors, and daily activity of vectors. Each one of the abovementioned movements is briefly described and explained. (CIAT)

0411

30519 FAUQUET, C.; FARGETTE, D.; DEJARDIN, J.; LEYLAVERGNE, F.; COLON, L.; THOUVENEL, J.C. 1987. Composantes de la résistance du manioc a la mosaique africaine du manioc. (Resistance mechanisms of cassava to cassava African mosaic). In Fauquet, C.; Fargette, D. Epidemiologie de la mosaique africaine du manioc: résumé. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Coopération. pp.26-28. Fr., 6 Ref., Il. (Laboratoire de Phytovirologie, ORSTOM, BP V51, Abidjan 01, Cote d'Ivoire)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; RESISTANCE; ANALYSIS; CULTIVARS; IVORY COAST.

To test the resistance of selected cassava clones compared with that of local clones, the different resistance mechanisms to CAMV were studied in Ivory Coast. Six different types of resistance were defined: RC, resistance in the field; R1, resistance to the vector; R2, resistance to inoculation; R3, resistance to virus multiplication; R4, resistance to symptoms; and R5, resistance to spread. The clone collection came from Ivory Coast, Togo, Nigeria, Central and Eastern Africa, Zaire, Kenya, Madagascar, India, and South America. A significant correlation was found between RC and the other resistances (r = 0.48-0.80). R1 was found to be the more independent type of resistance; R2, R3, and R4 also correlated significantly. Hybrids from Eastern Africa and Nigeria, local clones from Kenya, 2 Indian clones, and the clone Aipin Valenca were classified as resistant. (CIAT)

0412

30517 FAUQUET, C.; FARGETTE, D.; THOUVENEL, J.C. 1987. Développement de la mosaique africaine du manioc au niveau régional en Cote d'Ivoire. (Development of cassava African mosaic at regional level in Ivory Coast). In Fauquet, C.; Fargette, D. Epidémiologie de la mosaique africaine du manioc: résumé. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Coopération. pp.20-22. Fr., 3 Ref. (Laboratoire de Phytovirologie, ORSTOM, BP V51, Abidjan 01, Cote d'Ivoire)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; DISEASE TRANSMISSION; BEMISIA; FORESTRY; EPIDEMIOLOGY; ECOLOGY; FIELD EXPERIMENTS; SAVANNAS; CULTIVARS; IVORY COAST.

Field trials were carried out in Ivory Coast to determine the role of the cassava African mosaic vector in both forest and savanna conditions (annual

rainfall of 2000 and 1000 mm, resp.). Most of trials were planted with cv. CB (from Congo and moderately susceptible). Cv. H58 (a highly sensitive clone from Madagas-car) and BR (Bonoua Rouge, a local resistant clone) were also used. Data on plant contamination, vector populations, and plant growth were col-lected. Regardless the year or the clone considered, the contamination in the forest was always greater than in the savanna. Large differences were observed in the contamination dynamics of cas-sava fields within the same region and between different regions. Neither climatic conditions nor plant growth could explain the contamination rate. Within the same site, there was a good correlation between the no. of white-flies and the contamination rate; however, no correlation was observed from one site to another or from one region to another. (CIAT)

0413

30510 FAUQUET, C.; FARGETTE, D. 1987. Epidémiologie de la mosaique africaine du manioc: résumé. (Epidemiology of cassava African mosaic: a summary). Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Coopération. 30p. Fr., 38 Ref., Il. (Laboratoire de Phytovirologie, ORSTOM, BP V51, Abidjan 01, Cote d'Ivoire)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; EPIDEMIOLOGY; BEMISIA; DISEASE TRANSMISSION; ECOLOGY; CULTIVARS; RESISTANCE; IVORY COAST.

Different aspects of CAMD are summarized, such as: epidemiology, the virus, the vector (Bemisia tabaci), host plants, spatial and temporal dissemination of CAMV; automatic mapping of disease dissemination; primary and secondary contaminations of CAMV; regional development of the disease in Ivory Coast; and resistance mechanisms of cassava to the disease. (CIAT)

0414

30491 FAUQUET, C.; FARGETTE, D. 1987. Impact of African cassava mosaic disease on cassava growth and yield. In Séminaire International La Mosaique Africaine du Manioc et son Controle, Cote d'Ivoire, 1987. Résumés. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Cooperation. p.31. En., 10 Ref. (Phytovirologie, ORSTOM, BP V51 Abidjan, Cote d'Ivoire)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; PRODUCTIVITY; PEST DAMAGE; IVORY COAST.

A short bibliographic review is given on the impact of CAMD on cassava growth and yield. The relationship between the degree of symptom expression and yield loss of the moderately susceptible cv. CB was determined. Results showed that yield loss ranged from 0 to 77 percent, according to the mode and period of contamination and to the plant environment. Yield loss resulting from contaminated cuttings was found to be far greater (55-77 percent) than that resulting from a contamination by whitefly on a previously disease- free plant (35-60 percent). No effects on yield were observed when vector contamination occurred 100 days after planting. Yields of a single contamina-ted cassava plant located in the middle of a healthy field was found to be 70 percent less than the production of surrounding plants. Finally, if plants were contaminated, yield loss reached only 33 percent. (CIAT)

0415

30511 FAUQUET, C.; FARGETTE, D. 1987. Résumé sur l'épidemiolcgie du virus de la mosaique africaine du manioc. (Summary of the epidemiology of cassava African mosaic virus). In Fauquet, C.; Fargette, D. Epidémiologie de la mosaique africaine du manioc: résumé. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Coopération. pp.1-6. Fr., 14 Ref., Il. (ORSTOM, BP V51, Abidjan 01, Cote d'Ivoire)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; EPIDEMIOLOGY; BEMISIA; DISEASE TRANSMISSION; IVORY COAST.

The research work carried out on the epidemiology of CAMV is justified. Important data up to 1980 on various aspects of the disease are summarized. Major research results obtained in Kenya and Nigeria, where man was found to be the main disease vector, are also included. Difficulties encountered with planting material, the virus, the vector, and the methodology used are analyzed. Results on the ecology of CAMV, field distribution of Bemisia tabaci, spatial distri-bution of the disease, automatic mapping of disease dissemination, prima-ry and secondary dispersions; regional disease propagation; and cassava plant resistance mechanisms are mentioned. Temp. and wind were found to be the environmental factors that most influence disease dissemination; on the other hand, the performance and movements of the vector Bemisia tabaci depend on wind intensity and direction. Temp. also plays an important role in the population dynamics of the vector and on cassava growth. Production losses due to virus-infected cuttings were higher than those caused by whitefly transmission. (CIAT)

0416

30504 FAUQUET, C.; FARGETTE, D.; THOUVENEL, J.C. 1987. Selection of healthy cassava plants obtained by reversion in cassava fields. In Séminaire International La Mosaique Africaine du Manioc et son Controle, Cote d'Ivoire, 1987. Résumés. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Cooperation. p.46. En., 2 Ref. (Phytovirologie, ORSTOM, BP V51 Abidjan 01, Cote d'Ivoire)

CASSAVA; SELECTION; ON-FARM RESEARCH; CASSAVA AFRICAN MOSAIC VIRUS; IVORY COAST.

The possible role of reversion, defined as the ability of a diseased plant to produce a healthy one at the next generation, in the selection of healthy plants directly from diseased cassava fields, is discussed. In Ivory Coast the percentage of eradicated plants of the moderately susceptible CB clone decreased successively over a 3-yr period from 50 to 20 percent, eventually stabilizing at 5 percent. Since the reversion phenomenon was found to be unstable and conditions (climatic and/or biological) controlling it are still unknown, several hypotheses should be considered and tested before considering this method as a possible control measure of CAMD. (CIAT)

0417

32206 FIRMIN, A. 1988. Preparación tradicional de alimentos con yuca en Costa de Marfil. (Traditional preparation of cassava-based foods in Ivory Coast). Yuca Boletín Informativo 12(1):10-12. Es., Il.

CASSAVA; FOOD PRODUCTS; FOOFOO; ATIEKE; CASSAVA FLOUR; TAPIOCAS; IVORY COAST; CIAT-1.

Different ways of preparing cassava in Ivory Coast are described. Cassava roots are eaten either fresh (boiled) or processed into different food products (foutou, foofoo, CF, and tapioca). From fermented cassava, placali, bessiké, N'Bede-papa (cassava cake), Rito, N'Bete gboko, attoupkou, fresh atieke, and gari are obtained. (CIAT)

0418

30495 FISHPOOL, L.D.C.; VAN HALDEN, M.; VAN HELDER, I.; FARGETTE, D. ; FAUQUET, C. 1987. Monitoring Bemisia tabaci populations in cassava: field counts and trap catches. In Séminaire International La Mosaique Africaine du Manioc et son Controle, Cote d'Ivoire, 1987. Résumés. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Cooperation. p.35. En. (ORSTOM, BP V51, Abidjan, Cote d'Ivoire)

CASSAVA; BEMISIA; INSECT BIOLOGY; CASSAVA AFRICAN MOSAIC VIRUS; IVORY COAST.

The population dynamics and flight activity levels of the whitefly Bemisia tabaci, vector of CAMV, were studied in Ivory Coast, over a 5-mo. period, in a field of newly planted disease-free cassava. The population level of adults remained low un-til 6 wk. after planting, when it increased from 10 to 135 adults/plant within a month; then a rapid decrease was observed, stabilizing at 15 adults/plant for the rest of the period. Trap catch data showed that peak flight activity was recorded early in the morning. Largest catches just above the ground were recorded outside the field. Within the field, most flight activity was recorded beneath the crop canopy. Larger catches within the canopy occurred on the leeward side of the trap, while above the canopy catches were recorded on the windward side of the trap. A good correlation was found between adult whitefly population levels and the rate of contamination of cassava with CAMD. (CIAT)

0419

32010 FLIEDEL, G. 1983. Compte-rendu de mission en Cote d'Ivoire et au Togo du 28/11 au 7/12/1983. (Mission report in Ivory Coast and Togo from 28/11 to 7/12/1983). Paris, France, Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres. 24p. Fr.

CASSAVA; TECHNOLOGY; INDUSTRIALIZATION; FOOFOO; ATIEKE; GARI; NIGERIA; IVORY COAST; TOGO.

The major conclusions from a workshop on processing technologies for cassava and other root crops conducted in Abidjan (Ivory Coast) are reported. Results from a visit to 2 research institutes in Togo are given and lists of the participants and subjects presented are also included. Cassava was found to be a staple for most African countries; it is cultivated as a sole crop or in association. In order to decrease losses caused by adverse climatic factors and diseases and pests, countries such as Togo, Kenya, and Benin work on the obtainment of resistant var. and on the adoption of new cultivation practices. Considerable extents are planted to cassava in Ivory Coast, Congo, and Nigeria, where almost all cultivation stages are mechanized. Foofoo, gari, and atiéké are included among the main cassava products. Examples of the existing factories for cassava processing in Ivory Coast, Congo, Nigeria, and Guinea are given. (CIAT)

0420

30503 FRISON, E.A. 1987. Tissue culture and cassava sanitation. In Séminaire International La Mosaique Africaine du Manioc et son Controle, Cote d'Ivoire, 1987. Résumés. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Cooperation. p.44. En., 3 Ref. (F.A.O. 18, Maison de. Roie, Rome, Italie)

CASSAVA; TISSUE CULTURE; DISEASE TRANSMISSION; IVORY COAST.

The risk for widespread dissemination of pathogens and parasites when transferring plant material on a global scale is mentioned. Since virus-free material of cassava has been produced through tissue culture and used by research institutes for international exchange of cassa-va clones, this technique deserves special attention. (CIAT)

0421

30880 GODO, G. 1986. Actions de recherche sur le manioc en Cote d'Ivoire. (Research on cassava in Ivory Coast). Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Coopération. 18p. Fr., Il. Paper presented at Seminaire La Recherche sur le Manioc enAfrique, Bruxelles, Belgique, 1986. (Centre ORSTOM d'Adiopodoumé, B.P. V-51 Abidjan, Cote d'Ivoire)

CASSAVA; RESEARCH; CASSAVA PROGRAMS; DEVELOPMENT; MAPS; PRODUCTION; CULTIVATION SYSTEMS; MANIHOT GLAZIOVII; PLANT BREEDING; CASSAVA AFRICAN MOSAIC VIRUS; TECHNOLOGY EVALUATION; IVORY COAST.

The importance of cassava in Ivory Coast is highlighted; research institutes interested in this crop are mentioned. Maps are included showing cassava production (t)/department and location of research institutes that have cassava programs. Major ongoing projects are listed, and their objectives and justification are given. Agronomic studies were carried out on yield components, dynamics and functioning of cassava production systems in forestry regions, cassava in associated cropping systems, fertility evolution in soils planted to cassava, water uptake and balance of the crop, mechanization constraints, cultivation in oil palm-producing areas, association with coconut palms, and improvement of yields when associated with pineapple. Prospects of the wild species Manihot glaziovii in Ivory Coast, breeding, var. introduction and evaluation for different sites were also studied. As far as crop protection, CAMV and the relationship between nematodes and the cassava plant were studied. The improvement of traditional technologies for cassava processing and conservation was attempted. Recommendations are also given for new phytosanitary problems (i.e. CBB, mealybug, green mites, and anthracnose), soil fertility in different cassava cultivation systems, and postharvest technologies. (CIAT)

0422

31385 GODO, G. 1986. Evolution et maintien de la fertilité de sols sous systemes de cultures a base manioc dans le sud-est Ivoirien. Essai de longue durée. 1. Résultats de la campagne 1983-1984. (Evolution and maintenance of soil fertility under cultivation systems involving cassava in Southeastern Ivory Coast. Long-term trial. 1. Results of the 1983-1984 campaign). Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Coopération. 21p. Fr. (ORSTOM, Centre d'Adiopodoumé B.P. V-51 Abidjan, Cote d'Ivoire)

CASSAVA; SOIL FERTILITY; MECHANIZATION; FORESTRY; ROOT PRODUCTIVITY; FERTILIZERS; SOIL ANALYSIS; ROTATIONAL CROPS; FALLOWING; IVORY COAST.

The fertility evolution of a soil under cassava cultivation was monitored at Adiopodoumé exptl. station (Abidjan, Ivory Coast) in 1983-84. Cuttings of cassava var. Bonoua were planted at 3 different sites: (1) a mechanically cleared forest, (2) a mechanized fallow, and (3) a manually cleared forest. A comparison between fertilized and nonfertilized cassava yields at the 3 sites tested revealed a better fertilizer profit in the mechanized fallow and in the manually cleared forest, as shown by yield increases of 24 and 30 percent, resp., in comparison with nonfertilized cassava yields. In the mechanically cleared forest, fertilized and nonfertilized cassava yields were almost similar. Higher yields were obtained in tilled than in nontilled sites. (CIAT)

0423

31393 GODO, G. 1985. Influence de l'humidité du sol sur le comportement du manioc (Manihot esculenta Crantz) en début de cycle. (Influence of soil moisture on the performance of cassava at the beginning of the cycle). In Institut Francais de Recherche Scientifique pour le Développement en Coopération. Fau et développement agricole. Abidjan, Cote d'Ivoire, pp.70-73. Fr., 6 Ref., Il.

CASSAVA; SOIL WATER; ROOT DEVELOPMENT; IRRIGATION; DRY MATTER; TIMING; WATER REQUIREMENTS (PLANT); IVORY COAST.

The effect of soil moisture on cassava root development at the beginning of the cycle was studied. Cuttings from cassava var. CB were planted in black

polyethylene bags and 3 water treatments were used (1/6, 1/3, and 1 evapotranspiration). Ten days after planting soils reached field capacity. DM accumulation was measured both in the root system and in the whole plant at 30, 60, and 90 days after planting. DM accumulation increased according to irrigation dose; however, no differences were observed between 1/3 and 1 evapotranspiration for the 30-60 day period. For the 60-90 day period, a marked increase in DM was observed which corresponded at the same time to the increase of root wt. associated with tuber formation and that of the canopy. Water efficiency was found to be much higher when water supply was lower although DM accumulation was higher when water supply increased. (CIAT)

0424

31587 GODO, G.; YORO, G. 1984. Recherche sur les systemes de culture a base manioc en milieu paysannal dans le sud-est Ivoirien (Bonoua-Adiaké) deuxieme phase: résultats d'enquetes et observations au champ. (On-farm research on cropping systems involving cassava in South- Eastern Ivory Coast (Bonoua-Adiaké). Second stage: results from field surveys and observations). Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Coopération. 16p. Fr., 6 Ref., Il. (O.R.S.T.O.M. Centre d'Adiopodoumé, B.P. V51 Abidjan, Cote d'Ivoire)

CASSAVA; INTERCROPPING; ON-FARM RESEARCH; SURVEYS; FARM SIZE; ROOT PRODUCTIVITY; SOIL FERTILITY; SOIL IMPOVERISHMENT; YAMS; MAIZE; PLANTAIN; GROUNDNUT; IVORY COAST.

A group of farmers in SE Ivory Coast were surveyed for an in- situ study of the cultural practices commonly used in their cropping systems involving cassava. Information was collected on plot background, land tenancy, topographic position and plot area, and estimates of planting densities and yields. Maize-yam-plantain-cassava was the main association identified, followed by others such as maize-yam-cassava, maize-cassava, maize-cassava-plantain, maize-cassava-plantain-groundnuts, maize-cassava-groundnuts, cassava-groundnuts, cassava-potatoes, and maize-plantain. Their characteristics are given. A table is included with data on av. cassava yields as a function of plot background. Consequences on soil fertility due to these cultivation systems are analyzed and discussed, and some measures to avoid soil impoverishment are suggested. The importance of participative research is highlighted. (CIAT)

0425

31392 GOUE, B.; YAO, R.N.; ZELLER, B. 1985. Bilan hydrique sous manioc. (Water balance of a cassava crop). In Institut Francais de Recherche Scientifique pour le Développement en Coopération. Eau et développement agricole. Abidjan, Cote d'Ivoire, pp.63-69. Fr., 5 Ref., Il.

CASSAVA; SOIL MOISTURE; ANALYSIS; IVORY COAST.

Two methods were compared for measuring soil water levels in order to evaluate water uptake of a cassava crop. The neutron method was found to have more advantages than the global balance method. These included (1) quick measurement in situ with nondestructive effects on the environment; (2) possibility of repeating measurements at the same sites; and (3) accurate measurements. The major disadvantage of the method is the high operational costs. (CIAT)

0426

31332 GOUE, B.; YAO, N.R.; JANEAU, J.L. 1987. Consommation en eau d'une culture de manioc (Manihot esculenta Crantz) a l'echelle de la parcelle. (Water consumption of field-grown cassava plants). Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en

Coopération. 20p. Fr., Sum. Fr., En., 14 Ref., Il. (Laboratoire d'Agronomie, ORSTOM. Centre d'Adiopodoumé BP V51 Abidjan, Cote d'Ivoire)

CASSAVA; WATER ABSORPTION; SOIL WATER; DEVELOPMENTAL STAGES; IVORY COAST.

The water balance of a CB (Congo Brazzaville) cassava var. was determined. Plants were grown on tertiary sandy soils in lower Ivory Coast and soil water content was measured each week. The water consumption (evapotranspiration) of the plant was estimated over a 12-mo. period by the method of soil water content variations or the method of global balance. The mean values of actual evapotranspiration varied between 4.0 mm/day early in the plant development (6 wk. after planting) to 3.0 mm/day in the middle of the plant growth period (wk. 20-26) and 2.5 mm/day at the end of the growth period (wk. 46-52). Actual plant evapotranspiration was also determined by microclimatic measurements above the canopy, using the Bowen ratio coupled with the energy balance. This latter evapotranspiration was linearly related to the former except early in the plant development. (AS)

0427

30492 HARRISON, B.D. 1987. African cassava mosaic geminivirus: properties and geographical variation. In Séminaire International La Mosaique Africaine du Manioc et son Controle, Cote d'Ivoire, 1987. Résumés. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Cooperation. p.32. En., 8 Ref. (Scottish Crop Research Inst., Invergowrie, Dundee DD2 5 DA, UK)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; ANGOLA; IVORY COAST; NIGERIA; SOUTH AFRICA; KENYA; MADAGASCAR; MALAWI; INDIA; SRI LANKA.

A short bibliographic review is given on the main biological properties of cassava African mosaic geminivirus. Virus isolates from mosaic-affected cassava collected from different parts of Africa and India were classified into 3 groups on the basis of their biological properties, reactivity with monoclonal antibodies specific for particles of a west Kenyan isolate, and ability to hybridize with probes for DNA-1 and DNA-2 of this isolate. Group A included isolates from Angola, Ivory Coast, Nigeria, South Africa, and western Kenya; Group B isolates came from coastal Kenya, Madagascar, and Malawi, and those from Group C were found in India and Sri Lanka. The different geographical distribution of these groups may reflect 3 different routes of introduction of cassava from South America, and its subsequent infection with different indigenous geminivirus variants in different geographical regions. Further studies to establish the ecology and the effects of each group of isolates on putative mosaic-resistant cassava genotypes are necessary. (CIAT)

0428

29600 KNIPSCHEER, H.C. 1980. Ivory Coast urban retail prices for foodcrops 1976-1980. Ibadan, Nigeria, International Institute of Tropical Agriculture. Agricultural Economics Information Bulletin no.12 8p. En., Il.

CASSAVA; STATISTICAL DATA; ECONOMICS; PRICES; IVORY COAST.

Data on retail prices for food crops, including cassava, in Ivory Coast are provided on a monthly basis for the years 1976 through 1980. Graphics of price trends are included. (CIAT)

0429

32248 KOUACOU, N'DA 1986. Report on cassava mealybug and cassava green mites in some African countries: Ivory Coast. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria,

1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. p.143. En. (Ministry of Agriculture, B.P. 2049, Abidjan, Ivory Coast)

CASSAVA; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; IVORY COAST.

In Ivory Coast cassava is the 3rd most important crop after plantain and yam. Cassava mealybug was 1st observed in Touba and in Bouaké in the 1979 dry season. Green mite was 1st discovered in the 1981 dry season in the central region of the country. (Full text)

0430

30515 LECOUSTRE, R.; FAUQUET, C.; FARGETTE, D. 1987. Cartographie automatique de la dissémination de la mosaique africaine du manioc . (Automatic mapping of the dissemination of cassava African mosaic virus). In Fauquet, C.; Fargette, D.. Epidémiologie de la mosaique africaine du manioc: résumé. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Coopération. pp.15-16. Fr., 2 Ref., Il. (Laboratoire de Biomathématiques et Statistiques, IRHO/CIRAD La mé, 01 BP 1001 Abidjan, Ivory Coast)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; MAPS; IVORY COAST.

The application of the regionalized variables theory to determine the dissemination of CAMD is described in detail. Results from automatic mapping of disease development allow, with a sample of 7 percent, CAMD dissemination to be estimated. The correlation between the observed and the calculated mapping was 0.18. (CIAT)

0431

23773 LEDUC, B. 1981. CULTURE DE MANIOC SUR LES TESTS BINOMES. (CASSAVA CULTIVATION IN THE BINOMIAL TESTS). IN --------. LIAISON RECHERCHE. DEVELOPPEMENT IDESSA/ARSO; RECHERCHE DE SYSTEMES STABLES DE CULTURES VIVRIERES DANS LE SUD-OUEST. RESULTATS DE LA CAMPAGNE 1979. ABIDJAN, COTE D'IVOIRE, INSTITUT DE RECHERCHES AGRONOMIQUES TROPICALES ET DES CULTURES VIVRIERES. PP.17,68-90,143-145,183. FR., 7 REF.

AFRICA; CEREALS; CULTIVARS; CULTIVATION; CULTIVATION SYSTEMS, IVORY COAST; MAIZE; PRODUCTIVITY; RICE; ROOT PRODUCTIVITY; SOIL CONSERVATION PRACTICES;

SEVERAL SOIL PROTECTION TRIALS WITH DIFFERENT CULTIVATION SYSTEMS, WHICH INCLUDED CASSAVA VAR. CB, WERE CARRIED OUT IN 1978-79 IN SW IVORY COAST IN THE ZAGNE, SAN PEDRO, AND TABOU REGIONS. CASSAVA DID NOT HAVE A REPRESSIVE EFFECT ON RICE. VAR. CB WAS NOT VERY APPRECIATED BY THE FARMERS; THEY PREFER THE LOCAL VAR. BONCUA. THE AV. CASSAVA YIELDS IN TRIALS WITH RICE, MAIZE, AND OTHER CROPS FOR THE ZAGNE, SAN PEDRO, AND TABOU REGIONS WERE 4.35, 22.57, AND 13.30 T/HA, RESP.

0432

30487 LEFEVRE, F. 1987. Considérations sur la diversité génétique du manioc (Manihot esculenta Crantz) en Afrique d'apres les premiers résultats d'une analyse enzymatique. (Considerations on the genetic diversity of cassava in Africa according to preliminary results of an enzyme analysis). In Seminaire International La Mosaique Africaine du Manioc et son Controle, Cote d'Ivoire, 1987. Résumés. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Cooperation. pp.25-2. Fr., 4 Ref. (Génétique ORSTOM, B.P. V51 Abidjan, Cote d'Ivoire)

CASSAVA; GENETICS; ANALYSIS; ENZYMES; BIOCHEMISTRY; MANIHOT GLAZIOVII; IVORY COAST.

Enzyme analysis is highlighted as a method to determine the differences between morphological and biochemical analyses of cassava. The advantages of enzyme markers are briefly discussed. Three cv. collections were analyzed: 1 from Ivory Coast, another of 49 clones showing different degrees of resistance to CAMV, and a 3rd of Manihot glaziovii and M. esculenta x M. glaziovii hybrids. Results are summarized and discussed. (CIAT)

0433

31626 LEON, I. 1983. Les cultures vivrieres et le probleme alimentaire de la Cote d'Ivoire. (Foodcrops and the food problem in Ivory Coast). Economie Rurale no.156:41-46. Fr., Sum. Fr., En., 15 Ref.

CASSAVA; PRODUCTION; CONSUMPTION; MARKETING; PRICES; STATISTICAL DATA; TRADE; IVORY COAST.

The food problem in Ivory Coast and its relationship with food crop production are presented and analyzed. Increases on rice imports are highlighted; a lack of policies encouraging development of food self-sufficiency is also mentioned. Statistics are given on the cassava price evolution for Jan. 1974, July 1976, and Dec. 1979, and on production evolution from 1960 to 1980. Only 3.2 percent of the cassava production is commercialized. Although the cassava production satisfied national needs in 1980 a deficit of 100,000 t was foreseen for 1985. Suggestions on how to solve this problem are given. (CIAT)

0434

30475 LOKROU, A. 1986. Etiopathogenie des diabetes sucres acquisitions recentes. (Advances in the etiopathogenic study of diabetes mellitus). Revue Francaise d'Endocrinologie Clinique Nutrition et Metabolisme 27(3):227-237. Fr., Sum. Fr., En., 29 Ref. (Service de Medecine interne, Professeur B.Y. BEDA, B.P. V-3, Abidjan, Cote d'Ivoire)

CASSAVA; HUMAN HEALTH; DIABETES; MALNUTRITION; ETIOLOGY; HUMAN NUTRITION; IVORY COAST.

Diabetes mellitus is composed of many syndromes with hyperglycemia as common basement. Insulin dependent diabetes is often associated with particular HLA antigens and auto-immune factors (mainly type Ib). Among exogenous etiopathogenic factors, viruses seem to be the most important. Noninsulin dependent diabetes is also related to exogenous and genetic factors except for HLA antigens. Maturity onset diabetes in the young (Mody) is a particular, noninsulin dependent, familial diabetes occurring in the young and often associated with chlorpropamide alcohol flush, a neurovegetative phenomenon depending on hypersensitivity to endogenous opioid peptides such as enkephalins. Chronic pancreatitis, idiopathic hemochromatosis, and some endocrine diseases are unfrequent causes of diabetes mellitus. Nutritional diabetes (PFC syndrome and "J" diabetes) seems to be relatively important in some tropical countries and related to undernutrition and cassava. Extreme insulin resistance syndromes are exceptionally involved into diabetes pathogeny. (AS)

0435

31377 MARNOTTE, P.; TEHIA, K.F. 1985. Résultats des expérimentations pour le désherbage chimique du manioc, a Bouaké, en 1983 et 1984. (Results of experiments on chemical weed control of cassava in Bouaké, in 1983 and 1984). In Cote d'Ivoire. Ministere de l'Education Nationale et de la Recherche Scientifique. Recherche d'accompagnement manioc. Bouaké, Institut des Savanes. Rapport Semestriel d'Exécution Technique no.12 pp.28-41. Fr., (Centre Vivrier, Filiere Racines et Tubercules, IDESSA, B.P. 633 Bouaké, Cote d'Ivoire)

CASSAVA; HERBICIDES; IVORY COAST.

Expt. carried out to determine the effectivity and selectivity of herbicides in cassava crops are described and major results are presented. Oxyfluorfen, reported as effective and selective to cassava, is still the reference product. The mixture metribuzine + diuron at 700 + 1200 g/ha was effective and selective; however, the effectivity of herbicide mixtures needs to be confirmed. (CIAT)

0436

30505 MOLLARD, E. 1987. African cassava mosaic disease and the small farmer in lower Cote d'Ivoire. In Séminaire International La Mosaique Africaine du Manioc et son Controle, Cote d'Ivoire, 1987. Résumés. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Cooperation. p.47. En. (ORSTOM, 3191 Route de Mende, 34060 Montpellier, France)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; DISEASE CONTROL; PRODUCTIVITY. PLANT DAMAGE. IVORY COAST.

Results of an investigation on the technical and economic constraints of cassava cultivation for the small farmer showed 3 aspects under which CAMV has to be considered: its cause, its consequences, and conditions necessary for its eventual control. Cuttings from infected plants are the main cause of the disease and a marked variability in symptoms was observed between plants and locations. A correlation was found between secondary contamination and th degree of openness of the landscape and the quantity of cassava in each village. Under exptl. conditions, disease-free cuttings of Bonoua Rouge may result in increases in yield that reach 100 percent. Yield and percentage of tuber reduction were a direct consequence of CAMV. Further investigation is recommended to determine the more appropriate control measures for this disease. (CIAT)

0437

28568 NOEL, A.; MONNIER, J. 1983. ETUDE DE SOLUTIONS MECANISEES POUR LA RECOLTE DU MANIOC: ESSAIS CONDUITS PAR LE CIMA SUR LE CENTRE D'APPUI SODEPALM DE TOUMODI. (STUDY ON MECHANIZED SOLUTIONS FOR CASSAVA HARVESTING: TRIALS CARRIED OUT BY CIMA AT THE SODEPALM SUPPORT CENTER OF TOUMODI). MACHINISME AGRICOLE TROPICAL NO.83:8-15. FR., IL.

CASSAVA; MECHANIZATION; HARVESTING; AGRICULTURAL EQUIPMENT; IVORY COAST.

SOME CONCEPTS RELATED TO THE PHYSIOLOGY OF THE CASSAVA PLANT ARE BRIEFLY EXPLAINED AND A LIST IS MADE OF THE OPERATIONS CARRIED OUT DURING THE HARVESTING OF THIS TUBER CROP (TREATMENT OF AERIAL PARTS, UPROOTING, DETOPPING, AND LOADING), OF WHICH THE LAST 2 ARE DONE MANUALLY IN IVORY COAST. THE OVERALL CHARACTERISTICS OF THE 1ST 2 OPERATIONS AS WELL AS THE OPERATION OF THE MACHINERY DEVELOPED FOR SUCH PURPOSES ARE BRIEFLY DESCRIBED; RESULTS ACHIEVED ARE ALSO GIVEN. THE 4 OPERATIONS CURRENTLY INVOLVED IN CASSAVA HARVESTING (CRUSHING OF STEMS, UPROOTING OF TUBERS, DETOPPING OF TUBERS, AND LOADING) ARE BRIEFLY DESCRIBED; THE 1ST 2 ARE BEING MECHANIZED. A TECHNICAL DESCRIPTION IS INCLUDED OF 2 TYPES OF STEM CRUSHERS AND 1 TYPE OF UPROOTER AND THEIR OPERATION IS EXPLAINED. THE METHODOLOGY AND RESULTS OBTAINED IN TRIALS CONDUCTED IN SODEPALM (TOUMODI) ARE PRESENTED, LISTING THE ADJUSTMENTS DONE, THE DEFECTS FOUND, AND THE MODIFICATIONS PERFORMED TO THE MENTIONED MACHINERY. FINALLY, SOME RECOMMENDATIONS ARE GIVEN THAT SHOULD BE TAKEN INTO ACCOUNT BY THE CONSTRUCTOR TO IMPROVE THE EFFICIENCY OF THESE MACHINES. (CIAT)

0438

31583 NOTTEGHEM, J. 1983. Note sur l'extention du flétrissement bactérien du manioc en Cote d'Ivoire. (Note on the dissemination of cassava bacterial blight in Ivory Coast). In Pouzet, D. Recherches d'accompagnement manioc. Programme d'Agronomie. Bouaké, Cote d'Ivoire, Institut des Savanes. Rapport Semestriel d'Exécution Technique no.9 pp.59-60. Fr., Il.

CASSAVA; MAPS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; IVORY COAST.

Results are presented on observations on the dissemination of CBB in Ivory Coast. A pursuit of disease evolution in terms of space and time and further trials to look for more resistant var. are suggested. Cassava var. CB was found susceptible to the disease. A map is included with the zones and locations where CBB was observed from 1981 to 1983. (CIAT)

0439

31378 NOTTEGHEM, J.L.; POUZET, D.; COULIBALY, N. 1985. Suivi des maladies du manioc; synthese des tests de résistance variétale a la bacteriose du manioc 1981-1985. (Monitoring of cassava diseases; synthesis of varietal resistance tests to cassava bacterial blight, 1981-85). In Cote d'Ivoire. Ministere de l'Education Nationale et de la Recherche Scientifique. Recherche d'accompagnement manioc. Bouaké, Institut des Savanes. Rapport Semestriel d'Exécution Technique no.12 pp.42-52. Fr., Il. (Centre Vivriers, IDESSA, B.P. 633, Bouaké, Cote d'Ivoire)

CASSAVA; MAPS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CULTIVARS; RESISTANCE; IVORY COAST.

A map is included showing the dissemination of CBB in Ivory Coast since 1983. The cassava collection from the Institut des Savanes (Bouaké, Ivory Coast) was tested for resistance to CBB. Var. MO 74, 157, 346, and 435 were found very susceptible; however, only 5 clones showed 5 percent or more of dead branches. No conclusions were drawn from other field trials conducted at the Man and Ferkéssédougou exptl. stations. Greenhouse expt. were also carried out to assess resistance to CBB, using 2 inoculation methods. Clone 82286 was found very resistant although the effectivity of its resistance must be confirmed in the field. A table is included with the origin of clones and their resistance to CBB. (CIAT)

0440

29033 OSSENI, B. 1985. COMPORTEMENT DES CULTURES VIVRIERES ET LEGUMIERES SUR LES SOLS DESATURES DE BASSE COTE D'IVOIRE A MONOCULTURE D'ANANAS. (PERFORMANCE OF FOOD AND VEGETABLE CROPS INTEGRATED IN PINEAPPLE MONOCULTURES IN DESATURATED SOILS OF LOWER IVORY COAST). FRUITS 40(4):249-259. FR., SUM. FR., 12 REF., IL. (INST. DE RECHERCHES SUR LES FRUITS ET AGRUMES, 01 B.P. 1740, ABIDJAN 01, REPUBLIQUE DE COTE D'IVOIRE)

CASSAVA; ROTATIONAL CROPS; SOIL REQUIREMENTS; FOOD SECURITY; INTERCROPPING; PINEAPPLE; MAIZE; PRODUCTIVITY; CULTIVARS; IVORY COAST.

THE PERFORMANCE OF A NO. OF FOOD AND VEGETABLE CROPS INTEGRATED IN PINEAPPLE MONOCULTURES IN THE DESATURATED SOILS OF LOWER IVORY COAST HAS BEENFOLLOWED FOR SEVERAL YEARS. THE FACTOR LIMITING THE DEVELOPMENT OF SEVERAL OFTHESE CULTURES SEEMS TO BE THE LOW PH OF THE PERMEABLE AND SANDY SOIL. YAM AND CASSAVA BOTH SEEM TO ADAPT TO THE EXISTING SOIL CONDITIONS, CASSAVA YIELDING OVER 24 T/HA AT ALL THE TRIAL SITES AND ADAPTING WELL ON ALL SOILS. THE CROPS CULTIVATED ON 2 DISTRICT PLOTS, PINEAPPLE ON ONE AND A ROTATION OF (1) MAIZE, GROUNDNUTS, CASSAVA, AND BEANS OR (2) YAM, MAIZE, GROUNDNUTS, SWEET POTATO, BEANS, AND CASSAVA, WERE INTERCHANGED AFTER A PERIOD OF 4 YR. IT IS CONCLUDED THAT THE INTEGRATION OF FOOD AND VEGETABLE CROPS IN

PINEAPPLE PLANTINGS PRESENTS NUMEROUS TECHNICAL, FINANCIAL, AND SOCIAL ADVANTAGES FOR SMALL PLANTERS. (AS)

0441

26887 OSSENI, B. 1985. LES CULTURES VIVRIERES DANS LES SOLS FERRALLITIQUES DESATURES DU SUD DE LA COTE D'IVOIRE A MONOCULTURE D'ANANAS: DETERMINATION D'UN SEUIL MINIMUM DE PH CONVENABLE POUR QUELQUES CULTURES. (FOOD CROPS ON DESATURATED FERRALLITIC SOILS OF SOUTHERN IVORY COAST, CULTIVATED WITH PINEAPPLE IN MONOCULTURE: DETERMINATION OF THE LOWEST PH LIMIT FOR SEVERAL CROPS). FRUITS 40(12):797-805. FR., SUM. FR., 9 REF., IL. (INST. DE RECHERCHES SUR LES FRUITS ET AGRUMES, 01 B.P. 1740, ABIDJAN 01 R.C.I., IVORY COAST)

CASSAVA; SOIL REQUIREMENTS; SOIL ANALYSIS; PH; RAINFALL DATA; FERTILIZERS; N; P; K; ROTATIONAL CROPS; GROUNDNUTS; CULTIVATION; ROOT PRODUCTIVITY; IVORY COAST.

ALTHOUGH PINEAPPLES GROW WELL IN THE STRONGLY ACID DESATURATED FERRALLITIC SOILS OF SOUTHERN IVORY COAST, YIELDS OF MOST FOOD CROPS GROWN INTHESE SOILS ARE FAIRLY LOW. FIELD EXPT. WERE CONDUCTED TO FIND THE LOWEST PH LIMITS FOR SOME STAPLE FOOD CROPS OF THE REGION. YAMS AND CASSAVA TOLERATED PH VALUES MORE THAN OR EQUAL TO 4.5. THE PH OF SOILS OF EAST-COMOE IS IN THE RANGE OF 4.3- 4.5. IN THESE SOILS, DIVERSIFICATION AND INTENSIFICATION OF AGRICULTURAL PRODUCTION WOULD REQUIRE THE USE OF BASIC AMENDMENTS TO INCREASETHE INITIAL PH BY AT LEAST 1 UNIT. (AS)

0442

32274 POUZET, D.; GOURVAT, T.; TARTAR, M. 1983. Amélioration de la culture du manioc en Cote d'Ivoire. (Cassava culture improvement in Ivory Coast). Bouaké, Cote d'Ivoire, Institut des Savannes, Département des Cultures Vivrieres. 18p. Fr., Sum. Fr., Il.

CASSAVA; MAPS; ROOT PRODUCTIVITY; PRODUCTION; CASSAVA PROGRAMS; LAND PREPARATION; PLANTING; TIMING; FERTILIZERS; WEEDING; HARVESTING; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; GLOMERELLA CINGULATA; SOIL CONSERVATION; MECHANIZATION; IVORY COAST.

The importance of cassava as the 3rd food crop in Ivory Coast is highlighted; a map is included showing the different producing regions. Data on production and yields are also given. General information is presented on cassava research indicating the characteristics of a pilot project site. Project objectives are mentioned and the main results of activities carried from 1979 to 1983 are reported. Studies dealt with land preparation, planting (improved var., cutting position, and planting date), fertilization, and weed control. Other projects dealt with harvesting (canopy elimination, root lifting, and conditioning) and factors involved in cassava cultivation (climate, soil, phytosanitary conditions, agricultural and economic problems, and consequences). Weeds were the major constraint for cassava production followed by phytosanitary problems (CBB and anthracnose). Land conservation was another constraint. Regarding mechanization several stages remain manual. Important increases were obtained in yields from industrial cassava plots (from 15 to 20 t/ha in 1978-79 to 25-30 t/ha in 1981- 82). (CIAT)

0443

31584 POUZET, D. 1983. Evaluation de la qualité de la production. (Evaluation of production quality). In Pouzet, D. Recherches d'accompagnement manioc. Programme d'Agronomie. Bouaké, Cote d'Ivoire, Institut des Savanes. Rapport Semestriel d'Exécution Technique no.9. pp.61-62. Fr.

CASSAVA; DRY MATTER; ROOTS; IVORY COAST.

Differences in DM content were observed between the phelloderm (very hydrated) and the central cylinder of cassava roots. From the viewpoint of industrial technology, this results in an ease for peeling. Suggestions to avoid difficulties in the peeling process include reducing the time between harvest and treatment of roots, storage in a shaded site, and water spraying of stored roots before processing. (CIAT)

0444

28591 POUZET, D.; GODON, P. 1986. LA RECHERCHE SUR LE MANIOC ET L'AUTOSUFFISANCE ALIMENTAIRE EN COTE D'IVOIRE. (RESEARCH ON CASSAVA AND SELF-SUFFICIENCY IN FOOD IN THE IVORY COAST). AGRONOMIE TROPICALE 41(1).60-68. FR., SUM. FR., EN., ES., 15 REF., IL. (AGRICONGO, B.P. 785, BRAZZAVILLE, REPUBLIQUE POPULAIRE DU CONGO)

CASSAVA; TRADE; DEVELOPMENT; INDUSTRIALIZATION; MARKETING; PRODUCTION; DISEASES AND PATHOGENS; RESEARCH; FOOD SECURITY; IVORY COAST.

THE FOREIGN TRADE OF IVORY COAST IS CHARACTERIZED, IN PARTICULAR REGARDING CEREAL IMPORTS (WHEAT AND MAIZE). GOVERNMENT PLANS ARE TO DEVELOP ROOT CROPS SUCH AS CASSAVA, WHILE MAINTAINING CASH CROPS FOR EXPORTS. THE AVAILABILITY OF CASSAVA BY-PRODUCTS TO CONSUMERS IS STUDIED THROUGH A PRODUCTION-PROCESSING OPERATION, BASED ON MECHANIZED CASSAVA FARMING. THE PRINCIPAL CONSTRAINTS FOUND TO CASSAVA DEVELOPMENT ARE DETAILED. IN THE SHORT TERM, PROCESSING AND MARKETING ARE NOT SUFFICIENT TO ABSORB PRODUCTION. PRODUCTION IS THREATENED BY NEW BIOLOGICAL PROBLEMS (BACTERIAL DISEASES, MITES, SCALE INSECTS). IN THE MEDIUM TERM, A NECESSARY INTENSIFIED PRODUCTION WILL RESULT IN ENVIRONMENTAL DETERIORATION (FERTILITY, EROSION, WEEDS). THE DEVELOPMENT OF THIS CROP REQUIRES, THEREFORE, FURTHER RESEARCH. (AS)

0445

31585 POUZET, D. 1983. Propositions de programme. (Program proposals). In Pouzet, D. Recherches d'accompagnement manioc. Programme d'Agronomie. Bouaké, Cote d'Ivoire, Institut des Savanes. Rapport Semestriel d'Exécution Technique no.9 pp.63-69. Fr.

CASSAVA; CASSAVA PROGRAMS; LAND PREPARATION; SPACING; TIMING; HERBICIDES; CULTIVATION SYSTEMS; MECHANIZATION; PEST CONTROL; IVORY COAST.

Cassava research activities proposed for 1984-86 are listed and described in detail. Suggested programs include a survey of production plots and improvement of land preparation and production of cuttings. Other proposals dealt with cultivation methods and systems, planting density, cropping schedules, and fertilization. Finally, studies on early and late weed control, effectivity and selectivity of herbicides, harvesting, and crop protection are also proposed. (CIAT)

0446

31582 POUZET, D. 1983. Synthese des résultats au 30 juin 1983. (Synthesis of results up to June 30, 1983). In Pouzet, D. Recherches d'accompagnement manioc. Programme d'Agronomie. Bouaké, Cote d'Ivoire, Institut des Savanes. Rapport Semestriel d'Exécution Technique no.9 pp.5-27. Fr., Il.

CASSAVA; MAPS; ROOT PRODUCTIVITY; PRODUCTION; WEEDS; WEEDING; FERTILIZERS; N; P; K; CA; MG; PLANTING; TIMING; HARVESTING; MECHANIZATION; EROSION; CULTIVARS; DRY MATTER; DISEASES AND PATHOGENS; IVORY COAST.

Results of research activities on cassava conducted by the Institut des Savanes (Bouaké, Ivory Coast) from 1979 to 1983 are reported. Weeds,

phytosanitary problems, erosion, and maintenance of soil fertility were the major constraints to cassava production. However, yields in industrial plots increased from 15 to 20 t/ha in 1978-79, and from 25 to 30 t/ha in 1980-81. Further research in mechanization is recommended. Maps are included for av. yields and annual production of cassava in different regions of the country. (CIAT)

0447

31383 RAFFAILLAC, J.P.; NEDELEC, G. 1984. Fertilisation du manioc (Manihot esculenta Crantz, var. Bonoua) en basse Cote d'Ivoire. Etude de cas. (Fertilization of cassava var. Bonoua in lower Ivory Coast. Case study). Abidjan, Cote d'Ivoire, Office de la Recherche Scientifique et Technique Outre Mer. 14p. Fr., 11 Ref., Il. Paper presented at Seminaire Production Agricole etMaintien de la Fertilité des Sols en zone Tropicale, Yamoussoukro, Cote d'Ivoire, 1984. (Laboratoire d'Agronomie, Centre ORSTOM d'Adiopodoumé, B.P. V51, Abidjan, Cote d'Ivoire)

CASSAVA; FERTILIZERS; N; P; K; LEAVES; METABOLISM; ROOT DEVELOPMENT; IVORY COAST.

A short bibliographic review is presented on the role of NPK fertilization of cassava crops. A field trial was conducted to determine the effect of different NPK treatments on cassava performance. The trial was carried out with local var. Bonoua in a sandy soil of lower Ivory Coast. Growth controls were implemented by measuring stem diameter evolution. A leaf diagnosis was also carried out. Only KCl supply was found suitable from both agronomic and economic viewpoints. Antagonism was observed between N and K, therefore care should be taken when N is applied at the beginning of the vegetative cycle. A supplementary N supply resulted in additional uptake which affected the role of K in plant metabolism and avoided a supplementary increase of the level in tubers. (CIAT)

0448

31395 RAFFAILLAC, J.P. 1985. Pluviométrie et qualité de la production chez le manioc dans le sud de la Cote d'Ivoire. (Rainfall and quality of cassava production in southern Ivory Coast). In Institut Francais de Recherche Scientifique pour le Développement en Coopération. Eau et développerent agricole. Abidjan, Cote d'Ivoire, pp.78-81. Fr., 7 Ref., Il.

CASSAVA; RAINFALL; DRY MATTER; STORAGE; IVORY COAST.

Twelve-mo.-old cassava crops, planted at 7 (April-Oct. 1982) and 9 planting dates (April-Dec. 1983) at Adiopodoumé exptl. station, Ivory Coast, were compared to determine the effect of rainfall on production quality. Rainfall at the end of the cycle played an important role in determining root DM content and affected the efficiency of a traditional procedure to transform the fresh tuber into a finished product for consumption. Product storage can become a problem because of high MC. (CIAT)

0449

32299 SAWADOGO, A. 1977. L'agriculture en Cote d'Ivoire. (Agriculture in Ivory Coast). Paris, France, Presses Universitaires de France. 367p. Fr., 90 Ref., Il.

CASSAVA; ATIEKE; SMALL-SCALE PROCESSING; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; IVORY COAST.

The importance of agriculture in Ivory Coast is highlighted and the role of various food crops (including cassava) is described in detail. The main cassava-growing regions and the major qualities of the tuber are mentioned. Information is presented on the different ways in which cassava is eaten and

the existence of thousands of small-scale factories for its transformation into atieke. Other possibilities for cassava processing are mentioned. Finally, the need to include cassava in the major objectives of the 1970-80 developmental plan is highlighted. (CIAT)

0450

30868 VAN DE PLAS, G. 1983. Cultures vivrieres: manioc. (Food crops: cassava). In Van de Plas, G. Recherche d'un cultivar de bananier plantain adapté a la culture rationnelle. Rapport final. Rome, Italy, Food and Agriculture Organization of the United Nations. pp.27-30,41-42. Fr.

CASSAVA; CULTIVARS; SELECTION; RESISTANCE; CONGO; IVORY COAST.

From results of comparative trials between local cassava var. from Congo and Ivory Coast, selection was aimed at obtaining a short-cycle (10-14 mo.) and high-yielding var., resistant to root rot, CMV, anthracnose, and Cercospora. The selection-evaluation scheme used since 1976 for the material coming from the International Institute of Tropical Agriculture (IITA) is presented and the major agronomic characteristics of the best 1976 cassava clones (ME-76-7, ME-76-13, ME-76-33, and ME-76-6) are mentioned. From the var. maintained in 1979, 79-132 is highlighted for its high DM content (40 percent), and yellow tuber cassava var. (known to have more Ca and vitamin A than white var.). Recommendations are given for selection work for 1984-86. A table showing the major characteristics of cassava var. ME-76-13, ME-76-33, ME-76-7, and ME- 79-J1 is included. (CIAT)

0451

32001 VANDEVENNE, R. 1970. Notice culturale pour le manioc. (Review of cassava cultivation). Abidjan, Cote d'Ivoire, Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres. 2p. Fr.

CASSAVA; CULTIVATION; IVORY COAST.

General information is presented on cassava cultivation in Ivory Coast for 1970 regarding planting material (var. used and yields, yields obtained from improved var., and cutting removal), crop calendar (planting and harvesting time), and cultural practices (soil preparation, fertilization, plant density, weeding, and disease control). (CIAT)

0452

26788 YAO KOUASSI, M. 1985. LA SITUATION DU SECTEUR DES RACINES, TUBERCULES ET PLANTAINS EN COTE D'IVOIRE. (THE SITUATION OF ROOTS, TUBERS, AND PLANTAINS IN IVORY COAST). IN WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE, 1985. REPORT. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.27-75. FR., 10 REF., IL.

CASSAVA; MARKETING; TRADE; PRICES; COSTS; CONSUMPTION; DISTRIBUTION; POSTHARVEST LOSSES; PROCESSING; INTERCROPPING; PESTS; PLANT BREEDING; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; LEGAL ASPECTS; IVORY COAST.

THE SITUATION OF ROOTS, TUBERS, AND PLANTAINS IN IVORY COAST IS EVALUATED. THE PARTICIPATION OF THESE PRODUCTS IN TOTAL FOOD PRODUCTION DECREASED FROM 89.50 TO 79.27 PERCENT FROM 1960 TO 1980 DUE TO ARCHAIC STRUCTURES, ABSENCE OF CROP INTENSIFICATION PRACTICES AND FINANCIAL MECHANISMS, SELF-CONSUMPTION, AND DISTRIBUTION LOSSES. IN 1985 THE CONSUMPTION OF CASSAVA REACHED 970,000 T. THERE IS A BALANCE BETWEEN RURAL AND URBAN CONSUMPTION SINCE CASSAVA IS PRODUCED IN BOTH COASTAL AREAS AND AROUND ABIDJAN. CASSAVA IS MAINLY MARKETED AS ATIEKE. PRICE VARIATION IS DETERMINED BY SEASON AND MARKETS. PRICE MARGINS FAVOR MIDDLEMEN. CASSAVA SOLD AT RETAIL LEVELS PRODUCES HIGHER GROSS MARGINS THAN AT WHOLESALE LEVELS (160 VS. 60

PERCENT). MARKETING CONSTRAINTS, GOVERNMENT POLICIES, SOME ATTEMPTS OF INDUSTRIAL TRANSFORMATION, AND DIFFERENT CASSAVA PRODUCTS ARE DISCUSSED. PRIORITY SHOULD BE GIVEN TO VAR. IMPROVEMENT. (CIAT)

0453

31394 YAO, N.R.; GOUE, B.; MONTENY, B.; ZELLER, B. 1985. Effect du déficit hydrique du sol sur le développement foliare et sur la production de matiere seche chez le manioc (Manihot esculenta Crantz). (Effect of soil water stress on cassava leaf development and dry matter production). In Institut Francais de Recherche Scientifique pour le Développement en Coopération. Eau et développement agricole. Abidjan, Cote d'Ivoire, ;p.74-77. Fr., 5 Ref., Il.

CASSAVA; WATER STRESS; PLANT DEVELOPMENT; DRY MATTER; LEAVES; LEAF AREA; CANOPY; PLANT HEIGHT; CARBON DIOXIDE; IVORY COAST.

The effect of soil water stress on cassava development and DM production was studied in var. CB (Congo Brazzaville) planted at a density of 10,000 plants/ha. Parameters measured were LAI, DM accumulation in different parts of the plant, soil water level, av. no. of leaves/plant, canopy height, and height of basal leaves. At 45 days after planting, drought caused soil water stress to last for more than 1 mo., decreasing the rate of leaf emission (0.65-0.45 leaves/day/stem). After the rains, the rate of leaf emission increased until initial values were reached and then decreased again when soil water depletion occurred. Initiation of new leaves was reduced, leaves developed during drought were smaller, and senescence of basal leaves was detected as of the 1st water stress period. LAI was less than 3 decreasing the CO_2 exchanges between the plant and the atmosphere which, in turn, reduced DM production. (CIAT)

0454

30497 YAO, N.R. 1987. Microclimate in a cassava field. In Séminaire International La Mosaique Africaine du Manioc et son Controle, Cote d'Ivoire, 1987. Résumés. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Cooperation. p.37. En., 5 Ref. (Laboratoire de Bioclimatologie, ORSTOM/FERMA Abidjan, Cote d'Ivoire)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; ALEYRODIDAE; TEMPERATURE; IVORY COAST.

Results from a study on the influence of microclimatic parameters on the spread of whitefly-transmitted viral diseases showed that wind speed and direction were the more important climatic factors influencing CAMV spread. Turbulence phenomena (caused by changes in wind direction and speed) along the borders and above the canopy of the cassava field were found to be 2 efficient means of allowing the accumulation of whiteflies. Low wind speeds inside the canopy and wind profiles in general also accounted both for whitefly and disease distribution in the cassava field. The variation in whitefly activity during the day or day after day was influenced by the relationship between air temp., RH, and wind speed during the day. Changes in microclimatic conditions due to thunderstorms and intensive rain may have influenced the size and movement of whitefly populations and consequently affected disease spread. (Full text)

0455

25564 YEO, G. 1981. LE PLAN MANICC ET LE PROJET AGRO-INDUSTRIEL DE TOUMODI. (THE CASSAVA PLAN AND THE AGROINDUSTRIAL PROJECT OF TOUMODI). IN WORKSHOP ON PROCESSING TECHNOLOGIES FOR CASSAVA AND OTHER TROPICAL ROOTS AND TUBERS IN AFRICA, ABIDJAN, IVORY COAST, 1983. PROCEEDINGS. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.469-484. FR.

AFRICA; CASSAVA PROGRAMS; CULTIVATION; DEVELOPMENT; ECONOMICS; IVORY COAST; MECHANIZATION; PROCESSING; PRODUCTION; USES.

THE CASSAVA PLAN AND AGROINDUSTRIAL PROJECT OF TOUMODI, IVORY COAST, ARE PRESENTED AND DISCUSSED. THE BASIC OBJECTIVES OF BOTH ARE THE IMPROVEMENT OF CASSAVA CULTIVATION AND THE ESTABLISHMENT OF AN AGRICULTURAL UNIT FOR ITS PROCESSING, THUS NORMALIZING THE DEMAND AND STABILIZING THE PRICE. THEIR EXECUTION, DIFFICULTIES, EFFORTS, ACHIEVEMENTS, AND RESEARCH CARRIED OUT ARE ANALYZED. (CIAT)

0456

29522 ZAKRA, A.N.; POMIER, M.; TAFFIN, G. DE 1986. Premiers résultats d'une expérience d'association cocotiers- cultures vivrieres en Moyenne Cote d'Ivoire. (Initial results of an intercropping experiment of coconut with food crops in central Ivory Coast). Oléagineux 41(8-9):381-387. Fr., Sum. Fr., En., Es., 3 Ref., Il.

CASSAVA; INTERCROPPING; ROTATIONAL CROPS; COCONUT; INCOME; IVORY COAST.

A multisite coconut/food crop intercropping expt. was set up in 1982, in collaboration with 4 planters in Ivory Coast. Results indicate that in spite of a few practical problems, intercropping for 2 yr can favor coconut growth and development when food crops are correctly maintained and young coconuts protected from rodent attack. Recommended crops for intercropping are yam, cassava, sweet potato, groundnut, and maize. In the 2nd yr, Pueraria javanica is sown as a catch crop under maize which terminates intercropping. Well managed, intercropping will be financially rewarding for the farmer. Special extension efforts are, however, necessary at the farmer level. Aftereffects of food crops on nut production will be observed. (AS)

0457

31391 ZELLER, P.; GOUE, P.; MONTEMY, P.; YAO, E.F. 1985. Modélisation du bilan hydrique a l'échelle de la parcelle: application au cas du manioc dans les conditions édaphoclimatiques de Adiopodoumé. (Water balance modeling at a plot level: application to cassava within Adiopodoumé's edaphoclimatic conditions). In Institut Francais de Recherche Scientifique pour le Développement en Coopération. Eau et développement agricole. Abidjan, Cote d'Ivoire, pp.59-62. Fr., Il.

CASSAVA; SOIL MOISTURE; CANOPY; TRANSPIRATION; WATER STRESS; ANALYSIS; IVORY COAST.

General information is given on the role water plays in the plant. A scheme proposed for a better understanding of the water balance phenomenon in cassava crops is described in detail. It involves the measurements of real evapotranspiration, potential evapotranspiration, global canopy resistance, radiation, temp., air moisture, wind speed, and soil type. These measurements determine the water balance of the crop. The application of the model to the cropping schedules of a region allows crops water stress levels to be predicted. (CIAT)

0458

31331 ZIRIMBA, S.; KOUAMIO, A. 1985. Rapport des activités du service des tubercules racines et plantain: année 1985. (1985 Activities report from the root crops and plantain service). Cote d'Ivoire, Ministere du Développement Rural, Direction des Cultures Vivrieres. 13p. Fr.

CASSAVA; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; CASSAVA FLOUR; ATIEKE; CASSAVA ROOTS (VEGETABLE); CULTIVARS; CONSUMPTION; PRICES; MARKETING; POSTHARVEST LOSSES; STORAGE; RESISTANCE; HERBICIDES;

MECHANIZATION; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; PHENACOCCUS MANIHOTI; INSECTICIDES; PROCESSING; IVORY COAST.

The importance of cassava as the 2nd food crop in Ivory Coast is highlighted. Statistics are presented on area planted (ha), production (t), and yields (t/ha) of this tuber crop for 1980-83, and on consumption in the form of fresh cassava, CF, and atieke (kg/capita/yr). The different ways cassava is eaten are mentioned and briefly described. General characteristics of cassava commercialization are described and figures are proposed for the evolution of cassava retail prices for 1980-83. Losses were determined both at harvest and in storage and distribution of the tuber. Finally, the main results of research activities on cassava are reported. Works dealt with plant breeding, cultural practices, crop protection, conservation, and processing. Several var. such as Bonoua, H3, Kataoli, Tabouka, CB, TA 49, TA 24, P 33, and P 6 were proposed for dissemination. Cultural practices aimed at mechanization. Regarding full crop protection, 2 herbicides are mentioned as effective for weed control; resistant var. are the unique way to control CBB, and an insecticide for cassava mealybug control is recommended. A scheme that summarizes the processing stages of the Toumodi pilot factory is included. (CIAT)

KENYA

0459

29070 EAST AFRICAN AGRICULTURE AND FORESTRY RESEARCH ORGANIZATION. 1977. Cassava mosaic. In East African Agriculture and Forestry Research Organization. Quarterly Report Jan-Mar. 1977. Nairobi, Kenya, 7p. En.

CASSAVA; DISEASE CONTROL; CUTTINGS; CASSAVA AFRICAN MOSAIC VIRUS; KENYA.

The Jan.-March quarterly report on the advance of CAMD in East Africa is briefly presented; special reference is made to Kenya. Results from both western Kenya and Coast Province show that CAMD need not be the severely limiting factor it has been; control by the use of clean CAMD-free planting material is both practicable and possible. (CIAT)

0460

29316 EAST AFRICAN AGRICULTURE AND FORESTRY RESEARCH ORGANIZATION. 1973. Cassava mosaic virus. In East African Agriculture and Forestry Research Organization. Quarterly Report Jan-Mar. 1973. Nairobi, Kenya, p.7. En.

CASSAVA; PLANT BREEDING; RESISTANCE; CASSAVA AFRICAN MOSAIC VIRUS; KENYA.

A brief summary of advances and future objectives of the 1937-57 research program to search for resistance to CAMD in East Africa is presented. While field immunity could not be achieved, cassava var. derived from interspecific crosses (e.g., cassava x Manihot glaziovii) possessed useful degrees of field resistance. A collection of 60 elite var. is now in different stages of selection to attain the virus-free status. These materials will be used in field expt. to determine the rate of reinfection and factors influencing it. (CIAT)

0461

29080 KATUMANI RESEARCH STATION. KENYA. 1985. List of cassava germplasm; planted in Dec. 1983 and selections made in July 1985. Kenya, 5p. En., Dat.num.

CASSAVA; GERMPLASM; CULTIVARS; IDENTIFICATION; CASSAVA AFRICAN MOSAIC VIRUS; RESISTANCE; AGRONOMIC CHARACTERS; ORGANOLEPTIC EXAMINATION; KENYA.

Forty-nine cassava germplasm materials planted at Katumani Research Station, Kenya, in Dec. 1983 are listed. Information given on each accession includes skin and flesh color, no. of roots, taste, and information whether or not it was selected in July 1985. General remarks on tubers, resistance or susceptibility, branching habits, among others, are also given. (CIAT)

0462

29066 KENYA. DEPARTMENT OF AGRICULTURE. 1962. Cassava variety trial, Mtwapa. In Kenya. Department of Agriculture. Annual Report 1962. Kenya, p.212. En.

CASSAVA; CULTIVARS; ROOT PRODUCTIVITY; RESISTANCE; CASSAVA BROWN STREAK VIRUS; KENYA.

The results of a cassava var. trial including 16 CAMD-resistant var. in Mtwapa, Kenya, in 1962, are presented. Cassava var. 5543/19 and 5538/19 outyielded (5.84 and 5.68 t/ha, resp.) all others at the 5 percent level, and all except 46106/27 (5.07 t/ha) at the 1 percent level. These 2 var., however, were unpalatable and subject to heavy brown streak virus infection. Var. 46106/27 remains as the best cassava var. tested. (CIAT)

0463

29071 KENYA. MINISTRY OF AGRICULTURE. 1978. Cassava. In Kenya. Ministry of Agriculture. Annual Report 1978. Kenya, pp.37-38. En.

CASSAVA; STATISTICAL DATA; PRODUCTION; PRODUCTIVITY; PRICES; KENYA.

The current situation of cassava cultivation in the Coast Province of Kenya is briefly described. Comparative data on estimated area, yields, and total production per district in 1977 and 1978 are provided. CAMD continued to be a threat to all cassava cv. Important pests were baboons and wild pigs. Prices paid for cassava in local markets are given. (CIAT)

0464

29067 KENYA. MINISTRY OF AGRICULTURE. 1971. Cassava method of planting trial at Mtwapa. In Kenya. Ministry of Agriculture. Annual Report of Research Division 1971. Kenya, p.96. En.

CASSAVA; PLANTING; CUTTINGS; SPACING; PRODUCTIVITY; CASSAVA CHIPS; KENYA.

A cassava trial investigating the following 6 planting methods was conducted in Mtwapa, Kenya, in 1971: (1) standard (35-cm cuttings planted at 45-degree angle, at 20-cm depth, 1 m between plants); (2) upright planting (same as standard except planted at 90-degree angle); (3) furrow planting (35-cm cuttings horizontally placed end to end in continuous line 15 cm deep; (4) furrow planting (same as method 3 except cutting length = 70 cm); (5) furrow planting (15-cm cuttings horizontally placed and spaced at 1 m in base of furrow 15 cm deep); (6) furrow planting (same as method 5, except cutting length = 35 cm). Two harvesting dates (10 and 14 mo. after planting) and 2 cassava cv. (50284/33 and 54140/10) were used. Mean yields were low probably due to the dry season. Treatments 2, 4, 5, and 6 gave acceptable economic yields (av. for both harvesting dates 6.25, 6.98, 6.31, and 6.61 t dry chips/ha, resp.). No changes in the current recommended planting method can be advised. Harvesting at 14 mo. appears preferable to that at 10 mo. (CIAT)

0465

29073 KENYA. MINISTRY OF AGRICULTURE. 1979. Cassava production in Kenya. Kenya, 2p. En.,Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; KENYA.

Figures on cassava production and cultivated area in 1979 are given for the following provinces and districts in Kenya: Nyanza (Kisii, Kisumu, Siaya, and South Nyanza); Western (Bungoma, Busia, and Kakamenga); Coast (Kilifi, Kwale, Lamu, Mombasa, Taita/Taveta, and Tana River); Eastern (Embu, Kitui, Machakos, and Meru); Rift Valley (Baringo, Elgeyo Marakwet, and West Pokot); Central (Kiambu, Kirinyaga, and Muranga); and North Eastern. Total area planted to cassava in Kenya was 51,852 ha with a estimated production of 412,782 t. (CIAT)

0466

29077 KENYA. MINISTRY OF AGRICULTURE. COAST AGRICULTURAL RESEARCH STATION. 1983. CASSAVA VARIETY TRIAL, CASSAVA TIME OF PLANTING/HARVESTING TRIAL, CASSAVA ROTATION TRIAL. IN--------. ANNUAL REPORT 1983. KENYA. PP.41-46. EN.

CASSAVA; CULTIVARS; PLANTING; HARVESTING; PRODUCTIVITY; INTERCROPPING; MAIZE; COWPEA; PALATABILITY; KENYA.

THE RESULTS OF 3 CASSAVA TRIALS CONDUCTED IN KENYA ARE PRESENTED. TWELVE CASSAVA VAR. WERE TESTED IN THE VAR. TRIAL OF 1982-83. MWAKAZANGA (LOCAL) AND F 279 M CONTINUED TO BE THE TOP YIELDERS WITH 36.0 AND 33.9 T/HA, RESP., FOLLOWED BY THE LOCAL VAR. KIBANDAMENO (33.5 T/HA). WHILE THE LATTER WAS HIGH YIELDING AND THE MOST POPULAR AMONG LOCAL PEOPLE, IT IS MORE FIBROUS THAN THE REST. MWAKAZANGA IS ACCEPTABLE BUT IT TAKES VERY LONG TO COOK (40 MIN) AS WELL AS 5543/156 (35 MIN) THAT HAS TASTE PROBLEMS. VAR. 46106/27 WITH 31.34 T/HA SHOWED THE HIGHEST DEGREE OF ACCEPTABILITY, EXCEPT FOR COLOR. THE RESULTS OF 2 EXPT. ON PLANTING TIME/HARVESTING TIME INDICATED THAT THE HIGHEST AV. FRESH ROOT YIELD (34.35 T/HA) WAS OBTAINED WHEN CASSAVA WAS PLANTED DURING THE LONG RAINS IN APRIL AND HARVESTED 18 MO. LATER. THE HIGHEST YIELD (31.85 T/HA) FOR OCT. PLANTINGS (SHORT RAINS) WAS OBTAINED WHEN CASSAVA WAS HARVESTED 12 MO. LATER. THE AV. YIELDS FOR THE LONG AND SHORT RAINS WERE 29.4 AND 26.9 T/HA, RESP. THE CASSAVA ROTATION TRIAL WITH 4 TREATMENTS (CCCCCC, XXCXXC, XCCXCC, AND CXCCXC, WHERE C = CASSAVA VAR. 5543/156 AND X = MAIZE OR COWPEA) OVER THE PERIOD 1977-83 INDICATED THAT THE HIGHEST CASSAVA YIELDS WERE OBTAINED WHEN CASSAVA WAS PRECEDED BY A DIFFERENT CROP, AND THE LONGER THE LAND RESTS FROM CASSAVA, THE HIGHER THE CASSAVA YIELDS. (CIAT)

0467

29072 BOCK, K. 1979. HANDING-OVER NOTES: CASSAVA PROGRAMME. NAIROBI, KENYA AGRICULTURE RESEARCH INSTITUTE. CROP VIROLOGY RESEARCH PROJECT. 12P. EN.

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; ADAPTATION; RESEARCH; CASSAVA PROGRAMS; PLANTING; TIMING; CULTIVARS; KENYA.

THE STATUS OF CASSAVA RESEARCH ACTIVITIES AND NEEDS, ESPECIALLY PERTAINING TO CAMD, IN DIFFERENT RESEARCH STATIONS OF KENYA, IS REPORTED. IN THE COAST PROVINCE, RESEARCH IS BEING CONDUCTED IN MTWAPA, MSABAHA, MATUGA, AND SHIMO LA TEWA, ESPECIALLY REGARDING CAMD-FREE BULKING BLOCKS, LOCAL VAR. PLOTS, BULKING PLOTS FROM MERISTEM CULTURE-DERIVED CASSAVA, AND FIELD TRIALS (CROP ROTATION, TIME OF PLANTING/HARVESTING, AND VAR. TRIALS). RESEARCH IN EASTERN PROVINCE (KATUMANI AND MARINDUEO) AND IN WESTERN KENYA (KAKAMAGA AND MUGUGA) IS BRIEFLY REPORTED. (CIAT)

0468

30501 BOCK, K.R. 1987. Some aspects of the epidemiology of African cassava mosaic virus in coastal districts of Kenya. In Séminaire International La Mosaique Africaine du Manioc et son Controle, Cote d'Ivoire, 1987. Résumés. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Cooperation. p.42. En.

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; EPIDEMIOLOGY; RESISTANCE; KENYA.

The period of peak infection of CAMV in coastal districts of Kenya was found to occur during and immediately after the main rains of May, June, and July. During Sept.-Dec. a 2nd minor resurgence occurred. The dispersal range (long range and short range) of CAMV is mentioned. The use of mosaic-free planting mate-rial as the 1st prerequisite for field control of the disease is high-lighted; var. susceptibility and regional and local factors governing incidence should also be taken into account. (CIAT)

0469

29068 CHOGO, P. 1973. Cassava: method of planting trial. In Kenya. Ministry of Agriculture. Annual Report of Scientific Division 1973. Kenya. pp.106-107. En.

CASSAVA; PLANTING; CUTTINGS; HARVESTING; TIMING; ROOT PRODUCTIVITY; KENYA.

Six cassava planting methods were tested for yield performance at 10 and 18 mo. in Mtwapa, Kenya, in 1973. Methods were (1) standard, 35-cm cuttings planted at 45 degrees, 20 cm buried, and 1 m between plants; (2) furrow planting, 35-cm cuttings planted end to end in furrow covered 15 cm deep; (3) furrow planting, 35-cm cuttings spaced at 1 m in furrow covered 15 cm deep; (4) furrow planting, 70-cm cuttings planted end to end in furrow covered 15 cm deep; (5) furrow planting, 70-cm cuttings spaced at 1 m in furrow covered 15 cm deep; (6) furrow planting, 15-cm cuttings spaced at 1 m in furrow covered 15 cm deep. The highest av. yield (8559 kg/ha) was obtained with method 1, but the av. yield for all treatments combined was also high (7647 kg/ha). Av. yields for the rest of the treatments were 8207, 7631, 7327, 7215, and 6943 kg/ha for method 5, 3, 2, 6, and 4, resp. Furrow planting methods have good prospects in cassava propagation, especially in areas of large-scale cassava production. Results indicate that it is unadvisable to plant cassava too close (methods 2 and 4). Higher av. yields were obtained when crops were harvested at 14 mo. (8831 kg/ha) than at 10 mo. (6144 kg/ha). (CIAT)

0470

29313 DOUGHTY, L.R.; GOURLAY, D.W.; JENNINGS, D.L. 1957. Plant improvement and protection: cassava. Record of research 1956 to 1957. In East African Agriculture and Forestry Research Organization. Annual Report 1957. Tanzania, pp.43-44. En.

CASSAVA; PLANT BREEDING; HYBRIDIZING; BACKCROSSING; RESISTANCE; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BROWN STREAK VIRUS; KENYA; TANZANIA.

Advances in field trials screening for disease resistance and distribution of selected cassava clones in East Africa during 1956- 57 are reported. In the field trials Manihot glaziovii x cassava backcrosses and their intercrosses provided the promisory sources of resistance to both CAMD and cassava brown streak virus. Crosses between derivatives from line 4032 (1st backcross of M. glaziovii x cassava to cassava) and derivatives of other B1 M. glaziovii hybrid lines produced a high proportion of CAMD-resistant clones, but inferior in yield to line 4032. The highest proportion of high yielding clones was obtained from M. glaziovii x cassava hybrids and M. melanobasis x cassava hybrids, but their resistance to cassava brown streak was unsatisfactory as well as plant establishment. A fair proportion of CAMD-resistant clones was obtained from crosses between M. glaziovii x cassava derivatives and those from M. dichotoma x cassava, with few exceptions, tend to be poor yielders or susceptible to brown streak virus. (CIAT)

0471

29366 GITHUNGURI, M. 1982. Cassava rotation trial--Mtwapa. In Kenya. Ministry of Agriculture. Annual Report 1982. Kenya, Coast Agricultural Research Station. pp.115-117. En.

CASSAVA; ROTATIONAL CROPS; ROOT PRODUCTIVITY; KENYA.

Partial results of an on-going rotation trial with cassava cv. 5543/156 in Mtwapa, Kenya, to be conducted over 6-7 successive years and started in 1977, are briefly discussed. Av. yields the 1st year were 51 t/ha. In the 2nd year, av. yields were reduced to 27 t/ha and were more depressed when cassava followed cassava than when cassava followed cowpea or maize/simsim. In the 3rd year, cassava yields were further reduced to 15 t/ha in continuous cassava cropping, with no significant differences between this and the other rotational treatments. In the 4th year, av. yields for continuous cassava cropping were 20.2 t/ha, for CXCC (C = cassava; X = maize, simsim, or cowpea) 22.3 t/ha, for CCXC 23.0 t/ha, and for CXXC 23.2 t/ha. (CIAT)

0472

29367 GITHUNGURI, M. 1982. Cassava time of planting/harvesting trial . In Kenya. Ministry of Agriculture. Annual Report 1982. Kenya, Coast Agricultural Research Station. pp.117-119. En.

CASSAVA; PLANTING; TIMING; ROOT PRODUCTIVITY; KENYA.

Partial results are presented of an on-going planting date (April or Oct.) x harvesting date (1st harvest, 12 mo. after planting, and 10 harvests more at 1-mo. interval:) trial to study their effects on root yields of cassava cv. 5543/156 in Kenya. The April planting gave an av. yield of 29.40 t/ha and the Oct. planting, 26.92 t/ha. While data still require further statistical analysis, there are indications that the best planting time is April (beginning of the long rains). (CIAT)

0473

29365 GITHUNGURI, M. 1982. Cassava variety trial. In Kenya. Ministry of Agriculture. Annual Report 1982. Kenya, Coast Agricultural Research Station. pp.113-115. En.

CASSAVA; CULTIVARS; ROOT PRODUCTIVITY; KENYA.

The results of the 1981 and 1982 harvests of the on-going cassava var. trial in Coast Province, Kenya, are presented. The same 12 cassava var. were included in both years. Results of the 1st yr showed that Kibandameno (av. 25.04 t/ha), a local var. and the highest yielder, performed as well as the recommended var. 5543/156 (av. 25.58 t/ha) and better than 46106/27 (also recommended, av. 16.00 t/ha). Results of the 2nd yr showed that var. 5343/156 outyielded all other var. (47.00 t/ha) followed by 46106/27 (44.20 t/ha) and Aipim Valenca (45.00 t/ha); among local var., Mwakasanga was 1st (43.47 t/ha) followed by Kibandameno (40.13 t/ha). (CIAT)

0474

30437 GRAHAM, J.F. 1959. Notes on Kenya agriculture. 7. Insect pests and control measures. East African Agricultural Journal 25(1):2-9. En.

CASSAVA; AONIDOMYTILUS ALBUS; INSECT CONTROL; INSECTICIDES; KENYA.

Brief indications are given on how insect specimens should be sent for their corresponding identification in Kenya. General precautions to be taken when using toxic substances in agriculture are mentioned and indications are given on the mixture and dilution of insecticides. Some of the more

important pests of different crops (among them cassava) are listed. The only cassava pest mentioned is the cassava scale (Aonidomytilus albus), which attacks stems and leaves. Found in all areas, it is sometimes severe. Control measures include the spraying of diazinon or malathion at 0.1 percent. (CIAT)

0475

29065 GRIMES, R.C.; CLARKE, R.T. 1962. Continuous arable cropping with the use of manure and fertilizers. East African Agricultural and Forestry Journal October 1962:74- 80. En., Sum. En., 11 Ref.

CASSAVA; CULTIVATION SYSTEMS; DUNG; FERTILIZERS; ROOT PRODUCTIVITY; KENYA.

A trial was conducted at the Matuga Exptl. Station (Coast Province, Kenya) to determine if crop yields could be maintained under continuous arable cropping, using manure and fertilizers. In sorghum, sweet potatoes, maize, and cassava, there were large responses to FYM and artificial fertilizers; however, the response was significant only for cassava in all years (1953-60). In cassava, annual application of 3 t of manure was slightly superior to the triennial 9-t application. Artificial fertilizers were as effective as FYM in sustaining crop yields. (CIAT)

0476

29314 HOLLINGS, M.; BOCK, K.R. 1969. Cassava. In East African Agricultural and Forestry Research Organization. Annual Report 1969. Tanzania, p.84. En.

CASSAVA; RESISTANCE; CASSAVA AFRICAN MOSAIC VIRUS; KENYA; UGANDA.

Cassava plant pathology research in 1969 in East Africa is briefly reported. In the field, 35-50 percent severe infection of plants by the widespread CAMD was commonly encountered in mature plantations in most areas. Cuttings from apparently healthy resistant var. and of diseased plants from Coast Province of Kenya and the districts of Lango, West Nile, Teso, Bunyoro, and Buganda of Uganda were rooted and preliminary studies on the virus initiated. No virus particles were observed in initial examinations of samples. (CIAT)

0477

29064 HUMPHREY, N. 1938. Food crops and food shortage: cassava. East African Agricultural Journal September 1938:108. En.

CASSAVA; CULTIVARS; RESISTANCE; CASSAVA AFRICAN MOSAIC VIRUS; KENYA.

The identification of a cassava var. showing resistance to CAMD is reported. The var. was named Malindi and showed high CAMD resistance and root yield, and high palatability. (CIAT)

0478

29081 IMUNGI, J.K. 1986. Cassava in Kenya: consumption, cyanide contents and toxicity. In Interdisciplinary Conference on Natural Toxicants in Foods, Zurich Switzerland, 1986. Proceedings. Zurich, Switzerland, pp.191- 202. En., Sum. En., 15 Ref. (Dept. of Food Technology & Nutrition, Univ. of Nairobi, P.O. Box 29053, Kabete, Kenya)

CASSAVA; STATISTICAL DATA; PRODUCTION; CULTIVARS; HCN CONTENT; TOXICITY; DETOXIFICATION; KENYA.

General aspects of cassava production, consumption, and processing in Kenya are described. Five local var. (Gari Moshi, Mwakazanga, Guzo, Chokorokota, and Kasimbizi) and 4 Brazilian var. (Aipin Valencia, 4750, 4763, and 4770) were analyzed for HCN content at the Coastal Agricultural Research Station

in Mwapa. Total HCN content varied between 24 mg/kg fresh edible portion for var. Mwakazanga to 134 mg/kg fresh edible portion for 4750; HCN levels of var. 4750, 4770, 4750 (61.0 mg/kg) and Kasimbizi (53.0 mg/kg) exceeded the HCN tolerance level (50 mg/kg). Cases of hospitalization and deaths due to cassava consumption are reported. Aflatoxins from moldy cassava have also been detected at levels above the tolerable limit of 20 ppb; these could also cause poisoning. There is a need to screen and eliminate bitter and wild cassava var. presently cultivated in the country, and supply the farmers with sweet and higher yielding var. Improved processing or preparation techniques should be developed to reduce HCN to levels safe for consumption, as well as suitable storage systems which prevent the growth of molds, especially those producing aflatoxins. (CIAT)

0479

32239 INGRAM, W.R. 1986. Potential for the biocontrol of cassava green mite in Africa. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. pp.103-115. En., 35 Ref. (Commonwealth Inst. of Biological Control, Kenya Station P.O. Box 30148, Nairobi, Kenya)

CASSAVA; MONONYCHELLUS TANAJOA; PREDATORS AND PARASITES; BIOLOGICAL CONTROL; KENYA.

The identification features, damage, infestations, indigenous natural enemies, and introduction of natural enemies of Mononychellus tanajoa are reviewed. The potential for its biological control in Kenya is discussed. It is hoped that through indigenous, facultative, and introduced natural enemies, M. tanajoa will be biologically controlled in different areas of Kenya. (CIAT)

0480

26835 KEYA, E.L.; HADZIYEV, D. 1985. THE USE OF CASSAVA STARCH IN BREADMAKING. CROATICA CHEMICA ACTA 58(4):473-489. EN., SUM. EN., SERBO-CROATIAN., 9 REF., IL. (DEPT. OF FOOD SCIENCE & TECHNOLOGY, UNIV. OF NAIROBI, KENYA)

CASSAVA; CASSAVA STARCH; BREADS; COMPOSITE FLOURS; WHEAT FLOUR; TEMPERATURE; TIMING; ORGANOLEPTIC EXAMINATION; GLUTEN; KENYA.

A BREADMAKING-QUALITY WHEAT GLUTEN WAS USED IN A COMPOSITE FLOUR FORMULA OF 85 PERCENT STARCH AND 15 PERCENT VITAL GLUTEN TO ASSESS THE FEASIBILITY OF USING CASSAVA STARCH IN BREADMAKING. SOME CASSAVA STARCH TECHNOLOGICAL PROPERTIES, SUCH AS SIZE, SWELLING POWER, AND GELATINIZATION, WERE CLOSE TO THOSE OF WHEAT STARCH, WHEREAS AMYLOSE SOLUBILITY AND EXTENT OF RETROGRADATION DIFFERED. THE FORMER PROPERTY HAD A BENEFICIAL EFFECT ON STARCH GLUTEN AFFINITY WHILE THE LATTER HAD TO BE RECTIFIED BY FORMING STARCH CLATHRATE COMPOUNDS WITH ALPHA-CRYSTALLINITY FORMS OF C16-TYPE MONOGLYCERIDES. THEREFORE, WHEAT STARCH CAN BE INTERCHANGED WITH CASSAVA STARCH, RETAINING BREAD QUALITY CLOSE TO THAT OF TRUE WHEAT BREAD. ADDITIONALLY, THE FEASIBILITY OF USING CASSAVA ROOT FLOURS INSTEAD OF STARCH WAS ALSO SUGGESTED. (AS)

0481

29589 MARANGU, L.T. 1985. Utilization of food crops in Kenya: roots and tubers. In Country Statement for Consultation on Home Economics and Agricultural Research, Ibadan, Nigeria, 1985. Summary report and recommendations on food crops utilization. Ibadan, Nigeria, International Institute of Tropical Agriculture. Home Economics Association of Africa. pp.46-47,49-50. En.

CASSAVA; CONSUMPTION; STATISTICAL DATA; KENYA.

The need for more research on root and tuber crops utilization in Kenya, including cassava, is discussed and stressed. Food consumption estimates for 1986 are given, indicating that per capita consumption of cassava and other root crops is 30.5 and 3.0 kg/yr for rural and urban populations, resp., and the total national demand amounts to 369,000 t. Av. per capita availability figures of major foods in Kenya are compared for the periods 1965/70, 1971/75, 1970/80, and 1981/85, showing a decreasing trend for cassava from 59.8 kg per capita for the 1st period to 39.0 kg per capita for the last period. (CIAT)

0482

29074 OMONDI, O.C. 1980. CASSAVA. IN KENYA. MINISTRY OF AGRICULTURE. COAST AGRICULTURAL RESEARCH STATION. ANNUAL REPORT 1980. KENYA. PP.71-73. EN.

CASSAVA; CULTIVARS; PRODUCTIVITY; INTERCROPPING; MAIZE; COWPEA; ADAPTATION; KENYA.

RESULTS OF CASSAVA RESEARCH CONDUCTED DURING THE 1979/80 CROPPING SEASON AT COAST AGRICULTURAL RESEARCH STATION (KENYA) ARE PRESENTED. IN THA CASSAVA VAR. TRIAL, NO SIGNIFICANT YIELD DIFFERENCES BETWEEN VAR. WERE OBSERVED; YIELDS RANGED BETWEEN 27.0-35.2 T/HA. THE TOP YIELDER WAS LOCAL VAR. KIBANDAMENO, FOLLOWED BY MWAKAZANGA (34.8 T/HA) AND THEN THE EXPTL. HYBRIDS. INTENSIVE WORK TO COLLECT AND EVALUATE LOCAL VAR. IN THE COAST PROVINCE IS THEREFORE PROPOSED. A TRIAL WAS INITIATED IN MTWAPA IN 1977 TO STUDY THE EFFECT OF CROP ROTATIONS (CCC, XCC, CXC, AND XXC, WHERE C = CASSAVA AND X = MAIZE OR COWPEA) ON CASSAVA YIELDS. NO SIGNIFICANT DIFFERENCES WERE OBSERVED BETWEEN TREATMENTS. THE HIGHEST AV. CASSAVA YIELD (15.0 T/HA) WAS OBSERVED IN CXC AND THE LOWEST (10.7 T/HA) IN XXC. CASSAVA BULKING CONTINUED IN MPEKETONI, AND OVER 7000 CUTTINGS WERE GIVEN FOR DISTRIBUTION. (CIAT)

0483

30494 ROBERTSON, I.A.D. 1987. The role of Bemisia tabaci Gennadius in the epidemiology of ACMV in East Africa. Biology, population dynamics and interaction with cassava varieties. In Séminaire International La Mosaique Africaine du Manioc et son Controle, Cote d'Ivoire, 1987. Résumés. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Cooperation. p.34. En. (P.O. Box 162, Malindi, Kenya)

CASSAVA; BEMISIA; CASSAVA AFRICAN MOSAIC VIRUS; SYMPTOMATOLOGY; EPIDEMIOLOGY; RESISTANCE; KENYA.

The ecology of Bemisia tabaci, the vector of CAMV, was studied in coastal Kenya. The species was found on 83 of a total of 178 species examined. Population studies of the vector and counts of cassava plants with disease symptoms showed that the incidence of CAMV was highest soon after planting although at that time the insect population was quite low. The ability of B. tabaci to transmit the virus only through immature cassava leaves was confirmed. Later in the season when most of the cassava leaves were mature, CAMV incidence was low, although B. tabaci population was high. Epidemiology trials showed a high range of susceptibility to CAMV in the available cassava var. and also big differences in infection pressure at different localities. It was concluded from the evidence that in most localities cassava var. with moderate resistance to CAMV could be kept clean by regular removal of infected plants and that the degree of infection by the virus was reduced as the distance of the crop from infected cassava increased. (Full text)

0484

30436 SAVILE, A.H.; WRIGHT, W.A. 1958-1959. Notes on Kenya agriculture. 3. Oil seeds, pulses, legumes, and root crops. East African Agricultural Journal 24(1):1-9. En.

CASSAVA; CLIMATIC REQUIREMENTS; SOIL REQUIREMENTS; PLANTING; USES; PRODUCTIVITY; KENYA.

General recommendations on climate and soil requirements, cultivation, and harvesting for various crops (among them cassava) in Kenya are given. The major uses of cassava are also mentioned. Cuttings should be planted at 1.52 x 1.22 m, with yields of 1.21- 3.24 t/ha and 9-24 mo. to maturity. (CIAT)

0485

29069 SEIF, A.A. 1976. STUDIES ON THE EPIDEMIOLOGY OF CASSAVA MOSAIC. IN KENYA. MINISTRY OF AGRICULTURE. ANNUAL REPORT OF SCIENTIFIC DIVISION 1976. KENYA. PP.108-109. EN.

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; CULTIVARS; PRODUCTIVITY; PROPAGATION MATERIALS; ALEYRODIDAE; FIELD EXPERIMENTS; KENYA.

SEVEN CENTRALLY PLACED CAMD-INFECTED CUTTINGS OF CASSAVA CV. 46106/27 WERE SURROUNDED BY CONCENTRIC HEXAGONS OF 156 CAMD-FREE CUTTINGS OF THE SAME VAR. TO DETERMINE THE DISSEMINATION RATE OF CAMD WITHIN PLOTS. LIKEWISE, 100 CAMD-FREE PLANTS EACH OF CV. 46106/27 AND F279 WERE PLANTED APPROX. 300 M DOWNWIND OF CASSAVA PLOTS WITH HIGH CAMD INCIDENCE TO DETERMINE THE DISSEMINATION RATE INTO CAMD-FREE PLOTS. YIELD LOSSES WERE ALSO DETERMINED FOR BOTH CASSAVA VAR. SPREAD FROM INFECTED TO HEALTHY PLANTS WAS RAPID AND CONTINUED THROUGHOUT THE GROWING SEASON; AT HARVEST (14 MO.), 84 OF THE 156 PLANTS (54 PERCENT) WERE INFECTED. SPREAD INTO CAMD-FREE PLOTS WAS VERY SLOW AND SHOWED NO BUILD UP DURING THE SEASON. YIELD LOSSES IN 46106/27 WERE AT A 70 PERCENT LEVEL, WHILE THOSE OF F279 WERE AT THE 86 PERCENT LEVEL. CROP LOSS ASSESSMENTS SUGGESTED THAT THE CONTROL OF CAMD IN THE FIELD IN EAST AFRICAN COASTAL AREAS IS POSSIBLE THROUGH THE USE OF CAMD-FREE PLANTING MATERIAL, THE ROGUING OF INFECTED PLANTS, AND BY ALLOWING A REASONABLE DEGREE OF ISOLATION OF CLEAN PLOTS FROM INFECTED PLOTS. ALSO, MAN WAS FOUND TO BE A MORE EFFICIENT VECTOR BY HIS USE OF INFECTED CUTTINGS THAN THE WHITEFLY. (CIAT)

0486

29758 WARREN, A. 1986. Cassava processing and preparation in East Africa. United Kingdom, 5p. En.

CASSAVA; PROCESSING; CASSAVA STARCH; MARKETING; PRICES; KENYA; TANZANIA; UGANDA.

A brief account is given of cassava processing and preparation procedures in East African countries. Most cassava is consumed fresh, boiled without pounding or as a stiff porridge (ugali) made from CF, sometimes following a limited form of fermentation. The range of products is much less than that found in West Africa and, in particular, gari is unknown. Forms of consumption and processes described cover raw cassava, fresh roots boiled, fermented roots, dried cassava, CF (ugali), soaked roots, alcohol (waragi) or beer, and leaves. Commercial starch production aspects, especially regarding prices and marketing, in Tanzania, Uganda, and Kenya are briefly described. (CIAT)

LIBERIA

0487

30011 LIBERIA. MINISTRY OF AGRICULTURE. 1976. Cassava: number of agricultural households growing cassava and acres of cassava in mixed and pure stand, by county, Liberia, 1976. In Liberia. Ministry of Agriculture. Production estimates of major crops 1976. Monrovia, Liberia, 1p. En.

CASSAVA; STATISTICAL DATA; PRODUCTION; LIBERIA.

A table showing the no. of agricultural households growing cassava and area of the crop in mixed and pure stands, by county (Bong, Grand Bassa, Cape Mount, Grand Gedeh, Lofa, Maryland, Montserrado, Nimba, and Sinoe) in Liberia in 1976 is presented. A total of 30,352.2 ha were planted to cassava that year with an av. size of 0.32 ha/household. (CIAT)

0488

30014 LIBERIA. MINISTRY OF AGRICULTURE. 1975. Cassava: number of households growing cassava and area of cassava in mixed and pure stand, by county, Liberia, 1975. In Liberia. Ministry of Agriculture. Production estimates of major crops 1975. Monrovia, Liberia, p.76. En.

CASSAVA; STATISTICAL DATA; FARM SIZE; LIBERIA.

Data on the no. of households growing cassava and area planted to cassava in pure stands and in mixed stands with rice, in 9 Liberian counties (Bong, Grand Bassa, Cape Mount, Grand Gedeh, Lofa, Maryland, Montserrado, Nimba, and Sinoe) are presented for 1975. An av. of 60 percent of the agricultural households of Liberia was found growing cassava. (CIAT)

0489

29564 LIBERIA. MINISTRY OF AGRICULTURE. 1978. Production of main food crops by district (plus rubber). Ministry of Agriculture estimates. Monrovia, Liberia, 2p. En.

CASSAVA; STATISTICAL DATA; PRODUCTION; LIBERIA.

Production figures for cassava and other crops (rice, sugarcane, palm oil, and rubber) in Liberia in 1978 are given per district (52 in total). The percentage corresponding to cassava from total crop production in each district is given. (CIAT)

0490

30013 LIBERIA. MINISTRY OF AGRICULTURE. DIVISION OF RESEARCH AND STATISTICS. 1986. Estimates of agricultural commodities 1985. Annual survey. Monrovia, Liberia, 36p. En., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; PRODUCTIVITY; FARM SIZE; LIBERIA.

The results of the 1985 annual survey in Liberia on area, production, and no. of farms producing agricultural commodities, including cassava, are presented. Total cassava area harvested was estimated at 46,000 ha, with av. yields of 6.1 t/ha. Data on no. of farms and acreage planted to cassava is disaggregated by county (Grand Bassa, Bomi, Bong, Grand Cape Mount, Grand Gedeh, Grand Kru, Lofa, Maryland, Montserrado, Nimba, and Sinoe) and farm size units. Nimba and Bong reported the highest no. of cassava farms (27,000 and 18,600, resp.); 97 percent of the farms were of 1.09 ha or less. Tables indicating cassava farms and acreage by county, compared with rice and sugarcane, are included. (CIAT)

0491

30006 A-AS-SAQUI, M. 1985. Root and tuber crops. In Central Agricultural Research Institute. Annual Report 1982- 1983. Suakoko, Liberia, pp.18-24. En.

CASSAVA; GERMPLASM; CULTIVARS; SELECTION; RESISTANCE; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BACTERIAL BLIGHT; MONONYCHELLUS TANAJOA; FERTILIZERS; N; P; K; MG; ZN; MO; CUTTINGS; PLANTING; ROOT PRODUCTIVITY; FOLIAGE; STARCH CONTENT; LIBERIA.

Results of the 1982/83 research activities conducted by the Root Crops Project of the Central Agricultural Research Institute (CARI) in Liberia are presented. Results are summarized for a multilocational var. trial conducted at 7 sites where cassava var. CARICASS 1, 2, and 3 and a local cv. were tested for yield and resistance to major pests and diseases. CARICASS 2 and 3 showed marked resistance to CAMD, CBB, and cassava green mite, while CARICASS 1 was susceptible to all. An on-going trial on the effect of no. of cuttings/hill (1-5 cuttings and 1 cutting soaked in 10 ppm solutions of either ZnSO4, MgSO4, or Mo) showed that 4 cuttings/hill gave the highest root yield (40.1 t/ha) and that soaking in solution had no significant effect on yields compared with the remaining treatments. The higher the no. of cuttings/hill, the higher the no. of roots, the higher the competition, the smaller the tuber size, and the more planting materials produced. In another trial, the response of CARICASS 2 to fertilization (60-60-60-30 kg N-P-K-Mg as the complete treatment and the rest minus 1/2 or all of each nutrient and an unfertilized control) was investigated; results showed that none of the nutrients affected root yield significantly, but did affect stem wt., indicating that both N and K were marginal for optimum growth. Plants in complete minus P treatment grew better than most others, including the complete; this indicates that mycorrhiza infection was efficient. (CIAT)

0492

30008 A-AS-SAQUI, M.; WOUNUAH, D.D. 1985. Root crops. In Central Agricultural Research Institute. Annual Report 1983- 1984. Suakoko, Liberia, pp.22-27. En.

CASSAVA; CULTIVARS; SELECTION; FERTILIZERS; N; P; K; MG; ZN; MO; CUTTINGS; PLANTING; LIBERIA.

Results of the 1983/84 research activities conducted by the Root Crops Project of the Central Agricultural Research Institute, CARI, in Liberia, are presented. A brief account is given on cassava germplasm improvement objectives and selection trials conducted to achieve them. The response of CARICASS 2 to fertilization (60-60-60- 30 kg N-P-K-Mg as the complete treatment and the rest minus 1/2 or all of each nutrient) was investigated. An unfertilized control was included. Results showed that none of the nutrients affected root yield significantly, but did affect other plant parts, indicating that both N and K were marginal for optimum growth. Plants in complete minus P treatment grew better than most others, indicating that mycorrhizal infection was efficient. An on-going trial on the effect of no. of cuttings/hill showed that root yields increased as the no. of cuttings/hill increased from 1 to 4, but dropped at 5 cuttings/hill. No conclusions are possible until the 1984/85 cropping season. (CIAT)

0493

30124 A-AS-SAQUI, M.; WOUNUAH, D.D.; LAVELEH, A.S.; WILLIAMS, J.T.; MASON, J.; BOF, D.; KORVAH, F. 1985. Root crops project. In Central Agricultural Research Institute. Annual Progress Report July 1984-June 1985. Suakoko, Liberia, International Development Research Center. 46p. En., Il.

CASSAVA; FIELD EXPERIMENTS; GERMPLASM; CULTIVARS; ROOT PRODUCTIVITY; FOLIAGE; FERTILIZERS; N; P; MULCHING; INSECT CONTROL; TERMITES; INSECTICIDES; SPACING; CUTTINGS; SOCIOECONOMIC ASPECTS; MAPS; TECHNOLOGICAL PACKAGE; CASSAVA PROGRAMS; LIBERIA.

Results of the 1984/85 research activities conducted by the Central Agricultural Research Institute (CARI) in Liberia, through the Root Crops Project, are presented; plans for 1985/86 are indicated. Cassava receives top priority in the project followed by sweet potato, cocoyam, and yam. Cassava var. testing results are summarized for the clonal evaluation trial, preliminary yield trial, advanced yield trial, uniform yield trial, and field evaluations of tissue culture materials. An agronomic trial of the effect of mulching and fertilization in a continuous cassava crop on root yields showed that fertilized plots produced 38 and 61 percent higher root and stem yields, resp., than unfertilized plots, while for these same parameters, mulched plots produced 31 and 36 percent higher yields, resp. Mulching without fertilizer application and vice versa resulted in root yield increases of 42 and 47 percent, resp. The combination of both treatments resulted in a 60 percent increase in root yield over the control. In another agronomic trial that studied the effect of the no. of cuttings planted per hill on cassava root yields, it was found that 4 cuttings/hill gave the highest yield (23.9 t/ha). In a 3rd trial on the effect of insecticides and cultural control of termites, results showed that the dipping of cassava cuttings in either 0.1 percent chlorpyrifos, 0.05 percent methomyl, or 0.2 percent carbaryl gave considerable control of termite damage; in the absence of insecticides, the planting of 2-3 cuttings/hill is useful in ensuring plant stand and higher yields. The results of a survey to evaluate the acceptability and socioeconomic impact of improved cassava var. distributed to local farmers in the area of Kong are also presented. (CIAT)

0494

30007 A-AS-SAQUI, M.; WOUNUAH, I.D. 1984. Root crops project. In Central Agricultural Research Institute. Annual Progress Report 1983-1984. Suakoko, Liberia, pp.23-25,32,35-40. En.

CASSAVA; CASSAVA PROGRAMS; CULTIVATION; TISSUE CULTURE; MAPS; LIBERIA.

The objectives of the Root Crops Project at the Central Agricultural Research Institute (CARI) in Liberia are presented. The different agronomic trials to be conducted in 1984 are listed, and the activities and techniques used by the tissue culture unit and cooperative programs are indicated. The multiplication and distribution of cassava throughout the country are mentioned. (CIAT)

0495

30010 A-AS-SAQUI, M.; WOUNUAH, D.D. 1986. Root crops project (Liberia). In Central Agricultural Research Institute. Annual Progress Report 1985-1986. Suakoko, Liberia, pp.3-4,10-20,26-27,29-30,36-38. En. Il.

CASSAVA; FIELD EXPERIMENTS; GERMPLASM; CULTIVARS; SELECTION; PLANTING; CUTTINGS; STORAGE; FERTILIZERS; N; P; K; MG; MULCHING; ROOT PRODUCTIVITY; LEAF PRODUCTIVITY; CASSAVA PROGRAMS; MAPS; LIBERIA.

Results of the 1985/86 research activities conducted by the Central Agricultural Research Institute (CARI) in Liberia, through the Root Crops Project, are presented; plans for 1986/87 are indicated. Cassava yields and CAMD, CBB, scale insect, and green mite ratings are summarized for the uniform and advanced yield trials and field evaluations of tissue culture materials. An agronomic trial of the effect of different planting methods (vertical, horizontal, and slanted) showed that the highest fresh root yield (30.3 t/ha), fresh leaf yield (1.8 t/ha), and cutting yield (10.8 t/ha) were

obtained by vertical planting. Cutting yield also reported elsewhere in paper as 10.0 t/ha. Cassava var. CARICASS-3 was used to study the effect of the storage period of cuttings (0, 15, 30, and 45 days) on crop performance. The highest significantly different (P = 0.01) fresh root yield (47.2 t/ha) was obtained when cuttings were planted immediately after cutting, followed by 15-day storage (41.2 t/ha); 30-and 45-day storage periods had adverse effects on yield. Another expt. to study the effects of mulching and fertilization on cassava root yield and other parameters in a continuous cropping system showed a high correlation between root yield and stem yield, length, and circumference. Unlike 1984 results, the 1985 results showed that while both treatments applied together had a positive effect on yields (50.2 t/ha compared with 16.1 t/ha for the control), yields were lower than that for the fertilizer alone (57.7 t/ha). Nine fertilization treatments (120-60-180-60 kg N-P-K-MgO/ha as the complete treatment and the rest minus 1/2 or all of each nutrient) were applied to cassava var. CARICASS 2 and 3, compared with an unfertilized control. Results showed that CARICASS 2 always outyielded CARICASS 3 by at least 4 percent, irrespective of fertilizer treatment. While CARICASS 2 showed a significant response to N and only slight response to K and Mg, CARICASS 3 only showed a slight response to N and P. (CIAT)

0496

30009 A-AS-SAQUI, M.; WOUNUAH, D.P. 1985. The root crops project towards self-sufficiency in food in Literia. Monrovia, Literia, Central Agricultural Research Institute. 7p. En., Sum. En., 5 Ref., Il.

CASSAVA; CULTIVATION; MAPS; CULTIVARS; PRODUCTIVITY; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BACTERIAL BLIGHT; MONONYCHELLUS TANAJOA; LIBERIA.

Research efforts aimed at expanding cassava cultivation in Literia, where cassava is 2nd as a food staple after rice, are briefly reviewed. Aspects of traditional cassava cultivation and its problems as well as the var. improvement scheme being implemented are briefly discussed. The results of a cassava var. trial conducted at several sites are presented; av. yields of 21.7, 24.8, and 34.2 t/ha were recorded for var. CARICASS III, I, and II, resp., outyielding the local var. (11.4 t/ha) and showing low infection rates for CAMV, CBB, and cassava green spider mite. Multiplication and distribution efforts of the above var. are briefly indicated. (CIAT)

0497

26793 DENNIS, P.G.; FOSTER, I. 1985. COUNTRY PAPER ON ROOT, TUBER CROPS AND PLANTAINS. IN WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE, 1985. REPORT. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.112-120. EN.

CASSAVA; PRODUCTION; MARKETING; PRICES; POSTHARVEST LOSSES; SOCIOECONOMIC ASPECTS; PESTS; PLANTING; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; LEGAL ASPECTS; LIBERIA.

THE SITUATION OF ROOT, TUBER, AND PLANTAIN CROPS IN LIBERIA IS DESCRIBED. IN THIS COUNTRY APPROX. 75 PERCENT OF THE POPULATION AGED 15-64 IS ENGAGED IN AGRICULTURE. THESE PRODUCTS ARE CULTIVATED ON A SUBSISTENCE LEVEL; THERE IS NO COMMERCIAL PROCESSING, EXCEPT FOR CASSAVA BY-PRODUCTS, ESPECIALLY GARI WHICH IS SOLD IN THE SUPERMARKETS OF MONROVIA. TRADITIONAL TECHNIQUES ARE USED FOR CULTIVATING AND PREPARING THESE PRODUCTS. THE MARKETING SYSTEM IS COMPOSED OF A LARGE NO. OF PARTICIPANTS (SUBSYSTEMS) WHO FIX THEIR OWN PRICES. COMMERCIALIZATION MARGINS ARE BROAD AND THERE ARE NEITHER COMMERCIALIZATION NOR PRICE POLICIES FOR THESE PRODUCTS. MAJOR CONSTRAINTS TO CASSAVA PRODUCTION ARE DISCUSSED. (CIAT)

0498

30012 FRANKENBERGER, T.R.; LICHTE, J.A.; GEDEO, A.S.; JALLAH, J.K.; SHERMAN, M.J. 1985. Farming systems research in three counties in Liberia: a reconnaissance survey in Grand Gedeh, Nimba, and Bong counties.. Gainesville, Florida, Farming Systems Support Project. University of Florida. 196p. En., Sum. En., 19 Ref., Il.

CASSAVA; CULTIVATION; SURVEYS; RICE; INTERCROPPING; ON-FARM RESEARCH; LABOR; CULTIVARS; SOCIOECONOMIC ASPECTS; MARKETING; ECONOMICS; MAPS; CONSUMPTION; HUMAN NUTRITION; LIBERIA.

A farming systems survey was conducted in the counties of Grand Gedeh, Nimba, and Bong in Liberia in July 1984, covering 19 villages and 114 families, to provide information on rice-based farming systems and baseline data on cropping patterns, animal husbandry, off-farm economic activities, marketing, consumption, and major production constraints. General cropping patterns involving cassava, the 2nd most important food crop in Liberia, are briefly described; these include cassava intercropped with rice, cassava planted after rice, cassava planted simultaneously with rice, cassava before rice, rice-cassava double cropping, and monocropped cassava. Cassava var. planted, no. of cuttings traditionally planted, pests and diseases, and other crops intercropped with cassava are briefly indicated for each of the counties. Cassava was found to be more important in Nimba than in Gran Gedeh and Bong. The major constraints to cassava production identified were pests and diseases (groundhogs, CAMD, and CBB) and agronomic aspects (spacing and time of planting, stripping of leaves and lower branches of young plants to avoid shading rice, and intercropping with other crops such as sweet potato, peanuts, and coffee). Relevant recommendations are given. Marketing and consumption aspects are also reviewed. (CIAT)

0499

30003 GEDEO, A.S.; A-AS-SAQUI, M. 1985. Cassava pilot study in the BCADP area, Bong County. Suakoko, Liberia, Central Agricultural Research Institute. Economic and Social Analysis Office. Paper no.2. 48p. En., Sum. En.

CASSAVA; CASSAVA PROGRAMS; SURVEYS; ON-FARM RESEARCH; TECHNOLOGY TRANSFER; TECHNOLOGICAL PACKAGE; DEVELOPMENT; CULTIVATION; CULTIVATION SYSTEMS; CULTIVARS; LAND PREPARATION; PLANTING; PESTS; INTERCROPPING; PRODUCTIVITY; MARKETING; HUMAN NUTRITION; SOCIOECONOMIC ASPECTS; LABOR; PRICES; USES; LIBERIA; CIAT-2.

Fifty-four farmers who had received improved cassava cuttings from the Bong County Agricultural Development Project, Liberia, were surveyed to determine the acceptability of improved materials, taste preferences, improved management and cultural practices, and yields. Major findings are presented. It was found that most farmers followed the recommended agronomic practices. Cuttings longer than 25 cm are recommended since these dehydrate rapidly. The best time to deliver planting materials appears to be April-May. The no. of var. distributed should be limited to 3, since farmers were unable to distinguish between all 7 (CARICASS I, II, and III, NUCASS I and II, and ROCASS I and III) currently delivered. Extension visits should be more frequent, especially during the 1st few weeks after the delivery of materials. Of the farmers interviewed 71 percent planted cuttings horizontally (45 degrees) as recommended; 42 and 20 percent of the farmers built mounds and ridges, resp., as recommended. Only 1 farmer reported CBB, while termites and groundhogs were reported as the major pests. Of the farmers 53 percent preferred pure cassava stands, while 41 percent preferred intercropping (rice, maize, banana, plantain, sweet potato, peanut, eddoe, and other vegetables) and only 6 percent both cropping systems. The 1 x 1 m spacing recommended was not suitable for intercropping, thus farmers should

determine appropriate spacings themselves. The family labor constituted the most important source of labor (57 percent). Most farmers (63 percent) grew cassava both for home consumption and sale. Some cassava is left unharvested as a food reserve and because of lack of markets. A great majority of the farmers (76 percent) had not tasted improved var., but those who had, preferred CARICASS I. Watery and slightly bitter cassava var. should only be distributed to areas where processing into CF and foofoo is common. The av. yield for all districts was 32 t/ha. (CIAT)

0500

30004 GEDEO, A.S.; FINLEY, R.M. 1982. The economics of cassava and sweet potatoes in the Liberian economy. Suakoko, Liberia, Central Agricultural Research Institute. Economic and Social Analysis Office. 8p. En.

CASSAVA; ECONOMICS; HUMAN NUTRITION; ANIMAL NUTRITION; LIBERIA.

The role cassava could play in Liberia's economy, with special reference to reduced swine ration costs, is discussed. Two cassava-based rations (16 percent CP and 74.8 total digestible nutrients) containing 20 and 50 percent cassava chips are presented and their costs estimated. Also included is the standard cassava-based diet used as a control in pig feeding in Suakoko, in which cassava powder accounts for 30 percent of the diet and provides 1.2 percent CP. (CIAT)

0501

30005 KAYKAY, J.M. 1985. Basic knowledge of how to formulate feed for pigs and poultry from locally available feed ingredients. Suakoko, Liberia, Central Agricultural Research Institute. Division of Animal Nutrition. 5p. En.

CASSAVA; SWINE; POULTRY; FEEDS AND FEEDING; ANIMAL NUTRITION; DIETS; CASSAVA MEAL; LIBERIA.

Examples are given of a series f energy and protein feed sources found in Liberia that can be used in diets for feeding swine and poultry. Percentage composition of 5 diets for different animal categories (young pigs, weaned piglets, adult pigs, broiler chicks, laying hens) is provided. Ground cassava roots maize can be used at a 40 percent rate in diets for young pigs (7.5-37.3 kg); cassava powder at 12.5 percent in diets for weaned piglets; powdered cassava roots at 40-50 percent in diets for adult pigs (after 29.9 kg); and CM up to 20 percent for broiler chicks. (CIAT)

0502

26719 LOCKARD, R.G.; SAQUI, M.A.; WOUNUAH, D.D. 1985. EFFECTS OF TIME AND FREQUENCY OF LEAF HARVEST ON GROWTH AND YIELD OF CASSAVA (MANIHOT ESCULENTA CRANTZ) IN LIBERIA. FIELD CROPS RESEARCH 12(2):175-180. EN., SUM. EN., 7 REF. (CENTRAL AGRICULTURAL RESEARCH INST., P.O. BOX 3929, MONROVIA, LIBERIA)

CASSAVA; LEAVES; HARVESTING; TIMING; ROOT PRODUCTIVITY; STEMS; GROWTH; HARVEST INDEX; LIBERIA.

AN EXPT. WAS CARRIED OUT WITH CASSAVA VAR. CARICASS 2 TO TEST THE EFFECTS OF LEAF HARVESTING ON PLANT GROWTH AND YIELD. THE TERMINAL 5 OR 6 LEAVES OF EACH SHOOT WERE COLLECTED STARTING AT 4, 5, OR 6 MO. AFTER PLANTING AND AT INTERVALS OF 1 OR 2 MO. THE TIME AT WHICH COLLECTION STARTED HAD VERY LITTLE EFFECT ON THE WT. OF LEAVES COLLECTED OR ON THE YIELD OF TUBEROUS ROOTS. HOWEVER, THE FREQUENCY OF COLLECTION HAD A MARKED EFFECT ON BOTH. IT IS RECOMMENDED THAT LEAF COLLECTION SHOULD START 4 MO. AFTER PLANTING, AND HARVESTING SHOULD BE CARRIED OUT AT 2-MO. INTERVALS IN ORDER TO OBTAIN THE BEST YIELDS OF BOTH LEAVES AND TUBEROUS ROOTS. (AS)

0503

32249 PEWU, S.K. 1986. Report on cassava mealybug and cassava green mites in some African countries: Liberia. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. p.144. En.

CASSAVA; PHENACOCCUS MANIHOTI; LIBERIA.

Cassava, after rice, is the 2nd most important food crop in Liberia. In 1975 about 90,400 households were engaged in its production on 76,000 acres (Statistical Handbook of Liberia, 1976, Ministry of Agriculture). It is grown throughout Liberia both as a pure crop and as an intercrop with rice or other food crops such as eddoes, pepper, or bitterballs. Both leaves and tubers are consumed. The plant is also grown as livestock food. The cassava mealybug was 1st discovered in Liberia on August 30, 1982, in Paynesville, near Monrovia. Most of the cassava fields visited in that area were infested. A survey revealed its presence in the 3 principal cassava-producing coastal areas of Montserrado, Grand Cape Mount, and Grand Bassa. The other 6 areas were not surveyed, but a country-wide survey is planned for the coming dry season. About 15 percent of the cassava farmers in the coastal areas have abandoned their crops, because of tuber losses estimated at 30 percent and losses in leaf yield estimated at 25 percent. No totally defoliated fields have been found. (Full text)

0504

30016 VON GNIELINSKI, S. 1972. Rice. In Von Gnielinski, S. Liberia in maps, graphic perspectives of a developing country. New York, Africana Publishing Corporation. p.79. En., Mapa, esc. 1:3,000,000.

CASSAVA; CULTIVATION; MAPS; LIBERIA.

A map illustrating the distribution of major crops grown in Liberia is presented. Areas where rice, cassava, and cash crops are grown are indicated. (CIAT)

0505

29440 WARREN, A., comp. 1987. Liberia: cassava production relative to other major crops. En., 1 map, sc. 1:1,000,000.

CASSAVA; PRODUCTION; MAPS; LIBERIA

0506

29012 WARREN, A., comp. 1987. Liberia: distribution of cassava production. En., 1 map, sc. 1:1,000,000.

CASSAVA; PRODUCTION; MAPS; LIBERIA

MADAGASCAR

0507

30507 ARRAUDEAU, M. 1987. Statement of results obtained by IRAT concerning cassava mosaic control in Madagascar and West Africa. In Séminaire International La Mosaique Africaine du Manioc et son Controle, Cote d'Ivoire, 1987. Résumés. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Coopération. p.49. En. (CIRAD-IRAT, 45, Bis, Avenue Belle Gabrielle, 94736 Nogent-Sur- Marne Cedex, France)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; DISEASE CONTROL; RESISTANCE; CULTIVARS; PLANT BREEDING; MADAGASCAR.

Cassava var. improvement in Madagascar concentrated on tolerance to CAMV. Improved clones, among them H-57, H-58, and H-62, were obtained. The use of Manihot glaziovii has contributed to the efficacy of the program. The interest of breeders to increase the knowledge of cassava genetics is mentioned as an important step to further improve crop performance. (CIAT)

0508

32034 BARAN, R. 1976. Les parcelles de culture: manioc. (Cassava plots). In Société pour le Développement Economique de la Région de Morondava. Station de Recherches Agronomiques. Rapport d'Activités. Période du 1 Novembre 1974 au 31 Octobre 1975. Malgache, Société pour le Développement Economique de la Région de Morordava. Station de Recherches Agronomiques. Document no.11. pp.31-34. Fr., 11.

CASSAVA; TIMING; HARVESTING; ROOT PRODUCTIVITY; CULTIVARS; MADAGASCAR.

The effect of the length of the crop cycle (6, 7, 8, 9, and 10 mo.) on yield evolution of 2 cassava cv. (Longoasara and Madarasay) was studied. Two distinct morphological types were represented in the cv. used: type 1 (stem with trichotomous branchings only) and type 2 (main stem with 1 or more secondary stems). The latter seemed to give higher yields; however, the results obtained do not allow conclusions or recommendations to be made since a smaller plot area was used. Further studies involving the 2 rainy seasons are recommended. (CIAT)

0509

32281 BARAN, R. 1978. Manioc. (Cassava). In Société pour le Dévéloppement Economique de la Region de Morondava. Station de Recherches Agronomiques. Rapport d'Activités. Période du 1 Novembre 1976 au 31 Octobre 1977. Madagascar, pp.57-59. Fr.

CASSAVA; PLANTING; SPACING; ROOT PRODUCTIVITY; MADAGASCAR.

A cassava plant population density trial was conducted in the Morondava region, Madagascar, in 1976-77. The resp. spacing treatments between lines and plants tested were: 1.2 x 1.5 m (5555 plants/ha), 1.2 x 1.2 m (6944 plants/ha), 1.2 x 1.0 m (8333 plants/ha), 1.0 x 1.0 m (10,000 plants/ha), and 1.0 x 0.8 m (12,500 plants/ha). Treatments yielded 5.76, 5.43, 4.35, 3.44, and 3.21 t/ha, considered low, perhaps due to unfavorable rainfall conditions during plant development. (CIAT)

0510

32264 BRUYERE, R.; GRENILLET, B.; JANNAUD, G.; DELHAYE, R.E. 1962. Le P.C. 23. (P.C. 23). Lac Alaotra, République Malgache, Institut de Recherches Agronomiques Tropicales de Madagascar. Station Agronomique du Lac Alaotra. 70p. Fr., Il.

CASSAVA; ROOT PRODUCTIVITY; CULTIVATION; MADAGASCAR.

General characteristics of the P.C. 23, a region in the SW Alaotra Lake area in Madagascar are described. Information is given on the major food crops (including cassava) planted regarding cultivated area, soils, var., land preparation and planting, cultural practices, harvesting time, yields, utilization, and crop rotation. Cassava does not play an important role since the area planted is small; most tubers harvested are used fresh for human nutrition. (CIAT)

0511

32021 DUFOURNET, R. 1971. Progres agricoles en relation avec les résultats de la recherche agronomique pour quelques cultures et pour les plantes vivrieres en particulier. (Agricultural progress regarding the results of agronomic research for several crops and for food plants in particular). Bulletin Académie Malgache 49(1):49-54. Fr.

CASSAVA; CULTIVARS; ROOT PRODUCTIVITY; MADAGASCAR.

The major results of research carried out on various crops (among them cassava) in 1970 in Madagascar are presented. Cassava hybrid no. 54 is reported as an outstanding cv., with yields ranging from 18 t/ha in the NW to 40 t/ha in Lake Alaotra. On recovered soils of the Tananarive region, cassava yields of 300-400 q were obtained. (CIAT)

0512

30120 DURANT JUNIOR, T.J. 1985. Farming characteristics: crops planted in 1983. In Durant Junior, T.J.. The adoption and diffusion of crop technology by farmers in five ACRE zones in Sierra Leone. Njala, Sierra Leone, Southern University and Louisiana State University Consortium. Adaptive Crop Research and Extension Project. p.27. En.

CASSAVA; STATISTICAL DATA; CULTIVATION; ON-FARM RESEARCH; SIERRA LEONE.

Data on crops planted in 1983 by contact (153) and non-contact (151) farmers of Sierra Leone as part of the Adaptive Crop Research and Extension Project (ACRE) are presented. Cassava ranked 2nd after rice, being planted by 65.4 and 60.3 percent of contact and non- contact farmers, resp. (CIAT)

0513

26794 RAKOTONDRABE, P.; RAMAROSON, I. 1985. SITUATION DU SECTEUR DES RACINES ET TUBERCULES A MADAGASCAR. (SITUATION OF ROOT AND TUBER CROPS IN MADAGASCAR). IN WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE, 1985. REPORT. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.121-126. FR.

CASSAVA; MARKETING; PROCESSING; PRICES; SOCIOECONOMIC ASPECTS; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; LEGAL ASPECTS; MADAGASCAR.

THE SITUATION OF ROOT AND TUBER CROPS IN MADAGASCAR IS ANALYZED. THESE PRODUCTS ACCOUNT FOR 22 PERCENT OF THE TOTAL CULTIVATED LAND AND 50 PERCENT OF THE TOTAL FOOD PRODUCTION. A TOTAL OF 336,125 HA ARE PLANTED TO CASSAVA; PRODUCTION REACHES 2,047,160 T (1,929,472 T FOR HUMAN CONSUMPTION AND 381 T FOR EXPORT TAPIOCA) AND YIELDS ARE ONLY 6.09 T/HA. TAPIOCA AND STARCH FACTORIES USED 4970 T CASSAVA IN 1984; HOWEVER, COMMERCIALIZATION OF FRESH CASSAVA TUBERS IS LOW (5 PERCENT). APPROX. 10 PERCENT OF THE TOTAL CASSAVA PRODUCTION IS SOLD AS PEELED, SUN-DRIED TUBERS, OF WHICH 115,800 T WERE USED FOR ANIMAL FEEDING IN 1978 AND 317,778 T IN 1984. THE NEED TO MAINTAIN THE FERTILITY OF ARABLE LANDS IS STRESSED. IN MAROVITSIKA, YIELDS OF 20-40 T/HA (WITH FERTILIZATION) WERE OBTAINED WHEN 2 SUCCESSIVE CASSAVA CROPS WERE FOLLOWED BY A GRASS-LEGUME ASSOCIATION, WHICH WAS LATER USED AS GREEN MANURE. THE NATIONAL PLAN FOR 1986-90 GIVES EQUAL PRIORITY TO CASSAVA AS TO EXPORT CROPS. (CIAT)

0514

25543 RAVELOMANANTSOA, J.; RAKOTONANAHARY, J.P. 1981. SITUATION ACTUELLE DE LA PRODUCTION ET LA TRANSFORMATION DU MANIOC ET AUTRES TUBERCULES A MADAGASCAR. (CURRENT SITUATION OF THE PRODUCTION AND TRANSFORMATION OF CASSAVA AND OTHER TUBERS IN MADAGASCAR). IN WORKSHOP ON PROCESSING TECHNOLOGIES FOR CASSAVA AND OTHER TROPICAL ROOTS AND TUBERS IN AFRICA,

ABIDJAN, IVORY COAST, 1983. PROCEEDINGS. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.193-196. FR.

AFRICA; CASSAVA FLOUR; CASSAVA PRODUCTS; CASSAVA STARCH; ECONOMICS; MADAGASCAR; MARKETING; PRICES; PROCESSED PRODUCTS; PROCESSING; PRODUCTION; PRODUCTIVITY; TAPIOCAS; TRADE.

THE SITUATION OF CASSAVA AND POTATO IN MADAGASCAR IS PRESENTED. DATA ON PRODUCTION AND PRODUCTIVITY OF FRESH AND PROCESSED CASSAVA (STARCH, TAPIOCA) AS WELL AS ON MARKET AND TRADE PRICES ARE GIVEN. (CIAT)

MALAWI

0515

30525 COTAÇAO DE produtos agrícolas no mercado de Londres Outubro de 1968: mandioca. (Quotation of agricultural products in the London market. October 1968: cassava). Gazeta do Agricultor 20(233):319. 1968. Pt.

CASSAVA; PRICES; TRADE; UNITED KINGDOM; MALAWI.

0516

29053 MALAWI. DEPARTMENT OF AGRICULTURAL RESEARCH. 1973. Other root crops: cassava. In Malawi. Department of Agricultural Research. Annual Report 1972-1973. Malawi. pp.162-166. En.

CASSAVA; CULTIVARS; HARVESTING; FERTILIZERS; N; P; K; PRODUCTIVITY; RESISTANCE; ASPIDIOTUS DESTRUCTOR; CASSAVA AFRICAN MOSAIC VIRUS; PEST DAMAGE; MALAWI.

The results of 3 cassava trials conducted in Malawi in 1972/73 are presented. Yields/plot and Aspidiotus destructor and CAMD scores of a cassava var. (30 var.) x fertilizer x harvesting time (15 and 18 mo.) trial are provided. Highest av. yields were for T2 and T7 (3.86 and 3.00 kg fresh roots/plant). In var. observation plots in Limphasa, all cassava var. tested but Kanjuchi (28.76 t/ha) showed high potential: T14, 55.34 t/ha; T3, 40.69 t/ha; T11, 40.15 t/ha; Koloweka, 37.44 t/ha; and Goman, 35.81 t/ha. In another trial at 7 locations with 3 fertilization rates (F0 = ONPK, F1 = 224-224-168 kg ammonium sulphate-single superphosphate-KCl/ha, resp., and F2 = double F1) and different cassava var., the response to fertilization was very good, except in Nyombo and Kasoba. Av. yields across sites were 27.2, 35.4, and 41.1 t/ha for F0, F1, and F2, resp. The optimum fertilization rate appears to be somewhere between the levels used in F1 and F2. (CIAT)

0517

29054 MALAWI. DEPARTMENT OF AGRICULTURAL RESEARCH. 1974. Other root crops: cassava. In Malawi. Department of Agricultural Research. Annual Report 1973/1974. Malawi, pp.214-218. En.

CASSAVA; CULTIVARS; FERTILIZERS; N; P; K; ROOT PRODUCTIVITY; RESISTANCE; CASSAVA AFRICAN MOSAIC VIRUS; MALAWI.

Results of expt. with cassava conducted in 1973/74 in Malawi are summarized. In a cassava var. x fertilizer x harvesting trial in Limphasa, yields of var. Masangwi (2.87 kg/plant) were outstanding, followed by var. Kumpepe and T7 (2.22 and 2.02 kg/plant, resp.). In Baka, however, higher overall av. yields/plant were obtained; outstanding var. were Nchilingano (6.67 kg/plant), followed by Masangwi (5.0 kg/plant) and Kwete and Kanjuchi (both

with 4.55 kg/plant). Fertilizer trials conducted at 8 sites indicated that differences between treatments were positively significant in Kasyata (P = 0.05), Kasoba (P = 0.01), and Chintheche (P = 0.05), negatively significant in Vinthukutu (P = 0.05), and nonsignificant in Baka, Miyombo, Lupembe, and Limphasa. In a trial in Limphasa, all 6 cassava var. tested (T3, T11, T14, Gomani, Kanjuchi, and Koloweka) showed good yield potential (from 14,373 kg/ha for Koloweka to 56,012 kg/ha for T11); resistance to CAMD was observed in T3 and Gomani. Yield trials were also conducted in Baka and Limphasa with new cassava var. collected in Karonga and Nkhata Bay; in Baka, yields were encouraging (from 42,960 kg/ha for Mbundumali to 78,400 kg/ha for Gomani), and in Limphasa, yields of some collections were encouraging: 66,700 kg/ha for Kawalika, followed by 55,500 kg/ha for Gomera. Resistance to CAMD was encouraging at both sites. (CIAT)

0518

29052 MALAWI. DEPARTMENT OF AGRICULTURAL RESEARCH. 1972. Other root crops: cassava. In Malawi. Department of Agricultural Research. Annual Report 1971/1972. Malawi, pp.185-188. En.

CASSAVA; CULTIVARS; PLANTING; SPACING; ROOT PRODUCTIVITY; MALAWI.

Results of cassava trials conducted in Malawi in 1971/72 are reported. Nine germplasm materials were maintained in Chitedze, Chitala, and Nkhotakota. The former 2 sites were seed reserves but fresh root yields in Nkhotakota ranged between 11.8-26.9 t/ha, T14 yielding highest. Cv. T11, lowest yield, was damaged by baboons. All were sweet var. and appeared promising in the area. In a long- term trial (18 mo. harvest or more) in Thuchila, 30 local and Tanganyika var. were tested for yielding ability. Significant differences (P = 0.01) between cv. were observed; cv. Mpepe yielded highest (12.44 t/ha) and T13 lowest (2.92 t/ha). A similar short- term trial (12 mo. harvest or less) with 7 local short-term cv. also showed significant differences (P = 0.01) between yields. Cv. Mpepe gave the lowest yield (2.21 t/ha) while the highest yielder was Kolosiko (7.36 t/ha). A cassava spacing trial was established with bitter cassava var. Masangwi to determine optimum intrarow (61.0, 91.5, or 122.0 cm) and interrow planting distances (91.5, 122.0, or 183.0 cm) in a 3(3) factorial design. Only a small difference was observed in root yields of cassava planted at 61.0 and 122.0 cm intrarow spacing (av. 33.27 and 31.15 t/ha, resp.), but the 91.5 cm intrarow spacing gave the highest av. yield (43.58 t/ha). Interrow spacings of 91.5 and 183.0 cm gave av. root yields of 35.21 and 27.17 t/ha, resp., while the 122.0 cm interrow spacing gave an av. yield of 45.61 t/ha. The optimum spacings were 122 cm between rows and 91.5 cm within the row (61.43 t/ha). (CIAT)

0519

29051 MALAWI. DEPARTMENT OF AGRICULTURE. 1968. Cassava (Manihot esculenta). In Malawi. Department of Agriculture. Annual Report 1967-68. Malawi, p.61. En.

CASSAVA; CULTIVARS; ROOT PRODUCTIVITY; MALAWI.

An observation trial of single plots was conducted with 9 cassava var. in Nkhota-kota District, Malawi, harvested in May 1968. Root yields obtained were 7.33, 3.64, 2.14, 1.98, 1.90, 1.46, 1.42, 1.17, and 0.89 t/ha for T11, T14, T19, T3, Kwete, Somaliland, Chimphono, Kawalika, and Kanjuici, resp. Local inhabitants found that the quality of all the var. was satisfactory. Var. T3 and Kanjuici were considered the best for chewing raw; T3 and T19 had a high fiber content and thus produced less CF. Considerable losses due

to wild pigs and CAMD were recorded for cassava var. collected in 1965-66. (CIAT)

0520

29050 MALAWI. DEPARTMENT OF AGRICULTURE. 1966. Cassava manuring and time of lifting trial. In Malawi. Department of Agriculture. Annual Report 1965-66. Malawi, pp.43-44. En.

CASSAVA; ROOT PRODUCTIVITY; CULTIVARS; FERTILIZERS; N; P; HARVESTING; TIMING; MALAWI.

Cassava var. Tenene and Manyekora were planted in a trial in Chitala, Malawi, to assess the effects of N and P fertilization (224 kg/ha each alone or in combination) and harvesting time (11, 15, 19, and 23 mo. after planting) on yields. Fertilizer and var. had little effects on root yields, but harvesting time did; av. root yields for cassava harvested at different times were 7570, 7679, 19,536, and 25,109 kg/ha at 11, 15, 19, and 23 mo., resp. After about 18 mo., the quality of these var. tended to deteriorate, thus 15-20 mo. appears to be the best harvesting age. (CIAT)

0521

29048 MALAWI. DEPARTMENT OF AGRICULTURE. 1958. Cassava variety and time of lifting trials, 1954-1958. In Malawi. Department of Agriculture. Annual Report 1957-58. Malawi, pp.34-35. En.

CASSAVA; CULTIVARS; SELECTION; ROOT PRODUCTIVITY; RESISTANCE; CASSAVA AFRICAN MOSAIC VIRUS; MALAWI.

During 1954-58, 6 Amani cassava var. (T3, T5, T11, T14, T15, and T18), 5 local cv. (Chimphuno, Kawalika, Bitisumani, Thipula, and Mutheka), and 4 later introductions from Tanganyika (Aipim Valencia, 4705A/31, 49139/1, and Msitu) were tested for yields at 4 sites in Malawi with different harvesting dates at each site: Chitedze, 11 and 23 mo.; Tuchila, 20 mo.; Kota Kota, 14 mo.; and Banga, 14, 19, and 25 mo. Yields are given for each var. at each site and for each harvesting time. Among Amani var., T18 with good CAMD resistance was the only one who scored favorably for consumption; its yields, however, were low. T14 gave yields comparable with those of local var., ranked palatable, but was one of the least resistant var. to CAMD. All T var. appeared to perform better in Kota Kota. Of the local var., Kawalika and Bitisumani were considered the best of the sweet var. for recommendation. Root yields at the different sites and harvesting times ranged between 0.57-2.39 and 0.93-6.48 t/ha in Chitedze for harvests at 11 and 23 mo., resp.; 3.64-11.13 t/ha in Tuchila for the harvest at 20 mo.; 0.53-5.46 t/ha in Kota Kota for the harvest at 14 mo.; and 1.01-5.38, 1.54-4.45, and 2.35-7.61 t/ha in Banga for harvests at 14, 19, and 25 mo., resp. (CIAT)

0522

29049 MALAWI. DEPARTMENT OF AGRICULTURE. 1958. Cassava variety trials. In Malawi. Department of Agriculture. Annual Report 1958-59. Malawi, pp.37-38. En.

CASSAVA; HARVESTING; TIMING; CULTIVARS; ROOT PRODUCTIVITY; MALAWI.

The results of a cassava var. trial conducted in Kota Kota, Malawi, in 1958/59 are reported. In spite of their somewhat greater CAMD resistance, the Amani var. did not yield better than the local ones, and most of them were less palatable. The highest yielder was the local var. Bitisumani (av.

1.91 t/ha) followed by the Amani var. T11 (av. 1.72 t/ha). T18 was considered very palatable but poor yielding (av. 0.88 t/ha). (CIAT)

0523

29047 MALAWI. DEPARTMENT OF AGRICULTURE. 1957. Cassava variety trials and time and method of planting trial. In Malawi. Department of Agriculture. Annual Report 1956-57. Malawi, pp.31-32. En.

CASSAVA; CULTIVARS; RESISTANCE; CASSAVA AFRICAN MOSAIC VIRUS; PLANTING; CUTTINGS; HARVESTING; TIMING; ROOT PRODUCTIVITY; MALAWI.

Results of cassava var. and planting time/method trials conducted in Malawi in 1956/57 are briefly reported. From var. trials in Chitedze, the most promising of the CAMD-resistant Amani var. were T3, T5, T11, T14, T18, and T19; T14 and T5 were only moderately resistant. In Kota Kota, var. T5, T11, T14, T18, and T19 were all fair yielders at 13 mo. of age, but T14 and T18 were rejected due to poor eating quality. Introductions Msitu, 49139/1, and 4705A/31 yielded 3 to 4 times more than older Amani materials. Among local var., the best yielders were Kawalika, Somaliland, Bitisumani, Kwete, Kadango, Chimphuno, Usufu, and Kanjuci. In Chitedze, different planting times (mid-Dec., early Jan., late Jan., mid-Feb.) and harvesting times (18 or 30 mo.) were assessed; cuttings used were 30.48 cm long). Results indicated that root yield decreased from 3.93 t/ha for the mid-Dec. planting to 1.17 t/ha for the mid-Feb. planting. If cassava is planted when rains are reliable, cutting size has no effect on yields (1.82 and 2.10 t/ha for cuttings 21.24 and 30.48 cm long, resp.); also, cutting size had no effect on yield/plant. Cuttings should be planted vertically with only the top 2 nodes above the ground. Theoretical yields of harvests at 18 and 30 mo. were estimated at 3.16 and 4.53 t/ha. (CIAT)

0524

29057 MALAWI. MINISTRY OF AGRICULTURE. 1986. A guide to agricultural production in Malawi 1985-86: cassava. p.42. En.

CASSAVA; CULTIVATION; CULTIVARS; MALAWI.

Agronomic recommendations for increased cassava production in Malawi are given. Disease-free, 30-cm-long cuttings of early maturing var. should be planted with the 1st rains on well drained soils on ridges at a 0.9 x 0.9 m spacing. Weeding should be done during the 1st 3 mo. of crop establishment. High yielding cassava var. recommended are Gomani (bitter), Chitembwere and Mbundumali (sweet). When cassava is prepared to be sold as chips, it should be sliced into 2.5- and 5.0-cm chips to facilitate drying. (CIAT)

0525

32039 AMBUHL, H.J.; CASAGRANDE, J.C.; JAYASENA, W.G.; SYKES, J.D.; TELLO R., C. 1985. Smallholder farming systems in the South East Mulanje area of Mulanje rural development project Malawi. Wageningen, The Netherlands, International Course for Development Oriented Research in Agriculture. Bulletin no.18 78p. En., Sum. En., 30 Ref., Il.

CASSAVA; FARMING SYSTEMS; FARM SIZE; ON-FARM RESEARCH; QUESTIONNAIRES; SOCIOECONOMIC ASPECTS; CULTIVATION SYSTEMS; INTERCROPPING; ROTATIONAL CROPS; SOIL CONSERVATION; DEVELOPMENTAL RESEARCH; MALAWI.

Constraints for the improvement of the main farming systems in SE Mulanje area, Malawi, are analyzed. Predominant food crops are maize and cassava. Research and extension areas of interest in smallholding farming systems were also identified and evaluated. Farm size, land tenure, labor, crop and

animal production, off-farm activities, sales and purchases, and input use are given for the different systems, based on data collected in surveys. Parameters including soil fertility, cropping patterns, crop husbandry, input use, off-farm activities, and extension are analyzed and discussed. Continuous cropping of cassava and maize has resulted in soil degradation, and thus farmers have substituted maize for more cassava or cash crops and have searched for increased off-farm activities. Research priorities should concentrate on developing improved intercropping systems, crop rotations, and improved maize and cassava var. (CIAT)

0526

32277 ITIMU, O.A.; SAUTI, R.F.N. 1982. Cassava green spider mite (G.S.M.) (Mononychellus tanajoa) (Bondar): its history and possible control measures in Malawi. Mzuzu, Malawi, Ministry of Agriculture. Lunyangwa Research Station. 9p. En., 6 Ref.

CASSAVA; MONONYCHELLUS TANAJOA; MITE BIOLOGY; PRODUCTIVITY; SYMPTOMATOLOGY; MITE CONTROL; MALAWI.

The appearance, damage symptoms, biology, ecology, dissemination, and possible control measures of Mononychellus tanajoa in cassava in Malawi are described. Control measures reviewed include breeding and biological, cultural, chemical, and integrated control. (CIAT)

0527

29055 MUNTHALI, D.C. 1984. The effect of pests on cassava production by subsistence farmers in the Domasi-Namasalima area of Zomba, Malawi. In Greathead, A.H.; Markham, R.H.; Murphy, R.J.; Murphy, S.T.; Robertson, I.A.D., eds. Integrated pest management of cassava green mite; regional training workshop in East Africa, 1984. Proceedings. Ascot, United Kingdom, Commonwealth Institute of Biological Control. pp.87-93. En., Sum. En., 5 Ref., Il.

CASSAVA; PESTS; CASSAVA AFRICAN MOSAIC VIRUS; TERMITES; MONONYCHELLUS TANAJOA; ROOT PRODUCTIVITY; MAPS; MALAWI.

The effects of pest incidence on cassava production by subsistence farmers were studied in Zomba, Malawi. Sixteen gardens (av. size, 0.25 ha) were planted to var. Mchilingano (18-mo. growth cycle); data on the effect of CAMD on var. Manyokola (6-mo. growth cycle) are also presented. Av. planting density was 9048 plants/ha. High incidence of the cassava green mite (Mononychellus tanajoa), an unidentified termite species, and CAMV was found. While termites killed about 15 percent of planted cuttings, CAMV reduced root yield by about 80 percent. The effect of the green mite is still to be evaluated, and Zonocerus elegans can completely destroy a crop when present. It is recommended that cuttings killed by termites be replaced, and disease-free cuttings be used. (CIAT)

0528

28308 SAUTI, R.F.N. 1986. CASSAVA & SWEET POTATO REVIEW 1960-1985. THONDWE, MALAWI, ROOT AND TUBER CROPS RESEARCH. 34P. EN., 8 REF. (MAKOKA AGRICULTURAL RESEARCH STATION, PRIVATE BAG 3, THONDWE, MALAWI)

CASSAVA; FERTILIZERS; MINERALS; PLANTING; SPACING; HARVESTING; TIMING; ROOT PRODUCTIVITY; INTERCROPPING; MAIZE; SORGHUM; MONONYCHELLUS TANAJOA; PHENACOCCUS MANIHOTI; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA FLOUR; ORGANOLEPTIC EXAMINATION; CASSAVA PROGRAMS; MALAWI.

THE ACTIVITIES CARRIED OUT ON CASSAVA AND SWEET POTATO IN MALAWI DURING 2 PERIODS (1960-77 AND 1977-85) ARE SUMMARIZED AND THE NEED FOR FURTHER RESEARCH ON ROOT AND TUBER CROPS IS STRESSED. MAIN CASSAVA PRODUCTION

CONSTRAINTS IN THE COUNTRY ARE INDICATED: DISEASES AND PESTS (BEMISIA TABACI,MONONYCHELLUS TANAJOA, PHENACOCCUS MANIHOTI); TECHNICAL (LACK OF TRAINED PERSONNEL); CULTURAL (LACK OF HIGH YIELDING VAR., PLANTING TIME, PLANT POPULATIONS, SEED SELECTION, CROP HYGIENE); AND SOCIOECONOMIC FACTORS (PRICE STRUCTURE, ABSENCE OF ESTABLISHED MARKETING SYSTEM AND ADEQUATE PROCESSING AND PACKAGING SYSTEM). FOUR CASSAVA VAR. HAVE BEAN RELEASED, NAMELY GOMANI, CHITEMBWERE, MBUNDUMALI/MANYOKOLA, AND NYASUNGWI. RESULTS OF TRIALS ON VAR. XFERTILIZATION X HARVEST TIME, VAR. X FERTILIZATION, AND SPACING ARE GIVEN. THE CASSAVA BREEDING PROGRAM IS DESCRIBED AND THE DIFFERENT AGRONOMIC TRIALS CONDUCTED, AMONG THEM CASSAVA/MAIZE AND CASSAVA/SORGHUM INTERCROPPING, ARE DETAILED. THE EFFECT OF M. TANAJOA X PLANTING TIME X VAR. ON CASSAVA YIELDS AND ITS CHEMICAL CONTROL IN DIFFERENT VAR. WERE ALSO STUDIED. THE RESULTS OF STUDIES ON THE PROCESSING OF CF AND CRISPS ARE GIVEN. (CIAT)

0529

29056 SAUTI, R.F.N. 1984. Distribution, utilization and production constraints of cassava in Malawi. In Greathead, A.H.; Markham, R.H.; Murphy, R.J.; Murphy, S.T.; Robertson, I.A.D., eds. Integrated pest management of cassava green mite; regional training workshop in East Africa, 1984. Proceedings. Ascot, United Kingdom, Commonwealth Institute of Biological Control. pp.81-85. En., Sum. En., 9 Ref.

CASSAVA; PRODUCTIVITY; CASSAVA AFRICAN MOSAIC VIRUS; MONONYCHELLUS TANAJOA; PLANTING; TIMING; ROOT PRODUCTIVITY; RESISTANCE; CULTIVARS; MALAWI.

The administrative division of Malawi is indicated and the role of cassava, an important staple food crop for 15 percent of the population, is discussed. Production constraints indicated are time of planting, selection of seed, CAMD, the cassava green mite (Mononychellus tanajoa), and whiteflies (Bemisia tabaci). An expt. conducted to show the effect of M. tanajoa (a serious pest since 1981) on cassava yield is described. The effect of spraying and planting date were significant (P less than 0.05), and the var. appeared to be important; however, the effect of the latter could not be dissociated from the year of planting date. The interaction year x planting date was also significant (P less than 0.01). (AS)

0530

32223 SAUTI, R.F.N. 1987. Effect of plant density on the yield and yield components of cassava in Malawi (Abstract). In Terry, E.R.; Akoroda, M.O.; Arene, O.B., eds. Triennial Symposium of the International Society for Tropical Root Crops- Africa Branch, 3d, Owerri, Nigeria, 1986. Tropical root crops; root crops and the African food crisis: proceedings. Ottawa, Canada, International Development Research Centre. p.35. En. (Makoka Research Station, Thondwe, Malawi)

CASSAVA; PLANTING; SPACING; ROOT PRODUCTIVITY; MALAWI.

Cassava var. x plant density trials were conducted for 3 seasons in Mkondezi, and for 1 season in Vinthukutu, in northern Malawi. In Vinthukutu in the 1982/83 season, increased cassava densities neither increased yields nor reduced final plant populations at harvest. As density increased from 21,000 to 63,000 plants/ha, however, there was a significant reduction in the total no. of roots harvested/plot for both cassava var. In Mkondezi, results for the 1982/83 and 1983/84 seasons showed that higher densities did not increase yields. In the 1984/85 season, however, higher densities significantly reduced yield. Also in Mkondezi, there were significant differences in the no. of roots harvested/plot between the 1982/83 and 1983/84 seasons and between var. in the 1984/85 season. Increased plant densities significantly reduced the no. of roots harvested/plot in the 1983/84 and 1984/85 seasons but not in the 1982/83 season. The importance

of these results with respect to the availability and quality of planting materials in Malawi is discussed. (Full text)

MAURITIUS

0531
30416 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1984. Crop production: cassava. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1981. Port Louis, p.268. En., Dat.num.

CASSAVA; PRODUCTION; STATISTICAL DATA; MAURITIUS.

Area planted (in arpents; 1 arpent = 0.42 ha) to various food crops (among them cassava) in Mauritius, up to June 1981, is indicated. (CIAT)

0532
30418 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1979. Estimated foodcrop production in 1977: manioc. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1977. Port Louis, pp.196-197. En., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; PRODUCTIVITY; MAURITIUS.

Statistical data are given on area harvested (in arpents; 1 arpent = 0.42 ha), estimated av. yield (kg/arpent), and estimated total commercial production (t) for various food crops (among them cassava) in Mauritius for 1976-77. (CIAT)

0533
30409 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1982. Estimated foodcrop production in 1980: manioc. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1980. Port Louis, p.214. En., Dat.num.

CASSAVA; PRODUCTION; STATISTICAL DATA; PRODUCTIVITY; MAURITIUS.

Data are given on area harvested (in arpents; 1 arpent = 0.42 ha), estimated av. yield (kg/arpent), and estimated total commercial production (MT) for various food crops (among them cassava) in Mauritius for 1979-80. (CIAT)

0534
30402 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1953. Food crops: manioc. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1952. Port Louis, pp.10- 11. En.

CASSAVA; STATISTICAL DATA; PRODUCTION; MAURITIUS.

Data are given on total area planted (in arpents; 1 arpent = 0.42 ha) to food crops, including cassava, as a whole, and on total production (MT) in Mauritius for 1948-49, 1949-50, 1950-51, and 1951-52. Production tended to decline, but a small increase was observed in 1951-52. (CIAT)

0535
30401 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1978. Food crops: manioc. In Mauritius. Ministry of

Agriculture and Natural Resources and the Environment. Annual Report for the year 1976. Port Louis, pp.118,156. En.

CASSAVA; CULTIVARS; STATISTICAL DATA; PRODUCTIVITY; MAURITIUS.

Twenty var. conforming the cassava collection are listed. Data are given on area harvested (in arpents; 1 arpent = 0.42 ha), estimated av. yield (kg/arpent), and estimated total commercial production (MT) for various food crops (among them cassava) in Mauritius for 1975-76. (CIAT)

0536

30407 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1956. Foodcrops. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1954. Port Louis, p.14. En., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MAURITIUS.

Data are given on total area planted (in acres) to food crops, including cassava, as a whole, and on total production (MT) in Mauritius for 1948-49, 1949-50, 1950-51, 1951-52, 1952-53, and 1953-54. An appreciable area is planted to cassava. Food crop production decreased during the last season due to various factors, which are mentioned. (CIAT)

0537

30405 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1954. Foodcrops: manioc. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1953. Port Louis, p.9. En.

CASSAVA; STATISTICAL DATA; PRODUCTION; MAURITIUS.

Data are given on total area planted (in arpents; 1 arpent = 0.42 ha) to food crops, including cassava, as a whole, and on total production (MT) in Mauritius for 1948-49, 1949-50, 1950-51, 1951-52, and 1952-53. (CIAT)

0538

30403 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1977. Foodcrops: manioc. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1975. Port Louis, pp.102,144. En., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; PRODUCTIVITY; CULTIVARS; MAURITIUS.

The maintenance of a collection of 20 cassava var. to provide planting material to growers and for observation on their performance is mentioned. The cassava var. which will be planted are listed. Data are given on area harvested (in arpents; 1 arpent = 0.42 ha), estimated av. yield (kg/arpent), and estimated total commercial production (MT) for various food crops (among them cassava) in Mauritius for 1974-75. (CIAT)

0539

30415 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1977. Foodcrops: manioc. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1974. Port Louis, pp.69,104. En., Dat.num.

CASSAVA; CULTIVARS; STATISTICAL DATA; PRODUCTION; PRODUCTIVITY; MAURITIUS.

Twenty cassava var. conforming the new collection in Mauritius are listed. Data are given on area harvested (in arpents; 1 arpent = 0.42 ha), estimated

av. yield (kg/arpent), and estimated total commercial production (MT) for various food crops (among them cassava) for 1973-74. (CIAT)

0540

30417 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1980. Foodcrops: manioc. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1978. Port Louis, pp.157,203. En., Dat.num.

CASSAVA; CULTIVARS; STATISTICAL DATA; PRODUCTION; PRODUCTIVITY; MAURITIUS.

Twenty var. conform the cassava collection in Mauritius are listed. Data are given on area harvested (in arpents; 1 arpent = 0.42 ha), estimated av. yield (kg/arpent), and estimated total commercial production (MT) for various food crops (among them cassava) for 1977-78. (CIAT)

0541

30406 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1959. Foodcrops: manioc. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1957. Port Louis, p.19. En., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MAURITIUS.

Statistical data are given on area harvested (in arpents; 1 arpent = 0.42 ha), estimated av. yield (kg/arpent), and estimated total production (t) for various food crops (among them cassava) in Mauritius for 1956-57. (CIAT)

0542

30461 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1961. Foodcrops: manioc. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1959. Port Louis, p.23. En., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MAURITIUS.

Statistical data are given on area harvested (in arpents; 1 arpent = 0.42 ha), estimated av. yield (kg/arpent), and estimated total production (t) for various food crops (among them cassava) in Mauritius for 1958-59. (CIAT)

0543

30408 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1958. Foodcrops: manioc. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1956. Port Louis, p.30. En., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; PRODUCTIVITY; MAURITIUS.

Statistical data are given on area harvested (in arpents; 1 arpent = 0.42 ha), estimated av. yield (kg/arpent), and estimated total production (t) for various food crops (among them cassava) in Mauritius for 1955-56. (CIAT)

0544

30462 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1962. Foodcrops: manioc. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1961. Port Louis, p.22. En., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; PRODUCTIVITY; MAURITIUS.

Statistical data are given on area harvested (in arpents; 1 arpent = 0.42 ha), estimated av. yield (kg/arpent), and estimated total production (t) for various food crops (among them cassava) in Mauritius for 1960-61. (CIAT)

0545

30522 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1959. Foodcrops: manioc. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1958. Port Louis, p.22. Fn., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; PRODUCTIVITY; MAURITIUS.

Statistical data are given on area harvested (in arpents; 1 arpent = 0.42 ha), estimated av. yield (kg/arpent), and estimated total production (t) for various food crops (among them cassava) in Mauritius for 1957-58. (CIAT)

0546

30404 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1961. Foodcrops: manioc. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1960. Port Louis, p.22. Fn., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; MAURITIUS.

Statistical data are given on area harvested (in arpents; 1 arpent = 0.42 ha), estimated av. yield (kg/arpent), and estimated total production (t) for various food crops (among them cassava) in Mauritius for 1959-60. (CIAT)

0547

30411 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1965. Foodcrops: manioc. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1963. Port Louis, p.46. Fn., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; MAURITIUS.

Statistical data are given on area harvested (in arpents; 1 arpent = 0.42 ha), estimated av. yield (kg/arpent), and estimated total production (t) for various food crops (among them cassava) in Mauritius for 1962-63. (CIAT)

0548

30412 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1965. Foodcrops: manioc. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1964. Port Louis, p.48. Fn., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; MAURITIUS.

Statistical data are given on area harvested (in arpents; 1 arpent = 0.42 ha), estimated av. yield (kg/arpent), and estimated total production (t) for various food crops (among them cassava) in Mauritius for 1963-64. (CIAT)

0549

30414 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1967. Foodcrops: manioc. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1965. Port Louis, p.66. Fn., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; MAURITIUS.

Statistical data are given on area harvested (in arpents; 1 arpent = 0.42 ha), estimated av. yield (kg/arpent), and estimated total production (t) for various food crops (among them cassava) in Mauritius for 1964-65. (CIAT)

0550

30413 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1968. Foodcrops: manioc. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1966. Port Louis, p.71. En., Dat.num.

CASSAVA: STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; MAURITIUS.

Statistical data are given on area harvested (in arpents; 1 arpent = 0.42 ha), estimated av. yield (kg/arpent), and estimated total production (t) for various food crops (among them cassava) in Mauritius for 1965-66. (CIAT)

0551

30457 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1972. Foodcrops: manioc. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1969. Port Louis, p.52. En., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; MAURITIUS.

Statistical data are given on area harvested (in arpents; 1 arpent = 0.42 ha), estimated av. yield (kg/arpent), and estimated total production (t) for various food crops (among them cassava) in Mauritius for 1968-69. (CIAT)

0552

30410 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1963. Foodcrops:manioc. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1962. Port Louis, pp.22,37. En., Dat.num.

CASSAVA; PRODUCTION; STATISTICAL DATA; PRODUCTIVITY; CULTIVARS; MAURITIUS.

Data are given on area harvested (in arpents; 1 arpent = 0.42 ha), estimated av. yield (kg/arpent), and estimated total commercial production (MT) for various food crops (among them cassava) in Mauritius for 1961-62. On the other hand, in a var. trial with 22 cassava var., the most outstanding were Manioc de Table, Nestor, Manioc Blanc, Australia No. 29, Constantin, Burreum, Icery, and Trinidad II. The 1st 6 have bean included in another var. trial. (CIAT)

MOZAMBIQUE

0553

30523 PRECOS DOS produtos agrícolas verificados no marco nos vários mercados da província. (Prices of agricultural products verified within the framework of several provincial markets). Gazeta do Agricultor 18(202):92-93. 1966. Pt., Dat.num.

CASSAVA; CASSAVA ROOTS (VEGETABLE); PRICES; TRADE; MOZAMBIQUE

0554

30524 PRECOS DOS produtos agrícolas verificados no mes de Abril nos vários mercados da província. (Prices of agricultural products verified in April in several provincial markets). Gazeta do Agricultor 18(203):122-123. 1966. Pt., Dat.num.

CASSAVA; CASSAVA ROOTS (VEGETABLE); PRICES; TRADE; MOZAMBIQUE

0555

30167 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1972. Agricultura. 2. Areas ocupadas por principais culturas em terra arável. (Agriculture. 2. Areas planted to main crops in arable land). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1972. Mocambique, Direccao Provincial dos Servicos de Estatística. p.237. Pt.

CASSAVA; STATISTICAL DATA; MOZAMBIQUE.

Statistical data are given on total area (ha) planted to the main crops (among them cassava) in different districts of Mozambique during 1970. (CIAT)

0556

30199 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1960. Agricultura empresarial. Culturas, suas áreas e producao. (Commercial agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1960. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.316-317. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

Statistical data are given on total area (ha) and production (kg) of various crops (among them cassava) in different districts of Mozambique during 1957-58. (CIAT)

0557

30309 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1961. Agricultura empresarial. Culturas, suas áreas e producao. (Commercial agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1961. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.348-349. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

Data are given on total area (ha) and production (kg) of various crops (among them cassava) in different districts of Mozambique during 1958-59. (CIAT)

0558

30311 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1962. Agricultura empresarial. Culturas, suas áreas e producao. (Commercial agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1962. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.382-383. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

Statistical data are given on total area (ha) and production (kg) of various crops (among them cassava) in different districts of Mozambique during 1959-60. (CIAT)

0559

30164 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1969. Agricultura empresarial. Culturas, suas áreas e producao. (Commercial agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1968. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.286-287. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

0560

30179 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1966. Agricultura empresarial. Culturas, suas áreas e producao. (Commercial agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1966. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.282-283. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

0561

30181 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1967. Agricultura empresarial. Culturas, suas áreas e producao. (Commercial agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1967. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.296-297. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

0562

30184 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1965. Agricultura empresarial. Culturas, suas áreas e producao. (Commercial agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1965. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.216-217. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE

0563

30324 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1955. Agricultura indígena. Produtos agrícolas e florestais comprados aos indígenas. (Aboriginal agriculture. Agricultural and forest products bought from aborigines). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1955. Mocambique, Direccao Provincial dos Servícos de Estatística. p.270. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; STATISTICAL DATA; MARKETING; MOZAMBIQUE.

0564

30190 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1956. Agricultura indígena. Produtos agrícolas e florestais comprados aos indígenas. (Aboriginal agriculture. Agricultural and forest products bought from aborigines). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1956. Mocambique, Direccao Provincial dos Servicos de Estatística. p.280. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; STATISTICAL DATA; MARKETING; MOZAMBIQUE.

0565

30193 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1958. Agricultura indígena. Produtos agrícolas e florestais comprados aos indígenas. (Aboriginal agriculture. Agricultural and forest products bought from aborigines). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1958. Mocambique, Direccao Provincial dos Servicos de Estatística. p.300. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; STATISTICAL DATA; MARKETING; MOZAMBIQUE.

0566

30307 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1959. Agricultura indígena. Produtos agrícolas e florestais comprados aos indígenas. (Aboriginal agriculture. Agricultural and forest products bought from aborigines). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1959. Mocambique, Direccao Provincial dos Servicos de Estatística. p.366. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; STATISTICAL DATA; MARKETING; MOZAMBIQUE.

0567

30302 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1954. Agricultura indígena. Produtos agrícolas e florestais comprados aos indígenas. (Aboriginal agriculture. Agricultural and forest products bought from aborigines). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1954. Mocambique, Direccao Provincial dos Servicos de Estatística. p.250. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; STATISTICAL DATA; MARKETING; MOZAMBIQUE.

0568

30305 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1953. Agricultura indígena. Produtos agrícolas e florestais comprados aos indígenas. (Aboriginal agriculture. Agricultural and forest products bought from aborigines). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1953. Mocambique, Direccao Provincial dos Servicos de Estatística. p.246. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; STATISTICAL DATA; MARKETING; MOZAMBIQUE.

0569

30196 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1952. Agricultura indígena. Produtos agrícolas e florestais comprados aos indígenas. (Aboriginal agriculture. Agricultural and forest products bought from aborigines). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1952. Mocambique, Direccao Provincial dos Servicos de Estatística. p.232. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; STATISTICAL DATA; MARKETING; MOZAMBIQUE.

0570

30435 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1957. Agricultura indígena. Produtos agrícolas e florestais comprados aos indígenas. (Aboriginal agriculture. Agricultural and forest products bought from aborigenes). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1957. Mocambique, Direccao Provincial dos Servicos de Estatística. p.292. Pt., Dat.num..

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; STATISTICAL DATA; MARKETING; MOZAMBIQUE.

0571

30189 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1956. Agricultura Não indígena. Culturas, suas áreas e producao. (Nonaboriginal agriculture. Crops, their areas and production). In Instituto Nacional de Estatística.

Mocambique. Anuário Estatístico 1956. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.276-277. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

Statistical data are given on total area planted (ha) and production (kg) of various crops (among them cassava) in the different districts of Mozambique during 1953-54. (CIAT)

0572

30187 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1957. Agricultura ñao indígena. Culturas, suas áreas e producao. (Nonaboriginal agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1957. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.288-289. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

Statistical data are given on total area planted (ha) and production (kg) of various crops (among them cassava) in the different districts of Mozambique during 1954-55. (CIAT)

0573

30194 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1958. Agricultura ñao indígena. Culturas, suas áreas e producao. (Nonaboriginal agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1958. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.296-297. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

Statistical data are given on total area planted (ha) and production (kg) of various crops (among them cassava) in the different districts of Mozambique during 1955-56. (CIAT)

0574

30306 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1959. Agricultura ñao indígena. Culturas, suas áreas e producao. (Nonaboriginal agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1959. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.362-363. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

Statistical data are given on total area planted (ha) and production (kg) of various crops (among them cassava) in the different districts of Mozambique during 1956-57. (CIAT)

0575

30325 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1955. Agricultura ñao indígena. Culturas, suas áreas e producao. (Nonaboriginal agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1955. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.266-267. Pt.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

Statistical data are given on total area planted (ha) and production (kg) of various crops (among them cassava) in the different districts of Mozambique during 1952-53. (CIAT)

0576

30195 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1952. Agricultura nao indígena. Culturas, suas áreas e producao. (Nonaboriginal agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1952. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.228-229. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

Statistical data are given on total area planted (ha) and production (kg) of various crops (among them cassava) in the different districts of Mozambique during 1949-50. (CIAT)

0577

30304 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1953. Agricultura nao indígena. Culturas, suas áreas e producao. (Nonaboriginal agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1953. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.242-243. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

Statistical data are given on total area planted (ha) and production (kg) of various crops (among them cassava) in the different districts of Mozambique during 1950-51. (CIAT)

0578

30301 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1954. Agricultura nao indígena. Culturas, suas áreas e producao. (Nonaboriginal agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1954. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.246-247. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

Statistical data are given on total area planted (ha) and production (kg) of various crops (among them cassava) in the different districts of Mozambique during 1951-52. (CIAT)

0579

30162 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1969. Agricultura tradicional; produtos agrícolas e florestais comprados aos agricultores. (Traditional agriculture; agricultural and forest products bought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1969. Mocambique, Direccao Provincial dos Servicos de Estatística. p.276. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; STATISTICAL DATA; PRODUCTION; MARKETING; MOZAMBIQUE.

0580

30163 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1969. Agricultura tradicional. Produtos agrícolas e florestais comprados aos agricultores. (Traditional agriculture. Agricultural and forest products bought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1968. Mocambique, Direccao Provincial dos Servicos de Estatística. p.290. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; STATISTICAL DATA; PRODUCTION; MARKETING; MOZAMBIQUE

0581

30310 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1962. Agricultura tradicional. Produtos agrícolas e florestais comprados aos agricultores. (Traditional agriculture. Agricultural and forest products bought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1962. Mocambique, Direccao Provincial dos Servicos de Estatística. p.386. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; STATISTICAL DATA; PRODUCTION; MARKETING; MOZAMBIQUE.

0582

30186 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1963. Agricultura tradicional. Produtos agrícolas e florestais comprados aos agricultores. (Traditional agriculture. Agricultural and forest products bought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1963. Mocambique, Direccao Provincial dos Servicos de Estatística. p.224. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; STATISTICAL DATA; PRODUCTION; MARKETING; MOZAMBIQUE.

0583

30198 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1960. Agricultura tradicional. Produtos agrícolas e florestais comprados aos agricultores. (Traditional agriculture. Agricultural and forest products bought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1960. Mocambique, Direccao Provincial dos Servicos de Estatística. p.320. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; STATISTICAL DATA; PRODUCTION; MARKETING; MOZAMBIQUE

0584

30200 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1961. Agricultura tradicional. Produtos agrícolas e florestais comprados aos agricultores. (Traditional agriculture. Agricultural and forest products bought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1961. Mocambique, Direccao Provincial dos Servicos de Estatística. p.354. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; STATISTICAL DATA; MARKETING; PRODUCTION; MOZAMBIQUE.

0585

30178 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1966. Agricultura tradicional. Produtos agrícolas e florestais comprados aos agricultores. (Traditional agriculture. Agricultural and forest products bought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1966. Mocambique, Direccao Provincial dos Servicos de Estatística. p.286. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; STATISTICAL DATA; PRODUCTION; MARKETING; MOZAMBIQUE.

0586

30197 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1964. Agricultura tradicional. Produtos agrícolas e florestais comprados aos agricultores. (Traditional agriculture. Agricultural and forest products bought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário

Estatístico 1964. Mocambique, Direccao Provincial dos Servicos de Estatística. p.240. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; STATISTICAL DATA; PRODUCTION; MARKETING; MOZAMBIQUE.

0587

30183 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1965. Agricultura tradicional. Produtos agrícolas e florestais comprados aos agricultores. (Traditional agriculture. Agricultural and forest products bought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1965. Mocambique, Direccao Provincial dos Servicos de Estatística. p.220. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; STATISTICAL DATA; PRODUCTION; MARKETING; MOZAMBIQUE.

0588

30180 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1967. Agricultura tradicional. Produtos agrícolas e florestais comprados aos agricultores. (Traditional agriculture. Agricultural and forest products bought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1967. Mocambique, Direccao Provincial dos Servicos de Estatística. p.300. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; STATISTICAL DATA; PRODUCTION; MARKETING; MOZAMBIQUE.

0589

30159 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1970. Areas ocupadas por principais culturas em terra arável. (Areas devoted to major crops in arable land). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1970. Mocambique, Direccao Provincial dos Servicos de Estatística. p.265. Pt.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

Statistical data are given on total area (ha) planted to the main crops (among them cassava) in different districts of Mozambique during 1968. (CIAT)

0590

30339 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1971. Areas ocupadas por principais culturas em terra arável. (Areas devoted to the main crops in arable land). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1971. Mocambique, Direccao Provincial dos Servicos de Estatística. p.269. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; MOZAMBIQUE.

Statistical data are given on total area (ha) planted to the main crops (among them cassava) in different districts of Mozambique during 1969. (CIAT)

0591

30312 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1950. Comércio com os indígenas. Produtos agrícolas e florestais comprados aos indígenas pelo comércio da Colónia, e sua existencia em armazén em 31 de Dezembro. (Trade with aborigines. Agricultural and forest products bought from aborigines as

part of the Colony's trade, and their stock up to December 31). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1950. Mocambique, Direccao Provincial dos Servicos de Estatística. p.409. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; STATISTICAL DATA; MARKETING; MOZAMBIQUE.

0592

30303 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1954. Comércio de cabotagem. Movimento, por mercadorias. (Coastal trade. Movement, by commodity). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1954. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.346-347. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; STATISTICAL DATA; MARKETING; PRICES; MOZAMBIQUE.

0593

30192 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1958. Comércio de cabotagem: movimento, por mercadorias. (Coastal trade. Movement, by commodity). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1958. Mocambique, Direccao Provincial dos Servicos de Estatística. p.413. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; STATISTICAL DATA; MARKETING; PRICES; MOZAMBIQUE.

0594

30188 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1957. Comércio de cabotagem: movimento, por mercadorias. (Coastal trade. Movement, by commodity). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1957. Mocambique, Direccao Provincial dos Servicos de Estatística. p.403. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; STATISTICAL DATA; MARKETING; PRICES; MOZAMBIQUE.

0595

30191 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1956. Comércio de cabotagem: movimento, por mercadorias. (Coastal trade. Movement, by commodity). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1956. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.393-394. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; STATISTICAL DATA; MARKETING; PRICES; MOZAMBIQUE.

0596

30323 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1955. Comércio de cabotagem: movimento, por mercadorias. (Coastal trade. Movement, by commodity). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1955. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.373-374. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; STATISTICAL DATA; MARKETING; PRICES; MOZAMBIQUE.

0597

30308 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1959. Comércio de cabotagem: movimento, por mercadorias. (Coastal trade. Movement, by commodity). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1959. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.483-484. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; STATISTICAL DATA; MARKETING; PRICES; MOZAMBIQUE.

0598

30453 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1952. Comércio de cabotagem: movimento, por mercadorias. (Coastal trade. Movement, by commodity). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1952. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.12-13. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; STATISTICAL DATA; MARKETING; PRICES; MOZAMBIQUE.

0599

30165 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1972. Comércio de produtos agrícolas. 9. Agricultura tradicional. Produtos agrícolas e florestais, comprados aos agricultores. (Trade of agricultural products. 9. Traditional agriculture. Agricultural and forest products brought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1972. Mocambique, Direccao Provincial dos Servicos de Estatística. p.359. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; STATISTICAL DATA; MARKETING; MOZAMBIQUE.

0600

30160 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1970. Comércio de produtos agrícolas. 11. Agricultura tradicional. Produtos agrícolas e florestais comprados aos agricultores. (Trade of agricultural products. 11. Traditional agriculture. Agricultural and forest products brought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1970. Mocambique, Direccao Provincial dos Servicos de Estatística. p.469 . Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; STATISTICAL DATA; MARKETING; MOZAMBIQUE.

0601

30337 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1971. Comércio de produtos agrícolas. 11. Agricultura tradicional. Produtos agrícolas e florestais, comprados aos agricultores. (Trade of agricultural products. 11. Traditional agriculture. Agricultural and forest products bought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1971. Mocambique, Direccao Provincial dos Servicos de Estatística. p.453. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; STATISTICAL DATA; MARKETING; MOZAMBIQUE.

0602

30182 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1965. Comércio especial. Exportacao das principais mercadorias. (Special trade. Export of the main commodities). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1965. Mocambique, Direccao Provincial dos Servicos de Estatística. p.315. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; TRADE; MOZAMBIQUE.

0603

30185 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1963. Comércio especial. Exportacao das principais mercadorias. (Special trade. Export of the main commodities). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1963. Mocambique, Direccao Provincial dos Servicos de Estatística. p.319. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; TRADE; MOZAMBIQUE.

0604

30451 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1967. Importacao para consumo. (Imports for consumption). In Instituto Nacional de Estatística. Mocambique. Estatísticas do Comercio Externo 1967. Mocambique, Direccao Provincial dos Servicos de Estatística. v.1,pp.13,19. Pt.

CASSAVA; CASSAVA FLOUR; STATISTICAL DATA; TRADE; PRICES; MALAWI; MOZAMBIQUE.

0605

30455 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1966. Importacao para consumo. (Imports for consumption). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1966. Mocambique, Direccao Provincial dos Servicos de Estatística. v.1,pp.12,16. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; CASSAVA ROOTS (VEGETABLE); STATISTICAL DATA; TRADE; PRICES; MOZAMBIQUE.

0606

30454 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1966. Importacao para consumo. (Imports for consumption). In Instituto Nacional de Estatística. Mocambique. Estatísticas do Comercio Externo 1968. Mocambique, Direccao Provincial dos Servicos de Estatística. v.1,pp.5,9. Pt.,Dat.num.

CASSAVA; CASSAVA FLOUR; STATISTICAL DATA; TRADE; PRICES; MOZAMBIQUE.

0607

30456 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1970. Importacao para consumo. (Imports for consumption). In Instituto Nacional de Estatística. Mocambique. Estatísticas do Comércio Externo 1970. Mocambique, Direccao Provincial dos Servicos de Estatística. v.1,pp.8,21. Pt.,Dat.num.

CASSAVA; CASSAVA ROOTS (VEGETABLE); CASSAVA FLOUR; STATISTICAL DATA; TRADE; PRICES; ANGOLA; MALAWI; MOZAMBIQUE.

0608

30459 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1969. Importacao para consumo. (Imports for consumption). In Instituto Nacional de Estatística.

Mocambique. Estatísticas do Comércio Externo 1969. Mocambique, Direccao Provincial dos Servicos de Estatística. v.1,pp.8,12. Pt.,Dat.num.

CASSAVA; CASSAVA ROOTS (VEGETABLE); CASSAVA FLOUR; STATISTICAL DATA; TRADE; PRICES; MALAWI; MOZAMBIQUE.

0609

30313 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1950. Movimento de mercadorias em cabotagem. (Commodity movement in coastal trade). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1950. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.379-380. Pt., Dat.num.

CASSAVA; CASSAVA FLOUR; DRIED ROOTS; STATISTICAL DATA; MARKETING; PRICES; MOZAMBIQUE.

0610

30161 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1970. Producao das principais culturas em terra arável. (Production of major crops in arable land). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1970. Mocambique, Direccao Provincial dos Servicos de Estatística. p.266. Pt.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

Statistical data are given on total production (t) of the main crops (among them cassava) grown in different districts of Mozambique during 1968. (CIAT)

0611

30338 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1971. Producao das principais culturas em terra arável. (Production of the main crops in arable land). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1971. Mocambique, Direccao Provincial dos Servicos de Estatística. p.270. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

Statistical data are given on total production (t) of the main crops (among them cassava) grown in different districts of Mozambique during 1969. (CIAT)

0612

30166 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1969. Producao das principais culturas em terra arável. (Production of major crops in arable land). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1972. Mocambique, Direccao Provincial dos Servicos de Estatística. p.238. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

Statistical data are given on the total production (t) of the main crops (among them cassava) grown in different districts of Mozambique during 1970. (CIAT)

0613

30420 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Areas com culturas consociadas: estratos. (Areas under associated cropping: strata). In Missao

de Inquérito Agrícola de Mocambique. Recenseamento agrícola de Mocambique. 9. Inhambane 1965. Mocambique, p.2.3.3. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; INTERCROPPING; GROUNDNUT; BEANS; COTTON; MAIZE; SORGHUM; MOZAMBIQUE.

0614

30425 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Areas com culturas onsociadas (ha); concelhos ou circunscricoes. (Areas under associated cropping (ha); towns or districts). In Missao de Inquérito Agrícola de Mocambique. Recenseamento agrícola de Mocambique. 9. Inhambane 1965. Mocambique, p.2.2.2. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; INTERCROPPING; PRODUCTION; GROUNDNUT; MAIZE; BEANS; MOZAMBIQUE.

0615

30426 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Areas cultivadas (ha), expressas em percentagens, por estratos. (Cultivated areas (ha), expressed in percentages, by strata). In Missao de Inquérito Agrícola de Mocambique. Recenseamento agrícola de Mocambique. 9. Inhambane 1965. Mocambique, p.II. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

0616

30460 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1972. Mandioca. (Cassava). In Missao de Inquerito Agrícola de Mocambique. Estatísticas Agrícolas de Mocambique 1969. Mocambique, 1p. Pt.,Dat.num.

CASSAVA; STATISTICAL DATA; MONOCROPPING; INTERCROPPING; PRODUCTION; PRODUCTIVITY; MOZAMBIQUE.

Statistical data are given on the no. of exploitations, the total area harvested (ha), both as sole crop and intercropped, and the production (t) of cassava in various provinces of Mozambique during 1969. (CIAT)

0617

30458 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1970. Mandioca. (Cassava). In Missao de Inquerito Agrícola de Mocambique. Estatísticas Agrícolas de Mocambique 1970. Mocambique, p.22. Pt.,Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

Statistical data are given on the no. of exploitations, the total area harvested (ha), and the production (t) of cassava in various provinces of Mozambique during 1970. (CIAT)

0618

30421 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Mandioca fresca com casca. (Unpeeled fresh cassava). In Missao de Inquérito Agrícola de Mocambique. Recenseamento agrícola de Mocambique. 9. Inhambane 1965. Mocambique, p.2.1.8. Pt. Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE

0619

30428 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Médias: áreas cultivadas (ha) e producoes (kg) por estratos. (Mean cultivated areas (ha) and production (kg) by strata). In Missao de Inquérito Agrícola de Mocambique. Recenseamento agrícola de Mocambique. 9. Inhambane 1965. Mocambique, 2p. Pt.,Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

0620

30429 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Número de agricultores: áreas cultivadas e producoes (por cultura). (Number of farmers: cultivated areas and production (per crop)). In Missao de Inquérito Agrícola de Mocambique. Recenseamento agrícola de Mocambique. 9. Inhambane 1965. Mocambique, 1p. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; FARM SIZE; FARMERS; PRODUCTION; MOZAMBIQUE

0621

30430 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Número de agricultores por estrato; expresso em percetagens, por estrato. (Number of farmers per stratum; expressed in percentage per stratum). In Missao de Inquérito Agrícola de Mocambique. Recenseamento agrícola de Mocambique. 9. Inhambane 1965. Mocambique, 1p. Pt., Dat.num.

CASSAVA; FARMERS; CULTIVATION; STATISTICAL DATA; MOZAMBIQUE

0622

30423 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Número de parcelas com culturas consociadas, expresso em percentagens, por estrato. (Number of plots with associated crops, expressed in percentages, by stratum). In Missao de Inquérito Agrícola de Mocambique. Recenseamento agrícola de Mocambique. 9. Inhambane 1965. Mocambique, pp.2.3.4- 2.3.5. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; INTERCROPPING; BEANS; SORGHUM; COTTON; MAIZE; GROUNDNUT; MOZAMBIQUE.

0623

30422 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Número de parcelas com culturas consociadas, por estratos. (Number of plots with associated crops, by strata). In Missao de Inquérito Agrícola de Mocambique. Recenseamento agrícola de Mocambique. 9. Inhambane 1965. Mocambique, p.2.3.2. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; SORGHUM; INTERCROPPING; GROUNDNUT; BEANS; COTTON; MAIZE; MOZAMBIQUE.

0624

30419 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Producces (ton) por estratos, concelhos ou circunscricoes. (Production (t) by strata and by towns or districts). In Missao de Inquérito Agrícola de Mocambique. Recenseamento agrícola de Mocambique. 9. Inhambane 1965. Mocambique, pp.1v, 2.2.3, 2.3.6. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

0625

30424 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Raizes e tubéroulos; número de exploracoes que os produzem, áreas e producoes respectivas, por classes de tamanho, por concelhos ou circunscricoes. (Roots and tubers, number of producing exploitations, their areas and production by sizes and by towns or districts). In Missao de Inquérito Agrícola de Mocambique. Recenseamento agrícola de Mocambique. 9. Inhambane 1965. Mocambique, p.2.1.3. Pt., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; MOZAMBIQUE.

0626

30444 CASIMIRO, J.F. 1968. Producao agrícola em Mocambique. (Agricultural production in Mozambique). Revista de Ciencias Agronómicas 1(Serie A):27-88. Pt., Sum. Pt., En., Fr., Il.

CASSAVA; PRODUCTION; SOCIOECONOMIC ASPECTS; MAPS; MOZAMBIQUE.

The factors affecting agricultural production in Mozambique during 1968 were studied, namely, climate, soils, biotic and socioeconomic factors. General information is given of the agricultural structure, and data are included on the area devoted to the main crops (among them cassava). Information on cassava includes: major production areas, total value of the production compared with world production, values for each district, av. production/ha, prices, industrialization, and exports. Major agricultural problems in the country are discussed, and some suggestions on how to solve these problems are included. (CIAT)

0627

30448 LEITAO, A.B. 1970. Da mandioca no sul do Save. (Cassava in southern Save). Lourenco Marques, Instituto de Investigacao Agronómica da Mocambique. Comunicacao no.54 55p. Pt., Sum. Pt., En., 93 Ref., Il.

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; NUTRITIVE VALUE; TOXICITY; MAPS; PRODUCTION· INTERCROPPING; CASSAVA FLOUR; PRICES; CASSAVA MEAL; STATISTICAL DATA; CASSAVA ROOTS (VEGETABLE); MOZAMBIQUE.

A brief bibliographic review is given on the introduction of cassava into Africa, the role played by the Portuguese in its diffusion, and the importance of this tuber crop in intertropical regions. Some aspects of plant origin, nutritive value, and toxicity are mentioned. From surveys made during 1954-56 and 1965- 66, the cassava producing zones of southern Save, Mozambique, were defined. The most common types of intercropping are mentioned (maize, groundnut, and beans), and the different kinds of cassava products generally used by the local population are also indicated. Based on statistical data of the period 1939-64, the evolution of crop cultivation in patronal-type farming is analyzed, comments are made on the fluctuations observed, and possible explainations are attempted. On the other hand, the economic importance of cassava mosaic is highlighted and its dissemination into the regions of Inhambane, Lourenco Marques, and Gaza is studied. Finally, the obtainment of high yielding, mosaic-resistant cv. seems to greatly contribute to solve cassava problems in southern Save. (CIAT)

0628

30526 PIRES, F.F. 1960. Cultura da mandioca; trabalhos em curso no Posto Agrícola da Mahalamba. (Cassava cultivation; current research work at the Mahalamba agricultural station). Portugal, Mocambique, Direccao de

Agricultura e Florestas. 9p. Pt., Il. Separata dos Anais de 1960 da Direccao de Agricultural e Florestas.

CASSAVA; PLANT BREEDING; CASSAVA MOSAIC VIRUS; RESISTANCE; CULTIVARS; SELECTION; PROPAGATION; MADAGASCAR; MOZAMBIQUE.

The cassava breeding method adopted at the Mahalamba agricultural station in Inhambane, Mozambique, is described. The cassava collection includes var. from different regions of the country, Angola, and Madagascar. Var. H41 (from Madagascar) was found to be highly resistant to mosaic. Comparative trials to determine its productivity and the most appropriate planting distances are recommended. Clonal selection from free-pollinated seed is also used; the objectives and methodology followed are explained in detail, in-dicating the different steps: nursery; 1st and 2nd vegetative multiplication (by cuttings) and comparative trials; multiplication for release to growers; and registration (sample format included). (CIAT)

0629

21682 ROSLING, H. 1986. CASSAVA, CYANIDE AND EPIDEMIC SPASTIC PARAPARESIS; A STUDY IN MOZAMBIQUE ON DIETARY CYANIDE EXPOSURE. DOCTORIAL THESIS. UPPSALA, SWEDEN, UNIVERSITY OF UPPSALA. ACTA UNIVERSITATIS UPSALIENSIS NO.19. 52P. EN., SUM. EN., 121 REF., IL.

CASSAVA. ANALYSIS; BIOCHEMISTRY; BITTER CASSAVA; CYANIDES; HUMAN NUTRITION; HUMAN PHYSIOLOGY; THIOCYANATES; TOXICOLOGY; MOZAMBIQUE.

AN EPIDEMIC OF 1102 CASES OF SPASTIC PARAPARESIS IN A DROUGHT-STRICKEN AREA OF MOZAMBIQUE WAS ASSOCIATED WITH A HIGH DIETARY INTAKE OF CYANIDE FROM CASSAVA ROOTS. CASSAVA WAS THE ONLY CROP TO SURVIVE THE DROUGHT. DUE TO LACK OF OTHER FOOD, THE ROOTS, WHICH HAD A HIGH CYANIDE CONTENT, WERE EATEN WITHOUT PROLONGED SUN-DRYING NORMALLY APPLIED TO REDUCE TOXICITY. HIGH CYANIDE INTAKE WAS INDICATED BY VERY HIGH SERUM LEVELS OF SCN. FOLLOW-UP STUDIES SHOWED THAT THE POPULATION AFFECTED ALSO HAD A LOW INTAKE OF S, MEASURED AS THE URINARY EXCRETION OF INORGANIC SULPHATE. THE COMBINATION OF HIGH CYANIDE AND LOW S INTAKE IS THE MOST PROBABLE ETIOLOGY OF THE PARAPARESIS OBSERVED BUT THE RESULTS ARE NOT CONCLUSIVE. THE NEUROLOGICAL LESIONS MAY HAVE BEEN CAUSED BY IMPAIRED SYNTHESIS OF ESSENTIAL S COMPOUNDS OR THEY MAY HAVE BEEN AN EFFECT OF CYANIDE PER SE. THE INSTABILITY OF CYANIDE IN BLOOD PRECLUDED ITS DETERMINATION. HOWEVER, THE ADDITION OF AG IONS TO BLOOD SPECIMENS WAS FOUND TO STABILIZE CYANIDE. THIS NEW METHOD WILL FACILITATE TRANSPORT OF SPECIMENS IN TROPICAL CLIMATES AND THEREBY FUTURE DETERMINATIONS OF BLOOD CYANIDE IN CASSAVA-EATERS. THE ANKLE CLONUS RATE WAS HIGH AMONG APPARENTLY HEALTHY CHILDREN FROM THE AFFECTED AREA. CHILDREN WITH CLONUS HAD HIGHER CYANIDE INTAKE, MEASURED AS URINARY SCN. FURTHER STUDIES INDICATED THAT THE THYROID GLAND, IN THE PRESENCE OF AN ADEQUATE I INTAKE, CAN ADAPT TO A HEAVY BODY BURDEN OF SCN [illegible] HOUT DEVELOPMENT OF GOITRE OR HYPOTHYROIDISM. CASSAVA TOXICITY [illegible] CAUSE PROBLEMS UNDER SPECIAL CIRCUMSTANCES. HOWEVER, THE YIELD OF CASSAVA IS HIGH AND AN INCREASED CULTIVATION MAY THEREBY IN MANY AREAS IMPROVE THE HEALTH OF POOR PEASANT FAMILIES, PROVIDED THAT EFFICIENT METHODS FOR CYANIDE REDUCTION ARE USED, THAT SOME PROTEIN-RICH SUPPLEMENTARY FOOD IS AVAILABLE, AND THAT I SUPPLEMENTATION IS GIVEN WHEN NECESSARY. (AS)

NIGERIA

0630

30486 Séminaire International La Mosaique Africaine du Manioc et son Controle, Cote d'Ivoire. 1987. Résumés. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Coopération. 62p. 1987. Fr., En., 84 Ref., Il.

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; DISEASE CONTROL; PRODUCTIVITY; BEMISIA; ETIOLOGY; EPIDEMIOLOGY; GENETICS; TISSUE CULTURE; NIGERIA; MADAGASCAR; CONGO; KENYA; IVORY COAST.

Different aspects of CAMD and its control presented at an international seminar held in Ivory Coast are summarized in both French and English. A general synthesis is made of the reports presented by national representatives. Aspects covered dealt with the importance, distribution, and methods of control of the disease; impact of the disease on cassava growth and yield; properties and geographical variation of the causal agent, disease etiology and epidemiology; biology, population dynamics, and interaction of Bemisia tabaci with cassava var.; genetic variability of cassava; microclimatic parameters; tissue culture and cassava sanitation; selection of healthy cassava plants by reversion; and host-virus relationships. (CIAT)

0631

27680 COMMONWEALTH INSTITUTE OF BIOLOGICAL CONTROL. 1984. CASSAVA PESTS. IN--------. ANNUAL REPORT 1983-84. SLOUGH, UNITED KINGDOM, COMMONWEALTH AGRICULTURAL BUREAUX. PP.6-7. EN.

CASSAVA; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; APOANAGYRUS LOPEZI; INJURIOUS MITES; TYPHLODRAMALUS LIMONICUS; OLIGOTA MINUTA; UNITED KINGDOM; SOUTH AMERICA; NIGERIA; CONGO.

RESEARCH CARRIED OUT BY THE COMMONWEALTH INSTITUTE OF BIOLOGICAL CONTROL ON CASSAVA PESTS IS BRIEFLY REPORTED. APOANAGYRUS LOPEZI, THE MOST ABUNDANT PARASITE IN SOUTH AMERICA AND PREDATOR OF PHENACOCCUS MANIHOTI, A CASSAVA PEST, WAS RELEASED IN NIGERIA AT THE END OF 1981 AND CONTINUES TO SUPPRESS THE PEST AND TO SPREAD NATURALLY. IT IS ALSO ESTABLISHED IN CONGO. RECENTLY THE PREDATORY MITE TYPHLODRAMALUS LIMONICUS, WHICH CONTROLS CASSAVA MITES (MONONYCHELLUS SPP.), WAS SENT FROM SOUTH AMERICA FOR ONWARD SHIPMENT TO NIGERIA. STUDIES ON THE NATIVE MITE PREDATOR COMPLEX CONTINUED; UNFORTUNATELYNO RECOVERIES OF THE PREDATOR OLIGOTA MINUTA HAVE BEEN MADE. (CIAT)

0632

31552 INSTITUT DES PLANTES A TUBERCULES. TOGO. 1983. Le manioc. (Cassava). In Institut des Plantes a Tubercules. Togo. Rapport Annuel 1983. Lomé, Togo, Ministere du Développement Rural. pp.19-22,24-53. Fr.

CASSAVA; CASSAVA PROGRAMS; GERMPLASM; CULTIVARS; IDENTIFICATION; SELECTION; HCN CONTENT; RESISTANCE; CASSAVA AFRICAN MOSAIC VIRUS; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; TOGO; NIGERIA.

Clones from the cassava collection of the Institut National des Plantes a Tubercules (Lomé, Togo) in 1983 are listed mentioning their place of origin. A proposal for the classification of germplasm based on petiole color and stem branching is included. The main characteristics of clones introduced from Ivory Coast and others from the International Institute of Tropical Agriculture, IITA (Nigeria) are described. A list of seed families introduced from IITA is given. A table showing the HCN content of various clones determined by the

silver nitrate method is presented. Results from phytosanitary evaluations of cassava clones at Agoenyivé exptl. station are synthesized. Clone performance regarding resistance to CAMV, cassava mealybug, and cassava green spider is presented in a table. (CIAT)

0633

28127 INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE. 1985. BIOLOGICAL CONTROL OF CASSAVA MEALYBUG AND GREEN SPIDER MITES. IBADAN, NIGERIA, BIOLOGICAL CONTROL PROJECT. INFORMATION SERIES NO.16. 25P. EN., SUM. FN., IL.

CASSAVA; PHENACOCCUS MANIHOTI; MONONYCHELLUS; BIOLOGICAL CONTROL; EPIDINOCARSIS LOPEZI; PREDATORS AND PARASITES; AFRICA; NIGERIA.

THE PROGRESS IN THE BIOLOGICAL CONTROL OF PHENACOCCUS MANIHOTI AND MONONYCHELLUS SPP., 2 SERIOUS CASSAVA PESTS IN AFRICA, IS SUMMARIZED. INSECT APPEARANCE, BIOLOGY, AND CONTROL STRATEGIES ARE BRIEFLY DESCRIBED. SUCCESSFULCONTROL OF P. MANIHOTI HAS BEEN ACHIEVED WITH THE PARASITOID EPIDINOCARSIS LOPEZI, WHICH WAS 1ST RELEASED IN IBADAN (INTERNATIONAL INSTITUTE OF TROPICALAGRICULTURE, NIGERIA) IN 1981-82. IN THE CASE OF MONONYCHELLUS SPP. 11 PREDATORY MITES HAVE PROVED SUCCESSFUL IN CONTROLLING THE PEST WITH HIGH PREDATION RATES AND GOOD ESTABLISHMENT IN THE FIELD. THE CAMPAIGN FOR MASS-REARING AND DISTRIBUTION OF THE BIOLOGICAL CONTROL AGENTS IS BRIEFLY DESCRIBED. (CIAT)

0634

29575 INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE. 1982. Cassava breeding methods. In International Institute of Tropical Agriculture. Tuber and root crops production manual. Ibadan, Nigeria, Manual Series no.9. pp.92-102. En., 61 Ref., Il.

CASSAVA; PLANT BREEDING; CASSAVA PROGRAMS; NIGERIA.

The cassava breeding methods used by the International Institute of Tropical Agriculture (Nigeria) are described; breeding objectives are indicated. The steps followed were source populations (manual or in isolation pollinations, seed collection, and seed germination); screening (seedling selection; preliminary, advanced, and uniform yield trials), evaluation, and popularization. The latter stage occurs 6 yr after the breeding process has begun. (CIAT)

0635

29342 INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE. 1982. Chapter 4: Weed control. Fertilizing. In International Institute of Tropical Agriculture. Tuber and root crops production manual. Ibadan, Nigeria, Manual Series no.9. pp.43-60. En.

CASSAVA; WEEDS; WEEDING; LABOR; HERBICIDES; FERTILIZERS; N; P; K; AGRICULTURAL LIME; NIGERIA.

Weed control in cassava crops in Africa is reviewed; it is emphasized that weeding uses a high proportion of the labor devoted to the crop. Results from excellent weed control trials using herbicides such as fluometuron (2.0-3.0 kg a.i./ha), diuron (2 kg a.i./ha), or a mixture of them with alachlor or metolachlor (3.0 and 2.0 kg a.i./ha, resp.) are reviewed. The selection of cassava var. can be a useful weed control measure. Integrated weed control measures and the response of cassava to N, P, K, and liming are discussed. Calculations and examples are included for estimating fertilizer rates. Fertilizer mixtures and procedures are described. (CIAT)

0636

29343 INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE. 1982. Diseases and pests of cassava. In International Institute of Tropical Agriculture. Tuber and root crops production manual. Ibadan, Nigeria, Manual Series no.9. pp.61-83. En., Il.

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BROWN STREAK VIRUS; DISEASE CONTROL; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; XANTHOMONAS CAMPESTRIS PV. CASSAVAE; INSECT CONTROL; MITE CONTROL; CERCOSPORIDIUM HENNINGSII; GLOMERELLA MANIHOTIS; PHYLLOSTICTA; GLOMERELLA CINGULATA; BEMISIA; ZONOCERUS VARIEGATUS; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; TERMITES; NIGERIA.

The symptomatology, damage, and control of diseases and pests in Africa are reviewed. Among viral diseases described are CAMD and brown streak; among bacterial diseases, CBB (Xanthomonas campestris pv. manihotis and X. cassavae); and among fungal diseases, those caused by Cercosporidium henningsii, Cercospora caribaea, Colletrotrichum manihotis, Phyllosticta sp., and root rots (Glomerella cingulata, Phytophtora spp.). Disease The classification of disease severity in each case is illustrated. The damage and control of the pests Bemisia tabaci, Zonocerus variegatus, Phenacoccus manihoti, Mononychellus tanajoa, and termites are described. (CIAT)

0637

30498 INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE. 1982. Harvesting and postharvest technology. In International Institute of Tropical Agriculture. Tuber and root crops production manual. Ibadan, Nigeria, Manual Series no.9. pp.84-91. En.

CASSAVA; HARVESTING; TIMING; PROCESSING; GARI; CASSAVA FLOUR; CASSAVA MEAL; CASSAVA CHIPS; PELLETS; CASSAVA STARCH; LEAVES; COMPOSITION; NIGERIA.

Aspects of cassava harvesting and postharvesting technology in Africa are reviewed. Harvesting seasons and methods are discussed. Postharvest cassava root transformation into gari, CF, CM, chips, pellets, and starch is described. The use of cassava leaves for human consumption is also described, their chemical composition is included. (CIAT)

0638

29341 INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE. 1982. Land preparation and planting. In International Institute of Tropical Agriculture. Tuber and root crops production manual. Ibadan, Nigeria, Manual Series no.9. pp.29-42. En.

CASSAVA; LAND PREPARATION; PLANTING; CUTTINGS; PROPAGATION; SEED; NIGERIA.

Cassava land preparation and planting practices are reviewed and recommendations are made, particularly for Africa. An analysis is also made of the quality of planting materials based on plant age, no. of nodes/cutting, cutting thickness, mechanical damage of cuttings, and storage. Other cassava propagation methods are described including rapid propagation, tissue culture, and seed propagation. Planting position of cuttings, planting season and depth, and population density are also discussed. (CIAT)

0639

29340 INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE. 1982. Soils and environments for cassava production and their effective management. In International Institute of Tropical Agriculture. Tuber and root crops production manual. Ibadan, Nigeria, Manual Series no.9 pp.22-28. En.

CASSAVA; SOIL PHYSICAL PROPERTIES; SOIL MOISTURE; EROSION; MULCHING; CLIMATIC REQUIREMENTS; NIGERIA.

Results from several expt. with cassava in different soils and environments and their effective management in Nigeria are presented. Greenhouse studies conducted in an Alfisol at the International Institute of Tropical Agriculture showed severe root yield and shoot wt. reductions when cassava was cultivated at a soil water potential of -10 bars. In one expt. optimum cassava growth was observed at a soil temp. of 30 degrees Celsius. Ease of harvest depends on soil factors like texture, MC at harvest, clayey nature, structure, machinery used in land preparation, soil compaction, and others. In another expt., as slope increased from 1 to 15 percent, soil erosion increased 15 times. Expt. with mulches showed that dry straw from different legume crops, sawdust, rice bran, and chopped cassava stems increased root yields compared with unmulched plots. Favorable temp. and rainfall conditions for cassava cultivation in Africa are discussed. (CIAT)

0640

29339 INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE. 1982. The origin and botany of cassava. In International Institute of Tropical Agriculture. Tuber and root crops production manual. Ibadan, Nigeria, Manual Series no.9. pp.8-21. En., Il.

CASSAVA; IDENTIFICATION; PLANT GEOGRAPHY; TAXONOMY; PLANT ANATOMY; LEAVES; ROOTS; STEMS; PLANT PHYSIOLOGY; BRANCHING; ROOT DEVELOPMENT; NIGERIA.

Different aspects of the origin and botany (roots, stems, leaves) of cassava are described. Distribution and taxonomy are also covered. Leaf activity, branch production, root thickening, relationships between yield and plant density, and the canopy are also mentioned. (CIAT)

0641

28365 NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA. 1980. A SOCIO-ECONOMIC SURVEY OF FARMER-ADOPTION OF NATIONAL ACCELERATED FOOD PRODUCTION PROJECT'S (NAFPP) PACKAGE RECOMMENDATIONS FOR CASSAVA/MAIZE PRODUCTION IN NIGERIA; SURVEY PLAN. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE.NATIONAL CASSAVA CENTRE. PP.185-196. EN.

CASSAVA; TECHNOLOGY TRANSFER; MAIZE; INTERCROPPING; EXPERIMENT DESIGN; SOCIOECONOMIC ASPECTS; NIGERIA.

THE OBJECTIVES, JUSTIFICATION, COVERAGE, TIME REFERENCE, AND SAMPLE DESIGN OF A SOCIOECONOMIC SURVEY OF FARMER ADOPTION IN NIGERIA OF THE TECHNOLOGY PACKAGE FOR CASSAVA/MAIZE, DEVELOPED BY THE NATIONAL ACCELERATED FOOD PRODUCTION PROJECT, ARE DESCRIBED. THE QUESTIONNAIRE TO BE USED IS INCLUDED. (CIAT)

0642

28360 NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA. 1980. ANNUAL REPORT 1979/80 LAGOS STATE. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE.NATIONAL CASSAVA CENTRE. PP.156-164. EN.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; PRODUCTIVITY; SOCIOECONOMIC ASPECTS; TECHNOLOGY TRANSFER; FERTILIZERS; INTERCROPPING; MAIZE; NIGERIA.

THE 1979/80 ANNUAL REPORT OF ACTIVITIES OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) REGARDING CASSAVA IN LAGOS STATE, NIGERIA, IS PRESENTED. RESULTS OF 1978/79 FERTILIZER TRIALS, CASSAVA/MAIZE INTERCROPPING TRIALS, DEMONSTRATION TRIALS, MULTIPLICATION PLOTS, AND FIELD DAYS ARE GIVEN. CASSAVA VAR. TMX 30572 GAVE HIGHEST YIELDS IN THE

INTERCROPPING TRIALS. TRAINING ACTIVITIES ARE MENTIONED AND DIVERSE ADMINISTRATIVE ISSUES ARE DISCUSSED. A TOTAL OF 8110 IMPROVED CASSAVA CUTTINGS WERE DISTRIBUTED. (CIAT)

0643

28348 NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA. 1980. CASSAVA IN THE DELTA AREA OF BENDEL STATE. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.43-46. EN.

CASSAVA; PRODUCTION; TECHNOLOGY TRANSFER; PLANTING; NIGERIA.

CASSAVA PRODUCTION PRACTICES ARE DESCRIBED AND PRODUCTION PROBLEMS AND SUGGESTED SOLUTIONS ARE DISCUSSED FOR BENDEL STATE, NIGERIA, WHERE CASSAVA IS THE MAIN FOOD CROP AND THE MOST IMPORTANT CASH CROP. THE PACKAGE OF CASSAVA PRODUCTION PRACTICES RECOMMENDED BY NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) IS INDICATED; PROBLEMS PRESENTED BY ITS ADOPTION IN THE REGION ARE ANALYZED. RIDGING SHOULD BE ELIMINATED FROM THE PACKAGE AND THE SINGLE APPLICATION OF ONLY 1 COMPOUND FERTILIZER IS RECOMMENDED. (CIAT)

0644

28356 NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA. 1980. CASSAVA REPORT: BENUE STATE. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.130-138. EN.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BACTERIAL BLIGHT; NIGERIA.

CASSAVA RESEARCH ACTIVITIES CONDUCTED IN BENUE STATE, NIGERIA, IN 1979-80ARE BRIEFLY REPORTED. VAR. 30211, 30572, 3055, AND 1525 WERE INCLUDED IN MINIKIT TRIALS. CAMD AND CBB WERE REPORTED. (CIAT)

0645

28363 NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA. 1980. CO-OPERATION PROGRAMME DEVELOPMENT OF CASSAVA AND SWEET POTATOES (AGBARHO). IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.175-180. EN.

CASSAVA; CASSAVA PROGRAMS; BACTERIOSES; CULTIVARS PRODUCTIVITY; PLANTING; NIGERIA.

A COOPERATION PROGRAM TO DEVELOP CASSAVA AND SWEET POTATO TECHNOLOGY IN AGBARHO (BENDEL STATE, NIGERIA) IS BRIEFLY DESCRIBED. PROMISING HIGH YIELDING VAR. WITH RESISTANCE TO CBB AND CAMD HAVE BEEN IDENTIFIED. IMPROVED PRODUCTION TECHNOLOGY RELATED TO THE USE OF CHEMICAL INPUTS WAS RELEASED. DATA IS GIVEN ON CASSAVA VAR. DISTRIBUTED AND THE RESP. NO. OF CUTTINGS PROVIDED. (CIAT)

0646

28357 NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA. 1980. CROSS RIVER STATE REPORT. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.139-146. EN.

CASSAVA; CASSAVA PROGRAMS; FERTILIZERS; CULTIVARS; INTERCROPPING; MAIZE; PRODUCTIVITY; NIGERIA.

CASSAVA RESEARCH ACTIVITIES CONDUCTED IN CROSS RIVER STATE, NIGERIA, IN 1979-80 ARE BRIEFLY REPORTED. CASSAVA VAR. 30555 AND 30395 SHOWED THE BEST PERFORMANCE IN INTERCROPPING TRIALS WITH MAIZE IN AKAMKPA IN THE 1978-79 TRIALS; VAR. 30211 PERFORMED BEST IN UYO AND IKOM, 60506 IN ABAK, AND 30395 IN ORON AND IKOT EKPENE. RESULTS FROM THE CASSAVA/MAIZE DEMONSTRATION TRIALS

FOR THE SAME PERIOD INDICATE THAT FARMERS ACCEPTED THE IMPROVED PACKAGE PRACTICES. IN 1979-80, 9 CASSAVA/MAIZE MINIKIT TRIALS AND 2 FIELD DAYS WERE ORGANIZED. NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) ADMINISTRATIVE ISSUES, PROBLEMS, AND SOLUTIONS ARE DISCUSSED. (CIAT)

0647

28358 NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA. 1980. IMO STATE REPORT. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE.NATIONAL CASSAVA CENTRE. PP.147-151. EN.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; TECHNOLOGY TRANSFER; FERTILIZERS; PRODUCTIVITY; NIGERIA.

CASSAVA RESEARCH ACTIVITIES CONDUCTED IN IMO STATE, NIGERIA, IN 1979-80 ARE BRIEFLY REPORTED. CULTURAL PRACTICES ADOPTED (DEMONSTRATION OF IMPROVED PACKAGE; VAR. AND FERTILIZER TRIALS) ARE MENTIONED. VAR. TMX 30211, TMX 30555, AND TMX 30395 WERE SUPERIOR IN PERFORMANCE. SHORTAGE OF INPUTS AND LACK OF FINANCIAL SUPPORT WERE MAJOR CONSTRAINTS TO THE EXECUTION OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME). (CIAT)

0648

28355 NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA. 1980. NATIONAL ACCELERATED FOOD PRODUCTION PROJECT (NAFPP) 1979/80 ANNUAL REPORT FOR ANAMBRA STATE. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE.NATIONAL CASSAVA CENTRE. PP.120-135. EN.

CASSAVA; CASSAVA PROGRAMS; INTERCROPPING; CULTIVARS; MAIZE; RICE; PRODUCTIVITY; FERTILIZERS; TECHNOLOGY TRANSFER; NIGERIA.

THE 1979-80 REPORT OF THE NATIONAL ACCELERATED FOOD PRODUCTION PROJECT (NAFPP) IN ANAMBRA STATE, NIGERIA, IS PRESENTED. AMONG THE ACTIVITIES CONDUCTED ARE A NATIONAL CASSAVA WORKSHOP AND A SHORT MAIZE/CASSAVA AND RICE TRAINING COURSE. RESULTS OF CASSAVA AND CASSAVA/MAIZE VAR. AND FERTILIZER MINIKIT TRIALS, DEMONSTRATIONS, [illegible] PRODUCTION TRIALS ARE GIVEN. OTHER NAFPP ADMINISTRATIVE AND RESEARCH-RELATED TOPICS ARE REPORTED. (CIAT)

0649

28362 NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA. 1980. NATIONAL ACCELERATED FOOD PRODUCTION PROJECT: RIVERS STATE, 1979/80 REPORT. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE.NATIONAL CASSAVA CENTRE. PP.168-174. EN.

CASSAVA; CASSAVA PROGRAMS; MAIZE; INTERCROPPING; CULTIVARS; TECHNOLOGY TRANSFER; PRODUCTIVITY; FERTILIZERS; NIGERIA.

THE 1979/80 ANNUAL REPORT OF ACTIVITIES OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) REGARDING CASSAVA IN RIVERS STATE, NIGERIA, IS PRESENTED. ARMYWORM ATTACK AND ROOT ROTS WERE REPORTED. RESULTS OF THE 1978/79 VAR. MINIKIT TRIALS ARE GIVEN. CASSAVA VAR. PLANTED IN THE 1979/80 VAR. TRIALS ARE INDICATED. FIELD DAY OBSERVATIONS, TRAINING AND SEED MULTIPLICATION ACTIVITIES ARE MENTIONED. CONSTRAINTS TO THE EXECUTION OF 1979PLANS ARE LISTED. (CIAT)

0650

28343 NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA. 1980. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE.224P. EN., IL.

CASSAVA; CASSAVA PROGRAMS; SOCIOECONOMIC ASPECTS; TECHNOLOGY TRANSFER; CULTIVARS; SOIL FERTILITY; PLANT FERTILITY; PRODUCTIVITY; PEST CONTROL; PEST

DAMAGE; EXPERIMENT DESIGN; BIOLOGICAL CONTROL; WEEDING; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; CLONES; PLANTING; NUTRITIONAL REQUIREMENTS; NIGERIA.

THE PROCEEDINGS OF THE 4TH NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) NATIONAL CASSAVA WORKSHOP, HELD IN NIGERIA IN 1980, ARE PRESENTED.THE 25 TECHNICAL PAPERS PRESENTED INCLUDE NIGERIAN INSTITUTIONAL AND STATE REPORTS AND RESULTS OF STUDIES ON THE CONTROL OF PHENACOCCUS MANIHOTI, MINIKIT TRIALS, INNOVATIONS FOR CASSAVA PRODUCTION IN A HEAVILY POPULATED AREA OF EASTERN NIGERIA, TECHNOLOGY TRANSFER, MECHANIZATION, AGRICULTURAL CREDIT, CASSAVA CULTURAL PRACTICES, NUTRIENT DEMANDS, SOIL MANAGEMENT, COOPERATIVE PROGRAMS, IMPROVED CLONE SELECTION, FARMER ADOPTION OF TECHNOLOGYPACKAGES, AND VAR. (CIAT)

0651

28368 NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA. 1980. PROPOSED ACTIVITIES 1980/81. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE.NATIONAL CASSAVA CENTRE. PP.205-216. EN.

CASSAVA; CASSAVA PROGRAMS; DEVELOPMENT; FERTILIZERS; MAIZE; INTERCROPPING; PROPAGATION; NIGERIA.

THE OBJECTIVES, PROCEDURES, LOCATIONS, DURATION, AND DATA TO BE RECORDED FOR THE DIFFERENT CASSAVA RESEARCH PROJECTS OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) IN 1980-81 ARE PRESENTED. THE PROJECTSINCLUDE A HERBICIDE PRE-MINIKIT TRIAL, A MIXED CROPPING PRE-MINIKIT TRIAL, A CASSAVA VAR. MINIKIT TRIAL, FERTILIZER TESTS, CASSAVA/MAIZE DEMONSTRATIONS, ECONOMIC STUDIES OF CASSAVA/MAIZE DEMONSTRATION/PRODUCTION TRIALS, AND CASSAVA MULTIPLICATION. (CIAT)

0652

28359 NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA. 1980. REPORT ON NAFPP CASSAVA/MAIZE PROGRAMME IN KWARA STATE. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE.NATIONAL CASSAVA CENTRE. PP.152-155. EN.

CASSAVA; CASSAVA PROGRAMS; MAIZE; INTERCROPPING; HERBICIDES; PROPAGATION; FERTILIZERS; N; P; K; S; NIGERIA.

CASSAVA/MAIZE PROGRAM ACTIVITIES IN KWARA STATE, NIGERIA, IN 1979 ARE REPORTED. PRELIMINARY RESULTS OF HERBICIDE TRIALS INDICATE THE NEED FOR 1 HAND WEEDING IN CHEMICALLY TREATED FIELDS. IN FERTILIZER TRIALS, CASSAVA RESPONDED MORE TO NKS FERTILIZATION THAN TO NPKS, PKS, NPK, AND NPS. DATA AREPROVIDED ON CASSAVA MULTIPLICATION AND PLANS FOR 1980. (CIAT)

0653

28366 NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA. 1980. RESOLUTIONS MADE AT THE 4TH NAFPP NATIONAL CASSAVA WORKSHOP. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE.NATIONAL CASSAVA CENTRE. PP.197-199. EN.

CASSAVA; CASSAVA PROGRAMS; DEVELOPMENT; NIGERIA.

THE IDENTIFIED CONSTRAINTS AND THE RECOMMENDATIONS MADE BY A 12-MEMBER COMMITTEE, PARTICIPATING IN THE 4TH NATIONAL CASSAVA WORKSHOP OF THE NATIONALROOT CROPS RESEARCH INSTITUTE (NIGERIA) IN 1980, ARE PRESENTED. RECOMMENDATIONS RELATE TO ADEQUATE FUNDING, STAFFING, AND TRAINING OF THE INSTITUTIONS INVOLVED IN CASSAVA RESEARCH/EXTENSION ACTIVITIES, AND TO PROVIDING FARMERS WITH TIMELY CREDIT, INPUTS, AND MARKETING FACILITIES. (CIAT)

0654

28367 NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA. 1980. REVIEW OF CASSAVA VARIETIES; ECOLOGICAL TRIALS (10 TOP SELECTIONS). IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE.NATIONAL CASSAVA CENTRE. PP.200-204. EN.

CASSAVA; ECOSYSTEMS; CULTIVARS; PRODUCTIVITY; KPOKPO; GARI; ADAPTATION; SELECTION; NIGERIA.

YIELD DATA OF THE 10 TOP CASSAVA VAR. FROM EACH OF 5 NIGERIAN LOCATIONS (UMUDIKE, UGWUOBA, OTCBI, AJASSE, AND OBIOR), PLANTED IN MAY 1978 AND HARVESTED 1 YR LATER, ARE PRESENTED. SELECTED VAR. FOR ADVANCED TRIALS WERE 60506, 4080, 30337, U/41044, 40378, 30786, 30040, 73/335, TMX 335, AND 4(2)0599. (CIAT)

0655

28347 NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA. 1980. SOME INNOVATIONS FOR CASSAVA PRODUCTION IN A HEAVILY POPULATED AREA OF EASTERN NIGERIA. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE.NATIONAL CASSAVA CENTRE. PP.35-42. EN., 5 REF., IL.

CASSAVA; CLIMATIC REQUIREMENTS; NUTRITIONAL REQUIREMENTS; STATISTICAL DATA; SOCIOECONOMIC ASPECTS; TECHNOLOGY TRANSFER; CULTIVATION SYSTEMS; NIGERIA.

A SURVEY WAS CONDUCTED IN 6 VILLAGES OF A HEAVILY POPULATED AREA OF EASTERN NIGERIA IN ORDER TO RECOMMEND INNOVATIONS FOR CASSAVA PRODUCTION. SCARCITIES AND HAZARDS FOR CASSAVA FARMERS INCLUDED LABOR, CASH, RAINFALL, PESTS, STAPLE FOOD SUPPLIES, AND PROTEIN FOOD SUPPLIES. INFORMATION ON THE METHODS USED BY FARMERS TO DEAL WITH THESE CONSTRAINTS IS PROVIDED. CASSAVA PRODUCTION SYSTEMS ARE ALSO DESCRIBED. INNOVATIONS CAN BE MADE BY (1) LOWERING THE EARLY LABOR PEAK REQUIRED FOR CLEARING, TILLAGE, AND PLANTING; (2) INTERCROPPING WITH TREES; (3) MIN. TILLAGE; (4) DELAYED PLANTING; AND (5)USE OF EARLY OR LATE MATURING VAR. FOR LATE PLANTINGS. THESE RECOMMENDATIONS ARE BRIEFLY ASSESSED. (CIAT)

0656

28361 NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA. 1980. UP-TO-DATE REPORT ON CASSAVA VARIETY/MAIZE MINIKIT TRIAL 1979/80: ONDO STATE. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE.NATIONAL CASSAVA CENTRE. PP.165-167. EN.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; MAIZE; INTERCROPPING; NIGERIA.

AN UPDATED REPORT OF ACTIVITIES OF THE CASSAVA/MAIZE MINIKIT TRIALS IN ONDO STATE, NIGERIA, IN 1979-80 IS PRESENTED. DATA ARE GIVEN ON CASSAVA VAR.DISTRIBUTION TO DIFFERENT SITES AND CONDITION OF PLANTED PLOTS TO DATE. (CIAT)

0657

28369 NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA. 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE.200P. EN., IL.

CASSAVA; CASSAVA PROGRAMS; TECHNOLOGY TRANSFER; DEVELOPMENT; FERTILIZERS; SEED; CULTIVARS; CLONES; MAIZE; INTERCROPPING; PROCESSING; NUTRIENT UPTAKE; PEST CONTROL; NIGERIA.

THE PAPERS PRESENTED AT THE 5TH NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) NATIONAL CASSAVA WORKSHOP (UMUDIKE, NIGERIA), HELD ON FEB. 9-13, 1981, ARE COMPILED. IN ADDITION TO 13 NIGERIAN STATE ANNUAL REPORTS, SPECIFIC TOPICS DEALT WITH ARE AS FOLLOWS: A DELIVERY SYSTEM FOR CASSAVA,

IMPROVEMENT OF FOOD PRODUCTION SYSTEMS THROUGH NAFPP WORKSHOPS, RECOMMENDATIONS ON CASSAVA/MAIZE PRODUCTION, COMMERCIAL-SCALE ADAPTATION OF THE RAPID MULTIPLICATION TECHNIQUE, CHEMICAL CONTROL OF PHENACOCCUS MANIHOTI AND ITS EFFECTS ON YIELDS, CASSAVA VAR. PERFORMANCE, A CASE STUDY ON FERTILIZER DEMAND, CASSAVA/MAIZE RESPONSE TO FERTILIZATION, FACTORS AFFECTING FERTILIZER EFFICIENCY, AND PROGRESS AND PROBLEMS OF CASSAVA MULTIPLICATION. (CIAT)

0658

28520 NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA. 1982. ANAMBRA STATE. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.179-193. EN.

CASSAVA; SOCIOECONOMIC ASPECTS; CASSAVA PROGRAMS; NIGERIA.

THE 1981-82 REPORT OF THE NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME (NAFPP) IN ANAMBRA STATE, NIGERIA, IS PRESENTED. ACTIVITIES REPORTED ON CASSAVA ARE RELATED TO TRAINING AND SEED MULTIPLICATION. PROBLEMS FACED DURING THE EXECUTION OF THE NAFPP PROGRAM ARE ALSO INDICATED. (CIAT)

0659

28521 NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA. 1982. CROSS RIVER STATE. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE.NATIONAL CASSAVA CENTRE. PP.184-188. EN.

CASSAVA; CULTIVARS; PRODUCTIVITY; CASSAVA PROGRAMS; TECHNOLOGY TRANSFER; MAIZE; INTERCROPPING; NIGERIA.

A BRIEF REPORT OF CASSAVA RESEARCH ACTIVITIES CONDUCTED IN CROSS RIVER STATE, NIGERIA, IN 1981-82, IS PRESENTED. DATA OF CASSAVA YIELDS ACHIEVED IN 61 PRODUCTION TRIALS CONDUCTED IN 1980- 81 ARE GIVEN. IN 1981-82, 66 PRODUCTION PLOTS AND 25 MAIZE/CASSAVA PLOTS WERE ESTABLISHED. MASS ADOPTION OF NAFPP IMPROVED TECHNOLOGY AND IMPROVED CASSAVA VAR. HAS OCCURRED. TRAININGAND SEED MULTIPLICATION ACTIVITIES ARE ALSO REPORTED BRIEFLY. PROBLEMS FACED DURING THE EXECUTION OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAM) ARE POOR TRANSPORTATION FACILITIES, INADEQUATE USE OF STAFF, LACK OFINPUTS, AND LACK OF INCENTIVES TO FARMERS. TRIALS PROPOSED FOR 1982-83 ARE LISTED. (CIAT)

0660

28522 NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA. 1982. IMO STATE. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.189-196. EN.

CASSAVA; CASSAVA PROGRAMS; SOCIOECONOMIC ASPECTS; TECHNOLOGY TRANSFER; FERTILIZERS; CULTIVARS; PRODUCTIVITY; NIGERIA.

CASSAVA RESEARCH ACTIVITIES CONDUCTED IN IMO STATE, NIGERIA, IN 1981-82 ARE REPORTED. YIELD RESULTS ARE GIVEN FOR THE 1980 CASSAVA VAR. AND FERTILIZER MINIKIT TRIALS AND DEMONSTRATION PLOTS. BRIEF NOTES ARE GIVEN ON CASSAVA TRIALS ESTABLISHED DURING THE PERIOD, TECHNOLOGY ADOPTION, FARMER COOPERATIVES, SEED MULTIPLICATION, TRAINING, FIELD DAYS, AND PROBLEMS FACED DURING THE EXECUTION OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME). (CIAT)

0661

28523 NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA. 1982. KADUNA STATE. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE.NATIONAL CASSAVA CENTRE. PP.197-201. EN.

CASSAVA; CASSAVA PROGRAMS; SOCIOECONOMIC ASPECTS; TECHNOLOGY TRANSFER; NIGERIA.

CASSAVA RESEARCH ACTIVITIES CONDUCTED IN KADUNA STATE, NIGERIA, IN 1981-82 ARE REPORTED. BRIEF NOTES ARE GIVEN ON CASSAVA TRIALS ESTABLISHED DURING TH PERIOD, SEED MULTIPLICATION, TRAINING, FIELD DAYS, INSPECTION TOURS, AND MEETINGS. THE MAJOR PROBLEM FACED DURING THE EXECUTION OF THE NAFPP (NATIONALACCELERATED FOOD PRODUCTION PROGRAMME) WAS THE NONAVAILABILITY OF PLANTING MATERIAL. VARIETAL (8) AND FERTILIZER (4) TRIALS ARE PROPOSED FOR 1982. (CIAT)

0662

28524 NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA. 1982. KWARA STATE. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE.NATIONAL CASSAVA CENTRE. PP.202-2042. EN.

CASSAVA; CASSAVA PROGRAMS; SOCIOECONOMIC ASPECTS; TECHNOLOGY TRANSFER; NIGERIA.

CASSAVA PROGRAM ACTIVITIES IN KWARA STATE, NIGERIA, IN 1981-82 ARE REPORTED BRIEF NOTES ARE GIVEN ON CASSAVA TRIALS ESTABLISHED DURING THE PERIOD, SEED MULTIPLICATION, TRAINING, AND FIELD DAYS. STAFFING AND FINANCINGWERE MAJOR PROBLEMS FACED DURING THE EXECUTION OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME). TRIALS PROPOSED FOR 1982-83 ARE LISTED. (CIAT)

0663

28525 NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA. 1982. LAGOS STATE. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE.NATIONAL CASSAVA CENTRE. PP.205-210. EN.

CASSAVA; CASSAVA PROGRAMS; SOCIOECONOMIC ASPECTS; TECHNOLOGY TRANSFER; CULTIVARS; PRODUCTIVITY; NIGERIA.

CASSAVA ACTIVITIES OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) IN LAGOS STATE, NIGERIA, IN 1981-82 ARE REPORTED. RESULTS ARE GIVEN FOR THE 1980 CASSAVA VAR. AND DEMONSTRATION TRIALS. BRIEF NOTES ARE GIVEN ON CASSAVA TRIALS ESTABLISHED DURING THE PERIOD, TRAINING, MEETINGS, THE GREEN REVOLUTION COORDINATING COMMITTEE, LAND CLEARING, AND FIELD DAYS. PROBLEMS FACED DURING THE EXECUTION OF THE NAFPP ARE BRIEFLY DISCUSSED AND TRIALS PROPOSED FOR 1982-83 ARE LISTED. (CIAT)

0664

28526 NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA. 1982. OGUN STATE. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE.NATIONAL CASSAVA CENTRE. PP.211-215. EN.

CASSAVA; CASSAVA PROGRAMS; SOCIOECONOMIC ASPECTS; TECHNOLOGY TRANSFER; PRODUCTIVITY; CULTIVARS; NIGERIA.

ACTIVITIES OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) IN CASSAVA IN OGUN STATE, NIGERIA, IN 1981-82 ARE REPORTED. RESULTS ARE GIVENFOR THE 1980 CASSAVA VAR. AND FERTILIZER TRIALS. BRIEF NOTES ARE GIVEN ON CASSAVA TRIALS ESTABLISHED DURING THE PERIOD, TRAINING, FIELD DAYS, AND SEED MULTIPLICATION. PROBLEMS FACED DURING THE EXECUTION OF THE NAFPP WERE INSUFFICIENT SUPPLY OF CASSAVA CUTTINGS AND SHORTAGE OF STAFF. TRIALS PROPOSED FOR 1982-83 ARE LISTED. (CIAT)

0665

28527 NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA. 1982. ONDO STATE. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE.NATIONAL CASSAVA CENTRE. PP.216-221. EN.

CASSAVA; CASSAVA PROGRAMS; SOCIOECONOMIC ASPECTS; TECHNOLOGY TRANSFER; CULTIVARS; PRODUCTIVITY; NIGERIA.

ACTIVITIES OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) IN CASSAVA IN ONDO STATE, NIGERIA, IN 1981-82 ARE REPORTED. RESULTS ARE GIVEN FOR THE 1980 VAR., FERTILIZER, AND DEMONSTRATION TRIALS. BRIEF NOTES ARE GIVEN ON CASSAVA TRIALS ESTABLISHED DURING THE PERIOD AND SEED MULTIPLICATION. PROBLEMS FACED DURING THE EXECUTION OF THE NAFPP ARE DISCUSSED, AND SUGGESTIONS ARE MADE FOR TRIAL DATA RECORD KEEPING. (CIAT)

0666

28501 NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA. 1982. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE.247P. EN.

CASSAVA; DEVELOPMENT; SOCIOECONOMIC ASPECTS; TECHNOLOGY TRANSFER; CULTIVARS; SOIL FERTILITY; PLANT FERTILITY; PRODUCTIVITY; PEST CONTROL; PEST DAMAGE; EXPERIMENT DESIGN; BIOLOGICAL CONTROL; WEEDING; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; ADAPTATION; N; P; K; CA; NIGERIA.

THE PAPERS PRESENTED AT THE 6TH NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) NATIONAL CASSAVA WORKSHOP (UMUDIKE, NIGERIA), HELD ON FEB. 21-26, 1982, ARE COMPILED. IN ADDITION TO THE 10 STATE ANNUAL REPORTS, SPECIFIC PAPERS DEAL WITH TOPICS REGARDING FARMER ADOPTION OF CASSAVA/MAIZE TECHNOLOGY, INCREASED CASSAVA PRODUCTION, AGRONOMIC STUDIES REGARDING WEED AND PEST CONTROL (ESPECIALLY PHENACOCCUS MANIHOTI AND MONONYCHELLUS TANAJOA),AND FERTILIZATION. (CIAT)

0667

28528 NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA. 1982. RIVERS STATE: CASSAVA/MAIZE. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.222-228. EN.

CASSAVA; CASSAVA PROGRAMS; SOCIOECONOMIC ASPECTS; TECHNOLOGY TRANSFER; CULTIVARS; PRODUCTIVITY; PLANT FERTILITY; SOIL FERTILITY; MAIZE; ADAPTATION; NIGERIA.

THE ACTIVITIES OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) IN CASSAVA IN RIVERS STATE, NIGERIA, IN 1980-81 ARE REPORTED. RESULTS ARE GIVEN FOR THE 1980 CASSAVA VAR. AND FERTILIZER TRIALS; AV. YIELDS OF TOP CASSAVA VAR. 30572, 30211, 30555, 4488, AND 30395 WERE 28.4, 27.1, 27.0, 26.0, AND 24.0 T/HA, RESP. BRIEF NOTES ARE GIVEN ON THE CASSAVA TRIALS ESTABLISHED DURING THE PERIOD, TRAINING, MEETINGS, FIELD DAYS AND FIELD TRIPS, AND SEED MULTIPLICATION. PROBLEMS FACED DURING THE EXECUTION OF THE NAFPP WERE THE LACK OF STAFFING, TRANSPORTATION MEANS, AND FUNDS. TRIALS PROPOSED FOR 1982-83 ARE LISTED. (CIAT)

0668

28529 NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA. 1982. STATE NAFPP 1982 PROGRAMME OF WORK AND CASSAVA/MAIZE VARIETY SELECTIONS. IN--------. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.244-246. EN.

CASSAVA; CULTIVARS; INTERCROPPING; MAIZE; ADAPTATION; CASSAVA PROGRAMS; NIGERIA.

THE PROPOSED WORK PROGRAM OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) DURING 1982 IS PRESENTED IN TABLE FORM; THE CASSAVA/MAIZE VAR. SELECTIONS FOR EACH TYPE OF TRIAL ARE ALSO LISTED. CASSAVA VAR., FERTILIZER, DEMONSTRATION, AND PRODUCTION TRIALS ARE INDICATED FOR EACH OF 13 NIGERIAN

STATES AND 2 INSTITUTIONS, IN ADDITION TO ECONOMIC STUDIES ANDSEED MULTIPLICATION ACTIVITIES. (CIAT)

0669

29381 NATIONAL ROOT CROPS RESEARCH INSTITUTE. 1984. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, 71p. En., Il.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; RESISTANCE; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; ACARICIDES; INSECTICIDES; BIOLOGICAL CONTROL; CUTTINGS; GERMINATION; GLOEOSPORIUM MANIHOTIS; FUNGICIDES; SOIL MOISTURE; SOIL WATER; ANALYSIS; LAND PREPARATION; MULCHING; PLANTING; SPACING; INTERCROPPING; YAM; MAIZE; FERTILIZERS; N; P; K; AGRICULTURAL LIME; MANURES; PLANT DEVELOPMENT; PLANT HEIGHT; LEAF AREA; DRY MATTER; GERMPLASM; SELECTION; LEAVES; HCN CONTENT; HARVESTING; TIMING; ECONOMICS; PROCESSING; FOOFOO; CASSAVA FLOUR; GARI; DRYING; SOLAR DRYING; STORAGE; COMPOSITION; ORGANOLEPTIC EXAMINATION; TOXICITY; COSTS; LABOR; TECHNOLOGICAL PACKAGE; AGRICULTURAL EQUIPMENT; SMALL-SCALE EQUIPMENT; MECHANIZATION; INDUSTRIAL MACHINERY; PRESSING; ROOT PRODUCTIVITY; NIGERIA.

Results obtained by the cassava program of the National Root Crops Research Institute (Umudike, Nigeria) in 1984 are reported. Emphasis was placed on the control of Phenacoccus manihoti and Mononychellus tanajoa, the primary pests of cassava during the last 5 yr, through germplasm resistance and improved cultural, chemical, and biological control methods. Var. were identified that combined high yields, tolerance to P. manihoti and M. tanajoa, resistance to CAMD and CBB, and wide ecological adaptation. Cassava physiological studies were conducted and constraints imposed by soils and anthracnose received attention. Aspects of processing, utilization, and economics were studied. Improvements were made in the dewatering machine and harvesting aids. Individual papers are recorded in this same publication under the following consecutive numbers: (CIAT)

0670

29354 NATIONAL ROOT CROPS RESEARCH INSTITUTE. 1982. Efficiency of utilization of different N sources by cassava/maize mixed crop. In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, pp.17-18. En.

CASSAVA; INTERCROPPING; FERTILIZERS; N; ROOT PRODUCTIVITY; NIGERIA.

Four N rates (0, 50, 100, and 150 kg/ha) from 5 different N sources (ammonium sulphate, calcium ammonium nitrate, urea, and S- coated urea with 11 and 30 percent dissolution rates in 7 days) were applied 2 wk. after planting in a cassava/maize intercrop. Effects on root yields of cassava cv. TMS 30211 were assessed 12 mo. after planting. The application of 100 kg N/ha increased yields 43.[illegible] percent over the unfertilized control. Urea was the best N source (yields of 18.8 t/ha), giving a yield increase of 17.5 percent over ammonium sulphate (16.0 t/ha), ranking 3rd after S-coated urea (11 percent dissolution rate) which yielded 16.5 t/ha. (CIAT)

0671

32040 NATIONAL ROOT CROPS RESEARCH INSTITUTE. 1980. Project 1. Breeding for resistance to disease. In National Root Crops Research Institute. Cassava Program. Annual Report 1980. Umudike, Nigeria, pp.14-18. En.

CASSAVA; PLANT BREEDING; CULTIVARS; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BACTERIAL BLIGHT; PRODUCTIVITY; ADAPTATION; GARI; GENETICS; NIGERIA.

The results of cassava germplasm selections for high yields and resistance to CAMD and CBB in Nigeria in 1979/80 are presented. From 50 cassava var. assessed, NR 7904, 7912, 7905, 7906, 7801, 7808, 7733, 7907, 7717, and 7747

were selected for early season plantings, and NR 7717, 7734, 7741, 7721, 7732, 7737, 7708, 7808, 7733, and 7703 for late season plantings. The following var. showed wide adaptability and yields of 20-35 t/ha: NR 7722, 7735, 7706, 7707, 7777, 7775, 7798, 7708, 7808, 7732, 7743, 7749, 7721, 7790, 7712, 7750, and 7747. Eighty-seven cv. from 10 of the 19 morpho-types were evaluated for desirable processing characteristics; 5 groupings based on gari yields (below 20 percent, 21-25 percent, 26-30 percent, 31-35 percent, and 36 percent and over) were established. Results indicated that gari processing characteristics are not controlled by the same genetical factors as those that control morphological characteristics. (CIAT)

0672

30059 NATIONAL ROOT CROPS RESEARCH INSTITUTE. 1985. Project 1. Genetic resources: improvement and evaluation. Cassava germplasm. Field screening of NRCRI cassava germplasm for resistance to cassava mosaic disease. In National Root Crops Research Institute. Cassava Programme. Annual Report 1985. Umudike, Nigeria, p.1. En.

CASSAVA; CULTIVARS; RESISTANCE; CASSAVA AFRICAN MOSAIC VIRUS; NIGERIA.

A total of 483 cassava accessions were rated for resistance to CAMD in Umudike, Nigeria, in 1985. Ratings were based on a 0-5 scale (0-1 = resistant; 2-5 = tolerant). Thirty-five accessions were regarded as being resistant/tolerant to CAMD, and accession 70/307 was the only one that showed no symptoms. (CIAT)

0673

32041 NATIONAL ROOT CROPS RESEARCH INSTITUTE. 1980. Project 2. Cassava mineral nutrition. Influence of varying combinations of N, P, K and Mg on yield and nutrient content of cassava. In National Root Crops Research Institute. Cassava Program. Annual Report 1980. Umudike, Nigeria, pp.18-27. En., Il.

CASSAVA; CULTIVARS; NUTRITIONAL REQUIREMENTS; MINERAL CONTENT; FERTILIZERS; N; P; K; MG; ZN; ROOT PRODUCTIVITY; DRY MATTER; GLOMERELLA MANIHOTIS; NIGERIA.

Four expt. were conducted in Nigeria to study the effect of varying combinations of N, P, K, and Mg on yield and nutrient content of cassava. In expt. 1, nutrient rates tested with cassava cv. 60506 were 0, 30, 60, 90, and 120 kg N/ha as urea; 0, 6.5, 13.0, 26.0, and 52.0 kg P/ha as single superphosphate; 0, 37.5, 75.0, 112.0, and 150.0 kg K/ha as potassium muriate; and 0, 10, 20, 30, and 40 kg Mg/ha as magnesium sulphate. While testing a nutrient, a basal dressing of the others was provided. Fresh root yield increased from 9 to 27.5 t/ha at 0 and 150 kg K/ha, resp. The response to N was less marked but significant (P = 0.05); fresh root yield increased from 17 to 25 t/ha at 0 and 120 kg N/ha, resp. The effects of P and Mg were not significant. Leaf contents of K, N, and Mg increased with fertilizer application but not that of P. K significantly reduced Glomerella manihotis incidence while N enhanced it and P and Mg had no effect. In expt. 2, nutrient requirements and DM accumulation with age were investigated and results showed that, apart from nutrient requirements for bulking, the plant should be well supplied with nutrients at early stages for max. leaf development. In expt. 3, P requirements of 3 cassava cv. (60506, TMS 30211, and TMS 30395) were determined. For max. yields, cassava cv. 60506 and TMS 30211 required a soil solution P concn. of 0.08 micrograms/g soil, while the lower yielding cv. TMS 30395 required 0.16 micrograms/g soil; higher P concn. tended to depress yields. In expt. 4, the effect of added nutrients was investigated using 60, 30, 90, 20, and 20 kg N, P, K, Mg, and Zn/ha, resp., and cassava cv. 60506 and Nwugo. Yields were significantly reduced in both cv. when Zn was omitted, but the lack of Mg had no significant effect

on yields. Cv. 60506 was more responsive to fertilization than Nwugo, but the latter produced significantly higher DM yields. (CIAT)

0674

32042 NATIONAL ROOT CROPS RESEARCH INSTITUTE. 1980. Project 3. Cassava propagation studies. A) Studies on cultural management of propagules and adaptation of rapid multiplication technique for commercial interests. In National Root Crops Research Institute. Cassava Program. Annual Report 1980. Umudike, Nigeria, pp.27-30. En.

CASSAVA; PROPAGATION; CUTTINGS; STEMS; CULTURE MEDIA; GROWTH; NIGERIA.

Different soil and liquid media for rooting 2-node cassava cuttings and propagules, resp., were studied to develop a faster and cheaper rapid cassava propagation technique to be readily used by cassava growers in Nigeria. Unsterilized garden soil proved as good or better than the rest of the media for rooting both cuttings and propagules; the mean no. of propagules/5-node cutting 34 days after planting in unsterilized soil was 48.3, comparing favorably with the highest yielding treatment (unsterilized soil + NPKMg = 49 propagules). Linear growth rate of propagules in unsterilized soil was 1.06 cm/day, also comparing favorably with the highest growth rate (1.32 cm/day) obtained in a 1:2 soil:compost mixture and similarly (1.05 cm/day) to a 1:1 soil:compost mixture. These results were applied in a subsequent expt. to determine the optimum node no./stem cutting from 1-m mature stems of cassava var. 60506, TMS 30211, and TMS 30395. Unsterilized garden soil in tanks was used and propagules were rooted in polyethylene bags containing unsterilized garden soil. Less than 1 percent loss was observed during rooting under the shade and no significant differences were observed from an addition of compost. A higher no. of propagules can be obtained from a 1-m-long cutting of var. 60506, and therefore a higher no. of nodes/cutting. Six nodes on a cutting appeared optimum for the other 2 var. The no. of propagules established from a stem 1 m long ranged from 35 to 147 depending on node no. and cassava var. For rapid multiplication of elite materials, a farmer would require a nursery bed near a water source, shade, and polyethylene bags. (CIAT)

0675

32043 NATIONAL ROOT CROPS RESEARCH INSTITUTE. 1980. Project 3. Cassava propagation studies. b) Effect of pruning frequently and spacing on production of planting materials and root yields. In National Root Crops Research Institute. Cassava Program. Annual Report 1980. Umudike, Nigeria, pp.30-31. En.

CASSAVA; PRUNING; SPACING; CUTTINGS; ROOT PRODUCTIVITY; NIGERIA .

Four pruning treatments (P0, no pruning; P1, 4 times at 3-mo. intervals; P2, 3 times at 4-mo. intervals; P3, 2 times at 6-mo. intervals) and 4 within-row spacings (25, 50, 75, and 100 cm); were arranged in a factorial design with cassava cv. 60506 and Nwugo in field trials in Nigeria to study their effects on root yields and planting material production. Prunings at any time reduced root yields of both var. significantly: from 23.3 and 18.5 t/ha for 60506 and Nwugo, resp., in P0 to 1.2 and 1.4 t/ha, resp., in P1, 4.8 and 4.8 t/ha, resp., in P2, and 5.8 and 8.5 t/ha, resp., in P3. A significantly higher no. of cuttings were produced when var. 60506 was not pruned (235,000 cuttings) with a similar trend for Nwugo (240,000 cuttings). Var. x spacing interactions were significant; a 100-cm within-row spacing was optimum for root yields of cassava var. 60506 (14.5 t/ha) and 75 cm was optimum for Nwugo (13.8 t/ha); on the other hand, 75 cm was optimum for cutting production in 60506 (200 cuttings) and 100 cm in Nwugo (275.5 cuttings). (CIAT)

0676

32044 NATIONAL ROOT CROPS RESEARCH INSTITUTE. 1980. Project 3. Cassava propagation studies. C) Optimum time of planting cassava in various ecozones of Nigeria. In National Root Crops Research Institute. Cassava Program. Annual Report 1980. Umudike, Nigeria, pp.31-32. En., Il.

CASSAVA; PLANTING; TIMING; NIGERIA.

The optimum planting time for cassava var. 60506 and Nurigo is under study. Preliminary results indicate that May appears to be the best planting time for both var. (100 percent establishment). Poor plant establishment of both var. was observed from Nov. to Feb. (CIAT)

0677

32045 NATIONAL ROOT CROPS RESEARCH INSTITUTE. 1980. Project 4. Cultural management of cassava in mixed cropping systems. A) Determination of optimum plant populations in cassava/maize intercrop. In National Root Crops Research Institute. Cassava Program. Annual Report 1980. Umudike, Nigeria, pp.32-33. En., Il.

CASSAVA; INTERCROPPING; MAIZE; SPACING; ROOT PRODUCTIVITY; NIGERIA.

The effects of 5 maize population densities (0, 15,000, 25,000, 35,000, and 45,000 plants/ha) and 5 cassava population densities (0, 7500, 10,000, 12,500, and 15,000 plants/ha), arranged in a factorial design, on maize and cassava yields and yield components were studied in a maize/cassava intercrop in Nigeria. Cassava and maize population densities had no effect on cassava root yields, although yields decreased as maize density increased. Av. tuber size also decreased as maize and cassava densities increased. (CIAT)

0678

32046 NATIONAL ROOT CROPS RESEARCH INSTITUTE. 1980. Project 4. Cultural management of cassava in mixed cropping systems. B) Lysimeter studies on cassava/maize intercrop. In National Root Crops Research Institute. Cassava Program. Annual Report 1980. Umudike, Nigeria, pp.33-35. En.

CASSAVA; INTERCROPPING; MAIZE; FERTILIZERS; N; ROOT PRODUCTIVITY; DRAINAGE; NUTRIENT LOSS; NIGERIA.

The effects of N application (0 or 100 kg/ha) on yields of intercropped cassava and maize were studied in 4 field lysimeters in 1979 and 1980 in Nigeria. Cassava and maize population densities were 10,000 and 33,333 plants/ha, resp. Mean cassava root yields in 1979 increased from 19.6 to 23.5 t/ha as a result of N application, and in 1980, from 6.4 to 13.3 t/ha. Cassava grown with maize that received N was also taller and had more roots than cassava with no N. Cassava top growth also increased with N fertilization: in 1979 from 7.7 to 11.0 t/ha, and in 1980 from 3.9 to 7.8 t/ha. No drainage losses were recorded in Jan., Feb., March, and Dec., but after April drainage losses rose rapidly peaking in June; the large amount of drainage at this period is enough to wash off most of the added N since deficiency symptoms appear in cassava by mid-July. Research is needed to determine whether split N applications in cassava in July/Aug. would not influence final cassava yields. (CIAT)

0679

32047 NATIONAL ROOT CROPS RESEARCH INSTITUTE. 1980. Project 4. Cultural management of cassava in mixed cropping systems. C) Determination of optimum fertilizer rate for cassava/maize intercrop. In National Root Crops Research Institute. Cassava Program. Annual Report 1980. Umudike, Nigeria, pp.35-37. En., Il.

CASSAVA; INTERCROPPING; MAIZE; FERTILIZERS; N; P; K; ROOT PRODUCTIVITY; NIGERIA.

Three levels each of N (0, 45, and 90 kg/ha), P (0, 15, and 30 kg/ha and K (0, 90, and 180 kg/ha) and their combinations were tested for their effect on maize grain and cassava root yields in cassava/maize intercrops. Cassava root yields were not significantly affected by N applications, and although P and K increased root yields, these were not significant. K applied at 90 and 180 kg increased av. root size from 0.5 to 0.62 and 0.68 kg/root, resp. K applications also increased plant height significantly. (CIAT)

0680

32048 NATIONAL ROOT CROPS RESEARCH INSTITUTE. 1980. Project 4. Cultural management of cassava in mixed cropping systems. D) The influence of potassium and lime dressings on cassava-maize intercrop. In National Root Crops Research Institute. Cassava Program. Annual Report 1980. Umudike, Nigeria, pp.37-41. En., Il.

CASSAVA; INTERCROPPING; MAIZE; FERTILIZERS; K; PH; AGRICULTURAL LIME; SOIL AMENDMENTS; ROOT PRODUCTIVITY; NIGERIA.

The effects of 0, 75, and 150 kg K/ha and soil acidity on yields of cassava cv. 60506, TMS 30211, 30568, 1525, and A30395 when intercropped with maize were investigated in field trials conducted in Nigeria. The application of 75 kg K/ha was sufficient to achieve high yields in TMS 30211 (23.0 t/ha) and 30568 (22.5 t/ha). K at 150 kg/ha was needed for max. yields in the other cv. TMS 30211 required a soil pH of approx. 5.0 to attain max. yields (21.3 t/ha) while higher pH values depressed yields. Root yields of TMS 30395 were favored at pH 5.5 (20.6 t/ha), those of 30568 at pH 6.0 (25.0 t/ha), and those of 60506 and 1525 at pHs over 5.0 (16.4-18.1 t/ha and 17.7-18.0 t/ha, resp.). (CIAT)

0681

32049 NATIONAL ROOT CROPS RESEARCH INSTITUTE. 1980. Project 5. Processing and utilization of cassava tubers. A) Studies on the use of cassava products in poultry feeds. In National Root Crops Research Institute. Cassava Program. Annual Report 1980. Umudike, Nigeria, pp.42-43. En.

CASSAVA; CASSAVA MEAL; FEEDS AND FEEDING; ANIMAL NUTRITION; DIETS; POULTRY; EGGS; NIGERIA.

Mashed unpeeled cassava roots fermented for 48 h, with 100 ml effluent from fermented cassava/kg as inoculum, were satisfactory for CM preparation for use in poultry feeds in Nigeria. Maize in diets was substituted by CM at rates of 0, 25, 50, and 100 percent and CP content of diets was provided by fish meal. Layers were left on all treatments for 11 days before recording exptl. results. No adverse effects were observed from inclusion of cassava even at the 100 percent level. After 341 days of treatment, the highest no. of eggs/layer (199) was obtained with diets containing 50 percent cassava, 50 percent maize, and fish meal supplement, followed by the diet containing 100 percent cassava and fish meal supplement (191). Yolk color was definitely changed to white at cassava substitution levels above 50 percent. Egg size/wt. was highest when either cassava or maize were used at 100 percent (70.3 and 70.8 g). Shell thickness and yolk/albumin ratio were not significantly affected by CM. (CIAT)

0682

32050 NATIONAL ROOT CROPS RESEARCH INSTITUTE. 1980. Project 5. Processing and utilization of cassava tubers. B) Developments of other forms of cassava products ldp Umudike, Nigeria. In National Root Crops Research Institute. Cassava Program. Annual Report 1980. pp.43-44. En.

CASSAVA; PROCESSING; FERMENTATION; FOOFOO; GARI; NIGERIA.

Studies to standardize the technology for processing and fermenting cassava for food as foofoo, gari, and other products continue. The role of the major microflora in the hydrolysis of starch and glucosides is being monitored as well as that of the intermediate fermentation products. Some of the major products include simple sugars, alcohols, acids, and gases. Attempts are being made to prepare pure linamarin from fresh cassava roots for use in the study. (Full text)

0683

32051 NATIONAL ROOT CROPS RESEARCH INSTITUTE. 1980. Project 6. Mechanisation of planting and harvesting of cassava. In National Root Crops Research Institute. Cassava Program. Annual Report 1980. Umudike, Nigeria, pp.44-49. En.

CASSAVA; MECHANIZATION; PLANTING; HARVESTING; PROCESSING; PEELING; CASSAVA CHIPS; NIGERIA.

A cassava planter and a combine harvester, developed jointly with FAO in Nigeria, and a cassava root peeler and a chipper, are briefly described. Results of tests carried out with the planter and harvester during both the rainy and dry seasons are presented, as well as those carried out with the peeler. The rainy season trial with the planter indicated that the recommended speed for the machine was 0.6 m/s at a mean within-row spacing of 88 cm. A 4-unit machine at this speed can plant up to 2 ha/h. The performance of the machine during the dry season was acceptable, but recommendations are made on modifications. The rainy season trial with the combine harvester detected several problems; harvesting efficiency, however, was 65 percent. The performance of this machine during the dry season also called for modifications; bunchy-type cassava cv. should be breeded to ease mechanical harvesting. Trials with the peeler show that the machine can peel approx. 500 kg fresh cassava roots/h. (CIAT)

0684

26795 NIGERIA. FEDERAL DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT. 1985. SITUATION REPORT ON ROOTS, TUBERS AND PLANTAINS IN NIGERIA. IN WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE, 1985. REPORT. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2.PP.127-138. EN.

CASSAVA; MARKETING; PRICES; SOCIOECONOMIC ASPECTS; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; PLANT BREEDING; LEGAL ASPECTS; NIGERIA.

THE SITUATION ON ROOTS, TUBERS, AND PLANTAINS IN NIGERIA IS DESCRIBED. IN THIS COUNTRY, WHERE THE OIL SECTOR PREDOMINATES, AGRICULTURE REPRESENTS 22 PERCENT OF THE GROSS NATIONAL PRODUCT AND ENGAGES APPROX. 55 PERCENT OF THE LABOR FORCE. ELEVEN MILLION T OF CASSAVA ARE PRODUCED PER YEAR ON 0.93 MILLION HA. THERE IS NO ORGANIZED MARKETING SYSTEM FOR CASSAVA; ITS COMMERCE IS MAINLY THE RESPONSIBILITY OF WOMEN. AMONG TECHNICAL AND SOCIAL CONSTRAINTSTO CASSAVA PRODUCTION ARE THE SMALL SIZE OF FARMS, MULTIPLE CROPPING SYSTEMS,PESTS AND DISEASES, LOW SOIL FERTILITY, LACK OF IMPROVED PLANTING MATERIAL, AND DEFICIENT EXTENSION SERVICES. THE NATIONAL ROOT CROPS RESEARCH INSTITUTE AND INTERNATIONAL INSTITUTE FOR TROPICAL AGRICULTURE HAVE DEVELOPED HIGH YIELDING VAR. (UP TO 30 T/HA). ON THE OTHER HAND, SMALL-, MEDIUM-, AND LARGE-SCALE PROCESSING TECHNIQUES HAVE NOT BEEN ADEQUATELY PROMOTED. (CIAT)

0685

26865 ADAMSON, I.; MBAJIORGU, N. 1985. TISSUE LIPIDS AND INTESTINAL ATPASES IN RABBITS FED CASSAVA (MANIHOT UTTILISIMA) AND PLANTAIN (MUSA PARADISICA)

DIETS. NUTRITION RESEARCH 5(12):1359-1373. EN., SUM. EN., 45 REF., IL. (DEPT. OF BIOCHEMISTRY, UNIV. OF BENIN, P.M.B. 1154, BENIN CITY, NIGERIA)

CASSAVA; RABBITS; FEEDS AND FEEDING; BANANA-PLANTAINS; ANIMAL HEALTH; ENZYMES; FIBER CONTENT; FEED CONSTITUENTS; TIMING; FAT CONTENT; NIGERIA..

THE EFFECT OF 2 VEGETABLE SOURCES OF DIETARY FIBER FROM AFRICA, PLANTAIN AND CASSAVA, ON LIPID METABOLISM AND INTESTINAL ATPASES IN CHOLESTEROL-FED RABBITS WAS STUDIED. IN AN 8-WK. EXPT., IT WAS SHOWN THAT BOTH SOURCES OF DIETARY FIBER ARE CAPABLE OF REDUCING SERUM CHOLESTEROL LEVELS IN RABBITS BY DIVERTING CHOLESTEROL FROM THE BLOOD TO THE LIVER. THE DIETARY FIBER FROM PLANTAIN HAD MORE EFFECT WHEN THE RABBITS WERE SWITCHED FROM TEST TO CONTROL AND BACK TO THE TEST DIETS. ONLY THOSE ON PLANTAIN DIET MAINTAINED A STEADY STATE LEVEL OF SERUM CHOLESTEROL. THE OTHER DIETS CAUSED A DROP IN SERUM CHOLESTEROL LEVELS IN THE ABSENCE OF DIETARY CHOLESTEROL AND A SHARP REBOUND ON THE INTRODUCTION OF CHOLESTEROL- BASED DIETS. CASSAVA DIET WAS HYPERTRIGLYCERIDIMIC AT ALL TIMES. THE ATPASES WERE HIGHLY ELEVATED IN THE ILEUM OF RABBITS FED THE CASSAVA DIET AND THIS WAS ASSOCIATED WITH THE HIGHER CONTENT OF INSOLUBLE AND PARTICULATE COMPONENTS OF CASSAVA, WHICH MAY CAUSE CELL SLOUGHING AND ALTERATION IN THE MORPHOLOGY OF THE INTESTINE. ALSO, BECAUSE THE AVAILABLE MINERALS WILL BE DISTRIBUTED BETWEEN THOSE THAT WILL PHYSICALLY INTERACT WITH DIETARY FIBER AND THOSE TO BE TRANSPORTED, A RISE IN SPECIFIC ACTIVITY OF THE VECTORIAL ENZYME WAS STIMULATED TO MEET THE CHALLENGE OF COMPETITION FOR MINERALS. (AS)

0686

30090 ADAMU, S.O. 1987. Trends and prospects for cassava in Nigeria. Washington, D.C, International Food Policy Research Institute. 213p. En. 38 Ref., Il. Paper prepared for Workshop on Trends and Prospectsof cassava in the Third World, Washington, D.C., 1987.

CASSAVA; PRODUCTION; ECONOMICS; USES; TRADE; PRICES; CONSUMPTION; STATISTICAL DATA; FARM SIZE; CULTIVARS; COSTS; CULTIVATION; ROOT PRODUCTIVITY; SOCIOECONOMIC ASPECTS; HUMAN NUTRITION; ANIMAL NUTRITION; DEVELOPMENT; FARMING SYSTEMS; WOMEN; FOOD SECURITY; GARI; CASSAVA FLOUR; FOOFOO; CASSAVA STARCH; PROCESSING; SURVEYS; USES; NIGERIA.

The role of cassava in Nigerian farming systems is examined, as well as the effect of technological improvements on rural employment and income. Fresh and processed cassava consumption prospects in rural and urban areas and its scope for use in animal feeds are also examined. Starch production and other uses are studied as well as processing and storage technologies and their impact on increased cassava production and consumption. Cassava supply and demand prospects for 1990 and 2000 are presented. Cassava production, utilization, and trade policies are recommended. (CIAT)

0687

28156 ADEMOSUN, O.C. 1986. DETERMINATION OF THE OPTIMUM CAPACITIES OF FARM MACHINES TO ADAPT FOR A MEDIUM-SCALE MULTI-CROP PRODUCTION. AGRICULTURAL SYSTEMS 21(1):33-57. EN., SUM. EN., 9 REF., IL. (DEPT. OF AGRICULTURAL ENGINEERING, THE FEDERAL POLYTECHNIC, PMB 5351, ADO-EKITI, ONDO STATE, NIGERIA)

CASSAVA; PLANTING; LAND PREPARATION; HARVESTING; AGRICULTURAL EQUIPMENT; TILLAGE; TIMING; TECHNOLOGY EVALUATION; MECHANIZATION; NIGERIA.

OPERATIONS REQUIRED FOR THE PRODUCTION OF EARLY MAIZE, LATE MAIZE, GROUNDNUT, COWPEA, CASSAVA, AND YAMS, EACH ON A 100-HA FARM, ARE IDENTIFIED AS WELL AS THE VARIOUS FARM MACHINES USED FOR EACH OPERATION. THE DURATION OF EACH OPERATION USING EACH OF THE SUITABLE FARM MACHINES IS ALSO CALCULATED. A NETWORK IS CONSTRUCTED AND A NETWORK ANALYSIS PERFORMED. WITH

THE AID OF SIMULATION, THE CAPACITIES OF THE MACHINES REQUIRED FOR MECHANIZED OPERATIONSAND THE MAN-DAYS REQUIRED FOR SELECTED NONMECHANIZED OPERATIONS ARE DETERMINED, SUCH THAT EACH OPERATION IS COMPLETED WITHIN THE TIME SCHEDULE. HENCE, THE NO. AND CAPACITY OF EACH MACHINE REQUIRED FOR THE MECHANIZED OPERATIONS AND THE NO. OF MEN REQUIRED FOR THE NONMECHANIZED OPERATIONS ARE SELECTED, AND THE FARMING CALENDAR FOR THE YEAR IS MADE. (AS)

0688

28390 ADEYEMO, A. 1981. OYO STATE. IN NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA, 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.175-181. EN.

CASSAVA; ADAPTATION; TECHNOLOGY TRANSFER; CASSAVA PROGRAMS; PLANTING; CULTIVARS; FERTILIZERS; PROPAGATION; SEED; NIGERIA.

THE 1980 ANNUAL REPORT OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) IN THE STATE OF OYO, NIGERIA, IS PRESENTED. CASSAVA VAR. AND FERTILIZER MINIKIT TRIALS, FARMER INTEGRATION INTO COOPERATIVES, FIELD DAYS, TRAINING AND SEED MULTIPLICATION ACTIVITIES, AND AGROSERVICE CENTER DEVELOPMENT ARE REPORTED. CASSAVA VAR. 30572 WAS OUTSTANDING. CONSTRAINTS TOPLANNED TRIALS AND TO INCREASED CASSAVA PRODUCTION ARE BRIEFLY DISCUSSED. PLANS FOR 1981 ARE INDICATED AS WELL AS FINANCIAL REQUIREMENTS. (CIAT)

0689

26815 AGBEDE, O.O. 1985. IMPROVING AGROFORESTRY IN NIGERIA: EFFECT OF PLANT DENSITY AND INTERACTION ON CROP PRODUCTION. FOREST ECOLOGY AND MANAGEMENT 11(4):231-239. EN., SUM. EN., 7 REF. (FORESTRY RESEARCH INST. OF NIGERIA, P.M.B. 5054, IBADAN, NIGERIA)

CASSAVA; INTERCROPPING; GMELINA ARBOREA; SPACING; MAIZE; YAMS; ROOT PRODUCTIVITY; FORESTRY; PLANTING; NIGERIA.

THE PERFORMANCE OF GMELINA ARBOREA, A FOREST TREE CROP, AND THE YIELDS OF FOOD CROPS, AMONG THEM CASSAVA, AS AFFECTED BY THEIR PLANTING DISTANCES AND CROP COMBINATIONS WHEN INTERCROPPED WERE INVESTIGATED IN 6 DIFFERENT ECOLOGICAL AREAS OF SOUTHERN NIGERIA. THE PERCENTAGE SURVIVAL AND MEAN HEIGHT OF G. ARBOREA WERE NOT SIGNIFICANTLY AFFECTED BY THE DIFFERENT PLANTING DENSITIES OF THE FOREST AND THE FOOD CROP SPECIES; HOWEVER, CLOSELY PLANTED CASSAVA (1 X 1 M) TENDED TO REDUCE THE SURVIVAL OF THE TREE CROP. FOOD CROP YIELDS DEPENDED GREATLY (P = 0.01) ON THEIR PLANTING DENSITIES. MARKED DIFFERENCES IN THE YIELDS OF FOOD CROPS OCCURRED AMONG THE EXPTL. SITES. (CIAT)

0690

29347 AGBO, F.M.O. 1982. Breeding for resistance to CMB, GSM and grasshoppers and for high yield of good quality product. (Development of control systems for CMB, GSM, grasshoppers, and CAD). In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, p.6. En.

CASSAVA; CULTIVARS; HYBRIDIZING; RESISTANCE; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; ROOT PRODUCTIVITY; NIGERIA.

The current state of on-going cassava breeding efforts by the Root Crops Research Institute (Nigeria) for resistance to mealybugs, green spider mites and grasshoppers, and for improved yield, is briefly reported. Cassava var. used in reciprocal crosses in 1982 to obtain recombinants were NR 7908, 4(2)1425, NR 8104, NR 8101, TMS 30211, and Alibobuji. Likewise, 76 open-crossed promising selections were planted in 1982 in Umudike. A total

of 1200 hybrid seeds from the 1981 controlled and open crosses were also planted in Umudike that year. Results have not been obtained yet. (CIAT)

0691

29345 AGBO, F.M.O.; ENE, L.S.O. 1982. Cytogenetic studies for improving crossability in cassava varieties. In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, pp.3-4. En.

CASSAVA; CULTIVARS; HYBRIDIZING; CYTOGENETICS; POLLINATION; PLANT FERTILITY; NIGERIA.

Results of cytogenetical studies carried out by the Root Crops Research Institute (Nigeria) to improve cassava crossability are reported. In 1981, the recommended high yielding cassava var. TMS 30211 failed to set capsules when crossed with var. Alibobuji, but the reciprocal cross was 69.4 percent successful, producing 398 seeds from 258 crosses. In 1982 it was discovered that the stigma of TMS 30211 tended to cling to the flower, resulting in damage to the stigmatic surface during hand pollination. Flowers abscissed from the base of the ovary with the stigma still firmly adhered to the upper part of the flower. Few pods may be obtained from the bud pollination of TMS 30211 x Alibobuji when handled carefully. The phenomenon could be a form of developmental sterility. (CIAT)

0692

29346 AGBO, F.M.O.; ENE, L.S.O. 1982. Ecological adaptation trials. In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, pp.4-5. En.

CASSAVA; CULTIVARS; ADAPTATION; ECOLOGY; PRODUCTIVITY; RESISTANCE; GLOEOSPORIUM MANIHOTIS; MONONYCHELLUS TANAJOA; PHENACOCCUS MANIHOTI; NIGERIA.

Results of cassava progeny, var., and ecological adaptation trials planted in 1981 by the Root Crops Research Institute (Nigeria) are presented. Var. selected for high root yield and low incidence scores for cassava mealybug, green spider mite, grasshoppers, and anthracnose were NR 8117, 7799, 7910, 7780, 7750, 8108, 7770, 7803, and 8118. From the ecological adaptation trials with 10 elite materials, conducted at 5 locations (Umudike, Igbariam, Obior, Ajasse-Ipo, and Otobi), significant differences (P = 0.05) were observed in av. yields and disease incidence across locations. The highest yields recorded (approx. 15-16 t/ha) were for selections NR 7706, NR 7797, and NR 7909. (CIAT)

0693

32025 AGBOOLA, A.A. 1980. Effect of different cropping systems on crop, yield and soil fertility management in the humid tropics. FAO Soils Bulletin no.43:87-105. En. 8 Ref., Il.

CASSAVA; INTERCROPPING; MAIZE; PRODUCTIVITY; NUTRIENT UPTAKE; N; K; PLANTING; TIMING; NIGERIA.

A definition of a cropping system is given; the major cropping systems in the humid tropics, multiple cropping (mixed intercropping, relay cropping, and row intercropping) and sole cropping are described. Expt. were conducted in Badeku village (Nigeria) to determine the effect of maize intercropped with cassava on yields and soil fertility. Results indicated that the cassava planting pattern (in the same row or between rows) did not affect yields; however, time of planting affected maize. For that reason, farmers are advised to plant cassava when maize is at or near the tasselling stage

(8 wk. after). It was confirmed that intercropped mixtures extract more nutrients from the soil (particularly N and K) than single stands. (CIAT)

0694

28398 AJIBOLA, O.O. 1986. DESORPTION ISOTHERMS OF GARI FROM 40 DEGREES CELSIUS TO 70 DEGREES CELSIUS. JOURNAL OF AGRICULTURAL ENGINEERING RESEARCH 35(3):207-210. EN., SUM. EN., 8 REF., IL. (DEPT. OF AGRICULTURAL ENGINEERING, UNIV. OF IFE, ILE-IFE, NIGERIA)

CASSAVA; GARI; ANALYSIS; WATER CONTENT; PROCESSING; NIGERIA.

DESORPTION EQUILIBRIUM MC OF GARI WERE DETERMINED AT 40, 50, 60, AND 70 DEGREES CELSIUS OVER A RANGE OF RH FROM 11 TO 82 PERCENT. A NONLINEAR LEAST SQUARES REGRESSION PROGRAM WAS USED TO FIT 5 DESORPTION ISOTHERM MODELS TO THE EXPTL. DATA. THE MIN. STANDARD ERROR OF ESTIMATE OF EQUILIBRIUM MC (0.7 PERCENT) WAS OBTAINED BY USING THE MODIFIED HALSEY MODEL. THE MIN. STANDARD ERROR OF ESTIMATE OF EQUILIBRIUM RH (4.3 PERCENT) WAS OBTAINED BY USING THE CHEN CLAYTON MODEL. (AS)

0695

31662 AJIBOLA, O.O. 1987. Mechanical dewatering of cassava mash. Transactions of the American Society of Agricultural Engineers 30(2):539-542. En., Sum. En., 7 Ref., Il. (Agricultural Engineering Dept., Univ. of Ife, Ile-Ife, Nigeria)

CASSAVA; GARI; PRESSING; WATER CONTENT; MATHEMATICAL MODEL; NIGERIA.

Important factors in the dewatering of cassava mash were identified. The final MC of dewatering mash was affected only by the applied pressure. The solid content of the expressed liquid did not change significantly during dewatering and was unaffected by such factors as the applied pressure (72-789 kPa), screen porosity (2.9-34.5 percent), and material depth (12-35 cm). Mathematical models are presented which predict dewatering responses. (AS)

0696

32012 AJIBOLA, O.O.; IGE, M.T.; MAKANJUOLA, G.A. 1987. Preliminary studies of a new technique of cassava mash gelatinization. Journal of Agricultural Engineering Research 36(2):97-100. En., Sum. En., 5 Ref.

CASSAVA; GARI; GELATINIZATION; TEMPERATURE; COMPOSITION; ANALYSIS; NIGERIA.

A technique using steam for gelatinizing fermented cassava mash was investigated. The mash which was dewatered to about 50 percent MC (wet basis) was heated to between 88-94 degrees Celsius by steaming. The steamed product when dried had characteristics which compared favorably with 5 samples of gari produced by conventional techniques. The technique could provide the basis for an alternative technology for gelatinizing fermented cassava mash for gari production. (AS)

0697

26829 AKACHUKU, A.E. 1985. COST-BENEFIT ANALYSIS OF WOOD AND FOOD COMPONENTS OF AGRI- SILVICULTURE INNIGERIAN FOREST ZONE. AGROFORESTRY SYSTEMS 3(4):307-316. EN., SUM. EN., 4 REF. (DEPT. OF FOREST RESOURCES MANAGEMENT, UNIV. OF IBADAN, IBADAN, NIGERIA)

CASSAVA; INTERCROPPING; FORESTRY; INCOME; COSTS; HARVESTING; TIMING; PRODUCTION; CUTTINGS; PLANTING; LABOR; NIGERIA.

COSTS AND REVENUE OF AGRI-SILVICULTURE IN THE NIGERIAN FOREST ZONE WERE ESTIMATED. TWO CROP COMBINATIONS WERE CONSIDERED: GMELINA ARBOREA, A

HARD WOOD SPECIES, WAS INTERPLANTED WITH (A) YAM AND MAIZE AND (B) CASSAVA AND MAIZE. AGRI-SILVICULTURE INCREASES THE FARMER'S INCOME IN THIS ZONE. THE RATIOS OF TOTAL COST TO REVENUE ARE 1:2.3 FOR (A) AND 1:2.4 FOR (B). WHEN THE TREES ARE CLEAR-CUT AFTER 5 YR, THE RATIO OF COST TO REVENUE IS 1:2.4. FARMER'S NET INCOMES ARE GIVEN FOR THE 2 CROP COMBINATIONS AND FOR WOOD, BEING GREATER FOR(A), FOLLOWED BY WOOD, AND THEN (B). IF 5 PERCENT OF THE FARM FAMILIES IN THE AREA PRACTICE AGRI-SILVICULTURE, EACH FAMILY CULTIVATING 1 HA, THERE WILL BE ENOUGH FUEL WOOD AFTER 5 YR OF GROWTH. (AS)

0698

30584 AKEREDOLU, F. 1987. Shrinkage in dehydration of Manihot utilissima and Dioscorea rotunda. Drying Technology 5(1):107-128. En., Sum. En., 15 Ref., Il. (Dept. of Chemical Engineering, Univ. of Ife, Ile-Ife, Nigeria)

CASSAVA; DIOSCOREA; DRYING; ANALYSIS; STATISTICAL ANALYSIS; LABORATORY EXPERIMENTS; COMPOSITION; NIGERIA.

The shrinkage in dehydration of 2 Nigerian root crops, Manihot esculenta and Dioscorea rotunda, was investigated. Samples of each foodstuff were dried with hot air, and the surface areas and MC of the products were determined. Surface area of both foodstuffs decreased steadily during the drying period; the area at equilibrium MC was about half the initial value, depending upon the drying-air conditions. There was an indication that some rupture of the internal structure of the foodstuffs occurred during drying. Data were found to be adequately represented by a uniform drying shrinking model in which the decrease in vol. of the drying sample is assumed to be equivalent to the vol. of moisture removed. (AS)

0699

28506 AKINPELU, M. 1982. ENCOURAGE CASSAVA PRODUCTION AND ENHANCE NIGERIA AGRICULTURE. IN NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA, 1982. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.54-59. EN.

CASSAVA; SOCIOECONOMIC ASPECTS; DEVELOPMENT; NIGERIA.

PROBLEMS FACED BY NIGERIAN CASSAVA GROWERS ARE LISTED AND BRIEFLY DISCUSSED; POSSIBLE SOLUTIONS TO THEM ARE PROPOSED. THESE PROBLEMS INVOLVE MACHINERY FOR LAND PREPARATION, AGRICULTURAL CREDITS AND INPUTS, EXTENSION SERVICES, CASSAVA DISEASES AND PESTS, RURAL DEVELOPMENT, THE NATIONAL SEED SERVICE, MARKETING, CASSAVA MULTIPLICATION AND DISTRIBUTION THROUGH RIVER BASIN DEVELOPMENT AUTHORITIES. (CIAT)

0700

29037 AKINRELE, I.A. 1986. HYDROCYANIC ACID HAZARD DURING LARGE SCALE CASSAVA PROCESSING. TROPICAL SCIENCE 26(1):59-65. EN., SUM. EN., 30 REF., IL. (CENTRE FOR THE DEVELOPMENT OF INDUSTRY, 28 RUE DE L'INDUSTRIE, 1040 BRUSSELS, BELGIUM)

CASSAVA; TOXICITY; INDUSTRIALIZATION; PEELING; GRATING; FACTORIES; HCN; HUMAN HEALTH; DEVELOPMENT; NIGERIA.

CONSIDERING THAT CURRENT EFFORTS TO MODERNIZE AND INCREASE THE OUTPUT OF CASSAVA PRODUCTS THROUGH MECHANIZED PROCESSING COULD POSE TOXIC HAZARDS TO PROCESS WORKERS, AN ATTEMPT WAS MADE TO INVESTIGATE AND ASSESS THE POTENTIAL OF THIS HAZARD ON THE BASIS OF EXISTING OPERATIONAL ACTIVITIES. THE MOST POTENT UNIT OPERATION AREAS ARE THOSE OF PEELING AND GRATING OF FRESH CASSAVA ROOTS. THE AREA AROUND THE GRATING MACHINE HAD THE HIGHEST CONCN. OF HCN AND THE VALUE APPROACHED THE MAX. ALLOWABLE LIMIT FOR HUMAN HEALTH; PREVIOUS STUDIES HAVE SHOWED THAT EXPOSURE TO 100-200 PPM HCN CONCN. IN AIR FOR 30-60 MIN CAN CAUSE DEATH AND WITH LESSER AMOUNTS AND LONGER EXPOSURE,

CHRONIC POISONING FROM SCN AS WELL AS OTHER SYMPTOMS (HEADACHES, NAUSEA, AND LOSS OF APPETITE) MAY OCCUR. IT IS RECOMMENDED THAT A CASSAVA PROCESSING FACTORY SHOULD BE DESIGNED TO ALLOW FOR VENTILATION OF 25.5 CUBIC METERS AIR/1 KG PROCESSED ROOTS. (AS)

0701

28389 AKINRELERE, J.O. 1981. ONDO STATE. IN NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA, 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.169-174. EN.

CASSAVA; CASSAVA PROGRAMS; PRODUCTIVITY; MAIZE; INTERCROPPING; SEED; PROPAGATION; CULTIVARS; ADAPTATION; FERTILIZERS; NIGERIA.

THE 1980 ANNUAL REPORT OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) IN THE STATE OF ONDO, NIGERIA, IS PRESENTED. SEED MULTIPLICATION ACTIVITIES AND CASSAVA/MAIZE TRIALS DURING 1979 AND 1980 ARE REPORTED. YIELD DATA ARE REPORTED FOR ONLY 6 OF 15 EXPTL. STATIONS; FERTILIZED PLOTS YIELDED HIGHER THAN UNFERTILIZED PLOTS. CONSTRAINTS TO RESEARCH ACTIVITIES ARE DISCUSSED. THE CURRENT SITUATION OF THE TRIALS IS BRIEFLY ANALYZED. (CIAT)

0702

30828 AKORODA, M.O.; OYINLOLA, A.F.; GEBREMESKEL, T. 1987. Plantable stem supply system for IITA cassava varieties in Oyo State of Nigeria. Agricultural Systems 24(4):305-317. En., Sum. En., 7 Ref., Il. (Agronomy Dept., Univ. of Ibadan, Ibadan, Nigeria)

CASSAVA; TECHNOLOGY TRANSFER; STEMS; PROPAGATION MATERIALS; CULTIVARS; SELECTION; NIGERIA.

The system for supplying stems of improved cassava var. suitable for planting from the International Institute of Tropical Agriculture (IITA) was surveyed for Oyo State, Nigeria. The adoption of these var. during 1976-85 related to the supply of planting materials was examined. Based on completed questionnaires, visits to 21 of the 24 local government areas of Oyo State, official documents, and personal communications, it was found that the effective distribution of suitable stems to the majority of cassava farmers did not begin until the 2nd half of the study period. The required capacity and rate of multiplication of IITA cassava var. were found inadequate and var. have not been introduced into some localities due to a poor stem supply system. A large potential exists for further adoption of IITA var. if farmers can obtain more stems suitable for planting. The short supply of suitable stems to farmers was identified as the chief obstacle to a wider dissemination, adoption, and use of IITA-improved cassava for meeting the food needs of cassava-dependent rural farm families in Oyo State. A greater catalytic role is recommended for IITA to ameliorate the stem supply situation. (AS)

0703

32054 AMUND, O.O.; OGUNSINA, O.A. 1987. Extracellular amylase production by cassava-fermenting bacteria. Journal of Industrial Microbiology 2(2):123-127. En., Sum. En., 11 Ref., Il. (Dept. of Biological Sciences, Univ. of Lagos, Lagos, Nigeria)

CASSAVA; ENZYMES; FERMENTATION; INDUSTRIAL MICROBIOLOGY; NIGERIA.

Fermentation of cassava roots was accompanied by a gradual decrease in pH, increased amylase activity in the steep liquor, and increased microbial load and lactic acid concentration. Amylase- producing bacterial strains associated with cassava fermentation were isolated and identified as Bacillus subtilis, B. licheniformis, and B. cereus. The pH optima for the partially purified enzymes of these organisms were 7.0, 5.5, and 7.5, while

their temp. optima were 30, 37, and 80 degrees Celsius. There was no significant difference in amylase activities when starch, dextrin, amylopectin, glucose, and maltose were used as growth substrates. (AS)

0704

28515 ANUEBUNWA, F.O.; ELUAGU, L.S. 1982. CASSAVA MEALYBUG/GREEN SPIDER MITE INFESTATIONS AND THE DEMAND FOR FOODGRAINS IN NIGERIA: A CASE STUDY OF ANAMBRA STATE. IN NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA, 1982. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.123-133. EN., SUM. EN., 4 REF.

CASSAVA; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; PEST DAMAGE; PEST CONTROL; STATISTICAL DATA; SOCIOECONOMIC ASPECTS; GARI; NIGERIA.

THE DEMAND FOR FOOD GRAINS (RICE, MAIZE, BEANS) WAS DETERMINED AS WELL ASTHE RELATED ELASTICITIES, BASED ON TIME-SERIES DATA AND INFORMATION ON PRICES, CONSUMPTION OR EXPENDITURE PATTERNS, AND CASSAVA MEALYBUG (PHENACOCCUS MANIHOTI) AND GREEN SPIDERMITE (MONONYCHELLUS TANAJOA) INFESTATIONS IN ANAMBRA STATE, NIGERIA. THE STUDY INDICATED A HIGH EXPENDITURE ELASTICITY FOR MAIZE, WHICH REFLECTS AN INCREASING DEMAND FOR MAIZE AS A RESULT OF ITS NEW USES (MAIZE FLOUR) THAT NOW SUBSTITUTES AND, IN SOME CASES, COMPLEMENTS GARI. THE CHANGE IN PREFERENCE IN FAVOR OF MAIZE IS PRINCIPALLY THE RESULT OF THE INCREASING PRICE OF CASSAVA ROOTS OR GARI, WHICH IN TURN IS A CONSEQUENCE OF P. MANIHOTI AND M. TANAJOA INFESTATIONS. (CIAT)

0705

26174 ANUEBUNWA, F.O. 1979. ECONOMICS OF COWPEA IN LATE-SEASON CASSAVA/COWPEA (INTERPLANT) PRODUCTIONKIT. UMUDIKE, NIGERIA, NATIONAL CROPS RESEARCH INSTITUTE. 11P. EN., SUM. EN., 10 REF. PAPER PRESENTED AT 3RD NAFPP NATIONALCASSAVAWORKSHOP, UMUDIKE, NIGERIA, 1979.

CASSAVA; INTERCROPPING; COWPEA; PRODUCTIVITY; PRODUCTION; SOCIOECONOMIC ASPECTS; CULTIVATION; TIMING; PLANTING; NIGERIA.

IN ANAMBRA STATE, NIGERIA, A TRIAL WAS ESTABLISHED AT 3 DIFFERENT SITES (ENUGU, AWKA, AND ONITSHA) TO STUDY THE ECONOMICS OF INTERCROPPING CASSAVA AND COWPEAS BY TESTING 2 RELATIVE PLANTING DATES: SIMULTANEOUS AND CASSAVA 1 MO. AFTER COWPEAS. WHILE CASSAVA YIELDS WERE NOT MEASURED, IT WAS ASSUMED THAT INTERCROPPING HAD NO NEGATIVE EFFECTS ON YIELDS. COWPEA YIELDS WERE HIGHER ON PLOTS WHERE CASSAVA WAS PLANTED 1 MO. LATER. THE NO. OF MAN-DAYS REQUIRED PER HECTARE IN THE PLOTS WITH LATE-SEASON INTERCROPPING WAS HIGHER (145.9) THAN FOR CASSAVA/COWPEAS PLANTED SIMULTANEOUSLY (144.2) AS WAS ALSO THE CASE FOR TOTAL COSTS. (CIAT)

0706

28505 ANUEBUNWA, F.O. 1982. EVALUATION OF FARMER ADOPTION OF NATIONAL ACCELERATED FOOD PRODUCTION PROJECT (CASSAVA/MAIZE) PACKAGE RECOMMENDATIONS. IN NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA, 1982. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.36-53. EN., SUM. EN., 6 REF.

CASSAVA; SOCIOECONOMIC ASPECTS; DEVELOPMENT; TECHNOLOGY TRANSFER; STATISTICAL DATA; NIGERIA.

THE RESULTS OF A SURVEY AMONG NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) CASSAVA/MAIZE FARMERS IN 5 PARTICIPATING STATES (IMO, ANAMBRA, RIVERS, BENDEL, AND ONDO) ARE PRESENTED TO IDENTIFY KEY CONSTRAINTS TO TECHNOLOGY TRANSFER AND ADOPTION. A HIGH DEGREE OF AWARENESS OF THE NAFPP CASSAVA/MAIZE IMPROVED TECHNOLOGY PACKAGE WAS ACHIEVED. ALL COMPONENTS OF THE PACKAGE REACHED THE TRIAL STAGE OF THE ADOPTION PROCESS; MOST FARMERS ADOPTED IMPROVED CASSAVA AND MAIZE VAR. AS WELL AS FERTILIZERS. THE MOST

IMPORTANT FACTORS LIMITING FARMER ADOPTION WERE THE UNTIMELY SUPPLY OF IMPROVED CASSAVA PLANTING MATERIAL, MAIZE SEEDS, FERTILIZERS, AND PESTICIDES AS WELL AS THE INCREASED LABOR COSTS FOR RIDGING, LACK OF CREDIT, AND STORAGE AND MARKETING PROBLEMS. (CIAT)

0707

28376 ANUEBUNWA, F.O. 1981. THE DEMAND FOR FERTILIZERS IN IMO STATE OF NIGERIA: A CASE STUDY OF CASSAVA FARMERS. IN NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA. 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.69-84. EN., SUM. EN., 14 REF.

CASSAVA; CASSAVA PROGRAMS; FERTILIZERS; PRODUCTIVITY; STATISTICAL DATA; SOCIOECONOMIC ASPECTS; NIGERIA.

THE RESULTS OF A CASE STUDY CONDUCTED IN IMO STATE, NIGERIA, TO IDENTIFY FACTORS THAT INFLUENCE FERTILIZER DEMAND, DISTRIBUTION, AND USAGE PATTERNS BETWEEN 1973-78 ARE PRESENTED. RELATED AGRICULTURAL POLICIES DURING THE SAME PERIOD ARE DISCUSSED. DATA WERE OBTAINED FROM 216 FARMERS AND SECONDARY TIME-SERIES SOURCES. THE ESTIMATED INCREASE IN FERTILIZER USE DURING THE PERIOD WAS 73.8 PERCENT TO WHICH CASSAVA CONTRIBUTED THE MOST WITH 58.0 PERCENT. THE AMOUNT OF FERTILIZER USED WAS A DIRECT FUNCTION OF FARMER PARTICIPATION IN COOPERATIVES, EXTENSION CONTACT, FARM SIZE, FERTILIZER AVAILABILITY AT PLANTING TIME, AND DISTANCE TO FERTILIZER SUPPLIERS. THE LATTER 2 FACTORS WERE IDENTIFIED AS LIMITING FOR FERTILIZER USAGE. THE POLICY IMPLICATIONS OF THESE FINDINGS ARE DISCUSSED. RECOMMENDATIONS ARE BASED ON IMPROVING FERTILIZER DISTRIBUTION NETWORKS. (CIAT)

0708

28170 ARENE, O.B. 1978. CASSAVA BACTERIAL BLIGHT IN NIGERIA. UMUDIKE, NIGERIA, NATIONAL ROOT CROPS RESEARCH INSTITUTE. 15P. EN., SUM. EN., 23 REF. PAPER PRESENTED AT THE 8TH ANNUAL CONFERENCE OF NIGERIAN SOCIETY FOR PLANT PROTECTION, BENIN CITY, 1978.

CASSAVA; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; MAIZE; INTERCROPPING; DISEASE CONTROL; SYMPTOMATOLOGY; NIGERIA.

DIFFERENT ASPECTS (SYMPTOMATOLOGY) OF CBB ARE REVIEWED AND PROGRESS MADE TOWARDS ITS CONTROL IN NIGERIA IS SUMMARIZED. EFFECTIVE CONTROL MEASURES ARE PRUNING OF INFECTED PLANT PARTS, LATE OR EARLY PLANTING, BALANCED FERTILIZATION, INTERCROPPING WITH MAIZE AND/OR MELON, SELECTION OF RESISTANT CASSAVA CV., AND BURIAL OF INOCULUM SOURCES TO REDUCE THE PATHOGEN'S LONGEVITY. (CIAT)

0709

28182 ARENE, O.B. 1972. CASSAVA MOSAIC VIRUS: PROGRESS AND PROBLEMS. UMUDIKE, NIGERIA, NATIONAL ROOT CROPS RESEARCH INSTITUTE. 11P. EN. 28 REF. PAPER PRESENTED AT THE ANNUAL CONFERENCE OF NIGERIAN SOCIETY FOR PLANT PROTECTION, BENIN CITY, 1972.

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; BEMISIA TABACI; RESISTANCE; HYBRIDIZING; PROPAGATION; CULTIVARS; PRODUCTIVITY; BEMISIA NIGERIENSIS; NIGERIA.

THE PROBLEMS AND PROGRESS IN RESEARCH IN AFRICA REGARDING THE FOLLOWING ASPECTS OF THE CAMV ARE REVIEWED: SYMPTOMS, EFFECTS ON CASSAVA YIELDS, TRANSMISSION BY BEMISIA SPP. VECTORS, VAR. IMPROVEMENT FOR RESISTANCE THROUGH SCREENING AND INTRASPECIFIC AND INTERSPECIFIC HYBRIDIZATION, AND CONTROL THROUGH HEAT THERAPY AND MERISTEM PROPAGATION. (CIAT)

0710

28166 ARENE, O.B. 1977. DISTRIBUTION AND SURVIVAL OF XANTHOMONAS MANIHOTIS IN CASSAVA STEM TISSUES AND ITS SIGNIFICANCE IN THE SELECTION OF BACTERIA-FREE PLANTING MATERIAL. NIGERIAN JOURNAL OF PLANT PROTECTION 3:16-23. EN., SUM. EN., 6 REF., IL.

CASSAVA; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CASSAVA BACTERIAL BLIGHT; PRUNING; PLANT PHYSIOLOGY; NIGERIA.

THE RATE AT WHICH EXUDATES OF XANTHOMONAS MANIHOTIS, THE CAUSAL AGENT OF CBB, ERUPTED ALONG CASSAVA GREEN SHOOTS FROM THE POINT OF INFECTION SHOWED THAT THE BACTERIA MOVED VERY RAPIDLY UPWARDS, BUT THE MOVEMENT DOWN THE SHOOT WAS RESTRICTED. THE BACTERIA WERE ISOLATED FROM THE POINT OF INFECTION UP THETIP BUT ONLY FOR A SHORT DISTANCE BELOW THE POINT OF INFECTION, AND THEY PERSISTED FOR MORE THAN 9 WK. IN THESE TISSUES. YOUNG SHOOTS SPROUTING FROM ANY NODE ABOVE THE POINT OF INFECTION WERE INFECTED, BUT INFECTION IN THOSE FROM NODES 12 CM BELOW THIS POINT WAS SIGNIFICANTLY LESS. BACTERIA-FREE CUTTINGS MAY BE SELECTED BY PRUNING THE INFECTED CUTTING AT LEAST 12 CM BELOW THE POINT OF INFECTION WHICH IS MARKED IN OLDER STEMS BY THE LOWEST CANKER REGION. (AS)

0711

28167 ARENE, O.B. 1977. FIELD EVALUATION OF AGRIMYCIN 500 FOR THE CONTROL OF CASSAVA BACTERIAL BLIGHT. NIGERIAN JOURNAL OF PLANT PROTECTION 3:90-93. EN., SUM. EN., 5 REF.

CASSAVA; CASSAVA BACTERIAL BLIGHT; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; BACTERIOSES; DISEASE CONTROL; NIGERIA.

AGRIMYCIN 500, A FORMULATION OF ANTIBIOTICS AND FUNGICIDE (TERANMYCIN, 0.176 PERCENT; STREPTOMYCIN, 1.755 PERCENT; COPPER SULFATE, 80 PERCENT) WAS EVALUATED FOR THE CONTROL OF XANTHOMONAS MANIHOTIS IN A COMPLETE RANDOMIZED BLOCK EXPT. IN NIGERIA. THERE WERE 3 METHODS OF APPLICATION (DIP, FOLIAR, ANDFOLIAR + DIP) FOR THE 5 DOSAGE LEVELS USED (0, 400, 600, 800, AND 1000 G/100 LITERS OF WATER). ANALYSIS OF VARIANCE INDICATED ONLY A SIGNIFICANT F-VALUE FOR DOSAGE LEVEL; HOWEVER, DUNCAN MULTIPLE-RANGE TESTS SUGGESTED THAT INCIDENCE AND SEVERITY WERE SIGNIFICANTLY REDUCED BY FOLIAR APPLICATION OF AGRIMYCIN 500 AT THE RATE OF 800 G/100 LITERS OF WATER. (AS)

0712

28169 ARENE, O.B. 1978. ROOT DISEASES OF CASSAVA. UMUDIKE, NIGERIA, NATIONAL ROOT CROPS RESEARCH INSTITUTE. 16P. EN., SUM. EN., 6 REF. PAPER PRESENTED AT THE 8TH ANNUAL CONFERENCEOF THENIGERIAN SOCIETY FOR PLANT PROTECTION, BENIN CITY, 1978.

CASSAVA; SCLEROTIUM ROLFSII; FOMES LIGNOSUS; ROSELLINIA NECATRIX; PHYTOPHTHORA; DISEASE CONTROL; MYCOSES; DISEASES AND PATHOGENS; ROOT PRODUCTIVITY; SYMPTOMATOLOGY; NIGERIA.

THE STATUS OF THE PRESENT RESEARCH CARRIED OUT AT THE NATIONAL ROOT CROPS INSTITUTE (NIGERIA) ON THE ROOT DISEASES CAUSED BY SCLEROTIUM ROLFSII, FOMES LIGNOSUS , ROSELLINIA NECATRIX, AND PHYTOPHTHORA SPP. IS PRESENTED. INFORMATION ON DIAGNOSTIC SYMPTOMS, EPIPHYTOTICS, AND CONTROL IS GIVEN. ATTEMPTS ARE ALSO MADE TO HIGHLIGHT THE CHALLENGES CASSAVA ROOT DISEASES STILL POSE TO PLANT PROTECTIONISTS. (CIAT)

0713

28168 ARENE, O.B. 1977. SUSCEPTIBILITY OF NIGERIAN LOCAL CASSAVA CULTIVARS TO CASSAVA BACTERIAL BLIGHT AND CASSAVA MOSAIC DISEASE. UMUDIKE, NIGERIA,

NATIONAL ROOT CROPS RESEARCH INSTITUTE. 27P. EN., SUM. EN., 5 REF. PAPER PRESENTED AT THE 13TH ANNUAL CONFERENCEOF THEAGRICULTURAL SOCIETY OF NIGERIA, ZARIA, 1977.

CASSAVA; CASSAVA BACTERIAL BLIGHT; CASSAVA AFRICAN MOSAIC VIRUS; CULTIVARS; RESISTANCE; PLANT BREEDING; SELECTION; ADAPTATION; NIGERIA.

IN A SYSTEMATIC SURVEY, COLLECTION, AND SCREENING OF CASSAVA GERMPLASM THROUGHOUT NIGERIA, 766 CV. WERE ASSEMBLED AT THE NATIONAL ROOT CROPS RESEARCH INSTITUTE IN UMUDIKE BETWEEN 1973-75. EVALUATION OF THESE CV. FOR RESISTANCE TO CBB AND CAMD HAS SHOWN THAT ABOUT 14.3 PERCENT OF FDAR/IMO/ANAMBARA COLLECTIONS SHOW RESISTANCE TO CBB AND 42.5 PERCENT TO CAMD; ABOUT 33 PERCENT SHOW RESISTANCE TO CBB AND 40 PERCENT TO CAMD IN BENDEL COLLECTIONS. HOWEVER, DUE TO CONSIDERATIONS OF OTHER BREEDING PARAMETERS, ONLY 197 CV. HAVE BEEN SELECTED AS SOURCE OF ENTRIES FOR THE MULTILOCATIONAL TRIALS BEING CONDUCTED IN 9 REGIONS OF THE COUNTRY. (AS)

0714

32011 ASHRAF, M. 1986. A case study of on-farm adaptive research at Bida Agricultural Development Project, Nigeria. In Flora, C.B.; Tomecek, M., eds. Selected proceedings of Kansas State University's 1984 Farming Systems Research Symposium. Farming systems research & extension: implementation and monitoring. Manhattan, Kansas State University. Farming Systems Research Paper Series no.9 pp.190-215. En., 8 Ref., 11.

CASSAVA; ON-FARM RESEARCH; DEVELOPMENTAL RESEARCH; CULTIVATION; ECONOMICS; LABOR; COSTS; INCOME; NIGERIA.

The On-Farm Adaptive Research program within the Bida Agricultural Development Project in Niger State, Nigeria, is discussed. Four cropping systems-based target areas were identified, 1 of which was the upland cassava-based cropping system which, along with the yam-based system, produces higher quantities of food and farm incomes, and in which cassava covers 44 percent of the area, being very low in the other 3 areas. Mononychellus tanajoa and CAMD were the major production constraints in the cassava-based system. Continuous cassava cropping with cassava/okra at a later stage (Oct.-Dec.) had a small chance of being implemented by farmers in the rice-based system. These possible planting decisions and their probability are also shown for the cassava-based system. The av. cassava yield for all systems (1.1 t/ha) was the same for the cassava-based system. Av. farm costs and income budgets for target domains in the area are given. (CIAT)

0715

29352 ATU, U.G. 1982. Assay of pesticides for control of cassava green spider mite. In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, pp.15-16. En.

CASSAVA; MITE CONTROL; ACARICIDES; MONONYCHELLUS TANAJOA; NIGERIA.

Two applications (at 2 and 4 mo. after planting) of the acaricides methamidophos (0.50 kg a.i./ha), oxydemeton-methyl (0.25 kg a.i./ha), omethoate (0.60 kg a.i./ha), formetanate (0.60 kg a.i./ha), or bielofentazine (0.2 kg a.i./ha) were tested for Mononychellus tanajoa control in cassava var. TMS 30211 in Umudike, Nigeria. Omethoate and oxydemeton-methyl reduced incidence by 93 percent compared with the untreated control; severity of M. tanajoa was also low in plants treated with these 2 products (1.4 and 1.6, resp., on a 1-5 scale compared with 3.0 for the untreated control). (CIAT)

0716

28345 ATU, U.G.; ARINZE, A.F. 1980. CONTROL STRATEGIES FOR CASSAVA MEALYBUG PHENACOCCUS MANIHOTI. IN NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA, 1980. PROCEEDINGS. UMUDIKE, NATIONAL CASSAVA ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.27-31. EN. 6 REF.

CASSAVA; PHENACOCCUS MANIHOTI; PEST CONTROL; BIOLOGICAL CONTROL; ECOSYSTEMS; PREDATORS AND PARASITES; CULTIVATION INSECTICIDES; EXOCHOMUS FLAVIPUS; HYPERASPIS PUMILA; NIGERIA.

INTEGRATED PEST MANAGEMENT STRATEGIES, WHICH MAY BE USED ALONE OR TOGETHER, TO CONTROL PHENACOCCUS MANIHOTI IN NIGERIA ARE BRIEFLY DISCUSSED: (1) EXCLUSION OF PEST THROUGH CASSAVA CUTTING DIPS FOR 5 MIN IN DIMETHOATE ORPHOSPHAMIDON; (2) ERADICATION, PREFERABLY THROUGH INSECTICIDE SPRAYS (DIMETHOATE, PHOSPHAMIDON, MONOCROTOPHOS); (3) CULTURAL CONTROL THROUGH THE USE OF ADAPTED HEALTHY PLANTING MATERIAL, EARLY PLANTING AT THE ONSET OF RAINS, AND PROPER SOIL FERTILITY AND SOIL MOISTURE CONSERVATION METHODS; (4) BIOLOGICAL CONTROL, HOPEFULLY THROUGH MASS REARING AND DISSEMINATION OF THE IDENTIFIED PREDATORS EXOCHOMUS FLAVIPES AND HYPERASPIS PUMILA; AND (5) CHEMICAL CONTROL, ESPECIALLY AT THE CRITICAL THRESHOLD LEVEL OF THE PEST (DIMETHOATE AND PHOSPHAMIDON). THE DISADVANTAGES OF THIS LATTER STRATEGY ARE INDICATED. (CIAT)

0717

28375 ATU, U.G.; OKEKE, J.F. 1981. EFFECT OF INSECTICIDE APPLICATION ON CASSAVA YIELD IN CONTROL OF CASSAVA MEALYBUG (PHENACOCCUS MANIHOTI). IN NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA, 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.61-68. EN., SUM. EN., 6 REF.

CASSAVA; PHENACOCCUS MANIHOTI; INSECTICIDES; CULTIVARS; PRODUCTIVITY; CANOPY; NIGERIA.

THE EFFECT OF INSECTICIDES (DIAZINON, DIMETHOATE, METHIDATHION, MONOCROTOPHOS, AND PHOSPHAMIDON) USED TO CONTROL PHENACOCCUS MANIHOTI ON YIELDS OF CASSAVA VAR. 30211, HARVESTED 10 MO. AFTER APPLICATION, WAS STUDIED IN UMUDIKE, NIGERIA. INSECTICIDES WERE APPLIED TO 4-MO.-OLD PLANTS. NO SIGNIFICANT TOP YIELD DIFFERENCES WERE OBSERVED AMONG TREATMENTS, EXCEPT FOR DIAZINON WHICH YIELDED SIGNIFICANTLY HIGHER THAN THE CONTROL (26.6 VS. 17.6 T/HA, RESP.). DIAZINON FOLLOWED BY PHOSPHAMIDON AND METHIDATHION WERE SIGNIFICANTLY BETTER FOR ROOT YIELD IMPROVEMENT COMPARED WITH THE CONTROL (32.3, 26.3, AND 25.6 T/HA, RESP., VS. 17.9 T/HA FOR THE CONTROL). (CIAT)

0718

29419 ATU, U.G.; AGBO, F.M.O. 1983. Effects of fertilizer and carbofuran application in the control of cassava mealybug, Phenacoccus manihoti, in three cassava varieties. In National Root Crops Research Institute. Cassava Programme. Annual Report 1983. Umudike, Nigeria, pp.10-12. En.

CASSAVA; CULTIVARS; INSECT CONTROL; PHENACOCCUS MANIHOTI; INSECTICIDES; FERTILIZERS; N; P; K; ROOT PRODUCTIVITY; NIGERIA.

The effects of NPK fertilization (0 and 450 kg 15-15-15/ha) and insecticide sprays (0 and 3 kg a.i. carbofuran/ha) on the control of Phenacoccus manihoti in cassava var. U/41044, TMS 30211, and 60506 were evaluated in Umudike and Otobi, Nigeria, in Feb. and March at peak infestation levels. The severity of P. manihoti at harvest was lowest for var. 60506 in all treatments. Carbofuran applications reduced P. manihoti severity in all var., while fertilizer applications had no significant effect on this parameter. Var. TMS 30211 was the most susceptible to P. manihoti at both locations. In Otobi the highest root yield across all treatments was

obtained with 60506 (27.0 t/ha) with both carbofuran and fertilization, the latter 2 factors improving root yields equally by 12.0 percent. Var. 60506 and U/41044 with fertilizer and/or carbofuran applications reduced damage by P. manihoti and increased root yields in the late planted cassava crop compared with the controls. (CIAT)

0719

29420 ATU, U.G.; EZULIKE, T.O. 1983. Field evaluation of miticides for control of cassava green spider mite (Mononychellus tanajoa). In National Root Crops Research Institute. Cassava Programme. Annual Report 1983. Umudike, Nigeria, pp.12-14. En.

CASSAVA; MITE CONTROL; MONONYCHELLUS TANAJOA; ACARICIDES; NIGERIA.

The acaricides omethoate, formetanate hydrochloride, biolofentazine, methamidophos, and oxydemeton-methyl were applied at 0.05 percent a.i. to cassava fields in Umudike and Nsukka, Nigeria, in Oct. and Dec. 1982 and Feb. 1983, to evaluate their effectiveness in controlling Mononychellus tanajoa. No significant differences in M. tanajoa incidence were observed among treatments at either location, but all plots sprayed in Umudike were better than the untreated control by at least 31 percent during the peak infestation period (Feb. 1983). No differences were observed in severity scores recorded on plots treated with omethoate, formetanate hydrochloride, and oxydemeton-methyl at both locations; these plots had the lowest ratings of 2.8 and 1.0, resp. The highest fresh root yields were recorded in plots sprayed with omethoate at both locations (21.5 and 17.1 t/ha in Umudike and Nsukka, resp.). Ranked in order, omethoate, oxydemeton-methyl, formetanate hydrochloride, and biolofentazine could be useful for M. tanajoa control programs. (CIAT)

0720

28511 ATU, U.G.; OKEKE, J.F.; CHINAKA, C. 1982. GRANULAR INSECTICIDE FOR CONTROL OF CASSAVA MEALYBUG (PHENACOCCUS MANIHOTI). IN NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA, 1982. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.99-103. EN., SUM. EN., 10 REF.

CASSAVA; PHENACOCCUS MANIHOTI; INSECTICIDES; NIGERIA.

CARBOFURAN AT 1.5 KG A.I./HA WAS TESTED IN 1 APPLICATION AT PLANTING OR IN 2 APPLICATIONS, 1 AT PLANTING AND THE OTHER AFTER 6 WK., TO CONTROL PHENACOCCUS MANIHOTI IN CASSAVA VAR. 30211 PLANTED IN UMUDIKE, NIGERIA. NO SIGNIFICANT DIFFERENCES WERE OBSERVED IN THE NO. OF PLANTS ATTACKED BY P. MANIHOTI AT 3 MO. BETWEEN 1 OR 2 APPLICATIONS (73 AND 76 PERCENT REDUCTIONS, RESP.). PLANT HEIGHT WAS ALSO HIGHER WITH CARBOFURAN TREATMENTS: 34 AND 23 CM TALLER THAN THE CONTROL PLANTS UNDER SHADE AND IN THE FIELD, RESP., FOR 2 APPLICATIONS AND 28 AND 14 CM TALLER THAN THE CONTROL PLANTS, RESP., FOR 1 APPLICATION. FOR CARBOFURAN TO BE EFFECTIVE, APPLICATIONS SHOULD BE CONDUCTED WHEN THERE IS ENOUGH SOIL MOISTURE (AT PLANTING AT THE END OF THE RAINS). (CIAT)

0721

29351 ATU, U.G. 1982. Integrated management practices for cassava mealybug control. In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, pp.14-15. En.

CASSAVA; CUTTINGS; PLANTING; INSECT CONTROL; INSECTICIDES; PHENACOCCUS MANIHOTI; PRODUCTIVITY; NIGERIA.

The effects of 0, 1, or 2 applications of carbofuran (1.5 kg a.i./ha) on cassava cuttings and of 2 planting methods (completely buried horizontally

and slant planted with at least 3 nodes exposed) on cassava root and top yields and severity of cassava mealybug attacks were investigated in Nigeria. The highest root and top yields were obtained from plots in which cuttings were completely buried (5.1 and 8.0 kg/plot, resp.) or planted slanted (3.8 and 10.1 kg/plot, resp.) with 2 carbofuran applications (at planting and 4 wk. later). The severity of the attack affected yields more than mealybug incidence on cassava plants. (CIAT)

0722

29388 ATU, U.G.; OGBONNAYA, J. 1984. Project 1. Cassava mealybug (CMB) and green spider mite (GSM) control. Level of activity (L.A.) 3. Chemical control. Effective method of carbofuran application in control of cassava mealybug. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.13-14. En., Il.

CASSAVA; INSECT CONTROL; INSECTICIDES; PHENACOCCUS MANIHOTI; ROOT PRODUCTIVITY; NIGERIA.

The effect of 4 carbofuran application methods, applied 3 wk. after planting of cassava var. 30211 on Phenacoccus manihoti control was investigated in Otobi, Nigeria. Methods were (1) placement in a 15-cm groove around the plant; (2) basal application around the plant; (3) broadcasted on plants in the morning when plants were moist with dew; and (4) broadcasted when plants were not moist. Severity scores were lowest for methods 3, 2, and 1 and highest for the control; significantly higher root yields were obtained with carbofuran applied using methods 3 (13.0 t/ha) and 2 (12.6 t/ha) compared with the control (9.0 t/ha). (CIAT)

0723

30077 ATU, U.G. 1985. Project 3. Studies on control of other pests and diseases. Effect of method of application of carbofuran in the control of pests of late cassava crop. In National Root Crops Research Institute. Cassava Programme. Annual Report 1985. Umudike, Nigeria, pp.31-32. En.

CASSAVA; INSECT CONTROL; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; INSECTICIDES; ROOT PRODUCTIVITY; NIGERIA.

Three methods of applying carbofuran, at a rate of 2.5 kg a.i./ha, were tested in cassava cv. TMS 30555 and U/41044, planted in Sept./Oct. (late planting season) in Nigeria, to evaluate their effect on their control of Phenacoccus manihoti and Mononychellus tanajoa. These were (1) placement of granules in planting holes before covering with soil; (2) broadcasting after planting/covering; (3) placement in grooves made in planting holes after planting. In TMS 30555, no significant differences were observed in root yield, but the severity of both pests was reduced by broadcast-applied carbofuran. In U/41044, yields were higher, but not significantly different, for groove and broadcast carbofuran applications. Only in broadcast carbofuran applications was M. tanajoa severity significantly lower. Thus, broadcast applications of carbofuran after planting gave better control of the pests and was also an easier method to use. (CIAT)

0724

29433 ATU, U.G.; OGBUJI, R.O. 1986. ROOT-KNOT NEMATODE PROBLEMS WITH INTERCROPPED YAM (DIOSCOREA ROTUNDATA). PHYTOPROTECTION 67(1):35-38. EN. SUM. EN., FR., 13 REF. (FEDERAL UNIV. OF TECHNOLOGY, SCHOOL OF AGRICULTURE & AGRICULTURAL TECHNOLOGY, P.M.B. 1526, OWERRI, NIGERIA)

CASSAVA; RESISTANCE; INTERCROPPING; CULTIVARS; NEMATODES; PLANTING; DIOSCOREA; NIGERIA.

TEN INTERCROPS TRADITIONALLY PLANTED WITH YAMS IN SOUTHERN NIGERIA WERE TESTED FOR RESISTANCE TO MELOIDOGYNE INCOGNITA RACE 2. RESULTS BASED ON ROOT GALL INDICES AND NO. OF JUVENILES RECOVERED FROM SOIL AND ROOTS INDICATED THAT CORCHORUS OLITORUS, SPHENOSTYLIS STENOCARPA, ABELMOSCHUS ESCULENTUS, AND CUCURBITA PEPO WERE HIGHLY SUSCEPTIBLE; AMARANTHUS CAUDATUS, CITRULLUS VULGARIS, ZEA MAYS, AND MANIHOT ESCULENTA, MODERATELY SUSCEPTIBLE; TELFAIRIA OCCIDENTALIS, RESISTANT; AND MUCUNA PRURIENS, HIGHLY RESISTANT. SUSCEPTIBLE INTERCROPS PLANTED ON YAM MOUNDS RESULTED IN GREATER DAMAGE ON THE HARVESTED TUBERS. (AS)

0725

30147 AYANRU, D.K.G. 1987. Effects of mealybug (Phenacoccus manihoti) infestation on cassava yield components and plant tissue quality. Tropenlandwirt 88:5-10. En., Sum. En., De., 18 Ref. (Dept. of Microbiology, Univ. of Benin, PMB 1154 Benin City, Nigeria)

CASSAVA; PHENACOCCUS MANIHOTI; PEST DAMAGE; PLANT TISSUES; ANALYSIS; STEMS; DEFOLIATION; ROOT PRODUCTIVITY; CARBOHYDRATE CONTENT; N; PROTEIN CONTENT; METABOLISM; NIGERIA.

Half of the stands of cassava clone TMS 41044 planted in field plots in Ugbouro, Nigeria, in June 1983 were treated at 3-wk. intervals against mealybugs (Phenacoccus manihoti), using fenitrothion. At 10 mo., sprayed and unsprayed plants were evaluated for mealybug infestations, canopy height, and stem diameter, and harvested for yields and assessment of quality. Unsprayed plants were completely defoliated and reduced (23 percent) in canopy height, while sprayed ones were free from infestation symptoms. Dry stem and root yields of infested cassava were reduced significantly (P = 0.01) by 39 and 60 percent, resp., as compared with those of noninfested plants. Stem tissues of infested stands were less succulent than those of noninfested, while the reverse was true for root tissues. Stems and roots of nondefoliated as compared with defoliated cassava were depleted in total carbohydrates (28.41 vs. 19.06 percent and 70.72 vs. 65.13 percent, resp.) and ME contents (415 vs. 278 and 1033 vs. 951 kcal/kg, resp.). On the contrary, tissues of infested plants contained enhanced protein contents (over 88 percent). The dietary and other implications of augmented or depleted assimilates and anabolites in the tissues, and their induction mechanisms are discussed. (AS)

0726

28161 AYANRU, D.K.G.; SHARMA, V.C. 1986. EFFECTS OF MITE (MONONYCHELLUS TANAJOA) AND MEALYBUG (PHENACOCCUS MANIHOTI) INFESTATION ON THE MINERAL STATUS OF A CASSAVA CLONE. AGRICULTURE, ECOSYSTEMS AND ENVIRONMENT 18(1):73-81. EN., SUM. EN., 24 REF., IL. (DEPT. OF MICROBIOLOGY, UNIV. OF BENIN, BENIN CITY, NIGERIA)

CASSAVA; MONONYCHELLUS TANAJOA; PHENACOCCUS MANIHOTI; PEST DAMAGE; MINERAL CONTENT; ROOTS; STEMS; LEAVES; N; P; K; CA; MG; NA; TIMING; NIGERIA.

FOLITHION-SPRAYED AND UNSPRAYED PLANTS OF CASSAVA CLONE TMS/U 30395 WERE EVALUATED MONTHLY FOR INFESTATIONS BY MITES (MONONYCHELLUS TANAJOA) AND MEALYBUGS (PHENACOCCUS MANIHOTI) IN PLOTS IN UGBOWO, NIGERIA. THE PLANTS WERESAMPLED FOR MATURE LAMINA, STEM, AND TUBER PARENCHYMA TISSUES AND ANALYZED FOR 9 MINERAL ELEMENTS: N, P, K, CA, MG, NA, FE, MN, AND ZN. CONCN. OF P AND K IN ALL THE TISSUES SAMPLED VARIED FROM 0.09 TO 0.38 AND FROM 0.25 TO 1.46 PERCENT, RESP., AND WERE SIGNIFICANTLY LOWER (P LESS THAN 0.01) IN TISSUES OFSEVERELY PEST-INFESTED (UNSPRAYED) CASSAVA THAN IN THOSE OF HEALTHY (SPRAYED)PLANTS. ALSO, DIMINISHED VALUES OF FE, MN, AND ZN IN ROOTS AND STEMS, AND OF MG AND N IN LEAVES OF PEST-INFESTED PLANTS WERE FOUND; HOWEVER, CONTENTS OF CA IN ALL TISSUES, MG AND NA IN ROOTS, AND N IN ROOTS AND STEMS OF PEST-INFESTED AND DEFOLIATED PLANTS WERE CONSIDERABLY HIGHER

THAN THOSE IN TISSUESOF HEALTHY STANDS. THE PHYSIOLOGICAL BASES FOR THE PEST-INDUCED ELEMENTAL CONCN. IMBALANCES ARE DISCUSSED. (AS)

0727

28310 AYANRU, D.K.G. 1986. RELATIONS BETWEEN BIOMASS ACCUMULATION AND INFECTION BY VESICULAR- ARBUSCULAR MYCORRHIZAL FUNGI IN CASSAVA AS AFFECTED BY PLANTING DATE. PHYTOPATHOLOGISCHE ZEITSCHRIFT 117(4):362-366. EN., SUM. EN., DE., 14 REF. (DEPT. OF MICROBIOLOGY, FACULTY OF SCIENCE, UNIV. OF BENIN, P.M.B. 1154, BENNIN CITY, NIGERIA)

CASSAVA; BIOMASS PRODUCTION; GROWTH; MYCORRHIZAE; CLONES; TIMING; PLANTING; NIGERIA.

ROOTS OF 12, 3-MO.-OLD, FIELD-PROPAGATED CASSAVA CLONES WERE MORE HEAVILY MYCORRHIZAL IN THE DRY (JAN.-MARCH AND OCT.-DEC.) THAN IN THE WET SEASON (APRIL-SEPT.): 39-83 AND 20-71 PERCENT, RESP. MEAN DRY WT. (BIOMASS) OF ROOTS AND SHOOTS IN THE WET SEASON (3.8- 7.9 AND 9.7-19.1 G/PLANT) WERE HIGHER (P = 0.01) THAN IN THE DRY SEASON (2.1-5.9 AND 5.4-12.8 G/PLANT, RESP.). CLONES WITH SYMPTOMS OF CAMD WERE LESS MYCORRHIZAL (20-69 PERCENT) THAN MOSAIC SYMPTOM- FREE CLONES (51-83 PERCENT). HIGHER COLONIZATION OF ROOTS OF THE CLONES BY INDIGENOUS FUNGAL SYMBIONTS AND LOWER BIOMASS ACCUMULATION IN THE DRY SEASON ARE ATTRIBUTED MAINLY TO SOIL MOISTURE AND OTHER EFFECTS, WHILE REDUCED INFECTIONS IN CASSAVA WITH CAMD SYMPTOMS MAY BE DUE TO CAMD-INDUCED REDUCTIONS IN CARBOHYDRATE LEVELS. (AS)

0728

27606 AYERNOR, G.S. 1985. EFFECTS OF THE RETTING OF CASSAVA ON PRODUCT YIELD AND CYANIDE DETOXICATION. JOURNAL OF FOOD TECHNOLOGY 20(1):89-96. EN., SUM. EN., 18 REF., IL. (DEPT. OF FOOD SCIENCE & TECHNOLOGY, UNIV. OF NIGERIA, NSUKKA, NIGERIA)

CASSAVA; DETOXIFICATION PROCESSES; STEEPING; CULTIVARS; STARCH CONTENT; SUGAR CONTENT; FIBER CONTENT; DRY MATTER; ROOTS PRODUCTIVITY; HCN CONTENT; CYANIDES; NIGERIA.

A TRADITIONAL PROCESSING TECHNIQUE, REFERRED TO AS RETTING, THAT EFFECTS CYANIDE DETOXICATION IN CASSAVA PRODUCTS WAS INVESTIGATED. CASSAVA RETTING IS A TECHNIQUE OF LONG SOAKING OF CASSAVA ROOTS IN WATER TO EFFECT THE BREAK DOWN OF TISSUES AND EXTRACTION OF THE STARCHY MASS. A SIMULATION OF THE TECHNIQUE,FOLLOWED BY SUN DRYING, SHOWED THAT LOSS OF STARCH AND SOLUBLE COMPONENTS CAUSED AN APPARENT RISE IN PERCENT CRUDE FIBER IN THE PRODUCTS. THE RISE IN PERCENT FIBER AND ROOT PEEL:PULP RATIO SHOWED AN INVERSE RELATIONSHIP WITH PRODUCT YIELD. THE TECHNIQUE OF RETTING FOLLOWED BY SUN DRYING REMOVED UP TO 98.6 PERCENT OF INITIAL CYANIDE IN THE ROOTS, THE AV. CYANIDE CONTENT OF THE PRODUCT BEING 6.9 PPM; THIS IS OVER 20-FOLD MORE EFFICIENT THAN SIMPLE SUN DRYING. (AS)

0729

28175 AZIH, V.A. 1979. ESSENTIAL FEATURES OF CASSAVA VARIETY AND FERTILIZER MINIKIT TRIALS DEMONSTRATIONS AND PRODUCTION. UMUDIKE, NIGERIA, NATIONAL ROOT CROPS RESEARCH INSTITUTE. 14P. EN., 2 REF. PAPER PRESENTED AT THE 3RD NAFPP NATIONAL CASSAVAWORKSHOP,UMUDIKE, 1979.

CASSAVA; TECHNOLOGY TRANSFER; CULTIVARS; FERTILIZERS PLANTING; SPACING; INTERCROPPING; MAIZE; CULTIVATION; TECHNOLOGICAL PACKAGE; N; P; K; S; NIGERIA.

THE PROCEDURES USED TO CONDUCT VAR. AND FERTILIZER TRIALS, DEMONSTRATIONS, AND COMMERCIAL-SCALE PRODUCTION FIELD TESTS, IN A JOINT EFFORT BETWEEN RESEARCHERS AND CASSAVA FARMERS, ARE DESCRIBED. THE ESSENTIALINGREDIENT OF TRIALS AND DEMONSTRATIONS IS THAT FARMERS ARE FULLY INVOLVED INTHE WHOLE

PROCESS OF FIELD OPERATIONS, VAR. IDENTIFICATION, AND FERTILIZER RATE SELECTION FOR THEIR OWN ENVIRONMENTS. CRITERIA FOR SELECTING SUITABLE SITES AND FARMERS FOR TRIALS AND DEMONSTRATIONS ARE GIVEN. THIS METHODOLOGY IS PRIMARILY DESIGNED TO ACCELERATE FARMER ADOPTION OF IMPROVED TECHNOLOGY AND PROVIDE RESEARCHERS WITH A UNIQUE OPPORTUNITY TO GET THE NECESSARY FEEDBACK FROM FARMERS, EXTENSION WORKERS, AND CONSUMERS. (CIAT)

0730

28344 AZIH, V.A. 1980. REVIEW OF ACTIVITIES 1979/80. IN NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA, 1980. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.10-26. EN.

CASSAVA; CULTIVARS; WEEDING; PRODUCTIVITY; FERTILIZERS; CASSAVA PROGRAMS; NIGERIA.

CASSAVA PROJECTS CONDUCTED DURING 1979-80 IN NIGERIA BY THE NATIONAL CASSAVA CENTRE ARE BRIEFLY REPORTED. RESULTS ARE GIVEN FOR THE FOLLOWING PROJECTS: VAR. PRE-MINIKIT TRIAL, HERBICIDE PRE- MINIKIT TRIAL, MIXED CROPPING PRE-MINIKIT TRIAL, VAR. MINIKIT TRIAL, FERTILIZER MINIKIT TRIALS, CASSAVA/MAIZE DEMONSTRATIONS, AND CASSAVA MULTIPLICATION. PRELIMINARY DATA OBTAINED ARE REPORTED IN TABLE FORM. (CIAT)

0731

26796 BADIRU, M.A.; SOFELA, A.O. 1985. SITUATION OF ROOTS, TUBERS AND PLANTAINS IN NIGERIA. IN WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE, 1985. REPORT. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.139-171. EN., 33 REF., IL.

CASSAVA; SOCIOECONOMIC ASPECTS; MARKETING; PRICES; PROCESSING; PROCESSED PRODUCTS; CASSAVA FLOUR; FOOFOO; POSTHARVEST LOSSES; PRODUCTION; MECHANIZATION; PLANT BREEDING; CULTIVARS; STATISTICAL DATA; LEGAL ASPECTS; NIGERIA.

DATA ARE PRESENTED ON THE ROLE OF ROOT AND TUBER CROPS AND PLANTAIN IN NIGERIA. CASSAVA IS CULTIVATED THROUGHOUT THE COUNTRY, WITH AN APPROX. ANNUAL OUTPUT OF 10.1-11.0 MILLION T AND AN ESTIMATED YIELD OF 9.16 T/HA. IT IS THE MAJOR SOURCE OF CARBOHYDRATES (MAINLY AS GARI) AND IS ALSO USED FOR ANIMAL FEED AS WELL AS IN THE TEXTILE INDUSTRIES AND IN THE MANUFACTURE OF ALCOHOL. CASSAVA GOES DIRECTLY FROM THE PRODUCER TO THE PROCESSOR AND THENCE TO SALESMEN, RETAILERS, WHOLESALERS, AND CONSUMERS. IN 1981, 7.7 MILLION T OF CASSAVA WERE COMMERCIALIZED AND 2.75 MILLION T WERE STORED, WITH SUBSTANTIAL LOSSES DURING STORAGE AND TRANSPORTATION. CURRENT RESEARCH IS DESCRIBED AND THE IMPROVED VAR. RELEASED TO DATE ARE PRESENTED: U/41044, NR 7706, NR 7797, NR 7708, TMX 30211 Y MMX 30555; A METHOD FOR RAPID MULTIPLICATION OF PLANTINGMATERIAL, SEVERAL MACHINES, AND DEVELOPMENT ACTIVITIES ARE ALSO DESCRIBED. (CIAT)

0732

28346 BARTLETT, C.D.S.; IKEORGU, J.F. 1980. A REVIEW OF MINIKITS AND OF THE ECONOMICS OF RECOMMENDED PRACTICES FOR CASSAVA PRODUCTION. IN NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA, 1980. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.32-34. EN.

CASSAVA; DEVELOPMENT COSTS; PRODUCTION; TECHNOLOGY TRANSFER; NIGERIA.

RECOMMENDATIONS ON THE INTRODUCTION OF SOCIOECONOMIC SURVEYS AND THE MODIFICATION OF CASSAVA MINIKIT TRIALS AND PRODUCTION KITS ARE GIVEN, BASED ON THE TYPE OF INFORMATION FEEDBACK FROM PARTICIPANT FARMERS. SOCIOECONOMIC

SURVEYS AND ZONAL TRIALS YIELD MORE IMPORTANT INFORMATION ON INNOVATIONS THAN MINIKITS. ON THE OTHER HAND, MINIKIT TRIALS SHOULD BE MODIFIED AS FOLLOWS: VAR. MINIKITS SHOULD CONTINUE BUT MORE INFORMATION SHOULD BE GATHERED ON FARMERS' LIKES AND DISLIKES; FERTILIZER, HERBICIDE, AND PLANTING METHOD MINIKITS SHOULD BE DISCONTINUED; PRODUCTION KITS SHOULD CONTINUE BUT MORE INFORMATION GATHERED ON FARMERS' LIKES AND DISLIKES OF NEW METHOD; LESS EMPHASIS SHOULD BE GIVEN TO YIELD DATA FROM MINIKITS AND PRODUCTION KITS. (CIAT)

0733

32241 BAUMGAERTNER J.; SCHULTHESS, F. 1986. Development of sampling plans for Phenacoccus manihoti (Homoptera: Pseudococcidae) in cassava fields. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. pp.128-134. En., 24 Ref. (Inst. fur Phytomedizin, ETH-Z Clausiusstrasse 21, Zurich, Switzerland)

CASSAVA; PHENACOCCUS MANIHOTI; INSECT BIOLOGY; RESEARCH; NIGERIA.

Methods for assessing and analyzing spatial distributions of Phenacoccus manihoti are discussed. Techniques for sampling populations of the pest in cassava fields are also described. (CIAT)

0734

26717 CHILAKA, F.C.; ANOSIKE, E.O.; OBIDOA, O. 1985. EFFECT OF HIGH AND PROLONGED GARI DIETS ON SOME MICROSOMAL ENZYMES ACTIVITIES OF RAT LIVER. QUALITAS PLANTARUM PLANT FOODS FOR HUMAN NUTRITION 35(2):159-164. EN., SUM. EN., 20 REF. (DEPT. OF BIOCHEMISTRY, UNIV. OF NIGERIA, NSUKKA, NIGERIA)

CASSAVA; GARI; ENZYMES; DIETS; HCN; HCN ABSORPTION; CYANOGEN; ANIMAL PHYSIOLOGY; LABORATORY ANIMALS; BIOCHEMISTRY; NIGERIA.

MALE WISTER ALBINO RATS (90-130 G) WERE FED CONTROL AND (56 PERCENT WT./WT.) GARI-CONTAINING DIETS FOR 9 WK. AND SACRIFICED AT INTERVALS OF 1, 3, 6, AND 9 WK. LIVER MICROSOMAL FRACTIONS WERE ASSAYED FOR GLUCOSE-6- PHOSPHATASE, NADP (REDUCED)-CYTOCHROME C (P- 450) REDUCTASE, NADP (REDUCED)-DICHLOROPHENOLINDOPHENOL REDUCTASE, CYTOCHROME P-450 PEROXIDASE, AND ANILINE HYDROXYLASE ACTIVITIES. WHEREAS CHANGES WERE OBSERVED IN THE ACTIVITY RATES OF ALL ENZYMES, SIGNIFICANT CHANGES WERE OBSERVED IN THE NADP (REDUCED)-CYTOCHROME C REDUCTASE ACTIVITY (43 PERCENT INHIBITED, P LESS THAN 0.001) AND GLUCOSE-6-PHOSPHATASE (19 PERCENT INHIBITED, P LESS THAN 0.05) AT 9 WK. THE RESULTS ARE DISCUSSED IN TERMS OF THE HEPATOTOXICITY OF GARI. (AS)

0735

28586 CONNOLLY, M. 1986. IMPACT OF INTERNATIONAL AND NATIONAL AGRICULTURAL RESEARCH IN NIGERIA. IITA RESEARCH BRIEFS 7(1):1-3. EN., 1 REF., IL.

CASSAVA; CULTIVARS; MAIZE; CASSAVA PROGRAMS; INTERCROPPING; TECHNOLOGY TRANSFER; DEVELOPMENTAL RESEARCH; GERMPLASM; DISEASE CONTROL; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BACTERIAL BLIGHT; MITE CONTROL; MONONYCHELLUS TANAJOA; PHENACOCCUS MANIHOTIS; NIGERIA.

THE HIGHLIGHTS OF A STUDY ON THE IMPACT INTERNATIONAL AGRICULTURAL RESEARCH CENTERS HAVE MADE ON NATIONAL AGRICULTURAL RESEARCH INSTITUTES AND, THROUGH THEM, ON AGRICULTURAL DEVELOPMENT IN NIGERIA ARE PRESENTED.
REGARDING CASSAVA, THE INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE (IITA) HAS BEEN THE MAIN CONTRIBUTOR OF IMPROVED GERMPLASM, THE MOST IMPORTANT MATERIALS OF WHICH ARE TMS 30572, 50395, 30555, 42025, TMS 4(20), AND 1425. COLLABORATION BETWEEN IITA AND THE NATIONAL AGRICULTURAL RESEARCH CENTERS HAS RESULTED IN THE CONTROL OF MAJOR CASSAVA DISEASES INCLUDING

CAMD AND CBB AND, MORE RECENTLY, PESTS SUCH AS THE CASSAVA MEALYBUG AND THE GREEN SPIDER MITE. IMPROVED CASSAVA INTERCROPPING SYSTEMS HAVE ALSO BEEN DEVELOPED. SMALL MACHINES AND INFORMATION EXCHANGE ARE OTHER IMPACT AREAS BRIEFLY DISCUSSED. (CIAT)

0736

30037 DAHNIYA, M.T. 1979. Defoliation and grafting studies of cassava (Manihot esculenta Crantz) and sweet potatoes (Ipomoea batatas L.). Ph.D. Thesis. Nigeria, University of Ibadan. 188p. En., Sum. En., 84 Ref., Il.

CASSAVA; DEFOLIATION; PRUNING; TIMING; GRAFTING; N; FERTILIZERS; CUTTINGS; PLANTING; DRY MATTER PLANT DEVELOPMENT; ROOT DEVELOPMENT; ROOT PRODUCTIVITY; ROOTS; NIGERIA.

Defoliation expt. were conducted to determine the effects of leaf harvesting on the yield and yield components of cassava and sweet potato, and grafting studies to investigate their source-sink relationships. Significantly less leaf material was obtained by defoliating the lower instead of the upper leaves of cassava var. Isunikankiyan and 58308. Root yields of both var. were not significantly affected by the pattern of defoliation but plants with lower leaves harvested tended to give higher tuber yields than those with upper leaves harvested. Root yield of var. Isunikankiyan was reduced by 76, 62, and 15 percent, resp., by defoliating the upper leaves at 1-, 2-, and 3-mo. intervals while var. TMS 30211 suffered a root yield reduction of 56, 34, and 32 percent, resp. It is recommended that the leaves of var. Isunikankiyan and TMS 30211 should be defoliated at 3- and 2-mo. intervals, resp. Generally, the percentage of total plant DM deposited in the roots decreased with an increase in the frequency of defoliation. In cassava, the 4 grafted var. showed varying source potentials and sink capacities. Var. TMS 30211 was best with a mean stock (sink) effect of 1451.23 g/plant and a mean scion (source) effect of 1487.05 g/plant. Var. Isunikankiyan was the poorest with a mean stock (sink) effect of 451.13 g/plant and a mean scion (source) effect of 620.4 g/plant. The results suggest that a large and active tuberous root sink coupled with an efficient source are important in determining cassava tuberous root yield. (AS (extract))

0737

28195 DUYILEMI, B.O. 1986. FOOD PLANTS OF NIGERIA. JOURNAL OF BIOLOGICAL EDUCATION 20(1):13-14. EN., 7 REF., IL. (ONDO STATE COLLEGE OF EDUCATION PMB.250, IKERE-EKITI, NIGERIA)

CASSAVA; COMPOSITION; GARI; FOOFOO; NIGERIA.

EXAMPLES OF TROPICAL TUBER CROPS (AMONG THEM, CASSAVA), THEIR CHEMICAL CONSTITUENTS, AND METHODS OF PREPARATION ARE DISCUSSED WITH A VIEW TO ENCOURAGING PRACTICAL INVESTIGATIONS. IN NIGERIA, CASSAVA IS CONSUMED AS GARI, STARCH, OR FUFU. (AS)

0738

29523 EGUNJOBI, O.A.; OLAITAN, J.O. 1986. RESPONSE OF MELOIDOGYNE INCOGNITA-INFECTED COWPEA TO SOME AGRO- WASTE SOIL AMENDMENTS. NEMATROPICA 16(1):33-43. EN., SUM. EN., FS., 28 REF. (NEMATOLOGY LABORATORY, PHYTOPATHOLOGY UNIT, DEPT. OF AGRICULTURAL BIOLOGY, UNIV. OF IBADAN, IBADAN, NIGERIA)

CASSAVA; FRESH PRODUCTS; SOIL AMENDMENTS; PEST CONTROL; WASTE UTILIZATION; NIGERIA.

THE USE OF COCOA POD HUSKS, CASSAVA PEELINGS, AND RICE HUSKS AS SOIL AMENDMENTS FOR THE CONTROL OF MELOIDOGYNE INCOGNITA ON COWPEA CV. IFE BROWN WERE COMPARED WITH CARBOFURAN PESTICIDE AND NPK FERTILIZER APPLICATION IN

FIELD AND GREENHOUSE TRIALS. AMENDING SOIL WITH COCOA POD HUSKS PROVED VIRTUALLY AS EFFECTIVE AS CARBOFURAN APPLICATION, REDUCING POPULATIONS OF M. INCOGNITA, CROP DAMAGE, AND GALLING INDEX IN THE FIELD. IMPROVEMENTS IN COWPEA PRODUCTIVITY IN COCOA POD HUSKS AND CASSAVA PEELINGS-AMENDED SOIL WERE ASSOCIATED WITH M. INCOGNITA POPULATION DEPRESSION AS WELL AS OTHER UNKNOWN FACTORS THAT MAY INCLUDE SOME FERTILIZING PROPERTIES OF COCOA POD HUSKS. RICE HUSKS SIGNIFICANTLY REDUCED M. INCOGNITA POPULATIONS, BUT ALSO WERE A CARRIER FOR FUSARIUM SEMITECTUM, COLLETOTRICHUM LINDEMUTHIANUM, AND PHOMA SPP. (AS)

0739

28384 EJIKEME, C.U. 1981. IMO STATE. IN NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA, 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.139-149. EN.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; FERTILIZERS; SEED DEVELOPMENT; SOCIOECONOMIC ASPECTS; PEST CONTROL; ADAPTATION; PROPAGATION; PRODUCTIVITY; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; NIGERIA.

THE 1980 ANNUAL REPORT OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTIONPROGRAMME) IN THE STATE OF IMO, NIGERIA, IS PRESENTED. YIELD DATA ARE REPORTED FOR THE 1979-80 CASSAVA VAR. TRIALS AND FERTILIZER TRIALS; MAIN CONCLUSIONS REACHED ARE DISCUSSED. RESULTS OF SEED MULTIPLICATION ACTIVITIES ARE GIVEN AND TRAINING PROGRAMS ARE MENTIONED. THE ROLE OF AGROSERVICE CENTERS THROUGHOUT THE STATE IS BRIEFLY DISCUSSED. A BRIEF NOTE ON THE SUCCESSFUL CONTROL OF PHENACOCCUS MANIHOTI AND MONONYCHELLUS TANAJOA IS PRESENTED. FUNDING AND DISPOSAL OF FARMERS' PRODUCE ARE THE MAJOR CONSTRAINTS. (CIAT)

0740

29426 EJIOFOR, M.A.N.; OKPOKIRI, A.O.; IJIOMA, E.C.; ALOZIE, S.O. 1983. Evaluation of processing methods for cassava fufu production. In National Root Crops Research Institute. Cassava Programme. Annual Report 1983. Umudike, Nigeria, pp.26-29. En., Il.

CASSAVA; FOOFOO; PROCESSING; CASSAVA FLOUR; HCN CONTENT; ORGANOLEPTIC EXAMINATION; NIGERIA.

Four methods for processing cassava into foofoo were tested for chemical analysis and organoleptic characteristics in Nigeria: (1) peeling, washing, and fermentation of roots under water for 96 h; (2) steeping out pieces of roots and dewatering after 96 h; (3) steeping whole roots in water for 24 h, washing, grating, and resteeping for 48 h, and then sieving and dewatering; (4) similar to method 3, but whole roots steeped in water for 48 h, washed, grated, and resteeped for 24 h. The resulting pulp from all of the methods was dried, milled, and packed. The best foofoo mash and CF was obtained using method 4, with the lowest HCN and crude fiber content, and ranked highest for color, odor, texture, and acceptability. (CIAT)

0741

29403 EJIOFOR, M.A.N.; OKPOKIRI, A.O. 1984. Project 5. Product development, utilization and preservation of cassava. Comparative studies on the shelf-life of cassava fufu and instant flour processed by oven and sun drying. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.49-55. En., Dat.num.

CASSAVA; FOOFOO; CASSAVA FLOUR; STORAGE; CULTIVARS; TIMING; SOLAR DRYING; DRYING; COMPOSITION; ORGANOLEPTIC EXAMINATION; TOXICITY; HCN CONTENT; PROTEIN CONTENT; DRY MATTER; FIBER CONTENT; AMINO ACIDS; STARCH CONTENT; ASH CONTENT; NIGERIA.

Oven- or sun-dried foofoo and instant flour obtained from 5 cassava var. (30211, U/41044, 30555, 30572, and 79/1746) were packed in transparent polyethylene bags (0.5 kg) and stored at room temp. during 0, 6, and 12 mo. to assess possible changes in proximate analysis and sensory characteristics, and microbial contamination. A significant reduction in HCN content of foofoo and instant flour occurred in all var. as storage time increased, but quality was not significantly affected by storage. Macroscopic examination of the products showed that CF did not usually attract weevils/insects and that the packing method was adequate. Sun-dried products were more predisposed to heavy microbial contamination and possible intoxication by pathogens. The observed low intoxication probability score in reconstituted products are no indication of their safety. Spore-forming pathogenic microorganisms often leave behind toxic chemicals which, at increased concn., can lead to food poisoning. (CIAT)

0742

29402 EJIOFOR, M.A.N.; OKEKE, J.F. 1984. Project 5. Product development, utilization and preservation of cassava. Effect of bulking tubers from different cassava varieties on the proximate composition, HCN and sensory characteristics of cassava fufu products. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.47-48. En.

CASSAVA; CULTIVARS; PROCESSING; SOLAR DRYING; FOOFOO; PRODUCTIVITY; COMPOSITION; HCN CONTENT; ORGANOLEPTIC EXAMINATION; NIGERIA.

Attempts were made in 1984 in Nigeria to process cassava into foofoo by sun drying and mixing roots of cassava var. 30211, U/41044, 30555, 30572, 79/1746, and the control 60506 to assess proximate composition and sensory characteristics of the bulked foofoo product. While cassava var. 30211 and U/41044 were considered the best for foofoo production in another expt., foofoo produced from the bulking of roots of the 6 var. was as good as that from either 30211 or U/41044 in terms of proximate analysis, yield (21.8 percent), color, odor, texture, and acceptability. (CIAT)

0743

29401 EJIOFOR, M.A.N.; ANYANGBUNAM, V.O. 1984. Project 5. Product development, utilization and preservation of cassava. Varietal effects on yield, product quality and acceptability of cassava fufu and instant flour. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.43-46. En.

CASSAVA; CULTIVARS; PROCESSING; SOLAR DRYING; FOOFOO; CASSAVA FLOUR; PRODUCTIVITY; COMPOSITION; HCN; ORGANOLEPTIC EXAMINATION; NIGERIA.

Attempts were made in 1984 in Nigeria to process cassava into foofoo and instant flour by sun drying and to screen var. 30211, U/41044, 30555, 30572, 79/1746, and the control 60506 for those with highest yields and best proximate composition and sensory characteristics (color, odor, texture, acceptability). Cassava var. 30211 and U/41044 were considered the best for foofoo and instant flour production; var. 30211 yielded 20.85 percent foofoo and 28.50 percent instant flour, and var. U/41044 yielded 21.40 percent foofoo and 26.65 percent instant flour, both with significantly higher starch content than the rest. (CIAT)

0744

26831 EKPENYONG, T.E.; OBI, A.F. 1986. REPLACEMENT OF MAIZE WITH CASSAVA IN BROILER RATIONS. ARCHIV FUER GEFLUEGELKUNDE 50(1):2-6. EN., SUM. EN., DE., FR., RUS., 22 REF. (DEPT. OF ANIMAL SCIENCE, UNIV. OF IBADAN, IBADAN, NIGERIA)

CASSAVA; POULTRY; FEEDS AND FEEDING; NUTRITIVE VALUE; CASSAVA MEAL; FEED CONSTITUENTS; FEED MIXTURES; PRODUCTIVITY; ANIMAL HEALTH; NIGERIA.

THREE LEVELS OF CASSAVA-BASED DIETS (0, 37.5, AND 50.0 PERCENT CASSAVA) WERE SUPPLEMENTED WITH 3 LEVELS OF ZN TO DETERMINE THEIR EFFECTS ON BROILER PERFORMANCE. CASSAVA ROOTS WERE PREVIOUSLY PEELED, GRATED, SQUEEZED, AND SUN- DRIED. ZN SUPPLEMENTATION HAD LITTLE EFFECT ON WT. GAIN EFFICIENCY. FEED INTAKE INCREASED WITH INCREASE IN CASSAVA LEVEL AND THE ADDITION OF 50 PPM ZN. CARCASS QUALITY WAS AFFECTED BY DIETARY TREATMENT. THERE WAS A ZN X CASSAVA INTERACTION ON DRESSING PERCENTAGE, PLUCKED WT., AND ABDOMINAL FAT. ABDOMINAL FAT DECREASED AS LEVELS OF CASSAVA AND ZN INCREASED. ALTHOUGH 50.0 PERCENT CASSAVA SUPPLEMENTED WITH 50 PPM ZN GAVE OPTIMUM RESULTS, DIETS WITH 37.5 PERCENT CASSAVA SUPPLEMENTED WITH 100 PPM ZN WERE SATISFACTORY. (AS)

0745

29592 EKPERE, J.A.; IKPI, A.F.; GLEASON, G.; GEBREMESKEL, T. 1986. The place of cassava in Nigeria's food security, rural nutrition and farm income generation: a situation analysis for Oyo State-Nigeria. Ibadan, Nigeria, International Institute of Tropical Agriculture 42p. En., Sum. En., 10 Ref.

CASSAVA; PRODUCTION; PROCESSING; FOOD SECURITY; HUMAN NUTRITION; INCOME; WOMEN; USES; GARI; LABOR; PROCESSING; CASSAVA FLOUR; CASSAVA PROGRAMS; SOCIOECONOMIC ASPECTS; STATISTICAL DATA; NIGERIA.

The situation regarding food security and rural nutrition in Oyo State, Nigeria, was analyzed to develop a program model for increased cassava production in the country. Special emphasis is placed on the potential for improving household nutrition, income generation (particularly that of women), and household food security based primarily on increased adoption of improved cassava var., alternative processing techniques, and utilization. Cassava was chosen because of its perceived and potential contribution to the total food intake of the people of Oyo State. Results indicated that cassava represented 48 and 62 percent of the daily dietary and calorie intake of an av. rural consumer and only 8.7 percent of his total daily protein consumption. Women contributed 82 percent of all labor requirements in cassava production and processing. Policy implications are discussed, and recommendations for further cassava program development are given. (CIAT)

0746

29593 EKPIRE, J.A. 1986. Improved household food security and nutrition for Oyo Lga, Oyo State, Nigeria. Draft proposal. Lagos, Nigeria, United Nations Children's Fund. Nigeria Country Office. 12p. En.

CASSAVA; FOOD SECURITY; SOCIOECONOMIC ASPECTS; HUMAN NUTRITION; CASSAVA PROGRAMS; DEVELOPMENT; TECHNOLOGY TRANSFER, WOMEN; NIGERIA .

Given the increasing levels of child and woman malnutrition and the diminishing household income in Nigeria, a proposal is presented in which cassava plays a major role to improve household food security and nutrition in the pilot area of Oyo Local Government Area (Oyo State, Nigeria). Current efforts to improve nutrition, food security, production, and income generation are described, and strategies for each of these issues are proposed. Planned activities include, among others, the selection of pilot projects with certain institutions for cassava-related income generation and improved nutrition-related areas. Women involvement would be stressed. Preferred cassava var. should be identified and research conducted on new cassava uses, in particular the use of cassava and soybean leaves as protein sources. The government and corporations should be persuaded to undertake bulk purchases of cassava products and the planting of food security crops, including cassava, should be organized by July/Aug. 1986. Other activities

include the dissemination of improved cassava var., information, training, and distribution of planting material. (CIAT)

0747

26832 EKUNDAYO, C.A. 1984. MICROBIAL SPOILAGE OF PACKAGED GARI IN STORAGE. MICROBIOS LETTERS 26(103-104):145-150. EN., SUM. EN., 9 REF. (DEPT. OF BOTANY, UNIV. OF BENIN, BENIN CITY, NIGERIA)

CASSAVA; GARI; STORAGE; DETERIORATION; TIMING; BIOCHEMISTRY; INDUSTRIAL MICROBIOLOGY; NIGERIA.

THE SPOILAGE OF PACKAGED GARI IN STORAGE FOR 10 WK. WAS STUDIED. THE MICROBIAL FLORA OF FRESHLY ROASTED GARI CONSISTED INITIALLY OF PSEUDOMONAS SPP., BACILLUS SPP., PENICILLIUM SPP., ASPERGILLUS SPP., PICHIA MEMBRANAEFACIENS, AND SACCHAROMYCES CHEVALIERI. AFTER STORAGE FOR 10 WK. AT 15-20 DEGREES CELSIUS THE MICROORGANISMS PRESENT CONSISTED OF ALL THE SPECIES OCCURRING IN FRESH GARI IN MUCH GREATER POPULATIONS, AND IN ADDITION, CANDIDA KRUSEI AND GEOTRICHUM CANDIDUM. THE GARI BECAME SOOTY DUE TO THE PRESENCE OF MASSES OF FUNGAL SPORES, AND A YEAST-LIKE ODOR DEVELOPED, RENDERING IT UNACCEPTABLE FOR HUMAN CONSUMPTION. (AS)

0748

28502 ELEJE, I. 1982. AGRICULTURAL REVOLUTION IN NIGERIA; AN EXAMINATION OF SOME ANGLES. IN NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA, 1982. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.11-16. EN.

CASSAVA; CASSAVA PROGRAMS; SOCIOECONOMIC ASPECTS; TECHNOLOGY TRANSFER; NIGERIA.

SOME FACTORS HINDERING OVERALL AGRICULTURAL DEVELOPMENT IN NIGERIA ARE DISCUSSED AND SOLUTIONS TO OVERCOME THEM ARE PROPOSED. LACK OF CAPITAL AND REINVESTMENT IN THE AGRICULTURAL SECTOR, PRICING INCENTIVES FOR FARMERS, LANDTENURE, EXTENSION AND POLICY INTERACTIONS, AND GOVERNMENT PROJECTS/AGENCIES ARE BRIEFLY DISCUSSED. (CIAT)

0749

28503 ELEJE, I. 1982. AN ADDRESS TO THE 6TH NAFPP NATIONAL CASSAVA WORKSHOP, FEBRUARY 22-26, 1982. IN NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA, 1982. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.17-23. EN.

CASSAVA; DEVELOPMENT; SOCIOECONOMIC ASPECTS; NIGERIA.

AN OVERVIEW OF THE OBJECTIVES OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) IN NIGERIA IS PRESENTED, INCLUDING DETAILS OF THE STRATEGY FOR INCREASED FOOD PRODUCTION AND PLANS FOR CASSAVA GROWERS THAT WILL BENEFIT FROM EFFORTS THAT WILL BE MADE AS OF 1982 TO ACHIEVE THE FINAL GOAL OF SELF-SUFFICIENCY BY 1985. SUPPORT WILL BE PROVIDED IN LAND CLEARING AND SUPPLY OF MECHANICAL AIDS, SEED, AGROCHEMICALS, AND EQUIPMENT AS WELL AS TRAINING. A TOTAL OF 124 GROUPS OF CASSAVA FARMERS WILL BENEFIT FROM THIS SUPPORT THAT WILL BE PROVIDED TO 11 OF 20 NIGERIAN STATES. (CIAT)

0750

28371 ELEJE, I. 1981. IMPROVING OUR FOOD PRODUCTION EFFORTS THROUGH NAFPP WORKSHOPS. IN NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA, 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.8-12. EN.

CASSAVA; CASSAVA PROGRAMS; SOCIOECONOMIC ASPECTS; TECHNOLOGY TRANSFER; DEVELOPMENT; NIGERIA.

SUGGESTIONS ON HOW TO IMPROVE THE STRUCTURE AND OPERATION OF THE NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME (NAFPP) WORKSHOPS IN NIGERIA, INCLUDING THOSE DEALING WITH CASSAVA, ARE GIVEN. EMPHASIS SHOULD BE PLACED ON PRODUCTION CONSTRAINTS IN THE AREAS OF PROCESSING, STORAGE, PRICING, MARKETING, AND MECHANIZATION. WORKSHOP PARTICIPANTS SHOULD INCLUDE NOT ONLY SCIENTISTS BUT ALSO EXTENSION AGENTS, FARMERS, GOVERNMENT AGENCIES, AND PRIVATE INDIVIDUALS. EXTENSION AGENT TRAINING SHOULD ALSO BE IMPROVED. THE DECISIONS REACHED IN EACH WORKSHOP SHOULD BE FORMALLY PRESENTED TO TOP POLICYMAKERS. (CIAT)

0751

28507 ELUAGU, L.S. 1982. THE ROLE OF MARKETING IN THE ADOPTION OF THE NAFPP TECHNOLOGY, BY FARMERSIN IMO STATE. IN NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA, 1982. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.60-74. EN., SUM. EN., 10 REF.

CASSAVA; MARKETING; TECHNOLOGY TRANSFER; CASSAVA PROGRAMS; SOCIOECONOMIC ASPECTS; NIGERIA.

THE CASSAVA MARKETING PROBLEMS FACED BY NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) FARMERS IN THE STATE OF IMO, NIGERIA, WERE IDENTIFIED; SEVERAL SOLUTIONS ARE PROPOSED. AMONG THE GENERAL MARKETING PROBLEMS DISCUSSED ARE THE LACK OF ADEQUATE STORAGE FACILITIES, POOR TRANSPORTATION AND COMMUNICATION SYSTEMS, PRICE INSTABILITY, SHORTAGE OF STALLS, INSTITUTIONAL BARRIERS, LACK OF INFORMATION ON MARKETS, AND LACK OF WHOLESALERS TO PURCHASE THE PRODUCT AT THE FARM GATE LEVEL. THE IMPLICATIONS OF THESE FACTORS ON NAFPP TECHNOLOGY ADOPTION ARE ALSO DISCUSSED. (CIAT)

0752

26730 ELUAGU, L.S.; OKEREKE, O. 1985. THE SOCIO-ECONOMIC IMPACT OF GARI TRADERS' ASSOCIATION IN IMO STATE OF NIGERIA. OXFORD AGRARIAN STUDIES 14:92-103. EN., IL. (DEPT. OF AGRICULTURAL ECONOMICS, NIGERIA UNIV., NSUKKA, NIGERIA)

CASSAVA; GARI; TRADE; PRICES; PRICE MAINTENANCE; CONSUMPTION; SOCIOECONOMIC ASPECTS; NIGERIA.

THE EXTENT GARI TRADERS' ASSOCIATIONS IN IMO STATE, NIGERIA, INFLUENCE THE MARKETING OF GARI WAS STUDIED. THE FUNCTIONS OF THESE ASSOCIATIONS WERE DETERMINED AS WELL AS THE DEGREE OF COLLUSION AMONG THEM IN IMO. CONSUMER ATTITUDES TOWARD THESE ASSOCIATIONS WERE ALSO EXAMINED. ASSOCIATIONS WERE FOUND TO CREATE A FAVORABLE MARKETING ENVIRONMENT; HOWEVER, GARI PRICES WERE FIXED AT NONCOMPETITIVE LEVELS, A MONOPOLY OF MARKET STALLS WAS OBSERVED, AND ENTRY INTO THE GARI TRADE IS DIFFICULT. THE SUPPLY HAS BEEN CONTROLLED TO CREATE ARTIFICIAL SCARCITY. (CIAT)

0753

28181 EMEHUTE, J.K.U. 1986. A REVIEW OF PESTICIDE USAGE IN THE CONTROL OF CASSAVA MEALYBUG, PHENACOCCUS MANIHOTI MATILE-FERRERO (PSEUDOCOCCIDAE) AND GREEN SPIDER MITE, MONONYCHELLUS TANAJOA BONDAR (TETRANYCHIDAE). UMUDIKE, UMUAHIA, NIGERIA, NATIONAL ROOT CROPS RESEARCH INSTITUTE. 12P. EN., SUM. EN., 21 REF. PAPER PRESENTED AT THE 19TH ANNUAL CONFERENCEOFENTOMOLOGICAL SOCIETY OF NIGERIA, ILE, IFE, 1986. (NATIONAL ROOT CROPS RESEARCH INST., UMUDIKE, NIGERIA)

CASSAVA; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; INSECT CONTROL; MITE CONTROL; INSECTICIDES; NIGERIA.

THE HISTORY AND STATUS OF 2 IMPORTANT PESTS, PHENACOCCUS MANIHOTI AND MONONYCHELLUS TANAJOA, IN THE CASSAVA BELT OF AFRICA ARE BRIEFLY OUTLINED.

RESULTS OF SOME PESTICIDE EXPT. TO CONTROL P. MANIHOTI AND M. TANAJOA ARE HIGHLIGHTED. GENERALLY, YIELDS OBTAINED IN CHEMICALLY TREATED PLOTS WERE NOT SIGNIFICANTLY BETTER THAN YIELDS IN UNTREATED PLOTS. ON THIS BASIS, AND TAKING INTO ACCOUNT THE HIGH COSTS AND RISKS INVOLVED, IT IS CONCLUDED THAT THE EMPHASIS PLACED ON PESTICIDE USE TO CONTROL BOTH PESTS SHOULD BE RECONSIDERED. PESTICIDE USE, HOWEVER, COULD BE RECOMMENDED FOR EXPTL. AND COMMERCIAL FARMS. (AS)

0754

28513 EMEHUTE, J.K.U.; OKEKE, J.E.; ETIM, G.J.A. 1982. CASSAVA MEALYBUG AND THEIR ALTERNATIVE HOST SYSTEMS IN IMO STATE, NIGERIA. IN NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA, 1982. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.111-117. EN., SUM. EN., 5 REF.

CASSAVA; PHENACOCCUS MANIHOTI; PHENACOCCUS MADEIRENSIS; PEST CONTROL; NIGERIA.

CASSAVA MEALYBUG SPECIES AND THEIR ALTERNATIVE HOSTS IN IMO STATE, NIGERIA, ARE REVIEWED. PHENACOCCUS MANIHOTI AND P. MADEIRENSIS HAVE BEEN IDENTIFIED AS CAUSING SEVERE DAMAGE TO CASSAVA IN THE REGION. WHILE P. MANIHOTI IS SPECIFIC TO MANIHOT SPP., P. MADEIRENSIS CAN ESTABLISH ITSELF IN OTHER HOST PLANTS BUT STILL PREFERS MANIHOT SPP.; THIS POLYPHAGOUS HABIT MAKES THE LATTER A MORE DIFFICULT PEST TO CONTROL. SINCE MEALYBUGS ARE DRY SEASON PESTS, RESEARCH AT THE NATIONAL ROOT CROPS RESEARCH INSTITUTE IS PROVIDING EVIDENCE OF EFFECTIVE PEST CONTROL IF CASSAVA PLANTING IS CARRIED OUT WHEN RAINS ARE STEADY. THE LATTER, TOGETHER WITH RESISTANT/TOLERANT VAR. OR OVERHEAD IRRIGATION FOR LATE CROPS, COULD REDUCE THE ECONOMIC IMPORTANCE OF THE PEST IN NIGERIA. (CIAT)

0755

29421 EMEHUTE, J.K.U.; EZULIKE, T.O. 1983. Effect of burying cassava stakes completely in a horizontal position on CMB and GSM initial establishment. In National Root Crops Research Institute. Cassava Programme. Annual Report 1983. Umudike, Nigeria, pp.14-15. En.

CASSAVA; CUTTINGS; PLANTING; INSECT CONTROL; PHENACOCCUS MANIHOTI; MITE CONTROL; MONONYCHELLUS TANAJOA; NIGERIA.

The effect of burying cassava cuttings completely at a 5- cm depth on the initial incidence of Phenacoccus manihoti and Mononychellus tanajoa was evaluated in Nigeria in 1983, and compared with the traditional system of planting cuttings in a slanted position with part of the cutting above the soil surface. A total of 40 cassava sprouts were examined 12-15 days after planting. While the no. of sprouts infested by both pests was 0 for the complete burying of cuttings, all 40 sprouts were infested with both pests using the traditional planting system. Thus, fields planted using the former system can only be infested by these pests through external agents. (CIAT)

0756

32225 EMEHUTE, J.K.U.; EGWUATU, R.I. 1987. Effect of planting time on cassava yield and the populations of cassava mealybug (Phenaeoccus manihoti) and associated parasitoids (Abstract). In Terry, E.R.; Akoroda, M.O.; Arene, O.B., eds. Triennial Symposium of the International Society for Tropical Root Crops- Africa Branch, 3d, Owerri, Nigeria, 1986. Tropical root crops; root crops and the African food crisis: proceedings. Ottawa, Canada, International Development Research Centre. p.117. En. (National Root Crops Research Inst., Umudike, P.M.B. 7006, Umuahia, Nigeria)

CASSAVA; PLANTING; TIMING; PHENACOCCUS MANIHOTI; ROOT PRODUCTIVITY; INSECT BIOLOGY; PREDATORS AND PARASITES; NIGERIA.

The effect of planting time on the populations of cassava mealybug (Phenacoccus manihoti) and associated parasitoids was studied in relation to the cassava yield. Yield differences were significant (P equal to or greater than 0.05) between early and late planting. Plots planted early (March to mid-July) had well established plants and lower populations of P. manihoti. Root and stem yields decreased with increasing populations of P. manihoti. The parasitoids Epidinocarsis lopezi and Tetrastichus sp. showed a density-dependent relationship with P. manihoti. Two hyperparasites, Prochiloneurus insolitus and Chartocerus sp., were identified as factors that decrease the effectiveness of P. manihoti parasitoids. (Full text)

0757

29417 EMEHUTE, J.K.U. 1983. Identification of a native natural enemy of CMB. In National Root Crops Research Institute. Cassava Programme. Annual Report 1983. Umudike, Nigeria, pp.7-8. En.

CASSAVA; BIOLOGICAL CONTROL; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; NIGERIA.

The identification of 4 indigenous beneficial insects that have been found preying or parasitizing on the cassava pest Phenacoccus manihoti in Nigeria is briefly reported. Three of these are hymenopterans, which appear to be specific to adult P. manihoti, and the other is a neuropteran which feeds on eggs and adults. One of the hymenopterans was identified as Apoanagyrus lopezi. (Full text)

0758

29416 EMEHUTE, J.K.U. 1983. Mass rearing, releases and monitoring of Apoanagyrus lopezi and Diomus sp. In National Root Crops Research Institute. Cassava Programme. Annual Report 1983. Umudike, Nigeria, pp.6-7. En.

CASSAVA; BIOLOGICAL CONTROL; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; NIGERIA.

A preliminary report is presented on the mass rearing and field releases of the parasitoid Apoanagyrus lopezi and the predator Diomus sp. of the cassava pest Phenacoccus manihoti. in Amakama Umuahia, Olokoro Umuahia, Umudike, Umuahia, and Etiti (Nigeria) in 1983. Monitoring and evaluations continue on the recovery of parasitized carcasses and mummified individuals of P. manihoti. (CIAT)

0759

29386 EMEHUTE, J.K.U. 1984. Project 1. Cassava mealybug (CMB) and green spider mite (GSM) control. Level of activity (L.A.) 2. Cultural control. Effects of burying cassava cuttings completely in a horizontal position and planting in a slanting position, on CMB incidence, plant development and fresh tuber yield. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.8-9. En., Il.

CASSAVA; CUTTINGS; PLANTING; INSECT CONTROL; CULTURAL CONTROL; PHENACOCCUS MANIHOTI; GERMINATION; ROOT PRODUCTIVITY; NIGERIA.

The effects of (1) burying cuttings of cassava var. 60506 completely (7 cm deep) in a horizontal position and (2) planting cuttings of the same var. in a slanted position with part of the stem sticking above the soil, both with Phenacoccus manihoti crawlers, on pest incidence, no. of sprouts/cutting, establishment, lodging, and fresh root yield were investigated in Nigeria. No significant differences between the 2 methods in terms of no. of sprouts/cutting, lodging and fresh root yield, were observed; however,

germination in treatment 1 was slower, all sprouts produced showed no P. manihoti crawlers, plant establishment was significantly (P = 0.05) better, and harvesting was easier than in treatment 2. Treatment 1 should be recommended for adoption since it disinfests planting materials from P. manihoti and avoids intrinsic establishment of the pest in new cassava farms without sacrificing root yield. (CIAT)

0760

29385 EMEHUTE, J.K.U. 1984. Project 1. Cassava mealybug (CMB) and green spider mite (GSM) control. Level of activity (L.A.) 2. Cultural control. Effects of using, as planting materials, cassava stems with shortened internodes (SI) due to CMB infestation on development and yield of cassava crop. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.7-8. En., Il.

CASSAVA; CULTIVARS; INSECT CONTROL; CULTURAL CONTROL; CUTTINGS; GERMINATION; PRODUCTIVITY; ROOT PRODUCTIVITY; PHENACOCCUS MANIHOTI; NIGERIA.

The effects of using normal cuttings or cuttings with short internodes on germination, no. of sprouts/cutting, establishment, and fresh root and stem yields of cassava var. 60506, highly susceptible to Phenacoccus manihoti, were investigated in Nigeria. No significant differences (P = 0.01 and 0.05) between both treatments were found for the parameters studied. Planting materials of both normal and shortened internode cuttings can be used with confidence. (CIAT)

0761

29390 EMEHUTE, J.K.U. 1984. Project 1. Cassava mealybug (CMB) and green spider mite (GSM) control. Level of activity (L.A.) 3. Chemical control. Evaluation of effectiveness of natural enemies of cassava mealybug, Phenacoccus manihoti Mat-Ferr (Pseudococcidae) for bio-control. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.16-18. En.

CASSAVA; PHENACOCCUS MANIHOTI; BIOLOGICAL CONTROL; PREDATORS AND PARASITES; NIGERIA.

Releases of Apoanagyrus lopezi, Diomus sp., and a chalcid were conducted in Phenacoccus manihoti-infested cassava farms in the states of Anambra, Benue, and Imo (Nigeria) in 1983/84, to evaluate their efficiency as pest control. All released beneficials, except the exotic Diomus sp., were recovered from mummified P. manihoti. The universal presence of A. lopezi from the pre-release samples suggested that this parasitoid was indigenous. Both A. lopezi and the chalcid were present during the entire season and appeared to be density-dependent. Field observations on incidence and severity of P. manihoti and the presence of the parasitoids create doubts on the ability of the beneficials to acceptably control the pest. Their activities are likely to be more effective if safe and efficient systemic insecticides are used along with beneficials. Based on present knowledge of P. manihoti control, biological control per se may not be the ultimate answer to the P. manihoti problem. (CIAT)

0762

30065 EMEHUTE, J.K.U. 1985. Project 2. Cassava mealybug (CMB) and green spider mite (GSM) control. Dynamics of cassava mealybug and Epidinocarsis lopezi populations in Umudike, a high rainforest zone. In National Root Crops Research Institute. Cassava Programme. Annual Report 1985. Umudike, Nigeria, pp.11-13. En., Il.

CASSAVA; PHENACOCCUS MANIHOTI; BIOLOGICAL CONTROL; PREDATORS AND PARASITES; INSECT BIOLOGY; NIGERIA.

Studies on the population dynamics of Phenacoccus manihoti and its internal parasitoid Epidinocarsis (Apoanagyrus) lopezi were conducted in 1983/84 and 1984/85 in Umudike, Nigeria. During each study period cassava tops (30 and 50, resp.) were cut from plants at 1-mo. intervals and counts were made of 3rd and adult stages and mummies of P. manihoti. Emerging E. lopezi individuals from the P. manihoti mummies were also counted. Trends in population fluctuations of P. manihoti were very close for both years, with population increases in Feb.-April and peaks in March. In 1983/84, another peak occurred in Nov. E. lopezi showed a density-dependent relationship and appeared to respond poorly to low population densities of its host, a situation that can allow for the rapid population buildup of P. manihoti. Prochiloneurus sp., a hyperparasite of E. lopezi, was recovered from some mummified P. manihoti, a factor that is bound to influence the effectiveness and efficiency of E. lopezi and the population dynamics of the parasitoid/host system. (CIAT)

0763

30064 EMEHUTE, J.K.U. 1985. Project 2. Cassava mealybug (CMB) and green spider mite (GSM) control. Effect of cassava mealybug attack on the bio-chemical components of cassava root. In National Root Crops Research Institute. Cassava Programme. Annual Report 1985. Umudike, Nigeria, pp.9-11. En., Il.

CASSAVA; PHENACOCCUS MANIHOTI; ROOTS; COMPOSITION; STARCH CONTENT; DRY MATTER; PROTEIN CONTENT; HCN CONTENT; BIOCHEMISTRY; NIGERIA.

Ten cuttings of cassava cv. 60506 were planted in the field in Nigeria, burying them completely and protecting only half of them from Phenacoccus infestation, to study the effect of P. manihoti infestation on the biochemical composition of harvested cassava roots. A T-test analysis showed that moisture, starch, and HCN contents were significantly higher (P equal to or greater than 0.05) in roots from uninfested plants, whereas the DM content was significantly higher (P equal to or greater than 0.05) in roots from infested plants. Root protein content did not vary between infested and uninfested plants. The differences in root quality, particularly in the starch (16.4 and 6.3 percent for roots from uninfested and infested plants) and DM contents (69.6 and 86.4 percent for roots from uninfested and infested plants), are bound to affect the quality and acceptability of processed products and root fermentation. (CIAT)

0764

30062 EMEHUTE, J.K.U. 1985. Project 2. Cassava mealybug (CMB) and green spider mite (GSM) control. Effect of time of planting cassava on the cassava mealybug Phenacoccus manihoti Matile Ferrero (Pseudococcidae), natural enemies of P. manihoti, and yield components of cassava in a high rainforest zone. In National Root Crops Research Institute. Cassava Programme. Annual Report 1985. Umudike, Nigeria, pp.4-7. En., Il.

CASSAVA; INSECT CONTROL; PHENACOCCUS MANIHOTI; PLANTING; TIMING; BIOLOGICAL CONTROL; PREDATORS AND PARASITES; NIGERIA.

In Umudike, Nigeria, the effect of planting time (6 dates in 1984: March, May, July, Sept., Nov., and Jan.; 9 dates in 1985: March-Nov.) on the natural enemies of Phenacoccus manihoti and yield components of susceptible cassava var. 60506 was studied. Results indicated that March-June plantings gave economic returns and reduced P. manihoti populations in cassava farms. In addition to unknown mortality factors of P. manihoti parasitoids, 2 local hyperparasites (Prochiloneurus spp. and Chartocepis spp.) together caused 24-44 percent parasitoid mortality. Large colonies of P. manihoti were observed in most of the tops where P. manihoti mummies were recovered, indicating poor regulation of P. manihoti by the parasitoids. The effects of

the hyperparasites on P. manihoti parasitoids contributed to this poor regulation. Epidinocarsis (Apoanagyrus) lopezi was present in the locations where it was released. The effectiveness of this exotic beneficial insect and that of the local Tetrastichus sp. in the control of P. manihoti was doubtful. (CIAT)

0765

30066 EMEHUTE, J.K.U. 1985. Project 2. Cassava mealybug (CMB) and green spider mite (GSM) control. Effect of using, as planting materials, cassava stems with shortened internodes (S1) due to cassava mealybug infestation on development and yield of cassava crop. In National Root Crops Research Institute. Cassava Programme. Annual Report 1985. Umudike, Nigeria, p.14. En.

CASSAVA; PHENACOCCUS MANIHOTI; CUTTINGS; PLANTING; PLANT DEVELOPMENT; GROWTH; GERMINATION; ROOT PRODUCTIVITY; NIGERIA.

Stems of cassava cv. 60506 with shortened internodes caused by Phenacoccus manihoti infestations were compared with normal stems of the same cv. in terms of development and root yields in Umudike, Nigeria. Both treatments were replicated 5 and 6 times in 1984 and 1985, resp. Cuttings were buried completely at planting. No significant differences were observed in plant growth and root yield between the treatments, thus both types of stems can be used as propagation materials. (CIAT)

0766

30067 EMEHUTE, J.K.U. 1985. Project 2. Cassava mealybug (CMB) and green spider mite (GSM) control. Effects of burying cassava cuttings (stakes) completely in a horizontal position and planting in a slanting (angular) position on the incidence of cassava mealybug, plant development and yield variables. In National Root Crops Research Institute. Cassava Programme. Annual Report 1985. Umudike, Nigeria, pp.14-16. En.

CASSAVA; INSECT CONTROL; PHENACOCCUS MANIHOTI; CUTTINGS; PLANTING; PLANT DEVELOPMENT; GROWTH; ROOT PRODUCTIVITY; NIGERIA.

As in 1984, cuttings of cassava cv. 60506 carrying crawlers of Phenacoccus manihoti were subjected to 2 planting methods in Nigeria in 1985: (1) completely buried in a horizontal position, (2) slanted with part of the cutting above the soil surface. In 1985 cuttings were dipped before planting in 0.1 percent methidathion solution. The incidence of P. manihoti in planting treatment 1 and the dipping treatment was not significantly different. Sprouting, establishment, lodging, and root and stem yields were not significantly different in planting methods 1 and 2. Thus method 1 provides an efficient and safe method for disinfesting cassava stems from P. manihoti without sacrificing cassava growth and yield. (CIAT)

0767

30068 EMEHUTE, J.K.U. 1985. Project 2. Cassava mealybug (CMB) and green spider mite (GSM) control. Evaluation of different rates of Furadan 5G for the control of cassava mealybug, Phenacoccus manihoti Matile Ferrero (Pseudococcidae), in late planted cassava crop. In National Root Crops Research Institute. Cassava Programme. Annual Report 1985. Umudike, Nigeria, pp.16-17. En.

CASSAVA; PHENACOCCUS MANIHOTI; INSECT CONTROL; INSECTICIDES; ROOT PRODUCTIVITY; NIGERIA.

Carbofuran was applied at 5 rates (0, 1, 2, 3, and 4 kg a.i./ha) to susceptible cassava cv. 60506, planted on Aug. 10, 1984, in Nigeria, to

evaluate its effect on Phenacoccus manihoti infestation 1, 2, and 3 mo. after planting. Carbofuran at 2, 3, and 4 kg a.i./ha reduced the no. of infested stands within 2 mo. after application, with no significant differences in root (range 17.2-18.0 t/ha) and stem yields (range 33.25-36.5 m/plot); however, significantly different damage scores were observed at 3 mo. The lowest was for 4 and 3 kg carbofuran a.i./ha with 2.15 and 2.35 on a 1-5 scale. Carbofuran at 3 kg a.i./ha gave the best protection to cassava throughout 3 mo. of the dry season. (CIAT)

0768

30069 EMEHUTE, J.K.U. 1985. Project 2. Cassava mealybug (CMB) and green spider mite (GSM) control. Field assay of three pesticides for the control of cassava mealybug, Phenacoccus manihoti Matile-Ferrero (Pseudococcidae), in late planted cassava crop. In National Root Crops Research Institute. Cassava Programme. Annual Report 1985. Umudike, Nigeria, pp.18-20. En.

CASSAVA; PHENACOCCUS MANIHOTI; INSECT CONTROL; INSECTICIDES; ROOT PRODUCTIVITY; NIGERIA.

Carbofuran (2 kg a.i./ha), applied 10 wk. after planting, and promecarb (0.08 kg a.i./ha) and dimethoate (0.56 kg a.i./ha) applied in foliar sprays 7 wk. after carbofuran, were tested for controlling Phenacoccus manihoti infestations in cassava cv. 60506 planted late in the season in Umudike, Nigeria. None of the insecticides were toxic to cassava nor did they significantly reduce the populations of P. manihoti and its parasitoids, but the no. of P. manihoti and mummified P. manihoti between the dimethoate- and promecarb-treated plots were significantly different 2 wk. after foliar applications. Root and stem yields showed no significant differences between treatments (range 11.8-14.5 t/ha and 6.8-7.2 m/plot, resp.). The damage score (1-5 scale) was significantly higher in the dimethoate- treated plots (3.1) than in the carbofuran- and promecarb-treated ones (2.8 each). Promecarb killed all of the postembryonic stages of P. manihoti on contact and prevented eclosion. The percentage of parasitoids that emerged was lowest in the promecarb-treated plots (av. 72.2 percent). Results indicated that promecarb can be used to control P. manihoti spread in localized infestation areas or exptl. plots, but could be uneconomical for large-scale applications in high rain forest zones. (CIAT)

0769

30070 EMEHUTE, J.K.U. 1985. Project 2. Cassava mealybug (CMB) and green spider mite (GSM) control. Field evaluation of the establishment of released natural enemies of cassava mealybug, Phenacoccus manihoti Matile-Ferrero (Pseudococcidae) in three locations, Imo, Anambra and Benue States. In National Root Crops Research Institute. Cassava Programme. Annual Report 1985. Umudike, Nigeria, p.20. En.

CASSAVA; PHENACOCCUS MANIHOTI; BIOLOGICAL CONTROL; PREDATORS AND PARASITES; NIGERIA.

The exotic beneficial insects Epidinocarsis (Apoanagyrus) lopezi and Diomus sp. and the local beneficial insect Tetrastichus sp. (all natural enemies of Phenacoccus manihoti) were mass reared and released in 1983 in cassava areas infested with the pest in the states of Imo, Anambra, and Benue (Nigeria). These species were monitored twice in 1985 during the infestation period. All, except Diomus sp., were recovered in all of the locations. Parasitoids and hyperparasites that emerged from the recovered sample of P. manihoti mummies were identified, and only Tetrastichus sp. showed a gregarious trend, since on several occasions more than 1 specimen of this species/mummified P. manihoti were recovered. (CIAT)

0770

30063 EMEHUTE, J.K.U. 1985. Project 2. Cassava mealybug (CMB) and green spider mite (GSM) control. Functional response studies of some natural enemies of cassava mealybug. In National Root Crops Research Institute. Cassava Programme. Annual Report 1985. Umudike, Nigeria, pp.7-9. En.

CASSAVA; PHENACOCCUS MANIHOTI; BIOLOGICAL CONTROL; PREDATORS AND PARASITES; NIGERIA.

Functional response studies were conducted in Nigeria to assess the effectiveness of the parasitoid Epidinocarsis (Apoanagyrus) lopezi and the predators Hyperaspis pumila and H. senegalensis in the control of Phenacoccus manihoti in cassava. The functional response curves obtained were of type II for A. lopezi and of type III for both Hyperaspis species. Adults of H. senegalensis fed on ovisacs and adults of P. manihoti, while H. pumila preferred adults and only fed on ovisacs when starved for several days. The beneficial insects exhibited density dependence with respect to their host. Predation or parasitism/beneficial insect was low, which affects the effectiveness of the beneficial insects at high prey/host density. This was actually observed in the field. The inability of these beneficial insects to control P. manihoti could be linked to low productive capacity and lack of co-evolution with P. manihoti. (CIAT)

0771

29418 EMEHUTE, J.K.U. 1983. Studies on CMB population dynamics during the rainy season. In National Root Crops Research Institute. Cassava Programme. Annual Report 1983. Umudike, Nigeria, pp.8-9. En.

CASSAVA; PHENACOCCUS MANIHOTI; INSECT BIOLOGY; NIGERIA.

From June to Oct. 1983, 30 cassava plants were randomly selected per week in the field (Nigeria) to monitor Phenacoccus manihoti populations on the entire leaf canopy during the rainy season and to develop a control program for this period. Each plant canopy was divided into 3 parts (upper, middle, and lower) and a leaf, selected at random, was taken from each part and examined in the lab. A total of 90 leaves were examined during the entire period. Counts of the different pest stages and their distribution on the leaf canopy and lower surfaces of cassava leaflets were made. No hibernating stages and very little oviposition were detected during the stress period. P. manihoti populations were lowest in Aug. and highest in Sept., and greater on lower leaves. The highest percentage of individuals preferred the mid-vein areas of leaflets. Thus, it was concluded that the pest remains on the plant all year round and that a control program should be implemented in Aug. (CIAT)

0772

28514 EMEHUTE, J.K.U.; EZULIKE, T.O. 1982. TREND IN FIELD PRESENCE AND ALTERNATIVE HOST SYSTEMS OF CASSAVA GREEN SPIDER MITE AT NATIONAL ROOT CROPS RESEARCH INSTITUTE, UMUDIKE, IMO STATE, NIGERIA. IN NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA, 1982. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.118-122. EN., SUM. EN., 3 REF.

CASSAVA; MONONYCHELLUS TANAJOA; PEST CONTROL; CULTIVARS; MANIHOT DICHOTOMA; MANIHOT GLAZIOVII; NIGERIA.

THE PRESENCE OF MONONYCHELLUS TANAJOA IN THE FIELD WAS STUDIED OVER 15 MO. BY TAKING SAMPLES OF THE 1ST 6 LEAVES BELOW THE TERMINAL BUD OF CASSAVA PLANTS AT 4 LOCATIONS IN IMO STATE, NIGERIA. INSPECTIONS OF DIFFERENT PLANT SPECIES HELPED IDENTIFY ALTERNATIVE HOSTS. M. TANAJOA WAS 1ST OBSERVED AT

UMUDIKE DURING THE 1980 DRY SEASON. PEAK INFESTATIONS WERE FOUND TO OCCUR BETWEEN JAN.-APRIL, LOW LEVELS BEING REPORTED BETWEEN JULY-SEPT. RAINFALL WAS IMPORTANT FOR M. TANAJOA INCIDENCE NOT SO AMBIENT TEMP. MANIHOT GLAZIOVII AND M. DICHOTOMA ARE ALTERNATIVE HOSTS, SHOWING GREATER TOLERANCE THAN CASSAVA. THE BEST AND SAFEST METHOD OF CONTROL IS TO USE TOLERANT OR RESISTANT CASSAVA VAR. IN EARLY PLANTINGS. (CIAT)

0773

29349 EMEHUTEOKEKE EZULIKE. 1982. Time of planting cassava for the control of CMB and GSM. In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, pp.9-11. En., Sum. En.

CASSAVA; CULTIVARS; CUTTINGS; PLANTING; TIMING; INSECT CONTROL; PHENACOCCUS MANIHOTI; MITE CONTROL; MONONYCHELLUS TANAJOA; ROOT PRODUCTIVITY; NIGERIA.

The effect of time of planting of cassava var. 30211, 30395, and 60506 on cassava mealybug and green spider mite control was investigated in Umudike, Nigeria, 12 mo. later. Five planting dates were used: the 1st wk. of the months May through Sept., 1981. Root yields were significantly affected by time of planting; while av. yields for 30211, 30395, and 60506 across all planting dates were 31.4, 37.0, and 34.0 t/ha, resp., the highest yields for each var. were obtained in the June plantings for 30211 (46.3 t/ha) and 30395 (76.4 t/ha), and in the May planting for 60506 (64.5 t/ha). Cv. x time of planting interactions were not significant, nor was the effect of time of planting on severity of mealybugs and green spider mites. The correlation between fresh root yield and mealybug damage score (r = 0.21) was not significant (P = 0.05), but its correlation with green spider mite damage score (r = 0.98) was (P = 0.01). Cassava stem length and green spider mite correlation coefficient (r = 0.59) was significant (P = 0.01), but cassava stem length and mealybug damage score correlation coefficient (r = 0.01) was not significant (P = 0.05). (CIAT)

0774

29348 ENE, L.S.O.; AGBO, F.M.O. 1982. Cultural management practices for CMB/GMB control. In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, pp.7-9. En.

CASSAVA; CULTIVARS; PLANTING; FERTILIZERS; N; P; K; RESISTANCE; INSECT CONTROL; PHENACOCCUS MANIHOTI; MITE CONTROL; MONONYCHELLUS TANAJOA; ROOT PRODUCTIVITY; NIGERIA.

A var. x NPK fertilization x plant spacing trial was harvested in Umudike, Nigeria, in 1981, to evaluate the effects of these 3 variables on cassava yields and mealybug and green spider mite control. Treatments were cassava var. U/41044 and TMS 30211; 400, 600, and 800 kg 15-15-15/ha; and spacings of 1.00 x 1.0 m (10,000 plants/ha), 0.67 x 1.00 m (15,000 plants/ha), and 0.5 x 1.0 m (20,000 plants/ha). Var. U/41044 (av. yield 23.9 t/ha across spacings and fertilizer treatments) significantly (P = 0.01) outyielded TMS 3021 by 2.1 t/ha. Root yield significantly increased (P = 0.05) with increased plant population but not beyond 15,000 plants/ha. Yield results also showed that fertilizer rates above 400 kg/ha had no effect on yields (av. 23.4, 19.5, and 22.9 t/ha for 400, 600, and 800 kg compound fertilizer/ha, resp.). Spacing x fertilizer, spacing x var., and fertilizer x var. interactions were significant (P = 0.01). The low negative correlation coefficients for cassava mealybug and green spider mite scores/root yield indicated that these pests could be associated with yield reductions at high scores but not significantly under the low incidence level observed in the expt. (CIAT)

0775

29413 ENE, L.S.O.; OKEKE, J.E. 1983. Evaluation of ten top selections in five ecological zones of Nigeria. In National Root Crops Research Institute. Cassava Programme. Annual Report 1983. Umudike, Nigeria, pp.2-3. En.

CASSAVA; CULTIVARS; SELECTION; ADAPTATION; PEST DAMAGE; ROOT PRODUCTIVITY; PRODUCTIVITY; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; NIGERIA.

Ten top cassava selections were evaluated for root yields in replicated trials in 5 distinct ecozones (Igbariam, Umudike, Ajasse-Ipo, Obior, and Otobi) of Nigeria in 1983. The av. yield for each location showed an improvement ranging between 50-400 percent over the current national av. yield of 6 t/ha. The highest av. yields across all 5 locations were obtained with cv. NR8118 (19.6 t/ha), NR7780 (19.4 t/ha), and NR8108 (18.5 t/ha). The highest av. yield/location was obtained in Ajasse-Ipo with 26.3 t/ha followed by Otobi with 17.3 t/ha. Severity ratings for Mononychellus tanajoa and Phenacoccus manihoti varied with the location, and it appeared that P. manihoti caused greater yield reductions. (CIAT)

0776

29382 ENE, L.S.O.; OMENUKOR, R.; OKEKE, J.E.; MADUAKOR, B.N. 1984. Project 1. Cassava mealybug (CMB) and green spider mite (GSM) control. Level of activity (L.A.) I: Breeding for resistance to CMB and GSM. 1. Evaluation of ten top hybrid selections in high pest (CMB and GSM) density areas of Nigeria. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.2-3. En., Il.

CASSAVA; CULTIVARS; RESISTANCE; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; ROOT PRODUCTIVITY; NIGERIA.

Ten selected cassava var. were evaluated for root yields in Umudike, Otobi, and Igbariam (Nigeria), where Phenacoccus manihoti and Mononychellus tanajoa infestation pressures are high. Var. differences occurred both within and between locations. The highest av. yield across locations was obtained with var. NR 8231 (av. 35.2 t/ha), significantly outyielding the other var. except control var. NR 7750 (35.4 t/ha); this var. also proved to be a high rainfall- material adapted to medium and low rainfall conditions and tolerant to P. manihoti and M. tanajoa. Under the mild infestation levels of P. manihoti and M. tanajoa that occurred in Umudike in 1983/84, both NR 8231 and NR 8214 yielded 29.0 and 21.0 percent, resp., higher than the control (35.8 t/ha). Var. NR 8204 (av. across locations, 31.4 t/ha) also showed fairly wide adaptability. The av. for all var. of 27.9 t/ha suggested a better growth environment in 1984 than the year before and a progressive genotype improvement. (CIAT)

0777

28184 ENYINNIA, T. 1984. CASSAVA MOSAIC DISEASE (CMD) AND ITS CONTROL. UMUDIKE, UMUAHIA, NIGERIA, NATIONAL ROOT CROPS RESEARCH INSTITUTE. AGRICULTURAL EXTENSION RESEARCH LIAISON & TRAINING. EXTENSION BULLETIN NO.9. 6P. EN., 3 REF., IL.

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; DISEASE CONTROL; DISEASES AND PATHOGENS; TECHNOLOGY TRANSFER; CULTIVARS; FERTILIZERS; RESISTANCE; SYMPTOMATOLOGY; NIGERIA.

GENERAL INFORMATION ON SYMPTOMS, CAUSAL AGENT (UNKNOWN), SPREAD, FACTORS AFFECTING SEVERITY, AND CONTROL OF CAMD IS PRESENTED. IMPROVED CASSAVA VAR. SHOWING RESISTANCE TO CAMD IN NIGERIA INCLUDE TMS 30572, TMS 30211, TMS 30395, U/41044, AND U/42215. ADEQUATE FERTILIZATION IS ALSO RECOMMENDED FOR CAMD CONTROL. (CIAT)

0778

26880 ENYINNIA, T.; UNAMMA, R.P.A.; NOTTIDGE, D. 1983. EFFECT OF SELECTED HERBICIDES ON WEEDS AND YIELD OF MAIZE IN YAM/MAIZE/CASSAVA INTERCROPS. IN DEAT, M.; MARNOTTE, P., EDS. BIANNUAL CONFERENCE, WEST AFRICAN WEED SCIENCE SOCIETY, 2ND., NIGERIA, 1983. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. PP.195-199. EN., SUM. EN., 5 REF. (NATIONAL ROOT CROPS RESEARCH INST., UMUDIKE, P.M.B. 1006, UMUAHIA, NIGERIA)

CASSAVA; WEEDING; INTERCROPPING; HERBICIDES; YAMS; MAIZE; NIGERIA.

IN FIELD TRIALS IN NIGERIA IN 1983, THE EFFECTS OF 5 PREEMERGENCE HERBICIDES, ALONE OR COMBINED, ON YAM CV. AKALI AND CASSAVA CV. TMS 30211 INTERCROPPED ON RIDGES WITH MAIZE CV. TSZR- WHITE GROWN BETWEEN THE RIDGES WERE INVESTIGATED. ALL TREATMENTS GAVE SATISFACTORY WEED CONTROL FOR UP TO 70DAYS AFTER APPLICATION AND NONE AFFECTED MAIZE GERMINATION OR ROOT CROP BUDDING. (AS (EXTRACT))

0779

28183 ENYINNIA, T. 1984. THE GREEN SPIDER MITE OF CASSAVA AND ITS CONTROL. UMUDIKE, NIGERIA, NATIONAL ROOT CROPS RESEARCH INSTITUTE. AGRICULTURAL EXTENSION RESEARCH, LIAISON AND TRAINING. EXTENSION BULLETIN NO.12. 6P. EN., 6 REF., IL.

CASSAVA; MONONYCHELLUS TANAJOA; FERTILIZERS; SYMPTOMATOLOGY; CULTIVARS; PEST DAMAGE; WEEDING; ADAPTATION; INSECT BIOLOGY; PLANTING; TIMING; MITE CONTROL; NIGERIA.

BASIC INFORMATION ON THE CASSAVA GREEN SPIDER MITE AND AVAILABLE CONTROL METHODS IS PRESENTED. A BRIEF DESCRIPTION IS GIVEN OF THE PEST AND ITS SYMPTOMS, DISTRIBUTION IN NIGERIA, BIOLOGY, SURVIVAL, AND SPREAD ARE INDICATED. SUGGESTED CONTROL METHODS INCLUDE EARLY PLANTING, SELECTED VAR. SUCH AS TMS 4(2)1425, TMS 60142, U/41044, TMS 30555, AND TMS 30572, AND ADEQUATE SOIL FERTILIZATION (NPK AND MG). (CIAT)

0780

31664 ESEGHIE, H.A. 1987. Total nonstructural carbohydrate distribution in cassava during growth in a rainforest zone, Nigeria. Tropical Agriculture (Trinidad) 64(4):340-342. En., Sum. En., 8 Ref. (Faculty of Agriculture, Univ. of Benin, Benin City, Nigeria)

CASSAVA; GROWTH; CARBOHYDRATE CONTENT; LEAVES; STEMS; ROOTS; ANALYSIS; TIMING; SUCROSE; MALTOSE; FRUCTOSE; STARCH CONTENT; NIGERIA.

Changes in the nonstructural carbohydrates in the leaves, stem, and roots (tubers) of cassava during growth were examined. From the 5th mo. after planting, monthly samples were taken for analysis up to the 9th mo. when the tubers matured and were harvested. Generally, the nonstructural carbohydrate components increased appreciably in concn. as the plant matured. Sucrose formed the bulk of the sugars, with maltose presenting the least concn. in all plant parts at the different stages of growth. The other sugars were glucose and fructose. Starch accounted for the highest proportion of the nonstructural carbohydrates and was predominant in the tubers. (AS)

0781

26360 ETEJERE, E.O.; BHAT, R.B. 1985. TRADITIONAL PREPARATION AND USES OF CASSAVA IN NIGERIA. ECONOMIC BOTANY 39(2):157-164. EN., SUM. EN., 16 REF., IL. (DEPT. OF BIOLOGICAL SCIENCES, UNIV. OF ILORIN, PRIVATE MAIL BAG 1515, ILORIN, NIGERIA)

CASSAVA; CASSAVA FLOUR; CASSAVA STARCH; FOOFOO; GARI; NIGERIA; PROCESSING; TAPIOCAS.

VARIOUS METHODS OF CASSAVA PREPARATION ARE PRACTICED BY DIFFERENT ETHNIC GROUPS IN NIGERIA. THESE METHODS INVOLVE PEELING CASSAVA ROOTS, SOAKING ROOTS IN STREAMS, GRATING CASSAVA, AND PRESSING GRATED CASSAVA. OTHER METHODS INCLUDE HEATING SIEVED GRATED CASSAVA, BOILING PEELED CASSAVA ROOTS, AND POUNDING BOILED OR DRIED CASSAVA ROOTS. THE TRADITIONAL CASSAVA-BASED PRODUCTS ARE GARI, FUFU, AKPU, CF, EDIBLE STARCH, AND TAPIOCA. DETOXIFICATION OF FRESH CASSAVA ROOTS IS PARTLY ACHIEVED THROUGH CELL RUPTURE DURING CUTTING AND GRATING,SOAKING IN RUNNING OR STANDING WATER IN EARTHEN POTS FOR 3-5 DAYS, HEATING, DRYING, AND BOILING. (AS)

0782

26837 EZEALA, D.O. 1984. EFFECT OF FERMENTATION ON THE FATTY ACID CONTENT AND COMPOSITION OF CASSAVA TUBER MEAL. JOURNAL OF FOOD BIOCHEMISTRY 9(3):249-254. EN., SUM. EN., 18 REF. (FACULTY OF BIOLOGICAL SCIENCES, UNIV. OF PORT HARCOURT, P.M.B. 5323, PORT HARCOURT, NIGERIA)

CASSAVA; CASSAVA MEAL; FERMENTATION; FAT CONTENT; COMPOSITION; NIGERIA.

THE EFFECT OF FERMENTATION ON THE FATTY ACIDS CONTENT AND COMPOSITION OF CM WAS STUDIED. OLEIC AND PALMITIC ACIDS WERE THE MAJOR FATTY ACIDS OF THE CM LIPID. OTHER FATTY ACIDS FOUND, IN DECREASING ORDER, WERE LINOLEIC, LINOLENIC, PALMITOLEIC, STEARIC, MYRISTIC, PENTADECANOIC, HEPTADECANOIC, AND NONADECANOIC ACIDS. CM FERMENTATION RESULTED IN SUBSTANTIAL INCREASES IN THE ABSOLUTE QUANTITIES OF THE INDIVIDUAL FATTY ACIDS DETECTED, EXCEPT LINOLENIC ACID. FERMENTATION, HOWEVER, DID NOT ALTER THE PATTERN OF COMPOSITION OF THE FATTY ACIDS, BUT CAUSED INCREASES IN THE COMPOSITION OF SATURATED FATTY ACIDS AND DECREASES IN CERTAIN UNSATURATED ONES. STEARIC ACID INCREASED IN COMPOSITION BY ABOUT 92.6 PERCENT AND PENTADECANOIC BY ABOUT 50.0 PERCENT. REDUCTIONS OF ABOUT 72.0 PERCENT OF THE LINOLENIC ACID AND 24.2 PERCENT OF THE PALMITOLEIC ACID WERE OBTAINED IN THE FERMENTED CM LIPID. (AS)

0783

28600 EZEALA, D.O.; OKORO, N. 1986. PROCESSING TECHNIQUES AND HYDROCYANIC ACID CONTENT OF CASSAVA- BASED HUMANFOODSTUFFS IN NIGERIA. JOURNAL OF FOOD BIOCHEMISTRY 10(2):125-132. EN., SUM. EN., 16 REF. (DEPT. OF BOTANY, UNIV. OF PORT HARCOURT, P.M.B. 5323, PORT HARCOURT, NIGERIA)

CASSAVA; HCN CONTENT; FOOD PRODUCTS; GARI; FOOFOO; PROCESSED PRODUCTS; CASSAVA CHIPS; NIGERIA.

THE HCN CONTENT OF PEELED CASSAVA TUBERS FROM VARIOUS LOCALITIES IN EASTERN NIGERIA (MAJOR CASSAVA GROWING AND CONSUMING AREA) VARIED FROM 26.0 PLUS OR MINUS 1.6 TO 38.0 PLUS OR MINUS 2.6 MG/100 G FRESH WT. THERE WAS NO CORRELATION BETWEEN THE CYANIDE CONTENTS OF CASSAVA TUBERS AND LOCALITY. PROCESSING THE TUBERS WITH THE HIGHEST CYANIDE CONTENT INTO DIFFERENT FORMS OF CASSAVA-BASED FOODSTUFFS (GARI, FUFU, CASSAVA CAKE, AND CASSAVA CHIPS FOR CASSAVA SALAD) CONSUMED IN NIGERIA RESULTED IN AN UNDETECTABLE AMOUNT OF CYANIDE. IT IS CONCLUDED THAT THESE CASSAVA-BASED FOODSTUFFS ARE FREE FROM CYANIDE TOXICATION, AND THE INCIDENCE OF ATAXIC NEUROPATHY ASSOCIATED WITH PROLONGED CONSUMPTION OF CASSAVA AS A RESULT OF ITS CYANIDE CONTENT IS NOT DUE TO PROLONGED CONSUMPTION OF PROCESSED CASSAVA PRODUCTS. (AS)

0784

28351 EZEH, N.O.A. 1980. AGRICULTURAL CREDIT SURVEY OF SMALL FARMERS IN TWO VILLAGES IN OYO STATE OF NIGERIA. IN NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA, 1980. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.67-87. EN., SUM. EN., 16 REF.

CASSAVA; CASSAVA PROGRAMS; STATISTICAL DATA; PRODUCTION; SOCIOECONOMIC ASPECTS; NIGERIA.

THE RESULTS OF A SURVEY OF THE AMOUNT, USE, AND SOURCES OF AGRICULTURAL CREDIT FOR SMALL FARMERS IN BODE AND IKONIFIN, NIGERIA, FOR FOOD CROP PRODUCTION (INCLUDING CASSAVA) ARE PRESENTED. CASSAVA RANKS 2ND AFTER YAMS IN PERCENT CONTRIBUTION TO FARMER INCOME (16.9 PERCENT). OF THE LOANS OBTAINED BY FARMERS, UNFORTUNATELY NONE OF THEM WERE FROM INSTITUTIONAL SOURCES. AN ANALYSIS OF THE DESTINATION GIVEN TO THE LOANS IS PRESENTED. PUBLIC CREDIT INSTITUTIONS ARE RECOMMENDED TO (1) EXPAND THEIR ACTIVITIES ANDOPEN BRANCHES IN RURAL AREAS, (2) MAKE TIMELY DISBURSEMENTS OF LOANS TO FARMERS, AND (3) REMOVE ADMINISTRATIVE BOTTLENECKS THAT LIMIT ACCESS OF SMALLFARMERS TO AGRICULTURAL CREDIT. (CIAT)

0785

28373 EZEH, N.O.A. 1981. NAFPP CASSAVA/MAIZE PRODUCTION RECOMMENDATIONS: A SOCIO-ECONOMIC SURVEY OF ADOPTERS IN 4 STATES OF NIGERIA. IN NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA, 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.29-55. EN., 16 REF.

CASSAVA; CASSAVA PROGRAMS; TECHNOLOGY TRANSFER; SOCIOECONOMIC ASPECTS; DEVELOPMENT; STATISTICAL DATA; INTERCROPPING; MAIZE; INCOME; CULTIVATION; NIGERIA.

A SURVEY WAS CONDUCTED AMONG NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) CASSAVA/MAIZE FARMERS IN 4 NIGERIAN STATES (IMO, ANAMBRA, RIVERS, AND CROSS RIVER) TO IDENTIFY KEY CONSTRAINTS TO TECHNOLOGY ADOPTION. INFORMATION IS GIVEN REGARDING SOCIAL CHARACTERISTICS OF FARMERS, SOURCES OF INCOME, USE OF PRODUCTION INPUTS AND TECHNICAL INFORMATION, FARMERS' RESPONSE TO RECOMMENDED AGRONOMIC PRACTICES, PRODUCTION CONSTRAINTS, STRATEGIES FOR IMPROVED PRODUCTION, AND MARKETING PROBLEMS. FARMERS' OPINIONS ON THE APPROACH OF NAFPP TO IMPROVED TECHNOLOGY TRANSFER ARE DISCUSSED. WHILE TECHNOLOGY TRANSFER HAS PROVED EFFECTIVE, PRODUCTION CONSTRAINTS MENTIONED WERE (A) THE LACK OF LABOR, CAPITAL, FERTILIZERS, PESTICIDES, AND MARKETING FACILITIES AS WELL AS (B) THE INCIDENCE OF INSECT PESTS AND DISEASES. (CIAT)

0786

28512 EZULIKE, T.O.; EMEHUTE, J.K.U.; ATU, U.G. 1982. CASSAVA MITES IN NIGERIA. IN NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA, 1982. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.104-110. EN., SUM. EN., 12 REF.

CASSAVA; MONONYCHELLUS TANAJOA; MITE CONTROL; BIOLOGICAL CONTROL; OLIGONYCHUS GOSSYPII; INSECTICIDES; NIGERIA.

A BRIEF REVIFW IS PRESENTED OF THE GEOGRAPHICAL DISTRIBUTION, DAMAGE SYMPTOMS, ECONOMIC DAMAGE, BIOLOGICAL CYCLE, SPREAD, AND CONTROL OF MONONYCHELLUS TANAJOA AND OLIGONYCHUS GOSSYPII IN NIGERIA. CONTROL MEASURES DISCUSSED ARE CULTURAL CONTROL (EARLY PLANTING AT THE ONSET OF RAINS), HOST PLANT RESISTANCE, BIOLOGICAL CONTROL (AMBLYSEIUS FUSTIS, OLIGOTA MINUTA, TYPHLODROMUS LIMONICUS, T. RAPAX, STRETHORUS SP.), AND CHEMICAL CONTROL (TREATING PLANTING MATERIALS WITH PESTICIDES). (CIAT)

0787

26826 EZULIKE, T.O.; ODEBIYI, J.A. 1985. LIFE HISTORY OF AMBLYSEIUS FUSTIS (PRITCHARD AND BAKER), AN INDIGENOUS PREDATOR OF THE CASSAVA RED MITE, OLIGONYCHUS GOSSYPII (ZACHER) IN SOUTH WESTERN NIGERIA. INSECT SCIENCE AND ITS APPLICATION 6(2):193-197. EN., SUM. EN., 7 REF., IL. (NATIONAL ROOT CROPS RESEARCH INST., UMUDIKE, UMUAHIA, IMO STATE, NIGERIA)

CASSAVA; PREDATORS AND PARASITES; AMBLYSEIUS FUSTIS; OLIGONYCHUS GOSSYPII; LABORATORY EXPERIMENTS; MITE BIOLOGY; NIGERIA.

THE LIFE HISTORY OF AMBLYSEIUS FUSTIS WAS STUDIED IN THE LAB. AT FLUCTUATING TEMP. (24.4-28.0 DEGREES CELSIUS) AND RH (55.5-75.6 PERCENT). THE DEVELOPMENTAL STAGES CONSIST OF EGG, LARVA, PROTONYMPH, DEUTONYMPH, AND ADULT. THE LIFE CYCLE, FROM EGG TO ADULT, OF BOTH MALE AND FEMALE WAS ABOUT 8.0 DAYS, WHILE LONGEVITY WAS ABOUT 19.2 DAYS. MATED FEMALE LAID AN AV. OF 18.8 EGGS. THERE WAS NO SIGNIFICANT DIFFERENCE IN THE LONGEVITY AND FECUNDITY OF PREDATORS FED ON DIFFERENT LIFE STAGES OF THE HOST. THE PROPORTION OF MALE TO FEMALE IN THE PROGENY OF MATED FEMALES WAS 1:4. A. FUSTIS HAS A SHORTER DEVELOPMENTAL PERIOD AND LIVES LONGER THAN ITS PREY OLIGONYCHUS GOSSYPII, BUT THE LATTER IS MORE FECUND (26.9 EGGS/FEMALE) AND HAS A HIGHER PROPORTION OF FEMALES IN ITS PROGENY (1:4.8). THE SHORTER DEVELOPMENTAL PERIOD AND THE LONGER LIFE SPAN OF THE PREDATOR ARE LIKELY TO OFFSET THE HIGHER FECUNDITY OF THE PREY. (AS)

0788

29415 EZULIKE, T.O. 1983. Population dynamics of green spider mite, Mononychellus tanajoa, and its native predator, Amblyseius fustis. In National Root Crops Research Institute. Cassava Programme. Annual Report 1983. Umudike, Nigeria, pp.5-6. En., Il.

CASSAVA; MITE BIOLOGY; MONONYCHELLUS TANAJOA; BIOLOGICAL CONTROL; PREDATORS AND PARASITES; NIGERIA.

The seasonal population fluctuations of Mononychellus tanajoa and its natural predator mite in Nigeria, Amblyseius fustis, were compared to investigate the predatory potential of A. fustis in the field. Population counts of both the prey and the predator were made on naturally infested cassava leaves (var. 30555) from Oct. 1982 to Sept. 1983. Results indicated that increases in the no. of predators coincided with the abundance of the host mite, and low levels of the predator coincided with low levels of the host. While the av. population density curve of M. tanajoa was always above that of A. fustis, this did not indicate that A. fustis had no controlling effect on M. tanajoa. Populations of both prey and predator peaked between Dec.-Jan. The rate of increase of A. fustis appeared to be much lower than that of M. tanajoa. Results indicated that A. fustis is a low-density dependent predator. (CIAT)

0789

29353 EZULIKE, T.O. 1982. Population dynamics of green spidermite (GSM) and its Nigerian predator, Amblyseius fustis. In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, pp.16-17. En.

CASSAVA; MITE CONTROL; MONONYCHELLUS TANAJOA; PREDATORS AND PARASITES; BIOLOGICAL CONTROL; INSECT BIOLOGY; NIGERIA.

Partial results of an on-going study on the population dynamics of Mononychellus tanajoa and its natural predator mite, Amblyseius fustis, in Nigeria are presented. The expt. was planted in July 1982, and mean counts/leaf of both species were recorded. Mean M. tanajoa and A. fustis counts were 7 and 0/leaf sample in Oct., 19 and 4 in Nov., and 30 and 8 in Dec. (CIAT)

0790

29383 EZULIKE, T.O. 1984. Project 1. Cassava mealybug (CMB) and green spider mite (GSM) control. Level of activity (L.A.) 1: Breeding for resistance to CMB and GSM. Greenhouse evaluation of cassava cultivars for resistance to M. tanajoa. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.3-4. En., Il.

CASSAVA; CULTIVARS; RESISTANCE; MONONYCHELLUS TANAJOA; PLANT ANATOMY; LEAVES; NIGERIA.

Four cuttings each of 12 promising cassava var. were planted in plastic pots under greenhouse conditions in Nigeria and artificially infested with Mononychellus tanajoa when plants were 30 cm high. Resistance was assessed by visual damage ratings of cassava leaves (0-1, resistant; 2-3, intermediate; 4-5, susceptible), and counts of no. of mites and hairs on leaves were conducted using a stereomicroscope. Intermediate resistance to M. tanajoa was found in cv. TMS 4(2) 1425, 74/538, Anti-Ota, 73/93, 30195, and 1531. These cv. also had lower mite counts than the other 6 cv. A direct relationship was observed between trichome density and resistance to M. tanajoa. The fact that 2 out of the 6 tolerant cv. had low hair densities suggests the possibility that some other biochemical characteristics could be present that contribute to resistance. (CIAT)

0791

29387 EZULIKE, T.O. 1984. Project 1. Cassava mealybug (CMB) and green spider mite (GSM) control. Level of activity (L.A.) 2. Cultural control. Effect of intercropping cassava with pigeon pea on green spider mite infestation. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.9-10, 12-13. En., Il.

CASSAVA; INTERCROPPING; PIGEON PEA; MITE CONTROL; CULTURAL CONTROL; MONONYCHELLUS TANAJOA; ROOT PRODUCTIVITY; NIGERIA.

The effects of intercropping cassava var. U/41044 and TMS 30555 with pigeon pea on natural Mononychellus tanajoa infestation were investigated in Nigeria. Six planting patterns were tested: alternating cassava and pigeon pea in the same row, or in single, double, and triple rows, and both monocrops. Mite damage was lowest on plots where cassava was intercropped with pigeon pea in the same row (2.5 plus or minus 0.6 and 2.8 plus or minus 0.5 on a 0-5 damage scale for var. U/41044 and TMS 30555, resp.) and highest in sole crops (4.5 plus or minus 0.6 and 4.8 plus or minus 0.4, resp.), but root yields were severely reduced to 3.3 and 4.9 t/ha, resp., in the former. The highest root yields were obtained with double or triple alternating row arrangements (17.3 and 19.1 t/ha for TMS 30555, resp., and 16.4 and 14.9 t/ha for U/41044, resp.). (CIAT)

0792

29389 EZULIKE, T.O. 1984. Project 1. Cassava mealybug (CMB) and green spider mite (GSM) control. Level of activity (L.A.) 3. Chemical control. Field evaluation of pesticides for the control of M. tanajoa. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.14-16. En.

CASSAVA; MITE CONTROL; MONONYCHELLUS TANAJOA; ACARICIDES; BIOLOGICAL CONTROL; ROOT PRODUCTIVITY; NIGERIA.

In a field trial in Nigeria, 8 acaricides (formetanate hydrochloride, biclofentazine, formetanate hydrochloride + biclofentazine, carbofuran, omethoate, demeton methyl, dimethoate, and monocrotophos) were evaluated as to their effects on the control of Mononychellus tanajoa, least damage to predator mites, and cassava root yields. Spray concn. used was 0.05 percent a.i. and none of the acaricides was toxic at 20 kg/ha to cassava. All the pesticides showed acaricidal activity except carbofuran. Monocrotophos, formetanate hydrochloride, biclofentazine, omethoate, formetanate hydrochloride + biclofentazine and demeton methyl, in descending order, maintained M. tanajoa populations low and were moderately toxic to the predator mite A. fustis. Cassava yields were highest for monocrotophos-treated plots (20.7 t/ha) compared with the untreated control

plots (15.6 t/ha). The addition of an effective acaricide to predation by A. fustis and to other methods of control of M. tanajoa was considered essential. (CIAT)

0793

30073 EZULIKE, T.O. 1985. Project 2. Cassava mealybug (CMB) and green spider mite (GSM) control. Evaluation of insecticides for the control of green spider mite, Mononychellus tanajoa 1984/85. In National Root Crops Research Institute. Cassava Programme. Annual Report 1985. Umudike, Nigeria, pp.24-25. En.

CASSAVA; MONONYCHELLUS TANAJOA; MITE CONTROL; ACARICIDES; PREDATORS AND PARASITES; ROOT PRODUCTIVITY; NIGERIA.

The pesticides biclofentazine, formetanate hydrochloride, dimethoate, carbofuran, formetanate hydrochloride + biclofentazine, monocrotophos, omethoate, and oxydemeton-methyl were tested for the control of Mononychellus tanajoa and their effect on the predator mite Amblyseius fustis in Nigeria. Mite counts were conducted at 2, 4, 6, 8, and 10 wk. after application to cassava crops. All, except carbofuran, reduced mite populations to a low level, but their effectiveness varied. The following showed good acaricidal activity, in descending order: monocrotophos, biclofentazine, formetanate hydrochloride, omethoate, formetanate hydrochloride + biclofentazine, dimethoate, and oxydemeton-methyl. Monocrotophos was the most effective in controlling M. tanajoa; its no./leaf was reduced from 101.0 to 51.2, 22.0, 13.0, 6.5, and 4.3 M. tanajoa individuals/leaf at 2, 4, 6, 8, and 10 wk. after treatment, giving the highest root yield (32.8 t/ha), and allowing A. fustis to recover more rapidly after treatment. (CIAT)

0794

30072 EZULIKE, T.O. 1985. Project 2. Cassava mealybug (CMB) and green spider mite (GSM) control. Greenhouse screening of cassava cultivars for resistance to M. tanajoa. In National Root Crops Research Institute. Cassava Programme. Annual Report 1985. Umudike, Nigeria, p.23. En.

CASSAVA; CULTIVARS; SELECTION; RESISTANCE; MONONYCHELLUS TANAJOA; LABORATORY EXPERIMENTS; NIGERIA.

Nine promising cassava cv. (77/1, 77/97, Nwajuwa, UM.C3, 77/103, 75/714, 75/720, 73/337, and Nwugo) were screened under greenhouse conditions in Nigeria for resistance to Mononychellus tanajoa. A 0-5 visual damage score was used to assess resistance. No hairs were observed in any of the cv., a characteristic considered to provide resistance to the pest. The av. damage scores for the cv. were high (range 3.5-4.5), as well as mite counts/leaf (range 44.0-54.8). Thus, all of the cv. were considered as susceptible to M. tanajoa. (CIAT)

0795

30071 EZULIKE, T.O. 1985. Project 2. Cassava mealybug (CMB) and green spider mite (GSM) control. Population dynamics of green spider mite, M. tanajoa and red spider mite, O. gossypii. In National Root Crops Research Institute. Cassava Programme. Annual Report 1985. Umudike, Nigeria, pp.21-22 . En., Il.

CASSAVA; INSECT BIOLOGY; INJURIOUS MITES; MONONYCHELLUS TANAJOA; OLIGONYCHUS GOSSYPII; NIGERIA.

Population dynamics studies of Mononychellus tanajoa and Oligonychus gossypii were conducted from Jan. to Dec. 1985 in Nigeria; 10 cassava leaves (cv. TMS 30555) were sampled on a monthly basis, using the 5th leaf from the

top to the bottom. The av. no. of M. tanajoa found was higher than that of O. gossypii, but the no. of the latter were sufficiently high to cause economic damage. Both species showed similar population curves throughout the year, with peaks in Feb.-March. While their feeding habits and damage symptoms were similar, O. gossypii was found to form webs. Since both are phytophagous tetranychid mites, control measures developed for M. tanajoa will be good for controlling O. gossypii and vice versa. (CIAT)

0796

32226 EZULIKE, T.O. 1987. Resistance of cassava cultivars to green spider mite (Mononychellus tanajoa) infestation (Abstract). In Terry, E.R.; Akoroda, M.O.; Arene, O.B., eds. Triennial Symposium of the International Society for Tropical Root Crops- Africa Branch, 3d, Owerri, Nigeria, 1986. Tropical root crops; root crops and the African food crisis: proceedings. Ottawa, Canada, International Development Research Centre. p.118. En. (National Root Crops Research Inst., Umudike, P.M.B. 7006, Umuahia, Nigeria)

CASSAVA; CULTIVARS; MONONYCHELLUS TANAJOA; RESISTANCE; NIGERIA.

Twenty-one cassava cv. selected after field screening for tolerance to Mononychellus tanajoa were artificially infested with M. tanajoa in the greenhouse to confirm their resistance. Of 21 selected cv., the mean mite damage scores showed TMS 4(2)1425 to be the most tolerant to M. tanajoa infestation, followed by 74/538, Anti-Ota, 73/93, 30195, and 1531. These cv. supported fewer mites and 4 of them, TMS 4(2)1425, 73/93, 74/538, and Anti-Ota, had surface hairs on their leaves--an attribute of resistance. Mite damage and mite density were not correlated with variations in leaf HCN content. This factor, therefore, does not contribute to mite resistance in cassava. (Full text)

0797

32220 EZUMAH, H.C.; IKEORGU, J.E.G. 1987. Effect of cassava introduction time into maize on intercrop yields (Abstract). In Terry, E.R.; Akoroda, M.O.; Arene, O.B., eds. Triennial Symposium of the International Society for Tropical Root Crops- Africa Branch, 3d, Owerri, Nigeria, 1986. Tropical root crops; root crops and the African food crisis: proceedings. Ottawa, Canada, International Development Research Centre. p.34. En. (International Inst. of Tropical Agriculture, P.M.B. 5320, Oyo Road, Ibadan, Nigeria)

CASSAVA; INTERCROPPING; MAIZE; PLANTING; TIMING; NIGERIA; ZAIRE.

The time of planting for cassava is flexible; however, maize must be planted within a narrow time span to maximize biological yield. In a cassava/maize intercrop, cassava establishment through maize may be limited by shading and an early cessation of rain. To determine the flexibility of cassava planting time, cassava was introduced through maize in 2 environments in Nigeria and Zaire. More efficient land use was attained with cassava/maize intercropping regardless of the time of cassava introduction. Early introduction (planting on the same day to 5-8 wk. delay) resulted in no cassava yield reduction. The limits to cassava introduction time appear to be related to the duration of rainfall. Maize yield was not affected by the cassava var. or the date of cassava introduction. (Full text)

0798

28509 EZUMAH, H.C.; LAWSON, T.L. 1982. EVALUATION OF SOME CULTURAL PRACTICES FOR BETTER CASSAVA PRODUCTION. IN NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA, 1982. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.83-90. EN., 2 REF.

CASSAVA; PROPAGATION; LIGHT; SOIL MOISTURE; INTERCROPPING; SOIL REQUIREMENTS; GROUNDNUT; MAIZE; PLANTING; NIGERIA.

THE RESULTS OF EXPT. IN WHICH SEVERAL AGRONOMIC FACTORS AND CULTURAL PRACTICES WERE STUDIED TO IMPROVE CASSAVA PRODUCTION ARE PRESENTED. OPTIMUM CASSAVA YIELDS WERE OBTAINED WITH 40- TO 60-CM- LONG MATURE CUTTINGS (6-12 MO.OLD). WHILE DIFFERENCES IN TIME TO MATURITY BETWEEN CASSAVA AND MAIZE AND DIFFERENCES IN THEIR GROWTH HABIT AND ENVIRONMENTAL REQUIREMENTS AT TIMES RESULT IN A NONCOMPETITIVE INTERFERENCE IN CASSAVA/MAIZE MIXTURES, DIFFERENCES BETWEEN MAIZE IDEOTYPES PLANTED AT THE SAME PLANT POPULATIONS IN MIXTURES WITH CASSAVA CAN CAUSE HIGHER OR LOWER ROOT YIELD REDUCTIONS DEPENDING ON HOW MUCH LIGHT IS INTERCEPTED BY THE MAIZE CANOPY; THUS, COMPETITION CAN BE REDUCED BY ADEQUATE SELECTION OF MAIZE TYPE AND PLANTING PATTERNS. CASSAVA CAN BE INTRODUCED INTO GROUNDNUT OR OTHER CROPS OF SIMILAR CANOPY ESTABLISHED DURING THE MINOR CROPPING SEASON, WITHOUT SIGNIFICANT YIELD REDUCTIONS. (CIAT)

0799

28165 FARINU, G.O.; FETUGA, B.L. 1986. ORGAN GROWTH IN TWO BREEDS OF PIGS FED DIETS VARYING IN PROTEIN AND ENERGY LEVELS. NUTRITION REPORTS INTERNATIONAL 34(1):109-117. EN., SUM. EN., 17 REF., IL. (BIOCHEMISTRY DEPT., UNIV. OF ILORIN, ILORIN, NIGERIA)

CASSAVA; DIETS; ANIMAL HEALTH; FEEDS AND FEEDING; SWINE; CASSAVA FLOUR; NUTRITIVE VALUE; DIETARY VALUE; NIGERIA.

LARGE WHITE X LANDRACE AND NIGERIAN INDIGENOUS PIGS WERE GIVEN A 24 PERCENT CP WEANING DIET UNTIL AV. BODY WT. WERE 9.33 AND 6.05 KG, RESP. THREE DIFFERENT DIETS WERE THEN GIVEN FOR 84 DAYS: (1) A CONTROL DIET CONSISTING OFMAIZE MEAL 55.0 PERCENT AND SOYBEAN OILMEAL 31.2 PERCENT; (2) A LOW-PROTEIN, LOW-ENERGY DIET CONSISTING OF MAIZE MEAL 10.00 PERCENT, SOYBEAN OILMEAL 6.24 PERCENT, CELLULOSE 35.12 PERCENT, AND CF 42.84 PERCENT; OR (3) A LOW- PROTEIN,HIGH-ENERGY DIET CONSISTING OF MAIZE MEAL 10.00 PERCENT, SOYBEAN OILMEAL 6.24PERCENT, CELLULOSE 8.00 PERCENT, AND CF 63.96 PERCENT. CONTROL PIGS OF BOTH BREEDS GAINED SIGNIFICANTLY MORE WT. THAN THOSE GIVEN DIETS 2 OR 3. LARGE WHITE X LANDRACE PIGS ON DIETS 2 AND 3 SHOWED GROSS CHANGES IN APPEARANCE OF SKIN AND HAIR AND NIGERIAN INDIGENOUS PIGS HAD SMALLER BODY SIZE AND ROUGHER SKIN AND HAIR. THE DIET AND BREED SIGNIFICANTLY AFFECTED MEAN ORGAN AND GLANDWT. RESULTS INDICATE THAT THE NIGERIAN INDIGENOUS PIG COULD BE A SUITABLE MODEL FOR PROTEIN-CALORIE DEFICIENCY STUDIES, ESPECIALLY USING THE KIDNEY, SPLEEN, LIVER, AND PANCREAS AS MARKER ORGANS. (CIAT)

0800

28570 FASORANTI, J.O.; OLAGUNJU, O.M. 1985. FOOD SELECTION BY THE VARIEGATED GRASSHOPPER ZONOCERUS VARIEGATUS, L. FEEDING BIOASSAY USING CROPS AND WEEDS. INSECT SCIENCE AND ITS APPLICATION 6(6):681-686. EN., SUM. EN., FR., 17 REF., IL. (DEPT. OF BIOLOGICAL SCIENCES, UNIV. OF ILORIN, P.M.B. 1515, ILORIN, NIGERIA)

CASSAVA; ZONOCERUS VARIEGATUS; EUPHORBIACEAE; PEST DAMAGE; WEEDS; INSECT CONTROL; INSECT BIOLOGY; NIGERIA.

OBSERVATIONS ARE MADE ON THE QUANTIFICATION OF THE ACCEPTABILITY OF PLANTS TO ZONOCERUS VARIEGATUS, A SERIOUS PEST OF CASSAVA IN AFRICA, AS WELL AS THE EFFECT OF FOOD--2 CROPS (CASSAVA AND AMARANTUS SP.) AND 2 WEEDS (EUPHORBIA HIRTA AND TRIDAX PROCUMBENS)--ON ITS GROWTH. EARLY INSTARS OF THE INSECT FED ON MOST WEEDS, BUT PREFERRED THOSE IN THE FAMILIES EUPHORBIACEAE AND SOLANACEAE. PLANTS THAT WERE ACCEPTED INITIALLY WERE LESSER CONSUMED THANLATER CHOSEN ONES. ALTHOUGH THERE WAS NO APPARENT DIFFERENCE BETWEEN WT.

OF NYMPHS FED ON CASSAVA AND OTHER PLANTS IN THE 1ST 9 WK, THEREAFTER CASSAVA-FED INSECTS EXCELLED OTHERS. SOMATIC GROWTH WAS NOT AFFECTED BY FEED TYPE. (AS)

0801

28387 FATOKUN, P.A. 1981. LAGOS STATE. IN NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA, 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.158-166. EN.

CASSAVA; CLIMATIC REQUIREMENTS; CULTIVARS; PRODUCTIVITY; DEVELOPMENT; ADAPTATION; FERTILIZERS; PROPAGATION; TECHNOLOGY TRANSFER; NIGERIA.

THE 1980 ANNUAL REPORT OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) IN THE STATE OF LAGOS, NIGERIA, IS PRESENTED. VAR., FERTILIZER, DEMONSTRATION, AND MULTIPLICATION TRIALS CARRIED OUT DURING 1979-80 ARE BRIEFLY DESCRIBED. YIELD RESULTS ARE REPORTED FOR THE 1980 HARVESTS; CASSAVA VAR. TMX 30572, 30555, AND 30211 PERFORMED EXCEEDINGLY WELL ON FARMERS' PLOTS. TRAINING ACTIVITIES, FIELD DAYS, AND LAND CLEARING ARE ALSO REPORTED. MAJOR CONSTRAINTS ARE LACK OF TRANSPORTATION FACILITIES, FINANCING, DELAY IN SUPPLY OF INPUTS, AND SHORTAGE OF PERSONNEL. PLANS FOR 1981 REGARDING TRAINING AND TRIALS ARE INDICATED. (CIAT)

0802

31685 FISHER, N.M. 1987. On-farm research with complex mixed and multiple cropping patterns. In Holmes, J.C., ed. Improving food crop production on small farms in Africa. Rome, Food and Agriculture Organization of the United Nations. pp.233-239. En., Sum. En., 6 Ref., Il.

CASSAVA; ON-FARM RESEARCH; CULTIVATION SYSTEMS; RELAY CROPPING; MAIZE; SPACING; AFRICA; NIGERIA.

Four techniques are described which have been found useful for on-farm research with the complex cropping patterns of West Africa. Ideas are offered on how to identify, describe, analyze, and improve cropping patterns. Example diagrams of cropping patterns including cassava are given on how to illustrate crop relationships in time and space. An example of a step-wise design of an on-farm trial using fertilization and improved var. in the maize/cassava relay cropping pattern is presented. (CIAT)

0803

32237 FLECHTMANN, C.H.W. 1986. Taxonomy of the cassava green spider mite complex, Mononychellus spp. (Tetranychidae). In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. pp.70-80. En., 6 Ref., Il. (Univ. of Sao Paulo, Escola Superior de Agricultura Luiz de Queiroz, 13.400 Piracicaba-SP, Brasil)

CASSAVA; MONONYCHELLUS TANAJOA; MONONYCHELLUS; NIGERIA.

The diagnostic features of the species included in the Mononychellus tanajoa complex are presented. A taxonomical identification key with illustrations is given for the family Tetranychidae, the genus Mononychellus, and the species M. caribbeanae, M. tanajoa, M. progresivus, M. manihoti, and M. mcgregori. (CIAT)

0804

29457 FOMUNYAN, R.T.; ADEGBOLA, A.A.; OKE, O.L. 1984. THE STABILITY OF CYANOHYDRINS. FOOD CHEMISTRY 17(3):221-225. EN., 8 REF., IL. (DEPT. OF ANIMAL SCIENCE, UNIV. OF IFE, ILE-IFE, NIGERIA)

CASSAVA; CYANOGENIC GLUCOSIDES; TOXICITY; FERMENTATION; HUMAN NUTRITION; ANIMAL NUTRITON; PROCESSED PRODUCTS; NIGERIA.

ACETONE CYANOHYDRIN, A PRODUCT OF THE HYDROLYSIS OF THE CYANOGENIC GLUCOSIDE LINAMARIN FOUND IN CASSAVA, AND MANDELONITRILE WERE SYNTHESIZED TO INVESTIGATE THEIR STABILITY AT PH 2-9, WITH AND WITHOUT PALM OIL. MANDELONITRILE HYDROLYSIS WAS LOW (10-20 PERCENT) AT PH 4 AND 5, AND HIGH (55-80 PERCENT) AS PH VALUES INCREASED FROM 7 TO 9. ACETONE CYANOHYDRIN HYDROLYSIS WAS VERY LOW (5-15 PERCENT) AT PH 3-7, AND FOLLOWED THE SAME PATTERN AS THAT FOR MANDELONITRILE AT PH 9, BEING IRREGULAR AND DIFFICULT TO EXPLAIN AT PH 8. NEITHER COMPOUND HYDROLYZED IN PALM OIL AND HYDROLYSIS IN PALM OIL/BUFFER MIXTURE WAS LOWER THAN IN BUFFER ALONE. THE IMPLICATIONS OF THESE RESULTS ARE DISCUSSED IN TERMS OF REACTIVITY IN THE DIGESTIVE TRACT. THE STABILITY OF THESE PRODUCTS AT LOW PH VALUES AND THEIR EXTREME SOLUBILITY IN WATER CAN BE USED EFFECTIVELY IN THE PROCESSING OF CASSAVA BY EMPLOYING SEVERAL WATER CHANGES DURING FERMENTATION. ALSO, USING PALM OIL FOR FRYING CASSAVA MAY REMOVE RESIDUAL CYANOHYDRINS AND MAKE CASSAVA PRODUCTS SAFER FOR CONSUMPTION. (CIAT)

0805

28386 FULANI, I.B. 1981. KWARA STATE. IN NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA, 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.152-157. EN.

CASSAVA; CASSAVA PROGRAMS; MAIZE; HERBICIDES; SEED; INTERCROPPING; PROPAGATION; ADAPTATION; CULTIVARS; NIGERIA.

THE 1980 ANNUAL REPORT OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) IN THE STATE OF KWARA, NIGERIA, IS PRESENTED. THE CASSAVA/MAIZE PROGRAM IS BRIEFLY DISCUSSED. FIELD TRIALS WERE CARRIED OUT AT 11 SITES IN 1980 AND SEED MULTIPLICATION WAS CARRIED OUT WITH A NO. OF CASSAVA CV. IN AJASSE. A TOTAL OF 257 BUNDLES OF IMPROVED PLANTING MATERIAL WERE DISTRIBUTED. THE CASSAVA/MAIZE TRIAL PLANS FOR 1981 ARE INDICATED. (CIAT)

0806

30502 GEBREMESKEL, T.; OYEWOLE, D.B. 1987. Cassava in Africa and the world trends of vital statistics, 1965-1984. Ibadan, Nigeria, International Institute of Tropical Agriculture. Socioeconomic Unit. 75p. En., Dat.num., 10 Ref., Il.

CASSAVA; STATISTICAL DATA; PRICES; PRODUCTION; PRODUCTIVITY; CONSUMPTION; ANIMAL NUTRITION; HUMAN NUTRITION; USES; NIGERIA.

Complete statistical data are given on relevant cassava parameters (area planted, production, productivity, consumption, and uses) for the 1965-84 period. Trends are analyzed by world regions, particularly Africa, and countries within regions. Demand for cassava and cassava products for the next 5-10 yr will outstrip supplies in Sub-Saharan Africa. (CIAT)

0807

28391 GIADOM, S.B. 1981. RIVERS STATE. IN NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA, 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.185-193. EN.

CASSAVA; CASSAVA PROGRAMS; MAIZE; CULTIVARS; CLONES; PRODUCTIVITY; FERTILIZERS; ADAPTATION; TECHNOLOGY TRANSFER; SEED PROPAGATION; NIGERIA.

THE 1980 ANNUAL REPORT OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTIONPROGRAMME) IN THE STATE OF RIVERS, NIGERIA, IS PRESENTED. YIELD RESULTS FOR THE 1979 CASSAVA VAR. AND FERTILIZER TRIALS ARE GIVEN. CASSAVA

TRIALS, TRAINING ACTIVITIES, FIELD DAYS, SEED MULTIPLICATION, AND AGROSERVICE CENTER DEVELOPMENT CARRIED OUT IN 1980 ARE ALSO DISCUSSED. CONSTRAINTS TO PLANNED RESEARCH ACTIVITIES ARE INDICATED. (CIAT)

0808

31643 GIRARD, J.C. 1979. Compte rendu d'une visite a l'I.I.T.A. (International Institute of Tropical Agriculture) a Ibadan au Nigéria (18-22 avril 1979). (Review on a visit to IITA (International Institute of Tropical Agriculture) in Ibadan, Nigeria (April 18-22, 1979)). Montpellier, France, Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres. 15p. Fr.

CASSAVA; RESEARCH; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; ETIOLOGY; SYMPTOMATOLOGY; DISEASE CONTROL; RESISTANCE; SELECTION; NIGERIA.

Information collected during a visit to the International Institute of Tropical Agriculture (Ibadan, Nigeria) in 1979 is presented. CAMV and CBB (Xanthomonas campestris pv. manihotis) were found to be the major cassava problems. Brief information is given on the latter regarding origin and dissemination, economic importance, etiology, symptomatology, and diagnosis. Factors influencing disease spread and possible control measures are also mentioned. Research aimed at developing resistant cassava cv. is mentioned, indicating that the breeding method used is selection. Green mites (Mononychellus tanajoa) and mealybugs (Phenacoccus manihoti) were found to be the major cassava pests in Africa. (CIAT)

0809

30489 GODO, G. 1987. General synthesis of reports made by national representatives. In Seminaire International La Mosaique Africaine du Manioc et son Controle, Cote d'Ivoire, 1987. Résumés. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Cooperation. p.29. En. (ORSTOM, BP. V51 Abidjan-01, Cote d'Ivoire)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; RESISTANCE; IVORY COAST; NIGERIA.

The reports on cassava made by national representatives are synthesized. Cassava cultivation remains essentially traditional. Main production constraints are mentioned as well as different forms of consumption. CAMD is the most widespread disease, and Phenacoccus manihoti, Mononychellus tanajoa, and Zonocerus variegatus the major pests. Crop losses caused by the whitefly Bemisia tabaci vary from 20 to 80 percent. The importance of the International Institute of Tropical Agriculture as a supplier of CAMD-resistant clones is stressed. All producing countries should participate in an action program to control CAMD, considered the major cassava production constraint. (CIAT)

0810

32209 HAHN, S.K.; MAHUNGU, N.M.; OTOO, J.A.; MSABAHA, M.A.M.; LUTALADIO, N.B.; DAHNIYA, M.T. 1987. Cassava and the African food crisis. In Terry, E.R.; Akoroda, M.O.; Arene, O.B., eds. Triennial Symposium of the International Society for Tropical Root Crops- Africa Branch, 3d, Owerri, Nigeria, 1986. Tropical root crops; root crops and the African food crisis: proceedings. Ottawa, Canada, International Development Research Centre. pp.24-29. En., Sum. En., 25 Ref., Il. (International Inst. of Tropical Agriculture, P.M.B. 5320, Oyo Road, Ibadan, Nigeria)

CASSAVA; HUMAN NUTRITION; PRODUCTION; CULTIVATION; NIGERIA; AFRICA.

The potential and constraints to cassava production in the African farming and food systems are reviewed and related to the current African food crisis and to the future food production needs of the continent. (CIAT)

0811

28510 HAHN, S.K.; HERREN, H.R. 1982. CASSAVA MEALYBUG CONTROL STRATEGY: IITA'S APPROACH. IN NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA, 1982. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.91-98. EN., IL.

CASSAVA; PHENACOCCUS MANIHOTI; PEST CONTROL; BIOLOGICAL CONTROL; PREDATORS AND PARASITES; RESISTANCE; HYPERASPIS; SCYMNUS APOANAGYRUS LOPEZI; CLONES; EXOCHOMUS; PLANT BREEDING; NIGERIA.

STRATEGIES USED BY THE INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE TO CONTROL PHENACOCCUS MANIHOTI ATTACKING CASSAVA ARE REVIEWED. BIOLOGICAL CONTROL OF THE PEST HAS BEEN SUCCESSFUL WITH THE INTRODUCED PREDATORS HYPERASPIS SP. AND SCYMNUS SP. AND THE PARASITOID APOANAGYRUS LOPEZI. IT IS EXPECTED THAT BIOLOGICAL CONTROL IN COMBINATION WITH HOST PLANT RESISTANCE WILL REDUCE P. MANIHOTI PROBLEMS IN AFRICA IN THE FUTURE. CASSAVA BREEDING ISAIMED AT INCORPORATING HIGHER HAIR DENSITY ON THE SURFACE OF YOUNG CASSAVA LEAVES AND THE DEVELOPMENT OF GLABROUS CLONES THAT KEEP P. MANIHOTI POPULATIONS AT A LOW LEVEL. ANTIBIOSIS, ON THE OTHER HAND, APPEARS TO BE EFFECTIVE IN CLONE 70453 IN ON-GOING EXPT. (CIAT)

0812

29006 HAHN, S.K. 1984. Utilization, production constraints and improvement potential of tropical root crops. In Hawksworth, D.L., ed. Conference on Advancing Agricultural Production in Africa, 1., Arusha, Tanzania, 1984. Proceedings. Farnham Royal, England, Commonwealth Agricultural Bureaux. pp.91-97. En., 12 Ref.

CASSAVA; CULTIVATION; PRODUCTION; INTERCROPPING; CULTIVATION SYSTEMS; HCN CONTENT; CASSAVA PRODUCTS; PRODUCTIVITY; WEEDS; CULTIVARS; MULCHING; NIGERIA.

A revision is presented of the accumulated experience at the International Institute for Tropical Agriculture in Ibadan, Nigeria, since its establishment in 1967, with regard to different aspects of cassava cultivation and production: production constraints due to diseases and pests, var. improvement, biological control, agronomic practices, land preparation, cultivation under shade, soils, seed material, association with other crops (cassava/maize, cassava/melon/maize, cassava/peanuts, and cassava/cowpeas), consumption of the leaves as vegetable, weed control, continuous production in the same plot, HCN content, and the processing system for different cassava-based products. Cultivation under shade affected yield in wt. and no. of roots/plant. In association with maize, cassava produced, on the av., 10 t/ha. Imperata cylindrica is reported among the weeds that produce major losses in yield due to competition. Cassava is presented as a crop that is tolerant to the prevailing drought conditions in some regions of Africa. (CIAT)

0813

32089 HERREN, H.R.; NEUENSCHWANDER, P.; HENNESSEY, R.D.; HAMMOND, W.N.O. 1987. Introduction and dispersal of Epidinocarsis lopezi (Hym., Encyrtidae), an exotic parasitoid of the cassava mealybug, Phenacoccus manihoti (Hom., Pseudococcidae), in Africa. Agriculture, Ecosystems and Environment 19(2):131-144. En., Sum. En., 28 Ref., Il. (International Inst. of Tropical Agrieulture, P.M.B. 5320, Ibadan, Nigeria)

CASSAVA; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; INSECT BIOLOGY; NIGERIA.

The history of the spread of the cassava mealybug (Phenacoccus manihoti) and Epidinocarsis lopezi, a South American parasitoid, in Africa is traced up to

Dec. 1985. E. lopezi was imported into Nigeria for control of P. manihoti. It was multiplied in an insectary at the International Institute of Tropical Agriculture in Ibadan, and 1st released in 1981/82. Within 3 yr it dispersed over 200,000 square kilometers in SW Nigeria, occupying between 70-98 percent of all fields. By Dec. 1985, a total of over 50 releases in 34 regions had been made in 12 African countries. E. lopezi was already established in 28 regions, and in some cases E. lopezi spread across international borders. It now occupies 650,000 square kilometers in 13 countries: 420,000 square kilometers in West Africa, 210,000 square kilometers in Central Africa, and several small disjunct territories, covering a range of ecological zones (Sudan savannah, Guinea savannah, equatorial rain forest, highlands). (AS)

0814

28364 HEYS, G. 1980. SELECTION OF IMPROVED CASSAVA CLONES. IN NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA, 1980. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.181-184. EN.

CASSAVA; CLONES; PRODUCTIVITY; PLANT DEVELOPMENT; CULTIVARS; ADAPTATION; NIGERIA.

RESULTS OF LARGE-SCALE CASSAVA CLONE TRIALS CONDUCTED BY INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE (NIGERIA) TO IDENTIFY PROMISING HIGH YIELDING MATERIALS ARE PRESENTED. THE HIGHEST YIELDING CLONES AT 4 LOCATIONSWERE 30555 (40.8 T/HA) AND 30572 (36.0 T/HA). YIELD ESTIMATES FOR 6 PROMISING CLONES ARE GIVEN FOR 4 SITES (IITA, MORKWA, ONNE, AND WARRI). (CIAT)

0815

30155 HULUGALLE, N.R.; LAL, R.; OPARA-NADI, O.A. 1987. Management of plant residue for cassava (Manihot esculenta) production on an acid Ultisol in southeastern Nigeria. Field Crops Research 16(1):1-18. En., Sum. En., 24 Ref., Il. (IITA-SAFGRAD Project, B.P. 1783, Ouagadougou, Burkina-Faso)

CASSAVA; SOIL REQUIREMENTS; MULCHING; TILLAGE; SOIL CONSERVATION PRACTICES; SOIL PHYSICAL PROPERTIES; WASTES; SOIL ANALYSIS; GROWTH; PLANT HEIGHT; ROOT DEVELOPMENT; FIELD EXPERIMENTS; NIGERIA.

A study consisting of 2 expt. was conducted in SE Nigeria during 1983 and 1984 to determine whether cassava production on sandy, acid Ultisols could be improved by residue management techniques. One expt. studied the effect of location of Eupatorium odoratum mulch on soil properties and crop growth. A 2nd expt. studied the effect of tillage system and E. odoratum mulch on soil properties and crop growth. In both expt., mulch was applied at an annual rate of 12 t/ha (25 percent MC) in a split application at planting and 150 days after planting. No fertilizer was applied during the expt. Concn. of mulch in the plant row resulted in values of within-row bulk density in the surface 0.10 m which were lower by 15 and 13 percent in 1983 and 1984, resp. Tillage in combination with mulch reduced bulk density in the surface 0.10 m by an av. of 10 and 9 percent in 1983 and 1984, resp. No significant differences were found among other treatments. Soil chemical properties were unaffected by treatments in both expt. Cassava root yield was unaffected by location of E. odoratum mulch. Both plowing and no-tillage when combined with mulch improved root yields. Cassava root yields of untilled plots were 16.8 and 12.7 t/ha during 1983-84, and 13.1 and 8.5 t/ha during 1984-85 in mulched and unmulched treatments, resp. Root yields of tilled plots were 14.5 and 13.1 t/ha during 1983-84, and 11.3 and 6.9 t/ha during 1984-85 in mulched and unmulched treatments, resp. (AS)

0816

29363 IJIOMA, B.C. 1982. Improving fufu quality through controlled fermentation. In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, pp.33-39. En.

CASSAVA; FOOFOO; LABORATORY EXPERIMENTS; DETOXIFICATION; HCN CONTENT; FERMENTATION; LINAMARIN; YEAST PRODUCTION; INDUSTRIAL MICROBIOLOGY; USES; NIGERIA.

Work was carried out to improve foofoo quality, especially regarding the removal of its unpleasant odor and its low storability. Microorganisms involved in cassava fermentation for foofoo production were identified: Lactobacillus, Leuconostoc, Bacillus, Klebsiella, Corynebacterium, and Candida. Pure cultures of these organisms were reinoculated into sterilized cassava and the combination of Lactobacillus, Leuconostoc, and Bacillus produced fermented cassava with the characteristic foofoo odor. Other combinations of the isolated organisms did not produce rotting. The results of another study to investigate the ability of some microorganisms to break down linamarin and release HCN indicated that the bacteria Leuconostoc mesenteroides and Alcaligenes faecilis and the yeasts Saccharomyces cerevisiae and Rhodotorula minuta could be used in commercial detoxification of pulp used in gari production or other. On the contrary, the use of fungal isolates was discouraged due to their role in spoilage and intoxication of foods. The microbial utilization of cyanide from cassava was also investigated using cell counts and ammonia release (a by-product of HCN breakdown). S. cerevisiae, Aspergillus flavus, and A. niger grew without detectable inhibition when as much as a 0.1 percent HCN solution was used as growth media. The method developed to preserve purified beneficial yeasts and bacteria in cassava pulp juice, for use by farmers to detoxify cassava pulp in a cheap and safe way, is described. Using this method, microorganisms were viable for 6 mo. without significant losses. (CIAT)

0817

28518 IJIOMAH, M.I. 1982. CASSAVA AND THE GREEN REVOLUTION: A CASE STUDY IN IMO STATE. IN NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA, 1982. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.152-159. EN., 4 REF.

CASSAVA; PROCESSING; SOCIOECONOMIC ASPECTS; CASSAVA PROGRAMS; GARI; NIGERIA.

THE CONTRIBUTION OF CASSAVA IN THE FORM OF GARI TO THE GREEN REVOLUTION OF NIGERIA, PARTICULARLY IN IMO STATE, IS DISCUSSED. CASSAVA PROCESSING AND MARKETING, PESTS AND DISEASES, CASSAVA PRODUCTION INCREASE, AND INSTABILITY OF CASSAVA OUTPUT ARE COVERED. (CIAT)

0818

32219 IKEORGU, J.F.G.; ODURUKWE, S.O. 1987. Increasing the productivity of cassava-maize intercrops with groundnuts (Apios hypogea) (Abstract). In Terry, E.R.; Akoroda, M.O.; Arene, O.B., eds. Triennial Symposium of the International Society for Tropical Root Crops- Africa Branch, 3d, Owerri, Nigeria, 1986. Tropical root crops; root crops and the African food crisis: proceedings. Ottawa, Canada, International Development Research Centre. p.34. En. (National Root Crops Research Inst., Umudike, P.M.B. 7006, Umuahia, Nigeria)

CASSAVA; INTERCROPPING; MAIZE; GROUNDNUT; PLANTING; SPACING; NIGERIA.

Studies were initiated in 1983 to investigate the effects of intercropping cassava, maize, and groundnuts in a low fertility soil on the yield of the component species, the gross economic returns, and the total productivity of

the land. Where the groundnut population did not exceed 100,000 plants/ha, cassava/maize and cassava/groundnut intercrops yielded as much cassava root as did cassava alone. Cassava root yield decreased by 20 percent in a cassava/maize/groundnut intercrop where the groundnut population was equal to or greater than 100,000 plants/ha. The low maize yields in mixed cropping systems were attributed to the 50 percent of sole crop population used. The yield of maize grain/plant did not differ between cropping systems. Groundnut populations of 50,000 and 200,000 plants/ha caused significantly low pod yields of 67 and 78 percent, resp., when intercropped with cassava/maize. The corresponding reduction in groundnut yield at 100,000 plants/ha was only 10 percent. This study indicated that a cassava/maize/groundnut intercrop is more productive than cassava/maize or cassava/groundnut intercrops, provided the groundnut population is less than 100,000 plants/ha. (Full text)

0819

28172 IKEORGU, J.F.G.; BARTLETT, C.D.S. 1979. WHAT SORT OF IMPROVEMENTS FOR CASSAVA PRODUCTION DO FARMERS NEED FROM NAFPP?. UMUDIKE, NIGERIA, NATIONAL ROOT CROPS RESEARCH INSTITUTE. 8P.

CASSAVA; CASSAVA PROGRAMS; DEVELOPMENT; TECHNOLOGY TRANSFER; SOCIOECONOMIC ASPECTS; FOOD SECURITY; ECONOMICS; CULTIVATION; NIGERIA.

THE PRELIMINARY RESULTS OF A SURVEY ON FARMERS' NEEDS FOR CASSAVA PRODUCTION IMPROVEMENT IN IMO STATE, NIGERIA, ARE PRESENTED. THE LOCAL FARMING SYSTEMS ARE DESCRIBED REGARDING FARMING PATTERNS, FOOD SUPPLY, CROPPING CALENDAR, AND CROPS (CASSAVA AND YAMS). RESOURCE CONSTRAINTS ARE DISCUSSED WITH EMPHASIS ON LAND, LABOR, AND RAINFALL UNCERTAINTIES. STAPLE FOOD SHORTAGES, PROTEIN SUPPLIES, AND CASH SUPPLIES ARE ALSO DISCUSSED. IMPROVED, DISEASE-RESISTANT CASSAVA CV. OF BOTH EARLY AND LATE MATURING TYPES, YIELDING WELL UNDER LOW FERTILITY CONDITIONS, SHOULD BE MADE AVAILABLETO FARMERS; OTHER DESIRABLE CHARACTERISTICS INCLUDE HIGH STARCH CONTENT, LOW MC, AND STORABILITY. RESEARCH TOPICS ARE RECOMMENDED. (CIAT)

0820

31687 IKOGBO, B.N. 1987. Increased production through low-cost food crops technology at IITA. In Holmes, J.C., ed. Improving food crop production on small farms in Africa. Rome, Food and Agriculture Organization of the United Nations. pp.358-366. En., Sum. En., 7 Ref.

CASSAVA; CASSAVA PROGRAMS; RESEARCH; PLANT BREEDING; SOCIOECONOMIC ASPECTS; TECHNOLOGY EVALUATION; PRODUCTIVITY; DISEASES AND PATHOGENS; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; RESISTANCE; BIOLOGICAL CONTROL; HARVESTING; AGRICULTURAL EQUIPMENT; HUMID TROPICS; NIGERIA; AFRICA.

The mandate region of the International Institute of Tropical Agriculture (IITA) in the humid tropics of West and Central Africa is described as to climate, soils, vegetation, and socioeconomic conditions. Physical, biological, and socioeconomic constraints to increased food production are analyzed. Appropriate strategies and technologies for production improvement are outlined. Progress in research and training activities are presented. Regarding cassava, improved var. give yields of 20-50 t/ha in 12-15 mo., many are resistant to CBB, CAMD, and anthracnose, and tolerant to the cassava mealybug and the cassava green mite, among other characteristics. A hand-operated cassava harvester is mentioned among others as an appropriate technology developed for low resource farmers. Regarding emerging technologies in IITA's work, special reference is made to cassava tissue culture and the Africa-wide Phenacoccus manihoti and Mononychellus tanajoa biological control programs. (CIAT)cat J00

0821

28186 IKPI, A.E.; GEBREMESKEL, T.; HAHN, N.D.; EZUMAH, H.; EKPERE, J.A. 1986. CASSAVA - A CROP FOR HOUSEHOLD FOOD SECURITY. A 1986 SITUATION ANALYSIS FOR OYO LOCAL GOVERNMENT AREA NIGERIA. IBADAN, NIGERIA, INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE. SOCIO-ECONOMIC UNIT. 125P. EN., SUM. EN., 77 REF., IL.

CASSAVA; SOCIOECONOMIC ASPECTS; CULTIVATION; PRODUCTION CONSUMPTION; CASSAVA PROGRAMS; STATISTICAL DATA; PROCESSING MARKETING; GARI; CASSAVA FLOUR; HUMAN NUTRITION; TOXICITY; COSTS LABOR; INCOME; NIGERIA .

A SURVEY WAS CONDUCTED IN OYO LOCAL GOVERNMENT AREA, NIGERIA, TO ANALYZE CASSAVA CULTIVATION, PROCESSING, USE, AND ACCEPTANCE IN ORDER TO DETERMINE ITS POTENTIAL FOR HOUSEHOLD FOOD SECURITY, INCOME GENERATION FOR RURAL HOUSEHOLDS, AND IMPROVED NUTRITION. MAJOR FINDINGS ARE SUMMARIZED, BASED ON INTERVIEWS TO 150 FARMERS REGARDING PRODUCTION, PROCESSING, AND MARKETING. (CIAT)

0822

32228 IKPI, A.E. 1987. Socioeconomic and utilization considerations in cassava production: a basis for agronomic and genetic research (Abstract). In Terry, F.R.; Akoroda, M.O.; Arene, O.B., eds. Triennial Symposium of the International Society for Tropical Root Crops- Africa Branch, 3d, Owerri, Nigeria, 1986. Tropical root crops; root crops and the African food crisis: proc. edings. Ottawa, Canada, International Development Research Centre. p.154. En. (Dept. of Agricultural Economics, Univ. of Ibadan, Ibadan, Nigeria)

CASSAVA; PRODUCTION; SOCIOECONOMIC ASPECTS; FOOD SECURITY; SURVEYS; NIGERIA.

The results of a socioeconomic survey on cassava of 150 farmers from 15 villages in the Oyo Local Government Area of Nigeria are summarized. The decision-making roles of household members in the cassava enterprise are unclear; however, the roles appear highly differentiated and are specific for the various aspects of cassava production, processing, and marketing. The survey showed that cassava was consumed at least once a day in the av. household, that cassava consumption patterns varied with the season and the family income, and that cassava contributed to household food security when other food staples were scarce or too expensive. The versatility of cassava enhanced its potential contribution to food security. The survey also showed that cassava farming was a profitable enterprise. Labor and transportation were the most costly resources for the rural farmer in cassava production and processing, accounting for 37.3 and 35.7 percent of the total cost, resp. Overall, 72 percent of labor came from within the family and 28 percent came from hired help. Women and children were responsible for 71 percent of the labor. The economic implications of this division of labor are discussed. (Full text)

0823

30585 IWUNZE, M.O.; NNODIMELE, R.A. 1986. An evaluation of cassava starch as a gelling material for electrochemical salt bridges. Starch/Starke 38(6):193-194. En., Sum. En., De., 1 Ref., Il. (Modibbo Adama College, Univ. of Maidugiri, P.M.B. 2076, Yola, Africa)

CASSAVA; CASSAVA STARCH; GELATINIZATION; INDUSTRIAL STARCHES; NIGERIA.

Cassava starch was investigated for its potential use as a gelling material for electrochemical salt bridges. Different electrolytes, KCl, NH4, and NH4NO3, were mixed with the starch and the resulting voltage of a Zn-Cu cell in which it is used as a salt bridge was measured. The observed voltage agreed with the theoretical voltage within 3.6 percent error. It was

observed that the starch and ammonium nitrate electrolyte produced a better blend, gave more reproducible values, and has the lowest resistance of all the other electrolyte-starch mixtures. (AS)

0824

30803 IZOKUN-ETIOBHIO, B.O.; ORAEDU, A.C.I.; UGOCHUKWU, E.N. 1987. A simple procedure for the quantification of intact linamarin in cassava and its products. Journal of the Science of Food and Agriculture 41(1):81-86. En., Sum. En., 16 Ref. (Dept. of Biochemistry, Univ. of Benin, Benin City, Nigeria)

CASSAVA; ANALYSIS; LABORATORY EXPERIMENTS; LINAMARIN; HCN CONTENT; NIGERIA.

A thin-layer chromatographic method coupled with a colorimetric technique for the quantitative determination of linamarin is described. The procedure is based on the measurement of HCN released by linamarase hydrolysis of linamarin isolated on the chromatogram. The released HCN is determined by a modified alkaline picrate method employing Conway vessels. The procedure is free from interferences associated with previously described methods and its sensitivity permits as little as 0.8 micrograms linamarin (0.09 micrograms HCN) to be determined. (AS)

0825

25299 IZOMKUN-ETIOBHIO, B.O.; UGOCHUKWU, E.N. 1981. COMPARISON OF AN ALKALINE PICRATE AND A PYRIDINE- PYRAZOLONE METHOD FOR THE DETERMINATION OF HYDROGEN CYANIDE IN CASSAVA AND IN ITS PRODUCTS. JOURNAL OF THE SCIENCE OF FOOD AND AGRICULTURE 35(1):1-4. EN., SUM. EN, 14 REF. (DEPT. OF BIOCHEMISTRY, UNIV. OF BENIN, BENIN CITY, NIGERIA)

AFRICA; ANALYSIS; COMPOSITION; CYANIDES; ENZYMES; FOOD PRODUCTS; GARI; HCN CONTENT; LINAMARASE; NIGERIA; PLANT ANATOMY; ROOTS; USES.

THE HCN IN FRESH CASSAVA TISSUES AND IN PROCESSED CASSAVA PRODUCTS WAS DETERMINED BY USING AN ALKALINE PICRATE PROCEDURE AND A PYRIDINE-PYRAZOLONE METHOD WHICH USES CONWAY VESSELS. RESULTS OBTAINED FOR THE FRESH CASSAVA TISSUES BY THE 2 METHODS WERE SIMILAR. STATISTICALLY SIGNIFICANT HIGHER VALUES FOR PROCESSED CASSAVA PRODUCTS WERE OBTAINED WITH THE ALKALINE PICRATE PROCEDURE WHICH MEASURED BOTH GLYCOSIDIC AND NONGLYCOSIDIC CYANIDE. THE SUGGESTION IS REAFFIRMED THAT HCN IN PROCESSED CASSAVA PRODUCTS MAY EXIST IN 2 FORMS: GLYCOSIDIC AND NONGLYCOSIDIC (ENTRAPPED) CYANIDE. (AS)

0826

25735 JENNINGS, D.L.; HERSHEY, C.H. 1984. CASSAVA BREEDING: A DECADE OF PROGRESS FROM INTERNATIONAL PROGRAMMES. IN RUSSELL, G.E., ED. PROGRESS IN PLANT BREEDING. LONDON, BUTTERWORTHS. V.1,PP.89-116. EN., 81 REF., IL. (SCOTTISH CROP RESEARCH INST., INVERGOWRIE, DUNDEE DD2 5DA, SCOTLAND)

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; GERMPLASM; FLOWERING; HYBRIDIZING; SEED; PLANT PHYSIOLOGICAL PROCESSES; ROOT PRODUCTIVITY; STARCH CONTENT; BACTERIOSES; VIROSES; MITE CONTROL; DISEASE CONTROL; RESISTANCE; CYANOGENIC GLUCOSIDES; COLOMBIA; NIGERIA.

THE ADVANCES IN CASSAVA BREEDING OVER A DECADE UP TO 1985 BY CIAT AND THE INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE (NIGERIA) ARE REVIEWED. TOPICS DEALT WITH INCLUDE GERMPLASM RESOURCES IN THE GENUS MANIHOT; CYTOGENETICS OF MANIHOT SPP.; GERMPLASM COLLECTION AND CONSERVATION; FLOWERING BEHAVIOR, HYBRIDIZATION TECHNIQUE, AND SEED MANAGEMENT; BREEDING STRATEGIES IN AFRICA, LATIN AMERICA, AND ASIA; AND THE PHYSIOLOGICAL BASIS OF HIGH YIELD WITH SPECIAL REFERENCE TO THE SIGNIFICANCE OF PLANT HABIT AND CRITERIA/PROCEDURES FOR SELECTING HIGH-YIELDING GENOTYPES. THE DIFFERENT USES OF CASSAVA REQUIRE BREEDING TO BE FOCUSSED ON (1) ROOT QUALITY (HCN,

STARCH CONTENT AND QUALITY, POSTHARVEST DETERIORATION, AND PROTEIN CONTENT); (2) TOLERANCE TO STRESS (SOIL ACIDITY, LOW P, DROUGHT, AND LOW TEMP.), AND (3) RESISTANCE TO DISEASES AND PESTS WITH SPECIAL REFERENCE TO CAMD, XANTHOMONAS CAMPESTRIS PV. MANIHOTIS, FUNGAL DISEASES (COLLETOTRICHUM SPP. AND ELSINOE BRASILIENSIS, AMONG OTHERS), MITES (MONONYCHELLUS TANAJOA Y M. MCGREGORI, TETRANYCHUS URTICAE, AND OLIGONYCHUS PERUVIANUS), MEALYBUGS (PHENACOCCUS SPP.), AND THRIPS. GERMPLASM DISTRIBUTION AND MULTIPLICATION ASPECTS ARE DISCUSSED. DATA INDICATE THAT AV. CASSAVA YIELDS HAVE INCREASED IN THE IMPACT AREAS OF BOTH PROGRAMS. (CIAT)

0827

28379 JOSHUA, A.; UTOH, N.O.; ADEGBUYI, E. 1981. PROGRESS AND PROBLEMS OF NATIONAL CASSAVA MULTIPLICATION. IN NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA. 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.105-109. EN.

CASSAVA; TECHNOLOGY TRANSFER; CASSAVA PROGRAMS; SEED; NIGERIA.

THE PROGRESS AND PROBLEMS OF THE NIGERIAN CASSAVA MULTIPLICATION INFRASTRUCTURE ARE SUMMARIZED. THE POLICIES, THE NATIONAL PROGRAM, THE SEED STRATEGY, AND THE NEED FOR CONTINUITY IN CASSAVA MULTIPLICATION ACTIVITIES ARE DISCUSSED. (CIAT)

0828

29599 KNIPSCHEER, H.C. 1980. Indices of Lagos retail prices for foodstaples: yam, gari, rice, cowpea, millet, maize and plantain). Ibadan, Nigeria, International Institute of Tropical Agriculture. Agricultural Economics Information Bulletin no.2 19p. En., Il.

CASSAVA; GARI; STATISTICAL DATA; PRICES; NIGERIA.

Figures of urban retail prices for the main crops produced in Lagos, Nigeria, including cassava as gari, are provided in table form on a monthly basis per year and quarterly basis per year for the period 1975-2nd quarter 1979; the Nov. 1974 price was used as a basis for comparison. These price indices reflect the yearly and seasonal variation as well as the general trend over the 5-yr period. Price trends of gari are graphed in a histogram for the period considered. (CIAT)

0829

29597 KNIPSCHEER, H.C. 1979. Prices (1973-1979) of major food crops in South West Nigeria (rice, maize, beans, gari, yam, and palm oil in Ibadan and Oyo rural regions). Ibadan, Nigeria, International Institute of Tropical Agriculture. Agricultural Economics Information Bulletin no.4 26p. En., Il.

CASSAVA; GARI; STATISTICAL DATA; ECONOMICS; PRICES; NIGERIA.

Data on rural retail prices for major food crops, including gari, in the zones of Oyo and Ibadan in SW Nigeria are given for the years 1973-79 on monthly, quarterly, and annual bases. Differences in rural retail prices and producer prices for the same zones are also provided for the years 1977 through 1979 in table form. (CIAT)

0830

30001 KNIPSCHEER, H.C. 1981. Rural retail prices (1979-1980) of major food crops in South West Nigeria. Ibadan, Nigeria, International Institute of Tropical Agriculture. Agricultural Economics Information Bulletin no.2 6p. En.

CASSAVA; GARI; STATISTICAL DATA; ECONOMICS; PRICES; NIGERIA.

Data on rural retail prices for major food crops, including gari, in the zones of Oyo and Ibadan in SW Nigeria are given on a monthly basis for 1979 and 1980. Research has shown that urban retail prices and rural retail prices for gari, among others, differ approx. 12-18 percent. (CIAT)

0831

30109 KWATIA, J.T. 1986. Animal feed rations using cassava meal. In Kwatia, J.T.. Rural Cassava Processing and Utilization Centre: report. Nigeria, United Nations Children's Fund. p.62. En.

CASSAVA; CASSAVA MEAL; ANIMAL NUTRITION; DIETS; FEEDS AND FEEDING; POULTRY; SWINE; NIGERIA.

The percentage rates at which dry CM can be used in animal feed rations are given as well as the full composition of a CM-based diet (40.8 percent) for layers to be prepared by farmers in Nigeria. Max. dry CM levels indicated for feeding several animal categories are 10 percent for broiler-starter chicks (0-4 wk.), 20 percent for broiler-finisher chicks (4 wk.), 10 percent for chick starter, 25 percent for pullet grower, 40 percent for layers, 30 percent for sow/boars, 10 percent for piglets (to 8 wk.), 25 percent for pigs from 8 to 16 wk., and 30 percent for pigs from 16 wk. to maturity. (CIAT)

0832

30105 KWATIA, J.T. 1986. Cassava flour process. In Kwatia, J.T. Rural Cassava Processing and Utilization Centre: report. Nigeria, United Nations Children's Fund. pp.50-51. En.

CASSAVA; SMALL-SCALE PROCESSING; CASSAVA FLOUR; PEELING; DRYING; SOLAR DRYING; STORAGE; NIGERIA.

The processing of cassava roots into CF is described. Steps towards its preparation include peeling and chipping, drying (sun drying or artificial drying), dried cassava chip storage, milling, and CF storage. (CIAT)

0833

30111 KWATIA, J.T. 1986. Cassava flour processing equipment. In Kwatia, J.T. Rural Cassava Processing and Utilization Centre: report. Nigeria, United Nations Children's Fund. pp.85-93. En., Il.

CASSAVA; PROCESSING; CASSAVA FLOUR; SMALL-SCALE EQUIPMENT; DRYING; SOLAR DRYING; GRINDING; NIGERIA.

CF processing equipment available in Nigeria, their characteristics, and general operation are described and illustrated. These include dryers (among them, solar dryers), chippers, and grinders (plate and hammer mills). (CIAT)

0834

30112 KWATIA, J.T. 1986. Cassava starch processing equipment. In Kwatia, J.T. Rural Cassava Processing and Utilization Centre: report. Nigeria, United Nations Children's Fund. pp.94-95. En.

CASSAVA; SMALL-SCALE PROCESSING; CASSAVA STARCH; SMALL-SCALE EQUIPMENT; RASPING; GRINDING; SCREENING; DRYING; NIGERIA.

Cassava starch processing equipment available in Nigeria, their characteristics, and general operation are described and illustrated. These include equipment for grating/grinding, sifting/screening, separation of starch and water, drying, and disintegration of cassava starch. (CIAT)

0835

30106 KWATIA, J.T. 1986. Flow chart for detoxified cassava flour. In Kwatia, J.T. Rural Cassava Processing and Utilization Centre: report. Nigeria, United Nations Children's Fund. p.52. En.

CASSAVA; PROCESSING; DETOXIFICATION; CASSAVA FLOUR; NIGERIA.

A simple flow chart illustrating the production of detoxified CF is presented. After peeling, chipping, and drying, cassava chips are purified (90 percent of cyanides removed) through soaking and drying, and then detoxified chips (95 percent of cyanides removed) are obtained by oven drying. Grinding and sieving of the latter produce detoxified CF (30 percent yield). (CIAT)

0836

30110 KWATIA, J.T. 1986. Gari processing equipment. In Kwatia, J.T. Rural Cassava Processing and Utilization Centre: report. Nigeria, United Nations Children's Fund. pp.63-84. En., Il.

CASSAVA; GARI; SMALL-SCALE PROCESSING; SMALL-SCALE EQUIPMENT; PEELING; WASHING; RASPING; FERMENTATION; PRESSING; SCREENING; FRYING; DETOXIFICATION; HCN CONTENT; NIGERIA.

Gari processing equipment available in Nigeria, their characteristics, and general operation are described and illustrated. These include technology for cassava peeling, washing, grating/rasping, fermentation, dehydration, sifting, and frying. (CIAT)

0837

30113 KWATIA, J.T. 1986. List of manufacturers and prices of the cassava processing equipment. In Kwatia, J.T. Rural Cassava Processing and Utilization Centre: report. Nigeria, United Nations Children's Fund. pp.96-100. En., Dat.num.

CASSAVA; PROCESSING; SMALL-SCALE EQUIPMENT; GARI; CASSAVA FLOUR; CASSAVA STARCH; PRICES; MANUFACTURERS; NIGERIA.

Manufacturers of cassava processing equipment with the resp. technical characteristics and prices are listed. Equipment listed includes cassava graters, mash pressing and sieving machines, and fryers for gari processing; dryers, chippers, and grinders for CF processing; and screening machines, dryers, and pulverizers for cassava starch processing. (CIAT)

0838

30114 KWATIA, J.T. 1986. Machinery/equipment for the Rural Cassava Processing and Utilization Centre. In Kwatia, J.T.. Rural Cassava Processing and Utilization Centre: report. Nigeria, United Nations Children's Fund. pp.101-103. En., Dat.num., Il.

CASSAVA; PROCESSING; MECHANIZATION; GARI; CASSAVA FLOUR; CASSAVA STARCH; PRICES; NIGERIA.

The machinery and equipment required by the Nigerian rural cassava processing and utilization centers are listed. A brief description is included for each and the output expected, no. of units needed, price/unit, and total price, are detailed. A grater, a press, a sieving machine, and fryers are required for gari processing. A hammer mill, a drum dryer, and a screening machine are required for cassava starch processing. A chipper, a dryer, and a grinder are required for CF and chip processing. The layout of the cassava processing and utilization center is diagramed. (CIAT)

0839

30107 KWATIA, J.T. 1986. Recipes, using cassava flour. In Kwatia, J.T. Rural Cassava Processing and Utilization Centre. Nigeria, United Nations Children's Fund. pp.53-58. En.

CASSAVA; HUMAN NUTRITION; RECIPES; CASSAVA FLOUR; USES; BAKERY PRODUCTS; NIGERIA.

The ingredients and methods of preparation of 11 recipes using CF are presented. The recipes are for doughnuts, drop scones, muffins, banana bread, baking powder biscuits, akara balls, cookies, lemon cake, and cassava/wheat bread. (CIAT)

0840

30103 KWATIA, J.T. 1986. Recommended improved storage methods for small-scale farmer. In Kwatia, J.T. Rural Cassava Processing and Utilization Centre: report. Nigeria, United Nations Children's Fund. pp.42-45. En., Il.

CASSAVA; ROOTS; STORAGE; SMALL-SCALE PROCESSING; TECHNOLOGY; NIGERIA.

Two improved cassava storage methods recommended for small-scale farmers in Nigeria are described. Materials and procedures are given for the storage of cassava roots in sawdust in boxes, cartons, or baskets suitable for small-scale farmers or processors, and storage in trenches which can be used by large-scale farmers or processors or by agricultural or agro-processing cooperatives. Cassava roots can be stored fresh for 6-8 wk. using either method. (CIAT)

0841

30439 KWATIA, J.T. 1987. Report on the existing cassava storage and processing technologies in southern Nigeria with a view to making recommendations for the establishment of the rural cassava processing and utilization centre. Ibadan, Nigeria, 83p. En., Sum. En., 40 Ref., Il.

CASSAVA; CASSAVA PROGRAMS; INDUSTRIALIZATION; DEVELOPMENTAL RESEARCH; TECHNOLOGY EVALUATION; PROCESSING; STORAGE; SOCIOECONOMIC ASPECTS; CASSAVA FLOUR; RECIPES; CASSAVA STARCH; CASSAVA CHIPS; LABOR; SMALL-SCALE EQUIPMENT; SMALL-SCALE PROCESSING; GARI; WOMEN; NIGERIA.

A survey was conducted on the existing cassava processing and storage technologies to design appropriate cassava processing and utilization centers in the Owo and Oyo areas of Nigeria. Problems identified in traditional cassava processing were classified into 3 groups: scientific, engineering, and socioeconomic, each of which is described in detail. Alternative uses of cassava were found to be CF, cassava starch, and cassava chips, products which can be easily manufactured at the intermediate level of technology. Three major aspects involved in the engineering technology for cassava processing in Nigeria are discussed: (1) role of the informal engineering sector, (2) machines and implements for cassava processing, and (3) need for the regional and interregional transfer of cassava processing technology. Results of rapid assessment surveys carried out in Oyo and Owo on the place of cassava in household food security are included, and the role of women in cassava processing is assessed. The different aspects taken into account for the rural cassava processing and utilization center are also explained in detail: objectives, location, structure and layout, production output and raw material requirements, capital requirements, and phased implementation. Appendixes are included on recommended improved cassava storage technologies for the small-scale farmer, traditional cassava processing technologies, CF processing, flow chart for detoxified CF, 11 recipes using CF, starch processing, animal feed rations using CM, and for

processing cassava starch, gari, and CF (with corresponding diagrams). Manufacturers and prices of the cassava processing equipment and the machinery/equipment necessary for the rural cassava processing and utilization center are listed. (CIAT)

0842

30102 KWATIA, J.T. 1986. Rural Cassava Processing and Utilization Centre: report. Nigeria, United Nations Children's Fund. 113p. En., Sum. En., 40 Ref., Il.

CASSAVA; STORAGE; PROCESSING; SMALL-SCALE PROCESSING; SMALL-SCALE EQUIPMENT; DETOXIFICATION; PROCESSED PRODUCTS; CASSAVA FLOUR; CASSAVA STARCH; CASSAVA CHIPS; GARI; CASSAVA MEAL; ABACHA; PUPURU; FOOFOO; PEELING; DRYING; RASPING; SCREENING; WASHING; FERMENTATION; PRESSING; FRYING; CHIPPING; GRINDING; MANUFACTURERS; USES; BAKERY PRODUCTS; ANIMAL NUTRITION; DIETS; FEEDS AND FEEDING; POULTRY; SWINE; SOCIOECONOMIC ASPECTS; NIGERIA.

Cassava is grown at present in Nigeria mainly as a food source, but its processing into various products is one of the major informal food industries in the country. Thus, a complete study of existing technologies for the processing and utilization of cassava, its problems, and alternative uses through surveys and extensive reviews was conducted to identify appropriate technologies and to design suitable cassava processing and utilization centers in Owo and Oyo. The objectives, women's role, location, structure, layout, and capital requirements for the latter are described. Recommended cassava storage technologies are given as well as descriptions of traditional processing technologies, production of detoxified CF, uses of CF, cassava starch processing, animal feed rations using CM, and gari. Equipment required for CF and starch processing is indicated as well as that needed for the rural cassava processing and utilization centers. Final recommendations are to (1) identify, transfer, and adapt suitable low-cost cassava processing technologies from other African countries, Asia, and Latin America; (2) introduce improved technology for traditional cassava processing; (3) demonstrate new areas of cassava processing and utilization through the introduction of new cassava products, and (4) establish the rural cassava processing and utilization centers in Owo and Oyo. Individual papers are recorded in this publication under the following consecutive no.: (CIAT)

0843

30108 KWATIA, J.T. 1986. Starch process. In Kwatia, J.T.. Rural Cassava Processing and Utilization Centre: report. Nigeria, United Nations Children's Fund. pp.59-61. En.

CASSAVA; SMALL-SCALE PROCESSING; SMALL-SCALE EQUIPMENT; CASSAVA STARCH; PEELING; WASHING; RASPING; SCREENING; DRYING; STORAGE; NIGERIA.

The operations involved in the processing of cassava roots into starch are described, namely, root peeling and washing, rasping, screening, water and starch separation, drying, finishing and bagging. The equipment necessary for small-scale starch production (200 kg dry starch/day) is listed. Included are a grater or hammer mill, a sieving machine, woven or wooden trays, a dryer, and ancillary equipment. (CIAT)

0844

30104 KWATIA, J.T. 1986. Traditional cassava processing technologies. In Kwatia, J.T. Rural Cassava Processing and Utilization Centre: report. Nigeria, United Nations Children's Fund. pp.46-49. En.

CASSAVA; SMALL-SCALE PROCESSING; PROCESSED PRODUCTS; CASSAVA FLOUR; ABACHA; PUPURU; GARI; FOOFOO; NIGERIA.

Traditional cassava processing technologies used in Nigeria are briefly described for different food products: lafun, abacha, unfermented CF, pupuru, gari, and foofoo. (CIAT)

0845

28316 KWATIA, J.T. 1985. WOMEN AND SMALL-SCALE AGRO-PROCESSING INDUSTRIES. IBADAN, NIGERIA, INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE. 37P. EN. PAPER PRESENTED AT OYO STATE CO-OPERATIVE SEMINAR WOMEN ANDYOUTHS:POTENTIAL AREAS FOR CO-OPERATIVE MOVEMENT EXPANSION.

CASSAVA; DEVELOPMENT; SMALL-SCALE PROCESSING; SOCIOECONOMIC ASPECTS; TECHNOLOGY TRANSFER; GARI; PROCESSING; CREDIT; LABOR; MECHANIZATION; INDUSTRIALIZATION; WOMEN; COOPERATIVES; NIGERIA.

WOMEN'S PARTICIPATION IN THE INFORMAL SECTOR OF THE ECONOMY IS ANALYZED AND AN EXAMPLE OF A SURVEY AMONG WOMEN INVOLVED IN GARI PROCESSING ON A SMALL-SCALE LEVEL IS PRESENTED. OUT OF 40 WOMEN INTERVIEWED, 37.5 PERCENT WERE GARI PRODUCERS INVOLVED IN ALL 6 MAJOR PROCESSING STAGES (PEELING AND WASHING, GRATING, DEHYDRATION, SIEVING, DRYING, AND FRYING). A BREAKDOWN OF HOURS DEVOTED TO EACH STAGE IS PRESENTED AND THE PROBLEMS INVOLVED IN THE USE OF EQUIPMENTS, ATTITUDES TOWARDS NEW TECNOLOGIES, AND PRODUCTION PROBLEMS AREDISCUSSED. THE SOLUTIONS PROPOSED BY WOMEN ARE LISTED. RECOMMENDATIONS DISCUSSED RELATE TO THE ORGANIZATION OF WOMEN IN COOPERATIVES, CREDIT FACILITIES, SUPPLY OF INPUTS, SELECTIVE MECHANIZATION OF PROCESSES, EFFECTIVETRANSPORTATION AND MARKETING SYSTEMS, SOCIOCULTURAL REDIRECTION OF SOCIETY, AND INTEGRATION OF ACTIVITIES OF WOMEN-RELATED AGENCIES. (CIAT)

0846

28534 LAWANI, S.L. 1987. COMBATING PESTS AND DISEASES OF TROPICAL ROOT AND TUBER CROPS. COURIER NO.101:85-88. EN., SUM. EN., IL. (INTERNATIONAL INST. OF TROPICAL AGRICULTURE, P.M.B. 5320, IBADAN, NIGERIA)

CASSAVA; PEST CONTROL; BIOLOGICAL CONTROL; EPIDINOCARSIS LOPEZI; DISEASES AND PATHOGENS; CULTIVARS; PHENACOCCUS MANIHOTI; MONONYCHELLUS; RESISTANCE; NIGERIA.

THE STATEGIES BEING DEVELOPED IN AFRICA FOR THE CONTROL OF MAJOR PESTS AND DISEASES OF ROOT AND TUBER CROPS, AMONG THEM CASSAVA, ARE BRIEFLY REVIEWED. A POSITIVE RELATIONSHIP HAS BEEN OBSERVED IN BREEDING FOR RESISTANCE TO CAMD AND CBB, THE MAJOR CASSAVA DISEASES IN AFRICA; APPROX. 12 HIGH YIELDING AND RESISTANT CASSAVA VAR. HAVE BEEN RELEASED BY INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE IN 11 COUNTRIES AND TISSUE CULTURES HAVE BEEN SENT TO 31 COUNTRIES OF THE REGION. SUCCESSFUL BIOLOGICAL CONTROL PROGRAMS HAVE BEEN CONDUCTED TO CONTROL PHENACOCCUS MANIHOTI IN SEVERAL COUNTRIES THROUGH MASS RELEASES OF THE PREDATOR EPIDINOCARSIS LOPEZI; THE AIMIS TO ESTABLISH A COMPLEX OF ENEMY SPECIES. WORK ON THE BIOLOGICAL CONTROL OFMONONYCHELLUS SPP., ANOTHER OF THE MAJOR PESTS IN THE REGION, IS STILL AT AN EARLY STAGE AND EMPHASIS HAS BEEN PLACED ON THE USE OF 3 PHYTOSEIID MITE PREDATORS, INTRODUCED FROM SOUTH AMERICA. (CIAT)

0847

28587 LEMA, K.M. 1986. FURTHER STUDIES ON GREEN MITE RESISTANCE IN CASSAVA. IITA RESEARCH BRIEFS 7(1):7. EN.

CASSAVA; MONONYCHELLUS TANAJOA; MONONYCHELLUS PROGRESSIVUS; CULTIVARS; RESISTANCE; CLONES; PEST DAMAGE; NIGERIA.

TEN CASSAVA CLONES WERE PLANTED AT THE INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE (IBADAN, NIGERIA) FOR SCREENING AND MONONYCHELLUS TANAJOA/M. PROGRESSIVUS POPULATION DYNAMICS STUDIES. THE 1ST RESULTS INDICATED THAT TMS

91934, A PUBESCENT AND HIGH YIELDING CLONE, CONSISTENTLY SHOWED THE LOWEST DAMAGE SCORE, WHILE IN SOME FIELDS MITE POPULATIONS WERE ASHIGH AS IN MOST CLONES. BETWEEN PUBESCENCE AND DAMAGE SCORE, WHILE THE CORRELATION BETWEEN PUBESCENCEAND MITE POPULATION LEVELS WAS NOT SIGNIFICANT (R = - 0.50). (CIAT)

0848

28307 LEUSCHNER, K.; TERRY, E.; AKINLOSOTU, T. 1980. FIELD GUIDE FOR IDENTIFICATION AND CONTROL OF CASSAVA PESTS AND DISEASES IN NIGERIA. IBADAN, NIGERIA, INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE. MANUAL SERIES NO.3. 19P. EN., IL.

CASSAVA; OLIGONYCHUS GOSSYPII; MONONYCHELLUS TANAJOA; PHENACOCCUS MANIHOTI; ZONOCERUS VARIEGATUS; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BACTERIAL BLIGHT; COLLETOTRICHUM MANIHOTIS; FOMES LIGNOSUS; PHYTOPHTHORA; PEST CONTROL; DISEASE CONTROL; SYMPTOMATOLOGY; INSECT BIOLOGY; NIGERIA.

THE SYMPTOMS, LIFE CYCLE, SPREAD, CONTROL, AND HISTORY OF THE MAJOR INSECT PESTS OF CASSAVA IN NIGERIA (OLIGONYCHUS GOSSYPII, MONONYCHELLUS TANAJOA, PHENACOCCUS MANIHOTI, AND ZONOCERUS VARIEGATUS) ARE BRIEFLY DESCRIBED AND ILLUSTRATED. INFORMATION IS ALSO GIVEN ON THE SYMPTOMS, CAUSALAGENT, DISSEMINATION, AND CONTROL OF MAJOR DISEASES: CAMD, CBB, ANTHRACNOSE (COLLETOTRICHUM MANIHOTIS) AND ROOT ROTS CAUSED BY PHYTOPHTHORA AND FOMES LIGNOSUS. (CIAT)

0849

32236 LOEHR, B. 1986. The cassava mealybug, Phenacoccus manihoti Mat.-Ferr., in Paraguay: further information on occurrence and population dynamics of the pest and its natural enemies. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. pp.57-69. En. 6 Ref., Il. (Inst. Agronomico Nacional, Km. 48, CAACUPI, Paraguay)

CASSAVA; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; BIOLOGICAL CONTROL; INSECT BIOLOGY; PARAGUAY; NIGERIA.

Monthly evaluations from Aug. 1982 to Jan. 1983 were conducted on population dynamics of Phenacoccus manihoti and its natural enemies in cassava fields in 3 sites of Paraguay (Fulgencio Yegros, San Vicente, and Ypacaraí). The most important parasite species encountered was Epidinocarsis lopezi (12.0-83.5 percent of all mummified mealybugs collected yielded this species). An undescribed encyrtid occurred occasionally. Few Aecrophagus sp. were detected. Hyperparasitism of E. lopezi by Prochiloneurus dactylopii (7.7-86.7 percent) and Chartocerus sp. (3.4-33.3 percent) was observed. Parasitism of P. manihoti by E. lopezi increased from 20 percent in Aug. to 40 percent in Sept. and Oct. at all sites, with peaks of 76 percent in San Vicente in Nov., 54 percent in Fulgencio Yegros in Dec., and 86 percent in Ypacaraí in Jan. The most important P. manihoti predators were Ocyptamus spp. followed by Hyperaspis notata and Symmus sp./Diomus sp., and other occasional ones (Sympherobius sp., Chysoperla externa, Ceraeochryda sp., Nephus sp., Exochomus sp., and Kalodiplosis sp.). Strong fluctuations of no. of predators/shoot were observed at all sites. (CIAT)

0850

32079 LONGE, O. 1979. Energy values of cassava, maize and guinea corn starches and their residues for chicks. Nigerian Journal of Agricultural Sciences 1(1):27-30. En., Sum. En., 19 Ref.

CASSAVA; CASSAVA STARCH; WASTE UTILIZATION; CHICKS; ANIMAL NUTRITION; METABOLISM; ANIMAL PHYSIOLOGY; NIGERIA.

Starches with CP were isolated from maize, guinea corn, and cassava (0.77, 1.43, and 0.47 percent DM, resp.), leaving residues with 13.50, 17.06, and 3.10 percent CP and 9.01, 10.89, and 6.72 percent crude fiber. Chickens 2 to 5 wk. old were given either a practical reference diet with 20 percent CP or 1 of 6 diets in which starch or residue at 30 percent replaced equal percentages of glucose in the reference diet. The ME value of maize, guinea corn, and cassava starches was 3.67, 3.51, and 3.88, resp., and for the residues 1.86, 1.72, and 1.31 kcal/g. Body wt. gain was 228, 305, 279, 226, 345, 347, and 179 g for the reference diet, maize starch, guinea corn starch, cassava starch, and the resp. residues. All differences were significant except between the reference and cassava starch diets. Feed intake was 3.06 and 2.46 g/g gain, resp., for the diets including cassava starch and cassava starch residues, compared with 3.32 g/g gain for the reference diet. Tables are included with proximate composition of the 6 products tested and their GE and ME values. (CIAT)

0851

29445 LONGE, O.G. 1984. Effects of increasing the fibre content of a layer diet. British Poultry Science 25(2):187-193. En., Sum. En., 33 Ref. (Dept. of Animal Science, Univ. of Ibadan, Ibadan, Nigeria)

CASSAVA; DIETS; POULTRY; CORTEX; CASSAVA STARCH; FEEDS AND FEEDING; NUTRITIVE VALUE; ANIMAL NUTRITION; NIGERIA.

The fiber content of a basal diet fed to laying hens was increased from 149.2 to 218.6-292.3 g/kg by the inclusion of various fibrous farm wastes and by-products at 200 g/kg diet. The fibrous ingredients lowered the ME of the basal diet from 11.82 to 9.31-11.21 MJ/kg. Utilization (g food/kg egg) of the basal diet was not significantly different from values for diets containing maize cob, cassava, (peel or starch), or maize starch residues. The diet containing maize cob supported a performance similar to that of the basal diet, despite a lower energy content (10.08 MJ/kg). Diets containing cowpea shell, cassava peel, or sawdust, with lower energy contents, and those containing maize starch residue, palm kernel meal, or dried brewers grains, with higher energy contents, were not as good. The diet containing cassava starch residue supported similar egg production to the basal but egg size was smaller. Inclusion of some of the fiber sources caused slight decreases in yolk cholesterol, although this could not be correlated with dietary fiber content. Additional dietary fiber caused slight increases in gizzard wt. but this was also not simply related to dietary fiber content. (AS)

0852

31649 MAKAME, M.; AKORODA, M.O.; HAHN, S.K. 1987. Effects of reciprocal stem grafts on cyanide translocation in cassava. Journal of Agricultural Science (Australia) 109(3):605-608. En., 12 Ref. (International Inst. of Tropical Agriculture, P.M.B. 5320, Ibadan, Nigeria)

CASSAVA; ANALYSIS; GRAFTING; HCN CONTENT; LEAVES; ROOTS; TIMING; CULTIVARS; SELECTION; NIGERIA.

Reciprocal and self-grafts of mature and healthy stems of 3 improved cassava var. (TMS 30001, TMS 30572, and TMS 50395 with low, moderate, and high HCN concn., resp.) were conducted to study their HCN content in leaves at 3, 6, and 9 mo. after planting and in roots at harvest. Leaf and root HCN assessments confirm the predominant influence of scion (leaf or shoot) as a source of HCN that is accumulated in roots. However, the C.V. ($r(2) = 0.233$) was small and thus measurement of leaf HCN is not a reliable method for

selecting roots with low HCN. There appeared to be no relation between root HCN and plant age. The greater variability of HCN content among scions (C.V. = 39.1 percent) than among stocks (C.V. = 12.3 percent) indicates that scion HCN production greatly influences but is not the only determinant of HCN concn. in roots. As expected, TMS 50395 roots contained the most HCN in both scion (7.22 mg/100 g) or stock (5.44 mg/100 g). For edible cassava leaves, screening of genotypes based on direct assessment of leaf HCN is important. Low HCN in roots should be selected on the basis of accurate root HCN determinations in early breeding generations using peeled roots. (CIAT)

0853

30438 MBA, C.A. 1985. Intercropping cassava (Manihot esculenta Crantz) and cowpea (Vigna unguiculata (L.) Walp.) at different planting patterns in South-Western Nigeria. Dr.Sc.Agr. Thesis. Berlin, West Germany, Institute of Crop Science. Technical University Berlin. 132p. En., Sum. En., De., 77 Ref., Il.

CASSAVA; INTERCROPPING; COWPEA; PLANTING; SPACING; GROWTH; PLANT HEIGHT; ROOT PRODUCTIVITY; LEAF AREA; ROOTS; DRY MATTER; NIGERIA.

Three field expt. on cassava-cowpea intercropping were carried out at the International Institute of Tropical Agriculture in Ibadan, Nigeria, from Dec. 1981 to Nov. 1983 during the dry, major, and minor rainy seasons. Branching cassava var. TMS 30572 was intercropped either with the determinate cowpea var. TVx 3236 or with the indeterminate cowpea var. TVx 1948-01F at different planting patterns: within row, alternate rows, and alternate double rows. Sole crops of cassava and cowpea at 10,000 and 50,000 plants/ha, resp., were planted as control. Cowpea var. complete their life cycle in about 3 mo. while the cassava var. generally becomes due for harvest as from 12 mo. after planting. The effect of the different planting patterns on the component crops and the extent the intercrop cassava overcame the adverse cowpea competition of the early growth phase were determined. During the intercropping period, sequential harvesting and observation dates were chosen using the cowpea growth stages as criteria. After the cowpea harvest, sampling dates were set at 3-mo. intervals. In addition to the field trials, a container expt. was set up in which cowpea plants were removed at 25, 35, 45, 60, 80, and 90 days after planting. The expt. was harvested at 90 days. Results indicated that growth and yield were influenced by weather conditions, especially the water regime. Apparently, high rainfall was more conducive for the vigorous cowpea growth and that consequently caused more suppression of cassava. The reduction of cassava total DM yield was related to the close planting distances. Under optimum water regime, competition for the aboveground growth resources, presumably light, was more pronounced. But, under limited water supply, the competition for water was prominent: cowpea used its deep and extensive root system to explore effectively the available soil moisture to the detriment of cassava. After cowpea harvest, the ability of cassava to overcome the early growth competition depended on the extent of the growth suppression it suffered earlier. In addition, it appeared that plant growth vigor in alternate double row intercropping determined whether the root systems of both crops interacted effectively or not. This, in turn, determined whether intercropping was beneficial or not. These reflected on cassava fresh storage root yields at final harvest. None of the methods of yield assessment seemed to have satisfactorily indicated yield advantage of the intercropping. A combination of relevant models is, therefore, essential for the conclusive yield advantage to be identified. (AS (extract))

0854

30128 MUIMBA-KANKOLONGO, A.; TERRY, E.R.; ADENIJI, M.O. 1987. A disease-like injury on cassava caused by Pseudotheraptus devastans Dist. (Heteroptera:

Coreidae). Tropical Pest Management 33(1):35-38. En., Sum. En., 10 Ref., Il. (National Programme Manioc, B.P. 11635 Kinshasa 1, Zaire)

CASSAVA; PSEUDOTHERAPTUS DEVASTANS; PEST DAMAGE; INJURIOUS INSECTS; NIGERIA.

A disease-like injury on cassava due to feeding by Pseudotheraptus devastans is described. Exptl. data reveal that cassava plants are more severely damaged by males than females. Observations indicate the existence of a preferential feeding habit of P. devastans for certain clones, and there were linear relationships between the no. of lesions and the insect population, with some relationship to duration of feeding. (AS)

0855

32211 NEUENSCHWANDER, P.; HAMMOND, W.N.O.; HERREN, H.R. 1987. Biological control of the cassava mealybug (Phenacoccus manihoti) by the exotic parasitoid, Epidinocarsis lopezi. In Terry, E.R.; Akoroda, M.O.; Arene, O.B., eds. Triennial Symposium of the International Society for Tropical Root Crops- Africa Branch, 3d, Owerri, Nigeria, 1986. Tropical root crops; root crops and the African food crisis: proceedings. Ottawa, Canada, International Development Research Centre. pp.98-104. En., Sum. En., 26 Ref., Il. (International Inst. of Tropical Agriculture, P.M.B. 5320, Oyo Road, Ibadan, Nigeria)

CASSAVA; PHENACOCCUS MANIHOTI; BIOLOGICAL CONTROL; INSECT CONTROL; PREDATORS AND PARASITES; MAPS; NIGERIA.

The activities of the Africa-wide Biological Control Project on Epidinocarsis lopezi are reviewed. Since its accidental introduction into Africa, the cassava mealybug (Phenacoccus manihoti) has spread through about 70 percent of the cassava belt. From South America, the area of origin of P. manihoti, the specific parasitoid E. lopezi was introduced into Nigeria. Since 1981, it has been released in 12 countries. The potential efficiency of E. lopezi is exhibited by its remarkable spread and establishment. By Dec. 1985, the parasitoid was established in 13 African countries covering 650,000 square kilometers. In SW Nigeria, P. manihoti population declined after the 2 initial releases and stayed low. During the same period, populations of indigenous predators of P. manihoti, mainly coccinellids, and indigenous hyperparasitoids of E. lopezi declined because of a reduced supply of food and hosts, resp. The efficiency of E. lopezi was investigated experimentally by physical and chemical exclusion methods. In 2 sleeve cage expt., P. manihoti populations were 7.0 and 2.3 times lower on artificially infested cassava tips covered with open sleeves than on cassava tips with closed sleeves, which excluded natural enemies. Similarly, P. manihoti populations were higher in fields where parasitoids were excluded chemically than in fields with natural enemies (200 vs. 10/tip). These results are discussed in view of the special suitability of biological control for subsistence farming in Africa. (AS)

0856

28394 NEUENSCHWANDER, P.; SCHULTHESS, F.; MADOJEMU, E. 1986. EXPERIMENTAL EVALUATION OF THE EFFICIENCY OF EPIDINOCARSIS LOPEZI, A PARASITOID INTRODUCED INTO AFRICA AGAINST THE CASSAVA MEALYBUG PHENACOCCUS MANIHOTI. ENTOMOLOGIA EXPERIMENTALIS ET APPLICATA 42(2):133-138. EN., SUM. EN., FR., 18 REF., IL. (INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE, IBADAN, NIGERIA)

CASSAVA; PREDATORS AND PARASITES; EPIDINOCARSIS LOPEZI; PHENACOCCUS MANIHOTI; BIOLOGICAL CONTROL; EXPERIMENT DESIGN; NIGERIA.

THE CAPABILITY OF EPIDINOCARSIS LOPEZI TO CONTROL THE CASSAVA MEALYBUG (PHENACOCCUS MANIHOTI) WAS INVESTIGATED IN NIGERIA USING PHYSICAL AND

CHEMICAL EXCLUSION EXPT. IN 2 SLEEVE CAGE EXPT. MEALYBUG POPULATIONS, ABOUT 2MO. AFTER ARTIFICIAL INFESTATION, WERE 7.0 AND 2.3 TIMES LOWER ON ARTIFICIALLY INFESTED CASSAVA TIPS COVERED WITH OPEN CAGES THAN ON TIPS IN CLOSED CAGES WHICH EXCLUDED MOST PARASITOIDS. ON SIMILARLY INFESTED BUT UNCOVERED TIPS, MEALYBUG POPULATIONS WERE 24.3 AND 37.5 TIMES LOWER, AND PARASITIZATION RATES WERE HIGHER. IN AN ARTIFICIALLY INFESTED FIELD TREATED WEEKLY WITH CARBARYL, PARASITIZATION RATES WERE BELOW 10 PERCENT AND MEALYBUGPOPULATIONS EXCEEDED 200/TIP. IN THE CHEMICALLY UNTREATED PLOT, PARASITIZATION RATES WERE UP TO 25 PERCENT AND MEALYBUG DENSITIES WERE MOSTLY BELOW 10/TIP. THE EFFICIENCY OF E. LOPEZI IN CONTROLLING ITS HOST UNDER THE EXPTL. CONDITIONS WAS DEMONSTRATED. (AS)

0857

29448 NEUENSCHWANDER, P.; MADOJEMU, E. 1986. MORTALITY OF THE CASSAVA MEALYBUG, PHENACOCCUS MANIHOTI MAT.- FERR. (HOM., PSEUDOCOCCIDAE), ASSOCIATED WITH AN ATTACK BY EPIDINOCARSIS LOPEZI. BULLETIN DE LA SOCIETE ENTOMOLOGIQUE SUISSE 59(1-2):57-62. EN., SUM. EN., 19 REF.

CASSAVA; PHENACOCCUS MANIHOTI; EPIDINOCARSIS LOPEZI; BIOLOGICAL CONTROL; PREDATORS AND PARASITES; NIGERIA.

CASSAVA MEALYBUGS OF DIFFERENT STAGES, WHICH HAD BEEN STUNG BY AN EPIDINOCARSIS LOPEZI FEMALE, WERE INSPECTED AFTER 6 AND 20 DAYS. THE KILLING POWER OF THE PARASITOID WAS SEVERAL TIMES HIGHER THAN THE PRODUCTION OF PARASITOID OFF-SPRING. HOST FEEDING AND MUTILATION WERE RESPONSIBLE FOR 6-22 PERCENT AND 11-34 PERCENT MORTALITY, RESP. BOTH WERE SIGNIFICANTLY MORE IMPORTANT ON THE YOUNGER HOSTS. OF THE STUNG CASSAVA MEALYBUGS, 11-33 PERCENT YIELDED LIVE PARASITOIDS. REPRODUCTION WAS SIGNIFICANTLY MORE SUCCESSFUL ON OLDER CASSAVA MEALYBUGS; 30-56 PERCENT OF ALL CASSAVA MEALYBUGS SURVIVED A SINGLE OVIPOSITION ATTEMPT BY THE WASP. BY CONTRAST, MORTALITY OF THE UNSTUNG CONTROL WAS 4-8 PERCENT. IN CHOICE EXPT., 3RD INSTAR CASSAVA MEALYBUGS WERE SLIGHTLY BUT NOT SIGNIFICANTLY PREFERRED. (AS)

0858

30812 NG, Q. 1986. Germplasm collection and conservation at IITA. PGRC/E-ILCA Germplasm Newsletter no.13:33-36. En. (IITA, P.M.B. 5320, Oyo Road, Ibadan, Nigeria)

CASSAVA; GERMPLASM; GENETICS; PLANT BREEDING; NIGERIA.

An account is given of the germplasm collection at the International Institute for Tropical Agriculture (Nigeria) and the methods for its conservation. Of the more than 29,000 accessions of 15 crops, 3000 are of root and tuber crops; of these, 2000 are of Manihot esculenta and another 48 of wild Manihot spp. The distribution of germplasm between 1978-84 to the different continents (over 50 countries) is listed. (CIAT)

0859

28118 NG, S.Y.; HAHN, S.K. 1986. APPLICATION OF TISSUE CULTURE TO TUBER CROPS AT IITA. IN INTER-CENTER SEMINAR ON INTERNATIONAL AGRICULTURAL RESEARCH CENTERS AND BIOTECHNOLOGY, MANILA, PHILIPPINES, 1984. BIOTECHNOLOGY IN INTERNATIONAL AGRICULTURAL RESEARCH. MANILA, INTERNATIONAL RICE RESEARCH INSTITUTE. PP.29- 40. EN., SUM. EN., 39 REF., IL. (INTERNATIONAL INST. OF TROPICAL AGRICULTURE, OYO ROAD, P.M.B. 5320, IBADAN, NIGERIA)

CASSAVA; BIOTECHNOLOGY; APICAL MERISTEMS; PLANT TISSUES; TISSUE CULTURE; GERMPLASM; NIGERIA.

THE 5-YR TISSUE CULTURE RESEARCH AT THE INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE (IBADAN, NIGERIA) IS SUMMARIZED. MERISTEM CULTURE HAS BEEN USED TO ELIMINATE DISEASE IN TUBER CROPS: DISEASE- FREE PLANTS CAN BE DISTRIBUTED

IN VITRO TO REQUESTING NATIONAL PROGRAMS. DISEASE-FREE CASSAVA HAS BEEN DISTRIBUTED TO OVER 30 COUNTRIES IN AFRICA. ARRANGEMENTS FOR IN VITRO TUBER CROP GERMPLASM EXCHANGE ARE DESCRIBED. (AS (EXTRACT))

0860

27631 NG, S.Y.C. 1985. RECOMMENDATIONS FOR HANDLING TISSUE CULTURE MATERIALS (SWEET POTATO, YAM AND CASSAVA). IBADAN, NIGERIA, INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE. MANUAL SERIES NO.6. 13P. EN., IL.

CASSAVA; TISSUE CULTURE; PLANT REPRODUCTION; NIGERIA.

A SERIES OF RECOMMENDATIONS FOR HANDLING TISSUE CULTURE MATERIALS OF SWEET POTATO, YAM, AND CASSAVA DURING TRANSPORT AND UPON ARRIVAL ARE GIVEN. FACTORS AFFECTING THE SURVIVAL RATE ARE BRIEFLY DISCUSSED, NAMELY THE SELECTION OF THE CULTURE AND PRETREATMENT, THE SUBSTRATE USED FOR TRANSPLANTING, HUMIDITY CONTROL, TEMP., AND WATERING. THE PROCEDURES FOR TRANSPLANTING THE DIFFERENT TISSUE CULTURES ARE BRIEFLY DESCRIBED AND ILLUSTRATED. (CIAT)

0861

29355 NJOKU, B.O. 1982. Effect of time and source of N application on sole cassava. In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, pp.19-21. En.

CASSAVA; FERTILIZERS; TIMING; N; ROOT PRODUCTIVITY; NIGERIA.

The effects of 3 N sources (ammonium sulphate, calcium ammonium nitrate, and urea) at 2 rates (60 and 120 kg/ha) and 3 different times of application (8, 16, and 20 wk. after planting) on cassava root yields were investigated at 3 Nigerian sites (Umudike, Igbariam, and Otobi) 12 mo. after planting. Under Umudike conditions, cassava planted in June gave significantly higher yields when N was applied at 20 wk. (13.6 t/ha) than at 16 wk. (10.1 t/ha). In Igbariam where cassava was planted in July, yield differences were not significant but N applied 20 wk. after planting gave 10 percent higher yields (17.3 t/ha) than at 8 wk. (15.7 t/ha). Yields were depressed in Otobi as N application time increased, with a yield reduction of approx. 30 percent when N was applied at 20 wk. (12.5 vs. 16.3 t/ha when N was applied at 8 wk. after planting). Results suggest that under high rainfall conditions split N applications are desirable for early vegetative growth and rapid root bulking. (CIAT)

0862

32210 NJOKU, B.O.; ODURUKWE, S.O. 1987. Evaluation of nitrogen fertilizer sources and rates for a cassava-maize intercrop. In Terry, E.R.; Akoroda, M.O.; Arene, O.B., eds. Triennial Symposium of the International Society for Tropical Root Crops- Africa Branch, 3d, Owerri, Nigeria, 1986. Tropical root crops; root crops and the African food crisis: proceedings. Ottawa, Canada, International Development Research Centre. pp.30-33. En., Sum. En., 15 Ref., Il. (National Root Crops Research Inst., Umudike, P.M.B. 7006, Umuahia, Nigeria)

CASSAVA; INTERCROPPING; MAIZE; FERTILIZERS; N; ROOT PRODUCTIVITY; NIGERIA.

Three readily soluble N fertilizers (sulphate of ammonia, calcium ammonium nitrate, and urea) and 2 slow-release forms (sulphur-coated urea of 11 and 30 percent dissolution rate in 7 days) were each tested at 4 rates on a cassava/maize intercrop for 2 cropping seasons in the high rainfall zone of Nigeria. Cassava plots that were treated with calcium ammonium nitrate produced significantly higher root and starch yields than those that received sulphate of ammonia and the 2 slow-release forms. Urea was the 2nd best N source, although plots treated with urea did not yield significantly

higher than other plots. Maize dressed with urea produced significantly higher grain yields than those that received N from other sources. Increasing the rate of N applied up to 100 kg/ha produced a higher significant increase in maize grain yield and a nonsignificant depression in cassava root yield. Total energy yield from calcium ammonium nitrate-treated plots were significantly the highest. The results indicate that 100 kg N/ha in the form of calcium ammonium nitrate or urea is best for cassava/maize cultivation in this high rainfall zone. (AS)

0863

29398 NJOKU, B.O. 1984. Project 3. Cultural and soil fertility management studies. Determination of optimum rates of N and K for cassava production. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.38-39. En.

CASSAVA; INTERCROPPING; MAIZE; FERTILIZERS; N; K; ROOT PRODUCTIVITY; NIGERIA.

The effects of a factorial combination of N and K, each at 4 levels (0, 50, 100, and 150 kg/ha), applied to cassava and maize intercrops were studied in Umudike, Igbariam, and Otobi (Nigeria). No significant response in cassava yields was obtained in Umudike and Otobi. Shading of the cassava plant by maize contributed to the lack of response at both sites. In Igbariam, 50 kg K/ha significantly increased cassava yields (av. across all N rates, 22.41 t/ha) over the control (av. 19.17 t/ha). Higher K levels had no effect on cassava yields. No K x N interaction was observed at any location. (CIAT)

0864

29399 NJOKU, B.O. 1984. Project 3. Cultural and soil fertility management studies. Liming effect on the yield of cassava and its ability to withstand mealybug and green spidermite attack. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, p.40. En.

CASSAVA; AGRICULTURAL LIME; ROOT PRODUCTIVITY; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; NIGERIA.

The effect of 6 lime levels (0, 1, 2, 3, 4, and 5 t/ha) and 2 lime incorporation depths (0-15 and 0-30 cm) on cassava stem and root yields and severity of Phenacoccus manihoti and Mononychellus tanajoa attacks was studied in Umudike and Nsukka (Nigeria). In Umudike, cassava root and stem yields were not affected by either lime rate or incorporation depth; lime rate x incorporation depth interaction was also nonsignificant. In Nsukka, stem yield was significantly higher when lime was incorporated at 0-30 cm than at 0-15 cm. Lime rate x incorporation depth interaction was also significant ($P = 0.05$). While root yield was not significantly affected by either lime rate or incorporation depth, their interaction was significant. Root yield tended to decrease as lime incorporation depth increased. Lime rate or incorporation depth had no significant effect on the severity of the pests. (CIAT)

0865

30079 NJOKU, B.O. 1985. Project 5. The response of cassava varieties to liming. In National Root Crops Research Institute. Cassava Programme. Annual Report 1985. Umudike, Nigeria, pp.34-36. En.

CASSAVA; AGRICULTURAL LIME; CULTIVARS; RESISTANCE; MONONYCHELLUS TANAJOA; PEST DAMAGE; GARI; PRODUCTIVITY; ROOT PRODUCTIVITY; NIGERIA.

In Umudike and Nsukka, Nigeria, improved cassava var. TMS 30211, U/41044, TMS 30555, and TMS 30572 were limed at the rates of 0, 0.5, 1.0, 2.0, and

4.0 t/ha to evaluate the effect of liming on root yield, Monorychellus tanajoa severity, and gari yield and quality. TMS 30211 responded positively and significantly to liming at both sites up to 2 t/ha, while U/41044 and TMS 30555 showed no response at either location. TMS 30572 showed a significant positive response in Nsukka but not in Umudike, and was the highest root yielding var. (av. 19.8 and 29.4 t/ha, resp.). There was no significant effect of liming on M. tanajoa severity, but TMS 30572 was significantly more susceptible to the mite than the other var. Liming also had no significant effect on gari yield and quality, but differences between var. were recorded. (CIAT)

0866

28378 NJOKU, B.O. 1981. SOME FACTORS AFFECTING THE EFFICIENCY OF FERTILIZER UTILIZATION BY CASSAVA. IN NAFPP NATIONAL CASSAVA WORKSHOP 5TH., UMUDIKE, NIGERIA, 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.96-104. EN., SUM. EN., 2 REF.

CASSAVA; FERTILIZERS; NUTRIENT UPTAKE; ROOT DEVELOPMENT; PLANT DEVELOPMENT; SOIL AMENDMENTS; N; P; K; CA; MG; NIGERIA.

SOME FACTORS AFFECTING THE EFFICIENCY OF CASSAVA FERTILIZER UTILIZATION ARE DISCUSSED. NUTRIENT ABSORPTION BY CASSAVA IS EXPLAINED, BASED ON SOIL CECAND RESPONSES TO N, P, AND K FERTILIZER APPLICATIONS. THE EFFICIENCY OF UTILIZATION COULD BE IMPROVED THROUGH: (1) THE USE OF BALANCED FERTILIZERS; (2) APPLICATIONS DURING PERIODS OF HIGH DEMANDS BY THE CROP AND PROPER INCORPORATION WHEN THE SOIL IS WET; (3) CAREFUL CHOICE OF FERTILIZER SOURCES TO SUIT SOIL TYPE; AND (4) MINIMIZING LOSSES CAUSED BY LEACHING. (CIAT)

0867

29424 NJOKU, B.O.; Mba, P.C. 1983. Time of nitrogen application to cassava. In National Root Crops Research Institute. Cassava Programme. Annual Report 1983. Umudike, Nigeria, pp.21-22. En.

CASSAVA; FERTILIZERS; N; CA; TIMING; NIGERIA.

To determine the best N source (ammonium sulphate, calcium ammonium nitrate, or urea), rate (60 or 120 kg/ha), and time of application (8, 16, or 24 wk. after planting) for cassava, a field expt. was carried out at 3 locations in Nigeria in 1983. Higher, but not significant, root yields were obtained with 60 kg N/ha applied as calcium ammonium nitrate 8 wk. after planting. (CIAT)

0868

29368 NJOKU, B.O. 1982. Time of potassium application for efficient utilization in cassava/maize crop mixture. In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, pp.18-19. En.

CASSAVA; INTERCROPPING; MAIZE; FERTILIZERS; K; ROOT PRODUCTIVITY; NIGERIA.

The effects of 5 K rates (0, 50, 100, 150, and 200 kg/ha) applied at 5 different times (4, 8, 12, 16, and 20 wk. after planting) at 3 Nigerian locations (Umudike, Igbariam, and Otobi) on cassava root yields was studied in a cassava/maize intercrop. The effect of time of K application on root yield was not significant; however, relative yield figures suggest that K could be more effectively utilized when applied at 8 wk. after planting in Umudike and Igbariam. K tended to depress yields in Otobi where exchangeable soil K was 0.27 meq/100 g/ha. The rate of 100 kg K/ha was considered adequate for Umudike and Igbariam where exchangeable K values were 0.10 and 0.15 meq/100 g, resp. The highest yields at all 3 sites were obtained at this rate (16.3, 12.6, and 24.0 t/ha for Umudike, Igbariam, and Otobi, resp.). (CIAT)

0869

29392 NNODU, E.C.; ONYEAGBA, R.A. 1984. Project 2. Studies on control of other pests and diseases of cassava. Assay of chemicals for control of cassava anthracnose disease. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.22-24. En., Il.

CASSAVA; GLOEOSPORIUM MANIHOTIS; DISEASE CONTROL; FUNGICIDES; CULTIVARS; ROOT PRODUCTIVITY; NIGERIA.

The effect of 5 fungicides, applied 6 times at bi-weekly intervals, on the severity of Gloeosporium manihotis in the susceptible cassava var. 60506 and Nwugo and on their root yields was examined in Nigeria. Fungicides applied were mancozeb at 9 g/8 liters water, captafol at 60 ml/8 liters water, copper hydroxide at 18 mg/9 liters water, benomyl at 20 g/10 liters water, and benomyl + monocrotophos at 20 g + 20 ml/10 liters water, resp. Benomyl + monocrotophos significantly reduced disease severity from an av. of 28.2 percent for the untreated control to 17.1 percent. No significant root yield differences were observed between the control that yielded the least (19.15 t/ha) and the sprayed plots (range 18.55-20.35 t/ha), the highest being for mancozeb. Cassava var. 60506 yielded significantly more (22.50 t/ha) than Nwugo (15.88 t/ha). Only Nwugo showed a nonsignificant negative correlation between disease severity and yield. (CIAT)

0870

30076 NNODU, E.C.; ONYEAGBA, R.A. 1985. Project 3. Studies on control of other pests and diseases. Effect of time of planting on the control of cassava anthracnose disease (CAD). In National Root Crops Research Institute. Cassava Programme. Annual Report 1985. Umudike, Nigeria, pp.29-31. En.

CASSAVA; GLOEOSPORIUM MANIHOTIS; DISEASE CONTROL; CULTIVARS; PLANTING; TIMING; ROOT PRODUCTIVITY; NIGERIA.

Cassava cv. 30211, 60506, and Nwugo were planted at monthly intervals from April to Oct. 1985 in Nigeria to evaluate the effect of planting date on Gloeosporium manihotis severity 6 mo. after planting. The lowest av. disease indices (2.2 and 2.4) were observed for the Sept. and Oct. plantings, resp. No significant difference in the disease index among var. was observed (5.6, 6.5, and 6.9 for 30211, 60506, and Nwugo, resp.). Data showed that April plantings yielded significantly higher (mean 31.3 t/ha) than the other planting dates, except May (mean 26.2 t/ha), and that the lowest yields were for the Oct. (mean 7.9 t/ha) and Sept. (mean 12.7 t/ha) plantings. Cv. 30211 significantly outyielded 60506 and Nwugo (25.1, 19.4, and 16.9 t/ha, resp.). While disease severity is greater in April and Aug. plantings, the effect of planting was able to overcome the reducing effect of G. manihotis on yield. May/June appeared to be the best time to plant cassava to control yield loss by G. manihotis. (CIAT)

0871

30074 NNODU, E.C.; ONYEAGBA, R.A. 1985. Project 3. Studies on control of other pests and diseases. Rate of development of new anthracnose lesions on cassava. In National R ot Crops Research Institute. Cassava Programme. Annual Report 1985. Umudike, Nigeria, pp.26-27. En.

CASSAVA; DISEASE CONTROL; GLOEOSPORIUM MANIHOTIS; CULTIVARS; PEST DAMAGE; CUTTINGS; ROOT PRODUCTIVITY; NIGERIA.

The effect of using Gloeosporium manihotis-infected planting material on the subsequent development of the disease in cassava cv. 60506, 30211, and 30555 was investigated in Nigeria; 22-cm-long cuttings of each cv. with 0, 6, and

10 cankers were used. Results 6 mo. after planting showed that severity scores of the disease were higher, but not significantly different, for plants from cuttings with more cankers: severity scores averaged 21.1, 28.3, and 30.0 percent for plants from cuttings with 0, 6, and 10 G. manihotis cankers, resp. Cassava cv. 30211 exhibited less disease severity (av. 23.4 percent) and significantly outyielded (33.7 t/ha) cv. 60506 (27.2 percent and 25.1 t/ha, resp.) and 30555 (28.9 percent and 20.9 t/ha, resp.). Av. yields were also higher for plants from cuttings with no cankers (28.8 t/ha) compared with those with 6 and 10 cankers (27.6 and 23.3 t/ha, resp). Results showed that planting cassava with anthracnose-infected cuttings will cause greater disease development in the field and reduced yields. (CIAT)

0872

28350 NWOKEDI, P.M. 1980. MECHANIZATION OF CASSAVA PRODUCTION. IN NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA, 1980. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.60-66. EN., SUM. EN., 4 REF.

CASSAVA; PEELING; PLANTING; RASPING; AGRICULTURAL EQUIPMENT; HARVESTING; MECHANIZATION; NIGERIA.

STUDIES DESIGNED AT THE NATIONAL ROOT CROPS RESEARCH INSTITUTE (UMUDIKE, NIGERIA) TO DEVELOP TECHNIQUES AND MACHINES SUITABLE FOR PLANTING, HARVESTING, AND PROCESSING CASSAVA ROOTS ARE BRIEFLY DISCUSSED. OPERATIONAL PARAMETERS AND A DESCRIPTION OF A CASSAVA PLANTER, HARVESTER, AND PROCESSING MACHINE (CHIPPER) ARE GIVEN. (CIAT)

0873

29405 NWOKEDI, P.M. 1984. Project 6. Mechanisation of production and processing. Cassava dewatering machine. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.57,69. En.

CASSAVA; SMALL-SCALE PROCESSING; PRESSING; SMALL-SCALE EQUIPMENT; NIGERIA.

A cassava dewatering machine developed in Nigeria is briefly described and illustrated. Over 500 kg-bags of cassava mesh (grated cassava) can be dewatered in a packing of the machine. (CIAT)

0874

29407 NWOKEDI, P.M. 1984. Project 6. Mechanisation of production and processing. Cassava stem gripper. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.58, 71. En.

CASSAVA; HARVESTING; AGRICULTURAL EQUIPMENT; MECHANIZATION; NIGERIA.

A simple cassava uprooting machine, constructed for small-scale farmers in Nigeria and fabricated with materials available in the country, is described and illustrated. (CIAT)

0875

29406 NWOKEDI, P.M. 1984. Project 6. Mechanisation of production and processing. Falcon Junior boom sprayer. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.57-58, 70. En.

CASSAVA; AGRICULTURAL EQUIPMENT; MECHANIZATION; WEED CONTROL; HERBICIDES; NIGERIA.

A Falcon junior boom sprayer, designed mainly to ease the tedium of conveying a 10-liter herbicide spraying cylinder to the farm and along the ridges while at work, is briefly described and illustrated. (CIAT)

0876

29364 NWOKEDI, P.M. 1982. Project 6. Mechanization of production and processing. In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, pp.40-42. En.

CASSAVA; MECHANIZATION; DEVELOPMENT; SMALL-SCALE EQUIPMENT; HARVESTING; POSTHARVEST TECHNOLOGY; PRESSING; DRYING; PEELING; NIGERIA.

A cassava water extractor, a cassava chip dryer, and a single-row cassava harvester, designed and constructed in Nigeria, are briefly described. Also, the modifications required by the designed cassava peeler are indicated. (CIAT)

0877

30822 NWOKEDI, P.M.; ANYABOLU, G.F.N. 1986. The performance of the NRCRI/FAO cassava planter. Beitrage zur Tropischen Landwirtschaft und Veterinarmedizin 24(3):309-313. En., Sum. En., De., Ru., Fr., Es., 11 Ref. (National Root Crops Research Inst., Umudike, Umuahia, Imo State Nigeria)

CASSAVA; AGRICULTURAL EQUIPMENT; PLANTING; MECHANIZATION; NIGERIA.

The efficiency of a cassava planter, developed by the National Root Crops Research Institute (Nigeria) in collaboration with FAO, was assessed for 4 yr in a sandy loam soil of friable conditions in Umudike, using 3 speeds (0.50, 0.75, and 1.00 m/s) and a spacing of 1.34 x 0.80 m to plant cassava cuttings at a 25-cm depth and 43-degree angle. The output of 1 unit set was 1 ha/day at a speed not higher or lower than 0.75 m/s; with 4 units, connected with a long common tool bar attached to a tractor through 3-point linkage and with a 5-men team, including a tractor driver, the machine would plant 4-5 ha/day at a rate of 10,000 cassava stem cuttings/ha. The cassava planter is briefly described. (CIAT)

0876

31648 NWOKOLO, E. 1987. Leaf meals of cassava (Manihot esculenta Crantz) and siam weed (Eupatorium odoratum L.) as nutrient sources in poultry diets. Nutrition Reports International 36(4):819-826. En., Sum. En., 15 Ref. (Rivers State Univ. of Science & Technology, PMB 5080, Port Harcourt, Nigeria)

CASSAVA; CASSAVA LEAF MEAL; FEEDS AND FEEDING; POULTRY; ANALYSIS; COMPOSITION; MINERAL CONTENT; AMINO ACIDS; DRY MATTER; FIBER CONTENT; PROTEIN CONTENT; ASH CONTENT; NIGERIA.

CLM and siam weed (Eupatorium odoratum L.) leaf meal, prepared by milling sun-dried leaves, were analyzed for proximate constituents, minerals, and amino acid content. Broiler chick assays were used to determine true digestibility (availability) of minerals and amino acids in the leaf meals. Protein content was higher in CLM than in Eupatorium leaf meal. Similarly, K, Ca, and Zn contents (16,300, 12,300, and 119 mg/kg, resp.) were higher in CLM than in Eupatorium leaf meal, which itself had higher contents of P, Mg, Cu, Mn, and Fe (4352, 3202, 37, 71, and 79 mg/kg, resp.). Mineral availability was av. in both meals but slightly higher in CLM (53.7 percent) than in Eupatorium leaf meal (47.9 percent). Cystine and met. contents were low, and lysine content moderate in both leaf meals. The S amino acids might be the limiting amino acids in these leaf meals. Amino acid availability was low in Eupatorium leaf meal (65.4 percent) and only moderately high in CLM (77.8 percent). (AS)

0879

25530 NYANIN, O.O. 1981. SOME ECONOMIC ASPECTS OF INDUSTRIAL PROCESSING OF CASSAVA. IN WORKSHOP ON PROCESSING TECHNOLOGIES FOR CASSAVA AND OTHER TROPICAL ROOTS AND TUBERS IN AFRICA, ABIDJAN, IVORY COAST, 1983. PROCEEDINGS. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.1,PP.43-50. EN.

AFRICA; COSTS; ECONOMICS; FOOD PRODUCTS; GARI; NIGERIA; PRICES; PROCESSING; USES.

AN ECONOMIC ANALYSIS OF THE VIABILITY OF INDUSTRIAL PROCESSING OF CASSAVA IN AFRICA IS MADE, BASED ON THE INDUSTRIAL PROCESSING OF GARI EMPLOYED IN NIGERIA. IT IS CONCLUDED THAT THE FINANCIAL VIABILITY OF INDUSTRIAL PROCESSING OF CASSAVA WOULD DEPEND MAINLY ON 3 ENDOGENOUS VARIABLES: (1) THE OPERATIONAL EFFICIENCY OF THE PLANT WHICH IS CONSTRAINED BY PRODUCTION FACTOR COSTS AND THE COST OF THE FACTORY; (2) THE PRODUCTION EFFICIENCY OF THE EQUIPMENT; AND (3) THE CAPACITY AT WHICH THE PLANT IS OPERATED.

0880

28516 OBIBUAKU, L.O.; UZUEGBUNAM, C.O. 1982. THE EFFECT OF THE NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME (NAFPP) ON CASSAVA PRODUCTION IN ANAMBRA STATE. IN NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA, 1982. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.134-147. EN., 16 REF.

CASSAVA; PRODUCTION; TECHNOLOGY TRANSFER; SOCIOECONOMIC ASPECTS; DEVELOPMENT; PRODUCTIVITY; MARKETING; NIGERIA.

TO DETERMINE THE IMPACT OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) IN THE STATE OF ANAMBRA, NIGERIA, 2 GROUPS OF CASSAVA FARMERS (100 EACH OF NAFPP PARTICIPANTS AND NONPARTICIPANTS) FROM 5 AGRICULTURAL ZONES OF THE REGION WERE SURVEYED. TWENTY AGRICULTURAL ASSISTANTS ALSO PROVIDED INFORMATION ON THE PROGRAM. CASSAVA YIELDS OF BOTH GROUPS WERE COMPARED WITH THOSE OBTAINED IN NAFPP DEMONSTRATION PLOTS. AV. YIELDS OF NAFPP PARTICIPANTS ALMOST DOUBLED THOSE OF NONPARTICIPANTS (10.92 VS. 6.01 T/HA, RESP.). ON THE OTHER HAND, NAFPP PARTICIPANTS OBTAINED APPROX. 2/3 OF POTENTIAL YIELDS ATTAINABLE ACCORDING TO DEMONSTRATION PLOTS, SUGGESTING THAT GREATER EFFORTS ARE REQUIRED TO AID FARMERS IN INCREASING THEIR YIELDS. THE NAFPP HAS MADE SIGNIFICANT CONTRIBUTIONS TO INCREASE CASSAVA YIELDS, BUT THE GOAL OF INCREASING YIELDS 3-FOLD OR 4-FOLD, AS PROPOSED, HAS NOT BEEN ACHIEVED. THE MAIN CONSTRAINTS TO ACHIEVE THESE GOALSARE DISCUSSED, NAMELY, POOR FINANCING, MARKETING PROBLEMS, AND INADEQUATE STAFFING. RECOMMENDATIONS TO OVERCOME THESE PROBLEMS ARE PRESENTED. (CIAT)

0881

26806 OBIDOA, O.; UZOKA, G.U. 1985. INHIBITION OF HEPATIC MICROSOMAL NADPH-CYTOCHROME C (P-450) REDUCTASE ACTIVITY IN GARI-FED RATS. QUALITAS PLANTARUM PLANT FOODS FOR HUMAN NUTRITION 35(1):63-72. EN., SUM. EN., 21 REF., IL. (DEPT. OF BIOCHEMISTRY, UNIV. OF NIGERIA, NSUKKA, NIGERIA)

CASSAVA; GARI; LABORATORY ANIMALS; CYTOCHROME; ANIMAL PHYSIOLOGY; BIOCHEMISTRY; TIMING; ANIMAL HEALTH; NUTRITIVE VALUE; NIGERIA.

NICOTINAMIDE ADENINE DINUCLEOTIDE PHOSPHATE, REDUCED (NADPH)-CYTOCHROME C (P-450) REDUCTASE ACTIVITIES WERE MEASURED IN LIVER MICROSOMES PREPARED FROM MALE ALBINO RATS (110-115 G) FED CONTROL AND (35 PERCENT WT./WT.) GARI-BASED DIETS FOR 8 WK. AND SACRIFIED AT INTERVALS OF 1, 3, 5, AND 8 WK. AFTER AN INITIAL INCREASE (2- FOLD) IN NADPH OXIDATION IN THE 1ST WK., THE GARI DIET CONSISTENTLY PRODUCED MARKED DECREASES IN THE KM AND VMAX VALUES FOR NADPH OXIDATION AND CYTOCHROME C REDUCTION. INHIBITION OF CYTOCHROME C REDUCTION WAS CONSISTENTLY GREATER THAN THAT OF NADPH OXIDATION. INHIBITION

WAS GENERALLY NOT DEPENDENT ON DURATION OF GARI FEEDING. THE SITE OF INHIBITION OF ELECTRON TRANSFER WAS PROBABLY BETWEEN THE REDUCED PROSTHETIC GROUPS (FLAVIN ADENINE DINUCLEOTIDE AND FLAVIN MONONUCLEOTIDE) AND CYTOCHROME C (P- 450). (AS)

0882

27642 OBIOHA, F.C.; UJOH, S.C.; OKORO, E.O.; OZIGBU, D. 1985. THE COMPLETE SUBSTITUTION OF CASSAVA PEEL MEAL FOR MAIZE IN PIG GROWER-FINISHER RATIONS. NUTRITION REPORTS INTERNATIONAL 31(1):35-41. EN., SUM. EN., 8 REF. (DEPT. OF ANIMAL SCIENCE, UNIV. OF NIGERIA, NSUKKA, NIGERIA)

CASSAVA; ANIMAL NUTRITION; FEEDS AND FEEDING; CASSAVA PEEL MEAL; DIETS; SWINE; LABORATORY ANIMALS; MAIZE; HCN CONTENT; SUBSTITUTES; NIGERIA.

FIVE ISOCALORIC AND ISONITROGENOUS PIG GROWER-FINISHER DIETS, IN WHICH MAIZE WAS PROGRESSIVELY REPLACED BY PROCESSED CASSAVA PEEL (CPM) FROM 60 TO OPERCENT OF THE WHOLE DIET, WERE FED TO 30 PIGS AVERAGING 22.50 PLUS OR MINUS 3.82 KG UNTIL SLAUGHTER WT. OF 38.80 PLUS OR MINUS 7.44 KG. THERE WAS A PROGRESSIVE DECLINE IN AV. DAILY GAIN, FEED EFFICIENCY, AND PER FROM THE ZEROCPM RATION TO THE ZERO MAIZE RATION, BUT THESE COMPARISONS WERE NOT SIGNIFICANT. THE CONTROL RATION WAS, HOWEVER, INFERIOR TO THE ZERO MAIZE RATION IN DRESSING PERCENTAGE AND BACK FAT THICKNESS. PER CENT LIVER WT., HEART WT., AND SPLEEN WT. WERE SLIGHTLY HIGHER IN THE CPM DIETS THAN IN THE CONTROL DIET. (AS)

0883

28152 ODEBIYI, J.A.; BOKONON-GANTA, A.H. 1986. BIOLOGY OF EPIDINOCARSIS (= APOANAGYRUS) LOPEZI (HYMENOPTERA: ENCYRTIDAE)AN EXOTIC PARASITE OF CASSAVA MEALYBUG, PHENACOCCUS MANIHOTI (HOMOPTERA:PSEUDOCOCCIDAE) IN NIGERIA. ENTOMOPHAGA 31(3):251-260. EN., SUM. EN., FR., 8 REF., IL. (DEPT. OF AGRICULTURAL BIOLOGY, UNIV. OF IBADAN, NIGERIA)

CASSAVA; PREDATORS AND PARASITES; EPIDINOCARSIS LOPEZI; PHENACOCCUS MANIHOTI; ECOSYSTEMS; INSECT BIOLOGY; NIGERIA.

THE BIOLOGY OF EPIDINOCARSIS (= APOANAGYRUS) LOPEZI WAS STUDIED UNDER FLUCTUATING LAB. CONDITIONS OF 24-31 DEGREES CELSIUS AND 79- 90 PERCENT RH. ITIS A SOLITARY INTERNAL PARASITE WITH 4 TAILED LARVAL INSTARS. THE TOTAL DEVELOPMENTAL TIME FROM EGG TO ADULT RANGED FROM 11 TO 25 DAYS (AV. 18 DAYS).THE DURATION OF EACH DEVELOPMENTAL STAGE WAS: EGG 2 DAYS, 1ST INSTAR 1 DAY, 2ND INSTAR 1 DAY, 3RD INSTAR 2 DAYS, 4TH INSTAR 2 DAYS, PREPUPA 4 DAYS, AND PUPA 6 DAYS. MALES MATED SEVERAL TIMES, FEMALES MATED ONCE. MATED FEMALES PRODUCED BOTH MALES AND FEMALES, UNMATED FEMALES PRODUCED ONLY MALES. MATED OVIPOSITING FEMALES LIVED FOR 13 DAYS WHILE NONOVIPOSITING MATED FEMALES LIVED FOR 25 DAYS. PARASITIZATION DECREASED WITH INCREASING HOST DENSITY FROM30 PERCENT AT A DENSITY OF 10 HOSTS/PLANT/FEMALE TO 11 PERCENT AT A DENSITY OF 50. THERE WAS VIRTUALLY NO PREOVIPOSITION PERIOD. BASED ON 10 FEMALES, THEHIGHEST MEAN DAILY PROGENY PRODUCTION WAS 10. FEMALES HAVE AN AV. OVIPOSITIONPERIOD OF 11 DAYS AND AN AV. OF 67 ADULT PROGENY. THE SEX RATIO WAS 1:2.3 IN FAVOR OF FEMALES. (AS)

0884

30095 ODONGO, B.; OPOLOT, S.P. 1985. Pest complex of cassava. In National Root Crops Improvement Programme. Annual Report July 1984-June 1985. Uganda, pp.63-65. En.

CASSAVA; NOXIOUS ANIMALS; INJURIOUS INSECTS; INJURIOUS MITES; UGANDA.

Insects were collected by hand and with sweep nets in cassava crops in Uganda to identify the pest complex that attacks and affects cassava yield either directly or indirectly by transmitting disease pathogens. The pests

identified are listed with the type of damage caused. Pests attacking planting materials were Macrotermes spp., Parasaissetia nigra, and Pseudaulacaspis pentagona. Pests attacking leaves and stems were Acrosternum pallidocosp, Negara viridula, Agonoscelis spp., Systates castoneipennis, Lagria spp., Diopsis basalis, Zonocerus variegatus, Plegmatoplea spp., Mononychellus spp., Retithrips spp., and Phymatens vividipes. Pests that destroy roots were Rattus (?) spp., Mastomys (?) sp., Techyoryites spp., Potamochoerus spp., and Hystriy sp. (CIAT)

0885

29025 ODOZI, T.O.; DORE, R.O.; AKARANTA, O.; HART, A.E. 1986. USING CARBOXYMETHYLATED CASSAVA (MANIHOT) WASTES AS THICKENERS FOR LATEX PAINT. CARBOHYDRATE POLYMERS 6(4):249-256. EN., SUM. EN., 7 REF. (DEPT. OF APPLIED CHEMISTRY, UNIV. OF PORT HARCOURT, PORT HARCOURT, NIGERIA)

CASSAVA; WASTE UTILIZATION; INDUSTRIAL STARCHES; NIGERIA.

CSW CARBOXYMETHYLATED TO A DEGREE OF SUBSTITUTION IN THE RANGE OF 0.42-0.61 HAVE BEEN PREPARED AND USED AS THICKENING AGENTS FOR THE FORMULATION OF WATER-BASED LATEX PAINTS. IT WAS FOUND THAT PAINT THICKENED WITH CASSAVA WASTE-BASED SODIUM CARBOXYMETHYL STARCH ACQUIRED A MECHANICAL STRENGTH AND DRYING TIME COMPARABLE WITH PAINT FORMULATED WITH THE COMMERCIAL GRADE THICKENERS SUCH AS TYLOSE AND NATROSOL. (AS)

0886

30562 ODUNFA, S.A.; SHASORE, S.B. 1987. Saccharification of cassava peels waste for microbial protein enrichment. Acta Biotechnologica 7(1):23-29. En., Sum. En., 21 Ref., Il. (Dept. of Botany & Microbiology, Univ. of Ibadan, Ibadan, Nigeria)

CASSAVA; CORTEX; WASTE UTILIZATION; PROTEIN ENRICHMENT; INDUSTRIAL MICROBIOLOGY; CARBOHYDRATE CONTENT; NIGERIA.

A fermentation medium for the production of alpha-amylases was formulated to effect saccharification of the starch in cassava waste peels, which were found to constitute up to 55 percent of the original root and contain 41.8 percent carbohydrate, 1.1 percent protein, 12.5 percent ether extract, 4.9 percent total ash, and 20.8 percent crude fiber. Peels were also enriched with microbial protein. Amylase-producing microorganisms (Aspergillus fumigatus, A. flavus, A. niger, and a Pseudomonas sp. and A. niger) were isolated from rotten cassava root discs buried in the soil at different locations; the level of reducing sugar was 20.5 mg/ml. Generally the levels of saccharification were higher when the waste media were supplemented with different N sources. The CP yield in the cassava peel waste media by different microorganisms varied from 5.6 to 17.5 percent. The highest protein yield was in the waste medium fermented by A. fumigatus, followed by A. niger, B. subtilis, and Pseudomonas sp. in decreasing order. (AS)

0887

28171 ODURUKWE, S.O. 1977. CASSAVA AGRONOMIC TRIALS AT THE NATIONAL ROOT CROPS RESEARCH INSTITUTE, UMUDIKE 1973-1975. UMUDIKE, NIGERIA, NATIONAL ROOT CROPS RESEARCH INSTITUTE. 8P. EN., 3 REF. PAPER PRESENTED AT THE FIRST N.A.F.P.P. NATIONAL CASSAVAWORKSHOP,UMUDIKE, 1977.

CASSAVA; SOIL FERTILITY; PLANT FERTILITY; FERTILIZERS; EXPERIMENT DESIGN; PRODUCTIVITY; N; P; K; CA; MG; SPACING; NIGERIA.

THE RESULTS OF FERTILIZER AND PLANT DENSITY EXPT. WITH CASSAVA CONDUCTED IN NIGERIA BETWEEN 1973-75, ARE PRESENTED AND DISCUSSED. A 1ST EXPT. ASSESSED THE APPLICATION OF 0, 22, AND 44 KG N/HA, 0, 17, AND 34 KG P/HA, ANDO, 49, AND 90 KG K/HA AS AMMONIUM SULPHATE, SIMPLE SUPERPHOSPHATE, AND MURIATE OF

POTASH, RESP. THE AV. YIELD WAS 23.5 T/HA BUT ONLY N EFFECTS WERE SIGNIFICANT (P = 0.05). IN A 2ND EXPT. N, P, K, CAO, AND MGO WERE APPLIED ALONE OR IN COMBINATION AT 44, 34, 90, 36, AND 216 KG/HA, RESP., OVER 2 SEASONS; NUTRIENT EFFECTS FOR BOTH SEASONS WERE SIMILAR AND INDIVIDUAL NUTRIENTS IMPROVED FRESH ROOT YIELD SIGNIFICANTLY. MG WAS CONSIDERED IMPORTANT TO NPK FERTILIZATION IN HIGHLY LEACHED ACID SOILS. A 3RD EXPT. COMPARED 4 PLANT SPACINGS (60, 90, 120, AND 150 CM ON 90-CM RIDGES, CORRESPONDING TO 18.5, 12.3, 9.2, AND 7.4 THOUSAND PLANTS/HA, RESP.) FERTILIZED WITH 15-10-30, 30-20-60, OR 45-30-90 KG NPK/HA. NO SIGNIFICANT EFFECTS ON YIELDS WERE OBSERVED FOR PLANT SPACINGS OR FERTILIZATION. THE EXPT. WAS REPEATED WITH THE SAME FERTILIZER RATES BUT WITH PLANT SPACINGS OF 45, 60, 90, AND 180 CM ON 120-CM RIDGES. SPACING AND FERTILIZER EFFECTS ON ROOT YIELD, NO., AND SIZE WERE SIGNIFICANT; AS ROOT YIELD INCREASED LINEARLY,ROOT SIZE DECREASED. ROOT YIELD STARTED TO DECREASE AT 30-20-60 KG NPK/HA. ALTHOUGH RESULTS VARIED, IT IS RECOMMENDED TO PLANT 10,000 PLANTS/HA (1 X 1 M) AND APPLY 30-15-90 KG NPK/HA; MURIATE OF POTASH REDUCES YIELDS. THUS IT SHOULD BE USED ONLY WHEN K SULPHATE IS NOT AVAILABLE. (CIAT)

0888

28173 ODURUKWE, S.O. 1979. CASSAVA CULTURAL PRACTICES. UMUDIKE, NIGERIA, NATIONAL ROOT CROPS RESEARCH INSTITUTE. 16P. EN., 20 REF. PAPER PRESENTED AT THE 3ND. NATIONAL CASSAVA WORKSHOP,UMUDIKE, UMUAHIA, 1979.

CASSAVA; CULTIVATION; FERTILIZERS; N; P; K; CA; MG; PROPAGATION; NUTRIENT UPTAKE; PRODUCTIVITY; CULTIVARS; ADAPTATION; PLANTING; TIMING; WEEDING; ROOT DEVELOPMENT; WEED CONTROL; INTERCROPPING; MAIZE; COWPEA; NIGERIA.

A LITERATURE REVIEW ON CULTURAL PRACTICES IN CASSAVA IS PRESENTED. UNPUBLISHED RESULTS OF RESEARCH CONDUCTED AT THE NATIONAL ROOT CROPS RESEARCH INSTITUTE (UMUDIKE, NIGERIA) ARE ALSO INCLUDED. CASSAVA CV., PROPAGATION, CUTTING STORAGE, PLANTING POSITION, SOIL PREPARATION, PLANTING DATES, PLANT POPULATION, WEED CONTROL, CROPPING SYSTEMS, FERTILIZATION, HARVESTING, AND STORAGE ARE COVERED. (CIAT)

0889

28352 ODURUKWE, S.O. 1980. CASSAVA CULTURAL PRACTICES. IN NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA, 1980. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.88-102. EN., 18 REF.

CASSAVA; PROPAGATION; PLANTING; CULTIVARS; PRODUCTIVITY; WEEDING; PLANT DEVELOPMENT; ROOT DEVELOPMENT; HARVESTING; STORAGE; NIGERIA.

AVAILABLE LITERATURE AND UNPUBLISHED WORK OF THE NATIONAL ROOT CROPS RESEARCH INSTITUTE (NIGERIA) ON AGRONOMIC AND CULTURAL PRACTICES FOR CASSAVA PRODUCTION ARE REVIEWED. LAND PREPARATION, PLANTING MATERIAL (SOURCES, STORAGE, PREPARATION, AND PLANTING POSITION), PLANTING TIME, PLANT POPULATION, CROPPING SYSTEMS (MONOCROPS AND INTERCROPS), WEED CONTROL, HARVESTING, AND STORAGE ARE DISCUSSED. IT IS RECOMMENDED THAT CASSAVA BE PLANTED ON RIDGES IN HEAVY SOILS WITH MORE THAN 1200 MM RAINFALL/YR, AT THE BEGINNING OF THE RAINY SEASON IN AREAS WITH NO SEVERE DISEASE PROBLEMS AND ATTHE END OF THE RAINS IN THOSE WITH SERIOUS PROBLEMS. HEALTHY 20-CM STEM CUTTINGS SHOULD BE USED, PREVIOUSLY DIPPED IN FUNGICIDES. VERTICAL PLANTING AT 10 CM DEPTH AND A PLANT POPULATION OF 10,000 PLANTS/HA ARE RECOMMENDED. WEED CONTROL (CHEMICAL OR MANUAL) SHOULD BE PERFORMED DURING THE 1ST 4 MO. (CIAT)

0890

28377 ODURUKWE, S.O.; IGBOEWE, M.C. 1981. RESPONSES OF CASSAVA AND MAIZE TO FERTILIZATION IN MIXED CROPPING. IN NAFPP NATIONAL CASSAVA WORKSHOP, 5TH.,

UMUDIKE, NIGERIA, 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.85-95. EN., SUM. EN., 6 REF.

CASSAVA; MAIZE; INTERCROPPING; FERTILIZERS; PRODUCTIVITY SPACING; N; P; K; NIGERIA.

THE RESULTS OF 4 EXPT. ON THE RESPONSE OF CASSAVA AND MAIZE IN MIXED CROPPING TO FERTILIZATION ARE PRESENTED. EXPT. 1 STUDIED THE EFFECT OF 6 CASSAVA POPULATION DENSITIES (5.0, 7.5, 10.0, 12.5, 15.0, AND 17.5 X 10(3) PLANTS/HA) AND 5 FERTILIZER LEVELS (0, 164, 328, 492, AND 656 KG 30-15-90 (NPK)/HA, RESP.). INTERCROPPING DECREASED CASSAVA YIELDS SIGNIFICANTLY (AV. 14.1 T/HA FOR INTERCROPS VS. 18.3 T/HA FOR THE MONOCROP). TOTAL ENERGY YIELD WAS SIGNIFICANTLY INCREASED BY FERTILIZATION. EXPT. 2 DETERMINED THE OPTIMUM FERTILIZER LEVELS FOR CASSAVA/MAIZE. IN 1978, ONLY N LEVELS AFFECTED YIELDS SIGNIFICANTLY, WHILE IN 1979 P AND K LEVELS DID SO AT THE 0.1 LEVEL. IN EXPT. 3 (EFFECT OF LIME X K INTERACTIONS ON YIELDS), 75 KG K/HA WERE ENOUGH TO ACHIEVE ALMOST MAX. YIELD IN CASSAVA VAR. TMS 30211 AND 30568, BUT ROOT YIELDS INCREASED CONSISTENTLY FOR OTHER VAR. UP TO 150 KG K/HA. THE INCREASING EFFECT OF K ON ROOT YIELD WAS BETTER AT PH 5.0 AND 5.5 THAN AT 6.0. IN EXPT. 4 (LOSS OF N IN CASSAVA/MAIZE WITH AND WITHOUT N DRESSINGS) SHOWED THAT HIGHEST N LOSSES OCCURRED IN JUNE WHILE NO3- N WAS VIRTUALLY DEPLETED FROM THE TOP SOIL IN AUG. APPLICATIONS OF 100-150 KG N AND 90-180 KGK/HA COULD BE RECOMMENDED FOR CASSAVA/MAIZE IN EASTERN NIGERIA. (CIAT)

0891

28372 ODURUKWE, S.O. 1981. REVIEW OF N.A.F.P.P. NATIONAL CASSAVA CENTRE 1980. IN NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA, 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.13-28. EN.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; PRODUCTIVITY; TECHNOLOGY TRANSFER; SOCIOECONOMIC ASPECTS; FERTILIZERS; PEST DAMAGE; INTERCROPPING; ADAPTATION; MAIZE; SELECTION; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; NIGERIA.

THE RESULTS OF CASSAVA RESEARCH ACTIVITIES CONDUCTED BY THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) NATIONAL CASSAVA CENTRE (NIGERIA) IN 1980 ARE PRESENTED. THESE INCLUDED VAR., HERBICIDE, AND MIXED CROPPING FERTILIZATION PRE-MINIKIT TRIALS, VAR. AND FERTILIZER MINIKIT TRIALS, CASSAVA/MAIZE DEMONSTRATIONS, CASSAVA MULTIPLICATION, AND ECONOMIC/FEASIBILITY STUDIES. ADMINISTRATIVE PROBLEMS ARE DISCUSSED. MAJOR PROBLEMS WERE PHENACOCCUS MANIHOTI AND MONONYCHELLUS TANAJOA INFESTATIONS. (CIAT)

0892

28504 ODURUKWE, S.O. 1982. REVIEW OF THE NATIONAL CASSAVA CENTRE 1981. IN NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA, 1982. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.24-35. EN.

CASSAVA; DEVELOPMENT; PRODUCTIVITY; CULTIVARS; INTERCROPPING; MAIZE; FERTILIZERS; N; P; K; MG; ADAPTATION; TECHNOLOGY TRANSFER; NIGERIA.

ACTIVITIES CARRIED OUT DURING 1981 AT THE NATIONAL CASSAVA CENTER (NIGERIA) ARE REPORTED. RESULTS ARE GIVEN FOR THE HERBICIDE PRE-MINIKIT TRIALS, MIXED CROPPING PRE-MINIKIT TRIALS (CASSAVA/MAIZE + MELON), VAR. MINIKIT TRIALS, AND FERTILIZER TESTS. CASSAVA VAR. TMS 30572 PROVED SUPERIOR WITH AN AV. YIELD OF 22.9 T/HA ACROSS LOCATIONS COMPARED WITH 15.1 T/HA FOR THE BEST LOCAL VAR. NPK + MG WAS THE BEST TREATMENT GIVING AN AV. OF 13.8 T/HA. OTHER ACTIVITIES INCLUDED CASSAVA/MAIZE DEMONSTRATIONS, ECONOMIC STUDIES ON THE ADOPTION OF IMPROVED TECHNOLOGY, SEED MULTIPLICATION, TRAINING, WORKSHOPS, AND EXHIBITIONS. (CIAT)

0893

28380 OGBODU, B.C. 1981. ANAMBRA STATE. IN NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.110-116. EN.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; PRODUCTIVITY; TECHNOLOGY TRANSFER; FERTILIZERS; INTERCROPPING; MAIZE; NIGERIA.

THE 1980 CASSAVA ANNUAL REPORT OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) IN THE STATE OF ANAMBRA, NIGERIA, IS PRESENTED. PROPOSED AND ONGOING CASSAVA TRIALS (VAR., FERTILIZER, MAIZE/CASSAVA, PRODUCTION) ARE INDICATED; YIELDS OF THE 1979 CASSAVA DEMONSTRATION PLOTS ARE GIVEN. OTHER ACTIVITIES REPORTED INCLUDE TRAINING, SEED MULTIPLICATION, AGROSERVICE CENTERS, AND COMMUNITY FARM CENTER ESTABLISHMENT. PROBLEMS FOUND WHEN EXECUTING THE 1980 PROGRAM ARE LISTED. (CIAT)

0894

29411 OGBONNAYA, I.A.; NWATAMA, C.N. 1984. Project 7. Economic studies and cassava multiplication. Cassava multiplication. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.68. En.

CASSAVA; CULTIVARS; PROPAGATION; NIGERIA.

The 1984 cassava multiplication scheme of the cassava program of the National Root Crops Research Institute, Nigeria, is briefly presented; data are included on cassava var. multiplied, and supplies and sales of cassava roots and stems. (CIAT)

0895

28381 OGIO-OKIRIKA, J.A. 1981. BENDEL STATE. IN NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA, 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.117-129. EN.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; TECHNOLOGY TRANSFER; PRODUCTIVITY; FERTILIZERS; PROPAGATION; SEED; NIGERIA.

THE 1980 ANNUAL REPORT OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) IN THE STATE OF BENDEL, NIGERIA, IS PRESENTED. DATA FROM THE CASSAVA VAR. MINIKIT TRIAL, DEMONSTRATION PLOTS, AND THE FERTILIZER MINIKIT TRIAL ARE REPORTED. OTHER ACTIVITIES CARRIED OUT WERE ECONOMIC STUDIES ON PRODUCTION, AGROSERVICE CENTER DEVELOPMENT, AND SEED MULTIPLICATION. PROBLEMSENCOUNTERED WHEN EXECUTING THE PLANS FOR 1980 ARE OUTLINED. ADOPTION OF IMPROVED TECHNOLOGY BY FARMERS, ESPECIALLY REGARDING CASSAVA VAR., IS BRIEFLYDISCUSSED. A NOTE ON AN EXHIBITION OF CASSAVA PRODUCTS HELD IN BENIN CITY INNOV. 1980 IS INCLUDED. THE TRIALS PROPOSED FOR 1981 ARE LISTED. (CIAT)

0896

26870 OGUNSUA, A.O. 1985. CHANGES IN LIPIDS DURING FERMENTATION OF CASSAVA FLOUR. JOURNAL OF FOOD BIOCHEMISTRY 9(3):255-262. EN., SUM. EN., 14 REF. (DEPT. OF FOOD SCIENCE & TECHNOLOGY, UNIV. OF IFE, ILE-IFE, NIGERIA)

CASSAVA; CASSAVA FLOUR; FAT CONTENT; FERMENTATION; CASSAVA CHIPS; LABORATORY EXPERIMENTS; SUGAR CONTENT; COMPOSITION; ENZYMES; CARBOHYDRATE CONTENT; NIGERIA.

DURING THE INCUBATION OF CF WITH OR WITHOUT YEAST, LIPIDS INCREASED WITH THE MOBILITY OF DIGLYCERIDE. GLYCOLIPIDS WERE METABOLIZED DURING THE FERMENTATION AS EVIDENCED BY 17 PERCENT LESS HEXOSE IN THE LIPIDS. LINOLENIC ACID FELL FROM 11 PERCENT IN UNINCUBATED FLOUR TO 7 PERCENT IN THE FERMENTED

FLOUR. PALMITOLEIC ACID, A MAJOR YEAST FATTY ACID, WAS ABSENT IN THE FERMENTED PRODUCT. (AS)

0897

28178 OHIRI, A.C. 1983. EVALUATION OF TILLAGE SYSTEMS ON CASSAVA GROWN UNDER MULCH AND EFFECT ON SOIL ORGANIC C. UMUDIKE, NIGERIA, NATIONAL ROOT CROPS RESEARCH INSTITUTE. 11P. EN., SUM. EN., 11 REF., IL. PAPER PRESENTED AT THE FIRST NATIONALTILLAGE SYMPOSIUM, ILORIN, NIGERIA, 1983. (NATIONAL ROOT CROPS RESEARCH INST., UMUDIKE, UMUAHIA, NIGERIA)

CASSAVA; CULTIVATION; MULCHING; SOIL FERTILITY; SOIL PHYSICAL PROPERTIES; PRODUCTIVITY; SOIL CONSERVATION PRACTICES; PLOWING; MECHANIZATION; TECHNOLOGY TRANSFER; FERTILIZERS; N; P; K; NIGERIA.

THE EFFECTS OF 3 TILLAGE SYSTEMS, MULCHING, AND FERTILIZATION ON CASSAVA PRODUCTION AND SOIL ORGANIC C WERE INVESTIGATED FOR 2 YR ON A SANDY CLAY LOAMSOIL AT THE NATIONAL ROOT CROPS RESEARCH INSTITUTE FARM (UMUDIKE, NIGERIA). TILLAGE TREATMENTS WERE (1) PLOWING, HARROWING, AND RIDGING (CONVENTIONAL), (2) DIGGER-MADE NARROW HOLES (MIN.), AND (3) PUSHING CASSAVA CUTTINGS DIRECTLY INTO THE SOIL (ZERO TILLAGE). MULCHING TREATMENTS WERE NO-MULCH AND GRASS MULCH, AND FERTILIZATION CONSISTED OF NO FERTILIZER OR AN NPK FERTILIZER MIXTURE. THERE WERE NO SIGNIFICANT DIFFERENCES IN FRESH ROOT YIELDDUE TO TREATMENTS AND THEIR INTERACTIONS IN THE 1ST AND 2ND YR. SIGNIFICANT DIFFERENCES WERE OBTAINED FOR THE TOPS DUE TO TILLAGE TREATMENTS IN THE 2ND YR AND HIGHLY SIGNIFICANT DIFFERENCES DUE TO FERTILIZER APPLICATION IN THE 1ST AND 2ND YR. BOTH ZERO AND MIN. TILLAGE OUTYIELDED CONVENTIONAL PRACTICE BY 40 AND 23 PERCENT, RESP. FERTILIZER APPLICATION INCREASED TOP YIELDS BY 34PERCENT IN THE 1ST YR AND 57 PERCENT IN THE 2ND YR. A SANDY CLAY LOAM SOIL WITHOUT AERATION PROBLEMS MAY NOT REQUIRE INTENSIVE TILLAGE PRACTICES FOR CASSAVA PRODUCTION. MULCH BUILDS UP SOIL OM ESSENTIAL FOR AGGREGATION, AND FERTILIZER IS ESSENTIAL TO MAINTAIN SOIL NUTRIENT POTENTIAL. APPROPRIATE AGRICULTURAL IMPLEMENTS SHOULD BE DESIGNED TO FACILITATE THE MECHANIZATION OFREDUCED TILLAGE OPERATIONS. (AS)

0898

29425 OHIRI, A.C. 1983. Evaluation of tillage systems on cassava grown under mulch and their effects on soil organic carbon. In National Root Crops Research Institute. Cassava Programme. Annual Report 1983. Umudike, Nigeria, pp.22-26. En., Il.

CASSAVA; LAND PREPARATION; MULCHING; FERTILIZERS; N; P; K; MG; SOIL ANALYSIS; FOLIAGE; ROOT PRODUCTIVITY; NIGERIA.

The effect of mulch (grass at 0 or 2.5 t/ha, dry wt. basis), 3 tillage systems (conventional, min., and zero), and fertilization (0 or 30-14-78-30 kg NPKMg/ha) on root yields of cassava var. TMS 30211 and soil organic C buildup, was tested in a sandy clay loam soil of Western Farm, Umudike (Nigeria). Conventional tillage consisted of plowing at 20 cm, harrowing, and ridging; min. tillage of digger- made holes 20 cm deep; and zero tillage of pushing cassava cuttings directly into the soil. No significant differences were obtained in fresh root yield due to treatments and their interactions. Zero and min. tillage showed slight root yield increases of 8.0 and 1.0 percent, resp., over conventional tillage. The nonsignificant effect of the tillage x fertilizer interaction implied that fertilizer efficiency was not affected by the tillage system. Zero tillage significantly outyielded the conventional system by 40 percent in top yield. Fertilization caused a 67 percent increase in top yield over the control. Significant reductions occurred in soil organic C after cropping, irrespective of tillage system; zero and min. tillage caused a 23 percent reduction relative to the initial concn., while conventional tillage reduced it by 32 percent. Mulching increased soil organic C by 7 percent over the

unmulched control. Zero and min. tillage systems should be encouraged in some Nigerian soils of coarse and medium texture with no drainage or aeration problems. (CIAT)

0899

29356 OHIRI, A.C. 1982. Influence of tillage systems on cassava production. In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, p.21. En.

CASSAVA; LAND PREPARATION; MULCHING; FERTILIZERS; N; P; K; ROOT PRODUCTIVITY; NIGERIA.

The effects of 3 tillage systems (conventional, min., and zero), mulching and fertilization (0 and 40-10-90 NPK/ha) on cassava root yields were investigated in Nigeria. Conventional tillage consisted in plowing to a depth of 20 cm, harrowing, and ridging; min. tillage of planting in a narrow hole made with a digger; and zero tillage, planting directly into the soil with min. soil disturbance. No significant differences between treatments were found, but mulching (8.5 t dry grass/ha) increased yields 18.1 percent, conventional tillage 19.1 percent, and fertilization 22.2 percent. (CIAT)

0900

27648 OHOCHUKU, N.S. 1985. DEODORIZATION OF FERMENTED CASSAVA. JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY 33(2):220- 222. EN., SUM. EN., 9 REF. (COLLEGE OF EDUCATION, P.M.B. 5047, PORT HARCOURT, NIGERIA)

CASSAVA; FOOFOO; FERMENTATION; ORGANOLEPTIC EXAMINATION; DEODORIZING; PROCESSING; NIGERIA.

A METHOD TO REMOVE THE ODOR FROM FERMENTED CASSAVA ROOTS, SO AS TO POPULARIZE THEIR CONSUMPTION IN NIGERIA, IS DISCUSSED. THE HYDROGEN PEROXIDE-TREATED MASS COULD BE DRIED TO GIVE CF WITH A LONGER SHELF LIFE THAT COULD BEUSED IN TIMES OF NEED. THE NET EFFECT WOULD BE AN OVERALL INCREASE IN CASSAVAFUFU CONSUMPTION AND A DRIVE TOWARD MECHANIZED PRODUCTION OF THIS ODORLESS CF. THE USE OF ALKALI AND CAROTENOIDS IS ALSO DISCUSSED. (CIAT)

0901

26820 OJENIYI, S.O.; AGBEDE, O.O. 1980. AGRONOMIC ASSESSMENT OF THE EFFECT OF INTER-PLANTING GMELINA ARBOREA WITHFOOD CROPS. TURRIALBA 30(3):290-293. EN., SUM. EN., ES., 7 REF., IL. (COCOA RESEAHCH INST. OF NIGERIA, P.M.B. 5244, IBADAN, NIGERIA)

CASSAVA; INTERCROPPING; GMELINA ARBOREA; SOIL FERTILITY; SOIL REQUIREMENTS; ROOT PRODUCTIVITY; NIGERIA.

THE FOREST TREE CROP GMELINA ARBOREA WAS INTERPLANTED WITH YAM, CASSAVA, OR MAIZE OR ALL 3 TOGETHER IN 5 LOCATIONS IN SOUTHERN NIGERIA. AFTER 2 YR, GIRTH AND SURVIVAL OF G. ARBOREA ON PLOTS WITH ALL 3 FOOD CROPS OR WITH CASSAVA ALONE WERE LOWER THAN ON PLOTS WITH YAM, MAIZE, OR G. ARBOREA ALONE. THE DIFFERENCES WERE NOT SIGNIFICANT. THE YIELDS OF CASSAVA FROM AGRI-SILVICULTURE PLOTS IN BENDE, ORE, AND GAMBARI WERE GREATER (5.6, 1.9, AND 8.2T/HA, RESP.) THAN THOSE FROM LONG-CULTIVATED, UNFERTILIZED MONOCROPPED PLOTS AT OTHER SITES. (CIAT)

0902

26819 OJENIYI, S.O.; AGBEDE, O.O. 1980. EFFECT OF INTER-PLANTING GMELINA ARBOREA WITH FOOD CROPS ON SOIL CONDITION. TURRIALBA 30(3):268-271. EN. SUM. EN., ES., 7 REF.

CASSAVA; INTERCROPPING; GMELINA ARBOREA; SOIL FERTILITY; SOIL REQUIREMENTS; ANALYSIS; NIGERIA.

THE FOREST CROP GMELINA ARBOREA WAS INTERPLANTED WITH YAM, CASSAVA, OR MAIZE OR ALL 3 TOGETHER IN 3 LOCATIONS IN SOUTHERN NIGERIA. SOIL WAS SAMPLED ABOUT 30 MO. AFTER PLANTING. NO SIGNIFICANT CHANGES IN SOIL FERTILITY INDICATORS OR PH WERE NOTED; HOWEVER, A SLIGHT REDUCTION IN SOIL ORGANIC C AND INCREASES IN SOIL N AND P AS A RESULT OF THE SIMULTANEOUS PRODUCTION OF FOREST AND FOOD CROPS WERE OBSERVED. (CIAT)

0903

28187 OJI, M.A. 1983. RECIPE DEVELOPMENT AND UTILIZATION OF ROOT CROPS PRODUCTS. UMUDIKE, UMUAHIA, NIGERIA, NATIONAL ROOT CROPS RESEARCH INSTITUTE. AGRICULTURAL EXTENSION RESEARCH LIAISON AND TRAINING. EXTENSION BULLETIN NO.3. 37P. EN., 4 REF.

CASSAVA; HUMAN NUTRITION; CASSAVA FLOUR; FOOFOO; FERMENTED PRODUCTS; GARI; DIETS; FOOD PRODUCTS; NIGERIA.

RECIPES USING ROOT CROP PRODUCTS ARE PRESENTED. FOR CASSAVA, THE RECIPES OF AKARA BALLS, CF COOKIES, CF LEMON CAKE, TAPIOCA SALADS, FERMENTED CASSAVA FUFU, AND GARI FUFU ARE DETAILED. (CIAT)

0904

28385 OJO, P.O. 1981. KADUNA STATE. IN NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA, 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.150-151. EN.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; ADAPTATION; CASSAVA AFRICAN MOSAIC VIRUS; NIGERIA.

THE 1980 ANNUAL REPORT OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) IN THE STATE OF KADUNA, NIGERIA, IS PRESENTED. TRIALS WERE CONDUCTED WITH BITTER CASSAVA VAR. ONLY. CAMD WAS OBSERVED THROUGHOUT ALL SITES, VAR. TMX 60506, 30211, AND 30568 BEING SEVERELY AFFECTED. THE LACK OF QUALIFIED PERSONNEL AND THE SHORTAGE OF FUNDS HAVE BEEN MAJOR CONSTRAINTS. (CIAT)

0905

32062 OJOFEITIMI, E.; OLUFOKUNBI, B. 1986. Food preferences: an implication for nutrition education and agricultural production. Food and Nutrition Bulletin 8(4):11-13. En., 18 Ref. (Univ. of Ife, Ile-Ife, Nigeria)

CASSAVA; SURVEYS; CONSUMPTION; NUTRITIVE VALUE; HUMAN NUTRITION; COMPOSITION; ANALYSIS; PROTEIN CONTENT; FAT CONTENT; FIBER CONTENT; CARBOHYDRATE CONTENT; ASH CONTENT; FOOD ENERGY; SOCIOECONOMIC ASPECTS; NIGERIA.

The food preferences of 172 final-year students at 3 health- related institutions in Ile-Ife (Oyo State, Nigeria) were determined. Students were asked to rate some commonly available tuber and meat foods in the order in which they would prefer to eat them and would recommend them to others. About 70 percent ranked white yam as 1st choice, while about 18 percent ranked cassava 1st, although other tubers (water yam, yellow yam, and red cocoyam) have a greater nutritive content than yam. Cocoyam yellow yam, and water yam have higher digestible true protein than both; they are also richer in water-soluble vitamins and carotene content. The data indicated that the participants, who will subsequently have direct contact with the community, either knew very little about the nutritive content of some of the locally available foods or did not reflect their knowledge in their preferences. (CIAT)

0906

31682 OJOMO, O.A. 1987. The agricultural development projects (ADP) in Nigeria. In Holmes, J.C., ed. Improving food crop production on small farms in Africa. Rome, Food and Agriculture Organization of the United Nations. pp.171-177. En., Sum. Fn.

CASSAVA; DEVELOPMENT; TECHNOLOGY TRANSFER; SEED; ROOT PRODUCTIVITY; MARKETING; NIGERIA.

The objectives, organization, management, implementation, achievements, and constraints of the Nigerian agricultural development projects are described; special reference is made to the Oyo North Agricultural Development Project. Improved cassava planting material is mentioned as 1 of the minikit components distributed to participating farmers. Yield improvements from 1983 to 1985 as a result of the project are shown for cassava and other crop components; for cassava, there was a 12 percent increase from 1983 to 1984. In spite of the cassava production improvements, a major constraint has been the excess production for which there are no markets. (CIAT)

0907

27807 OKAFOR, N.; EJIOFOR, M.A.N. 1985. THE LINAMARASE OF LEUCONOSTOC MESENTEROIDES: PRODUCTION, ISOLATION AND SOME PROPERTIES. JOURNAL OF THE SCIENCE OF FOOD AND AGRICULTURE 36(8):669-678. EN., SUM. EN., 16 REF., IL. (DEPT. OF INDUSTRIAL MICROBIOLOGY, ANAMBRA STATE UNIV. OF TECHNOLOGY, P.M.B. 5025, AWKA, NIGERIA)

CASSAVA; LINAMARASE; LINAMARIN; INDUSTRIAL MICROBIOLOGY; HCN HYDROLYSIS; LEUCONOSTOC MESENTEROIDES; BIOCHEMISTRY; NIGERIA.

LEUCONOSTOC MESENTEROIDES WAS FOUND TO PRODUCE HIGHLY ACTIVE LINAMARASE WHEN LINAMARIN WAS INCORPORATED IN ITS GROWTH MEDIUM. THE ENZYME WAS ISOLATED FROM THE BACTERIUM AND PARTIALLY PURIFIED USING DIETHYLAMINOETHYL (DEAE) CELLULOSE. ITS ACTIVITY WAS MEASURED SPECTROPHOTOMETRICALLY USING LINAMARIN EXTRACT FROM CASSAVA TISSUES. THIS YIELDED 62.2 MG CYANIDE/G OF LINAMARIN. A STUDY OF SOME OF ITS PROPERTIES SHOWED IT WAS ACTIVE IN THE TEMP. RANGE OF - 10 TO +45 DEGREES CELSIUS, WITH AN OPTIMUM AT 29 PLUS OR MINUS 2 DEGREES CELSIUS. ACTIVITY WAS OBSERVED OVER A WIDE PH RANGE, 4.0-8.0, WITH OPTIMUM AT6.0-6.5. ITS PH OF STABILITY WAS 5.5-7.5, WHILE ABOVE PH 8.0 THERE WAS A RAPID LOSS OF ACTIVITY. INCUBATING THE ENZYME AT 50 DEGREES CELSIUS LED TO LOSS OF OVER 90 PERCENT OF ITS ACTIVITY WITHIN 18 MIN. THE OPTIMAL SUBSTRATE CONCN. WAS 0.15-0.20 MG/ML. WHEREAS ABOVE 0.25 MG/ML THERE WAS NO OBSERVABLE INCREASE IN ACTIVITY, LOSS OF ACTIVITY BECAME MORE PRONOUNCED BELOW 0.10 MG/ML OF SUBSTRATE. (AS)

0908

28594 OKEKE, E.C.; OBIZOBA, I.C. 1986. THE NUTRITIVE VALUE OF ALL-VEGETABLE PROTEIN DIETS BASED ON LEGUME, CEREAL AND TUBER IN WEANLING RATS. QUALITAS PLANTARUM PLANT FOODS FOR HUMAN NUTRITION 36(3):213-222. EN., SUM. FN., 7 REF. (DEPT. OF HOME SCIENCE & NUTRITION, UNIV. OF NIGERIA, NSUKKA, NIGERIA)

CASSAVA; FEEDS AND FEEDING; ANIMAL HEALTH; DIETS; LABORATORY ANIMALS; NUTRITIVE VALUE; ANIMAL PHYSIOLOGY; NIGERIA.

THIRTY ALBINO WEANLING MALE RATS (45-55 G) WERE DIVIDED INTO 5 GROUPS OF 6 RATS EACH ON THE BASIS OF BODY WT. AND FED COMBINATIONS OF DEHULLED BROWN BEANS, PARBOILED RICE, AND CM PROVIDING 10 PERCENT PROTEIN FOR 35 DAYS. CASEIN SERVED AS THE REFERENCE PROTEIN. COMBINATIONS OF DEHULLED BROWN BEANS (50-80 PERCENT) WITH RICE (18-48 PERCENT) AND CM (2 PERCENT) PRODUCED VARIED EFFECTS ON BODY WT., N INTAKE, N DIGESTIBILITY AND RETENTION, BV, LIVER WT., AND PLASMA ALBUMIN (P LESS THAN 0.05). THE DEHULLED BROWN BEANS:RICE:CM (70:28:2) BLEND INDUCED DECREASES IN ALL THE PARAMETERS TESTED, EXCEPT FOR

THE BV AND PER VALUES. THE CONTROL GROUP PRODUCED DIGESTED AND RETAINED N, PER, WT. GAIN, AND LIVER WT. THAT WERE SIGNIFICANTLY HIGHER THAN FOR THOSE OF THE TEST DIETS (P LESS THAN 0.05). THESE RESULTS APPEAR TO SUGGEST THAT STARCHY FOODS WHEN BLENDED WITH LEGUMES AT LOW LEVELS PRODUCED GOOD QUALITY PROTEIN COMPARABLE WITH CASEIN. (AS)

0909

28342 OKEKE, G.C.; OJI, U.I.; UBA, F.N. 1986. MAIZE REPLACEMENT VALUES OF CASSAVA PEELS IN THE DIET OF GROWING RABBITS. BEITRAGE ZUR TROPISCHEN LANDWIRTSCHAFT UND VETERINARMEDIZIN 24(2):221-226. EN., SUM. EN., DE., RU., FR., ES., 8 REF. (DEPT. OF ANIMAL SCIENCE, FACULTY OF AGRICULTURE, UNIV. OF NIGERIA, NSUKKA, ANAMBRA STATE, NIGERIA)

CASSAVA; CORTEX; RABBITS; FEEDS AND FEEDING; USES; HCN CONTENT; DETOXIFICATION PROCESSES; DRYING; SILAGE; DIETARY VALUE; ANIMAL NUTRITION; NIGERIA.

IN A FEEDING EXPT. WITH 48 GROWING NEW ZEALAND RABBITS CARRIED OUT FOR 56 DAYS, MAIZE WAS REPLACED BY 15, 30, AND 45 PERCENT CASSAVA PEEL MEAL. THE ADDITION OF UP TO 30 PERCENT MEAL FROM ENSILED PEELS OR 15 PERCENT FROM SUN-DRIED PEELS GAVE LIVE WT. GAINS SIMILAR TO THOSE OF THE CONTROL GROUP. FROM 30 PERCENT ON, SUN-DRIED PEEL MEAL AFFECTED THE FEED UPTAKE, AND THE CONTENT OF SCN IN THE SERUM INCREASED. KIDNEY WT., LIVER WT., AND LIVER FAT WERE ALSO AFFECTED. SUN-DRIED CASSAVA PEEL MEAL CAN BE INCLUDED UP TO 15 PERCENT AND ENSILED CASSAVA PEEL MEAL UP TO 30 PERCENT INTO THE FEED RATION, PROVIDED THAT THE DIET IS SUFFICIENTLY FORTIFIED WITH MET. OR FISH MEAL. (AS)

0910

28179 OKEKE, J.E. 1986. ALTERNATIVE USES OF CASSAVA IN VIEW OF ANTICIPATED INCREASED PRODUCTION. UMUDIKE, NIGERIA, NATIONAL ROOT CROPS RESEARCH INSTITUTE. 10P. EN., SUM. EN., 16 REF. PAPER PRESENTED AT THE 4TH JOINT NAFPPWORKSHOP,IBADAN, NIGERIA, 1986. (NATIONAL ROOT CROPS RESEARCH INST., UMUDIKE, UMUAHIA, NIGERIA)

CASSAVA; USES; ANIMAL NUTRITION; SWINE; POULTRY; CASSAVA STARCH; NIGERIA.

THE IMPORTANCE OF CASSAVA IN THE DOMESTIC ECONOMY OF NIGERIA IS EXAMINED IN THE LIGHT OF A FLUCTUATING PRODUCTION TREND. TWO ALTERNATIVE USES, AS ANIMAL FEED (SWINE AND POULTRY) AND AS INDUSTRIAL STARCH, ARE DESCRIBED AND THEIR IMPLICATIONS ON FRESH ROOT SUPPLY ARE ANALYZED. A DEFICIT IN SUPPLY FORHUMAN CONSUMPTION EXISTS WHILE COMPETITION FROM ANIMAL FEED AND INDUSTRIAL STARCH IMPOSES HIGHER PRODUCTION TARGETS. THE POTENTIAL OF THE CROP ASSURES ADEQUATE NATIONAL OUTPUT UPON INCREASED RESEARCH SUPPORT FOR EFFICIENT PRODUCTION TECHNOLOGIES. (AS)

0911

29357 OKEKE, J.F. 1982. Determination of best crop species for intercropping with cassava. In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, pp.22-23. En.

CASSAVA; INTERCROPPING; COWPEA; MAIZE; RICE; PRODUCTIVITY; LAND EQUIVALENT RATIO; NIGERIA.

At 2 Nigerian locations, Otobi and Umudike, cassava was intercropped with maize, upland rice, or cowpeas in 6 different combinations: cassava/maize, cassava/upland rice, cassava/maize/cowpea, cassava/cowpea, cassava/cowpea/upland rice, and cassava/upland rice/maize/cowpea. The best crop species for intercropping with cassava was determined. Intercropping lowered cassava yields at both locations compared with monocrops (17.0 and 30.7 t/ha in Otobi and Umudike, resp.). Yield losses ranged between 40-66

percent in Otobi and 11-39 percent in Umudike, where results appear to represent normal cassava performance in intercropping since mealybug and green spider mite attacks in Otobi seriously affected cassava. Cassava/maize and cassava/maize/cowpea intercrops gave the highest LERs. (CIAT)

0912

29423 OKEKE, J.E. 1983. Determination of optimum planting pattern and relative time of planting cassava and maize in mixtures. In National Root Crops Research Institute. Cassava Programme. Annual Report 1983. Umudike, Nigeria, pp.19-21. En.

CASSAVA; INTERCROPPING; CULTIVARS; MAIZE; PLANTING; SPACING; TIMING; ROOT PRODUCTIVITY; NIGERIA.

Cassava cv. TMS 30211 and TMS 30555 were grown with maize var. FARZ 34 in Umudike, Nigeria, to determine the best spatial and temporal planting arrangements. Maize and cassava were planted on the top of ridges, cassava on the top of ridge and maize on the opposite sides of the ridge, and cassava on the top of the ridge and maize in alternate positions on the sides of the ridge. Maize was planted 4 wk. before, simultaneously, or 4 wk. after cassava. Both root and energy yields of TMS 30555 were significantly higher than those of TMS 30211 (21.0 vs. 18.2 t/ha). Planting cassava on the top of the ridge with maize on opposite sides or in alternate positions on the sides of the ridge (20.9 and 19.0 t/ha, resp.) was better than the farmers' practice of planting them both on top of the ridges (17.9 t/ha), with no significant differences in maize grain yield and total energy for the 3 treatments. The highest significant increase in cassava yields from 16.9 t/ha, for the traditional practice of simultaneous planting, to 21.8 t/ha was obtained by planting maize 4 wk. after cassava. Yields of 20.0 t/ha were obtained when maize was planted 4 wk. before cassava. (CIAT)

0913

29358 OKEKE, J.E. 1982. Determination of optimum spatial arrangement for component crops in cassava-based mixed cropping systems. In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, pp.23-24. En.

CASSAVA; PLANTING; SPACING; INTERCROPPING; COWPEA; MAIZE; YAMS; PRODUCTIVITY; NIGERIA.

Partial results of an on-going spatial arrangement trial with cassava-based mixed cropping systems in Nigeria are reported. Cassava was planted in double rows (0.5 x 0.6 m) on ridges or on the flat, and flanked 1 m apart on either side of the double row by maize, cowpeas, or yam. Plant densities were 10,000 plants/ha for cassava and yams, and 33,000 plants/ha for maize and cowpeas. Ridge planting gave significantly higher av. cassava yields (14.8 t/ha) than planting on the flat (12.8 t/ha). The cassava/maize or cassava/yams cropping patterns described gave significantly higher cassava yields than monocropped cassava. Cassava/maize in the double-row pattern was also superior to the normal interplanting pattern. Maize was a better companion crop than yams or cowpeas. (CIAT)

0914

29422 OKEKE, J.E. 1983. Effect of fertilizer and carbofuran on improved cassava varieties in distinct ecozones. In National Root Crops Research Institute. Cassava Programme. Annual Report 1983. Umudike, Nigeria, pp.15-19. En.

CASSAVA; CULTIVARS; TECHNOLOGY EVALUATION; INSECTICIDES; FERTILIZERS; N; P; K; ROOT PRODUCTIVITY; NIGERIA.

The performance of an improved technological package, consisting of fertilization (0 and 60 kg N, 30 kg P, and 90 kg K/ha), an insecticide spray (0 and 3 kg a.i. carbofuran/ha), and the improved cassava var. U/41044, TMS 30211, TMS 30555, TMS 30395, and 60506, was tested in Umudike, Otobi, and Igbariam, Nigeria; the best local checks (var. Ichenke for Otobi and var. Nwaraba for Igbariam) were also included. While improved cv. performed significantly better than the local materials, significant cv. yield differences occurred at each location. Cv. U/41044, 60506, and TMS 30211 were superior to TMS 30555 in Umudike. Cv. TMS 30211 and 60506 were superior to other cv. in Igbariam but differences were not significant. On the av., fertilization and carbofuran applications increased yields of all cv. by 24 and 17 percent, resp., in Otobi, while the combination TMS 30211 + fertilization + carbofuran was 150 percent superior to TMS 30395 grown without fertilization and carbofuran applications. Yields of over 26 t/ha were obtained with U/41044 and 60506 in Umudike with carbofuran and fertilizer applications. Yields in Igbariam were generally low due to high soil clay content. The 3- factor interactions were significant in both Igbariam and Umudike, confirming that the components should be adopted as an integrated package. With suitable cv., the package proved viable in both the savanna and rain forest zones. (CIAT)

0915

28519 OKEKE, J.E. 1982. EFFECT OF FERTILIZERS ON TUBER YIELDS AND NUTRIENT REMOVAL IN TUBERS OF CASSAVA VARIETIES (MANIHOT ESCULENTA CRANTZ) ON ALFISOL AND ULTISOL OF SOUTHERN NIGERIA. IN NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA, 1982. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.160-178. EN., SUM. EN., 15 REF.

CASSAVA; CULTIVATION; FERTILIZERS; SOIL FERTILITY; PRODUCTIVITY; CULTIVARS; STARCH PRODUCTIVITY; NUTRIENT UPTAKE; N P; K; CA; FALLOWING; NIGERIA.

TWO FIELD TRIALS WERE CONDUCTED IN 1976-78 TO EVALUATE THE NUTRIENT INPUT/OUTPUT BALANCES OF ALFISOLS AND ULTISOLS ON WHICH CASSAVA IS WIDELY GROWN IN NIGERIA. A 3(3) FACTORIAL EXPT. ON AN ULTISOL SHOWED THAT 30 KG N, 7 KG P, AND 150 KG K/HA GAVE THE HIGHEST ROOT YIELD (18.4 T/HA). IN ANOTHER EXPT. WITH 3 CASSAVA VAR. (60506, NWUGO, AND 53101) AND N AND P AT 2 LEVELS ON AN ALFISOL, THE EFFECT OF P ON ROOT DM YIELDS AT 12 MO. WAS SIGNIFICANT. CASSAVA VAR. 60506 GAVE SIGNIFICANTLY HIGHER YIELDS THAN NWUGO AND 53101. ESTIMATES OF NUTRIENT REMOVAL SHOWED THAT, EXCEPT FOR K, APPROX. EQUAL AMOUNTS OF THE MAJOR NUTRIENTS WERE REMOVED FROM THE ALFISOL AND ULTISOL PER UNIT WT. OF ROOTS; K REMOVAL WAS HIGHER IN ALFISOLS (11.2 KG/HA) THAN ULTISOLS (8.5 KG/HA). CASSAVA VAR. 60506 REMOVED 7.0-8.0 KG N, 0.4-0.5 KG P, AND 0.4 KG CA/HA. THE NEED TO MAINTAIN SOIL NUTRIENT STATUS THROUGH FERTILIZATION AND/OR LEGUME AND GRASS FALLOW IS STRESSED. (CIAT)

0916

29414 OKEKE, J.E. 1983. Evaluation of currently recommended cassava varieties under natural CMB and GSM pressures. In National Root Crops Research Institute. Cassava Programme. Annual Report 1983. Umudike, Nigeria, pp.4-5. En.

CASSAVA; CULTIVARS; SELECTION; PEST DAMAGE; ROOT PRODUCTIVITY; PRODUCTIVITY; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; NIGERIA.

To rank cv. performances for later recommendation to farmers, ten currently used, high yielding cassava cv. were evaluated for root yields under natural infestations by Phenacoccus manihoti and Mononychellus tanajoa in a rain forest zone of Nigeria. Four cv. maintained economic yields of over 20 t fresh roots/ha: U/41044, TMS 30211, TMS 30555, and 631024 (33.9, 27.8, 27.5, and 23.9 t/ha, resp.). The highest dry root yields were for U/41044, TMS

30555, and TMS 30211 (10.1, 9.5, and 6.4 t/ha, resp.). Severity symptom scores ranged from 1 to 2 and from 1 to 4 for M. tanajoa and P. manihoti, resp. (CIAT)

0917

29350 OKEKE, J.F. 1982. Investigation on the effect of potassium fertilizer on the performance of cassava varieties under natural infestation by CMB and GSM. In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, pp.11-13. En.

CASSAVA; CULTIVARS; FERTILIZERS; K; INSECT CONTROL; PHENACOCCUS MANIHOTI; MITE CONTROL; MONONYCHELLUS TANAJOA; ROOT PRODUCTIVITY; NIGERIA.

The effect of different K fertilizer treatments (0, 37.5, 75.7, 112.5, and 26.7 kg/ha) on cassava mealybug and green spider mite control in 3 cassava var. (TMS 30211, U/41044, and TMS 30555) was investigated in Nigeria. Only green spider mite symptoms were significantly and negatively correlated with fresh root yield. The model Y = 69.4 -26.7x well fitted the score scheme in that the highest score of 3 represented total crop loss. Cassava mealybug attack appeared to promote root rot more than green spider mite attack, but r values were not significant. Generally, the severity scores ranged from 0 to 3 for mealybugs and from 0 to 2 for green spider mites, and mild attacks reflected on cassava performance. K applications significantly improved yields: the highest yields for TMS 30211 (38.7 t/ha) and U/41044 (59.9 t/ha) were obtained at 75.7 and 112.5 kg K/ha, and U/41044 gave the highest aggregated yield followed by TMS 30555. The significant differences in root no. and size accounted for var. yield differences and both components were additive. K application had no effect on the 2 components. (CIAT)

0918

28353 OKEKE, J.E. 1980. NUTRIENT DEMANDS OF CASSAVA IN RELATION TO THE POTENTIALS OF MAJOR NIGERIAN SOILS. IN NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA, 1980. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.103-114. EN., SUM. EN., 10 REF.

CASSAVA; SOIL FERTILITY; PLANT FERTILITY; SOIL CONSERVATION; SOIL IMPOVERISHMENT; NUTRIENT UPTAKE; SOIL PHYSICAL PROPERTIES; FERTILIZERS; NIGERIA.

ESTIMATES OF NUTRIENTS REMOVED IN HARVESTED CASSAVA ROOTS ARE GIVEN AS WELL AS DATA ON THE FERTILITY STATUS OF NIGERIAN SOILS IN CASSAVA GROWING AREAS AND FROM CASSAVA LEAF ANALYSES TO DETERMINE NUTRIENT DEMANDS OF CASSAVA. TO REPLENISH N AND K LOSSES IN A YIELD OF 10 T DRY CASSAVA ROOTS/HA,ABOUT 240 KG AMMONIUM SULPHATE AND 120 KG MURIATE OF POTASH/HA ARE REQUIRED. ALMOST ALWAYS THERE IS A DEFICIENCY OF N IN SOILS WHERE CASSAVA IS WIDELY GROWN IN SOUTHERN NIGERIA. ALFISOLS HAVE INTERMEDIATE TO HIGH BASE RESERVES, BUT HEAVY ALFISOLS TEND TO HOLD P AGAINST PLANT UPTAKE. AN APPROACH TO APPROPRIATE FERTILIZER RECOMMENDATIONS REQUIRES THE CALIBRATION OF SOIL ANALYSIS DATA WITH PLANT ANALYSIS DATA AND THE CORRELATION OF ANALYSIS DATA WITH CROP RESPONSES TO FERTILIZATION. (CIAT)

0919

28177 OKEKE, J.F. 1980. POTASSIUM STATUS OF SOME MAJOR NIGERIAN SOILS IN RELATION TO CASSAVA NUTRITION. UMUDIKE, NIGERIA, NATIONAL ROOT CROPS RESEARCH INSTITUTE. 15P. EN., SUM. EN., 18 REF. PAPER PRESENTED AT THE 8TH ANNUAL JOINTCONFERENCE OF THE NATIONAL SOIL CORRELATION COMMITTEE AND THE SOIL SCIENCE SOCIETY OF NIGERIA, BENIN CITY, 1980.

CASSAVA; K; SOIL FERTILITY; PLANT NUTRITION; MINERAL DEFICIENCIES; NUTRIENT UPTAKE; STARCH CONTENT; PLANT DEVELOPMENT PLANT PHYSIOLOGY; SOIL PHYSICAL PROPERTIES; NIGERIA.

LEVELS OF K IN MAJOR CASSAVA SOILS OF SOUTHERN NIGERIA ARE PESENTED. SOILS FROM IGNEOUS ROCK MATERIALS USUALLY HAVE SUFFICIENT RESERVES OF AVAILABLE K AND REQUIRE ONLY MAINTENANCE PROGRAMS THAT CONSIDER CROP REMOVAL, MINERAL RELEASE, AND POSSIBLE LOSSES DUE TO LEACHING AND RUN OFF. SOILS DERIVED FROM SANDSTONE MATERIALS ARE K- DEFICIENT AND DO NOT SUPPORT A GOOD CASSAVA CROP WITHOUT ADEQUATE K FERTILIZATION. THE IMPORTANCE OF K IN CASSAVAMINERAL NUTRITION AND CROP RESPONSES TO K ARE DISCUSSED. GOOD CORRELATIONS BETWEEN EXCHANGEABLE SOIL K AND PERCENT SOIL CLAY OR LEAF BLADE K CONTENT AREREPORTED. (AS)

0920

29384 OKEKE, J.F. 1984. Project 1. Cassava mealybug (CMB) and green spider mite (GSM) control. Level of activity (L.A.) II: Cultural control. Effects of variety, fertiliser and pesticide on control of CMB and GSM in three distinct ecological zones of Nigeria. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.5-7. En., Il.

CASSAVA; CULTIVARS; FERTILIZERS; N; P; K; ACARICIDES; MONONYCHELLUS TANAJOA; INSECTICIDES; PHENACOCCUS MANIHOTI; ROOT PRODUCTIVITY; INSECT CONTROL; MITE CONTROL; CULTURAL CONTROL; NIGERIA.

Improved cassava var. U/41044, TMS 30211, TMS 30555, and TMS 30395 were treated or not with carbofuran (3 kg a.i./ha) and fertilized (400 kg NPK 15-15-15/ha) 8 wk. after planting and the acaricide omethoate (0.6 kg a.i./ha) applied 24 wk. after planting in 3 ecologically distinct locations (Umudike, Igbariam, and Ikole- Ekiti) of Nigeria. Var. differences were observed within and between locations, particularly in Umudike and Igbariam, where U/41044 gave significantly higher yields (27.4 and 38.8 t/ha, resp., with no treatment) than the other var. and where var. significantly responded to fertilization; no response to fertilization was observed in Ikole-Ekiti. Carbofuran and omethoate had no significant effect on yields in Umudike where pest infestation levels were low in 1983/84, but their effect was highly significant at the other 2 sites (av. yield improvements of 44 and 23 percent in Ikole-Ekiti and Igbariam, resp.). In conclusion, a threshold level of pest attack appeared necessary to obtain a response to pesticides, while fertilization effects remain a fuction of soil nutrient status. (CIAT)

0921

30061 OKEKE, J.E.; CHIKWENDU, C.C. 1985. Project 1. Genetic resources: improvement and evaluation. Cassava germplasm. Evaluation of ten top selections in three ecological zones of Nigeria. In National Root Crops Research Institute. Cassava Programme. Annual Report 1985. Umudike, Nigeria, pp.2-4. En.

CASSAVA; CULTIVARS; ROOT PRODUCTIVITY; RESISTANCE; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; ZONOCERUS VARIEGATUS; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BACTERIAL BLIGHT; GLOEOSPORIUM MANIHOTIS; NIGERIA.

In 1985, 10 top cassava selections were evaluated for root yield and biotic stress indices (Phenacoccus manihoti, Mononychellus tanajoa, Zonocerus variegatus, CAMD, CBB, and Gloeosporium manihotis) in Umudike, Igbariam, and Otobi (Nigeria). Yields in Umudike ranged between 19.6-36.1 t/ha, the highest being for 8233; all var. showed resistance/tolerance to the various pests and diseases. The following cv. could be recommended for the rain forest zone represented by Umudike: 8233, 8319, 8308, 8205, and 8311. Yields

in Otobi ranged between 9.4-30.9 t/ha, the highest being for 8008, and all var. also showed resistance/tolerance to the various pests and diseases. Cv. 8008 and 8226 could be recommended for the ecozone represented by Otobi (less than 1500 mm rainfall). Yields in Igbariam ranged between 6.0-22.0 t/ha, the highest being for cv. 8218, which can be recommended for this ecozone. (CIAT)

0922

29396 OKEKE, J.E.; KALU, C.O. 1984. Project 3. Cultural and soil fertility management studies. Comparison of double and single row planting pattern on the performance of mixed crops. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.34-35. En.

CASSAVA; INTERCROPPING; PLANTING; SPACING; YAM; MAIZE; ROOT PRODUCTIVITY; NIGERIA.

Optimum planting patterns for mixed cropping systems were determined in Umudike, Nigeria, by comparing the performance of sole crops of cassava, yams, and maize, and mixed crops of cassava + yam, cassava + maize, and yam + maize in single and double rows. The double-row pattern (e.g., 2 rows of cassava planted on the same ridge alternating with 2 rows of another crop on a separate ridge) was significantly better in terms of cassava root yield and total energy than the traditional mixing of crops in a row on the same ridge; cassava yields in double-row patterns with yam and maize were 27.1 and 31.7 t/ha, resp., compared with 25.6 and 22.5 t/ha for the resp. single-row patterns. Monocropped cassava yielded 22.5 t/ha. (CIAT)

0923

29393 OKEKE, J.E.; KALU, C.O. 1984. Project 3. Cultural and soil fertility management studies. Effect of population density and fertilisers on the performances of two cassava varieties on a loamy sand in the rainforest zone of Nigeria. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.25-26. En., Il.

CASSAVA; CULTIVARS; PLANTING; SPACING; SOIL FERTILITY; FERTILIZERS; N; P; K; ROOT PRODUCTIVITY; NIGERIA.

The effect of 4 plant populations (20,000, 15,000, 10,000, and 8000 plants/ha), with or without fertilization (60, 30, and 90 kg N, P, and K/ha, resp.) on root yield and other plant parameters of cassava var. U/41044 and TMS 30211 was studied on a loamy sand soil in the rain forest zone of Nigeria. Root yields decreased as the distance between plants increased with coefficients of -1.8 and -1.6 for U/41044 and TMS 30211, resp. Higher populations of both var. (10,000-20,000 plants/ha) are preferable in sole cropping. Var. TMS 30211 gave significantly higher yields at twice the normal density of 10,000 plants/ha. The effect of fertilization was significant, with an av. improvement of 17 percent, and a higher positive response of 20 percent for U/41044. This latter var. proved superior to TMS 30211 under all treatment regimes. (CIAT)

0924

29397 OKEKE, J.E.; KALU, C.O. 1984. Project 3. Cultural and soil fertility management studies. Effect of poultry manure (droppings) and inorganic fertilisers on intensive cultivation of cassava in the rainforest zone of Nigeria. 1. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.35-37. En.

CASSAVA; FERTILIZERS; N; P; K; MANURES; ROOT PRODUCTIVITY; NIGERIA.

Four levels each of inorganic fertilizers and poultry manure (3.2, 3.0, and 3.4 percent NPK, resp.) were applied to cassava var. TMS 30211 at planting in Western Farm (Umudike, Nigeria) to establish sound soil fertility management practices to maintain high yields under intensive cassava cropping systems. Levels of NPK were 0, 32, 30, and 60 kg/ha,; 64, 60, and 170 kg/ha; and 96, 90, and 180 kg/ha, resp., and those of poultry manure were 0, 1000, 2000, and 3000 kg/ha supplemented with 26, 52, and 68 kg K/ha, resp., for the latter 3 levels of manure. Results showed that the sandy loam soil of the location required no fertilization; however, poultry manure at 2000 kg/ha + 52 kg K/ha improved yields significantly from 13.1 t/ha for the untreated control to 20.4 t/ha. The generally low yields obtained with other treatments were attributable to the high clay content of the soil (over 30 percent), since cassava performs better at lower clay levels. (CIAT)

0925

30078 OKEKE, J.E. 1985. Project 4. Cassava physiology. Predictive indices for rapid screening of cassava for high root yield. In National Root Crops Research Institute. Cassava Programme. Annual Report 1985. Umudike, Nigeria, p.33. En.

CASSAVA; CULTIVARS; SELECTION; PLANT DEVELOPMENT; GROWTH; LEAF AREA; PLANT HEIGHT; DRY MATTER; ROOT PRODUCTIVITY; NIGERIA.

Plant height, root wt., and LAI of 10 cassava var. were monitored at 12 wk. after planting in Nigeria in 1985, and each parameter was regressed on fresh root yield, HI, and dry root yield at 12 mo. after planting to determine predictive indices for rapid screening of cassava for high root yield. Plant height at 12 wk. after planting showed a significant negative correlation with fresh root yield at 12 mo. after planting (r = -0.62). LAI was positively correlated with dry root yields (r = 0.85), a range of 1.3-2.3 appearing to be optimum for DM accumulation in roots. The 1984 results showed that the early growth parameters were better correlated with plant performance at 9 mo. after planting. (CIAT)

0926

29400 OKEKE, J.E.; MADUAKOR, B.N. 1984. Project 4. Growth and development studies on cassava. Determination of predictive indices for rapid screening of cassava, Manihot esculenta, for high root yield. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.41-42. En.

CASSAVA; CULTIVARS; SELECTION; ROOT PRODUCTIVITY; PLANT DEVELOPMENT; PLANT HEIGHT; LEAF AREA; DRY MATTER; NIGERIA.

Correlations between growth parameters (LAI, dry wt. of leaves, plant height) 12 wk. after planting and final root yields at 9 and 15 mo. after planting were determined for 10 cassava var. to define predictive indices that could allow for early screening of germplasm for high root yield. LAI, dry wt. of leaves, and plant height 12 wk. after planting had significant correlations with root dry wt. at 9 but not at 15 mo. after planting, perhaps due to increased root losses due to root rots at the later date of harvesting. A LAI of 1.8-2.4 was associated with the highest dry root yield at 9 mo. after planting (r = 0.93), accounting for 96 percent of total variation. Plant height and dry wt. of leaves 12 wk. after planting showed high correlation coefficients (r = 0.82 and 0.76, resp.) with dry root yields at 9 mo. after planting. (CIAT)

0927

32250 OKEKE, J.E.; EMEHUTE, J.K.U.; EZULIKE, T.O.; ATU, U.G. 1986. Report on cassava mealybug and cassava green mites in some African countries: Nigeria. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological

Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. pp.144-145. En. (National Root Crops Research Inst., P.M.B. 1006, Umudike, Umuahia, Nigeria)

CASSAVA; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; NIGERIA.

A brief report is presented on detection, distribution, and root yield and planting material losses by Phenacoccus manihoti and Mononychellus tanajoa in Nigeria. Approx. 4/5 of Nigerian cassava are being attacked by either or both pests. Root yield losses of up to 84 percent and planting material losses of up to 78 percent have been detected in Nigeria in controlled expt. (CIAT)

0928

28374 OKEKE, J.F. 1981. STUDIES ON ADAPTATION OF THE TECHNIQUE OF RAPID MULTIPLICATION OF CASSAVAFOR ADOPTION BY FARMERS. IN NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA, 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.56-60. EN., SUM. EN., 2 REF.

CASSAVA; PROPAGATION; PLANT DEVELOPMENT; NUTRITIONAL REQUIREMENTS; TECHNOLOGY TRANSFER; CULTIVARS; CUTTINGS; NIGERIA.

THE RESULTS OF 3 EXPT. ON THE VARIABLES OF THE CASSAVA RAPID MULTIPLICATION TECHNIQUE FOR ADOPTION BY NIGERIAN FARMERS ARE BRIEFLY DISCUSSED. IN EXPT. 1 AND 2, UNSTERILIZED SOIL WAS AS GOOD AS OTHER MEDIA FOR ROOTING 2-NODE CUTTINGS AND SUPERIOR FOR TOP GROWTH YIELD OF PROPAGULES 47 DAYS AFTER PLANTING. IN EXPT. 3, THE OPTIMUM NO. OF NODES/1-M-LONG CUTTING OF 3 VAR. (60506, TMS 30211, AND TMS 30395) WAS DETERMINED. VAR. DIFFERENCES WERE OBSERVED IN NO. OF PROPAGULES GENERATED FROM THE SAME NO. OFNODES/CUTTING OF THE SAME AGE, THE HIGHEST NO. OF PROPAGULES BEING FOUND FOR VAR. 60506; 6 NODES/ CUTTING APPEARED OPTIMUM FOR TMS 30211 AND 30395. FOR ARAPID MULTIPLICATION OF DISEASE-FREE ELITE MATERIALS, A FARMER WOULD REQUIRE A NURSERY BED OF WELL- DRAINED SOIL NEAR A WATER SOURCE, SHADE, AND POLYETHYLENE BAGS. (CIAT)

0929

31659 OKEREKE, G.U.; NWOSU, V.C. 1987. Crop storage losses in southern Nigeria caused by the activities of micro-organisms. Mircen Journal of Applied Microbiology and Biotechnology 3(3):201-210. En., Sum. En., Fr., Es., 42 Ref. (Dept. of Horticulture & Plant Protection, Anambra State Univ. of Technology, P.M.B. 01660, Enugu, Anambra State, Nigeria)

CASSAVA; STORAGE; DETERIORATION; GARI; FOOFOO; CASSAVA CHIPS; NIGERIA.

The present storage system of food crops in Nigeria is reviewed. Microbiological activities leading to spoilage and loss of 3 major food crops grown in southern Nigeria (maize, cassava, and yam) are discussed. Among factors found to influence the infestation and growth of microorganisms in these crops during storage, moisture is especially significant. To aid in its preservation, cassava is usually processed into more shelf-stable products such as gari, foofoo, and cassava chips. These processed products, in spite of their relatively shelf-stable nature, are still subject to microbial infection if improperly handled and stored. It is concluded that much work needs to be done in Nigeria to improve storage conditions. (AS (extract))

0930

28349 OKEREKE, H.E. 1980. PROBLEMS OF TECHNOLOGY TRANSFER TO NIGERIAN FARMERS. IN NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA, 1980.

PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.47-59. EN., IL.

CASSAVA; TECHNOLOGY TRANSFER; NIGERIA.

A COMPREHENSIVE ANALYSIS OF THE CONSTRAINTS TO CASSAVA TECHNOLOGY TRANSFER, DERIVED FROM THE NIGERIAN AGRICULTURAL SYSTEM COMPONENTS (RESEARCH,EXTENSION, AND THE FARMER), IS PRESENTED. A SERIES OF SOLUTIONS AND RECOMMENDATIONS TO THESE PROBLEMS IS ALSO INCLUDED. RESEARCH EFFORTS SHOULD: (1) STUDY THE FARMER AND HIS ENVIRONMENT AS A BASIS FOR FORMULATING RELEVANT RESEARCH PROJECTS; (2) ADOPT A SYSTEMS APPROACH TO PRODUCE PACKAGES OF APPROPRIATE TECHNOLOGY; (3) SEE THAT RESEARCH RESULTS ARE TRANSMITTED TO FARMERS. EXTENSION EFFORTS SHOULD BE INTEGRATED TO RESEARCH EFFORTS AND APPROPRIATE COMMUNICATION MEANS SHOULD BE DEVELOPED. FARMER PROBLEMS, ON THE OTHER HAND, ARE SOCIAL PROBLEMS THAT SHOULD BE TACKLED THROUGH LAND REFORM, CREDITS, EDUCATION, AND TECHNICAL ASSISTANCE. THE ROLE OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) IS DISCUSSED WITHIN THIS CONTEXT. (CIAT)

0931

29395 OKIRI, A.C. 1984. Project 3. Cultural and soil fertility management studies. Calibration curve for estimation of soil moisture tension/content. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.29-34. En., 11.

CASSAVA; SOIL ANALYSIS; SOIL MOISTURE; SOIL WATER; NIGERIA.

A study was conducted on Western Farm (Umudike, Nigeria) to establish a relationship between soil moisture tension and MC with a view of predicting soil moisture levels of sandy clay loam soils within the region in particular and the country in general. Jetfill tensiometers were installed at 20-cm depths in 48 cassava plots with various tillage and mulch treatments. Moisture determinations were also done gravimetrically. A linear regression analysis was adopted to show the relationship between the log of moisture tension (log y) and MC (x). A correlation coefficient of -0.86 was obtained in the regression analysis, with corresponding values of 0.04896 for slope and 3.4740 for y intercept. The equation $y = 2978.5164e(-0.1127x)$ described the relationship between soil moisture tension and MC. It is hoped that the above equation will be a valuable tool to predict soil moisture in sandy clay loam soils of sand-stone origin. (CIAT)

0932

29394 OKIRI, A.C. 1984. Project 3. Cultural and soil fertility management studies. Tillage and mulch effects of soil water. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.27-28. En., Il.

CASSAVA; LAND PREPARATION; MULCHING; SOIL MOISTURE; SOIL WATER; TIMING; NIGERIA.

The effect of mulch (grass at 2.5 t/ha, dry wt. basis) and 3 tillage systems (conventional, min., and zero) on soil water was tested in a sandy clay loam soil of Western Farm (Umudike, Nigeria), using cassava var. TMS 30211 as the test crop. Soil water was measured gravimetrically at 15-20 cm depths on a weekly basis from Dec. 1983 to March 1984. Soil water in the zero (pushing cuttings directly into soil) and min. (digger-made narrow holes) tillage treatments was significantly higher ($P = 0.05$) than that of the conventional tillage (plowing, harrowing, and ridging). Increases of 14.0 and 8.7 percent in soil moisture were recorded for the zero and min. tillage treatments over conventional tillage. Mulch significantly increased ($P = 0.01$) soil water by 18.2 percent. Poor plant growth in the reduced tillage treatments was due to

high soil bulk density (1.60 g/cubic centimeter) and mechanical impedance (more than 4.5 kg/square centimeter at 13.6 percent) causing serious limitations in root proliferation. (CIAT)

0933

32063 OKIY, D.A.; OKE, O.L. 1986. Nutritional evaluation of thermally deteriorated palm oil. Oleagineux 41(2):77-81. En., Sum. En., Fr., Es., 23 Ref. (Chemistry Dept., Nigerian Inst. for Oilpalm Research, P.M.B. 1030, Benin City, Nigeria)

CASSAVA; LEAVES; PROTEIN CONTENT; DIETS; LABORATORY ANIMALS; SUPPLEMENTS; DIGESTIBILITY; NIGERIA.

Cassava leaf protein diets were supplemented with either fresh unheated palm oil, heated palm oil, heated palm oil containing 1 percent pepper, or heated palm oil containing 1 percent table salt, and fed to test rats. PER, NPU, true digestibility, and B.V. were measured to test the effect of thermally deteriorated palm oil on the protein. Although the true digestibility of the diet supplemented with fresh unheated palm oil was significantly greater than that of the control and those of the diets supplemented with heated palm oil and pepper-treated oil, it was similar to the true digestibility of the diet supplemented with the salt-treated sample of palm oil. PER, NPU, and B.V. did not differ significantly in the diets, signifying that the thermally deteriorated samples of palm oil did not effect irregularities in the diets of this study. (AS)

0934

28180 OKOLI, O.O.; HAHN, S.K.; OTOO, J.A.; ELEJE, I. 1986. POTENTIAL CONTRIBUTION OF ROOT CROPS TO THE NATIONAL GOAL OF SELF SUFFICIENCY--A REVISED NATIONAL PLAN. UMUDIKE, NIGERIA, NATIONAL ROOT CROPS RESEARCH INSTITUTE. 9P. EN., 1 REF. PAPER PRESENTED AT THE 7TH JOINT NAFPP WORKSHOP, IBADAN,NIGERIA,1986. (NATIONAL ROOT CROPS RESEARCH INST., UMUDIKE, UMUAHIA, NIGERIA)

CASSAVA; PRODUCTIVITY; CONSUMPTION; CASSAVA PROGRAMS; NIGERIA.

BACKGROUND INFORMATION IS GIVEN ON THE NATIONAL PLAN TO IMPROVE ROOT CROP PRODUCTION, INCLUDING CASSAVA, IN NIGERIA. ROOT CROP PRODUCTION CONSTRAINTS CAN BE TECHNICAL, INFRASTRUCTURAL, SOCIAL, OR ENVIRONMENTAL IN NATURE. THE ROLES THAT NATIONAL AGENCIES (FEDERAL GOVERNMENT, NATIONAL SEED SERVICE, NATIONAL CASSAVA CENTRE, AND STATE MINISTRIES OF AGRICULTURE) PLAY TO ACHIEVE INCREASED ROOT CROP PRODUCTIVITY ARE BRIEFLY OUTLINED. THE SHORT-TERM (1986-87) PROGRAM FOR ENHANCED CASSAVA PRODUCTION IS PRESENTED; IT EMPHASIZES THE PLANTING OF HIGH YIELDING, EARLY MATURING VAR. AND THE INCREMENT IN PLANTED AREA. THE BENEFITS EXPECTED FROM THIS APPROACH ARE INDICATED. (CIAT)

0935

28157 OKOLI, P.S.O.; WILSON, G.F. 1986. RESPONSE OF CASSAVA (MANIHOT ESCULENTA CRANTZ) TO SHADE UNDER FIELD CONDITIONS. FIELD CROPS RESEARCH 14(4):349-359. EN., SUM. EN., 16 REF., IL. (FEDERAL AGRICULTURAL COORDINATING UNIT, 6/8 UNIJE STREET, INDEPENDENCE LAYOUT, P.O. BOX 1766, ENUGU, ANAMBRA STATE, NIGERIA)

CASSAVA; PLANT DEVELOPMENT; PRODUCTIVITY; ILLUMINATION; LEAF AREA; NIGERIA.

TO DETERMINE THE EFFECT OF SHADING ON ITS DEVELOPMENT AND YIELD, CASSAVA WAS SUBJECTED TO 6 SHADE REGIMES (0, 20, 40, 50, 60, AND 70 PERCENT OF FULL SUNLIGHT). THE 2-YR FIELD STUDY WAS UNDERTAKEN ON A SANDY CLAY LOAM SOIL (OXIC PALEUSTALF OR FERRIC LUVISOL) IN SW NIGERIA. AS THE PERCENTAGE OF SHADE INCREASED PLANT HEIGHT INCREASED AND LAI DECREASED. STEM AND LEAF DRY

WT. INCREASED WITH DECREASING DEGREE OF SHADE. ALL LEVELS OF SHADE DELAYED TUBER BULKING. COMPARED WITH THE 0 PERCENT SHADE OR CONTROL, THE 20, 40, 50, 60, AND 70 PERCENT SHADE LEVELS REDUCED CASSAVA YIELD BY 43, 56, 59, 69, AND 80 PERCENT, RESP. SUGGESTIONS FOR IMPROVING CASSAVA PRODUCTIVITY IN MIXED CROPPING AND INTERCROPPING SYSTEMS INCLUDE THE USE OF LATE-MATURING CASSAVA VAR., REDUCING THE POPULATION OF THE ASSOCIATED CROP, AND ALLOWING LONG RECOVERY INTERVALS AFTER THE HARVEST OF THE INTERCROP. (AS)

0936

29427 OKPOKIRI, A.O.; UKPA, N.; EJIOFOR, M.A.N.; OHIRI, V.U. 1983. Assessment of gari quality of cassava cultivars based on chemical characteristics and sensory evaluation. In National Root Crops Research Institute. Cassava Programme. Annual Report 1983. Umudike, Nigeria, pp.29-32. En.

CASSAVA; CULTIVARS; PROCESSING; GARI; COMPOSITION; STARCH CONTENT; HCN CONTENT; FAT CONTENT; ORGANOLEPTIC EXAMINATION; PRODUCTIVITY; NIGERIA.

The quality of gari obtained from 10 top selections of cassava germplasm in Nigeria was assessed. Data are given for starch, fat, HCN, titratable acidity, gari yield, and swelling index for all var., as well as ratings for color, taste, texture, and acceptability. The highest gari yield (22.0 percent) was obtained with var. 631024. Significant variations among cv. occurred in starch (35.31-55.66 percent), fat (0.15-2.90 percent), HCN (3.66- 47.1 mg/kg), and swelling capacity (1.14-1.94), with no significant differences between their titratable acidity. Cv. Nwugo was rated significantly higher in organoleptic and acceptability parameters compared with the rest, and in spite of its relatively low gari yield (19.0 percent), it contained a very low HCN level (3.66 mg/kg) and was more readily acceptable. (CIAT)

0937

29362 OKPOKIRI, A.O.; UGWU, B.O. 1982. Processing and utilization of cassava tubers. Effect of cassava- based rations on the performance of a laying flock. In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, pp.30-32,34. En.

CASSAVA; FEEDS AND FEEDING; DIETS; POULTRY; EGGS; ECONOMICS; COSTS; NIGERIA.

Cassava was used to replace maize at 4 substitution levels (0, 40, 60, and 100 percent) in diets for layers from birth to the laying period. Mortality occurring up to the 20th wk. could be attributed to other factors different from feed treatments. Cassava at 100 and 60 percent substitution levels significantly reduced the no. of eggs laid/yr: 1755 and 1728 eggs/yr, resp., vs. 2002 and 2119 eggs/yr for cassava substitution levels of 40 and 0 percent, resp. No significant differences in fresh egg wt., shell wt., albumin wt., and cull wt. were recorded, however, between treatments. A significantly lower yolk wt. was recorded for cassava at the 100 percent substitution level (16.7 g/egg) compared with the 0 substitution level (17.5 g/egg). Economic analysis showed that egg production is cheaper when cassava is used compared with maize. (CIAT)

0938

29455 OLAIFA, J.I. 1986. TOXICITY OF SOME INSECTICIDES TO THE GRASSHOPPER ZONOCERUS VARIEGATUS (ORTHOPTERA:PYRGOMORPHIDAE). INSECT SCIENCE AND ITS APPLICATION 7(2):135-138. EN., SUM. EN., FR., 15 REF. (DEPT. OF PLANT SCIENCE, UNIV. OF IFE, ILE-IFE, NIGERIA)

CASSAVA; INSECTICIDES; TOXICITY; ZONOCERUS VARIEGATUS; INSECT BIOLOGY; ANALYSIS; NIGERIA.

TWENTY-ONE INSECTICIDES WERE TESTED IN THE LAB. FOR ACUTE TOXICITY BY SURFACE FILM CONTACT METHOD AGAINST THE GRASSHOPPER ZONOCERUS VARIEGATUS, A MAJOR CASSAVA PEST IN SOUTHERN NIGERIA. DELTAMETHRIN, CYPERMETHRIN, LINDANE, O,O-DIETHYL(P-METHYL SULFINYL) P'-PHOSPHOROTHIOATE, AND DIELDRIN WERE HIGHLY POTENT. MODERATELY POTENT INSECTICIDES WERE PROPOXUR, D-TRANS ALLETHRIN, ISOBENZAN, ISODRIN, HEPTACHLOR, AND ROTENONE. A TOXIC SYMPTOM COMMON TO ALL POTENT INSECTICIDES IN THE FEMALE WAS THE OPENING AND CLOSING OF OVIPOSITOR VALVES WHICH REMAINED WIDE OPEN AT DEATH. FIVE INSECTICIDES--DIELDRIN, ISOBENZAN, P,P'-DDT, CHLOROBENZILATE, CHLORFENETHROL, AND CHLORDIMEFORM-INDUCED CANNIBALISM AMONG THE TREATED FEMALES. (AS)

0939

29005 ONAYEMI, O. 1985. SENSORY TEXTURE PROFILE OF AFRICAN FOODS MADE FROM YAM AND CASSAVA. JOURNAL OF TEXTURE STUDIES 16(3):263-269. EN., SUM. EN., 16 REF. (DEPT. OF FOOD SCIENCE & TECHNOLOGY, UNIV. OF IFE, ILE-IFE, NIGERIA)

CASSAVA; FOOD PRODUCTS; GARI; CASSAVA FLOUR; INDUSTRIALIZATION; INDUSTRIAL MACHINERY; NIGERIA.

TEXTURAL CHARACTERISTICS OF AFRICAN FOODS MADE FROM YAM AND CASSAVA (GARIAND FLOUR) WERE CHARACTERIZED BY SENSORY PROFILE TECHNIQUES. PRODUCTS WITH IDENTICAL PROCESSING TECHNIQUES RECONSTITUTED TO THE SAME MC SHOWED SIMILAR CHARACTERISTICS OF FIRMNESS, ADHESIVENESS, AND EASE OF WORKING TO A SPHERICAL MASS. THE IMPORTANT ATTRIBUTES OF SMOOTHNESS, SPRINGINESS OR BOUNCINESS, AND EASE OF SWALLOWING WITHOUT MOUTH COATING WERE COMMON TO ALL PRODUCTS AND ARE GOOD MEASURES OF OVERALL ACCEPTABILITY. THIS METHOD IS SIMPLE AND PROVIDES A METHOD OF QUALITY CONTROL THAT COULD BE USED BY INDUSTRIAL MANUFACTURERS OF THESE PRODUCTS. (AS)

0940

26390 ONONOGBU, I.C.; OKPARA, G.C. 1986. EFFECT OF GARI DIET ON LECITHIN: CHOLESTEROL ACYLTRANSFERASE (LCAT) IN RATS. NUTRITION REPORTS INTERNATIONAL 33(1):79-87. EN. (DEPT. OF BIOCHEMISTRY, UNIV. OF NIGERIA, NSUKKA, NIGERIA)

CASSAVA; GARI; LABORATORY ANIMALS; CLINICAL MANIFESTATIONS; ENZYMES; HCN; DIETS; NIGERIA.

THE EFFECT OF GARI DIET ON THE ENZYME LECITHIN:CHOLESTEROL ACYLTRANSFERASE (LCAT) IN ALBINO RATS WAS INVESTIGATED. ANALYSIS INVOLVED THE MEASUREMENT OF PLASMA AND LIVER FREE, TOTAL, AND ESTERIFIED CHOLESTEROL AS WELL AS LECITHIN AND LYSOLECITHIN, WHICH ARE THE BLOOD CONSTITUENTS MOST INVOLVED IN LCAT ACTIVITY. IN THE GARI-FED RATS, PLASMA AND LIVER CHOLESTEROL ESTERIFICATION WAS DECREASED (P LESS THAN 0.05). ALTHOUGH CHOLESTEROL ESTERIFICATION WAS LECITHIN-DEPENDENT IN THE PLASMA, LIVER CHOLESTEROL ESTERIFICATION WAS LECITHIN-INDEPENDENT. IN BOTH THE GARI-FED AND THE CONTROL RATS, THERE WAS AN INCREASE IN PROTEIN CONCN. IN BOTH PLASMA AND LIVER. THE LOWERING OF LCAT ACTIVITY BY GARI MAY CONTRIBUTE, THEREFORE, TO SOME OF THE LIPOPROTEIN ABNORMALITIES FOUND IN COMMUNITIES THAT SUBSIST ON GARI. (AS)

0941

28370 ONWUEME, I.C. 1981. A DELIVERY SYSTEM FOR CASSAVA IN NIGERIA -- A KEYNOTE ADDRESS. IN NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA, 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.3-7. EN., 1 REF.

CASSAVA; HARVESTING; PEELING; RASPING; SMALL-SCALE PROCESSING; POSTHARVEST TECHNOLOGY; MARKETING; KPOKPO; GARI; NIGERIA.

A DELIVERY SYSTEM FOR CASSAVA IN NIGERIA IS PROPOSED IN AN ATTEMPT TO SOL\ THE CASSAVA ROOT SUPPLY PROBLEMS OF NIGERIAN PROCESSING FACTORIES. CASSAVA IS HAND HARVESTED AND PEELED BY THE FARMER AND HIS FAMILY, AND THEN DELIVERED TO THE VILLAGE, WHERE IT IS GRATED AND DEWATERED. THE DEWATERED MASH IS COLLECTED BY AGENTS AND TAKEN TO A CENTRAL FRYING FACTORY WHERE IT ISPROCESSED INTO GARI. ADVANTAGES AND DISADVANTAGES OF THIS SYSTEM ARE DISCUSSED. (CIAT)

0942

29428 ONYEAGBA, R.A.; NNODU, E.C. 1983. Determination of suitable time of planting and use of fertilizer for the control of cassava anthracnose disease. In National Root Crops Research Institute. Cassava Programme. Annual Report 1983. Umudike, Nigeria, p.32. En.

CASSAVA; CULTIVARS; GLOEOSPORIUM MANIHOTIS; FERTILIZERS; PLANTING; TIMING; DISEASE CONTROL; NIGERIA.

Cassava var. Nwugo and 60506 were planted at monthly intervals during 12 mo., with or without fertilization (115 kg calcium ammonium nitrate, 83 kg P, and 300 kg K/ha), to determine the best time to plant cassava in Umudik Nigeria, in order to avoid heavy infections by Gloeosporium manihotis and the effect of fertilizers. Disease severity scores were taken 3 mo. after planting for each planting date. There was no significant difference in th response of both var. to the disease nor to fertilization. There was a significant difference in severity for some of the months (April through Aug.). (CIAT)

0943

29391 ONYEAGBA, R.A.; NNODU, E.C. 1984. Project 2. Studies on control of other pests and diseases of cassava. 1. Effect of potassium fertilization (the severity of cassava anthracnose disease. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.19-21. En., Il.

CASSAVA; GLOEOSPORIUM MANIHOTIS; FERTILIZERS; K; CULTIVARS; ROOT PRODUCTIVITY; PEST DAMAGE; NIGERIA.

The effect of applying 5 levels of K fertilization (0, 90, 120, 150, and 18 kg/ha), 8 wk. after planting, on the reduction of the severity of anthracnose (Gloeosporium manihotis) in cassava var. 30211, Nwugo, 60506, 30555, and 41044, was studied in Nigeria. Increasing levels of K fertilization had no effect on G. manihotis severity, ranging between 28.4-31.2 percent across all K rates. There was, however, a var. response t the disease; var. 30555 had a significantly higher disease incidence (37.8 percent) than the rest of the var., and that of var. 60506 was significantl higher (30.0 percent) than 41044 (27.7 percent), 30211 (26.4 percent), and Nwugo (25.4 percent). Yields of var. 41044 were significantly higher (av. 28.32 t/ha), followed by 30211 (av. 19.88 t/ha). A significant response to fertilization in root yield was also observed; while the av. yield for all var. at 0 kg K/ha was 14.46 t/ha, the av. highest yield was 24.64 t/ha at 180 kg K/ha. No significant var. x fertilization level interaction was observed. A negative correlation was observed between disease severity and yield for var. 30211 and 30555, and a positive correlation for the other 3 var. (CIAT)

0944

30075 ONYEAGBA, R.A.; NNODU, E.C. 1985. Project 3. Studies on control of other pests and diseases. Assay of chemicals for control of cassava anthracnose disease (CAD). In National Root Crops Research Institute. Cassava Programme. Annual Report 1985. Umudike, Nigeria, pp.27-29. En.

CASSAVA; GLOEOSPORIUM MANIHOTIS; DISEASE CONTROL; FUNGICIDES; ROOT PRODUCTIVITY; NIGERIA.

The Gloeosporium manihoti-susceptible cassava cv. 60506 and Nwugo were sprayed with either mancozeb, captafol, copper hydroxide, benomyl, or benomyl + monocrotophos (applied 6 times at bi-weekly intervals) in Nigeria to evaluate their effect on the control of G. manihotis. Severity scores and root yield data showed no significant effects of the chemicals on the severity of G. manihotis; however, Nwugo was found to be more susceptible to the disease than 60506 (30.00 and 12.75 percent, resp.) and the lower severity in the latter could be responsible for the significant difference in yield between them (22.2 and 16.5 t/ha for 60506 and Nwugo, resp.). It is suggested that new chemicals be evaluated along with copper hydroxide and benomyl which showed some positive trends. (CIAT)

0945

28560 ONYEZILI, N.I.; EJEZIE, G.C.; ENWONWU, C.O. 1986. INADEQUACY OF PLASMA THYROXINE-BINDING PREALBUMIN AS INDEX OF PROTEIN MALNUTRITION. NUTRITION REPORTS INTERNATIONAL 34(2):165-173. EN., SUM. EN., 30 REF. (NATIONAL INST. FOR MEDICAL RESEARCH, P.M.B. 2013, EDMOND CRESCENT, YABA, NIGERIA)

CASSAVA; HUMAN HEALTH; MALNUTRITION; DIETS; KWASHIORKOR; NIGERIA.

PLASMA PREALBUMIN AND VARIOUS ANTHROPOMETRIC PARAMETERS WERE MEASURED IN 127 IMPOVERISHED NIGERIAN CHILDREN AGED 4-36 MO. THE CHILDREN WERE FED THE SAME TYPES OF DIETS BEFORE AND DURING THE STUDIES. THESE DIETS CONSISTED MOSTLY OF A MAIZE-BASED FOOD HIGHLY LIMITING IN TRYPTOPHAN, STARCHY ROOTS SUCH AS CASSAVA AND YAM, AND PLANTAIN. GROUP A CHILDREN WERE DEWORMED AND TREATED WITH ANTIMALARIALS. GROUP B RECEIVED NO PRIOR MEDICAL ATTENTION WHILEGROUP C CONSISTED OF 19 CHILDREN WITH CLINICAL EVIDENCE OF MARASMIC- KWASHIORKOR. PLASMA PREALBUMIN WAS HIGHEST IN GROUP A BUT FAILED TO DISTINGUISH BETWEEN GROUPS B AND C. ONLY ARM CIRCUMFERENCE DISCRIMINATED BETWEEN GROUPS B AND C. THE APPARENTLY "NORMAL", MILDLY, AND MODERATELY MALNOURISHED CHILDREN WITHIN GROUP B DID NOT DIFFER IN PREALBUMIN LEVELS. THEDATA SUGGESTED THAT PREALBUMIN LEVEL WAS SUSCEPTIBLE TO INFECTIONS, AND ALSO CORRELATED POORLY WITH THE VARIOUS STAGES OF PROTEIN-ENERGY MALNUTRITION. (CIAT)

0946

30142 OPARA-NADI, O.; LAL, R. 1987. Effects of plant population on soil structure, soil moisture depletion and on yield of cassava (Manihot esculenta) on an Ultisol in Southeast Nigeria. Journal of the Science of Food and Agriculture 38(4):291-302. EN., SUM. EN., 20 REF., Il. (International Inst. of Tropical Agriculture, Ibadan, Nigeria)

CASSAVA; PLANTING; SPACING; SOIL PHYSICAL PROPERTIES; SOIL MOISTURE; SOIL ANALYSIS; ROOT PRODUCTIVITY; RAINFALL DATA; ANALYSIS; WATER REQUIREMENTS (PLANT); NIGERIA.

The effects of 4 cassava populations (8, 10, 13, and 20 x 10(3) plants/ha) on soil physical properties, moisture retention characteristics, moisture potential profiles, and moisture depletion patterns were compared with uncropped plots receiving no cultivation of an Ultisol in the humid region in eastern Nigeria. The growing of cassava decreased the bulk density of 0-10 cm depth by 17 percent in comparison with the uncultivated soil (1.53 Mg/cubic meter). The bulk density of the 10-20 cm depth was higher for the cropped than the uncropped control plots. The moisture retention below a suction of pF 2.4 for 0-10 cm depth was less for the uncultivated control than for soil growing cassava. The reserve was found in moisture retention characteristics of the 20-40 cm depth especially for low suction ranges of pF below 0.8. The 0-10 cm soil layer of uncropped control dried more rapidly than the cropped soil. Below 10 cm, however, cassava depleted moisture

reserves more rapidly than in uncropped control. The effect of plant population on soil moisture depletion was more conspicuous within than between rows. Significant differences in water flux and in water uptake fr different horizons were observed among various population densities. The total water loss was the highest for the least plant population for the between-row zone, and for the highest population for the within-row zone. Plant population had no effect on root and stem yields. (AS)

0947

32056 OPARA-NADI, O.A.; LAL, R. 1987. Effects of no-till and disc plowing with and without residue mulch on tropical root crops in southeastern Nigeria. Soil and Tillage Research 9(3):231-240. En., Sum. En., 10 Ref., Il. (International Inst. of Tropical Agriculture, Ibadan, Nigeria)

CASSAVA; LAND PREPARATION; PLOWING; MULCHING; GROWTH; ROOT PRODUCTIVITY; SOIL ANALYSIS; ROOT DEVELOPMENT; NIGERIA.

Field expt. were conducted on an Ultisol in southern Nigeria to study the effects of no tillage and disc plowing, with and without residue mulching, on soil properties and the growth and yield of cassava and yam. Plowing to depth of 10 cm and then applying mulch decreased soil bulk density. Of the no-till plots, those with mulch had the greatest soil moisture retention at low suctions; those without mulch had low moisture retention for suctions exceeding 0.1 bar. Cassava plants in plowed plots were more vigorous than those in no-till plots, and mulching decreased plant height of cassava in the initial stages and increased plant height at about 38 wk. after planting. The root length density of cassava was 0.32 cm/cubic centimeter for no-till plots vs. 0.16 cm/cubic centimeter for plowed plots. Mulch application, however, significantly increased root length density of cassav in no-till plots only. Cassava root yield was more in no-till than in plowed plots, and application of mulch increased cassava root yield. (AS (extract))

0948

32057 OPARA-NADI, O.A.; LAL, R. 1987. Influence of method of mulch application on growth and yield of tropical root crops in southeastern Nigeria. Soil and Tillage Research 9(3):217-230. En., Sum. En., 18 Ref., Il. (International Inst. of Tropical Agriculture, Ibadan, Nigeria)

CASSAVA; MULCHING; GROWTH; ROOT PRODUCTIVITY; ROOT DEVELOPMENT; SOIL PHYSICAL PROPERTIES; SOIL ANALYSIS; NIGERIA.

The effects of 4 methods of mulch application on growth and yields of yam and cassava were studied on an Ultisol in Onne (Port Harcourt, SE Nigeria). Treatments consisted of 3 different methods of applying 12 t dry mulch/ha, which were compared with an unmulched control. The 3 methods were complete surface mulch, row zone mulch, and mulch incorporated in the top 10-15 cm layer with the 2nd hoeing. Mulching had a significant effect on soil bulk density under cassava but not under yam. Application of mulch in the row zone and mulch incorporation in the top layer decreased soil bulk density of the 0-10 cm layer by 9 and 4 percent, resp., in comparison with the unmulched control. The least infiltration rate, however, was observed for the mulch incorporated treatment due to formation of surface seal. During the dry season, the cumulative water loss from the soil was least for the complete surface mulch treatment. Soil chemical properties were also more favorable for complete surface mulch treatment. Density of feeder roots of cassava was high for the complete surface mulch and mulch incorporated treatments. Feeder root density of yam was lower than that of cassava and mulching had no effect. The highest tuber yield of yam was obtained for surface mulching. Cassava root yield, however, was not significantly affected by mulching. (AS)

0949

29491 OSSOM, E.M. 1986. EFFECT OF PLANT POPULATION ON YIELD AND WEED INFESTATION OF CASSAVA-MAIZE INTERCROPPING. INDIAN JOURNAL OF AGRICULTURAL SCIENCES 56(10):732-734. EN., 3 REF.

CASSAVA; CULTIVARS; SPACING; INTERCROPPING; MAIZE; PRODUCTIVITY; WEEDS; NIGERIA.

AN EXPT. WAS CONDUCTED IN PORT HARCOURT, NIGERIA, TO STUDY THE EFFECT OF PLANT POPULATION ON YIELD AND WEED INFESTATION OF CASSAVA VAR. 3575 WHEN INTERCROPPED WITH MAIZE VAR. FARZ 34. MAIZE POPULATION WAS MAINTAINED CONSTANT AT 30,000 PLANTS/HA WHILE CASSAVA POPULATIONS TESTED WERE 20,000, 30,000 AND 40,000 PLANTS/HA. CASSAVA YIELDS AT THE RESP. PLANT POPULATIONS, INTERCROPPED WITH MAIZE, WERE 10,292, 9828, AND 7464 KG/HA, COMPARED WITH 9076 KG/HA FOR MONOCROPPED CASSAVA. WHILE MONOCROPPED MAIZE YIELDED 2400 KG/HA, WHEN INTERCROPPED IT YIELDED 3280, 3120, AND 1680 KG/HA AT THE 3 POPULATIONS TESTED. WEED INFESTATION WAS HIGHER IN MONOCROPS THAN IN INTERCROPS. RESULTS SUGGEST THAT MIXED CROPPING OF CASSAVA AND MAIZE AT A COMBINED PLANT POPULATION OF 50,000 PLANTS/HA IS BENEFICIAL IN INCREASING THE TOTAL YIELD AND REDUCING WEED INFESTATION. (CIAT)

0950

30060 OTI, E.; ALAKA, C.I.; ANYAEGBUNAM, V.O. 1985. Project 1. Genetic resources: improvement and evaluation. Cassava germplasm. Quality characteristics of some germplasm accessions. In National Root Crops Research Institute. Cassava Programme. Annual Report 1985. Umudike, Nigeria, pp.1-2. En.

CASSAVA; CULTIVARS; ROOTS; COMPOSITION; STARCH CONTENT; DRY MATTER; GARI; HCN CONTENT; NIGERIA.

Fresh roots of 32 cassava cv. from the National Root Crops Research Institute, Nigeria, were analyzed for starch and DM contents, and the gari prepared from each cv. was analyzed for HCN content and swelling capacity. Starch contents of fresh roots and gari samples ranged between 12.5-34.4 percent and 66.5-95.0 percent, resp. Based on starch content and swelling capacity, the following cv. with DM contents above 40 percent were considered as promising for breeding and multiplication: 82/10 Alu, TMS 30572, TMS 30211, TMS 1531, 74/546, 60506, 74/595, 75/743, 74/547, and 75/413. HCN levels in the gari of the selected cv. were below 10 mg/kg and swelling capacities ranged between 45-100 percent. (CIAT)

0951

30051 OTOO, J.A. 1983. The effects of daylength on the flowering, fruiting, seed- setting and other characters of cassava (Manihot esculenta, Crantz). Ph.D Thesis. Legon, Accra, University of Ghana. 190p. En., Sum. En., 195 Ref., Il.

CASSAVA; GROWTH CHAMBER EXPERIMENTS; PHOTOPERIOD; ILLUMINATION; TEMPERATURE; DEVELOPMENTAL STAGES; FLOWERING; FRUITING; SEED; BRANCHING; ROOT DEVELOPMENT; PLANT HEIGHT; PRODUCTIVITY; NIGERIA.

Three expt. were conducted in Ibadan, Nigeria, to study the effect of 5 day length treatments on flowering, fruiting, seed- setting, and other plant characteristics of 6 cassava var. (early flowering var. 58308 and TMS 30395, intermediate flowering var. TMS 30001 and TMS 30572, and late flowering var. TMS 50395 and Isunikankiyan), to attempt the identification of a photoperiodic class for flowering in cassava. Treatments were 8 h, 12 h (natural daylength), 16 h (extended through the use of fluorescent light), 8/16 h (8 h for the 1st 35 days after planting and 16 h there on), and 16/8 (16 h for the 1st 35 days after planting and 8 h there on). The effects of 2

day/night temp. (25/20 and 30/15 degrees Celsius) and 2 daylengths (12 ar 16 h) on flowering initiation and plant characteristics were also investigated. All measurements were taken 180 days after planting. Result suggested the existence of at least 2 photoperiodic classes: short-day plants, to which early flowering var. are likely to belong, and long-day plants, to which intermediate and late flowering plants are likely to belong. Daylengths of 16 h tended to inhibit peduncle, flower, and fruit development in early and late flowering plants, but promoted their development to some extent in intermediate flowering var. Daylengths of 1 produced the highest no. of peduncles in early and intermediate flowering var. and the highest no. of female flowers, fruits, and seeds in all var. groups. Day/night temp. of approx. 27-29/22-23 degrees Celsius in combination with a 12-h daylength could promote flower initiation and development. Natural daylengths gave the highest no. and wt. of storage roots in the intermediate and late flowering var., while the 8-h daylengt also promoted both parameters in all var. Daylengths of 16 h inhibited storage root development, but intermediate flowering var. tended to be insensitive to daylength regarding root yield. Plant height, no. of branches, leaf area, and no. of leaves tended to increase in all var. in long days. Correlations showed that root yield was not antagonistic to flowering and fruiting. (CIAT)

0952

30002 OYEWOLE, T.; FAPOHUNDA, B.; GEBREMESKEL, T.; HAHN, N. 1986. Cassava processing in Ibadan area; techniques and processes. Ibadan, Nigeria, International Institute of Tropical Agriculture. Socio Economic Unit. 18p En., 12 Ref.

CASSAVA; SMALL-SCALE PROCESSING; GARI; CASSAVA FLOUR; SMALL-SCALE EQUIPME SOCIOECONOMIC ASPECTS; WOMEN; COSTS; ECONOMICS; INCOME; NIGERIA.

The results of a survey conducted among 55 randomly selected cassava processors of the area of Ibadan, Nigeria, to describe the processing techniques, determine technological changes in the last few years, and identify opportunities for technological improvement, are presented. The descriptions are restricted to gari (29) and lafun (26) processors. Steps involved in the processing of the products are briefly described: for gari peeling, grating, fermenting, dewatering, sieving, and frying; for lafun (CF), peeling, soaking, pulverizing, dewatering, and drying. Socioeconomic aspects of cassava processing, such as age and educational distribution of respondents, household size, input supply, income- generating potential of processing, marketing, and storage, are discussed. Processors were found be mostly women and techniques used are predominantly traditional, with sc innovations, however, in gari processing (use of powered graters and hydraulic press methods). (CIAT)

0953

28517 OYOLU, C. 1982. ASSESSMENT OF NAFPP WITH SPECIAL REFERENCE TO THE EASTERN STATES OF NIGERIA. IN NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA, 1982. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.148-151. EN.

CASSAVA; DEVELOPMENT; TECHNOLOGY TRANSFER; FOOD SECURITY; NIGERIA.

THE EFFECTIVENESS OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) IN THE EASTERN STATES OF NIGERIA IS DISCUSSED. QUESTIONS ARE RAISED REGARDING THE SYSTEMS APPROACH USED BY THE NAFPP IN THE REGION, THE TECHNOLOGICAL PACKAGES TRANSFERRED TO FARMS SINCE 1973, AND THE IMPACT ON FOOD PRODUCTIVITY AND SUPPLY IN THE COUNTRY, AND ESPECIALLY IN THE EASTERN STATES. (CIAT)

0954

28162 POWELL, J.M.; WATERS-BAYER, A. 1985. INTERACTIONS BETWEEN LIVESTOCK HUSBANDRY AND CROPPING IN A WEST AFRICAN SAVANNA. IN TOTHILL, J.C.; MOTT, J.J., EDS. ECOLOGY AND MANAGEMENT OF THE WORLD'S SAVANNAS. QUEENSLAND, AUSTRALIA, COMMONWEALTH AGRICULTURAL BUREAUX. PP.252- 255. EN., SUM. EN., 9 REF. (INTERNATIONAL LIVESTOCK CENTRE FOR AFRICA. SUBHUMID PROGRAMME, P.M.B. 2248, KADUNA, NIGERIA)

CASSAVA; SAVANNAS; CULTIVATION; CATTLE; NIGERIA.

THE INTEGRATION OF LIVESTOCK AND CROP PRODUCTION IN ABET, A VILLAGE LOCATED IN SOUTHERN KADUNA STATE, NIGERIA, IS UNDER STUDY WITH A VIEW TO DESIGN INNOVATIONS WHICH COULD STRENGTHEN THE LINKS AND BENEFIT BOTH SECTORS. CASSAVA IS ONE OF THE MAJOR CROPS GROWN; IT IS GENERALLY PLANTED ON RIDGES, AND MIXED CROPPING IS WIDESPREAD. SINCE ALL OPERATIONS ARE DONE MANUALLY, LABOR IS THE MAJOR INPUT. THE BENEFITS AND CONFLICTS OF THE INTEGRATED SYSTEMARE DESCRIBED. ON-FARM EXPT. WITH SMALL-SCALE PASTURES AND UNDERSOWING OF LEGUMES IN CEREAL CROPS AND IN SMALL-SCALE FENCED FODDER BANKS ARE ALSO BEINGCONDUCTED. (CIAT)

0955

30493 ROSSEL, H.W.; THOTTAPILLY, G.; VAN LENT, J.M.M.; HUTTINGA, H. 1987. The etiology of cassava mosaic (CMD) in Nigeria. In Séminaire International La Mosaique Africaine du Manioc et son Controle, Cote d'Ivoire, 1987. Résumés. Abidjan, Cote d'Ivoire, Institut Francais de Recherche Scientifique pour le Développement en Cooperation. p.33. En.

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; ETIOLOGY; NIGERIA.

Successful results of isolation expt. carried out by the International Institute of Tropical Agriculture (Ibadan, Nigeria) on the causal agent of CAMD are reported. The low infection inci-dence observed in attempts to transmit the virus back to cassava was attributed to the virus's poor translocation within its host. Several improved var. (in tissue culture form) developed at the Institute are available. (CIAT)

0956

28388 SAKA, A.A. 1981. OGUN STATE. IN NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA, 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.167-168. EN.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; ADAPTATION; FERTILIZERS; NIGERIA.

THE 1980 ANNUAL REPORT OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) IN THE STATE OF OGUN, NIGERIA, IS PRESENTED. ESTABLISHED CASSAVA TRIALS ARE BRIEFLY DISCUSSED; THE SHORTAGE OF ADEQUATE CUTTINGS MAY HAVE AFFECTED YIELD FIGURES. FOR 1981, PLANS INCLUDE 24 VAR. TRIALS AND 44 FERTILIZER TRIALS. (CIAT)

0957

32217 TEWE, O.O. 1987. Cassava peel utilization in poultry diets. In Terry, E.R.; Akoroda, M.O.; Arene, O.B., eds. Triennial Symposium of the International Society for Tropical Root Crops-Africa Branch, 3d, Owerri, Nigeria, 1986. Tropical root crops; root crops and the African food crisis: proceedings. Ottawa, Canada, International Development Research Centre. pp.150-151. En., Sum. En., 10 Ref. (Dept. of Animal Science, Univ. of Ibadan, Ibadan, Nigeria)

CASSAVA; CORTEX; WASTE UTILIZATION; POULTRY; ANIMAL NUTRITION; ANIMAL PHYSIOLOGY; EGGS; NIGERIA.

Three trials with broilers and layers assessed their performance on diets based on cassava peels. In trial 1, diets contained 0, 7.5, 15.0, 22.5, and 30.0 percent cassava peels as a replacement for maize for broilers. Cassava peel increased feed intake, reduced body wt. gain, and reduced nutrient utilization. In trial 2, diets containing 0, 7.5, 15.0, and 22.5 percent cassava peel with or without food energy (palm oil) or protein supplementation were fed to broilers. Nutrient supplementation of the cassava peel diets did not greatly affect the biological performance of the birds. In trial 3, the inclusion of up to 27 percent cassava peels in the diet of layers at the expense of maize gave satisfactory feed intake, egg production, and feed/unit egg produced. In each trial, the economy of feed conversion was better on the cassava peel diets than on the maize control diet. (AS)

0958

26893 TEWE, O.O.; MANER, J.H. 1985. CYANIDE, PROTEIN AND IODINE INTERACTION IN THE PERFORMANCE AND METABOLISM OF RATS. JOURNAL OF ENVIRONMENTAL PATHOLOGY AND TOXICOLOGY 6(1):69-78. EN., SUM. EN., 15 REF., IL. (DEPT. OF ANIMAL SCIENCE, UNIV. OF IBADAN, IBADAN, NIGERIA)

CASSAVA; HCN; LABORATORY ANIMALS; ANIMAL PHYSIOLOGY; ANIMAL HEALTH; IODINE; PROTEIN DEFICIENCIES; FEED CONSTITUENTS; FEEDS AND FEEDING; FEED MIXTURES; THIOCYANATES; HCN ABSORPTION; NIGERIA.

PERFORMANCE AND METABOLIC TRAITS WERE MEASURED IN 64 GROWING RATS FED ON VARYING LEVELS OF DIETARY CYANIDE, PROTEIN, AND I. THE PRESENCE OF CYANIDE IN THE DIETS CAUSED A NONSIGNIFICANT REDUCTION IN BOTH FEED CONSUMPTION AND GROWTH RATE. MOREOVER, ON PROTEIN- DEFICIENT DIETS, THE LOWEST BODY WT. GAIN WAS OBTAINED IN THE ANIMALS WITH 750 PPM CYANIDE. I DEFICIENCY DID NOT HAVE ANY MARKED INFLUENCE ON PERFORMANCE. DIETARY CYANIDE SIGNIFICANTLY INCREASED SERUM AND URINARY SCN CONCN. WHILE I DEFICIENCY CAUSED SIGNIFICANT REDUCTIONS IN SERUM PROTEIN-BOUND I. INTERACTIONS OF PROTEIN DEFICIENCY AND DIETARY CYANIDE ALSO SIGNIFICANTLY REDUCED SERUM SCN CONCN., WHILE INTERACTIONS OF THE 3 DIETARY VARIABLES SIGNIFICANTLY REDUCED KIDNEY PROTEIN CONTENT. (AS)

0959

27599 TEWE, O.O.; MANER, J.H. 1980. CYANIDE, PROTEIN AND IODINE INTERACTIONS IN THE PERFORMANCE, METABOLISM AND PATHOLOGY OF PIGS. RESEARCH IN VETERINARY SCIENCE 29:271-276. EN., SUM. EN., 17 REF., IL. (DEPT. OF ANIMAL SCIENCE, UNIV. OF IBADAN, IBADAN, NIGERIA)

CASSAVA; CYANIDES; HCN; IODINE; PROTEIN; ANIMAL PHYSIOLOGY1; ENDEMIC GOITRE; DIETS; DIETARY VALUE; LABORATORY ANIMALS; SWINE; ANIMAL HEALTH; NIGERIA.

PERFORMANCE AND METABOLIC AND PATHOLOGICAL CHANGES WERE EVALUATED IN 48 GROWING PIGS FED DIFFERENT LEVELS OF DIETARY PROTEIN, CYANIDE, AND I. PROTEIND EFICIENCY REDUCED URINARY I EXCRETION AND THE SERUM CONCN. OF PROTEIN, PROTEIN-BOUND I, AND SCN. IT ALSO REDUCED LIVER RHODANESE ACTIVITY AND CAUSED A DECREASE IN URINARY SCN EXCRETION THAT WAS NOT SIGNIFICANT. DIETARY CYANIDE INCREASED URINARY SCN AND I EXCRETION AND SERUM SCN CONCN. WHILE THE BASAL DIET REDUCED URINARY I EXCRETION AND SERUM PROTEIN- BOUND I. PATHOLOGICAL STUDIES SHOWED THAT CYANIDE TREATMENT HAD NO MARKED EFFECT ON THE MICROANATOMY OF THE TISSUES EXAMINED. DIETARY PROTEIN DEFICIENCY CAUSED HISTOLOGICAL CHANGES IN THE THYROID GLAND AND BONE WHICH SUGGESTED A DECLINE IN METABOLIC ACTIVITY. I DEFICIENCY CAUSED HYPERPLASTIC GOITRE IN THE EXPTL. ANIMALS. (AS)

0960

26729 TEWE, O.O.; KASALI, O.B. 1986. EFFECT OF CASSAVA PEEL PROCESSING ON THE PERFORMANCE, NUTRIENT UTILIZATION AND PHYSIOPATHOLOGY OF THE AFRICAN

GIANT RAT (CRICETOMYS GAMBIANUS WATERHOUSE). TROPICAL AGRICULTURE 63(2):125-128. EN., SUM. EN., 22 REF. (DEPT. OF ANIMAL SCIENCE, UNIV. OF IBADAN, NIGERIA)

CASSAVA; CORTEX; ANIMAL PHYSIOLOGY; FERMENTATION; METABOLISM; DRYING; HCN; THIOCYANATES; NITROGEN; FERMENTED PRODUCTS; FEED CONSTITUENTS; ENDEMIC GOITER; DIETS; LABORATORY ANIMALS; DIGESTIBILITY; NIGERIA.

FOUR DIETS WERE PREPARED THAT CONTAINED 31.12 PERCENT OF EITHER MAIZE (DIET 1) OR PROCESSED CASSAVA PEEL, WHICH WAS SUN DRIED, OVEN DRIED, OR FERMENTED, CONSTITUTING DIETS 2-4, RESP. THEY WERE FED TO WEANLING GIANT RATS IN A 42-DAY TRIAL. HCN CONTENTS OF THE RATIONS WERE 0, 130.20, 595.20, AND 42.16 PPM, RESP. PERFORMANCE WAS BEST ON DIET 1 AND POOREST ON DIET 3. ME AND N RETENTION WERE POORER IN GIANT RATS FED THE CASSAVA PEEL RATIONS. SERUM AND URINARY SCN VALUES WERE HIGHER (P LESS THAN 0.01) IN THE GIANT RATS FED EITHER DIET 2 OR 3 THAN IN THOSE FED DIET 1 OR 4. CYANIDE INTAKE WAS SIGNIFICANTLY (P LESS THAN 0.05) CORRELATED WITH DAILY WT. GAIN, SERUM PROTEIN, UREA, SCN, URINARY SCN AND N RETENTION VALUES. THERE WERE NO GROSS OR HISTOLOGICAL LESIONS IN THE TISSUES IN ANY OF THE TEST ANIMALS. (AS)

0961

21692 TEWE, O.O.; AFOLABI, A.O.; GRIFFOM, F.F.G.; LITTLETON, G.K.; OKE, O.L. 1984. EFFECT OF VARYING DIETARY CYANIDE LEVELS ON SERUM THYROXINE AND PROTEIN METABOLITES IN PIGS. NUTRITION REPORTS INTERNATIONAL 30(5):1249-1253. EN., SUM. EN., 16 REF. (NUTRITIONAL BIOCHEMISTRY DIVISION, DEPT. OF ANIMAL SCIENCE, UNIV. OF IBADAN, NIGERIA)

ANIMAL NUTRITION; CASSAVA; CORTEX; FEED CONSTITUENTS; HCN CONTENT; HUMAN NUTRITION; NIGERIA; PHYSIOLOGY; SOLAR DRYING; SWINE.

THREE CASSAVA-BASED DIETS CONTAINING 0, 96, AND 400 PPM CYANIDE (DIETS 1, 2, AND 3) WERE FED TO 30 PIGS. THE EFFECTS ON SERUM THYROXINE AND PROTEIN METABOLITES WERE DETERMINED ON DAYS 35 AND 72 OF TRIAL. SERUM THYROXINE DECREASED FROM DIETS 1 TO 3 ON DAY 35. A SIMILAR BUT NOT SIGNIFICANT TREND WAS OBSERVED ON DAY 72. VALUES OBTAINED ON DAY 72 WERE SLIGHTLY LOWER THAN DAY 35 ON DIETS 1 AND 2. SERUM THYROXINE WAS HIGHER IN MALES THAN FEMALES. SERUM UREA INCREASED WITH HIGHER DIETARY CYANIDE LEVELS FOR BOTH PERIODS. SERUM TOTAL PROTEINS, SERUM ALBUMIN, GLUTAMIC OXALOACETIC AND GLUTAMIC-PYRUVATE TRANSAMINASES WERE SIMILAR IN ALL TREATMENTS. CYANIDE INTAKE IN PIGS HAS SIGNIFICANT EFFECTS ON THYROID AND PROTEIN METABOLISM. (AS)

0962

26857 TEWE, O.O. 1985. PROTEIN METABOLISM IN GROWING PIGS FED CORN OR CASSAVA PEEL BASED DIETS CONTAINING GRADED PROTEIN LEVELS. RESEARCH IN VETERINARY SCIENCE 38(3):259-263. EN., SUM. EN., 13 REF. (DEPT. OF ANIMAL SCIENCE, UNIV. OF IBADAN, IBADAN, NIGERIA)

CASSAVA; CORTEX; USES; SWINE; PROTEINS; FEEDS AND FEEDING; ANIMAL PHYSIOLOGY; ANIMAL NUTRITION; NIGERIA.

SIXTY-FOUR LARGE WHITE X LAND RACE WEANLING PIGS WERE RANDOMLY ALLOTTED TO8 TREATMENTS IN A 2 X 4 FACTORIAL ARRANGEMENT. THE 2 DIETARY VARIABLES WERE CASSAVA PEEL (0 AND 40 PERCENT) AND CP (20, 15, 10, AND 5 PERCENT). TOTAL SERUM PROTEIN CONCN. WAS SIGNIFICANTLY (P LESS THAN 0.01) REDUCED BY PROTEIN DEFICIENCY AND BY ITS INTERACTION WITH CASSAVA PEEL. THE MULTIPLE COEFFICIENTOF DETERMINATION (R(2)) SHOWED THAT PROTEIN INTAKE WAS THE PRIMARY FACTOR DETERMINING CHANGES IN SERUM PROTEIN. R(2) VALUES FOR CYANIDE INTAKE (INDEPENDENT VARIABLE) ON SERUM PROTEIN (DEPENDENT VARIABLE) INCREASED FROM DAY 30 TO 90 OF THE TRIAL. SERUM UREA WAS INCREASED ON THE 5 PERCENT PROTEIN DIETS ON DAYS 60 AND 90 OF THE TRIAL. THE R(2) VALUES FOR

CYANIDE AND PROTEININTAKE ON SERUM UREA CONCN. INCREASED FROM DAY 30 TO 90 OF THE TRIAL. SERUM CREATININE INCREASED (P LESS THAN 0.05) ON THE 5 PERCENT PROTEIN DIET ON DAY 90 OF THE TRIAL. THE R(2) VALUE FOR THE EFFECTS OF PROTEIN INTAKE ON SERUM CREATININE WAS HIGHER THAN FOR CYANIDE INTAKE ON DAYS 30 AND 90. THE RESULTS CONFIRM THE PROGRESSIVE AND PRONOUNCED EFFECTS OF LONG-TERM CYANIDE INTAKE ONSERUM NITROGENOUS METABOLITES IN PIGS CONSUMING BETWEEN 110-120 PPM HCN, ESPECIALLY IN DIETS CONTAINING 10 PERCENT OR LESS PROTEIN. (AS)

0963

32256 THEBERGE, R.L. 1987. The effects of climatic conditions on cassava bacterial blight development and dissemination. In Rijks, D.; Mathys, G., eds. Seminar on Agrometeorology and Crop Protection in the Lowland Humid and Sub-Humid Tropics, Cotonou, Benin, 1986. Proceedings. Geneva, Switzerland, World Meteorological Organization. pp.51-57. En., Sum. Fn., 26 Ref. (IITA, P.M.B. 5320, Ibadan, Nigeria)

CASSAVA; CASSAVA BACTERIAL BLIGHT; CLIMATIC REQUIREMENTS; SYMPTOMATOLOGY; EPIDEMIOLOGY; DISEASE CONTROL; AFRICA; NIGERIA.

CBB epidemics were devastating in Africa during the 1970's. Climatic factors (rain, RH, cooler temp., and reduced solar radiation) that either inhibit or are conductive for disease development and/or spread are discussed. Other factors promoting disease include poor soils, monocropping, virulent pathogenic strains, susceptible hosts, and harvesting method. CBB symptoms and epidemiological control strategies are presented. Control measures suggested include use of disease-free cuttings, resistant var., pruning infected plant parts, crop rotation and sanitation, bulk harvesting, and use of fertilizers. Further studies on micro- and macro-environments are recommended for disease prevention. (CIAT)

0964

26733 THEBERGE, R.L., ED. 1985. COMMON AFRICAN PESTS AND DISEASES OF CASSAVA, YAM, SWEET POTATO AND COCOYAM. IBADAN, NIGERIA, INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE. 116P. EN., IL.

CASSAVA; DISEASES AND PATHOGENS; SYMPTOMATOLOGY; PEST CONTROL; PEST DAMAGE; NOXIOUS ANIMALS; INSECT BIOLOGY; INJURIOUS INSECTS; INJURIOUS MITES; ROOT CROPS; NIGERIA.

AN ILLUSTRATED GUIDE TO CASSAVA, YAM, SWEET POTATO, AND COCOYAM PESTS AND DISEASES IN AFRICA IS PRESENTED. BRIEF NOTES ON DISTRIBUTION, HOSTS, SYMPTOMS, DAMAGE, PHYSICAL DESCRIPTION, BIOLOGY, AND CONTROL ARE INCLUDED FOR MOST OF THEM. CASSAVA DISEASES INCLUDED ARE CAMD AND THOSE CAUSED BY XANTHOMONAS CAMPESTRIS PV. MANIHOTIS, X. CAMPESTRIS PV. CASSAVAE, COLLETOTRICHUM GLOEOSPORIOIDES, CERCOSPORIDIUM HENNINGSII, CERCOSPORA CARIBAEA, C. VICOSAE, SCLEROTIUM ROLFSII, THE COMPLEX PHYTOPHTHORA SPP. - PYTHIUM SPP. -FUSARIUM SPP. THE COMPLEX ARMILLARIELLA MELLEA-ROSELLINIA NECATRIX-OTHERS, AND MELOIDOGYNE SPP. CASSAVA PESTS INCLUDED ARE MONONYCHELLUS SPP., OLIGONYCHUS GOSSYPII, TETRANYCHUS SPP., PHENACOCCUS MANIHOTI, P. MADEIRENSIS, FERRISIA VIRGATA, AONIDOMYTILUS ALBUS, AND ZONOCERUS SPP. (CIAT)

0965

32221 UDEALOR, A.; EZEDINMA, F.O.C. 1987. Effect of time of cutting back cassava stems on the yield and quality of roots (Abstract). In Terry, E.R.; Akoroda, M.O.; Arene, O.B., eds. Triennial Symposium of the International Society for Tropical Root Crops-Africa Branch, 3d, Owerri, Nigeria, 1986. Tropical root crops; root crops and the African food crisis: proceedings.

Ottawa, Canada, International Development Research Centre. pp.34-35. En. (National Root Crops Research Inst., Umudike, P.M.B. 7006, Umuahia, Nigeria)

CASSAVA; CUTTINGS; SELECTION; ROOT PRODUCTIVITY; NIGERIA.

In traditional farming systems, cassava harvesting involves 1st cutting back the stems and then, some days later, harvesting roots. The effect that the time of cutting back the cassava stems had upon cassava performance was therefore studied. Cassava clone TMX 30211 was planted in the field and cut back once during the study period at 3, 6, 9, and 12 mo. after planting. The control was left uncut. Cutting back cassava stems significantly reduced root yield by 14.3 percent. Yields from plots cut back at 9 mo. after planting (37.7 t/ha) and 12 mo. after planting (38.1 t/ha) were not significantly different from the control (40.9 t/ha) but were significantly higher than those plots cut back at 3 mo. after planting (31.3 t/ha) and 6 mo. after planting (33.1 t/ha). Plant height and mean no. of roots/plant were similarly affected by the treatments. Root mean wt., LAI, and root quality, however, were not significantly affected. (Full text)

0966

28383 UDOH, F.D. 1981. CROSS RIVER STATE. IN NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA, 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.133-138. EN.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; SEED; MAIZE; SOCIOECONOMIC ASPECTS; ADAPTATION; PRODUCTIVITY; PROPAGATION; INTERCROPPING; NIGERIA.

THE 1980 ANNUAL REPORT OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) IN THE STATE OF CROSS RIVER, NIGERIA, IS PRESENTED. DURING 1979- 80, CASSAVA VAR. 30395 OUTYIELDED VAR. 30211, 30555, AND 60506 WITH AN AV. YIELD OF 27.5 T/HA COMPARED WITH 18.5 T/HA FOR THE LOCAL CONTROL. RESULTS OF MAIZE/CASSAVA TRIALS, FIELD DAYS, TRAINING, SEED MULTIPLICATION, AND AGROSERVICE DEVELOPMENT DURING 1980 ARE GIVEN. CONSTRAINTS TO THE 1980 PLANS ARE BRIEFLY DISCUSSED AND TRIALS PROPOSED FOR 1981 ARE LISTED. (CIAT)

0967

29408 UGWU, B.O.; OKEKE, J.E. 1984. Project 7. Economic studies and cassava multiplication. Economic analysis of cassava production using modern technology. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.59-61. En.

CASSAVA; PRODUCTION; ECONOMICS; TECHNOLOGICAL PACKAGE; COSTS; LABOR; INCOME; CULTIVARS; PRODUCTIVITY; NIGERIA.

An economic analysis was conducted to compare an improved cassava technological package recommended in Nigeria with the traditional system. The improved package consisted of var. 30211, 30555, 30572, or U/41044; preemergence application of fluometuron and alachlor at 6.0 and 5.2 liters/ha, resp.; application of carbofuran at 5 g/plant; application of 60, 30, and 120 kg N, P, and K/ha, resp.; and planting on ridges at a 1 x 1 m spacing. All fixed and variable costs, production, and returns were calculated. A benefit:cost ratio of 2.18 and a net benefit:cost ratio of 1.18 were estimated for the improved technological package. (CIAT)

0968

29409 UGWU, B.O.; OBIEKWE, A. 1984. Project 7. Economic studies and cassava multiplication. Economic analysis of gari production using Umudike

(semi-mechanised) technology. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.62-63. En.

CASSAVA; ECONOMICS; PROCESSING; GARI; COSTS; LABOR; NIGERIA.

A cost and returns budget was conducted to make an economic analysis of gari production using the semimechanical processing technology implemented in Umudike, Nigeria, which consists of manual peeling of cassava roots, mechanical grating and dewatering of roots and pulp, resp., manual sieving, and semimechanized frying. The benefit:cost ratio of the operation was estimated to be 1.14 and the net budget:cost ratio, 0.14. (CIAT)

0969

29410 UGWU, B.O.; EJIOFOR, M.A.N.; IJIOMA, B.C. 1984. Project 7. Economic studies and cassava multiplication. Relative costs of producing cassava fufu and instant flour by sun and oven drying. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, pp.63-67. En.

CASSAVA; FOOFOO; CASSAVA FLOUR; ECONOMICS; PROCESSING; DRYING; SOLAR DRYING; COSTS; LABOR; NIGERIA.

The relative costs of producing cassava foofoo and instant flour in Nigeria by either sun or oven drying were estimated. Labor requirements and machine time for mechanical operations are detailed for both foofoo and instant flour processing, and then total costs are calculated. Oven drying always showed higher processing costs than sun drying for both products. (CIAT)

0970

25766 UGWU, B.O. 1981. THE PROBLEM OF INADEQUATE SUPPLY OF RAW CASSAVA FOR INDUSTRIAL CASSAVA PROCESSING: A CASE STUDY OF THE NIGERIAN ROOT CROPS PRODUCTION COMPANY, ENUGU, NIGERIA. AGRICULTURAL SYSTEMS 18(3):155-170. EN., SUM. EN, 17 REF. (NATIONAL ROOT CROPS RESEARCH INST., UMUDIKE, UMUAHIA, NIGERIA)

AFRICA; DEVELOPMENT; DISTRIBUTION; ECONOMICS; INJURIOUS INSECTS; INJURIOUS MITES; LABOR; NIGERIA; NOXIOUS ANIMALS; PESTS; PHENACOCCUS; PRICES; PROCESSING; PRODUCTION.

THE REASONS SUPPORTING THE ESTABLISHMENT OF THE NIGERIAN ROOT CROPS PRODUCTION COMPANY IN ENUGU ARE GIVEN. THE COMPANY CANNOT OPERATE AT FULL CAPACITY BECAUSE OF A SHORTAGE OF CASSAVA ROOTS FOR PROCESSING. THE FACTORS RESPONSIBLE FOR THE INADEQUATE SUPPLY OF RAW CASSAVA TO THE COMPANY ARE IDENTIFIED AND SOLUTIONS ARE PROPOSED. IN ORDER TO SPREAD THE BENEFITS OF THIS PROJECT TO SMALL- SCALE FARMERS, AS WELL AS TO MINIMIZE THE CASSAVA ROOT SUPPLY PROBLEM, IT IS SUGGESTED THAT THE COMPANY ORGANIZE THESE FARMERS AS OUTGROWERS AND ENCOURAGE THEM TO SUPPLY AT LEAST 50 PERCENT OF ITS ROOT REQUIREMENTS, THROUGH TECHNICAL ADVICE AND THE SUPPLY OF IMPROVED CASSAVA CUTTINGS AND BY HELPING THEM TO OBTAIN PRODUCTION CREDIT.

0971

29344 UKPA, N. 1982. Cassava germplasm development. In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, pp.1-2. En.

CASSAVA; PLANT BREEDING; CULTIVARS; HYBRIDIZING; HYBRIDS; NIGERIA.

Improved cassava germplasm activities carried out by the Root Crops Research Institute (Nigeria) in 1982 are reported. A total of 223 new materials, suspected to be tolerant/resistant to CAMD and green spider mites, and 2

selections from the International Institute of Tropical Agriculture (TMS 61042 and 4 (2) 1425), reported to be tolerant/resistant, were added to the collection and are now under observation. On-going hybridization and progeny testing activities are described; the 1981 results of 9 crosses in terms of no. of matured hybrid seed planted and no. of seedlings established are also given. (CIAT)

0972

29412 UKPA, N.; EZULIKE, T.O.; EMEHUTE, J.K.U.; ONYEAGBO 1983. Field screening of NRCRI cassava germplasm for resistance to cassava mealybug, green spider mite and cassava anthracnose disease. In National Root Crops Research Institute. Cassava Programme. Annual Report 1983. Umudike, Nigeria, pp.1-2. En.

CASSAVA; RESISTANCE; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; GLOEOSPORIUM MANIHOTIS; NIGERIA.

Five stands each of the 758 cassava collections were planted in the field in Nigeria in June of 1982, to assess incidence, severity, and recovery rate of the individual collections under natural infestation/infection by Phenacoccus manihoti, Mononychellus tanajoa, and Gloeosporium manihotis. Results based on a 0-5 evaluation scale showed that 9 accessions were tolerant/resistant to P. manihoti, 65 to M. tanajoa, 54 to G. manihotis, 7 to both M. tanajoa and P. manihoti, and 1 to all 3 pests. (Full text)

0973

29404 UKPABI, U.J.; EJIOFOR, M.A.N.; OTI, E. 1984. Project 5. Product development, utilization and preservation of cassava. Harvesting of cassava leaves: effect of time of the day on the cyanide content of the leaves. In National Root Crops Research Institute. Cassava improvement studies. 1984 Annual Research Report. Umudike, Nigeria, p.56. En.

CASSAVA; HARVESTING; TIMING; LEAVES; HCN CONTENT; NIGERIA.

Leaves of cassava var. TMS 30211, U/41044, and IITA/1425, collected on 2 different days with RH at noon of 68 (high) and 55 percent (low) and at 06:00, 12:00, and 18:00 h, were analyzed for HCN content. Results showed that leaf HCN content was significantly higher at noon (av. for all var. 639.8 and 907.2 mg/kg for the high and low RH conditions, resp.). It is recommended that harvesting of the leaves for processing/packaging and silage should be undertaken in the early and/or late hours of the day. In the case of the expt., HCN content of leaves collected in the early hours averaged 326.3 and 506.7 mg/kg in days of high and low RH, resp., and that of leaves collected in the late hours averaged 431.7 and 487.9 mg/kg in days of high and low RH, resp. (CIAT)

0974

26702 UMOH, I.B.; OGUNKOYA, F.O.; MADUAGWU, E.N.; OKE, O.L. 1985. EFFECT OF THIAMIN STATUS ON THE METABOLISM OF LINAMARIN IN RATS. ANNALS OF NUTRITION AND METABOLISM 29(5):319-324. EN., SUM. EN., 18 REF. (DEPT. OF BIOCHEMISTRY, COLLEGE OF MEDICAL SCIENCES, UNIV. OF CALABAR, CALABAR, NIGERIA)

CASSAVA; THIAMIN; LINAMARIN; ANIMAL PHYSIOLOGY; ATAXIC NEUROPATHY; DIETS; NIGERIA.

THE EFFECT OF GRADED LEVELS OF THIAMIN ON THE METABOLISM OF LINAMARIN WAS INVESTIGATED IN RATS. IT WAS OBSERVED THAT ON A DIET DEFICIENT IN THIAMIN, A LARGE AMOUNT OF LINAMARIN WAS RECOVERED UNCHANGED IN THE URINE, TOGETHER WITH SIGNIFICANTLY MORE SCN RELATIVE TO THE CONTROL. THE LEAST AMOUNT OF SCN (P LESS THAN 0.05 RELATIVE TO CONTROL) WAS FOUND IN ANIMALS RECEIVING THE

HIGHEST AMOUNT (TWICE DAILY REQUIREMENT) OF THIAMIN IN THE DIET, BUT THE AMOUNT OF UNMETABOLIZED LINAMARIN WAS SIMILAR TO THE CONTROL. IT IS SUGGESTED THAT THIAMIN DEFICIENCY MAY BE IMPLICATED IN THE ETIOLOGY OF TROPICAL ATAXIC NEUROPATHY THROUGH THE SCN OVERLOAD IN PEOPLE EATING LARGE AMOUNTS OF CASSAVA AND CASSAVA DERIVATIVES THAT CONTAIN LINAMARIN. (AS)

0975

29030 UMOH, I.B.; MADUAGWU, E.N.; AMOLE, A.A. 1986. FATE OF INGESTED LINAMARIN IN MALNOURISHED RATS. FOOD CHEMISTRY 20(1):1-9. EN., SUM. EN., 18 REF. (DEPT. OF BIOCHEMISTRY, COLLEGE OF MEDICAL SCIENCES, UNIV. OF CALABAR, NIGERIA)

CASSAVA; LINAMARIN; ANIMAL NUTRITION; DIETS; ANIMAL HEALTH; KWASHIORKOR; RIBOFLAVIN; CYANOGENIC GLUCOSIDES; CYANIDES; THIOCYANATES; NIGERIA.

PURE LINAMARIN AT A DOSE LEVEL OF 30 G/100 G BODY WT. WAS ADMINISTERED IN FOOD TO A GROUP OF WISTAR RATS MAINTAINED ON VITAMIN B2-DEFICIENT, SUFFICIENT, AND EXCESS DIETS FOR 5 WK. AND TO ANOTHER GROUP OF KWASHIORKOR RATS. FREE AND TOTAL CYANIDE, INTACT LINAMARIN, AND SCN LEVELS WERE ESTIMATED IN URINE AND FECES OBTAINED AT 0-, 24-, 48-, AND 72-H PERIODS AND IN BLOOD SAMPLES OBTAINED IN THE 72ND H AFTER THE DRUG HAD BEEN ADMINISTERED. THERE WAS NO DETECTABLE CYANIDE OR INTACT LINAMARIN IN THE FECAL SAMPLES. VITAMIN B2-SUFFICIENT AND EXCESS GROUPS OF RATS EXCRETED HIGHER TOTAL AND FREE CYANIDE THAN THE RESP. VITAMIN B2-DEFICIENT GROUPS. MOST OF THE LINAMARIN WAS DEGRADED AFTER THE 1ST 24 H. THE RATE OF BREAKDOWN OF THE GLUCOSIDE WITHIN THE 1ST 24 H WAS SLOWEST FOR THE ZERO AND HALF NORMAL VITAMIN B2 STATUS, RESP., AS EVIDENCED BY ITS APPEARANCE IN LARGE QUANTITIES IN THE URINE. THE KWASHIORKOR RATS, ON THE OTHER HAND, EXCRETED LESS SCN THAN THE CONTROLS. IN ADDITION, THEIR CONTROL GROUP EXCRETED MOST OF THE (SCN-) IN THE 1ST 24 H WHILE THE KWASHIORKOR RATS EXCRETED THEIRS IN THE 1ST 48 H. DIETARY PROTEIN DEFICIENCY PROLONGS THE TIME OF METABOLISM AND HENCE INCREASES THE TOXICITY OF CYANOGENIC GLYCOSIDE IN THE BODY. IT IS ALSO SUGGESTED THAT EXCESSIVE EXPOSURE OF MALNOURISHED HUMANS TO CYANIDE COULD BE A CONTRIBUTARY FACTOR IN THE RAMPANT CASES OF TROPICAL ATAXIC NEUROPATHY. (AS)

0976

28185 UNAMMA, R.P.A.; ODURUKWE, S.O.; OKEREKE, H.E.; ENE, L.S.O.; OKOLI, O.O. 1985. FARMING SYSTEMS IN NIGERIA: REPORT OF THE BENCH-MARK SURVEY OF THE FARMING SYSTEMS OF THE EASTERN AGRICULTURAL ZONE OF NIGERIA. UMUDIKE, UMUAIHA, NIGERIA, THE AGRICULTURAL EXTENSION & RESEARCH LIAISON SERVICES, NATIONAL ROOT CROPS RESEARCH INSTITUTE. 158P. EN., SUM. EN., 18 REF., IL.

CASSAVA; DEVELOPMENT; SOCIOECONOMIC ASPECTS; PRODUCTION; TECHNOLOGY TRANSFER; MARKETING; STATISTICAL DATA; EROSION; PRODUCTIVITY; CULTIVARS; INTERCROPPING; MAIZE; YAMS; LEGUME CROPS; FOOFOO; GARI; NIGERIA.

RESULTS OF A SURVEY CONDUCTED IN EASTERN NIGERIA ON FARMING SYSTEMS ARE GIVEN IN DETAIL. INFORMATION IS PROVIDED ON WHAT FARMERS DO, WHEN, HOW, AND WHY, AS WELL AS ON PRODUCTION CONSTRAINTS. CASSAVA, A MAJOR FOOD CROP (93 PERCENT), APPEARS AS A COMPONENT OF 12 OF THE 21 MOST COMMON MIXED CROPPING SYSTEMS IN ALL STATES OF THE REGION. IT IS NORMALLY PLANTED IN APRIL, BUT PLANTING TIME COULD BE EXTENDED TO SEPT. DATA ON CASSAVA MARKETED, CONSUMED, AND STORED IN THE REGION IN 1981 ARE GIVEN. CASSAVA AND YAMS RENDERED THE HIGHEST FARM REVENUES THAT YEAR. FUFU AND GARI ARE THE MAIN PROCESSED CASSAVA PRODUCTS. RECOMMENDATIONS AIMED AT RESEARCHERS AND POLICY MAKERS ARE PRESENTED. (CIAT)

0977

28599 UNAMMA, R.P.A.; ENE, L.S.O.; ODURUKWE, O.S.; ENYINNIA, T. 1986. INTEGRATED WEED MANAGEMENT FOR CASSAVA INTERCROPPED WITH MAIZE. WEED

RESEARCH 26(1):9-17. EN., SUM. FN., FR., DE., 21 REF. (NATIONAL ROOT CROPS RESEARCH INST., UMUDIKE, P.M.B. 7006, UMUAHIA, NIGERIA)

CASSAVA; HOEING; PRODUCTIVITY; INTERCROPPING; HERBICIDES; COWPEA; MAIZE; COSTS; NIGERIA.

TRIALS WERE CONDUCTED IN THE TROPICAL RAINFOREST ZONE OF NIGERIA FROM 1982 TO 1984 TO COMPARE MANUAL WEEDING WITH CHEMICAL AND INTEGRATED WEED CONTROL SYSTEMS IN CASSAVA/MAIZE INTERCROP. UNCONTROLLED WEEDS REDUCED CASSAVA AND MAIZE COMPONENT YIELDS BY 2- YR AV. OF 49 AND 62 PERCENT, RESP., AND THEIR COMBINED ENERGY YIELD BY 53 PERCENT COMPARED WITH 30,572 KCAL/HA OBTAINED FROM THE CONTROL PLOTS HAND-HOED AT 3 AND 8 WK. AFTER PLANTING. HIGHEST ECONOMIC RETURNS WERE OBTAINED FROM USING COWPEA OR EGUSI MELON. INTEGRATED USE OF COWPEA AND PREEMERGENCE APPLICATION OF ALACHLOR AT 2.0 OR CHLORAMBEN AT 3.4 KG A.I./HA AND PREEMERGENCE APPLICATION OF EITHER FLUOMETURON OR CHLORAMBEN AT 2.5 AND 3.4 KG A.I./HA, RESP., OR THEIR MIXTURE GAVE MORE ECONOMIC NET RETURNS THAN 2 HAND HOEINGS. UNDER SIMILAR MANAGEMENT LEVEL, INTERCROPPING CASSAVA AND MAIZE RESULTED IN 36-43 PERCENT MORE LAND BEING MADE AVAILABLE TO THE FARMER FOR OTHER USES THAN SOLE CROPPING THEM. (AS)

0978

28508 UNAMMA, R.P.A.; ODURUKWE, S.O.; ENYINNIA, T. 1982. PRELIMINARY INVESTIGATIONS ON INTEGRATED WEED MANAGEMENT IN CASSAVA (MANIHOT ESCULENTA CRANTZ CV. TIS 30572) INTERCROPPED WITH MAIZE (ZEA MAYS CV. NS1). IN NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA, 1982. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.75-82. EN., SUM. EN., 9 REF.

CASSAVA; WEEDING; INTERCROPPING; MAIZE; HERBICIDES; ENERGY PRODUCTIVITY; COWPEA; NIGERIA.

THE RESULTS OF PRELIMINARY RESEARCH CONDUCTED IN UMUDIKE, NIGERIA, ON INTEGRATED WEED MANAGEMENT IN INTERCROPPED CASSAVA VAR. TIS 30572/MAIZE ARE PRESENTED. WEED MANAGEMENT INVOLVED HAND HOEING, CHEMICAL CONTROL, BIOCONTROL, AND AN INTEGRATED WEED MANAGEMENT METHOD THAT CONSISTED OF A LOW HERBICIDE RATE + A LOW- GROWING LIVE CROP SUCH AS COWPEA AND GROUNDNUT. UNCONTROLLED WEED GROWTH REDUCED TOTAL ENERGY YIELD BY 62 PERCENT. INTERCROPPING PER SE REDUCED BOTH CASSAVA AND MAIZE YIELDS. THREE WEEDINGS CONDUCTED AT 3 AND 8 WK. AFTER PLANTING GAVE CASSAVA YIELDS (11.6 T/HA) COMPARABLE TO WEED-FREE MONOCROPPED CASSAVA (12.3 T/HA) OR COWPEA INTERPLANTED IN THE CASSAVA/MAIZE MIXTURE (10.6 T/HA). (CIAT)

0979

29361 UNAMMA, R.P.A. 1982. Critical period of weed interference in cassava/maize mixed crop. In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, pp.27-30. En., Il.

CASSAVA; INTERCROPPING; MAIZE; WEEDING; PRODUCTIVITY; NIGERIA.

The critical period of weed interference in cassava/maize mixed crops was determined in Umudike, Nigeria. In the case of cassava, the plot needs to be weed-free for the 1st 8 wk. Beyond this period, weeding is unnecessary for good cassava yields. (CIAT)

0980

29359 UNAMMA, R.P.A. 1982. Effect of time of fertilizer application and weed control techniques on cassava intercropped with sweet potato. In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, pp.25-26. En.

CASSAVA; INTERCROPPING; SWEET POTATOES; FERTILIZERS; N; P; K; WEEDING; HERBICIDES; NIGERIA.

A cassava/sweet potato intercrop was fertilized with 30, 15, and 90 kg NPK/ha, resp., at planting or 28, 42, and 56 days after planting in Nigeria. While cassava yields have not been determined, preemergent herbicides fluometuron (3.0 kg a.i./ha) or chloramben (3.4 kg a.i./ha) proved to minimize sweet potato yield losses due to weed infestation. Cassava caused a 50 percent sweet potato yield loss. (CIAT)

0981

29360 UNANMA, R.P.A.; ODURUKWE, S.O.; ENYINNIA, T.; NJOKU, B.O. 1982. Integrated weed management in cassava intercropped with maize. In National Root Crops Research Institute. Cassava Improvement Program. Annual Report 1982. Umudike, Nigeria, p.27. En.

CASSAVA; INTERCROPPING; MAIZE; WEEDING; NIGERIA.

Weed control methods (hand weeding, herbicides, and low growing crops) were evaluated in cassava/maize intercrops in the rain forest and the guinea savanna zones of Nigeria. Population densities were 10,000 and 30,000 plants/ha for cassava and sweet potato, resp., while maize, egusi, cowpea, and groundnut were each planted at 40,000 plants/ha. Uncontrolled weed growth reduced maize grain (14 percent MC) yield by 48 percent compared with the weed-free sole cropped maize. Use of chloramben (3.4 kg a.i./ha) and egusi to control the weeds produced the highest grain yield (4.14 t/ha). The egusi component yielded 69 kg seed/ha when chloramben was applied compared with 83 kg/ha obtained by weeding at 3 and 8 wk. Preemergence application of fluometuron (2.5 kg a.i./ha) mixed with alachlor (2.0 kg a.i./ha) or cowpea and alachlor (kg a.i./ha) increased maize grain yield. (Full text)

0982

29429 UNANMA, R.P.A.; ATU, U.G. 1983. Screening herbicides for cassava production in South Eastern Agric. zone of Nigeria. In National Root Crops Research Institute. Cassava Programme. Annual Report 1983. Umudike, Nigeria, pp.33-34. En.

CASSAVA; WEEDING; HERBICIDES; WEEDS; ROOT PRODUCTIVITY; NIGERIA .

The herbicides chloramben, fluometuron, Primextra (metolachlor + atrazine), diuron, butachlor, and alachlor + atrazine were evaluated in preemergence trials, at their recommended commercial rates and 0.5 and 1.5 times that rate, for weed control efficiency in Nigeria. Chloramben (6.75 kg a.i./ha) and diuron (3.5 and 7.0 kg a.i./ha) gave as good weed control and cassava yields (29.5, 27.0, and 22.9 t/ha, resp.) as weeding the crop every 28 days up to harvest (30.7 t/ha) or weeding it 2 times at 21 and 56 days after planting (27.3 t/ha). However, diuron at 7.0 kg a.i./ha caused some crop injury (5 percent) which resulted in the lower yield given above. (CIAT)

0983

28382 USAKA, A.H. 1981. BENUE STATE. IN NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA, 1981. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.130-132. EN.

CASSAVA; DEVELOPMENT; SOCIOECONOMIC ASPECTS; TECHNOLOGY TRANSFER; USES; PROPAGATION; SEED; CASSAVA AFRICAN MOSAIC VIRUS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; PHENACOCCUS MANIHOTI; NIGERIA.

THE 1980 ANNUAL REPORT OF THE NAFPP (NATIONAL ACCELERATED FOOD PRODUCTION PROGRAMME) IN THE STATE OF BENUE, NIGERIA, IS PRESENTED. BRIEF

NOTES ARE GIVEN ON MINIKIT TRIALS, FIELD DAYS, TRAINING ACTIVITIES, SEED MULTIPLICATION, CASSAVA USES, AND TRIAL DISTRIBUTION IN 1980-81. CAMD, PHENACOCCUS MANIHOTI, AND CBB WERE OBSERVED ATTACKING MOST TRIAL PLOTS. THE TRIALS PROPOSED FOR 1981- 82 ARE LISTED. (CIAT)

0984

32214 VAN DER BRUGGEN, P.; MARAITE, H.; HAHN, S.K. 1987. An in vitro cassava-inoculation method for the selection of anthracnose-resistant cultivars. In Terry, E.R.; Akoroda, M.O.; Arene, O.B., eds. Triennial Symposium of the International Society for Tropical Root Crops- Africa Branch, 3d, Owerri, Nigeria, 1986. Tropical root crops; root crops and the African food crisis: proceedings. Ottawa, Canada, International Development Research Centre. pp.113-116. En., Sum. En., 13 Ref. (Université Catholique de Louvain, 3 place Croix de Sud, B-1348, Louvain-La-Neuve, Belgium)

CASSAVA; GLOMERELLA MANIHOTIS; INOCULATION; CULTIVARS; RESISTANCE; SELECTION; LABORATORY EXPERIMENTS; NIGERIA.

The development of natural anthracnose lesions was compared with that of lesions artificially inoculated with Colletotrichum gloeosporioides. The in vitro inoculation method produced the same symptoms as the natural infections; anthracnose lesions developed either toward cankers defined by a layer of lignified cells that isolated the tissues colonized by the pathogen, or toward an invasion of the stem (necrosis of the top that is similar to the symptoms of bacterial wilt). This in vitro method provides a fast and easy way of selecting cassava cv. resistant to C. gloeosporioides and of studying resistance mechanisms. (AS)

0985

28354 VINE, P.N. 1980. SOIL MANAGEMENT FOR CASSAVA. IN NAFPP NATIONAL CASSAVA WORKSHOP, 4TH., UMUDIKE, NIGERIA, 1980. PROCEEDINGS. UMUDIKE, NATIONAL ROOT CROPS RESEARCH INSTITUTE. NATIONAL CASSAVA CENTRE. PP.115-119. EN. 3 REF.

CASSAVA; LAND PREPARATION; SOIL PHYSICAL PROPERTIES; CULTIVATION; PLANT PHYSIOLOGY; PLANT DEVELOPMENT; NIGERIA.

CASSAVA WAS PLANTED IN UNIFORM FIELD TRIALS ON 3 SOIL TYPES (COCONUT BAST, SILICA SAND, BOTTLE GLASS SAND) IN PLOTS WITH AND WITHOUT TILLAGE TO MEASURE THE RESPONSE TO SOIL CONDITIONS OR TILLAGE. RESULTS INDICATED THAT CASSAVA RESPONDS TO SOIL CONDITIONS RATHER THAN TO THE METHOD BY WHICH THE CONDITIONS WERE OBTAINED (TILLAGE METHOD); ROOT NO. AND SIZE INCREASED WITH MORE FAVORABLE SOIL CONDITIONS. THE ONLY DIFFICULTY FORESEEN FOR CASSAVA GROWN UNDER A MULCHED NO-TILLAGE SYSTEM, PROVIDING GOOD ROOT GROWTH CONDITIONS EXIST, IS IN PULLING THE ROOTS FROM THE GROUND AT HARVEST. (CIAT)

0986

26894 WEERASINGHE, B.; NAQVI, S.H.Z. 1985. SOME COMPARATIVE PHYSIOLOGICAL STUDIES ON SELECTED ISOLATES OF BOTRYODIPLODIA THEOBROMAE PAT. CAUSING STORAGE ROT OF YAMS, CASSAVA, AND SWEET POTATO IN NIGERIA. INTERNATIONAL BIODETERIORATION 21(3):225-228. EN., SUM. EN., 11 REF., IL. (DEPT. OF BOTANY, OPEN UNIV., NAWALA, SRI LANKA)

CASSAVA; BOTRYODIPLODIA THEOBROMAE; STORAGE; POSTHARVEST LOSSES; DETERIORATION; NIGERIA.

HOST SPECIFICITY OF 3 ISOLATES OF B. THEOBROMAE FROM YAM, CASSAVA AND SWEET POTATO IS REPORTED. PHYSIOLOGICAL DIFFERENCES BETWEEN THE YAM AND SWEET POTATO ISOLATES WERE ESTABLISHED IN THEIR GROWTH ON SELECTED SUGARS, PATTERN OF EXTRACELLULAR ENZYME PRODUCTION, AND PATHOGENICITY UNDER DIFFERENT TEMP. AND RH REGIMES. (AS)

0987

32258 YANINEK, J.S.; BELLOTTI, A.C. 1987. Exploration for natural enemies of cassava green mites based on agrometeorological criteria. In Rijks, D.; Mathys, G., eds. Seminar on Agrometeorology and Crop Protection in the Lowland Humid and Sub-Humid Tropics, Cotonou, Benin, 1986. Proceedings. Geneva, Switzerland, World Meteorological Organization. pp.69-75. En., Sum. En., 15 Ref. (IITA, P.M.B. 5320, Ibadan, Nigeria)

CASSAVA; MONONYCHELLUS TANAJOA; BIOLOGICAL CONTROL; CASSAVA PROGRAMS; ECOLOGY; NIGERIA.

The Africa-wide Biological Control Project (ABCP) at the International Institute of Tropical Agriculture (Nigeria) was initiated in 1980 to control exotic cassava pests using classical biological control. Ecological profiles of the major cassava areas affected by the cassava green mite (CGM) in Africa are being developed based on a combination of selected agrometeorological factors (temp., solar radiation, precipitation, and soil moisture). The search for natural enemies of CGM is being made in the neotropics by CIAT. Similar areas (ecological homologues) in the neotropics will then be identified and explored. The strategy is an ecological guide for identifying the type of areas in Africa where CGM is a problem, determine the places where imported natural enemies might survive, and detect areas in the neotropics where natural enemies for introduction can be found. It is expected that this strategy help increase the chance of finding CGM natural enemies suitably adapted for targeted areas in Africa. (AS)

0988

32257 YANINEK, J.S.; ANIMASHAUN, A. 1987. Why cassava green mites are dry season pests. In Rijks, D.; Mathys, G., eds. Seminar on Agrometeorology and Crop Protection in the Lowland Humid and Sub-Humid Tropics, Cotonou, Benin, 1986. Proceedings. Geneva, Switzerland, World Meteorological Organization. pp.59-67. En., Sum. En., 19 Ref., Il. (IITA, P.M.B. 5320, Ibadan, Nigeria)

CASSAVA; MONONYCHELLUS TANAJOA; TEMPERATURE; RAINFALL; SIMULATION MODELS; LEAVES; BIOMASS PRODUCTION; DRY MATTER; NIGERIA.

Factors responsible for high densities of the cassava green mite (CGM) Mononychellus tanajoa observed during the dry season were investigated in Nigeria in 1984-85. Seasonal differences in temp. and host plant effects on the population growth rate of CGM were determined in expt. using age-specific life table studies. Temp. effects were positively linear from 20 to 31 degrees Celsius; however, the small difference in the av. ambient temp. between seasons was insufficient to account for the large difference observed in CGM populations. Likewise, the population growth rates of CGM were significantly greater on wet-season host plants than on dry-season host plants. A series of field expt. during the wet season revealed that rainfall caused significant CGM mortality. A simple simulation model illustrates how rainfall alone can suppress the population growth rates of CGM to the low levels observed during the wet season and, thereby, account for the peak CGM populations during the dry season. (AS)

0989

32238 YASEEN, M. 1986. Exploration for natural enemies of Phenacoccus manihoti and Mononychellus tanajoa: the challenge, the achievements. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. pp.81-102. En. 33 Ref., Il. (Commonwealth Inst. of Biological Control, Gordon Street, Curepe, Trinidad & Tobago)

CASSAVA; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; PREDATORS AND PARASITES; BIOLOGICAL CONTROL; TRINIDAD; NIGERIA.

A review of the natural enemies of Phenacoccus manihoti and Mononychellus tanajoa, explored particularly in South America, is presented. The introduction of some of them for rearing and release in Africa is also included. Lists of both parasites and predators of P. manihoti discovered in South America (Brazil, Bolivia, and Paraguay) in 1981 are given. Lists are also provided for predators of M. tanajoa surveyed in the neotropics between 1974-81. Results of natural enemy releases for both pests in Africa are briefly discussed. (CIAT)

RWANDA

0990

31639 INSTITUT DES SCIENCES AGRONOMIQUES DU RWANDA. 1985. Manioc (Manihot esculenta Crantz). (Cassava). In Institut des Sciences Agronomiques du Rwanda. Rapport Annuel 1985. Rubona, Rwanda, pp.143-156. Fr.

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; RESISTANCE; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; CULTIVARS; ROOT PRODUCTIVITY; INSECT CONTROL; CUTTINGS; PLANTING; TIMING; HARVESTING; CASSAVA AFRICAN MOSAIC VIRUS; CERCOSPORIDIUM HENNINGSII; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; RWANDA.

Results of research activities on cassava conducted by the Institut des Sciences Agronomiques du Rwanda during 1984 are reported. Studies were carried out on selection (germplasm introduction and evaluation, crossbreeding blocks, screening for green mite resistance, clonal evaluation, and var. and multilocal comparative yield trials), pathology (chemical control of the green mite and biological control of the cassava mealybug), and cultural practices (effect of cutting position at planting on yields). On- farm trials were also established at different sites and var. Eala 07, Kiryumukwe, Maguruyinkware Creolinha, Mulundi, and U.Y.K. Bulk 1977/11 were multiplied and distributed among farmers. (CIAT)

0991

28105 INSTITUT DES SCIENCES AGRONOMIQUES DU RWANDA. 1983. MANIOC (MANIHOT ESCULENTA GRANTZ). (CASSAVA). IN--------. RAPPORT ANNUEL 1983. RUBONA, RWANDA. PP.69-79. FR.

CASSAVA; CASSAVA PROGRAMS; CLONES; CASSAVA MOSAIC VIRUS; PRODUCTIVITY; CERCOSPORIDIUM HENNINGSII; SELECTION; CULTIVARS; CULTIVATION; MONONYCHELLUS TANAJOA; RWANDA.

RESULTS OF RESEARCH ON CASSAVA CONDUCTED DURING 1983 BY THE INSTITUT DES SCIENCES AGRONOMIQUES DU RWANDA, AT THE KARAMA, RUBONA, AND MUTARA EXPTL. STATIONS, ARE PRESENTED. WORK WAS CARRIED OUT IN NURSERIES, CLONAL EVALUATION TRIALS, COLLECTION OF VAR., SELECTION AND YIELD TRIALS, CULTURAL PRACTICE TRIALS, COLLABORATIVE PROJECTS, RAPID MULTIPLICATION, AND MULTIPLICATION AND DISSEMINATION OF CASSAVA MATERIALS. REGARDING THE NURSERIES, MOSAIC IS THE MOST HARMFUL DISEASE IN KARAMA, BACTERIOSIS WAS NOT OBSERVED, AND CERCOSPORIDIUM HENNINGSII IS BECOMING AN ECONOMICALLY IMPORTANTDISEASE; FURTHERMORE, THE GREEN MITE WAS OBSERVED IN ALL MATERIALS. IN THE CLONAL EVALUATION TRIAL, IT WAS OBSERVED ONCE MORE THAT BOTH C. HENNINGSII AND THE GREEN MITE ARE TENDING TO GROW IN IMPORTANCE. KARAMA HAS 100 VAR. IN ITS COLLECTION. IN THE SELECTION TRIALS, LOCAL VAR. NTOLILI STILL RANKS HIGHEST IN YIELDS, BOTH AT 12 AND 18 MO.; ONCE MORE, C. HENNINGSII AND GREEN MITE ATTACKS WERE OBSERVED. IN YIELD TRIALS, VAR. MULUNDI AND MAGURUYINKWARE(SWEET) AND EALA 07, CREOLINHA, AND NTOLILI SEED 16 (BITTER) WERE OUTSTANDING. FINALLY, MERISTEM CULTURE IS BEING USED TO PROPAGATE AND DISSEMINATE THE BEST CASSAVA VAR. (CIAT)

0992

26799 RWANDA. MINISTERE DE L'AGRICULTURE, DE L'ELEVAGE ET DES FORETS. 1985. SITUATION DES RACINES, TUBERCULES ET BANANES PLANTAINS AU RWANDA. (SITUATION OF ROOTS, TUBERS, AND PLANTAINS IN RWANDA). IN WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE, 1985. REPORT. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.196-216. FR.

CASSAVA; MARKETING; HARVESTING; PROCESSING; CULTIVARS; PRICES; PRODUCTIVITY; STATISTICAL DATA; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; RWANDA.

THE SITUATION OF ROOT, TUBER, AND PLANTAIN CROPS IN RWANDA IS DESCRIBED. SINCE 1982 THE GOVERNMENT HAS AGREED TO GIVE PRIORITY TO THE PRODUCTION OF FOODS, WITH A STRATEGY THAT INCLUDES INPUTS, PROMOTION OF FOOD AND ANIMAL PRODUCTS, ANTI-ISOLATIONIST POLICIES, AND THE ESTABLISHMENT OF REGIONAL EXCHANGES AND OF FOOD SECURITY STOCKS. CASSAVA IS CULTIVATED THROUGHOUT THE COUNTRY AS A BETWEEN- HARVEST CROP ON A TOTAL OF 45,451 HA AND WITH A TOTAL ANNUAL PRODUCTION OF 500,514 T. THE AV. YIELD IS 11 T/HA. BITTER CASSAVA VAR.EALA 07 YIELDS UP TO 20 T/HA AT THE INSTITUT DES SCIENCES AGRONOMIQUES DU RWANDA. RESEARCH GOALS AND CULTIVATION CONSTRAINTS FOR CASSAVA ARE GIVEN. (CIAT)

0993

32218 ALVAREZ, M.N.; MULINDANGABO, J. 1987. Cassava production in Rwanda: state of the art. In Terry, E.R.; Akoroda, M.O.; Arene, O.B., eds. Triennial Symposium of the International Society for Tropical Root Crops-Africa Branch, 3d, Owerri, Nigeria, 1986. Tropical root crops; root crops and the African food crisis: proceedings. Ottawa, Canada, International Development Research Centre. pp.160-163. En., Sum. En., 4 Ref., Il. (International Inst. of Tropical Agriculture, P.M.B. 5320, Oyo Road, Ibadan, Nigeria)

CASSAVA; PRODUCTION; LAND PREPARATION; PLANTING; HARVESTING; MARKETING; CONSUMPTION; HUMAN NUTRITION; MONONYCHELLUS TANAJOA; PHENACOCCUS MANIHOTI; CASSAVA AFRICAN MOSAIC VIRUS; CERCOSPORA; USES; RWANDA.

A survey of cassava production in Rwanda was conducted to provide an insight into production practices and the limitations of the existing genetic pool. Aspirations of cassava farmers were also identified. The establishment of a multiplication system for the supply of healthy planting material is recommended. (AS)

0994

30433 CAMERMAN, A. 1972. Situation de la recherche sur les plantes vivrieres au Rwanda. (Situation of research of food crops in Rwanda). Rubona, Institut des Sciences Agronomiques du Rwanda. Note Technique no.16 11p. Fr., Sum. Fr., En., Il.

CASSAVA; CASSAVA PROGRAMS; RESEARCH; PRODUCTIVITY; CULTIVARS; RWANDA.

Ecological conditions prevailing in Rwanda are summarized, and general characteristics of demographic increase and its relationship with the decrease of cultivated areas are mentioned. Current research carried out at the Institut des Sciences Agronomiques du Rwanda on different crops (among them cassava) is indicated, with main emphasis on var. trials and cultural practices. At the Rubona and Karama expt. stations, cassava var. Eala Amer 07 yielded up to 30,000 and 25,000 kg/ha, resp. (CIAT)

0995

30445 DELEPIERRE, G. 1972. Evolution des cultures au paysannat pilote de Muhero. (Crop evolution in the Muhero pilot rural community). Rubona, Institut des Sciences Agronomiques du Rwanda. Note Technique no.8. 19p. Fr., Sum. Fr., Il.

CASSAVA; CULTIVATION; TIMING; INTERCROPPING; BEANS; MAIZE; STATISTICAL DATA; PRODUCTION; SOCIOECONOMIC ASPECTS; RESEARCH; RWANDA.

Prevailing ecological conditions in Muhero, Rwanda, where 90 families participate in a pilot rural community, are described. Tables with data on the evolution of the cultivated area during the period 1957-71 are included. Area devoted to the major crops (among them cassava) and fluctuations throughout the period are given. Data analysis indicated that cassa-va was

not a basic food crop for the population. Area planted under different crop associations with cassava (beans, maize, groundnut, potato, sweet potato, sorghum) is indicated. (CIAT)

0996

30442 MOSTADE, J.M. 1977. Un nouveau parasite du manioc au Rwanda, l'acarien vert (Mononychellus tanajoa Bondar). (A new cassava parasite in Rwanda: the cassava green mite (Mononychellus tanajoa)). Rubona, Institut des Sciences Agronomiques du Rwanda. Note Technique no.2. 11p. Fr., 4 Ref., Il.

CASSAVA; MONONYCHELLUS TANAJOA; PREDATORS AND PARASITES; MITE CONTROL; RESISTANCE; ACARICIDES; RWANDA.

In Oct. 1976, a cassava green mite (Mononychellus tanajoa) attack was reported for the 1st time in Nkanga (Bugesera, Rwanda). The evolution of the pest in several African countries (Uganda, Sudan, Tanzania, and Burundi) is mentioned. The symptoms and plant injuries are described, as well as the morphological characteristics of the different developmental stages of the pest. Sizes of each one of the mite stages are also given, and the evolution cycle of M. tanajoa schematized. Among control measures recommended, biological control is highlighted; predators Oligo-ta sp., Stethorus sp., and 2 Coleoptera were observed in Burundi. The use of tolerant var. should be considered as well as chemical control. Further studies on the evolution of predator populations are required. (CIAT)

0997

26798 MULINDAGABO, M.M.; ALVAREZ, M.N. 1985. LA RECHERCHE ET LE DEVELOPPEMENT DU PROGRAMME NATIONAL D'AMELIORATION DESPLANTES A RACINES ET A TUBERCULES AMYLACES AU RWANDA. (RESEARCH AND DEVELOPMENT OF THE NATIONAL ROOT AND TUBER IMPROVEMENT PROGRAM IN RWANDA). IN WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE, 1985. REPORT. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.182-195. FR., SUM. FR., 3 REF., IL.

CASSAVA; CULTIVARS; ROOT PRODUCTIVITY; MONONYCHELLUS TANAJOA; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; PHENACOCCUS MANIHOTI; BACTERIOSES; CASSAVA MOSAIC VIRUS; CERCOSPORIDIUM HENNINGSII; RWANDA.

THE SITUATION OF ROOT AND TUBER CROPS, ESPECIALLY CASSAVA AND SWEET POTATO, IN RWANDA IS ANALYZED AND CURRENT RESEARCH PROJECTS ARE DESCRIBED. THE INSTITUT DES SCIENCES AGRONOMIQUES DU RWANDA IS ENGAGED IN AN INTERINSTITUTIONAL BREEDING PROGRAM FOR THESE CROPS, AND IS ALSO THE HEADQUARTERS FOR A PROGRAM AT THE MACROREGIONAL LEVEL. MAJOR CONSTRAINTS OF CASSAVA CULTIVATION ARE LOW YIELDS, LATE-MATURING VAR. (9-12 AND 18-24 MO. FOR SWEET AND BITTER VAR., RESP.), PESTS (MONONYCHELLUS TANAJOA, PHENACOCCUS MANIHOTI) AND DISEASES (MOSAIC, BACTERIOSES, CERCOSPORIOSES), AND DEFICIENT TRANSPORTATION FACILITIES OF PRODUCTS, AND POOR QUALITY OF BY- PRODUCTS. (CIAT)

0998

29063 MULINDANGABO, J.; BIRANDANO, B. 1984. Some problems of cassava production in Rwanda. In Greathead, A.H.; Markham, R.H.; Murphy, R.J.; Murphy, S.T.; Robertson, I.A.D., eds. Integrated pest management of cassava green mite; regional training workshop in East Africa, 1984. Proceedings. Ascot, United Kingdom, Commonwealth Institute of Biological Control. pp.95-99. En., Sum. En., 5 Ref.

CASSAVA; ROOT PRODUCTIVITY; CULTIVARS; MONONYCHELLUS TANAJOA; MITE CONTROL; RWANDA.

The history of cassava in Rwanda is described. Four zones of different levels of production are identified. Cassava production constraints are discussed: high population density leads to marginal land being used for cassava, with an ensuing inevitable drop in yield; market organization is poor and there is thus little incentive to grow cassava. Viral, bacterial, and fungal diseases are described, and control measures are outlined. Insect pests are listed. The incidence of the cassava green mite is discussed; its life cycle and damage symptoms are described. Expt. to assess yield loss due to the cassava green mite and susceptibility to this pest are also described. Possible methods of control are considered. (AS)

0999

28130 NDAMAGE, G.; MULINDANGABO, J.; ALVAREZ, M.N. 1985. PROGRAMME MANIOC - PATATE DOUCE. (CASSAVA-SWEET POTATO PROGRAM). RWANDA, INSTITUT DES SCIENCES AGRONOMIQUES DU RWANDA. RAPPORT BISANNUEL 1984-1985. 35P. FR., IL.

CASSAVA; GERMPLASM; SELECTION; LAND PREPARATION; PLANTING; CUTTINGS; ROOT PRODUCTIVITY; PROPAGATION; DEVELOPMENT COSTS; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; ADAPTATION; TECHNOLOGY TRANSFER; RWANDA.

THE ANTECEDENTS, OBJECTIVES, AND MOST OUTSTANDING RESULTS OF THE CASSAVA-SWEET POTATO RESEARCH PROGRAM, INITIATED BY THE INSTITUT DES SCIENCES AGRONOMIQUES DU RWANDA, IN COLLABORATION WITH THE INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE (NIGERIA), AND THE INTERNATIONAL DEVELOPMENT RESEARCH CENTER (CANADA), ARE PRESENTED. IN CASSAVA, WORK WAS DONE ON SELECTION (GERMPLASM INTRODUCTION AND EVALUATION, CROSSING BLOCKS, COLLECTION MAINTENANCE, AND SELECTION, MULTILOCATIONAL, VAR., AND ADAPTABILITY TRIALS), CULTURAL PRACTICES TRIALS (EFFECTS OF SOIL PREPARATION AND PLANTING POSITION OF CUTTINGS ON DEVELOPMENT AND YIELD), AND MULTIPLICATION AND PROPAGATION OF THE BEST CASSAVA VAR. OTHER ACTIVITIES INCLUDED TRAINING COURSES AND SEMINARS, AND VISITS BY INTERNATIONAL RESEARCHERS. THE MAIN LIMITATIONS FOR THE PROGRAM DURING 1984-85 WERE THE LACK OF PERSONNEL AND SUFFICIENT VEHICLES FOR THEIR MOVEMENTS TO OTHER EXPTL. STATIONS. THE PERSPECTIVES FOR THE PROGRAM ARE GIVEN, AND A LIST OF PERSONNEL AND OF PUBLICATIONS DURING THIS PERIOD IS INCLUDED. FINALLY, A TABLE WITH THE PROGRAM'S BUDGET IS PRESENTED. (CIAT)

SENEGAL

1000

31352 STATISTIQUES AGRICOLES et de la population au Sénégal. (Agricultural and demographic statistics in Senegal). Sénégal, 7p. 1987. Fr., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; PRICES; SENEGAL.

Statistical data are given on area planted (ha), av. yields (kg/ha), production (t), and prices for the major agricultural crops (among them cassava) in Senegal over the period 1960-86. Data on the evolution of the population, by regions, for 1971-76 and on the evolution of the rural and urban population for 1976-86 are also included. (CIAT)

1001

31547 SENEGAL. DIRECTION GENERALE DE LA PRODUCTION AGRICOLE. 1983. Statistiques de production: cultures vivrieres; manioc. (Production statistics: food crops: cassava). In Senegal. Direction Générale de la Production Agricole. Rapport Annuel, campagne 1982-1983. Senegal, Ministere du Developpement Rural. p.49. Fr., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; SENEGAL.

Statistical data are given on area (ha) planted to cassava and production (t) in different regions of Senegal, on an annual basis, for the 1977-83 period. (CIAT)

1002

31384 SENEGAL. MINISTERE DU PLANT ET DE LA COOPERATION. DIRECTION DE LA PLANIFICATION. 1976. Travaux groupe mixte Sénégal/FAO, Rome Septembre/Octobre 1976: rapport de mission. (Collaborative work Senegal/FAO, Rome September/October 1976: mission report). Sénégal, 13p. Fr.

CASSAVA; STATISTICAL DATA; PRODUCTIVITY; COMPOSITION; PRICES; CONSUMPTION; PRODUCTION; SENEGAL.

Results of an analysis of statistics collected in Senegal in 1974 are reported. Information given deals with harvest losses for different foodstuffs (including cassava), prices, calorie and protein supply, estimates for total demand/capita for 1977, 1981, and 1985, and production available (kg/yr) for 1974. (CIAT)

1003

32215 CHINSMAN, B.; FIAGAN, Y.S. 1987. Postharvest technologies of root and tuber crops in Africa: evaluation and recommended improvements. In Terry, E.R.; Akoroda, M.O.; Arene, O.B., eds. Triennial Symposium of the International Society for Tropical Root Crops- Africa Branch, 3d, Owerri, Nigeria, 1986. Tropical root crops; root crops and the African food crisis: proceedings. Ottawa, Canada, International Development Research Centre. p.122-134. En., Sum. En., 8 Ref., Il. (African Regional Centre for Technology, Dakar, Senegal)

CASSAVA; POSTHARVEST TECHNOLOGY; SMALL-SCALE PROCESSING; PROCESSING; GARI; CASSAVA CHIPS; CASSAVA FLOUR; NUTRITIVE VALUE; COMPOSITION; SOCIOECONOMIC ASPECTS; SENEGAL.

The main causes and extent of root and tuber postharvest losses are summarized, the major postharvest technologies are evaluated, and a project to increase the availability of root crop products, based on an integration of production and postharvest activities, is recommended. Yams and cassava are emphasized, being by far the most important root and tuber crops both in terms of quantity and as a staple in the African diet. (AS)

1004

26852 DE LANNOY, G. 1984. ELEMENTS DE BASES POUR UN PROGRAMME D'AMELIORATION DU MANIOC AU SENEGAL. (BASIC ELEMENTS FOR A CASSAVA IMPROVEMENT PROGRAM IN SENEGAL). DAKAR, SENEGAL, MINISTERE DE LA RECHERCHE SCIENTIFIQUE ET TECHNIQUE. INSTITUT SENEGALAIS DE RECHERCHES AGRICOLES. 46P. FR., IL.

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; GERMPLASM; CULTIVARS; PLANT DEVELOPMENT; PROPAGATION; CUTTINGS; ROOTING; PLANTING; NUTRITIVE VALUE; COMPOSITION; ROOTS; ROOT PRODUCTIVITY; CASSAVA AFRICAN MOSAIC VIRUS; PHENACOCCUS MANIHOTI; RESISTANCE; SENEGAL.

THE GENERAL SITUATION OF CASSAVA CULTIVATION IN SENEGAL IS DESCRIBED AND THE MAIN RESULTS ARE GIVEN OF RESEARCH CARRIED OUT TO DATE ON THE ESTABLISHMENT OF A BASIC COLLECTION, DEVELOPMENT OF THE AERIAL PART, INFLUENCE OF PHYSIOLOGICAL AGE OF CUTTINGS AND THEIR POSITION, CHARACTERIZATION OF VAR., CHEMICAL COMPOSITION AND NUTRITIVE VALUE, INCIDENCEOF MOSAIC ON CASSAVA GROWTH AND YIELD, AND GENETIC IMPROVEMENT. CONCLUSIONS AND RECOMMENDATIONS ARE GIVEN REGARDING THE SELECTION OF RESISTANT VAR. AND THE USE OF APPROPRIATE CULTURAL TECHNIQUES FOR THE CONTROL OF CAMD AND MEALYBUGS, AS WELL AS BIOLOGICAL CONTROL MEASURES AND MEASURES AGAINST DROUGHT. (CIAT)

1005

32251 DIAGNE, D. 1986. Report on cassava mealybug and cassava green mites in some African countries: Senegal. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. p.145. En. (Ministere du Developpement Rural, B.P. 486, Dakar, Senegal)

CASSAVA; PHENACOCCUS MANIHOTI; SENEGAL.

In Senegal the cassava mealybug was initially reported in 1976 in the area of Sine-Saloum near the Gambian border. It is now causing its greatest damage in the coastal region of Louga, where 70-80 percent of Senegal's cassava is planted. In that area many peasants have abandoned the culture of cassava. It is becoming more and more difficult to obtain even small quantities of uninfested cuttings for planting. Damage in other regions is less severe but still important. Yield losses were estimated at about 75-80 percent. Attempts to control the pest with insecticides have been unsuccessful. (Full text)

1006

30877 MBAYE, A. 1987. Réponse du représentant du Sénégal au questionnaire national. (Answer of the Senegal representative to the national questionnaire). Dakar, Sénégal, Institut Sénégalais de Recherches Agronomiques. 4p. Fr. Paper presented at Séminaire International de Yamoussoukro surla Mosaique Africaine du Manioc et son Controle, 1987. (ISRA/CDH B.P. 3120, Dakar, Sénégal)

CASSAVA; QUESTIONNAIRES; PRODUCTION; CASSAVA AFRICAN MOSAIC VIRUS; SENEGAL.

General information on various aspects of cassava cultivation in Senegal are summarized: its importance as a food crop, percentage of consumption, av. prices to producer, uses, estimates on area planted (ha) and production (t) in 1986-87, major diseases and pests, current research programs, economic importance of CAMV, main producing regions, and introductions. (CIAT)

1007

31610 SAGNA, F.I. 1987. Communication en conseil interministériel sur: le bilan de la campagne de production agricole 1986-1987; le déroulement de la campagne de commercialisation 1986-1987; la préparation de la campagne agricole 1987-1988. (Interministerial council communication on: the balance of the 1986-87 agricultural production campaign, the development of 1986-87 commercialization campaign; the preparation of 1987-88 agricultural campaign). Sénégal, Ministere du Développement Rural. 19p. Fr.

CASSAVA; PRODUCTION; ROOT PRODUCTIVITY; RESEARCH; SENEGAL.

A balance is given on the 1986-87 agricultural production campaign in Senegal for various food crops (among them cassava). A total of 20,089 ha was planted and 74,044 t were produced, with an av. yield of 3953 kg/ha. Regardless of the yield losses caused by the cassava mealybug (in Central and Northern Senegal) and by CAMV (in Northern Senegal), it was observed that area planted and production were 3-fold more than those corresponding to the 1985-86 campaign. (CIAT)

1008

32003 SENE, D. 1973. Synthese des travaux sur le manioc au CNRA de Bambey depuis 1961. (Synthesis of work on cassava at Bambey CNRA since 1961). Bambey, Sénégal, Centre National de Recherches Agronomiques. 6p. Fr.

CASSAVA; CULTIVARS; ROOT PRODUCTIVITY; SENEGAL.

The main results of yield trials on cassava conducted by the Centre National de Recherches Agronomiques (Bambey, Senegal) since 1961 are summarized. Cassava harvesting should be done 16-18 mo. after planting. Clone M53-250 performed best (25 t/ha in 16 mo.) regarding cooking time (10-20 min.) and taste after cooking. (CIAT)

SIERRA LEONE

1009

30022 ADAPTIVE CROP RESEARCH AND EXTENSION PROJECT. 1983. Baseline agronomic survey: report. Njala, Sierra Leone, 50p. En., 19 Ref., Il.

CASSAVA; TECHNOLOGY TRANSFER; STATISTICAL DATA; UPLAND FARMING; FARM SIZE; CULTIVATION SYSTEMS; PRODUCTIVITY; ON-FARM RESEARCH; SURVEY; SIERRA LEONE.

The results of a survey on agronomic aspects of farming systems in Sierra Leone are presented to serve as a guide for the work of researchers and extension agents and to provide benchmarks against which future progress of the Adaptive Crop Research and Extension Project (ACRE) can be evaluated. Aspects of the physical and biological environment, cropping systems patterns, and general farming problems are characterized. Cassava was found to be a major crop grown in the dry season in inland valley swamps (Kabala zone) and under upland conditions in the wet season in monocrops. It was also found among crops being cultivated in approx. 1/4 or less of cultivated farm area (sometimes with up to other 8-9 species intercropped with rice) in all zones; rice crops occupy 3/4 of cultivated farm area. Cassava in mixture with rice was most important in the Kenema, Kabala, and Njala zones. The range of duration of upland cassava in the field was 7-14 mo. In Kenema, Kabala, and Makeni, farmers could obtain an av. of 301, 1560, and 159 kg cassava/ha under mixed upland cropping patterns, in addition to rice and other grain cereals and legumes. Farming calendars are provided that indicate dates of soil preparation, planting, and harvesting of cassava in the zones of Kenema, Kabala, Makeni, Rokupr, and Njala. Among general farming problems identified were climate, animal pests, weeds, soils, low yielding var., shortage of equipment, labor, and agrochemicals, land disputes, and high interest rates for credit. Little or no introduction of improved cassava materials was found in Sierra Leone. (CIAT)

1010

30017 ADAPTIVE CROP RESEARCH AND EXTENSION PROJECT. 1986. Cassava research. In Adaptive Crop Research and Extension Project. End of project report 1980-1986. Sierra Leone, Njala University College. 2p. En.

CASSAVA; CULTIVARS; SELECTION; SIERRA LEONE.

Outstanding results of cassava research activities by the Adaptive Crop Research and Extension Project (ACRE) in Sierra Leone from 1980 to 1986 are briefly summarized. Yields of NUCASS 1 and NUCASS 2 were outstanding: 10 t/ha on farmers' fields. Rates of return of 1056 percent were obtained from improved var. with intermediate management, and additional returns to fertilizer applications were 470 percent. The highest yielding clone has been 80/29 with yields ranging between 19-50 t/ha under exptl. station conditions. NUCASS 2 was identified as the best for processing into gari and foofoo. Clone 80/40, with yields of 9 t/ha, was recently identified as having relatively good cooking qualities; less progress has been made in screening for cookability. Mixtures of released cassava var. with wheat in

1:2 ratio made good quality cookies. CF yields were low (31 percent), but could be stored in airtight containers for up to 8 wk. (CIAT)

1011

30023 ADAPTIVE CROP RESEARCH AND EXTENSION PROJECT. 1984. Facts about ACRE Project's services to farmers. Njala, Sierra Leone, 20p. En.

CASSAVA; CASSAVA PROGRAMS; TECHNOLOGICAL PACKAGE; SURVEYS; SOCIOECONOMIC ASPECTS; DEVELOPMENT; SIERRA LEONE.

Field activities of the Adaptive Crop Research and Extension Project (ACRE) of Sierra Leone in 5 operational zones are highlighted. Growth parameters from 1982 to 1983 are given for each zone: Kenema, Rokupr, Njala, Makeni, and Kabala. These are no. of contact farmers, no. of on-farm trials and demonstrations, distribution of contact and interested farmers, minikit distribution to farmers, farmer training, and institutions/zone supplied with planting materials. In 1983, a total of 19,355, 18,793, 8580, 18,662, and 21,792 cassava cuttings were distributed to farmers in the resp. zones. (CIAT)

1012

30039 CENTRAL STATISTICS OFFICE. SIERRA LEONE. 1971. Agricultural statistical survey of Sierra Leone 1970-1971. Sierra Leone, 15p. En., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; FARM SIZE; INTERCROPPING; SIERRA LEONE.

Statistics gathered in an agricultural survey conducted in Sierra Leone in 1970/71 are reported in table form. Data are given on the no. of holders growing 19 crops, including cassava and cassava leaves, per size of holding per district (Bo, Bonthe, Moyamba, Pujehum, Kailahun, Kenema, Kono, Bombali, Kambia, Koinadugu, Port Loko, and Tonkolili). The acreage and no. of holdings with cassava in pure stand and in mixed stands as the major crop are also given. Data are also given for areas planted to mixed crops, with either upland or swampland rice as major crop, per district and per province, with cassava planted as one of the minor crops. (CIAT)

1013

30027 SIERRA LEONE. DEPARTMENT OF AGRICULTURE. 1962. Rotation experiments. In Sierra Leone. Department of Agriculture. Annual Report 1962. Njala, Sierra Leone, pp.46-47. En.

CASSAVA; ROTATIONAL CROPS; PUERARIA; MAIZE; GROUNDNUT; FERTILIZERS; N; P; K; AGRICULTURAL LIME; PRODUCTIVITY; SIERRA LEONE.

Partial yield results are presented of an on-going expt. conducted in Njala, Sierra Leone, to demonstrate that the rotation kudzu, maize, groundnuts, and cassava can, with appropriate fertilizer treatments, maintain or improve soil fertility. Fresh root wt. production/plot are given for 20 treatments. (CIAT)

1014

30115 SIERRA LEONE. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES. 1986. Report on the 1984/85 large scale & institutional farm census . Sierra Leone. Agricultural Data Collection System. 37p. En.

CASSAVA; STATISTICAL DATA; FARM SIZE; PRODUCTION; QUESTIONNAIRES; SIERRA LEONE.

As part of an overall agricultural survey of large-scale (min. size = 6 ha) and institutional farms in Sierra Leone in 1984/85, data are given on no. of holdings, amount of improved seed, area and production of cassava on a per size of holding basis (under 10 ha, under 16 ha, and 16 ha and over). The following provinces and their resp. districts were covered: Southern Province (districts of Bo, Bonthe, Moyamba, Punjehun); Eastern Province (districts of Kailahun, Kenema, Kono); Northern Province (districts of Bombali, Kambia, Koinadugu, Port Loko, Tonkolili). (CIAT)

1015

30032 SIERRA LEONE. MINISTRY OF AGRICULTURE, NATURAL RESOURCES AND FORESTRY. 1986. Organization of the sample census. In Sierra Leone. Ministry of Agriculture, Natural Resources and Forestry. 1984-1985 sample census of agriculture of Sierra Leone. Sierra Leone, Planning Evaluation Monitoring and Services Division. pp.1-15,174-196,215-255,259-262. En.

CASSAVA; STATISTICAL DATA; FARM SIZE; PRODUCTION; SIERRA LEONE.

A complete report of the agricultural sample census conducted in Sierra Leone in 1984/85 is presented. All statistical data for the crops covered are presented in table form on per size of holding, country, province, and district bases. In the case of cassava, data cover area and stand as a whole, in pure stands, and in mixed stands as the major and minor crop, and no. and area of fields. Cassava area and production figures on a per size of holding basis are summarized separately, including country totals and totals for the Northern Province and its districts of Bombali, Kambia, Koinadugu, Port Loko, Tonkolili; Western Province and its rural district; Eastern Province and its districts of Kailahun, Kenema, and Kono; and Southern Province and its districts of Bo, Moyamba, Pujehun, and Bonthe. (CIAT)

1016

30033 SIERRA LEONE. MINISTRY OF HEALTH NUTRITION UNIT. 1978. Sierra Leone National Nutrition Survey; summary report and recommendations. Washington, D.C, Office of Nutrition Development Support Bureau. Agency for International Development. 22p. En., Sum. En., Il.

CASSAVA; HUMAN NUTRITION; SURVEYS; SOCIOECONOMIC ASPECTS; SIERRA LEONE .

A national nutrition survey was conducted in Sierra Leone to provide a nationwide estimate of the nutritional status of young children and their mothers, compare the nutritional status of selected areas, and provide information on certain factors associated with nutritional status such as diet, socioeconomic level, health, and population. The survey covered 4880 children aged 3-59 mo., 3724 mothers, and 1965 households. Cassava was found to be consumed by over 30 percent of the families, except in the northern provinces (15 percent), and a high proportion of children also received this food. It is recommended that to improve nutrition governmental and nongovernmental activities in the country should be coordinated and that future activities should emphasize nutrition education. (CIAT)

1017

31683 BANYA, G.S. 1987. Increased food production on the small farms, experiences from Eastern IADP in Sierra Leone. In Holmes, J.C., ed. Improving food crop production on small farms in Africa. Rome, Food and Agriculture Organization of the United Nations. pp.178-191. En., Sum. En., 7 Ref.

CASSAVA; TECHNOLOGY EVALUATION; FARMING SYSTEMS; TECHNOLOGY TRANSFER; ON-FARM RESEARCH; FARM SIZE; INTERCROPPING; RICE; MAIZE; COSTS; LABOR; PRODUCTIVITY; INCOME; STATISTICAL DATA; SIERRA LEONE.

Experiences of the Eastern Integrated Agricultural Development Project (IADP) of Sierra Leone, 1 of the 7 IADP's of the country that aim towards increased food production on small farms, are reported. The target area, objectives, technology packages being developed, and impact of improved technology transfer on crop production are described. Five crop rotations, including cassava among other crops, have been developed for the upland farming system areas. The agroeconomic performance of the upland rice + cassava + maize cropping system in Kenema during the 1983 and 1984 cropping seasons is indicated. The model has been found to be productive and profitable, and farmers have shown interest in it. (CIAT)

1019

30019 DAHNIYA, F.N. 1985. Cooking and processing quality of improved cassava. In Adaptive Crop Research and Extension Project. Annual Report 1982-1983. Njala, Sierra Leone, pp.13-16. En.

CASSAVA; COOKING; CULTIVARS; ORGANOLEPTIC EXAMINATION; CASSAVA FLOUR; PULP; BAKERY PRODUCTS; SIERRA LEONE.

The cooking and processing qualities of improved cassava clones from the 1982/83 uniform yield trial, the 1982/83 advanced yield trial, and the 1983/84 preliminary yield trial in Sierra Leone were investigated; the preparation of cookies with CF from cv. Cocoa and Nucass 2 was also studied. From the 1982/83 uniform yield trial, only cassava cv. Rocass 1 cooked consistently well in 25 min, and the final product was sweet and dry. The cooking time and other qualitative characteristics are given for 17 cassava clones in the 1982/83 advanced yield trial and for 20 in the 1983/84 preliminary yield trial; the cooking time ranged between 12 (clone 81/117) and 60 min (clones 83/24, 83/26, 83/54, 83/98, and 83/205). Cookies were prepared from cassava pulp or CF of cv. Cocoa and Nucass 2, mixed in various proportions with wheat flour. Both fresh cassava pulp and CF were readily incorporated into mixtures with wheat flour. Cookies made out of mixtures of cassava and wheat (1:2 ratio) were almost as good as cookies made of 100 percent wheat flour, but cookies made solely out of cassava were of poor quality. On the other hand, cookies made from Nucass 2 were not as crisp or sweet as those made from cv. Cocoa. (CIAT)

1019

30035 DAHNIYA, M.T.; RHODES, E.R., comp 1969. Cassava. In Dahniya, M.T.; Rhodes, E.R., comps. Summary of research on agronomic crops conducted at Njala 1904-1964. Njala, Sierra Leone, pp.22-25. En.

CASSAVA; CULTIVARS; CUTTINGS; PLANTING; MANURES; FERTILIZERS; N; P; K; MG; CA; ROOT PRODUCTIVITY; TIMING; NUTRITIONAL REQUIREMENTS; SIERRA LEONE.

Results of different cassava trials conducted between 1904-64 in Njala, Sierra Leone, are summarized. In 1923 a trial to evaluate cutting size (whole stems vs. standard cuttings 30.5-45.7 cm long), planted on ridges or on the flat using 2 var. (black or red stems), showed that root wt. of 3 plants was highest for the short red cuttings planted on ridges (3.32 kg) followed by the short black or long red cuttings planted on the flat (2.99 kg). In a manurial expt. in 1926, the highest yields were obtained with pitstuff (14,322.6 kg/ha) followed by the control with no manure (14,235.2 kg/ha), the lowest (11,706.2 kg/ha) being for lime + pitstuff + ammonium sulphate; the other 5 treatments were intermediate. In 1936, cassava var. Mayugbe, Kande, Kono, Two Cent, and White were tested for yields and best harvesting time (6, 9, 12, or 15 mo. after planting). Results showed that Mayugbe and Kande were the highest yielders and that the 15 mo. harvesting time gave the highest yields and best quality. In 1938 a trial was carried out to assess the effect of manuring with rice meal or burnt rice husk, alone or in combination, at 2 rates (550.70 or 1101.41 kg/ha) on yields of

cassava var. Two Cent. No significant differences from applying burnt husk were observed, but rice meal gave significantly higher yields at both rates. In 1961, a P and K (each at 18.36 kg/ha alone or combined) fertilization trial was harvested; highest yields were obtained from K fertilization (2074.32 kg/ha), followed by the PK combination (1275.80 kg/ha). From a 1962 expt. it was tentatively concluded that a soil having 0.36 meq exchangeable K, 1.30 meq exchangeable Ca, and 9.00 meq exchangeable Mg/100 g soil required no additional nutrients for max. yields. The available P figure obtained (0.57 meq/100 g soil) was regarded as satisfactory. (CIAT)

1020

30018 DAHNIYA, M.T. 1985. Cassava improvement programme. In Adaptive Crop Research and Extension Project. Annual Report 1982-1983. Njala, Sierra Leone, pp.9-13. En.

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; CULTIVARS; ROOT PRODUCTIVITY; MONONYCHELLUS TANAJOA; SIERRA LEONE.

Results of the advanced yield trial and uniform yield trials conducted at 3 locations in Sierra Leone during 1982/83 are presented. Fresh root yields for the advanced yield trial with 27 clones and the local var. Cocoa (6.3 t/ha) ranged between 4.9 t/ha for clone 81/61 and 27.0 t/ha for clone 81/31. Ten clones were selected for further evaluation in 1983/84. In the uniform yield trials, clone 80/29 outyielded all of the other 18 materials at the 3 locations (av. 30.6 t/ha). The 1st outbreak of Mononychellus tanajoa in cassava in Sierra Leone is reported; this occurred in Sept. 1983. (CIAT)

1021

30036 DAHNIYA, M.T. 1981. Cassava production in Sierra Leone: problems and prospects. Sierra Leone Agricultural Journal 6(2):75-78. En., Sum. En., 9 Ref.

CASSAVA; PRODUCTION; VIROSES; MYCOSES; BACTERIOSES; INJURIOUS INSECTS; USES; PLANT BREEDING; SIERRA LEONE.

The major cassava production constraints in Sierra Leone (diseases, pests, weeds, soils, and cultural practices) are discussed. Cassava is 2nd to rice as a food crop and its improvement at the Rokupr Rice Research Station and Njala U. College resulted in the release of the var. ROCASS 1, 2, and 3 in 1978, with av. root yields of 43.6, 39.0, and 29.3 t/ha, resp. Major diseases are CBB, brown leaf spot, white thread (Fomes lignosus), and anthracnose, and major pests are Zonocerus variegatus, Bemisia sp., termites, cassava mealybug, and cassava green mite. In some parts of the country monkeys, grasscutters, and squirrels are also important pests. Because of high rainfall, spacings of 1 m would need at least 3 well-timed hand weedings. Research on the nutritional composition of cassava leaves, important component of the national diet, is in progress at Fourah Bay College. (CIAT)

1022

30021 DAHNIYA, M.T. 1985. Farming systems research in Sierra Leone: some practical lessons. Sierra Leone, Njala University College. Department of Agronomy. 18p. En.

CASSAVA; CULTIVATION; CASSAVA PROGRAMS; TECHNOLOGY EVALUATION; PRODUCTION; SOCIOECONOMIC ASPECTS; DEVELOPMENTAL RESEARCH; SIERRA LEONE.

The Adaptive Crop Research and Extension (ACRE) Project, sponsored by USAID, the Government and University of Sierra Leone, is reviewed. Its main objective is to increase the agricultural productivity of small farmers through adaptive crop research, crop demonstrations, and an effective

extension service. The results obtained from station research are used to design simple on-farm adaptive research trials; based on these trials, on-farm demonstrations are developed for the benefit of farmers. The organization, problems, and achievements of research, demonstrations, and extension activities are highlighted. Practical lessons learnt include the need for some initial survey prior to the commencement of field operations, the rejection of high yielding crop var. because of certain preferences such as tuber peel and petiole color, the depression of prices as a result of bumper crop harvests, the dislike of farmers for thinning crops, and the inclusion of paths in field trials. The high cost of the present extension system is emphasized. It has been demonstrated that small-scale farmers are willing to accept innovation if their needs are satisfied. (AS)

1023

30020 DAHNIYA, M.T. 1985. Feeding the nation - The role of root and tuber crops. Sierra Leone, Njala University College. Department of Crop Science. 15p. En., Sum. En., 11 Ref. Paper presented at the 14th Annual Conference, Agricultural Society of Sierra Leone, Kenema, 1985.

CASSAVA; PRODUCTIVITY; DISEASES AND PATHOGENS; INJURIOUS INSECTS; INJURIOUS MITES; CULTIVATION; STATISTICAL DATA; PRODUCTION; PRUNING; CULTIVARS; SIERRA LEONE.

Cassava production problems in Sierra Leone are briefly reviewed, and on-going research efforts to overcome them through var. improvement are described. Consumer acceptability of improved var. is discussed as well as var. response to leaf harvest; in Sierra Leone cassava is traditionally used to produce both edible leaves and roots. The main production problems indicated are CAMD, CBB, Cercosporidium henningsii, Colletotrichum spp., Fomes lignosus, Zonocerus variegatus, termites, monkeys, Mononychellus tanajoa, Phenacoccus manihoti, and weeds. Cultural factors and the periodic harvesting of leaves also affect production. Improved cassava var. released locally to overcome some of these major problems were Rocass 1, 2, and 3 and Nucass 1, 2, and 3. Farmers have shown preference for cassava with red petioles and pink root skin, soft cooking quality, less dense canopy for intercropping with rice, and tolerance to root rot; work is underway to this respect. Low root yield in the country can be partially attributed to the periodic harvesting of leaves; reasonable root yields could be obtained by adopting an optimum leaf plucking interval for a particular var. (CIAT)

1024

30034 DEIGHTON, F.C. 1944. Cassava varieties in Sierra Leone. Njala, Sierra Leone Agriculture Notes no.4. 12p. En.

CASSAVA; CULTIVARS; IDENTIFICATION; MANIHOT GLAZIOVII; MANIHOT PALMATA; SIERRA LEONE.

A taxonomical key to cassava var. found in Sierra Leone, based on information compiled in 1931/33, is presented. Notes on var. included in the key and vernacular general names for cassava are given. Twenty-four cassava var. are included in the key, 15 of which are classified into 3 groups according to general leaf characteristics (group A: glabrous leaves; group B: abnormal leaves; group C: normal leaves), and the rest in 2 alternative keys. Other species of Manihot likely to be confused with cassava are included. (CIAT)

1025

30121 DURANT JUNIOR, T.J. 1985. Adoption and diffusion of crop technology. In Durant Junior, T.J.. The adoption and diffusion of crop technology by farmers in five ACRE zones in Sierra Leone. Njala, Sierra Leone, Southern

University and Louisiana State University Consortium. Adaptive Crop Research and Extension Project. pp.28-45. En.

CASSAVA; SURVEYS; STATISTICAL DATA; DEVELOPMENT; ON-FARM RESEARCH; TECHNOLOGY EVALUATION; TECHNOLOGY TRANSFER; SIERRA LEONE.

A survey was conducted among farmers in Sierra Leone to collect information on adoption and diffusion of crop technology, including improved cassava, provided by the Adaptive Crop Research and Extension Project (ACRE). Of contact and non-contact farmers, 96.1 and 93.4 percent, resp., had heard of improved cassava promoted by ACRE through various means; 5.9 percent of contact farmers from a total of 153 reported benefits derived from improved cassava, while only 2.0 percent indicated the need for assistance in using it. Improved cassava was used by 39.9 percent vs. 9.3 percent of contact and non-contact farmers, resp. The main reasons indicated by contact farmers for not using improved cassava were unavailability (54.9 percent) and inapplicable for utilization (41.9 percent). These 2 same reasons were indicated by non-contact farmers but unavailability was more important (86.8 percent). Regarding the duration of use of improved cassava, 60.1 percent of contact farmers indicated none, 18.3 percent less than 1 yr, 13.1 percent 2 yr, 5.9 percent 3 yr, and 2.6 percent more than 3 yr. (CIAT)

1026

30117 DURANT JUNIOR, T.J. 1986. An assessment of the ACRE minikit program in the five ACRE zones. In Durant Junior, T.J.. An assessment of the impact of the ACRE minikit program in five zones in Sierra Leone. Njala, Sierra Leone, Southern University and Louisiana State University Consortium. Adaptive Crop Research and Extension Project. pp.21-44. En.

CASSAVA; SURVEYS; ON-FARM RESEARCH; SOCIOECONOMIC ASPECTS; TECHNOLOGICAL PACKAGE; TECHNOLOGY TRANSFER; TECHNOLOGY EVALUATION; SIERRA LEONE.

A survey was conducted among farmers to assess the Adaptative Crop Research and Extension Project (ACRE) minikit program between 1981-85 in 5 zones (Rokupr, Kabala, Kenema, Makeni, and Njala) of Sierra Leone. Results of the cassava minikit, among others, are presented. Aspects assessed through interviews included the no. of minikits received by farmers, fertilizer contents of minikits, temporal distribution of minikits, var. included, source and method of minikit delivery, farmers' understanding of minikit use, maintenance by farmers, desire to use minikits, frequency of visits by extension agents, difficulties in using minikits, yield and income benefits from using minikits, problems, improvements in minikits suggested by farmers, and social contact as a source of diffusion of minikit materials. Tables showing survey results on general aspects and those pertaining to cassava are given. (CIAT)

1027

30118 DURANT JUNIOR, T.J. 1986. Factors influencing minikit distribution, use and maintenance. In Durant Junior, T.J.. An assessment of the impact of the acre minikit program in five zones in Sierra Leone. Njala, Sierra Leone, Southern University and Louisiana State University Consortium. Adaptive Crop Research and Extension Project. pp.45-49. En.

CASSAVA; SURVEYS; SOCIOECONOMIC ASPECTS; ON-FARM RESEARCH; TECHNOLOGICAL PACKAGE; TECHNOLOGY TRANSFER; TECHNOLOGY EVALUATION; SIERRA LEONE.

A survey was conducted among farmers of Sierra Leone (Rokupr, Kabala, Kenema, Makeni, and Njala) who received the cassava, rice, sweet potato, and maize minikits of the Adaptative Crop Research and Extension Project between 1981/85. Results are presented per zone regarding the factors that

influenced minikit distribution, use, and maintenance. No minikit maintenance problems were reported. The cassava minikit helped increase their yields and subsequently, their income. Farmers who received the cassava minikits reported rodents, weeds, and birds to be the main problems. Farmer suggestions to improve minikits included the need for more fertilizer and planting material and the timely arrival of planting material. (CIAT)

1028

30122 DURANT JUNIOR, T.J. 1985. Farmers' evaluation of ACRE-promoted crop technology. In Durant Junior, T.J.. The adoption and diffusion of crop technology by farmers in five ACRE zones in Sierra Leone. Njala, Sierra Leone, Southern University and Louisiana State University Consortium. Adaptive Crop Research and Extension Project. pp.46-70. En.

CASSAVA; STATISTICAL DATA; SURVEYS; DEVELOPMENT; ON-FARM RESEARCH; TECHNOLOGY EVALUATION; COSTS; TECHNOLOGY TRANSFER; INCOME; LABOR; CULTIVATION; SIERRA LEONE.

A survey was conducted among farmers in Sierra Leone to collect information on how they rate ACRE (Adaptive Crop Research and Extension Project)-promoted crop technology, including improved cassava. Most answers of respondents (approx. 80-84 contact farmers and 32-39 non-contact farmers) were recorded on a little, some, or much basis. In the case of improved cassava, a "much" answer among contact farmers was given by 69.9 percent of farmers for preference, 45.8 percent for perceived time-saving capacity, 73.5 percent for perceived impact on yield, 41.2 percent for degree of ease of use, 37.3 percent for cost of use, and 69.1 percent for income benefit from use. In the case of improved cassava, 41.7 percent of contact farmers reported that pests were the major problem. Improved cassava ranked 4th after fertilizer use, improved sweet potato, and improved rice in adoptability of ACRE-promoted improved technology. Based on the rate of adoption of improved crop var. by zone (Kenema, Kabala, Makeni, Rokupr, and Njala) between 1981-84, cassava ranked 3rd after rice and sweet potato among contact farmers, and was 2nd with rice after sweet potato among non-contact farmers. The Kenema and Makeni zones showed higher adoption rates for cassava. (CIAT)

1029

30119 DURANT JUNIOR, T.J. 1986. Minikit distribution, use and maintenance by ecology. In Durant Junior, T.J. An assessment of the impact of the ACRE minikit program in five zones in Sierra Leone. Njala, Sierra Leone, Southern University and Louisiana State University Consortium. Adaptive Crop Research and Extension Project. pp.50-57. En.

CASSAVA; ECOLOGY; SURVEYS; SOCIOECONOMIC ASPECTS; TECHNOLOGICAL PACKAGE; TECHNOLOGY TRANSFER; TECHNOLOGY EVALUATION; SIERRA LEONE.

A survey was conducted among upland farmers and inland valley swamp (IVS) farmers of Sierra Leone who received the cassava, rice, sweet potato, and maize minikits of the Adaptative Crop Research and Extension Project (ACRE) between 1981/85. Results are presented regarding maintenance, income benefits, problems, and farmers' suggestions on minikit improvement. Upland farmers showed a slightly greater tendency to maintain planting material from their cassava minikit than IVS farmers. A slightly greater proportion of IVS farmers felt that the cassava minikit would help increase their yields and had helped increase their income. A wider range of problems (rodents, weeds, and birds) were reported by farmers who received cassava, sweet potato, and maize minikits. Farmer suggestions to improve minikits included the need for more fertilizer, planting material, and minikits; the timely arrival of planting material; and pest control. Detailed information

is given on the analysis of age and sex as related to minikit distribution and use by ecology. (CIAT)

1030

30028 GODFREY-SAM-AGGREY, W. 1976. Cassava (Manihot esculenta) fertilizer and nutritional studies in Sierra Leone, West Africa. Ph.D. Thesis. Gottingen, Federal Republic of Germany, Georg- August-Universitat zu Gottingen. 201p. En., Sum. En., De., 126 Ref., Il.

CASSAVA; SOIL REQUIREMENTS; NUTRITIONAL REQUIREMENTS; N; P; K CA; MG; FERTILIZERS; FALLOWING; AGRICULTURAL LIME; POTASH; ROOT PRODUCTIVITY; COMPOSITION; SIERRA LEONE.

Expt. were conducted on Njala upland soils (Oxisols, Orthoxic Palehumults) to (1) monitor the direct and residual effects of factorial fertilizers and NPK fertilizer ratios as well as the direct effects of N, P, K, and lime rates on cassava yield components and yields at sites with varying cropping intensities and (2) evaluate the economics of fertilizer use. The 3 cassava cutting types (basal, mid, and top stems) responded predominantly to different major fertilizer nutrients and nutrient ratios at sites intensively cropped after 4 yr and newly opened land after 6 yr of bush fallows. A comparison of the mean root yields of the planting sets showed no significant differences, except in the 1st residual NPK fertilizer ratio evaluation, where basal cuttings performed significantly better than midstem cuttings. N, P, and K, either singly or in various ratios, and Ca and Mg singly showed significant and economic responses. The time of harvest influenced the type of nutrient to be applied. The nutrient responses reflected the nutrient deficiencies at the sites with varying cropping intensities and all agreed with previously recorded data. N response was not observed when sulphate of ammonia was applied to soil with C:N 10 but occurred at sites with C:N ratios less than 10. Lime rates beyond 260 kg/ha showed no significant effects on yields but significantly depressed individual root wt. Lime rate of 260 kg/ha produced significant direct and residual yield increases with basal cuttings at the site after 6 yr of bush fallow. Basic slag (P), which contains 260 kg of active lime/ha, is recommended on the basis that it produced large and economic direct and residual effects in addition to inducing the optimum level of liming within pH 5.5-6.5. There appears to be a genotype x fertilizer interaction in cassava cv. Cocoa and Nigeria, Ca and P being indicated as the 2 elements concerned, resp. Exchangeable K levels obtained at preplanting were not reliable indices for K responses. No K response was observed at the site after 9 yr of bush fallow. In the 1st direct fertilizer application at the site intensively cropped after 4 yr of bush fallow, variability in bark Mn appeared to be a significant contributor to variability in root yields after multiple regression analysis. This effect was related to N application; however, in the 2nd direct fertilizer application (3rd cropping cycle) variabilities in bark N, K, Mg, and Mn were found to contribute significantly to root yield variability. It is suggested that cassava should be cropped for 2 cycles to obtain the direct and residual fertilizer yields to make its production economic. After 2 cycles of cropping, a green manure fallow should be employed to improve soil nutrient-holding capacity. (AS)

1031

29588 GREEN, P. 1985. Utilization of food crops in Sierra Leone. Roots and tubers: cassava. In Country Statement for Consultation on Home Economics and Agricultural Research, Ibadan, Nigeria, 1985. Summary report and recommendations on food crops utilization. Ibadan, Nigeria, International Institute of Tropical Agriculture. Home Economics Association of Africa. pp.5-9. En.

CASSAVA; USES; PROCESSED PRODUCTS; FOOD PRODUCTS; CASSAVA BREAD; FOOFOO; GARI; BOILING; ROASTING; BAKERY PRODUCTS; CULTIVARS; SIERRA LEONE.

Preparation procedures of different cassava foods used in Sierra Leone are briefly described, and research results on cassava utilization are reported. Ways of preparing cassava for consumption are boiled cassava, boiled cassava foofoo, raw cassava foofoo, cassava bread, gari, and roasted cassava. Out of 10 cassava clones evaluated for boiling characteristics in 1982/83, only Rocass 1 consistently cooked well in 25 min and produced a sweet and dry product. Cassava-wheat cookies were found to be almost as good as cookies made entirely with wheat flour. Cassava var. Nucass 2 gave the highest foofoo yield and the best potential for its production; Nucass 3 could also be used, but Nucass 1, in spite of high yields, produced foofoo with bad odor. Nucass 1 and 2 produced significantly more gari of better quality than Nucass 3 and Cocoa. It was recommended that large-scale multiplication and distribution of var. Nucass 1 and 2 should continue, while that of Nucass 3 should be stopped. (CIAT)

1032

30154 JAMES, B.D. 1987. The cassava mealybug Phenacoccus manihoti Mat-Ferr (Hemiptera: Pseudococcidae) in Sierra Leone: a survey. Tropical Pest Management 33(1):61-66. En., Sum. En., 9 Ref., Il. (Dept. of Zoology, Fourah Bay College, Univ. of Sierra Leone, Freetown, Sierra Leone)

CASSAVA; PHENACOCCUS MANIHOTI; PEST DAMAGE; MAPS; BIOLOGICAL CONTROL; SIERRA LEONE.

A survey was undertaken in Sierra Leone to map the distribution of the cassava mealybug (Phenacoccus manihoti) and to identify ways in which it was spread (naturally and by humans). These features would then become inputs to a control program. The pest was found to be firmly established in the western part of the country and is progressively extending to the provincial areas. All available cassava var. are susceptible to the insect, and the damage is especially significant on the late-planted crop. Biological control, for example by ground release of exotic hymenopteran parasitoids in the dry season, is recommended as a long lasting strategy to undermine the pest's status as a constraint to food production. (AS)

1033

30029 JINDIA, J.R.; DAHNIYA, M.T. 1985. Costs and returns of ACRE technology packages. Njala, Sierra Leone, Adaptive Crop Research and Extension Projet. Research Series no.1 15p. En., Sum. En., 7 Ref., Il.

CASSAVA; ECONOMICS; TECHNOLOGICAL PACKAGE; COSTS; INCOME; LABOR; SIERRA LEONE.

Twenty-four demonstrations of the cassava improved minikit were carried out in the 5 zones of Sierra Leone covered by the Adaptive Crop Research and Extension Project (ACRE) in 1982-83. The minikit included improved cassava var. NUCASS 1, ROCASS 1, or ROCASS 3; planting at 1 x 1 m spacing on ridges for 10,000 plants/ha; 2-3 weedings; intermediate management without fertilizer or improved management with 6 bags of 15-15-15 NPK applied at 4 wk. and 3 mo. after planting. Partial budget and sensitivity analyses and estimation of net benefits were conducted based on results. Av. returns to the new var. under intermediate management were 1506 percent and returns to improved management were 470 percent, showing that the ACRE package with intermediate management is highly profitable for farmers and that fertilizer application is also very profitable; some farmers, however, could be reluctant to using them because of the long duration of the crop and marketing and transportation problems. (CIAT)

1034

26800 JOHNSON, B.T.; KAWA, J.A. 1985. ROOTS, TUBERS AND PLANTAINS PRODUCTION IN SIERRA LEONE. IN WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE, 1985. REPORT. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.217-227. EN., 5 REF.

CASSAVA; MARKETING; PROCESSING; POSTHARVEST LOSSES; SOCIOECONOMIC ASPECTS; STATISTICAL DATA; DEVELOPMENTAL RESEARCH; CASSAVA PROGRAMS; SIERRA LEONE.

THE SITUATION OF ROOT, TUBER, AND PLANTAIN CROPS IN SIERRA LEONE IS DESCRIBED. ONLY SMALL QUANTITIES OF THESE CROPS ARE PRODUCED (105,000 T CASSAVA IN 1983). CASSAVA IS AN IMPORTANT FOODSTUFF, BOTH ITS ROOTS AND LEAVES ARE EATEN AND IT IS CONSIDERED A RESERVE FOOD FOR ITS EASY STORAGE IN THE GROUND. CASSAVA IS INTERCROPPED AND PLANTED AFTER RICE IN SHIFTING ROTATIONAL CULTIVATIONS; IT IS ALSO GROWN IN SWAMPY AREAS. THE MARKETING PROCESS AND THE MOST COMMON PROCESSING EQUIPMENT AND TECHNIQUES ARE DESCRIBED; TECHNICAL AND ECONOMIC PRODUCTION CONSTRAINTS ARE DISCUSSED. SEVERAL RESEARCH AND EXTENSION INSTITUTIONS ARE ENGAGED IN PROMOTION PROGRAMSFOR THESE CROPS. SOME IMPROVED CASSAVA VAR. ARE ROCASS 1, 2, AND 3 (ROKUPR RICE RESEARCH STATION) AND THE NUCASS SERIES (NJALA U. COLLEGE). THE PERFORMANCE OF THESE IMPROVED VAR., COMPARED WITH LOCAL ONES, FOSTERS THE INTENSIVE CULTIVATION OF CASSAVA ALL OVER THE COUNTRY. (CIAT)

1035

30116 JONES, R.A.D.; TARAWALLI, G.; TUCKER, E.S.; KARGBO, D.D.; TURAY, A.F. 1978. Cassava. In Jones, R.A.D.; Tarawalli, G.; Tucker, E.S.; Kargbo, D.D.; Turay, A.F.. Towards the development of improved practices for root and tuber crops. Sierra Leone, pp.3-4,8-9. En. Paper presented at the First Regional Root and Tuber Crop Improvement Workshop, Sierra Leone, 1978.

CASSAVA; DEFOLIATION; LEAVES; FERTILIZERS; N; PRODUCTIVITY; ROOT PRODUCTIVITY; INCOME; SIERRA LEONE.

To evaluate the effect of defoliation on cassava leaf and root yields, a virus-susceptible var. was subjected to a defoliation treatment (removal of mature leaves, except the top 8 from the apex) every 28 days for 3 mo. starting when the plants reached 1 m in height. Four N application rates (0, 60, 12, and 240 kg/ha) were applied. Under all levels of applied N, defoliation led to increased leaf production and the optimum N level appeared to be 60 kg/ha (21,745 kg/ha vs. 15,038 kg/ha for 0 kg/N/ha and 7201 kg/ha for undefoliated cassava with 60 kg N/ha). The av. wt. of leaves from defoliated plants was approx. 2.7 times greater than that obtained from undefoliated plants. N applications had no significant effect on root yield, irrespective of defoliation treatment. Root yields, however, were significantly reduced by defoliation from an av. of 18,742 kg/ha for undefoliated cassava to 11,539 kg/ha for defoliated cassava. It was tentatively concluded that defoliation of cassava plants at monthly intervals does not result in total yield losses, provided that the 1st 8 leaves starting from the apex are left at each defoliation time. This practice means increased sources of income to farmers and enhanced economic returns from N applications. (CIAT)

1036

30030 JONES, R.A.D.; TUCKER, E.S.; TARAWALI, G.; JOHNSON, S.D. 1977. The effect of defoliation on the yield (leaf and tuber) of cassava at four different levels of nitrogen application. Njala, University of Sierra Leone. 7p. En., Sum. En., Il. Paper presented at the 7th Annual Conference of the Agricultural Society of Sierra Leone, 1977.

CASSAVA; FERTILIZERS; N; PRUNING; ROOT PRODUCTIVITY; LEAVES; SIERRA LEONE.

The effect of defoliation on leaf and root yields of cassava var. Seken at 4 N fertilization levels (0, 60, 120, and 240 kg/ha in a split application: 1/2 at 1 wk. after planting and 1/2 at 6 wk. after dormancy breakage) was studied at the Rokupr Rice Research Station, Sierra Leone. Economic returns from defoliated and nondefoliated cassava plants were also assessed. The 1st defoliation took place when plants reached 1-m height and then at 28-day intervals for a total of 4 defoliations. N applications of up to 60 kg/ha increased fresh leaf yield at all defoliation dates: 4557, 5037, 4700, and 4300 kg/ha for a total of 18,591 kg/ha compared with 13,461 kg/ha with 0 kg N/ha. Higher N rates resulted in noneconomic leaf yield increases. At 60 kg N/ha, defoliated plants yielded a total of 21,745 kg fresh leaves/ha, while nondefoliated plants produced 7201 kg fresh leaves/ha. N application did not increase root yields significantly, irrespective of the defoliation treatment, but nondefoliated plants produced higher av. yields (18,742 kg/ha) than defoliated plants (11,539 kg/ha). After analyzing the gross returns to leaf, root, and edible matter from defoliated and nondefoliated plants, however, it was concluded that appreciable returns are obtained by defoliating cassava on a monthly basis and that N applications of up to 60 kg/ha increased returns. It was concluded that defoliation of cassava plants does not result in total yield losses if the 1st 8 leaves starting from the apex are left intact. (CIAT)

1037

30024 KALLON, J.M. 1981. Land evaluation for selected crops for Sierra Leone. Sierra Leone Agricultural Journal 6(2):54-67. En., 12 Ref.

CASSAVA; SOIL REQUIREMENTS; CLIMATIC REQUIREMENTS; CULTIVATION; SIERRA LEONE.

The criteria used by the Land Resources Survey Project to determine the suitability of Sierra Leone lands for the potential cultivation of cassava and 7 other crops are reviewed. Cassava requirements and land characteristics (rooting space, soil fertility, moisture and oxygen availability, and resistance to erosion) of Sierra Leone were matched. It was concluded that cassava cultivation should be restricted to well-drained upland areas that are free from flooding throughout the year; it requires a gravel- free soil although it can be grown on soils with as much as 30 percent gravel. Cassava is one of the most suitable crops to be grown in climate D2 where the length of the dry season is too long. In the hilly region, cassava cultivation should be restricted to hill sides with a slope less than 12 percent. Mangrove and inland swamps, which get flooded for up to 6 mo. of the year, and sandy beaches were not considered suitable for cassava cultivation. (CIAT)

1038

31666 KOLLER, B. 1986. Schaffen neue technologien arbeitserleichterungen fur die frauen? Beispiel: kassava-reiben in Sierra Leone. (Creation of a new technology to improve work perspectives of women. The case of gari in Sierra Leone). Entwicklung und Landlicher Raum 20(6):16-18. De., Sum. De., En., 1 Ref. (Hans-Thoma-Strabe 5, 6000 Frankfurt am Main 70, Germany)

CASSAVA; WOMEN; GARI; MARKETING; INCOME; TECHNOLOGY TRANSFER; INDUSTRIALIZATION; SOCIOECONOMIC ASPECTS; SIERRA LEONE.

Women in rural areas of Sierra Leone are subsistence farmers. They produce, among others, rice, vegetables, and cassava, the 2nd most important staple food after rice. Only processing of cassava to gari, and its marketing, offers a relatively secure income to women. Cassava/gari has become more important as a cash crop with the increasingly unstable provision of rice. In town areas, motor- driven raspers facilitate the production process of gari. Financially potent men buy the cassava crop from the women, use new

gari production technology, and thus achieve advantages in production for themselves. In the long run, this will mean a shifting of the gari production into the town and into the hands of the men. The women's program of a project of technical cooperation has therefore tried to obviate this process by direct assistance of the women producers of cassava and gari. Access to groups of women to credits enabled them to buy an expensive, motor-driven cassava rasping machine. Difficulties encountered in the introduction of improved technology are discussed as well as the control measures necessary to insure that women are not pushed aside in their traditional branches of production. (AS (extract))

1039

32260 LAMIN, A.S. 1987. Major agricultural pests and diseases in Sierra Leone. In Rijks, D.; Mathys, G., eds. Seminar on Agrometeorology and Crop Protection in the Lowland Humid and Sub-Humid Tropics, Cotonou, Benin, 1986. Proceedings. Geneva, Switzerland, World Meteorological Organization. pp.209-221. En. (Land & Water Development Division, Ministry of Agriculture & Natural Resources, Freetown, Liberia)

CASSAVA; BEMISIA; ZONOCERUS VARIEGATUS; AONIDOMYTILUS ALBUS; TETRANYCHUS TELARIUS; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; SIERRA LEONE.

A general guide on major pests and diseases of important crops and animals in Sierra Leone is provided. Insects listed as important cassava pests are Bemisia tabaci, Zonocerus variegatus, Aonidomytilus albus, Tetranychus telarius, Phenacoccus manihoti, and Mononychellus tanajoa. (CIAT)

1040

30026 MITRA, A.K. 1970. Production, production requirements, costs and returns of crops in the western area of Sierra Leone (Agricultural resource situation A). Freetown, Sierra Leone, Food and Agriculture Organization of the United Nations. pp.1-4, 14-18, 20-22, 24, 26-29, 36-37. En.

CASSAVA; ECONOMICS; PRODUCTION; STATISTICAL DATA; COSTS; LABOR; SIERRA LEONE.

Cassava in western Sierra Leone occupies 1500 acres of land, but only 8.08 percent (0.37 acres) of an av. farming unit (4.58 acres). The 1st crop planted after brushing, burning, and land clearing is cassava followed by maize and then yams; after hoeing, upland rice is sown and then cassava again or other crops after 2-3 yr before land fallowing. Estimated costs and returns/acre of upland cassava, as well as labor requirements, are given for both traditional and improved management; returns to traditional management are negative (Le -2.57) while returns to improved management are positive (Le 5.53). (CIAT)

1041

30025 ROBERTS, A.T. 1978. Cassava: its economic importance in Sierra Leone. Freetown, Sierra Leone, Njala University College. 13p. En. Sum. En., 16 Ref.

CASSAVA; STATISTICAL DATA; PRODUCTION; COSTS; LABOR; INCOME; ROOTS; CASSAVA LEAVES (VEGETABLE); FARM SIZE; ECONOMICS; MARKETING; SOCIOECONOMIC ASPECTS; SIERRA LEONE.

The economic importance of cassava in Sierra Leone, where it is the 2nd most important crop after rice in area planted and consumption, is analyzed. Figures are provided for 1970/71 on total area planted to cassava, total production, total acreage per farm size categories, per districts, and per cultivation patterns, production per district, and production costs and returns at different sites of the country. Aspects of cassava processing, livestock feeding, marketing, and government policies are discussed.

Consumption and sales figures per province are compared for the periods 1965/66 and 1970/71. (CIAT)

1042

30038 SANNEH, F.; KAMARA, I.B.; DAHNIYA, F.N.; DAHNIYA, M.T. 1982. Evaluation of improved cassava varieties for processing into foofoo and gari. Sierra Leone, Njala University College. 10p. En., Sum. En., 2 Ref. Paper presented at the West African Root CropsWorkshop, Suakoko, Liberia, 1982.

CASSAVA; CULTIVARS; PROCESSING; FOOFOO; GARI; PRODUCTIVITY; ORGANOLEPTIC EXAMINATION; SIERRA LEONE.

Cassava improved var. NUCASS 1, 2, and 3 and the local cv. Cocoa were evaluated for their suitability to produce foofoo and gari in Sierra Leone. The significantly highest foofoo yield (25.8 percent) was obtained from NUCASS 2, followed by NUCASS 1 (22.5 percent), Cocoa (21.3 percent), and NUCASS 3 (11.7 percent). NUCASS 2, however, took the longest time to cook in 150- and 300-ml samples of foofoo (4 and 9 min, resp.). Based on yields and organoleptic characteristics (texture, color, odor, taste), NUCASS 3 was the only var. considered unsuitable for foofoo production. NUCASS 2 and 1 produced significantly higher gari yields (37.9 and 36.6 percent) than Cocoa and NUCASS 3 (34.6 and 30.5 percent, resp.). The same held true for consumer acceptability; NUCASS 1 and 2 were considered to produce good (77.7 percent of panel) or fairly good (88.1 percent) gari. It was recommended that large-scale multiplication and distribution of cassava var. NUCASS 1 and 2 should continue, while that of NUCASS 3 should cease. (CIAT)

SOMALIA

1043

26862 VECCHIO, V.; RAIMONDO, F.M.; SHIRWA, A.H.; ROSSITTO, M. 1984. LES MAUVAISES HERBES DU MANIOC EN SOMALIE. (WEEDS IN CASSAVA IN SOMALIA). IN COLLOQUE INTERNATIONAL SUR L'ECOLOGIE, LA BIOLOGIE ET LA SYSTEMATIQUE DES MAUVAISE HERBES, 7EME., FLORENCE, ITALY, 1984. COMPTES RENDU. ITALY, UNIVERSITA DEGLI STUDI DI FIRENZE. PP.191-200. FR., SUM. FR., EN 4 REF.

CASSAVA; WEEDS; WEEDING; SOMALIA.

AS A RESULT OF WEED SURVEYS AT 11 SITES IN THE CASSAVA GROWING AREAS OF SOMALIA, 102 SPECIES BELONGING TO 88 GENERA AND 31 FAMILIES WERE IDENTIFIED. THE WEED COVER WAS ABOUT 45 PERCENT WITH AN AV. OF 41.45 SPECIES/SITE. THE WEED COMMUNITY CLOSELY RESEMBLES THE GISEKIO-TEPROSETUM PUMILAE COMMUNITY FOUND IN PASTURES AND DUNES OF THE AREA. CROPS ARE CURRENTLY HAND WEEDED 4 OR 5 TIMES DURING THE RAINY SEASON. (AS)

SOUTH AFRICA

1044

29566 SOUTH AFRICAN CASSAVA ASSOCIATION. 1987. RECOMMENDATIONS FOR THE PLANTING AND HARVESTING OF CASSAVA FOR THE 1986/87 SEASON. EMPANGENI, SOUTH AFRICA. 31P. EN., IL.

CASSAVA; PROPAGATION MATERIALS; TIMING; SOIL REQUIREMENTS; CLIMATIC REQUIREMENTS; ROTATIONAL CROPS; FERTILIZATION; WEEDING; PEST CONTROL; HARVESTING; DISTRIBUTION; LABOR; SOUTH AFRICA.

RECOMMENDATIONS FOR THE PRODUCTION OF CASSAVA ROOTS AND GOOD PROPAGATION MATERIAL IN SOUTH AFRICA ARE GIVEN REGARDING THE SELECTION OF SUITABLE LAND, PARTICULARLY REGARDING LOADING FACILITIES, SOILS, SLOPE, CLIMATE, AND PREVIOUS CROPS. LAND PREPARATION, FERTILIZATION, AND PLANTING MATERIAL, TIME, DENSITY, POSITION, AND DEPTH ARE ALSO INDICATED. PROCEDURES FOR DISEASE, PEST, AND WEED CONTROL ARE GIVEN AND DIFFERENT ASPECTS OF HARVESTING ARE DISCUSSED. (CIAT)

1045

29571 MELIS, R.J.M.; VAN STADEN, J. 1986. THE EFFECT OF ALAR (SUCCINIC ACID 2,2-DIMETHYLHYDRAZIDE) ON THE GROWTH OF CASSAVA (MANIHOT ESCULENTA) UNDER SUBTROPICAL CONDITIONS. SOUTH AFRICAN JOURNAL OF PLANT AND SOIL 3(1):49-51. EN., SUM. EN., AF., 8 REF., IL. (DEPT. OF CROP SCIENCE, UNIV. OF NATAL, P.O. BOX 375, PIETERMARITZBURG, 3200 REPUBLIC OF SOUTH AFRICA)

CASSAVA; PLANT DEVELOPMENT; PRODUCTIVITY; PRUNING; GROWTH; ADAPTATION; TEMPERATURE; SOUTH AFRICA.

THE EFFECT OF ALAR (SUCCINIC ACID 2,2-DIMETHYLHYDRAZIDE) AND PRUNING ON CASSAVA WAS STUDIED UNDER SUBTROPICAL CONDITIONS IN NATAL, SOUTH AFRICA. ALAR APPLICATION IN EARLY SUMMER HAD LITTLE EFFECT ON SHOOT GROWTH AND DID NOT INCREASE YIELD. PRUNING AT THE START OF THE 2ND GROWING SEASON STIMULATED SHOOT GROWTH AND LED TO A LOW TUBER GROWTH RATE. ALAR REDUCED SHOOT GROWTH BUT DID NOT LEAD TO AN INCREASE IN TUBER YIELD. (AS)

1046

29526 MEYER, H.J.; VAN STADEN, J. 1986. Inorganic nutrient requirements of in vitro cultured Manihot esculenta explants. South African Journal of Botany 52(5):472-480. En., Sum. En., Afr., 20 Ref., Il. (UN/CSIR Research Unit for Plant Growth & Development, Dept. of Botany, Univ. of Natal, P.O. Box 375, Pietermaritzburg, 3200, Republic of South Africa)

CASSAVA; NUTRITIONAL REQUIREMENTS; MINERALS; ROOT DEVELOPMENT; SHOOTS; TISSUE CULTURE; CULTIVARS; PLANT TISSUES; SOUTH AFRICA.

Attempts to determine the optimum requirements for both macro- and micronutrients for the in vitro culture of cassava axillary bud explants are reported. Previous studies indicated that both the root and shoot growth of in vitro cultured bud explants of cassava could be improved by manipulating the concn. of a no. of inorganic constituents in the medium of Murashige & Skoog. Studies with cv. MVEN 25, MBRA 12, CMC 681.2, and CMC 1964 using both Murashige & Skoog and a devised medium indicated that each cv. apparently has its own specific nutrient requirements for in vitro culture. (AS)

1047

29492 ROACH, P.M.; GARNETT, H.M. 1986. SUITABILITY OF CELL SUSPENSION CULTURES FOR STUDYING THE INTERACTION OF CASSAVA WITH THE PATHOGEN CAUSING BACTERIAL BLIGHT. SOUTH AFRICAN JOURNAL OF SCIENCE 82(10):592-594. EN., SUM. EN., 9 REF., IL.

CASSAVA; CULTIVARS; BACTERIOSES; DISEASE CONTROL; CASSAVA BACTERIAL BLIGHT; SOUTH AFRICA.

A STUDY WAS CONDUCTED TO DETERMINE WHETHER THE PATHOGENIC EFFECT OF ERWINIA STRAINS ISOLATED FROM CASSAVA PLANTS WAS ELICITED IN CASSAVA CELL SUSPENSION AS SUCH A MODEL SYSTEM COULD FACILITATE FURTHER STUDIES ON THE PATHOGENIC PROCESS. PLANT CELL SUSPENSIONS OF 2 CASSAVA CV. SHOWED ALMOST COMPLETE CELL DEATH OVER 72 H WHEN INOCULATED WITH 2 PATHOGENIC STRAINS OF ERWINIA AT INITIAL CONCN. OF 10(3), 10(5), AND 10(7) BACTERIA/ML. A 10-15 PERCENT DECREASE IN PLANT CELL VIABILITY WAS NOTED WHEN A NONPATHOGENIC STRAIN WAS USED. BACTERIAL CELL-FREE FILTRATES OF ERWINIA CULTURES ADDED TO THE CELL

SUSPENSION CULTURES DECREASED PLANT CELL VIABILITY WHEN FILTRATES WERE PREPARED FROM THE PATHOGENIC STRAINS, BUT NOT WHEN A FILTRATE WAS PREPARED FROM A PLANT CELL CULTURE OR FROM THE NONPATHOGENIC ERWINIA STRAIN. (AS)

1048

26387 WHITLOCK, V.H.; HILL, R.R.; COWLEY, H.M. 1986. NEW BACTERIAL PATHOGEN CAUSING BLIGHT OF CASSAVA IN SOUTHERN AFRICA. PLANT DISEASE 70(2):167-169. EN., SUM. EN., 11 REF., IL. (DEPT. OF MICROBIOLOGY, UNIV. OF THE WITWATERSRAND, 1 JAN SMUTS AVE., JOHANNESBURG, 2001, SOUTH AFRICA)

CASSAVA; LABORATORY EXPERIMENTS; ISOLATION; ERWINIA HERBICOLA; ENTEROBACTER AGGLOMERANS; SYMPTOMATOLOGY; LEAVES; INOCULATION; DISEASE TRANSMISSION; SOUTH AFRICA.

CULTURES FROM LESIONS SIMILAR TO BACTERIAL BLIGHT FROM CASSAVA PLANTINGS IN NATAL AND SWAZILAND YIELDED A YELLOW-PIGMENTED ORGANISM SHOWING CHARACTERISTICS OF THE GENUS ERWINIA. PATHOGENICITY WAS ESTABLISHED BY INDUCTION OF SIMILAR LESIONS IN EXPTL. PLANTS BY LEAF INOCULATION. FIELD AND LAB. SYMPTOMS WERE SIMILAR. SYMPTOMS PROGRESSED FROM ANGULAR CHLOROTIC LESIONS TO TIP AND MARGIN NECROSIS FOLLOWED BY WILTING, AND FINALLY, ABSCISSION. PLANT DEATH OCCURRED 5 WK. AFTER INOCULATION IN THE LAB. TAXONOMIC PROFILES OF ISOLATES SUGGEST SIMILARITY TO THE ERWINIA HERBICOLA-ENTEROBACTER AGGLOMERANS COMPLEX. (AS)

SUDAN

1049

28585 CONNOLLY, M. 1986. IMPROVED VARIETIES OF CASSAVA AND SWEET POTATOES FOR SUDAN AND MALAWI. IITA RESEARCH BRIEFS 7(1):1,4. EN., IL.

CASSAVA; CULTIVARS; ADAPTATION; CLONES; CASSAVA AFRICAN MOSAIC VIRUS; SUDAN; NIGERIA; KENYA; UGANDA.

THE RESULTS OF CASSAVA VAR. TRIALS CONDUCTED IN SUDAN ARE BRIEFLY REPORTED. CASSAVA CLONES FROM NIGERIA, KENYA, AND UGANDA WERE TESTED, INCLUDING 4 VAR. FROM THE INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE (IITA) AND THE LOCAL CONTROL ORESTE. IITA VAR. TMS 30555 PERFORMED BEST WITH A PROJECTED YIELD OF 69 T/HA; IT ALSO HAD THE HIGHEST SCORE FOR TASTE AND GOOD RESISTANCE TO CAMD. THIS VAR. HAS THEREFORE BEEN RELEASED (ON A PRELIMINARY BASIS) FOR RAPID MULTIPLICATION AND DISTRIBUTION TO FARMERS. (CIAT)

TANZANIA

1050

29324 CASSAVA QUESTIONNAIRE for survey on cassava production and nutrition in 3 regions: Mtwara, Shiayanga, and Zanzibar. Morogoro, Tanzania Agricultural Research Organization. 3p. s.f. En.

CASSAVA; QUESTIONNAIRES; SURVEYS; TANZANIA.

A model questionnaire to be used for conducting interviews in agricultural households and to collect data on family income sources, energy use, food situation, and cassava production is presented. Questions on cassava production cover aspects such as area planted, production systems, cultural practices, harvesting, processing, and uses, in particular the use of cassava as weaning food. Information on family labor distribution in different stages of cassava production and processing is requested. (CIAT)

1051

29562 TANZANIA: CASSAVA varieties by region. Tanzania, 2p. 1986. En.

CASSAVA; CULTIVARS; TANZANIA.

A brief inventory of cassava cv. found in 11 regions of Tanzania is presented. (CIAT)

1052

30137 EAST AFRICAN AGRICULTURAL RESEARCH STATION AMANI. 1941. Agricultural research: cassava. In East African Agricultural Research Station Amani. Annual Report 1941. Tanzania, p.3. En.

CASSAVA; CASSAVA BROWN STREAK VIRUS; VECTORS; TANZANIA.

The main results on cassava expt. carried out at the East African Agricultural Research Station (Amani, Tanzania) during 1940 and summarized. Plant pathology expt. confirmed that the brown streak virus is transmitted by the whitefly (the same vector of the mosaic virus). Approx. 400 seedlings were reared from crosses made in Dec. 1940 and Jan. 1941. A large proportion of these were backcrosses to cassava of the F1 generation from cassava x Manihot glaziovii and similar backcrosses of cassava x tree cassava. The F1 generation of cassava x M. dichotoma set fruits for the 1st time and a no. of seedlings were raised from the open-pollinated flowers. Disease resistance trials in Kizugu were harvested in Aug. As in previous years infection by both mosaic and brown streak virus was very high, but a no. of clones were largely free of one or both. In particular, a cassava x cassava cross of the 1937 series survived its 2nd test entirely mosaic-free. (Full text)

1053

29331 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1986. DISTRICT AND REGIONAL CASSAVA PRODUCTION IN TANZANIA; 1984-85 AND 1985-86. TANZANIA, 5P. EN., DAT.NUM.

CASSAVA; CASSAVA PROGRAMS; STATISTICAL DATA; TANZANIA.

STATISTICS ON AREA PLANTED TO CASSAVA AND CASSAVA PRODUCTION IN 19 REGIONS OF TANZANIA, WITH A TOTAL OF 75 DISTRICTS, ARE GIVEN IN TABLE FORM FOR THE YEARS 1984-85 AND 1985-86. (CIAT)

1054

29332 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1986. Final food production estimate 1983-1984 to 1985-1986 season compared with the estimates in previous seasons (000 M.T.). Tanzania, 2p. En., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; TANZANIA.

Production estimates of major crops, including cassava, in 19 regions of Tanzania are tabulated for the period 1983/84, 1984/85, and 1985/86. Cassava production estimates are not provided for 1983/84; however, total cassava production decreased from 2,052,000 MT in 1984/85 to 2,031,000 MT in 1985/86. (CIAT)

1055

29034 REGIONAL AGRICULTURAL DEVELOPMENT OFFICE. TANZANIA. 1984. Cassava: regional production estimates quantities in '000 m. tons. 1p. En., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; TANZANIA.

Cassava production estimates for 20 regions, and for Tanzania as a whole, are tabulated on a yearly basis for the period 1975/76-1983/84. (CIAT)

1056

29327 REGIONAL AGRICULTURAL DEVELOPMENT OFFICE. TANZANIA. 1984. Cassava regional production estimates quantities in '000 tons, 1972-1984. Tanzania, 2p. En., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; TANZANIA.

Cassava production estimates for 21 districts and Tanzania as a whole are given in table form on a yearly basis for the period 1972/73-1983/84. (CIAT)

1057

29328 REGIONAL AGRICULTURAL DEVELOPMENT OFFICE. TANZANIA. 1986. Regional area estimates for all main food crops 1984-85 to 1986-87. Tanzania, 3p. En., Dat.num.

CASSAVA; PRODUCTION; STATISTICAL DATA; TANZANIA.

Regional area estimates for all main food crops, including cassava, in 20 regions of Tanzania are given in tables for 1984/85, 1985/86, and 1986/87. (CIAT)

1058

29321 ROOT AND TUBER CO-ORDINATING COMMITTEE MEETING, UKIRIGURU, TANZANIA. 1984. Minutes. Mwanza, Tanzania Agricultural Research Organization. 11p. En.

CASSAVA; RESEARCH; CASSAVA PROGRAMS; DISEASES AND PATHOGENS; VIROSES; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BROWN STREAK VIRUS; BACTERIOSES; CASSAVA BACTERIAL BLIGHT; INJURIOUS MITES; MONONYCHELLUS TANAJOA; MONONYCHELLUS PROGRESIVUS; PRODUCTIVITY; CULTIVARS; TANZANIA.

The minutes of the meeting held in 1984 by the Root and Tuber Coordinating Committee of the Tanzania Agricultural Research Organization are presented. The overall root and tuber research program is briefly reviewed, and discussions among participants on cassava and sweet potato research results in 1983/84 and plans for 1984/85 are presented. Most cassava var. tested in 1983/84 showed mild infections by CAMD and CBB and mild infestations by the green cassava mite; it is not known whether Mononychellus tanajoa or M. progresivus is most common in Tanzania, but both are present and are both named as green cassava mites. The cassava brown streak was suspected to be present in some fields, for which specimens were sent for analysis. Poor cultural practices and the use of low yielding var., susceptible to pests and diseases, were identified as major constraints to improved on-farm cassava productivity in Mtwara. On the other hand, while cassava yields in farmers' fields in Naliendele were only 5 t/ha, yields at the exptl. station were 7 -30 t/ha. The use of cassava var. Liongo and Aipin Valenca in most expt. was supported by the fact that the former is sweet with good DM content and the latter, bitter with good flour production for "ugali" elaboration, qualities well accepted by farmers. (CIAT)

1059

29311 TANZANIA. DEPARTMENT OF AGRICULTURE. 1954. Cassava. In Tanzania. Department of Agriculture. Annual Report 1954. Tanzania, pp.11-12. En.

CASSAVA; CASSAVA PROGRAMS; RESEARCH; STATISTICAL DATA; MARKETING; TANZANIA.

The distribution of cuttings of CAMD-resistant cassava var. throughout Tanzania, by the Dept. of Agriculture, is summarized. Data of dried root sales in local markets in the different provinces (Southern, Western, Eastern, Central, and Lake) are tabulated for 1950-54. (CIAT)

1060

29310 TANZANIA. DEPARTMENT OF AGRICULTURE. 1951. Cassava. In Tanzania. Department of Agriculture tto Annual Report 1951. Zanzibar, Tanzania, p.13. En.

CASSAVA; PLANT BREEDING; HYBRIDIZING; TANZANIA.

Results of trials conducted with cassava interspecific hybrids (cassava x Manihot glaziovii and cassava x M. dichotoma), clones, and var. in Zanzibar, Tanzania, in 1951 are briefly discussed. Yields of up to 6.07-8.09 t/ha were recorded for several clones, most of them with resistance to CAMD and only some very palatable and acceptable for Zanzibar growers. (CIAT)

1061

29312 TANZANIA. DEPARTMENT OF AGRI LTURE. 1956. Cassava. In Tanzania. Department of Agriculture. Annual Report 1956. Tanzania, p.102. En.

CASSAVA; CULTIVARS; SELECTION; TANZANIA.

As a result of previous work in Tanzania, 12 cassava var. were planted on April 20, 1955, and half of each plot was harvested in June 1956. Results in 1956 compared with previous results indicate that the best 3 cassava var. were 4697/4, 4760/37, and 46110/8, all of which yielded well and are adequately disease-free. These 3 var. will be bulked up. (Full text)

1062

29326 TANZANIA. MINISTRY OF AGRICULTURE. 1986. Aspects of the open market for food commodities in Mainland Tanzania. Dar es Salaam, Marketing Development Bureau. pp.38-39. En., Il.

CASSAVA; ECONOMICS; MARKETING; PRICES; STATISTICAL DATA; TANZANIA.

The cassava open market trade based on price trends in Mainland Tanzania is briefly analyzed. No clear seasonal price pattern was observed. Because no real peak periods of cassava supply with prolonged low price levels occur due to producer habits of harvesting and taking cassava to the market any time when cash or supplies are required, and because price trends in one market can be offset by an opposite price evolution in other markets, the av. price evolution could show no distinguishable pattern. Thus, open market trade of cassava can hardly be analyzed on a national basis as far as price trends within the marketing year are concerned. (CIAT)

1063

29325 TANZANIA. MINISTRY OF AGRICULTURE. 1986. Lindi-Mtwara and Coast regions. An approach to the cashewnut farming system cropping pattern and costs of production. Dar es Salaam, Marketing Development Bureau. 55p. En., Il.

CASSAVA; INTERCROPPING; CASHEW NUTS; ON-FARM RESEARCH; SURVEYS; PRICES; PRODUCTION; COSTS; LABOR; INCOME; CULTIVATION SYSTEMS; TANZANIA.

Six villages in Mtwara region, 10 in Lindi, and 4 districts in the Coastal Region of Tanzania were surveyed on the cashew nut farming system, cropping patterns used, and production costs and returns. Cassava was included as a component crop of farming systems, either in pure stand or in mixed cropping patterns (70 percent intercropped), of both the uplands and lowlands of

Mtwara and Lindi, and as 1 of the main food crops intercropped with cashew nut/coconut in the Coastal Region. Costs of production and returns of the cashew nut farming systems are calculated, including yield and price estimates and labor requirements and distribution throughout the year for additional crop components. Data indicate that cassava, in pure stands or intercropped, brings good returns mainly due to the price factor (high at the moment) and the relatively small labor requirement. Data on labor requirements/ha for cassava cultivation in Mtwara-Lindi (as the dominant crop and intercropped with maize/peas and others) and the Coast (as the dominant crop and with either maize or paddy rice), and production costs and returns for a typical small farmer in both regions for the various alternative cropping patterns are given in tables. (CIAT)

1064

29379 TANZANIA. MINISTRY OF AGRICULTURE. 1986. The increasing importance of cassava in Tanzania. Tanzania, 2p. En.

CASSAVA; STATISTICAL DATA; PRODUCTION; TANZANIA.

The increasing importance of cassava in Tanzania is discussed and demonstrated. Total cassava production increased 34 percent from an av. production of 1,266,000 t in 1975/76-1976/77 to an av. production of 1,930,000 t in 1984/85-1985/86. In the 5 regions where cassava is the major crop (Coast, Mwanza, Mtwara, Morogoro, and Tanga), percent changes in cassava production were compared with those of the 2nd major crop in each region for the period 1975/77- 1983/84. There were high positive percentage increases in cassava production in all regions (76, 52, 70, and 36 percent in Coast, Mtwara, Morogoro, and Tanga, resp.) except in Mwanza (-36 percent). Percentage increases in cassava production in 20 regions of Tanzania are also given for the periods 1975/76-1976/77 and 1982/83-1983/84, showing an av. increase for all regions of 34 percent. (CIAT)

1065

30055 TANZANIA. MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT. 1985. Price policy recommendations for the 1985 agricultural price review. v.2. Sorghum, millet, cassava and beans (prices for 1986/87 marketing season). Dar es Salaam, Marketing Development Bureau. 47p. En., Sum. En., Il.

CASSAVA; CASSAVA PRODUCTS; CASSAVA ROOTS (VEGETABLE); CASSAVA FLOUR; PRODUCTION; ECONOMICS; MARKETING; CONSUMPTION; COSTS; PRICES; STATISTICAL DATA; MAPS; TANZANIA.

Past trends and the current situation of production, consumption, production and marketing costs, sales and price figures in Tanzania are analyzed for cassava, sorghum, millet, and beans, and price policy recommendations are made for the period 1986-87. The official producer prices for drought staples in 1986-87 were estimated to be 10 percent above the 1985-86 prices, representing a decline in real price of over 24 percent (35 percent inflation rate). CF price is estimated to rise by 43 percent in nominal terms. Cassava production costs and returns are given for both the traditional and the improved smallholders for the 1984-85 and 1985- 86 production years and the corresponding 1985-86 and 1986-87 marketing years, resp. Monthly sales of CF and cassava roots during 1984-85 are also recorded as well as marketing costs of cassava during 1985-86. (CIAT)

1066

29489 TANZANIA. MINISTRY OF AGRICULTURE. DISTRICT AGRICULTURE OFFICERS. 1986. Cassava area and production by district. Estimates. 4p. En., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; TANZANIA.

Cassava area and production estimates are tabulated per district (76 in total) in 17 regions of Tanzania for the periods 1983/84, 1984/85, and 1985/86. (CIAT)

1067

29317 TANZANIA. MINISTRY OF FINANCE AND PLANNING. BUREAU OF STATISTICS. 1979. Planted area by crops and size of holding. In Tanzania. Ministry of Finance and Planning. Bureau of Statistics. Agricultural census of Tanzania 1971/72. Peasant farming. Dar es Salaam, v.1,pp.1-28,60-65,69-71,73,87, 90,94,99,104,115,117,121,124,126,130,133, 139,144,149,152-153,155, 158-159,162,167-168,176-177,179,182,184,467. En., 7 Ref., Dat.num.

CASSAVA; STATISTICAL DATA; INTERCROPPING; FARM SIZE; PRODUCTION; TANZANIA.

The methodology used to collect and analyze the agricultural census data of Tanzania in 1971/72 is described. Data are given on planted area and no. of holdings for all main crops and mixtures on a per size of holding basis and per region. When applicable, data for cassava is disaggregated for cassava as major crop and cassava in mixed cropping systems with banana, beans, cashew nuts, coconut, coffee, millet, groundnuts, paddy, palm nuts, sorghum, sweet potatoes, bambara, cotton, oranges, peas, maize, yams, and simsim. Regions included are Coast, Kigoma, Kilimanjaro, Mara, Mbeya, Mtwara/Lindi, Mwanza, Ruvuma, Shinyanga, Singida, Tabora, Tanga, West Lake, and Tanzania Mainland. Estimated av. dry cassava yield in a total area of 9728 ha was 2720 kg/ha. (CIAT)

1068

29436 JENNINGS, D.L. 1957. Studies on the mosaic virus of cassava. Record of research 1956 to 1957. In East African Agriculture and Forestry Research Organization. Annual Report 1957. Tanzania, pp.44-46. En., 2 Ref.

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; SYMPTOMATOLOGY; KENYA; TANZANIA .

Progress in CAMD research in East Africa in 1956-57 is reported. The appearance of CAMD symptoms in more highly resistant cassava types was found to be influenced by environment. Symptomless plants were also found to be carriers of the virus. Tip plucking from growing branches or pruning such branches were found to be practices that can result in CAMD symptom appearance in young leaves of plants that were previously symptom-free. CAMD was shown to be not fully systemic in the host; resistance appears to be, at least in part, an ability to move the virus rapidly to parts of the plant where it can do no harm to the host. (CIAT)

1069

29330 KAJUMULO, D.A. 1986. Report on informal market prices of cassava from the crop monitoring and early warning unit, Nov. 1985-Nov. 1986. Dar es Salaam, Tanzania, Food and Agriculture Organization of the United Nations. 4p. En., Il. (P.O. Box 5384, Dar es Salaam, Tanzania)

CASSAVA; STATISTICAL DATA; MAPS; CASSAVA CHIPS; PRICES; TANZANIA.

Rural prices for cassava chips in 19 regions of Tanzania are given on a monthly basis from Nov. 1985 to Nov. 1986. Prices were about 3 percent higher in 1986. A map of the country showing the distribution of cassava chip prices up to Nov. 26, 1986, is also included. (CIAT)

1070

31679 KYOMO, M.L.; KESWANI, C.L. 1987. Structure and distribution of land and corresponding yields of field food crops in Eastern and Southern Africa. In Holmes, J.C., ed. Improving food crop production on small farms in

Africa. Rome, Food and Agriculture Organization of the United Nations. pp.54-69. En., Sum. En., 15 Ref.

CASSAVA; LAND USE; FARM SIZE; PRODUCTION; TANZANIA; ANGOLA.

The different types of farm holdings in Eastern and Southern Africa are described. Emphasis is given to 9 Southern African Development Coordination Conference countries: Angola, Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Zambia, and Zimbabwe. Data on yields of main food crops and other selected characteristics are presented for each country. Production data for cassava as a major staple per type of farming unit are given for Angola (1981) and Tanzania (1983/84); data on area planted and yields are also included for Tanzania. (CIAT)

1071

20309 LUNAN, M. 1950. Mound cultivation in Ufipa, Tanganyika. East African Agricultural Journal October 1950:88-89. En., Il.

CASSAVA; CULTIVATION; INTERCROPPING; ROTATIONAL CROPS; TANZANIA .

The traditional mound cultivation system used in Ufipa district, Tanganyika, is described. Cassava is sometimes used as a component of crop rotations/intercrops in mound cultivation. When planted, it is always placed at the base of the mounds and left in the field when the mound is broken down, so that it continues to grow among the finger millet and maize. (CIAT)

1072

26854 MAEDA, E.E. 1985. EFFECT OF SOLAR DEHYDRATION ON AMINO ACID PATTERN AND AVAILABLE LYSINE CONTENT IN FOUR TROPICAL LEAFY VEGETABLES. ECOLOGY OF FOOD AND NUTRITION 16(3):273-279. EN., SUM. EN., 26 REF. (FACULTY OF AGRICULTURE, FORESTRY & VETERINARY SCIENCE, UNIV. OF DAR ES SALAAM, MOROGORO, TANZANIA)

CASSAVA; SOLAR DRYING; LEAVES; PROTEIN CONTENT; AMINO ACIDS; TANZANIA.

WHEN FRESH TROPICAL LEAFY VEGETABLES (AMARANTHUS SP., COWPEA, SWEET POTATO, CASSAVA) WERE SUN-DRIED, THERE WERE INCREASES IN ASPARTIC ACID, GLUTAMIC ACID, VALINE, LEUCINE, AND ISOLEUCINE CONTENT AND DECREASES IN LYSINE AND HISTIDINE, INDICATING COMPLEX INTERACTIONS INVOLVING THE N-BEARING COMPOUNDS, PARTICULARLY THE AMINO ACIDS. DRIED AMARANTHUS LEAVES WERE RICH IN ALL THE ESSENTIAL AMINO ACIDS. DRIED COWPEA, CASSAVA, AND SWEET POTATO LEAVES WERE ALSO RICH IN ESSENTIAL AMINO ACIDS, EXCEPT THE S AMINO ACIDS. (AS)

1073

29320 MAKEME, M.; SAID, M.R. 1984. Cassava production in Zanzibar. In Greathead, A.H.; Markham, R.H.; Murphy, R.J.; Murphy, S.T.; Robertson, I.A.D., eds. Integrated pest management of cassava green mite; regional training workshop in East Africa, 1984. Proceedings. Ascot, United Kingdom, Commonwealth Institute of Biological Control. pp.107-111. En., Sum. En., 3 Ref.

CASSAVA; PRODUCTION; STATISTICAL DATA; CASSAVA AFRICAN MOSAIC VIRUS; PRODUCTIVITY; MONONYCHELLUS TANAJOA; TANZANIA.

Cassava cultivation in Zanzibar is described. Serious problems affecting the crop include CAMD and the cassava green mite (Mononychellus tanajoa). Lack of sweetness in the improved var. and low yield potential of the local var. (which are sweet) contribute to the poor development of the crop in the isles. The inability of the peasants to follow recommended agronomic

practices such as the use of clean planting material serves as a major hindrance to the development of the cassava industry in Zanzibar. (AS)

1074

28112 MAKUNDI, R.H. 1986. THE TOXICITY OF DELTAMETHRIN AND CYFLUTHRIN TO THE LARGER GRAIN BORER, PROSTEPHANUS TRUNCATUS (HORN) (COLEOPTERA:BOSTRYCHIDAE). INTERNATIONAL PEST CONTROL 28(3):79-81. EN., SUM. FN., 9 REF., IL. (LARGER GRAIN BORER CONTROL PROJECT, MINISTRY OF AGRICULTURE, P.O. BOX 9192, DAR-ES-SALAAM, TANZANIA)

CASSAVA; PROSTEPHANUS TRUNCATUS; INSECTICIDES; STORAGE; INSECT CONTROL; TANZANIA.

AN OUTBREAK OF PROSTEPHANUS TRUNCATUS, A SERIOUS PEST OF STORED MAIZE ANDDRIED CASSAVA, WAS REPORTED IN TANZANIA ABOUT 3 YR AGO. LAB. RESULTS ON THE EFFICIENCY OF 2 SYNTHETIC PYRETHROIDS, DELTAMETHRIN AND CYFLUTHRIN, AGAINST P. TRUNCATUS ARE PRESENTED. DELTAMETHRIN (LD50 = 0.0063 MICROGRAM/INSECT) WASMORE TOXIC THAN CYFLUTHRIN (LD50 = 0.00217 MICROGRAM/INSECT) BY TOPICAL APPLICATION. THE 2 PYRETHROIDS WERE SIMILARLY SYNERGIZED AT THE 1:5 RATIO BY TOPICAL APPLICATION, AND THE DOSAGES LEADING TO 100 PERCENT MORTALITY OF ADULT P. TRUNCATUS WERE CONSIDERABLY REDUCED BY PIPERONYL BUTOXIDE AT 1:10 RATIO. EVALUATION OF DELTAMETHRIN AND CYFLUTHRIN DUSTS OVER A 4-WK. PERIOD HAS INDICATED THEIR POSSIBLE POTENTIAL FOR FUTURE CONTROL APPLICATION. (AS)

1075

30056 MSABAHA, M.A.M. 1980. A review of cassava research in Tanzania . Mwanza, Tanzania, Agricultural Research Institute. 19p. En., Sum. En., 30 Ref., Il.

CASSAVA; GERMPLASM; CULTIVARS; ROOT PRODUCTIVITY; PLANTING; SPACING; WEEDING; INTERCROPPING; MAIZE; GROUNINUT; COWPEA; INCOME; CASSAVA PROGRAMS; RESEARCH; TANZANIA.

Local and introduced var. have been assembled at Ukiriguru, Naliendele, and Uyole (Tanzania) for evaluations on high tuberous root yield/unit area and resistance to pests and diseases. Selected high yielding var. were evaluated over seasons and locations around Lake Victoria; Mzimbitala and Liongo performed best in tuberous root yield/unit area (41.5 and 30.7 t/ha, resp.). Var. having field resistance to both CAMD and cassava brown leaf spot were selected in Naliendele. Selections made at Ukiriguru were mostly for resistance to green cassava mites. Five local var. (Mzimbitala, Njema, Dalama, Kanyanzige, and Kongolo) were recommended as mite resistant. Host nonpreference and antibiosis were postulated as mechanisms of resistance to green cassava mites. Tuberous root yield losses of 50-80 percent caused by green cassava mite infestations can be prevented, using mite-resistant var. Limited planting materials of mite-resistant var. are multiplied in Ukiriguru and distributed free. The acceptability of the mite- resistant var. to farmers is yet to be known; however, it is certain that some mite-resistant var. are poor in tuberous root yield and flowering. Hybridization programs for plant breeding may be developed eventually, provided flowering is not a limiting factor. The recommended spacing for monocropping cassava in areas around Lake Victoria is 75 cm within ridges 150 cm wide. The best spacings in Morogoro varied from 68 to 81 cm, depending on the var., grown on ridges 90 cm wide. Consecutive weedings 4, 10, and 16 wk. after planting in monocropped cassava were neeessary for better tuberous root yield/unit area in Ukiriguru. Intercropping cassava with groundnuts has the potential to give good cash returns/unit area. Cassava products can be used in formulating rations for broilers, layers, and dairy cows. Properly formulated cassava-based diets did not limit palatability or feed conversion efficiency; however, broiler ducks did not

respond well to cassava- based diets. Fermentation in water for 7 days was the most efficient method of reducing prussic acid content in cassava products. (AS (extract))

1076

29319 MSABAHA, M.A.M. 1984. Cassava production and constraints in mainland Tanzania. In Greathead, A.H.; Markham, R.H.; Murphy, R.J.; Murphy, S.T.; Robertson, I.A.D., eds. Integrated pest management of cassava green mite; regional training workshop in East Africa, 1984. Proceedings. Ascot, United Kingdom, Commonwealth Institute of Biological Control. pp.101-105. En., Sum. En., 11 Ref.

CASSAVA; MONONYCHELLUS TANAJOA; PLANT INJURIES; CASSAVA AFRICAN MOSAIC VIRUS; RESISTANCE; CULTIVARS; ROOT PRODUCTIVITY; TANZANIA.

Different aspects of cassava production, an important drought-resistant staple in mainland Tanzania, are discussed. Major constraints include CAMD, green mites, use of poor planting materials, and poor agronomic practices. Promising local var. with resistance to CAMD and green mites, yielding from 19 to 42 t/ha/yr, have been selected. Interspecific hybrids released 40 yr ago have shown an erosion of resistance to CAMD. An interdisciplinary approach is suggested to develop an integrated pest control (host plant resistance, improved agronomic practices, and biological control). (AS)

1077

30058 MSABAHA, M.A.M.; KEPAKEPA, V.M.; LASWAI, H.S.M. 1986. Cassava production and consumption in the United Republic of Tanzania. Dar es Salaam, Agricultural Research Institute. 74p. En., Sum. En., Il. Paper presented at the UNICEF/IITA Meeting,Morogoro, Tanzania, 1986.

CASSAVA; CULTIVATION; INTERCROPPING; CULTIVARS; PRODUCTION; ROOT PRODUCTIVITY; PRODUCTIVITY; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BROWN STREAK VIRUS; MONONYCHELLUS TANAJOA; PLANT BREEDING; ECONOMICS; COSTS; FOOD SECURITY; MAPS; MARKETING; CONSUMPTION; HUMAN NUTRITION; WOMEN; PROCESSING; BOILING; ROASTING; FRYING; FERMENTATION; FOOD PRODUCTS; CASSAVA STARCH; CASSAVA FLOUR; CASSAVA CHIPS; UGALI; STORAGE; USES; ANIMAL NUTRITION; SOCIOECONOMIC ASPECTS; STATISTICAL DATA; TANZANIA.

The role of cassava in food security policies, and the different production and consumption practices of the crop in Tanzania are discussed. Grown mainly in drought-stricken areas around Lake Victoria, Lake Tanganyika, and on the coasts, cassava contributes about 27.1 percent of total energy required daily in the country and is the 4th preferred staple. Major constraints to cassava production include the lack of improved var., the existence of few multiplication centers, CAMD, cassava green mites, and the lack of appropriate cultural practices. Cassava can help alleviate hunger as an inexpensive energy source, especially in households with poor resources. Cassava is mainly boiled, roasted, or fried for eating as snacks, or dried and pounded to render flour for making ugali as a staple dish. Lake zones in the country mainly follow the dry processing methods, while cassava is wet processed only in few regions letting it ferment before drying. Often this flour is mixed with bananas to prepare local bread. Industrial production of cassava starch has already been initiated, and cassava is also being used as a livestock feed. The sale of cassava chips and flour is marketed through a special institution, while cassava leaves and boiled or fried cassava are mainly marketed by women. Cassava is used as a traditional weaning food in certain parts of the country. Only limited cases of HCN toxicity by cassava have been reported. (CIAT)

1078

30057 MSABAHA, M.A.M. 1984. Cassava research, 1982/1983. Mwanza, Tanzania, Agricultural Research Institute. 6p. En., Paper presented at Root Crop Co-ordinating Committee Meeting, Ukiriguro, 1984.

CASSAVA; CULTIVARS; SELECTION; RESISTANCE; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BACTERIAL BLIGHT; MONONYCHELLUS TANAJOA; ROOT PRODUCTIVITY; TANZANIA.

The results of a cassava var. trial with 70 var. harvested at Ukiriguru, Tanzania, in early 1984 are presented. All var. were rated 1 (no visible symptoms) on a 1-5 scale for CAMD and CBB, and 1 on a 0-5 scale for Mononychellus tanajoa infestation; there was no significant differences among var. in resistance to any of the pests. Regarding plant height, 2.8, 45.7, 45.7, and 5.7 percent of the materials were classified into the 0-1.00, 1.00-1.49, 1.50-1.99, and 2.00-2.49 m groups, resp. Regarding branching pattern, 20.0, 38.6, and 41.4 percent of the materials showed tertiary, primary, and secondary branches, resp. Most var. flowered 4 mo. after planting (May). Seventeen cassava var. outyielded the control var. Liongo (12.1 t/ha), the highest fresh root yield being for var. Kibumba (18.0 t/ha) followed by Mganda (16.9 t/ha) and Pesai (15.5 t/ha). Yields and other characteristics (root no./plant, root size, and taste) are given for these 17 cassava var. and the control Liongo. Significant differences in no. of shoots and top wt. were recorded between var. Sixteen var. outyielded the control var. Liongo (13.9 t/ha), the highest being for var. Rwabihoye (19.4 t/ha) followed by Mzimbitala and U-CVA-21 (18.7 t/ha each). Fresh top yields and no. of shoots/plant are given for these 16 materials and the control Liongo. (CIAT)

1079

29322 MSABAHA, M.A.M.; NDIBAZA, R. 1985. Cassava Research Progress Report 1984-1985. Mwanza, Tanzania Agricultural Research Organization. 44p. En., Il. Paper presented at the Root and Tuber Crops Coordinating Committee, 1985.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; SELECTION; RESISTANCE; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BACTERIAL BLIGHT; MONONYCHELLUS TANAJOA; PEST CONTROL; INTERCROPPING; PLANTING; SPACING; INCOME; ECONOMICS; ROOT PRODUCTIVITY; SHOOTS; TANZANIA.

Results of cassava trials harvested in the 1984/85 season by the Root and Tuber Crop Research Programme in Ukiriguru, Tanzania, are reported. Out of 151 entries in the germplasm bank, 32 yielded more than the control var. Liongo (9.4 t/ha). In the intermediate yield trial, 18 var. were selected for root yields equal to or higher than those of the control var. Liongo (9.1 t/ha). In the uniform yield trial conducted at 2 ecologically distinct sites (Ukiriguru and Naliendele), 10 var. were evaluated for root and shoot yields, reaction to diseases (CAMD and CBB) and pests (Mononychellus tanajoa), plant establishment and plant height; significant interactions of var. and sites were found for root yields and resistance to CAMD and M. tanajoa. The performance of cassava (C) var. Liongo and Aipin Valenca was evaluated in an intercropping trial with cereals (maize (M) and/or sorghum (S)), cowpeas (CP), and sweet potato (SP) in single, 2, or 3 crop combinations using different cropping patterns. Gross returns and LER were higher for selected intercropping systems including C + M + SP, C + CP + M + SP, C + M, C + S + M + SP, C + CP, C + CP + S, C + CP + M, and C + CP + M + S, which will be further evaluated. Important characteristics (maturity, root yields, taste, plant height, and resistance to CAMD, CBB, and M. tanajoa) of var. Ali Mtumba, Liongo, Aipin Valenca, Liongo Kwimba, and Msitu Zanzibar, multiplied for distribution to farmers, are given. M. tanajoa infestations and between and within plant distribution were recorded for

cassava var. Mzimbitala (resistant), Aipin Valenca and Ali Mtumba (moderately resistant), and Liongo (susceptible). (CIAT)

1080

29323 MSABAHA, M.A.M.; NDIBAZA, R; MTAMBO, K. 1986. Cassava Research Progress Report 1985-1986. Mwanza, Tanzania Agricultural Research Organization. 40p. En., Il. Paper presented at the Root and Tuber Crops ResearchCoordinating Committee, Mwanza, Tanzania, 1986.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; SELECTION; HARVEST INDEX; BRANCHING; STEMS; RESISTANCE; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BACTERIAL BLIGHT; MONONYCHELLUS TANAJOA; INTERCROPPING; ECONOMICS; FERTILIZERS; N; P; K; ROOT PRODUCTIVITY; SHOOTS; PALATABILITY; INCOME; CASSAVA LEAVES (VEGETABLE); HARVESTING; TIMING; TANZANIA.

Results of cassava trials harvested in the 1985/86 season by the Root and Tuber Crop Research Programme in Ukiriguru, Tanzania, are reported. In the preliminary yield trial, 46 var. were selected for root yields higher than those of control var. Liongo-C (5.4 kg/plot). In the intermediate yield trial, 24 out of 40 var. were selected for root yields ranging between 7.7-13.8 t/ha, and 20 for high shoot yields (9.0-17.4 t/ha). Yields of 18 var. included in the advanced yield trial are also given. In the uniform yield trial conducted at 4 ecologically distinct sites (Ukiriguru, Naliendele, Tumbi, and Chambezi), 12 var. were evaluated for root yields, reaction to CAMD and Mononychellus tanajoa, plant establishment, and DM (percentage). The performance of cassava (C) var. Liongo and Aipin Valenca was evaluated for the 2nd time in an intercropping trial with cereals (maize (M) and/or sorghum (S)), cowpeas (CP), and sweet potato (SP) in single-, 2-, or 3 crop combinations using different cropping patterns. Gross returns and LER (1.49-2.42) were higher for selected intercropping systems including C + SP, C + S + SP, C + CP + SP, C + M + SP, C + M + S + SP (the latter 2 selected in 1983/84), C + CP + S + SP, C + S + M, and C + CP + M + S, which will be further evaluated. The effect of harvesting leaves (0, 1-, 2-, 3-, and 4-mo. intervals) on shoot and root yields was evaluated using cassava var. Liongo and Aipin Valenca. The former var. yielded more leaves than the latter and the 1-mo. plucking interval gave the highest leaf yields but also reduced root yields by 45.2 percent. Preliminary results of a fertilization trial conducted in Nyanghomango showed no significant response of cassava root yields to NPK (20-10-10 kg/ha, resp.). (CIAT)

1081

29318 MSABAHA, M.A.M. 1982. REVIEW OF NATIONAL ROOT AND TUBER CROPS IMPROVEMENT. TANZANIA, TANZANIA AGRICULTURAL RESEARCH ORGANIZATION. 6P. EN., 11 REF.

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; CULTIVARS; MONONYCHELLUS TANAJOA; PRODUCTION; INTERCROPPING; POULTRY; FEEDS AND FEEDING; TANZANIA.

HIGHLIGHTS OF RESEARCH ON POTATO, CASSAVA, AND SWEET POTATO IN TANZANIA ARE REVIEWED. THE PROGRAM CONTINUED PURSUING A CASSAVA VAR. WITH RESISTANCE TO CAMD, ONE OF THE MAJOR CASSAVA PRODUCTION CONSTRAINTS IN THE COUNTRY. LOCAL CASSAVA VAR. MZIMBITALA, KANYANZIGE, NJEMA, KONGOLO, AND DALAMA WERE SELECTED FOR RESISTANCE TO MONONYCHELLUS TANAJOA, BUT WERE POOR IN ROOT YIELD, SUSCEPTIBLE TO CAMD, OR SHOWED POOR FLOWERING. IN UKIRIGURU, CASSAVA SHOULD BE PLANTED IN NOV.-DEC. AT 0.75 X 1.50 M SPACING; 4 WEEDINGS AT MONTHLY INTERVALS, BEGINNING THE 1ST MO., ARE RECOMMENDED. CASSAVA/MAIZE AND CASSAVA/GROUNDNUT INTERCROPS SHOWED FAVORABLE IMPROVED ROOT YIELD AND GROSS ECONOMIC RETURNS. HIGHER WT. GAINS AND FOOD CONVERSION EFFICIENCY WAS OBTAINED IN BROILERS WHEN FED WITH A MEAL CONTAINING CASSAVA ROOTS FERMENTED IN WATER FOR 7 DAYS, WHICH REDUCED HCN CONTENT. RECOMMENDATIONS ON FUTURE RESEARCH ARE GIVEN. (CIAT)

1082

28115 PRESTON, S.R.; TAYLOR, B.R.; SIMONS, J.H. 1986. THE CHOICE OF GROUNDNUT (ARACHIS HYPOGAEA) VARIETIES BY SMALLHOLDERS IN SOUTH-EAST TANZANIA. 2. VARIETY X SPACING AND VARIETY X SOWING DATE INTERACTIONS. EXPERIMENTAL AGRICULTURE 22(3):279-287. EN., SUM. EN., ES., 14 REF., IL. (14 TARRAWAY ROAD, PAIGNTON, TQ3 2DU, ENGLAND)

CASSAVA; INTERCPOPPING; GROUNDNUT; PRODUCTIVITY; TECHNOLOGY TRANSFER; TANZANIA.

IN A SERIES OF VAR. X SPACING AND VAR. X SOWING DATE TRIALS CARRIED OUT IN SE TANZANIA, GROUNDNUT-CASSAVA INTERCROPPING WAS EVALUATED OVER 2 SEASONS.GROUNDNUT AND CASSAVA WERE SOWN IN ALTERNATE ROWS (1982) AND IN SINGLE AND DOUBLE ROWS BETWEEN THE CASSAVA ROWS (1983). ALTERNATE CASSAVA PLANTS WERE HARVESTED AT THE END OF THE DRY SEASON OF 1982, LEAVING A STAGGERED FORMATIONIN ALTERNATE ROWS; THE REMAINING PLANTS WERE HARVESTED AFTER THE GROUNDNUTS IN 1983. GROUNDNUT YIELDS WERE CONSISTENTLY LOWER WHEN INTERCROPPED WITH CASSAVA DUE TO THE SHADE PRODUCED. THERE WAS NO EVIDENCE THAT HYPOGAEA FORMS ARE BETTER ADAPTED THAN NATAL COMMON TO MIXED CROPPING WITH CASSAVA. (CIAT)

1083

29308 ROUNCE, N.V. 1949. CASSAVA. IN--------. THE AGRICULTURE OF THE CULTIVATION STEPPE OF THE LAKE, WESTERN AND CENTRAL PROVINCES. TANGANYIKA, TANZANIA, LONGMANS. PP.77-81. EN., IL.

CASSAVA; CASSAVA PROGRAMS; PRODUCTION; CASSAVA MOSAIC VIRUS; ADAPTATION; CULTIVATION SYSTEMS; SOIL FERTILITY; FERTILIZATION; TANZANIA.

GENERAL ASPECTS OF CASSAVA CULTIVATION IN TANGANYIKA (NOW TANZANIA) ARE BRIEFLY DESCRIBED. THESE COVER ITS PLACE IN NATIVE AGRICULTURE, SOILS, CULTIVATION METHODS, YIELDS AND RESPONSE TO MANURING, AND DISEASES. SUGGESTIONS FOR CONTROLLING MOSAIC DISEASES (SEVERE MOSAIC, MILD MOSAIC, AND BROWN STREAK) INCLUDE: THE USE OF DISEASE-FREE PLANTING MATERIAL; THE USE OF CASSAVA VAR. WITH LEAVES THAT ARE UNSUITABLE AS A VEGETABLE; PLANTING ON BETTER SOILS AND MANURING; AND PLANTING MOSAIC-TOLERANT VAR. (CIAT)

1084

31681 SHAO, F.M. 1987. The role of the small farming sector in food crops production in Tanzania. In Holmes, J.C., ed. Improving food crop production on small farms in Africa. Rome, Food and Agriculture Organization of the United Nations. pp.146-155. En., Sum. En., 18 Ref.

CASSAVA; PRODUCTION; PRODUCTIVITY; FARMING SYSTEMS; SOCIOECONOMIC ASPECTS; STATISTICAL DATA; CASSAVA AFRICAN MOSAIC VIRUS; MONONYCHELLUS TANAJOA; TANZANIA.

The small farming sector of Tanzania, which accounts for 80 percent of the total food crops production on approx. 4 percent of the total land area, is described. Major production constraints are identified and future improvement strategies are recommended for the sector. Cassava is identified as 1 of the major food crops grown by the small farming sector. CAMD and Mononychellus tanajoa are specific biological factors limiting cassava production, in addition to others which apply to all crops such as unreliable and/or poor rainfall distribution, failure of farmers to adapt to changing environmental conditions and to adopt new technologies, low prices, lack of irrigation facilities, insufficient selection of suitable var., large postharvest losses, poor research-extension-farmer linkages, poor extension services, and poor supply of inputs. (CIAT)cat J00

1085

29306 STOREY, H.H. 1941. Plant pathology: cassava. In East African Agricultural Research Station Amani. Annual Report 1941. Tanzania, pp.7-8. En.

CASSAVA; ETIOLOGY; DISEASE TRANSMISSION; GRAFTING; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BROWN STREAK VIRUS; CROSSBREEDING; MANIHOT GLAZIOVII; MANIHOT DICHOTOMA; TANZANIA.

Results of cassava plant pathology activities in Amani, Tanzania, in 1941 are summarized; testing of materials for resistance to viruses (CAMD and brown streak virus) and breeding of new types were emphasized. Of 108 introduced var., very few exhibited resistance comparable with that of local var. and the majority were discarded. Of the cassava x cassava crosses, a few appeared to be more resistant to CAMD, brown streak virus, or both than any local var. Manihot glaziovii x cassava hybrids showed high field resistance to both viruses, although most were fully susceptible to infection by grafting. All the Manihot dichotoma x cassava hybrids but 1 resisted CAMD by grafting and by field infection, and only a few were susceptible to the brown streak virus. Based on studies with colchicine-treated plants, M. dichotoma hybrids proved to be not entirely sterile, as previously reported. The identity of the brown streak virus vector cannot yet be confirmed. (CIAT)

1086

29305 STOREY, H.H. 1938. Virus diseases of cassava. In East African Agricultural Research Station Amani. Annual Report 1938. Tanzania, pp.16-18. En.

CASSAVA; ETIOLOGY; EPIDEMIOLOGY; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BROWN STREAK VIRUS; VECTORS; BEMISIA; CROSSBREEDING; MANIHOT GLAZIOVII; MANIHOT DICHOTOMA; TANZANIA.

Research activities conducted in Amani, Tanzania, in 1938 regarding cassava virus diseases are briefly reported. Results of studies conducted on local strains of the CAMV and disease transmission by Bemisia sp. were published. No progress was made in the search for a vector of the cassava brown streak virus, and its form of transmission is still unknown. A marked seasonal difference in the CAMD infection rate was demonstrated over 2 successive years; plantings made in June (cool season) and, to a lesser extent, in May, July, and Aug., remained largely disease-free for the longest time, while those made from Dec. to April were mostly diseased within 3 mo. Virus resistance trials were planned for 1939 with interspecific hybrids (cassava x Manihot glaziovii and cassava x M. dichotoma) and approx. 300 crosses between the more resistant cassava var. A total of 105 exotic cassava var. were introduced into the country, including a collection of 60 Brazilian var. (CIAT)

1087

29304 STOREY, H.H. 1937. VIRUS DISEASES OF PLANTS. THE MECHANISM OF TRANSMISSION BY INSECTS. IN EAST AFRICAN AGRICULTURAL RESEARCH STATION AMANI. TANZANIA. ANNUAL REPORT 1937. TANZANIA. PP.9-13. EN.

CASSAVA; DISEASES AND PATHOGENS; CASSAVA AFRICAN MOSAIC VIRUS; BEMISIA; PHENACOCCUS; DISEASE TRANSMISSION; TANZANIA.

OBSERVATIONS OF INSECT TRANSMISSION OF CASSAVA VIRUSES IN TANZANIA ARE BRIEFLY REPORTED. SUCCESSFUL TRANSMISSION OF BOTH SEVERE AND MILD STRAINS OF CAMV BY WHITEFLIES (BEMISIA GOSSYPIPERDA AND B. NIGERIENSIS) WAS OBSERVED ONLY IF INSECTS FED ON YOUNG LEAVES THAT HAD NOT FULLY EXPANDED. THE VECTOR

OF THE BROWN STREAK VIRUS REMAINS TO BE FOUND; WHITEFLIES AND MEALYBUGS FAILED TO TRANSMIT THE DISEASE. (CIAT)

1088

26830 TERI, J.M.; KESWANI, C.L. 1985. NEW RECORDS OF PLANT DISEASES AND PATHOGENS IN TANZANIA. EAST AFRICAN AGRICULTURAL AND FORESTRY JOURNAL 46(1-4):97-99. EN., 4 REF. (DEPT. OF CROP SCIENCE, UNIV. OF DAR ES SALAAM, P.O. BOX 643, MOROGORO, TANZANIA)

CASSAVA; PERICONIA MANIHOTICOLA; MYCOSES; TANZANIA.

THE OCCURRENCE OF SOME PLANT PARASITIC FUNGI AND AN ALGA IN TANZANIA IS REPORTED. NEW RECORDS OBTAINED SINCE 1980 INCLUDE PERICONIA MANIHOTICOLA, WHICH CAUSES LEAF SPOT ON CASSAVA AND ON MANIHOT GLAZIOVII. (CIAT)

1089

29561 WARREN, A. 1986. Geographical distribution of cassava in the farming systems of Tanzania. United Kingdom, 6p. En.

CASSAVA; CULTIVATION; INTERCROPPING; PLANT GEOGRAPHY; TANZANIA.

The main cropping systems in which cassava is found in Tanzania are briefly described for the regions of Ruvuma, Tabora, Mara, Mwanza, Shinyanga, Kagera, Coast and Tanga, Mtwara and Lindi, Iringa, and Mbeya. (CIAT)

1090

29201 WARREN, A., comp. 1987. Tanzania, cassava marketing: price (shillings/debe) of cassava. Tanzania. En. 1 map, sc. approx. 1:4,200,000.

CASSAVA; MARKETING; PRICES; MAPS; TANZANIA.

1091

29514 WARREN, A., comp. 1987. Tanzania: distribution of cassava production. Tanzania. En. 1 map, sc. 1:2,500,000.

CASSAVA; PRODUCTION; MAPS; TANZANIA.

1092

29307 WILSON, F.B. 1944. Emergency food production in Zanzibar: cassava. East African Agricultural Journal October 1944:96-98. En., Il.

CASSAVA; STATISTICAL DATA; PRODUCTION; TANZANIA.

Problems faced by the 1942 cassava campaign launched in Zanzibar, Tanzania, especially promoting cassava var. Msitu, are discussed. Cassava is regarded in Zanzibar as the principal starchy food when rice and other grains are scarce. The aim was that 1 acre of cassava/adult male in the districts was to be planted between May and Aug.; this was attained only in few areas but approx. 0.5 acre/head was planted. Deliveries of raw cassava to the Zanzibar town market on a weekly basis for 1942 and 1943 are given; 1943 production was found to nearly double that of 1942. Food was reasonably assured in the country in 1943 due to the large areas of cassava. (CIAT)

TOGO

1093

31640 APERCUS ECONOMIQUES sur le Togo. 1. Les productions agricoles vivrieres et diverses. (Economic estimations for Togo. 1. Food crop production). Bulletin de l'Afrique Noire no.917:17909. 1977. Fr.

CASSAVA; STATISTICAL DATA; PRODUCTION; CASSAVA STARCH; TAPIOCAS; TOGO.

Statistics are presented on area planted (ha) and production (t) of the major food and industrial crops (among them cassava) in Togo for the years 1972-73, 1973-74, 1974-75, and 1975-76. Production estimates for 1980 are also given (547,600 t of cassava). Data on cassava starch and tapioca production (t) from 1966 to 1976 and from 1969 to 1976, resp., are also included. (CIAT)

1094

31641 APERCUS ECONOMIQUES sur le Togo. 2. Les productions agricoles. A. Les productions vivrieres et diverses. (Economic estimates for Togo. 2. Agricultural production. Food crops and others). Bulletin de l'Afrique Noire 1040:20073. 1980. Fr.

CASSAVA; STATISTICAL DATA; PRODUCTION; TOGO.

Statistics are presented on the evolution of food crops (among them cassava) production (t) in Togo in 1972-73, 1973-74, 1974-75, 1975-76, 1976-77, and 1977-78. Cassava is also used for industrial purposes; the cassava starch factory in Ganavé has a capacity to process 50,000 t roots to produce 7000 t starch and 4500 t tapioca. (CIAT)

1095

32268 PLAN 3e. quinquennal de développement du Togo (1976-1980). 2. Le développement rural. (Third quinquennial plan for the development of Togo (1976-1980). 2. Rural development). Bulletin de l'Afrique Noire no.874:17.055-17.058. 1976. Fr.

CASSAVA; STATISTICAL DATA; PRODUCTION; HUMAN NUTRITION; ANIMAL NUTRITION; TRADE; INDUSTRIALIZATION; TOGO.

Estimates are presented on production needs for different commodities (such as cassava) in Togo for 1985. Such needs concern local consumption (products for human nutrition, animal feeding, and industrial processing) and exports. Data on cassava production are given for 1975 as well as production expected for 1980. Finally, estimates are given on area planted and cassava production in the different regions of this country for 1980. (CIAT)

1096

31557 INSTITUT DES PLANTES A TUBERCULES. TOGO. 1983. Amélioration de la conservation et promotion de la transformation. (Conservation improvement and transformation promotion). In Institut des Plantes a Tubercules. Togo. Rapport Annuel 1983. Lomé, Togo, Ministere du Développement Rural. pp.105-110. Fr.

CASSAVA; GARI; PRODUCTIVITY; PRICES; CASSAVA ROOTS (VEGETABLE); CASSAVA CHIPS; TOGO.

Trials were carried out at Adagbé exptl. station in Togo for gari obtention from fresh cassava. An av. 80.5 kg gari were obtained from a total of 3,000 kg tubers processed which represents 6.35 percent yields. In the 2nd trial, 1 kg gari was obtained from 5 kg tubers processed accounting for 20 percent yields. Graphs are included for price evolution of gari, fresh cassava, and cassava chips in the markets of Agbadahonou, Ahanoukopé, and Agoenyivé for 1983. (CIAT)

1097

31556 INSTITUT DES PLANTES A TUBERCULES. TOGO. 1983. Amélioration des techniques culturales. (Improvement of cultural practices). In Institut des

Plantes a Tubercules. Togo. Rapport Annuel 1983. Lomé, Togo, Ministere du Développement Rural. pp.98-102. Fr.

CASSAVA; CASSAVA PROGRAMS; MECHANIZATION; COSTS; CULTIVATION; HERBICIDES; TOGO.

Studies on manual and mechanized land clearing and uprooting of cassava crops in Togo are reported. Costs of operation, no. of h and days spent, and area prepared are included. Regarding weed control, the best results were obtained when diuron (3.5 kg/ha) was sprayed 2 wk. before cassava planting. Other manual maintenance work necessary for the crop is also reported. (CIAT)

1098

31555 INSTITUT DES PLANTES A TUBERCULES. TOGO. 1983. La collection de manioc (Sotouboua). (Sotouboua's cassava collection). In Institut des Plantes a Tubercules. Togo. Rapport Annuel 1983. Lomé, Togo, Ministere du Développement Rural. pp.87-89. Fr.

CASSAVA; CASSAVA PROGRAMS; GERMPLASM; ROOT PRODUCTIVITY; PLANT ANATOMY; CULTIVARS; IDENTIFICATION; TOGO.

A table is included showing the main agronomic characteristics (cortex, peel, and flesh color; no. of tubers/plant; av. wt./plant; av. wt. of 1 tuber; no. of plants harvested; total wt. in kg; and yields in kg/ha) of the cassava collection at Sotouboua exptl. station in Togo. All var. tested yielded more than 10 t/ha; var. Bassila yielded 88.91 t/ha. (CIAT)

1099

31317 INSTITUT DES PLANTES A TUBERCULES. TOGO. 1983. Programme manioc. (Cassava program). In Institut des Plantes a Tubercules. Togo. Rapport Annuel 1982. Lomé, Togo, Ministere du Développement Rural. pp.33-52,85-90,110. Fr.

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; CULTIVARS; GERMPLASM; RESISTANCE; CASSAVA AFRICAN MOSAIC VIRUS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; GLOMERELLA CINGULATA; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; GARI; INDUSTRIALIZATION; ECONOMICS; PLANTING; COSTS; HERBICIDES; TOGO.

Research activities on cassava plant breeding conducted at the Institut des Plantes a Tubercules (Lome, Togo) in 1982 are reported. The cassava collections at the Agoenyive, Adangbé, Danyi, and Sotouboua exptl. stations were evaluated for resistance to CAMV, CBB, anthracnose, the cassava mealybug, and cassava green mites. Studies were also carried out on the improvement of cultural practices and on the promotion of cassava transformation into gari. Clones forming the cassava collection at the Agoenyive exptl. station are listed and the main agronomic characteristics of several are given. Var. of the collections of the Adangbé, Danyi, and Sotouba exptl. station are also listed including their place of origin. The performance of cassava materials regarding resistance to major diseases and pests is presented. Production costs for traditional and mechanized cassava cultivation are compared. Mechanized planting was found to reduce time about 2-fold when compared with manual planting; diuron was effective for weed control at a dose of 4 kg/ha. Results of trials to promote cassava transformation into gari are tabulated. (CIAT)

1100

31607 INSTITUT DES PLANTES A TUBERCULES. TOGO. 1982. Programme manioc. (Cassava program). In Institut des Plantes a Tubercules. Togo. Rapport Annuel 1981. Lomé, Togo, Ministere du Développement Rural. pp.8-13,15,28-29,35- 43. Fr.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; GERMPLASM; MECHANIZATION; ROTATIONAL CROPS; PHENACOCCUS MANIHOTI; RESISTANCE; GARI; PEELING; WASHING; FERMENTATION; PRESSING; GRINDING; SCREENING; BOILING; WOMEN; PRODUCTIVITY; TOGO.

Results of research on cassava conducted by the Institut des Plantes a Tubercules (Lomé, Togo) in 1980-81 are presented. Projects on plant breeding (var. collection and evaluation) and an improvement of cultural practices (mechanization and crop rotation) were carried out. An exptl. mobile unit for the transformation of cassava into gari was also tested. Var. forming the collection of the Adangbé, Danyi-Apéyémé, Sotouboua, and Agoenyivé exptl. stations are listed including their place of origin. The resistance of several var. to the cassava mealybug is also reported. Mechanization studies dealt with land preparation, planting, and cutting preparation. Finally, the different elements of the mobile unit are listed and described and its operation is explained in detail. Women's participation in the procedure is highlighted. An av. yield of 160-220 kg gari is obtained from 1 t fresh cassava; factors such as harvesting time, var., and plant age determine gari yields. (CIAT)

1101

31606 INSTITUT DES PLANTES A TUBERCULES. TOGO. 1981. Programme manioc. (Cassava program). In Institut des Plantes a Tubercules. Togo. Rapport Annuel de Synthese 1980. Lomé, Togo, Ministere du Développement Rural. pp.18- 25,35-37,39-42. Fr.

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; ROOT PRODUCTIVITY; SELECTION; PLANTING; CULTIVARS; MECHANIZATION; GARI; TOGO.

Results of research on cassava carried out by the Institut des Plantes a Tubercules in Togo during 1980 are presented. Studies dealt with plant breeding (var. collections from Adangbé and Sotouboua, multiplication and collection center in Agoenyivé), improvement of production techniques (trials on mechanization of planting in Adangbé and crop rotation in Sotouboua), and improved preservation and transformation (mechanized gari manufacturing). Highest yields were obtained with var. Goula (40,521.6 kg/ha) from the Sotouboua var. collection. In the multiplication and collection center of Agoenyivé, 3 local var. (Goula, Kataoli, and Ankra) and 1 introduced (312/524) were multiplied. Finally, the improved method for gari obtention is recommended for big plantations and cooperatives. (CIAT)

1102

31608 INSTITUT DES PLANTES A TUBERCULES. TOGO. 1980. Rapport de synthese des activités 1976-1980. (Activities Report. Synthesis 1976-80). Lomé, Togo, Ministere du Développement Rural. 48p. Fr.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; GERMPLASM; STARCH CONTENT; ROOT PRODUCTIVITY; MECHANIZATION; HERBICIDES; PRODUCTION; STATISTICAL DATA; GARI; PROCESSING; INCOME; CASSAVA CHIPS; PRICES; TAPIOCAS; TOGO.

Research on cassava conducted by the Institut des Plantes a Tubercules (Lomé, Togo) from 1976 to 1980 is summarized. Agronomic aspects (plant breeding and cultural practices), processing and conservation, and commercialization were studied. The main goal is the development of disease- and pests-resistant var. The major agronomic characteristics of clones from the Adangbé and Sotouboua exptl. stations collections are tabulated; the starch content of several of them is also included. Further trials on mechanization and chemical weed control in cassava are recommended. The importance of tuber crops in Togo is highlighted; data on production of the major food crops for the 1972-80 period are given. Results from comparisons between the traditional and improved or semi- industrial

methods for gari obtention indicated that the latter allowed larger amounts of cassava to be processed and should be recommended for industrial crops. Studies on the income-yield of the semi-industrial method are suggested. Results from trials to obtain gari and cassava chips using different var. and both methods are presented. Tables are also included with data on av. 1978 prices of cassava and its products (tapioca, chips, and gari) for the coastal and central regions of Togo. Statistics are also given on sales of cassava products for the 1977-78, 1978-79, and 1979-80 periods. (CIAT)

1103

31554 INSTITUT DES PLANTES A TUBERCULES. TOGO. 1983. Travaux d'amélioration du matériel végétal dans la région des plateaux . (Plant breeding in the plateau region). In Institut des Plantes a Tubercules. Togo. Rapport Annuel 1983. Lomé, Togo, Ministere du Développement Rural. pp.70-74. Fr.

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; GERMPLASM; CULTIVARS; IDENTIFICATION; PHENACOCCUS MANIHOTI; RESISTANCE; TOGO.

Cassava var. Atihé, Dokpodoe, Domedje, and Nakoko (or Danyime) were used for exptl. plantings in Dayi's Plateau, Togo. The 9 var. forming the collection at Danyi exptl. station are listed including their place of origin. Except for local var., clone Abidjan seemed to be well adapted to Danyi conditions. Attacks of the cassava mealybug were reported in the whole region. In exptl. plantings at Notsé exptl. station, attacks of the cassava mealybug were also observed. A table is included showing the major agronomic characteristics (cycle, flavor, plant architecture, and petiole color) of the cassava collection. (CIAT)

1104

31553 INSTITUT DES PLANTES A TUBERCULES. TOGO. 1983. Travaux d'amélioration du matériel végétal dans la région maritime. (Plant breeding in the coastal region). In Institut des Plantes a Tubercules. Togo. Rapport Annuel 1983. Lomé, Togo, Ministere du Développement Rural. pp.64-65. Fr.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; GERMPLASM; ZONOCERUS VARIEGATUS; RESISTANCE; TOGO.

The 12 cassava var. forming the Adangbe exptl. station collection in Togo are listed including place of origin. At Togodo exptl. station, the introduced var. Fétonégbodji showed good plant development, abundant foliage, and disease resistance; however, a light attack of Zonocerus variegatus was observed. (CIAT)

1105

31614 INSTITUT NATIONAL DES PLANTES A TUBERCULES. TOGO. 1985. Lutte biologique contre la cochenille farineuse du manioc. (Biological control of the cassava mealybug). In Institut National des Plantes a Tubercules. Togo. Rapport Annuel 1984. Lomé, Togo, Ministere du Développement Rural. pp.27-31. Fr.

CASSAVA; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; INSECT BIOLOGY; PEST DAMAGE; TOGO.

The economic importance of Phenacoccus manihoti in cassava crops of Togo is highlighted. General morphological and biological characteristics of the pest are briefly described. Factors favoring its dissemination are also mentioned as well as injuries caused to the plant. In 1984 the Institut National des Plantes a Tubercules (Togo) carried out a cooperative study with the International Institute of Tropical Agriculture (Nigeria) to study the effectivity of 2 natural enemies (Diomus spp. and Epidinocarsis lopezi)

in controlling the cassava mealybug. Both species were released in the localities of Gligji, Bokokipé, Koaouka, Kamina, and Sokodé. Diomus spp. failed to establish whereas E. lopezi established well. A decrease in the population of cassava mealybug was observed; other local predators (Exochomus spp. and Hyperaspis senegalensis) were identified. (CIAT)

1106

31612 INSTITUT NATIONAL DES PLANTES A TUBERCULES. TOGO. 1985. Manioc: amélioration des techniques culturales. (Cassava: improvement of cultural practices). In Institut National des Plantes a Tubercules. Togo. Rapport Annuel 1984. Lomé, Togo, Ministere du Développement Rural. pp.13-16. Fr.

CASSAVA; LAND PREPARATION; COSTS; INTERCROPPING; ROOT PRODUCTIVITY; TOGO.

Research on land preparation and associated crops (cassava- cowpea) were conducted in Togodo (Togo) in 1984. Costs were reduced when a rake was used for land cleaning, followed by mechanical tillage. No competition was observed when cassava was planted with cowpea. Results from trials carried out in Sotouboua to compare mechanical and manual planting of cassava showed the best emergence when the 1st practice was used. (CIAT)

1107

31611 INSTITUT NATIONAL DES PLANTES A TUBERCULES. TOGO. 1985. Manioc: amélioration variétale. (Cassava plant breeding). In Institut National des Plantes a Tubercules. Togo. Rapport Annuel 1984. Lomé, Togo, Ministere du Développement Rural. pp.4-12. Fr.

CASSAVA; CULTIVARS; PLANT BREEDING; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CASSAVA AFRICAN MOSAIC VIRUS; RESISTANCE; ROOT PRODUCTIVITY; TOGO.

Research activities on cassava plant breeding carried out by the Institut National des Plantes a Tubercules in Togo in 1984 are reported. In Agoenyivé 107 clones were selected from seed families from the International Institute of Tropical Agriculture (Nigeria). The resistance of some introduced var. to CBB and CAMV is tabulated. In Togodo a collection of 11 var. was established; good development was observed in plants obtained from tissue culture. In Danyi 20 local and introduc

1108

31613 INSTITUT NATIONAL DES PLANTES A TUBERCULES. TOGO. 1985. Protection des cultures. (Crop protection). In Institut National des Plantes a Tubercules. Togo. Rapport Annuel 1984. Lomé, Togo, Ministere du Développement Rural. pp.17-26. Fr.

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; PHENACOCCUS MANIHOTI; CULTIVARS; RESISTANCE; INSECTICIDES; TOGO.

Phytosanitary surveys were carried out in Agoenyivé, Notsé, Togodo, Danyi, and Sotouboua (Togo) in 1984 to evaluate the performance of cassava var. in response to CAMV, mealybugs, and green mites. Nursery and clonal evaluations were conducted. In Agoenyivé only 2 var. (A5-1 and D4) showed resistance to CAMV as well as 9 clones evaluated in the 2nd generation. In Notsé only 3 var. (Atihé, Akpadjin, and Dokpodoe) showed apparent resistance to mealybugs. In Togodo all var. obtained from tissue culture were susceptible to CAMV; carbofuran (5 g/plant) was found to be effective in controlling the cassava mealybug. In Danyi all var. tested were susceptible to both the disease and the mealybug. Similar observations were made in Sotouboua. (CIAT)

1109

30898 SOCIETE TOGOLAISE D'ETUDES DE DEVELOPPEMENT. 1980. Etude de marché du manioc et de ses derivés; capacité technique et situation financiere de la Compagnie du Bénin. (Marketing study of cassava and its by-products; technical capacity and financial situation of the Compagnie du Benin). Lomé, Togo, 62p. Fr., 30 Ref., Il.

CASSAVA; MARKETING; CONSUMPTION; INDUSTRIALIZATION; ECONOMICS; CASSAVA STARCH; HUMAN NUTRITION; ANIMAL NUTRITION; PRODUCTION; TRADE; CULTIVARS; PRICES; MAURITANIA; SENEGAL; NIGER; MALI; CHAD; BURKINA FASO; BENIN; GABON; NIGERIA; TOGO.

World, regional, and national markets of cassava and its by- products were studied and analyzed. The financial situation and real production capacity of the Compagnie du Benin were also studied. The cassava starch factory located in Ganave, Togo, initiated activities in 1953 but because of an irregular cassava supply it closed in 1977. Regarding the cassava world market, aspects of utilization and processing (generalities, human and animal nutrition, and industrial uses), world production, and world trade (products traded, commercialization of starches and livestock feeds) were studied. For the African cassava markets the analysis involved the situation of Ivory Coast, the Sahel countries (Mauritania, Senegal, Niger, Mali, Chad, and Burkina Faso), Benin, Gabon, and Nigeria. Regarding the Tongolese cassava market, aspects studied were production (var. planted, production means and factors, cultural practices, and maize-cassava interferences); cassava production and demand (production level, cassava demand in the coastal region, production and consumption in the plateaux region, and improved supply for the starch factory) and commercialization of cassava and its by-products (traditional commercialization circuits, markets, prices, and price variation). The Compagnie de Benin analysis recommends that the factory be directed towards manufacturing livestock feeds. Another site should be chosen in the plateaux region for the establishment of a factory for high quality starch production for the African industry, particularly the textile industry. Some suggestions are given for the technical, administrative, and commercial organization of the factory. It is recommended that feasibility studies be conducted as soon as possible. (CIAT)

1110

31381 SOCIETE TOGOLAISE D'ETUDES DE DEVELOPPEMENT. 1982. Production et transformation du manioc. (Cassava production and processing). Lomé, Togo, 86p. Fr., Sum. Fr., 22 Ref.

CASSAVA; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; CULTIVARS; CONSUMPTION; TRADE; CASSAVA CHIPS; CASSAVA FLOUR; CASSAVA STARCH; GARI; PRICES; CASSAVA PROGRAMS; INDUSTRIALIZATION; ECONOMICS; TOGO.

The importance of cassava in Togo is highlighted. Data are given on its production, yields, and area planted for 1977-81. General information on the growing areas is presented and commonly used var. are briefly described. National and international markets of cassava and its products (chips, CF, starches, and gari) were analyzed as well as evolution prospects and prices. A project was designed to increase cassava production and establish processing units for the obtention of gari, starch, and alcohol. The main characteristics of the area where the project is located, objectives, and necessary means for the accomplishment of industrial and small-scale production are given. The supply of cassava tubers, the processing units and their surroundings, and general organization of the project are mentioned. Economic and financial studies were also carried out to determine viability. Statistics are presented on investments, production costs, estimates on free on board (F.O.B.) export prices, and profitability. (CIAT)

1111

31349 TOGO. DIRECTION DES ENQUETES ET STATISTIQUES AGRICOLES. 1986. Prix moyens a la production des principaux produits vivriers: manioc. (Average production prices of the main food crops: cassava). Togo, 17p. Fr., Dat.num.

CASSAVA; STATISTICAL DATA; PRICES; GARI; TAPIOCAS; PRODUCTION; PRODUCTIVITY; TOGO.

Statistics on av. production prices of the main food crops (among them cassava) in Togo for 1976-83 are presented on an annual basis. Data are also given on av. monthly prices for cassava, gari, and tapioca in 1986. Finally, data on area planted to cassava (ha), yields (t/ha), and production (t), among other crops, for different regions in 1972-85 are also included. (CIAT)

1112

32252 ADAM, F. 1986. Report on cassava mealybug and cassava green mites in some African countries: Togo. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. pp.145-146. En. (Plant Protection Dept., B.P. 12163, Lome, Togo)

CASSAVA; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; TOGO.

Cassava was the most important crop in Togo in 1982 (372,000 t). Production is now being reduced by the cassava mealybug which appeared in 1980 in the eastern part of the coastal region in Aneho, Aklakou, Avévé, Tabligo, and Vogan. Infestations have spread to the eastern and southern parts of the plateaux region. In 1982 heavy infestations were found in this region near Kpalim and Atakpam. Isolated infestations also occurred in the central region. Insecticidal treatments have been unsuccessful. Le Service de la Protection Végétaux has recommended producers to (1) avoid the transfer of cuttings from uninfested to infested zones; (2) burn infested stems after harvest; (3) plant uninfested cuttings only; and (4) plant early in the rainy season. The cassava green mite was discovered in June 1980 in Adangbe in the coastal region. It has become more numerous in almost all cassava cultivated areas. (Full text)

1113

32252 ADAM, F. 1986. Report on cassava mealybug and cassava green mites in some African countries: Togo. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. pp.145-146. En.

CASSAVA; PHENACOCCUS MANIHOTI; INSECT CONTROL; PEST DAMAGE; TOGO.

Cassava was the most important crop in Togo in 1982 (372,000 t). Production now is being reduced by the cassava mealybug, which appeared in 1980 in the eastern part of the Coastal Region in the zones of Aneho, Aklakou, Avévé, Tabligbo, and Vogan. From there infestations spread to the eastern and southern parts of the Plateaux Region. In 1982 heavy infestations were found in this region near Kpalimé and Atakpamé. Isolated infestations occur also in the Central Region. Insecticidal treatments have been unsuccessful. Le Service de la Protection Végéteaux has recommended to producers that they: (1) avoid the transfer of cuttings from uninfested to infested zones; (2) burn infested stems after harvest; (3) plant only uninfested cuttings;

and (4) plant early in the rainy season. The cassava green mite was discovered in June 1980 in Adangbe in the Coastal Region. Since then it has become more numerous in almost all zones where cassava is cultivated. (Full text)

1114

30872 ADRI, K. 1984. Cultures associées. (Associated crops). Lomé, Togo, Programme Recherche Systemes. pp.193-207. Fr.

CASSAVA; INTERCROPPING; GROUNDNUT; MAIZE; TOGO.

Results from trials carried out on associated crops with cassava in Togo in 1984 are reported. No significant differences were observed when intercropped with maize or groundnut compared with sole cropping. (CIAT)

1115

31388 ADRI, K.; ATTISO, Y.; AGBOGA, K. 1985. Programme systemes de production. (Production systems program). In Togo. Direction de la Recherche Agronomique. Rapport Annuel 1985. Lomé, Togo, Ministere du Développement Rural. pp.87-108. Fr.

CASSAVA; INTERCROPPING; MAIZE; RICE; GROUNDNUT; ROOT PRODUCTIVITY; MONOCROPPING; SPACING; TOGO.

Results of research on cultivation systems conducted in Cacaveli (Togo) in 1985 are reported. Different associations involving cassava (maize-cassava, maize-cassava-groundnut, cassava-groundnut, and maize-cassava-rice) were studied. In the maize-cassava association, yields for the latter were reduced by 60 percent compared with yields of monocropped cassava. Cassava yields obtained in the cassava-groundnut association were higher than those of cassava-maize. Planting densities were 20,000 and 8000 maize and cassava plants/ha, resp., and 8 kg/ha for rice in the maize-cassava- rice association. (CIAT)

1116

32269 BERARD, J. 1955. Actes du pouvoir local: affaires économiques. (Records from local authorities: economic affairs). Journal Officiel du Territoire du Togo no.863:881-882. Fr.

CASSAVA; TAPIOCAS; LEGAL ASPECTS; TOGO.

A decree establishing the payment of 5000 francs/t tapioca exported from Togo is transcribed. Such payment is for the maintenance account and supply of local production and for financing the Institut Francais du Tapioca. (CIAT)

1117

30443 CHUZEL, G.; GAUTHIER, P.; GRIFFON, D. 1986. Un cas concret de coopération industrielle au Togo pour la transformation du manioc. (A specific case of industrial cooperation for cassava transformation in Togo). Machinisme Agricole Tropical no.96:57-66. Fr., Sum. Fr., En., Es., Il. (CEEMAT, Domaine de Lavalette, 34100, Montpellier)

CASSAVA; GARI; MECHANIZATION; INDUSTRIAL MACHINERY; FERMENTATION; RASPING; PRESSING; DRYING; TOGO.

A cooperative program was undertaken to mechanize gari production in Togo through the development of a continuous cassava processing method to obtain a stable product easily stored that would satisfy the consumers' quality demands. The different steps (rasping, fermentation, pressing, grinding/defibering, and cooking/drying) involved in traditional gari

processing were analyzed. Biogas was used as the energy source. The processing unit capacity was 200-300 kg/fresh roots/h (40-60 kg gari). The performance, general characteristics, and constraints of the following equipment developed are described in detail: a grater, a fermentation trough, a continuous mechanized press, a grinding- defibering machine, and a cooker. Studies were carried out 1st in France and then in Togo in 1986. Preliminary results are given and analyzed. (CIAT)

1118

32270 COCO, H.D. 1962. Arreté no. 10/MF AE/AE du 1er-9-62 abrogeant les dispositions des arretés nos. 2 et 3/MF/AE/AE des 7 et 15 février 1962 interdisant. (Decree no. 10/MF AE/AE from 1st-9-62 derogating resolutions of decrees no. 2 and 3/MF AE/AE from February 7 and 15, 1962, which temporarily forbade the export of food products). Journal Officiel de la République Togolaise Septembre 1962:634. Fr.

CASSAVA; TRADE; LEGAL ASPECTS; TOGO.

A decree derogating resolutions from previous decrees which temporarily forbade the export of food products (including cassava and CM) from Togo is transcribed. (CIAT)

1119

32009 DELCASSO, G. 1972. La production du manioc dans la région maritime du Togo; situation actuelle-perspectives. (Cassava production in coastal Togo; current situation and prospects). Paris, France, Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres. 20p. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; CULTIVATION; PROCESSING; PRODUCTION; INTERCROPPING; MAIZE; CULTIVARS; GARI; MARKETING; TRADE; TAPIOCAS; PRICES; CASSAVA STARCH; PRODUCTIVITY; TOGO.

Data are given on the production of different crops (including cassava) for coastal Togo. Cassava (intercropped with maize or as a sole crop) is the major crop. The main characteristics of this tuber crop are described as well as agronomic characteristics of the 3 var. commonly used (Kataoli, Coula, and Dazane Feto). Most of the cassava produced is transformed into gari (for local consumption) and small amounts are exported to Ghana and Dahomey. A graph is included with the av. prices of maize and gari in Anfoin from 1970 to 1972. Starch and tapioca are also obtained from cassava. Data are given on the amounts exported by Togo from 1967 to 1970. A graph shows the supplies and industrial yields of the Ganave starch factory and the factory supply schedule. The objectives, activities, and results of research programs on cassava are reported. Future activities are listed and estimates are given on local consumption of fresh cassava roots and gari, industrial transformation, and expected exports for 1970, 1975, and 1980. (CIAT)

1120

31320 FARINET, J.L. 1986. Unité expérimentale de recyclage de déchets de transformation du manioc au Togo. (Experimental unit for the recycling of cassava processing wastes in Togo). Lomé, Togo, Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres. 36p. Fr., 6 Ref., Il. Rapport de synthese des missions d'appui Techniqueau Togo en 1986.

CASSAVA; GARI; INDUSTRIALIZATION; WASTE UTILIZATION; FACTORIES; PROCESSING; TOGO.

An exptl. unit for cassava processing into gari was established in Davie, Togo. Its rationale and objectives are defined; the different steps for gari obtention are described in detail. Since waste results from cassava

processing, a recycling unit for biogas obtention was designed and established in February, 1986. Its major characteristics and operation are described in detail. Preliminary results are presented and analyzed and some suggestions are given for further studies and trials. (CIAT)

1121

31618 GU-KONU, Y.E. 1981. Agriculture. (Agriculture). Atlas du Togo. Paris, France, Editions Jeune Afrique. pp.30-37. Fr., Il.

CASSAVA; PRODUCTION; STATISTICAL DATA; MAPS; TOGO.

General characteristics of agriculture in Togo are described. Data on production trends of the main food crops (among them cassava) for the 1972-78 period are given, as well as production estimates for the 1974-78 period. Along with maize, cassava is a basic staple in Lower Togo. A map showing cassava growing regions is also included. (CIAT)

1122

29598 KNIPSCHEER, H.C. 1980. Prices (1976-1978) of major food crops in Togo (cowpea, millet, sorghum, groundnut, maize, cassava and rice). Ibadan, Nigeria, International Institute of Tropical Agriculture. Agricultural Economics Information Bulletin no.5. 13p. En., Il.

CASSAVA; STATISTICAL DATA; PRICES; MAPS; MARKETING; TOGO.

Rural retail prices for major food crops in Togo, including cassava, are presented on a monthly and quarterly basis for 1976, 1977, and 1978. Graphics comparing the price trends of several crops (rice, cowpea, maize, and cassava) for the different years are included as well as a histogram with quarterly figures for cassava for the entire period. (CIAT)

1123

30158 LE BRIS, F. 1984. Les marchés ruraux dans la circonscription de Vo, République du Togo. (Rural markets in Vo District, Republic of Togo). Paris, France, Office de la Recherche Scientifique et Technique Outre-Mer. Travaux et Documents de l'ORSTOM no.171. 96p. Fr., 32 Ref., Il. (ORSTOM, 24 rue Bayard, 75008 Paris, France)

CASSAVA; GARI; CONSUMPTION; MARKETING; PRODUCTION; TOGO.

A study was carried out on the rural markets of SW Togo including (1) history of the development of commerce in this area; (2) commerce methodology and main characteristics; (3) economic analysis of rural markets; and (4) geographic analysis of the market phenomenon. Gari is one of the products with more demand in the area. Graphs on evolution, seasonal and occasional variations of gari flow in the Tabligo market (1967-73) and in different markets (Aklakou, Vogan, Mome Hounkpati, and Lomé) in 1970 are included and analyzed. A graph and comments on maize and gari flow evolution in the Lomé and Tabligo markets for 1970-72 are also included. (CIAT)

1124

31633 MARQUETTE, J. 1985. Le manioc en culture associée sur terres de barre du Togo. (Cassava in associated crops in Togo's clayey soils). Montpellier, France, Institut des Recherches Agronomiques Tropicales et des Cultures Vivrieres. 9p. Fr., 6 Ref.

CASSAVA; ROOT PRODUCTIVITY; MONOCROPPING; INTERCROPPING; MAIZE; GROUNDNUT; TOGO.

Expt. were conducted in Togo from 1977 to 1979 to determine whether cassava yields were affected when planted in association with maize or groundnut. Treatments for the 1st yr were (1) monocropped cassava, (2) cassava intercropped with maize, and (3) cassava intercropped with groundnut. The 2nd yr all treatments were planted to maize and in the 3rd yr the treatments from the 1st yr were repeated. Higher yields were obtained with monocropped cassava compared with those from cassava planted with maize. Further research is needed to determine the best associated crop for cassava; groundnut remains a possible choice. (CIAT)

1125

25547 OLYMPIO, H.K.; ALOGBLETO, K. 1981. APERCU SUR LA PRODUCTION ET LES UTILISATIONS DES PLANTES A TUBERCULES AU TOGO. (SURVEY ON THE PRODUCTION AND UTILIZATION OF TUBER CROPS IN TOGO). IN WORKSHOP ON PROCESSING TECHNOLOGIES FOR CASSAVA AND OTHER TROPICAL ROOTS AND TUBERS IN AFRICA, ABIDJAN, IVORY COAST, 1983. PROCEEDINGS. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.235-242. FR., IL.

AFRICA; CASSAVA FLOUR; CASSAVA PRODUCTS; CASSAVA STARCH; ECONOMICS; FOOD PRODUCTS; GARI; MARKETING; PRICES; PROCESSED PRODUCTS; PROCESSING; PRODUCTION; SMALL-SCALE PROCESSING; TAPIOCAS; TOGO; USES.

THE SITUATION OF CASSAVA, YAM, SWEET POTATO, POTATO, AND TARO IN TOGO IS PRESENTED. THE MOST IMPORTANT CROPS ARE CASSAVA AND YAM; THEIR PRODUCTION, PROCESSING, AND MARKETING ARE INDICATED. CASSAVA IS CONSUMED FRESH OR IT IS PROCESSED INTO STARCH, TAPIOCAS, FLOUR, OR GARI.

1126

30468 TEUSCHER, T.; BAILLOD, P.; TEUSCHER, A.; ROSMAN, J.B. 1987. Absence of diabetes in a rural West African population with a high carbohydrate/cassava diet. Lancet 1(8536):765-768. En., Sum. En., 26 Ref., Il. (Dept. of Pediatrics, Hopital Cantonal, Univ. of Geneva Medical School, 1200 Geneva 4, Switzerland)

CASSAVA; DIABETES; HUMAN HEALTH; HUMAN NUTRITION; ETIOLOGY; TOGO.

Of the 1038 inhabitants of the West African village of Agbave, 1028 (99 percent) and a random sample of 353 (12.4 percent) of the population of 2850 in Kati, another West African village, were screened for diabetes. Also recorded were their anthropometric data, dietary habits, possession of antibodies to malaria, and serum IgG concn. About 85 percent of the study population consumed cassava roots at least once a day. The mean (SD) capillary random blood glucose concn. was 5.1 (1.1) mmol/liter in men and 5.1 (0.6) in women. The mean (SD) body mass index was 20.2 (1.8) in men and 20.7 (2.3) in women. The mean blood glucose was similar whether cassava was consumed once daily, more than once daily, or less than once daily. None of the 1381 subjects examined had diabetes. This finding suggests that a high carbohydrate/cassava intake (84 percent of a mean daily supply of 1916 calories) combined with a low protein consumption (8 percent of caloric supply) does not cause diabetes. This does not support the World Health Organization hypothesis that malnutrition-related diabetes exists, at least not in this West African rural population. (AS)

1127

26801 TOUGNON, K. 1982. SITUATION DU SECTEUR DES RACINES, TUBERCULES ET PLANTAINS AU TOGO. (THE SITUATION OF THE ROOT, TUBER, AND PLANTAIN SECTOR IN TOGO). IN WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE, 1985. REPORT. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.228-247. FR., IL.

CASSAVA; MARKETING; PRICES; PROCESSING; SOCIOECONOMIC ASPECTS; STATISTICAL DATA; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; LEGAL ASPECTS; TOGO.

CLIMATIC AND ECOLOGICAL DATA OF TOGO ARE GIVEN AND THE SITUATION OF ROOT,TUBER, AND PLANTAIN CROPS IN THE COUNTRY IS DESCRIBED. IN 1975 THE INSTITUT NATIONAL DES PLANTES A TUBERCULES WAS FOUNDED TO PROMOTE THE PRODUCTION OF CASSAVA AND OTHER STARCHY CROPS. CASSAVA AND YAMS, WITH AN ANNUAL GROWTH RATEOF ONLY 1.5 PERCENT ARE REGARDED AS BETWEEN-HARVEST SUBSTITUTES FOR BASIC CEREALS. THE COMMERCIALIZATION SYSTEM, WHICH IS OF A PRIVATE NATURE, DYNAMIC,AND EFFECTIVE, IS DESCRIBED, AND THE MAJOR PRODUCTION CONSTRAINTS ARE DISCUSSED. (CIAT)

UGANDA

1128

29092 UGANDA. DEPARTMENT OF AGRICULTURE 1966. District and province percentages by crop acreages and maps of agricultural systems, population, rainfall and temperature. Uganda, pp.24-29. En., Il.

CASSAVA; STATISTICAL DATA; PRODUCTION; MAPS; UGANDA.

Data is provided on percentage area of major crops produced by province and district in Uganda in 1966; maps showing agricultural systems, population, rainfall and temp. distributions are included. Cassava was grown in 2, 6, 8, and 11 percent of the area in Buganda, Eastern, Western, and Northern provinces, resp. (CIAT)

1129

29563 GEOGRAPHIC DISTRIBUTION of cassava varieties in Uganda. Uganda, 2p. 1986. En.

CASSAVA; PLANT GEOGRAPHY; UGANDA.

The geographic distribution of cassava germplasm in Uganda is reported. No. of genotypes collected are given for 12 districts (Northern Province was not included). The survey revealed large differences between districts in the level of genetic variation, which was not correlated with the importance of the crop in each area. Possible reasons for different levels of genetic diversity are discussed; these include rainfall distribution patterns, migration, food preferences, and shortage of both planting materials and land. A severe loss of genotypes is occurring in eastern Uganda, particularly Teso, where cassava var. Ebwanateraka (early maturing, sweet, and with some resistance to CAMD and Mononychellus tanajoa) is now dominant. (CIAT)

1130

30080 NATIONAL ROOT CROPS IMPROVEMENT PROGRAMME. 1985. Annual Report July 1984 - June 1985. Uganda, Serere Agricultural Research Station. 161p. En., Il.

CASSAVA; CULTIVATION; CULTIVATION SYSTEMS; CULTIVARS; SOCIOECONOMIC ASPECTS; ECONOMICS; PRODUCTION; PRODUCTIVITY; ROOT PRODUCTIVITY; CUTTINGS; DRY MATTER; PLANT HEIGHT; PLANT DEVELOPMENT; INTERCROPPING; SWEET POTATOES; PLANT BREEDING; PLANT ANATOMY; RESISTANCE; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BACTERIAL BLIGHT; GLOEOSPORIUM MANIHOTIS; MONONYCHELLUS TANAJOA; INSECT BIOLOGY; BEMISIA; ZONOCERUS VARIEGATUS; PLANTING; SPACING; TIMING; NOXIOUS ANIMALS; INJURIOUS INSECTS; INJURIOUS MITES; EPIDEMIOLOGY; CERCOSPORA VICOSAE; BOTRYODIPLODIA THEOBROMAE; CERCOSPORIDIUM HENNINGSII; PHAEORAMULARIA MANIHOTIS; DEVELOPMENT; CASSAVA PROGRAMS; UGANDA.

Results of cassava research activities conducted by the National Root Crops Improvement Programme of Uganda between July 1984-June 1985 are reported. Agronomic trials focussed on cassava cutting length, seedbed type, planting methods, spacing, and intercropping with beans, maize, and sweet potato. Cassava improvement activities concentrated on evaluating germplasm in seedling nurseries, preliminary yield trials, advanced yield trials, and local var. trials. Work in entomology identified major cassava pests and their incidence as well as cultural practices and their effects on pest damage severity. Research in pathology concentrated on the relative importance of diseases, screening germplasm for resistance, and the effects of cultural practices on disease incidence and severity. The resolutions and recommendations of the 2nd Eastern and Southern African Root Crops Workshop are given. (CIAT)

1131

30088 NATIONAL ROOT CROPS IMPROVEMENT PROGRAMME. 1985. Cassava seedling nursery (Serere and Nakabango, Jinja). In National Root Crops Improvement Programme. Annual Report July 1984-June 1985. Uganda, Serere Agricultural Research Station. pp.41-42. En.

CASSAVA; CULTIVARS; PLANT ANATOMY; RESISTANCE; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BACTERIAL BLIGHT; GLOEOSPORIUM MANIHOTIS; MONONYCHELLUS TANAJOA; UGANDA.

Partial results of the evaluation of 216 cassava materials imported from the International Institute of Tropical Agriculture (Nigeria), incorporated into the seedling nursery planted at Serere and Nakabango Var. Trial Centre in Uganda, are reported. Data on branching habit, peticle color, canopy structure, and CAMD, CBB, Gloeosporium manihotis, and Mononychellus tanajoa ratings are given for 47 selected materials that presented resistance to CBB, CAMD, or G. manihotis and good plant characteristics. (CIAT)

1132

30085 NATIONAL ROOT CROPS IMPROVEMENT PROGRAMME. 1985. Intercropping cassava with beans and maize. In National Root Crops Improvement Programme. Annual Report July 1984-June 1985. Uganda, Serere Agricultural Research Station. pp.31-34. En.

CASSAVA; INTERCROPPING; MAIZE; BEANS; PLANTING; SPACING; GROWTH; ROOT PRODUCTIVITY; UGANDA.

The effects of 3 different spacings of cassava (0.75 x 0.75, 1.00 x 1.00, and 1.50 x 1.50 m) on the yields of intercropped cassava/maize and cassava/beans were studied. Cassava spacing had no effect on bean pod formation. Bean yields were higher when intercropped with cassava, probably due to weed suppression by the latter. Data on cassava/maize intercropping are not yet available. (CIAT)

1133

30101 NATIONAL ROOT CROPS IMPROVEMENT PROGRAMME. 1985. Resolutions and recommendations of the second Eastern and Southern African Root Crops Workshop, Kampala, Uganda. In National Root Crops Research Institute. Annual Report July 1984 - June 1985. Uganda, Serere Agricultural Research Station. 3p. En.

CASSAVA; DEVELOPMENT; LEGAL ASPECTS; CASSAVA PROGRAMS; UGANDA.

The resolutions and recommendations of the 2nd Eastern and Southern African Root Crops Workshop held from Dec. 10 to 15 in Kampala, Uganda, are presented. Outstanding aspects of these resolutions and recommendations include the priority that should be given in the region to quarantine

regulations for Mononychellus tanajoa and Phenacoccus manihoti and the importance of carrying out further studies on the handling, storage, and processing of cassava, regional production systems, and crop mechanization. Governmental policies should give root crops, including cassava, equal importance as other crops, and training programs should be conducted in the region. Information media such as a newsletter on root crops should be developed. A brief set of recommendations for countries threatened by P. manihoti is given. (CIAT)

1134

29097 UGANDA. DEPARTMENT OF AGRICULTURE. 1984. Area and production of cassava in Uganda by districts 1981/83 and estimated yield loss to cassava green mite. Uganda, 3p. En., Dat. num.

CASSAVA; STATISTICAL DATA; PRODUCTION; PRODUCTIVITY; MONONYCHELLUS TANAJOA; UGANDA.

Cassava area and production figures for the years 1981-83 are given on a per region (Northern, Eastern, Central, and Western) and per district (30 districts) basis for Uganda. Figures are also given for yields, estimated potential yield, and estimated yield losses due to Mononychellus tanajoa in 1972-74 in Eastern, Northern, Buganda, and Western regions. (CIAT)

1135

29083 UGANDA. DEPARTMENT OF AGRICULTURE. 1947. Cassava. In Uganda. Department of Agriculture. Annual Report 1947. Uganda, pp.60-61. En.

CASSAVA; CULTIVARS; SELECTION; UGANDA.

Cassava research activities in Uganda in 1947 are briefly reported. The main work centered on a long-term trial of time of harvesting x palatability x CAMD elimination, still to be completed. After 30 mo., only 1/3 of the var. remained in the trial. Cassava var. 7 37244E (Mbwa), 8 Aipim Valenca, 11 F 279 (Mpologoma), 14 Kru, 15 Msitu, and 43 Mkezumbe were grown in multiplication blocks for distribution in the districts (Busoga, Mbale, and Karamoja) served by the Main Farm. Var. 11 F 279 was the most palatable. (Full text)

1136

29084 UGANDA. DEPARTMENT OF AGRICULTURE. 1950. Cassava. In Uganda. Department of Agriculture. Record of investigations report 1950. Uganda, Serere Experimental Station. p.43. En.

CASSAVA; CULTIVARS; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BROWN STREAK VIRUS; UGANDA.

Cassava research activities conducted in 1949 in Serere, Uganda, are briefly reported. In Nov. 1948, all cassava in Serere was uprooted and destroyed following an outbreak of cassava brown streak virus. Clean material was obtained from Kawanda and the following var. were planted in April 1949 for multiplication and eventual distribution in the Eastern and Northern Provinces: No. 3 Aipim Valenca (1.70 ha), No. 7 37244E (1.42 ha), No. 11 F.279 (0.10 ha), and No. 14 Kru (0.24 ha). All of these were rogued for CAMD, and during the season only 1.5 percent infected plants were uprooted. (Full text)

1137

29099 UGANDA. DEPARTMENT OF AGRICULTURE. 1985. Cassava area (HA) and production (tons) by district 1981/84. Uganda, 1p. En., Dat. num.

CASSAVA; STATISTICAL DATA; PRODUCTION; UGANDA.

Cassava area and production figures for the years 1981-84 are given for 32 districts in Uganda. Av. area and production figures for the period 1981-83 are also provided. (CIAT)

1138

29088 UGANDA. DEPARTMENT OF AGRICULTURE. 1960. Cassava (Ateso: emuogo. Swahili: muhogo) Manihot utilissima. In Uganda. Department of Agriculture. The systems of agriculture practiced in Uganda. Uganda, p.42. En.

CASSAVA; CULTIVATION; PROCESSING; UGANDA.

Cassava is the main famine reserve crop in the district of Teso, Uganda, where plantings in recent years account for over 36,423 ha/yr. Cassava is often grown at the end of a rotational sequence and the land is left to rest under the resulting weedy stand. Otherwise it is grown on land out of the rotational sequence, either near the homestead or in specially selected communal areas. Once the crop is established, little weeding is done. It can be planted at any time of the year except in the middle of the dry season in Jan., Feb., or March. Teso District was the 1st in which the new mosaic-resistant var. were established to the exclusion of all mosaic- susceptible types. Consequently, there is now no long-term or bitter cassava grown. Harvesting occurs from 8 mo. after planting to 2 years at the most. Roots of sweet var. can be eaten freshly cooked after peeling, or if harvesting is done all at one time, the surplus roots are sliced and sun-dried to form a hard white product which, after storing in a granary for some months, can be ground down to a fine flour. Yields can reach 29.65-34.59 t/ha, but usually 9.88 t/ha are harvested. (Full text)

1139

29087 UGANDA. DEPARTMENT OF AGRICULTURE. 1960. CASSAVA: (LANGO-MOGO; ACHOLI-MOGO) MANIHOT UTILISSIMA. IN-------. THE SYSTEMS OF AGRICULTURE PRACTICED IN UGANDA. UGANDA. PP.28- 30. EN.

CASSAVA; CULTIVATION SYSTEMS; PRODUCTION; PLANTING; INTERCROPPING; CASSAVA AFRICAN MOSAIC VIRUS; ZONOCERUS; ECOLOGY; USES; PROCESSING; UGANDA.

ASPECTS OF CASSAVA CULTIVATION AND UTILIZATION IN LANGO AND ACHOLI (NORTHERN PROVINCE, UGANDA) ARE BRIEFLY DESCRIBED. THESE INCLUDE PLANTING, INTERCROPPING, AND FOOD PRODUCTION. CAMD IS CONSIDERED THE MAIN DISEASE AND ZONOCERUS SP., THE MAJOR PEST. SCALE INSECTS ARE QUITE COMMON IN LANGO. (CIAT)

1140

29085 UGANDA. DEPARTMENT OF AGRICULTURE. 1955. Crop production: estimated acreages under crops--1954 and 1955. African cultivation. In Uganda. Department of Agriculture. Annual Report 1955. Uganda, pp.22-26,32. En., Dat.num.

CASSAVA; PRODUCTION; STATISTICAL DATA; UGANDA.

Data of estimated area planted to cassava and other crops in 1954 and 1955 in Uganda are tabulated on a per province and per district basis. Provinces and their resp. districts included were: Buganda (Mengo, Masaka, and Mubende); Eastern (Busoga, Bugisu, Bukedi, and Teso); Western (Ankole, Bunyoro, Kigezi, and Toro); and Northern (Lango, Acholi, West Nile/Madi, and Karamoja). (CIAT)

1141

29090 UGANDA. DEPARTMENT OF AGRICULTURE. 1962. Crop production: estimated acreages under crops, 1961 and 1962, African cultivation. In Uganda. Department of Agriculture. Annual Report 1962. Uganda, pp.52-56. En.

CASSAVA; STATISTICAL DATA; PRODUCTION; UGANDA.

Tables providing data on area planted to major crops in Uganda in 1961 and 1962, on a per province and per district basis, are presented. Acreages planted to cassava are given for both years in the provinces of Buganda, Eastern, Northern, and Western, and disaggregated per districts: Mengo, Masaka, and Mubende (Buganda); Busoga, Bukedi, Bugisu, Teso, and Karamoja (Eastern); Ankole, Bunyoro, Kigezi, and Toro (Western); and Lango, Acholi, and West Nile/Madi (Northern). (CIAT)

1142

29091 UGANDA. DEPARTMENT OF AGRICULTURE. 1964. Crop production: estimated acreages under crops 1963 and 1964, African cultivation. In Uganda. Department of Agriculture. Annual Report 1964. Uganda, pp.40-44,52. En.

CASSAVA; STATISTICAL DATA; PRODUCTION; UGANDA.

Tables providing data on area planted to major crops in Uganda in 1963 and 1964 are presented on a per province and per district basis. Cassava planted acreages are given for both years for the provinces of Buganda, Eastern, Northern, and Western, and disaggregated per districts: Mengo, Masaka, and Mubende in Buganda; Busoga, Bukedi, Bugisu, Teso, and Karamoja in Eastern Province; Ankole, Bunyoro, Kigezi, and Toro in Western Province; and Lango, Acholi, and West Nile/Madi in Northern Province. (CIAT)

1143

29095 UGANDA. DEPARTMENT OF AGRICULTURE. 1983. Production area and yield of cassava in Uganda 1971/83. In Uganda. Department of Agriculture. Annual Report 1983. Uganda, 1p. En., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; UGANDA.

Figures of cassava production, area, and yield in Uganda are given on a yearly basis for 1971-83. Yields for the period ranged between 3792 kg/ha in 1978 to 9861 kg/ha in 1980, with an av. overall yield of 6404 kg/ha for the entire period. (CIAT)

1144

29086 UGANDA. DEPARTMENT OF AGRICULTURE. 1958. Revised crop acreage estimates 1945-1956. Area of cassava and all major food crops per district. Uganda, pp.3,8-20,23-24. En., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; UGANDA.

Cassava (and other crops) acreage estimates in Uganda from 1945 through 1956, including a comparative estimate for 1939, are presented in table form on a per district basis. Area planted to cassava in Uganda ranged between 184-245 ha for the study period. Data indicated that Buganda (districts of Mengo, Masaka, and Mubende), Eastern Province (districts of Busoga, Mbale, Bukedi, Bugisu, and Teso), Western Province (districts of Ankole, Bunyoro, Kigezi, and Toro), and Northern Province (districts of Lango, Acholi, West Nile/Madi, and Karamoja), accounted for 8, 39, 20, and 33 percent, resp., of total area planted to cassava in the country. (CIAT)

1145

29093 UGANDA. DEPARTMENT OF AGRICULTURE. 1968. Root crops: cassava and sweet potatoes. In Uganda. Department of Agriculture. Report of annual agricultural statistics 1967 and 1968. Entebbe, Uganda, pp.69-74. En.

CASSAVA; STATISTICAL DATA; PRODUCTION; UGANDA.

Tables providing data on area planted to cassava in pure and mixed stands in Uganda in 1967/68 and 1968 (1st and 2nd rains) are provided. Figures are further disaggregated by provinces and by resp. districts: West Mengo, East Mengo, Mubende, and Masaka in Buganda; Busoga, Bukedi, Bugisu/Sebei, and Teso in Eastern Province; Lango, Acholi, and West Nile/Madi in Northern Province; and Bunyoro, Ankole, and Kigezi in Western Province. The trends are briefly analyzed. (CIAT)

1146

29089 UGANDA. DEPARTMENT OF AGRICULTURE. 1960. THE WEST NILE SYSTEMS OF AGRICULTURE. IN--------. THE SYSTEMS OF AGRICULTURE PRACTICED IN UGANDA. UGANDA. PP.53-58. EN.

CASSAVA; CULTIVATION SYSTEMS; STATISTICAL DATA; INTERCROPPING; SOCIOECONOMIC ASPECTS; CASSAVA PROGRAMS; ECOLOGY; UGANDA.

THE CROPPING SYSTEMS FOUND IN THE WEST NILE REGION OF UGANDA ARE BRIEFLY DESCRIBED. SURFACE AREA DISTRIBUTION OF CROPS IN 9 COUNTIES OF THE REGION IN 1956 ARE PRESENTED IN TABLE FORM; DATA SHOW THAT CASSAVA PREDOMINATED IN AREA PLANTED. SIMILARLY, CASSAVA ACREAGE WAS ALWAYS HIGHER THAN FOR OTHER CROPS EVERY YEAR DURING 1953-58. FOUR DIFFERENT CROP ROTATION SYSTEMS THAT INCLUDE CASSAVA AS A COMPONENT CROP, PRACTICED IN THE REGION, ARE DESCRIBED. (CIAT)

1147

29302 UGANDA. SERERE RESEARCH STATION. 1986. Utilization patterns and demand. In Uganda. Serere Research Station. Development of improved cassava processing techniques and utilization patterns in Uganda. Uganda, 3p. En.

CASSAVA; CONSUMPTION; SOCIOECONOMIC ASPECTS; USES; UGANDA.

Aspects of the production, demand, and utilization of cassava in Uganda are discussed. Most cassava in Uganda is dried prior to use. Results of a survey in major cassava producing districts showed that 41.48 and 34.09 percent of av. farm land in Soroti/Kumi and Tororo, resp., is planted to cassava. Cassava is preferably consumed as gari in mixtures with various proportions of sorghum and/or millet. Data indicate that 100 percent of the families used cassava as a staple throughout the year, especially during drought and food shortage periods; 90 percent sold some cassava for cash income; 50 percent used some cassava for local alcoholic drinks; 20 percent used some for buttering with other foodstuffs; and 7 percent used some for hired labor payment. It was concluded that the current cassava supply in Uganda is still far below the demand. The need for an efficient, integrated production and processing strategy is stressed. (CIAT)

1148

31686 NANGOTI, N.J.K. 1987. Objectives and achievements of on-farm demonstrations and trials of improved production technology of field crops in Eastern and Northern Uganda. In Holmes, J.C., ed. Improving food crop production on small farms in Africa. Rome, Food and Agriculture Organization of the United Nations. pp.282-288. En., Sum. En., 6 Ref.

CASSAVA; ON-FARM RESEARCH; TECHNOLOGY EVALUATION; INTERCROPPING; COWPEA; GROUNDNUT; PLANTING; UGANDA.

The objectives of the Adaptive Research Program in Eastern and Northern Uganda are presented, as well as results of the 1986 trials conducted at different sites. In the cassava/cowpea-groundnut intercropping trial in Oburin, Akoboi, and Kamod, broadcast planting of the grain legume (traditional method) was compared with row planting (improved method). While cassava yield results are pending, row planting of grain legumes more than

doubled the yield of the broadcast-sown plots. Measurements of cassava plant height indicated, however, that row planting with cowpeas in particular reduced cassava growth more than broadcast sowing. The results so far indicate that row sowing will be more profitable than broadcast sowing. The on-farm trial program for 1987 is briefly described in which a cassava plant population density trial will be conducted. (CIAT)

1149

29483 NYIIRA, Z.M. 1972. Cassava: investigations 1972-1973. In Kawanda Research Station. Uganda. Entomology Section. Annual Report: part.2. Kampala, Uganda, 6p. En.

CASSAVA; MONONYCHELLUS TANAJOA; ECOLOGY; INSECT BIOLOGY; PREDATORS AND PARASITES; CULTIVARS; RESISTANCE; MITE CONTROL; ACARICIDES; BIOLOGICAL CONTROL; UGANDA.

Results of ecological, biological, dispersal, and control studies (among others) of Mononychellus tanajoa in cassava in Uganda in 1972/73 are presented. Areas with av. temp. ranging between 21-23 degrees Celsius, av. monthly rainfall between 30-126 mm, and RH of 75-80 percent were found most favorable for M. tanajoa attacks. Pest distribution in the districts of Buganda and Eastern Provinces in 1972 is indicated. Wind was found to be the major dispersal mechanism, favored by day temp. of 25-28 degrees Celsius between 10 a.m. and 5 p.m. Adult mite populations varied on leaves depending on time of the day, plant age, infestation level, and cassava var. Life cycles of adult males and females were determined as well as alternative hosts (Manihot glaziovii, M. cartagenensis, and Manihot sp.) and natural predators (Oligota sp., Stethorus sp., Typhlodromus sp., Orius sp., and other spider mites). Var. trials for resistance to M. tanajoa showed that among the 36 var. tested, Kru, 46301-15, and K-Kawanda presented less damage. Low, negative, and nonsignificant correlation coefficients were obtained for the relationship between leaf P, Ca, and Mg content and mite infestation, and low, positive, and nonsignificant correlations for leaf N and K contents. Dicofol, dimethoate, and chlorobenzilate at 227 g, 45 ml, and 45 ml/36 liters water, resp., managed to reduce mite populations the most up to 93.8 percent after 10 days application of dicofol and 89.3 and 88.3 percent after 5 days application of dimethoate and chlorobenzilate, resp. Mite populations, however, started to build up again thereafter, possibly due to the destruction of natural enemies also. (CIAT)

1150

29094 NYIIRA, Z.M. 1975. CASSAVA MITES AND METEOROLOGY. IN SYMPOSIUM ON RESEARCH THE BACKBONE OF AGRICULTURE, 2, KAMPALA, UGANDA, 1975. PROCEEDINGS. KAMPALA, UGANDA SOCIETY OF AGRONOMY. PP.101-109. EN., 22 REF.

CASSAVA; INJURIOUS MITES; MONONYCHELLUS TANAJOA; TETRANYCHUS TELARIUS; TETRANYCHUS CINNABARINUS; INSECT BIOLOGY; TEMPERATURE; ECOLOGY; UGANDA.

ENVIRONMENTAL FACTORS INFLUENCING CASSAVA MITE DEVELOPMENT, MIGRATION, AND DISPERSAL ARE DISCUSSED, AND THE COMPARATIVE BIOLOGY OF THESE PESTS (MONONYCHELLUS TANAJOA, TETRANYCHUS TELARIUS, T. CINNABARINUS, AND OTHER SPECIES) ARE REVIEWED. RESULTS OF STUDIES ON THE EFFECT OF TEMP. AND WIND ON THE ABOVEMENTIONED ASPECTS ARE DISCUSSED. (CIAT)

1151

29043 OCITTI-OBWOYA, C.N.; OTIM-NAPE, G.W. 1986. REPORT ON ON-FARM SURVEY ROOT CROPS-BASED FARMING SYSTEM; SOROTI, KUMI AND TORORO DISTRICTS, EASTERN REGION, UGANDA. SOROTO, UGANDA, NATIONAL ROOT CROPS IMPROVEMENT PROGRAM. SERERE AGRICULTURAL RESEARCH STATION. 39P. EN., SUM. EN., IL.

CASSAVA; ROOT CROPS; CULTIVATION SYSTEMS; PRODUCTION; CASSAVA PROGRAMS; CULTIVATION; SOCIOECONOMIC ASPECTS; TECHNOLOGY TRANSFER; DEVELOPMENT COSTS; INCOME; LABOR; PRICES; MARKETING; UGANDA.

RESULTS OF A 1-MO. ON-FARM SURVEY CARRIED BETWEEN MAY-JUNE 1985 IN THE AREAS OF TORORO AND SOROTI (UGANDA) BY A MULTIDISCIPLINARY TEAM ARE REPORTED.OBJECTIVES WERE TO (1) UNDERSTAND THE FARMERS' METHODS OF PRODUCTION AND PRODUCTION CONSTRAINTS SO AS TO ADJUST FUTURE RESEARCH PROGRAMS AND (2) DESIGN AND DEVELOP APPROPRIATE PRODUCTION TECHNOLOGIES THAT ARE TECHNICALLY WITHIN THE FARMER'S ABILITIES, CULTURALLY COMPATIBLE, AND ECONOMICALLY FEASIBLE. CROP YIELDS, PARTICULARLY THOSE OF CASSAVA AND SWEET POTATOES, DURING THE 1980/81 SEASON WERE AFFECTED BY THE 1979 CIVIL WAR. PRODUCTION WASLOW AND YIELDS WERE ALSO DEPRESSED BY DROUGHT. LABOR AND LACK OF FARM INPUTS ALSO AFFECTED CROP OUTPUT SIGNIFICANTLY. THE PRESENT PRODUCTION LEVEL EXPLAINS THE SIGNIFICANT ROLE OF CASSAVA AS THE MAIN CASH SOURCE FOR 2 TARGETGROUPS; BOTH FARMERS WITH AND WITHOUT CATTLE HAVE THE LARGEST PERCENTAGE OF CULTIVABLE LAND UNDER CASSAVA. THE DIFFERENCE IN OUTPUT BETWEEN THESE GROUPS INDICATE THAT THE POTENTIAL FOR INCREASED PRODUCTION AND YIELDS OF CASSAVA AND SWEET POTATO EXIST PROVIDED CONSTRAINTS ARE OVERCOME. FOR CASSAVA, THESE ARE LACK OF PROPER AGRONOMIC AND CULTURAL PRACTICES, LABOR SHORTAGE, LACK OF INCENTIVES, LIMITED NO. OF VAR., UNAVAILABILITY OF PLANTING MATERIAL, PESTS AND DISEASES, WEEDS, AND SOIL FERTILITY. (CIAT)

1152

30092 OPONGO, B.; OPOLOT, S.P. 1985. Assessment of major cassava pests and their seasonal abundance. In National Root Crops Improvement Programme. Annual Report July 1984-June 1985. Uganda, Serere Agricultural Research Station. pp.53-58. En.

CASSAVA; INSECT BIOLOGY; MONONYCHELLUS TANAJOA; BEMISIA; UGANDA .

Population dynamics studies of major cassava pests in Uganda, namely Mononychellus tanajoa and whiteflies (Bemisia sp.), were conducted on var. Bukalasa 8, Ebwanateraka, Bintiminti, and Bukalasa 11. M. tanajoa severity increased gradually from Oct. through Feb., peaking in March and dropping sharply in April. M. tanajoa populations did not necessarily correlate with leaf damage. The highest Bemisia spp. populations were detected in April, followed by Feb. and then Jan.-Dec. Differential var. responses to both pests were observed. Bukalasa 8 succumbed the most to M. tanajoa attack followed in descending order by Bintiminti, Bukalasa 11, and Ebwanateraka. Bintiminti showed the highest Bemisia spp. populations followed by Ebwanateraka, Bukalasa 11, and Bukalasa 8. (CIAT)

1153

30094 OIONGO, B.; OPOLOT, S.P. 1985. The effect of planting cassava at different times at different spacings on pests of cassava. In National Root Crops Improvement Programme. Annual Report July 1984-June 1985. Uganda, Serere Agricultural Research Station. pp.61-62. En.

CASSAVA; INSECT CONTROL; MONONYCHELLUS TANAJOA; BEMISIA; CUTTINGS; PLANTING; SPACING; TIMING; UGANDA.

The effects of planting cassava var. Ebwanateraka on 5 different dates (April, June, Aug., Oct., and Dec.) and at 5 spacings (2.0 x 1.0 m, 1.0 x 1.0 m, 1.0 x 0.75 m, 0.75 x 0.75 m, and 0.5 x 0.5 m) on insect pest populations were investigated in Uganda. The lowest Mononychellus tanajoa populations and damage scores were observed in the Oct. plantings at all spacings. Bemisia spp. populations were lowest for the April, June, and Dec. plantings and the 0.75 x 0.75 spacing treatment. The lowest attacks from

grasshoppers (Pleamaloptera spp. and Phymateus viripes) occurred in April, June, and Oct. and the 0.5 x 0.5 spacing treatment. While Oct. plantings favored low M. tanajoa populations, it favored high Bemisia spp. populations. Aug. plantings were moderate for M. tanajoa and grasshoppers, but favored Bemisia spp. This latter pest, the vector of CAMD, was not favored by April and Dec. plantings. (CIAT)

1154

30093 ODONGO, B.; OPOLOT, S.P. 1985. The effect of seedbed preparation and method of planting on population of major cassava pests and damage severity on cassava plants. In National Root Crops Improvement Programme. Annual Report July 1984-June 1985. Uganda, Serere Agricultural Research Station. pp.58-60. En.

CASSAVA; PLANTING; CUTTINGS; INSECT BIOLOGY; LAND PREPARATION; MONONYCHELLUS TANAJOA; BEMISIA; ZONOCERUS VARIEGATUS; UGANDA.

The local var. Ebwanateraka was planted in seedbeds on ridges or on the flat using 4 different methods: 2 cuttings/hole in a cross; 2 cuttings/hole in parallel; 1 cutting/hole horizontally; and 1 cutting/hole inclined. Their effect on the populations and severity of Mononychellus tanajoa, Bemisia spp., and Zonocerus variegatus was assessed. The lowest M. tanajoa population was observed in ridge and flat planting with 2 cuttings placed horizontally. Damage scores, however, did not correlate with the population levels observed. Bemisia spp. populations were lowest in ridge planting with 2 cuttings horizontally crossed. Low populations of Z. variegatus were observed in all, except ridge planting with 2 cuttings horizontally crossed followed by flat planting with 2 cuttings planted horizontally and then 1 cutting planted horizontally on ridges. Populations of the major pests showed that some combinations of different planting methods on either flat or ridged seedbeds affect the pest in a restrictive manner, but further research is required. (CIAT)

1155

30089 OTIM NAPE, G.W.; ODONGO, B.; OLUPOT, M.; INGOOT, D.; EINAU, G. 1985. Cassava preliminary yield trial. In National Root Crops Improvement Programme. Annual Report July 1984-June 1985. Uganda, Serere Agricultural Research Station. pp.42-48. En.

CASSAVA; CULTIVARS; SELECTION; PLANT ANATOMY; RESISTANCE; CASSAVA AFRICAN MOSAIC VIRUS; CASSAVA BACTERIAL BLIGHT; GLOEOSPORIUM MANIHOTIS; ROOT PRODUCTIVITY; UGANDA.

The results of the 1984/85 cassava preliminary yield trial conducted in Uganda and that included 646 lines are reported. Data on branching habit, petiole color, canopy structure, CAMD, CBB, Gloeosporium manihotis ratings, and root yield are given for 89 selected materials which outyielded (range 13.5-38.5 t/ha) the local var. Ebwanateraka. (CIAT)

1156

30096 OTIM NAPE, G.W.; INGOOT, D. 1985. Diseases of cassava and their relative importance. In National Root Crops Improvement Programme. Annual Report July 1984-June 1985. Uganda, Serere Agricultural Research Station. pp.73-84. En.

CASSAVA; CULTIVARS; EPIDEMIOLOGY; CASSAVA AFRICAN MOSAIC VIRUS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CERCOSPORIDIUM HENNINGSII; PHAEORAMULARIA MANIHOTIS; CERCOSPORA VICOSAE; GLOEOSPORIUM MANIHOTIS; BOTRYODIPLODIA THEOBROMAE; UGANDA.

Cassava diseases were identified and their severity rated at monthly or bi-monthly intervals in 12 var. in Ngetta and 4 var. each in Serere and Nakabango (Uganda). Pathogens detected in both Serere and Ngetta were Xanthomonas campestris pv. manihotis, CAMD, Cercosporidium henningsii, Phaeoramularia manihotis, Cercospora vicosae, Gloeosporium manihotis, and Botryodiplodia theobromae. Corresponding data for Nakabango are not provided. Var. susceptibility to the different diseases is discussed, as well as observations on disease epidemics development. The relative importance of cassava diseases was assessed using the mean disease severity and the area under the disease progress curve, indicating that the latter method was always superior to the 1st method. (CIAT)

1157

29301 OTIM NAPE, G.W.; INOOT, A. 1986. Effect of cassava spacing, time of planting and number of shoots on the incidence and severity of the African cassava mosaic disease. Uganda, Serere Research Station. 10p. En.,Sum. En., 8 Ref., Il. Paper presented at the 3rd SymposiumISTRC-AB,Umudike, Nigeria, 1986. (Unreip, Serere Agricultural Research Station, P.O. Soroti, Uganda)

CASSAVA; CUTTINGS; PLANTING; TIMING; SPACING; CASSAVA AFRICAN MOSAIC VIRUS; VECTORS; UGANDA.

The effects of spacing and time of planting and spacing and no. of shoots of cassava on the incidence and severity of CAMD were studied in 2 split-plot expt. Cassava canopy temp., RH, whitefly population, CAMD incidence and severity were recorded at 2-mo. intervals beginning 4 and ending 14 mo. after planting. Cassava canopy temp. significantly increased with increased spacing, while RH was not affected by any of the treatments. Whitefly population and the incidence and severity of CAMD increased with further delay in cassava planting, and reached highest levels on cassava planted in Aug. Similarly, CAMD incidence increased with further increase in cassava spacing and was significantly decreased by increase in no. of cassava shoots/stand. The effects of the treatments on CAMD are discussed. (AS)

1158

30091 OTIM NAPE, G.W.; INGOOT, D. 1985. Evaluation of local cassava varieties for tuber and quality. In National Root Crops Improvement Programme. Annual Report July 1984-June 1985. Uganda, Serere Agricultural Research Station. pp.49-52. En.

CASSAVA; CULTIVARS; ROOT PRODUCTIVITY; UGANDA.

Twelve local Ugandan cassava var. were evaluated in 1982/83 and 1983/84 at Ngetta Exptl. Station. For each year, data on root yields, dry wt., marketable and nonmarketable roots, root rot, and tuber wt. are given for the following materials: Ebwanateraka, Ejaritu, Bintiminti, Azalia, Ocole, Bao atar, David D, Bukalasa 8, Bao, Okoiyoadak, Bukalasa 11, and E37244. Cassava var. Ebwanateraka performed best in both years. (CIAT)

1159

30097 OTIM NAPE, G.W.; INGOOT, D. 1985. Screening promising cassava lines for resistance to important diseases. In National Root Crops Improvement Programme. Annual Report July 1984-June 1985. Uganda, Serere Agricultural Research Station. pp.85-105. En.

CASSAVA; CULTIVARS; SELECTION; RESISTANCE; CASSAVA AFRICAN MOSAIC DISEASE; CASSAVA BACTERIAL BLIGHT; GLOEOSPORIUM MANIHOTIS; CERCOSPORA VICOSAE; BOTRYODIPLODIA THEOBROMAE; ROOT PRODUCTIVITY; UGANDA.

Results are given of a screening trial conducted in Uganda with 646 cassava lines to rate resistance to diseases and root yield. Data on branching habit, petiole color, canopy structure, bitterness, and fresh root yield are given as well as resistance scores to CBB, CAMD, Gloeosporium manihotis, Cercospora vicosae, Botryodiplodia theobromae, and root rots. Results indicated that cassava lines resistant to CAMD, CBB, and Gloeosporium manihotis with high root yield and acceptable plant characteristics can be obtained from the materials selected. (CIAT)

1160

30100 OTIM NAPE, G.W.; INGOOT, D. 1985. The effect of spacing and number of shoots of cassava on diseases. In National Root Crops Improvement Programme. Annual Report July 1984-June 1985. Uganda, Serere Agricultural Research Station. pp.139-152. En.

CASSAVA; DISEASE CONTROL; PLANTING; CUTTINGS; SHOOTS; SPACING; CASSAVA BACTERIAL BLIGHT; CASSAVA AFRICAN MOSAIC VIRUS; GLOEOSPORIUM MANIHOTIS; CERCOSPORIDIUM HENNINGSII; CERCOSPORA VICOSAE; PHAEORAMULARIA MANIHOTIS; BOTRYODIPLODIA THEOBROMAE; UGANDA.

The effects of 4 different spacings (0.50 x 0.50 m, 0.50 x 0.75 m, 0.75 x 0.75 m, and 1.00 x 1.00 m) and no. of shoots (single, double, and multishoot plants) of cassava var. Ebwanateraka on the incidence and severity of various diseases (CBB, CAMD, Gloeosporium manihotis, Cercosporidium henningsii, Cercospora vicosae, Phaeoramularia manihotis, and Botryodiplodia theobromae) were investigated in Uganda. CBB incidence was significantly lower in cassava spaced at 0.75 x 0.75 m, but its severity was lowest at 1.00 x 1.00 m; the no. of shoots had no effect on disease incidence or severity. CAMD incidence tended to significantly increase at wider spacings and to decrease with increasing no. of shoots. A strong positive interaction was observed between the effect of spacing and no. of shoots on disease incidence. Severity of CAMD was not affected by either factor. G. manihotis and B. theobromae incidences were not affected by plant spacing nor no. of shoots, but severity of both was reduced by increased spacings. C. vicosae incidence was lower at spacings of 0.50 x 0.50 m and 0.75 x 0.75 m, but severity was not affected by either spacing or no. of shoots. (CIAT)

1161

30099 OTIM NAPE, G.W.; INGOOT, D. 1985. The effect of time of planting and spacing of cassava on diseases. In National Root Crops Improvement Programme. Annual Report July 1984-June 1985. Uganda, Serere Agricultural Research Station. pp.126-138. En.

CASSAVA; DISEASE CONTROL; PLANTING; CUTTINGS; TIMING; SPACING; CASSAVA BACTERIAL BLIGHT; CASSAVA AFRICAN MOSAIC VIRUS; GLOEOSPORIUM MANIHOTIS; CERCOSPORIDIUM HENNINGSII; CERCOSPORA VICOSAE; PHAEORAMULARIA MANIHOTIS; BOTRYODIPLODIA THEOBROMAE; UGANDA.

The effects of planting cassava var. Ebwanateraka on 5 different dates (April, June, Aug., Oct., and Dec.) and at 5 spacings (2.0 x 1.0 m, 1.0 x 1.0 m, 0.75 x 0.75 m, 0.75 x 0.50 m, and 0.5 x 0.5 m) on the incidence and severity of CBB, CAMD, Gloeosporium manihotis, Cercosporidium henningsii, Cercospora vicosae, Phaeoramularia manihotis, and Botryodiplodia theobromae was investigated in Uganda. The lowest CBB, G. manihotis, B. theobromae, C. henningsii, C. vicosae, and P. manihotis incidence and severity occurred in Aug. plantings; spacing had no effect on incidence, but severity of CBB and G. manihotis increased as the spacing was reduced. The lowest CAMD incidence and severity, as well as that of its vector, Bemisia spp., occurred in the Dec. plantings; spacing had no effect on CAMD incidence, but severity increased as spacing decreased. (CIAT)

1162

30098 OTIM NAPE, G.W.; INGOOT, D. 1985. The effect of types of seedbed and methods of planting cassava on diseases. In National Root Crops Improvement Programme. Annual Report July 1984-June 1985. Uganda, Serere Agricultural Research Station. pp.116-125. Fn.

CASSAVA; PLANTING; CUTTINGS; LAND PREPARATION; RESISTANCE; CASSAVA BACTERIAL BLIGHT; CASSAVA AFRICAN MOSAIC VIRUS; GLOEOSPORIUM MANIHOTIS; CERCOSPORIDIUM HENNINGSII; CERCOSPORA VICOSAE; PHAEORAMULARIA MANIHOTIS; BOTRYODIPLODIA THEOBROMAE; UGANDA.

The effect of flat and ridge planting and planting method on disease incidence and severity in Ugandan cassava var. Ebwanateraka was investigated. Planting methods were 1 cutting planted inclined with part of the cutting above the soil surface; 1 cutting planted horizontally and completely covered; 2 cuttings planted horizontally parallel and completely covered; and 2 cuttings planted horizontally crossed and completely covered. Diseases assessed were CBB, CAMD, Gloeosporium manihotis, Cercosporidium henningsii, Cercospora vicosae, Phaeoramularia manihotis, and Botryodiplodia theobromae. Seedbed types and planting methods significantly affected the severity of CBB, Gloeosporium manihotis, Bemisia spp., and CAMD, but not that of the rest. CBB was more severe in plants from single cuttings planted inclined. G. manihotis lesions were significantly greater in cassava planted on the flat than on ridges, and in 1- and 2-cutting plantings planted horizontally. Cassava planted from 1 or 2 cuttings buried horizontally was more favorable to Bemisia spp. and, therefore, to CAMD. Root yields and quality of were not affected by treatments. (CIAT)

1163

29100 OTIM NAPE, G.W. 1978. The incidence and severity of cassava bacterial blight (CBB) in Uganda (1976-1977) and the effect of soil nutrient status. Uganda, Serere Research Station. 4p. Fn.,Dat.num.

CASSAVA; CASSAVA BACTERIAL BLIGHT; CULTIVARS; SOIL ANALYSIS; PEST DAMAGE; UGANDA.

The incidence and severity of CBB in Uganda in 1976/77 and its relation with soil nutrient status is presented in table form. Data provided for 23 districts and their counties and subcounties include cassava var. affected, symptoms, percentage of fields with infection, CBB severity score, soil type, CEC, percent base saturation, and soil pH, N, P, K, and organic C. (CIAT)

1164

29096 OTIM-NAPE, G.W.; ODONGO, B. 1984. Cassava production in Uganda. In Greathead, A.H.; Markham, R.H.; Murphy, P.J.; Murphy, S.T.; Robertson, I.A.D., eds. Integrated pest management of cassava green mite; regional training workshop in East Africa, 1984. Proceedings. Ascot, United Kingdom, Commonwealth Institute of Biological Control. pp.113-120. Fn.,Sum. Fn., 9 Ref. (Root Crops Programme, Serere Agricultural Research Station, PO Soroti, Uganda)

CASSAVA; PRODUCTION; STATISTICAL DATA; ROOT PRODUCTIVITY; MONONYCHELLUS TANAJOA; CULTIVARS; RESISTANCE; PLANT BREEDING; UGANDA.

Farming practices and cassava utilization in Uganda are described. Bacterial, viral, and fungal diseases are listed. Estimates of cassava yield loss and annual cassava green mite (CGM) population trends are given. Chemical control of CGM is thought to be uneconomic and possible biological control agents are discussed. Current work on improving cassava production,

primarily concerned with improving host plant resistance, is described. An expt. to determine population fluctuations of CGM and to identify the most resistant local var. is also described. (AS)

1165

32212 OTIM-NAPE, G.W.; INGOOT, D. 1987. Effect of cultural practices on the African cassava mosaic disease and its vector, Bemisia tabaci. In Terry, E.R.; Akoroda, M.O.; Arene, O.B., eds. Triennial Symposium of the International Society for Tropical Root Crops- Africa Branch, 3d, Owerri, Nigeria, 1986. Tropical root crops; root crops and the African food crisis: proceedings. Ottawa, Canada, International Development Research Centre. pp.105-108. Fn.,Sum. Fn., 10 Ref., Il. (Serere Agricultural Research Station, Soroti, Uganda)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; BEMISIA; CUTTINGS; PLANTING; SPACING; TIMING; UGANDA.

The effects of plant spacing, planting time, and no. of cassava shoots on the incidence and severity of CAMD were studied in 2 split-plot expt. Cassava canopy temp., RH, whitefly (Bemisia tabaci) population, and CAMD incidence and severity were recorded bimonthly from 4 to 14 mo. after planting. Cassava canopy temp. significantly increased with wider spacing, but RH was not affected by any treatment. The whitefly population and the incidence and severity of CAMD increased with delayed planting and reached a peak for cassava planted in Aug. CAMD incidence also increased with wider spacing and decreased significantly with increases in the no. of cassava shoots/stand. The effects of the treatments on CAMD are discussed. (AS)

1166

30084 P'OBWOYA, O.; EMOKOL, W. 1985. Effects of spacing and number of shoots on growth and yield of cassava. In National Root Crops Improvement Programme. Annual Report July 1984-June 1985. Uganda, Serere Agricultural Research Station. pp.29-31. En.

CASSAVA; PLANTING; CUTTINGS; SPACING; ROOT PRODUCTIVITY; SHOOTS; GROWTH; UGANDA.

The effects of 4 different spacings (a, 0.50 x 0.50 m; b, 0.50 x 0.75 m; c, 0.75 x 0.75 m; d, 1.0 x 1.0 m) on the no. of marketable roots of single, double, and multishoot cassava plants were investigated under Serere and Nakabango (Uganda) conditions. Yields increased at greater spacings, being highest for treatment d (av. 191.0 marketable roots) followed by c, b, and a (167.0, 159.0, and 94.4 marketable roots, resp.). The highest no. of marketable roots was achieved by multishoot plants with treatment d (242.0). In general, the single, double, and multishoot plants gave the highest no. of marketable roots at the wider spacing in treatment d. (CIAT)

1167

30087 P'OBWOYA, O.; EMOKOL, W. 1985. Intercropping sweet potato with cassava and beans. In National Root Crops Improvement Programme. Annual Report July 1984-June 1985. Uganda, Serere Agricultural Research Station. pp.35-37. En.

CASSAVA; INTERCROPPING; SWEET POTATOES; UGANDA.

The effects of intercropping cassava, beans, and maize with sweet potato on sweet potato yields were investigated at the Nakabango Var. Trial Centre, Uganda. Of the 3 species, cassava was found to reduce sweet potato yields (59.3 percent) and quality the most. The pronounced effect of cassava on sweet potato could be due to shading. (CIAT)

1168

30081 P'OBWOYA, O.; BUA, A.; EMOKOL, W.; OTIM NAPE, G.W.; ETOLIM, O. ; OJILONG, A. 1985. On-farm survey of root crops-based farmers. In National Root Crops Improvement Programme. Annual Report July 1984-June 1985. Uganda, Serere Agricultural Research Station. pp.11-23. En.,Sum. En., Il.

CASSAVA; ON-FARM RESEARCH; CULTIVATION; SURVEYS; CULTIVATION SYSTEMS; CULTIVARS; SOCIOECONOMIC ASPECTS; ECONOMICS; PRODUCTION; PRODUCTIVITY; UGANDA.

The results of an on-farm survey conducted in the important cassava and sweet potato growing areas of Eastern Region of Uganda (counties of Serere, Soroti, Kumi, Pallisa, Tororo, and West Budama) are reported. Two main recommendation domains (cattle owners and nonowners and farmers in fertile and less fertile areas) were identified and surveyed. Aspects such as land holding, sources and use of farm power, farm and farmer characteristics (climate, soils, socioeconomic aspects, land tenure, market, and credit facilities), farming systems, and production constraints are described. Cassava was found to be the priority crop and the preferred food in the area surveyed. Cassava performance is described and the cropping calendar in the region is given. Cassava var. planted are listed, the most widespread being Ebwanateraka. Data is provided on the availability of land and labor for cassava and other crops, as well as on sources of family income; cassava is considered the most important by 60 percent of the farmers surveyed. Cultural practices and production methods of cassava are briefly described. Production constraints identified include overdependence on 1 var., diseases and pests (CBB, CAMV, Gloeosporium manihotis, Mononychellus tanajoa), soil fertility, weeds, the lack of long-term var. and adequate marketing channels. (CIAT)

1169

30082 P'OBWOYA, O.; EMOKOL, W. 1985. Optimum stake length for cassava. In National Root Crops Improvement Programme. Annual Report July 1984-June 1985. Uganda, Serere Agricultural Research Station. pp.25-27. En.

CASSAVA; CUTTINGS; SELECTION; CULTIVARS; ROOT PRODUCTIVITY; DRY MATTER; PLANT HEIGHT; PLANT DEVELOPMENT; UGANDA.

Cutting lengths of 15, 20, 25, 30, 35, and 40 cm were tested in Uganda to determine the optimum length for improved cassava var. Ebwanateraka and Bakalasa 11. Cuttings were planted horizontally 10-15 cm deep and completely covered with soil. No significant differences were observed between var. nor between var. x cutting length interactions. Significant differences (P = 0.05) were observed between cutting lengths regarding plant height, no. of shoots/plant, and stem thickness. Ebwanateraka always outyielded Bukalasa 11 (av. of 41.4 and 31.4 t/ha, resp.). Results showed that there were no significant differences in DM content (35.6 and 35.5 percent) and utilization index (1.45 and 1.75) between Ebwanateraka and Bukalasa 11, resp., and among cutting lengths. The results tended to show that cutting lengths of 25-30 cm are generally beneficial for both var., gaving the highest root yields: 49.8 and 51.2 t/ha for Ebwanateraka and 42.3 and 30.9 t/ha for Bukalasa 11, resp. (CIAT)

1170

30083 P'OBWOYA, O.; EMOKOL, W. 1985. The effects of type of seedbed and methods of planting cassava on growth and yield of the crop. In National Root Crops Improvement Programme. Annual Report July 1984-June 1985. Uganda, Serere Agricultural Research Station. pp.27-29. En.

CASSAVA; CUTTINGS; PLANTING; LAND PREPARATION; ROOT PRODUCTIVITY; UGANDA.

Local Ugandan cassava var. Ebwanateraka was planted in seedbeds on ridges or on the flat using 4 planting methods: 2 cuttings/hole in a cross; 2 cuttings/hole in parallel; 1 cutting/hole horizontally; and 1 cutting/hole inclined. Their effects on root yield and quality were assessed. No significant differences (P = 0.05) were observed in root yield and quality between the planting methods and seedbed types. Av. root yields for ridge and flat planting were 926.0 and 927.8 kg/ha, resp. (CIAT)

1171

29303 P'OBWOYA, O. 1986. The exploratory survey. Detailed guidelines for discussions with farmers (Used in Teso and Tororo 1984-85 and Longo 1986). Uganda, National Root Crops Improvement Programme. Serere Research Station. 12p. En.

CASSAVA; CULTIVATION; ON-FARM RESEARCH; SOCIOECONOMIC ASPECTS; QUESTIONNAIRES; SURVEYS; UGANDA.

The model questionnaire used to interview Uganda farmers in Teso and Tororo in 1984-85 and in Longo in 1986 on farming systems is presented. Specific questions on cassava are addressed regarding crops (area and yield), var. grown, planting and harvesting dates, and food preferences; production practices and causes of losses; land, labor, and cash availability; and general production systems (land preparation, planting, and pest and disease control). (CIAT)

1172

29247 WARREN, A., comp. 1987. Uganda: distribution of cassava production. Uganda. En., 1 map.

CASSAVA; PRODUCTION; MAPS; UGANDA.

1173

29255 WARREN, A., comp. 1987. Uganda: forms of eating cassava. Serere, Uganda. En., 1 map.

CASSAVA; USES; MAPS; UGANDA.

ZAIRE

1174

31629 L'EVOLUTION DU marché du manioc. (The evolution of the cassava market). Marchés Tropicaux et Méditerranéens no.1674:3414. 1977. Fr.

CASSAVA; STATISTICAL DATA; PRODUCTION; CASSAVA CHIPS; CASSAVA ROOTS (VEGETABLE); PRICES; ZAIRE.

Prices trends of cassava chips (50-kg sack) in Kinshasa, Zaire, are analyzed for the 1972-77 period. Production estimates of cassava roots and cassava chips for the 1975-80 period are also included. (CIAT)

1175

31397 BUREAU D'ANALYSE ECONOMIQUE DU SERVICE D'ETUDES ET PLANIFICATION DU DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. ZAIRE. 1986. Synthese de la situation actuelle de l'agriculture Zairose. Projet d'Etudes Sectorielles de l'Agriculture. Projet 070. (Synthesis of the current agricultural situation in Zaire. Agricultural studies. Project 070). Kinshasa, Zaire, 93p. Fr., 29 Ref., Il.

CASSAVA; TRADE; PRICES; STATISTICAL DATA; PRODUCTION; MARKETING; MAPS; ECONOMICS; ZAIRE.

The current situation of production and commercialization of major food crops (including cassava) in Zaire is summarized. Some recommendations for policy improvement in the agricultural sector are given. A synthesis of the situation of the agro-industrial sector is also included. (CIAT)

1176

31398 INSTITUT NATIONAL DE LA STATISTIQUE. ZAIRE. 1982. Annuaire statistique du Zaire 1979. (1979 Zaire statistics yearbook). Zaire, Commissariat Général au Plan. v.3,pp.1-8,107-268,480-495. Fr., Dat.num.

CASSAVA; PRICES; CASSAVA FLOUR; CASSAVA CHIPS; CASSAVA ROOTS (VEGETABLE); CASSAVA LEAVES (VEGETABLE); CHICKWANGUE; CONSUMPTION; STATISTICAL DATA; ZAIRE.

Statistics are presented on the evolution of av. retail prices of various cassava products in different Zairian markets in 1976-78. Data are given on cassava flour, chips, tubers, leaves, and chickwangue for the Kinshasa and Kisangani markets for 1978-79 and 1979, resp. For the Matadi, Kikwit, Lubumbashi, Bukavu, Kananga, and Mbuji-Mayi markets, data are given on the same products except for chickwangue. Statistics for 1978 are also included for the last 3 markets. (CIAT)

1177

24613 INSTITUT NATIONAL POUR L'ETUDE AGRONOMIQUE DU CONGO BELGE. 1951. Legumineuses: Phaseolus vulgaris. (Legumes: Phaseolus vulgaris). In Institut National Pour l'Etude Agronomique du Congo Belge. Rapport Annuel 1951. Zaire, Station de Nioka. pp.15-18,31-35. Fr.

CASSAVA; FERTILIZERS; ROTATIONAL CROPS; INTERCROPPING; PRODUCTIVITY; PLANTING; ZAIRE.

The results of 3 expt. on cassava in Zaire are presented. The 1st studied the effects of different fertilizer rates (400, 600, and 1000 kg Reno superphosphate/ha and 600 kg Reno superphosphate + 40 t manure/ha) applied at the beginning of the rotation scheme beans/sunflower/beans/maize/cassava/beans on cassava relative yields compared with an unfertilized control. The lowest relative yield increase (7.2 percent) was obtained by cassava. No significant differences in cassava yields were observed in a 2nd expt. between the traditional method of burning crop residues and the practices of burying them or using them as a mulch. In a 3rd expt. of intercropping cassava with other species, cassava yields harvested 24 mo. after planting were 40,388 kg/ha when sole cropped and 32,833, 27,169, 37,950, 35,804, and 33,109 kg/ha when intercropped with maize, beans, Eleusine, Amarante, and Eleusine and Amarante, resp. Protein content of cassava increased in the association with beans. In the association beans-Eleusine-cassava, the Eleusine should be planted about 1 mo. after beans. (CIAT)

1178

30394 INSTITUT NATIONAL POUR L'ETUDE AGRONOMIQUE DU CONGO BELGE. 1951. Manihot utilissima. In Institut National pour l'Etude Agronomique du Congo Belge. Rapport Annuel 1951. Zaire, pp.70-73. Fr.

CASSAVA; GRAFTING; CULTIVARS; SELECTION; SEED; ROOT PRODUCTIVITY; GERMINATION; ZAIRE.

The main results of research carried out on cassava during 1950 in Zaire are reported. Clones from Zaire, Ivory Coast, Zimbabwe, Sri Lanka, and

Madagascar were introduced. Saccharification trials showed the best results when sulfuric acid was used at 5 percent for an immersion time of 1-2 min. High variability was observed among the different clones tested in the grafting trials. Finally, preliminary results of selection trials were nonsignificant. (CIAT)

1179

30393 INSTITUT NATIONAL POUR L'ETUDE AGRONOMIQUE DU CONGO BELGE. 1950. Manihot utilissima Cassava. In Institut National pour l'Etude Agronomique du Congo Belge. Rapport Annuel 1950. Zaire, pp.54-57. Fr.

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; SELECTION; CULTIVARS; ANALYSIS; ROOT PRODUCTIVITY; PLANT DEVELOPMENT; HCN CONTENT; PROTEIN CONTENT; LEAVES; RESISTANCE; ZAIRE.

The main results of research carried out on cassava during 1949 in Zaire are reported. From 48 clones introduced, only 6 from Yangambi (Agwetuke, Ongenabutu, Lilanga, Yabongo, Basekalongo, and Kapitula) showed resistance to CAMV. Clones 0129/45/11 and 0442/45/15 were selected for further trials. The length:width ratio of the middle leaflet of the cassava leaf was determined; it was found that this parameter could not be used as an intervarietal parameter. The max. permissible threshold of toxicity allowed for export products was 0.02 percent (on a dry wt. basis). Protein content in young (5 mo. old) and mature leaves (8.5 mo. old) was 35.2 and 32.5 percent, resp. (on a dry wt. basis). No correlation was observed between protein content and toxicity. (CIAT)

1180

30399 INSTITUT NATIONAL POUR L'ETUDE AGRONOMIQUE DU CONGO BELGE. 1957. Manioc (Manihot utilissima). (Cassava). In Institut National pour l'Etude Agronomique du Congo Belge. Rapport Annuel 1957. Zaire, pp.51-53. Fr.

CASSAVA; CULTIVARS; SELECTION; ROOT PRODUCTIVITY; ZAIRE.

The main results of research carried out on cassava during 1956 in Zaire are reported. Seed harvested from polyclonal fields continued to be sent to the expt. stations interested in selection trials. From these trials, clones Nguma, Ikele Moke, and Ongenabutu were selected as superior based on their high yields (30.4, 26.6, and 26.6 t/ha, resp.) compared with check var. Aipi Valenca (17.6 t/ha). (CIAT)

1181

30400 INSTITUT NATIONAL POUR L'ETUDE AGRONOMIQUE DU CONGO BELGE. 1958. Manioc (Manihot utilissima). (Cassava). In Institut National pour l'Etude Agronomique du Congo Belge. Rapport Annuel 1958. Zaire. pp.48-50. Fr.

CASSAVA; CULTIVARS; SELECTION; ROOT PRODUCTIVITY; ZAIRE.

The main results of research carried out on cassava during 1956 in Zaire are reported. The distribution of seed harvested from polyclonal fields was completed. Introduction of mosaic-resistant clone Gimbi 57 is highlighted. Based on their root productivity, clones Base-kalongo and Ongenabutu were considered superior (37.6 and 35.6 t/ha, resp.) compared with the check (28.8 t/ha). (CIAT)

1182

30397 INSTITUT NATIONAL POUR L'ETUDE AGRONOMIQUE DU CONGO BELGE. 1954. Manioc (Manihot utilissima). (Cassava). In Institut National pour l'Etude Agronomique du Congo Belge. Rapport Annuel 1954. Zaire, pp.62-71. Fr. Dat.num., Il.

CASSAVA; CULTIVARS; SELECTION; ROOT PRODUCTIVITY; ZAIRE.

The main results of research carried out on cassava during 1953 in Zaire are reported. Seed harvested from polyclonal fields was sent to the expt. stations interested in selection. Selection trials showed that clones 02864, 0704, 0443, 02945, 0442, 0129, 0128, and 02715 were outstanding on the basis of their root yields. Clones 02991 and 03119 were resistant to lodging. Similar yield results were observed with clones 0443/45/7, 0129/45/11, and X 45/5. (46.2, 40.0 and 39.8 t/ha, resp.). (CIAT)

1183

30396 INSTITUT NATIONAL POUR L'ETUDE AGRONOMIQUE DU CONGO BELGE. 1953. Manioc (Manihot utilissima). (Cassava). In Institut National pour l'Etude Agronomique du Congo Belge. Rapport Annuel 1953. Zaire, pp.67-71. Fr.

CASSAVA; CULTIVARS; SELECTION; CASSAVA AFRICAN MOSAIC VIRUS; SEED; ROOT PRODUCTIVITY; STARCH PRODUCTIVITY; RESISTANCE; HARVESTING; AGRICULTURAL EQUIPMENT; PLANT INJURIES; ZAIRE.

The main results of research carried out on cassava during 1952 in Zaire are reported. Seed harvested from the polyclonal fields was sent to the expt. stations interested in selection. In the selection trials, clones 0129/45/11 and 0443/45/7 yielded 42.4 t/ha each and mo-saic incidence was 2.4 and 8.4 percent, resp.; however, they did not show resistance to lodging. The effectivity of manual (with the aid of a bar) and mechanical harvesting of cassava tubers was compared. Mechanical harvesting was found to be the best since the tubers harvested showed no wounds, and consequently, no yield losses occurred. (CIAT)

1184

30398 INSTITUT NATIONAL POUR L'ETUDE AGRONOMIQUE DU CONGO BELGE. 1956. Manioc (Manihot utilissima). (Cassava). In Institut National pour l'Etude Agronomique du Congo Belge. Rapport Annuel 1956. Zaire, pp.68-70. Fr.

CASSAVA; CULTIVARS; SELECTION; RESEARCH; CASSAVA AFRICAN MOSAIC VIRUS; ROOT PRODUCTIVITY; STARCH PRODUCTIVITY; DRY MATTER; ZAIRE.

The main results of research carried out on cassava during 1955 in Zaire are reported. Seed harvesting from polyclonal fields continued and in the nurseries issued from such seed, the resistance to mosaic was noted. In the selection trials, clone 0442/45/15 was found to be resistant to root rot, mosaic, and lodging. It also had high DM and starch contents. Data is also included on fresh root yield, percentage DM, and starch content for 11 elite clones and 4 others in the gene pool. (CIAT)

1185

30392 INSTITUT NATIONAL POUR L'ETUDE AGRONOMIQUE DU CONGO BELGE. 1949. Manioc (Manihot utilissima). (Cassava). In Institut National pour l'Etude Agronomique du Congo Belge. Rapport Annuel 1949. Zaire, pp.23-26. Fr.

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; SELECTION; RESISTANCE; CULTIVARS; GRAFTING; HCN CONTENT; LABOR; HARVESTING; PEELING; STEEPING; ZAIRE.

The main results of research carried out on cassava during 1948 in Zaire are reported. Of 9 clones introduced, only 1 (E29) showed resistance to CAMD. In the selection trials, clones 0443/45/15, 0129/45/11, 0129/45-17, X45/5, 0707/45/8, 0443/45/17, 0749/45/4, and 0442/45/15 performed the best, with theoretical yields ranging from 26,750 to 43,150 kg/ha. The HCN content of 18 clones varied from 4.90 to 125.75 mg/100 g DM; however, after drying at 60 degrees Celsius, HCN content was less than 1 mg in all the clones. Yield reductions (35-69 percent) were observed in grafting trials. In harvesting

trials, it was found that 1 man was able to harvest 25.9 plants/h, 4 h were necessary to place 1 t in the vehicle and to transport it a distance of 57 m. Finally, 1 man can peel and steep 19.40 and 8.25 kg/h, resp. (CIAT)

1186

30395 INSTITUT NATIONAL POUR L'ETUDE AGRONOMIQUE DU CONGO BELGE. 1952. Manioc (Manihot utilissima). (Cassava). In Institut National pour l'Etude Agronomique du Congo Belge. Rapport Annuel 1952. Zaire, pp.68-76. Fr.

CASSAVA; SEED; GERMINATION; SELECTION; CASSAVA AFRICAN MOSAIC VIRUS; PROPAGATION; ROOT PRODUCTIVITY; RESISTANCE; CULTIVARS; ZAIRE.

The main results of research carried out on cassava during 1951 in Zaire are reported. In germination trials, the check treatment (seeds with caruncle) was better than the other treatments (immersion in H2O2 at 2, 5, and 10 percent during 3, 6, and 9 h, resp., and H2SO4 at the same concn. at 2, 4, and 6 h, resp.); the effect of H2SO4 on germination was negative. In the se-lection trials, clones 0443, 02961, 0129, 0704, 0442, 0128, and 02715 showed the lowest percentage of mosaic symptoms (1-8 percent). (CIAT)

1187

30896 PROGRAMME NATIONAL DE MANIOC. ZAIRE. 1985. Objectifs, historique, réalisations et travaux en cours. (Objectives, background, accomplishments, and studies in progress). Zaire, Département de l'Agriculture et du Développement Rural. 18p. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; ENTOMOLOGY; CULTIVARS; RESISTANCE; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; PHENACOCCUS MANIHOTI; TIMING; SPACING; LAND PREPARATION; CUTTINGS; WEEDING; HARVESTING; LEAVES; INTERCROPPING; CASSAVA AFRICAN MOSAIC VIRUS; GLOMERELLA CINGULATA; PREDATORS AND PARASITES; NIGERIA; ZAIRE.

Zaire is highlighted as the 3rd cassava-producing country in the world and the 1st in Africa. The importance of this tuber crop in human feeding is mentioned. The background, characteristics, and objectives of the Programme National Manioc, established in 1974 in collaboration with the International Institute of Tropical Agriculture (Nigeria), are presented. Selection and plant breeding, agronomy, entomology, pathology, and multiplication/extension activities are conducted by 5 subprograms. Their outlines, objectives, accomplishments, and current research work are described in detail. The selection and plant breeding subprogram obtained promising var. such as 30085/28 (Kinuani, CBB-resistant), F100 (high yielding), and clone 70453 (cassava mealybug-resistant). The agronomy subprogram presented recommendations on land preparation; planting time, material, and density; weed control; leaf harvesting; and associated crops. The pathology subprogram developed effective methods for screening CBB and CAMV resistance; important information was obtained on anthracnose etiology. The effectiveness of Epidinocarsis lopezi, a cassava mealybug parasite, was evaluated by the entomology subprogram. Finally, the amount of planting material from improved var. distributed among farmers in lower Zaire and Bandundu is indicated as well as the total area planted for improved clone multiplication. (CIAT)

1188

31304 PROGRAMME NATIONAL MANIOC. ZAIRE. 1983. Agronomie. (Agronomy). In Programme National Manioc. Zaire. Rapport Annuel 1983. Zaire , Département de l'Agriculture et du Développement Rural. pp.A1-A9. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; ROOT PRODUCTIVITY; PLANTING; SPACING; N; K; FERTILIZERS; INTERCROPPING; GROUNDNUT; BEANS; MULCHING; RESISTANCE;

XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CASSAVA AFRICAN MOSAIC VIRUS; GLOMERELLA CINGULATA; ZAIRE.

In 1983 the Programme National Manioc of Zaire conducted various studies on the effect of planting density and soil fertility level on the performance of improved var., and the effect of NPK fertilization on cassava yields. Other studies were carried out on differences between planting cassava on ridges or on flat land, productivity of associated crops, effect of late planting in cassava intercropped with beans, and on-farm trials. The improved var. 02864 gave the highest yields; significant differences were observed among var. in response to plant density. Local var. Mpelolongi gave the lowest yields at 10,000 plants/ha; however, when planted at 20,000 plants/ha, yields increased more than 50 percent. Cassava showed a response to N and K fertilization when 75 and 100 kg/ha, resp. were applied. The major advantages of planting cassava on ridges were better soil physical conditions in the rooting area and good weed control. The productivity of associated crops (cassava-groundnut) was high when the former was planted on ridges. An increase in cassava yields was observed when a rice straw mulch was used in the cassava-beans association. In farm trials Kinuani yielded more than local var. and its resistance to CBB, CAMV, and anthracnose was better. (CIAT)

1189

31517 PROGRAMME NATIONAL MANIOC. ZAIRE. 1982. Agronomie. (Agronomy). In Programme National Manioc. Zaire. Rapport Annuel 1982. M'vuazi, Zaire, Institut National pour l'Etude et la Recherche Agronomiques. Département de l'Agriculture. pp.A1-A12. Fr., 11.

CASSAVA; CASSAVA PROGRAMS; CUTTINGS; PLANTING; TIMING; HARVESTING; CASSAVA LEAVES (VEGETABLE); ROOT PRODUCTIVITY; INTERCROPPING; FERTILIZERS; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; BEANS; MAIZE; GROUNDNUT; MULCHING; ORGANOLEPTIC EXAMINATION; ZAIRE.

Research activities conducted on agronomic aspects of cassava by the Programme National Manioc (Zaire) in 1981-82 are presented. Activities were oriented towards conservation of cuttings, effect of time of planting, land preparation, and fertilization. Other work dealt with associated crops, straw mulch effect, leaf harvesting, clone evaluation for leaf production, and cultural practices for cassava in the 2nd season. The highest percentage (88 percent) of rooting was obtained when cuttings were stored in a shed; time of storage reduced this percentage. Yield reductions ranging from 25 to 44.8 percent and from 17.6 to 33.8 percent were observed in var. 02864 and Mpelolongi, resp., when planting was delayed. Higher yields were obtained when cassava was planted on hoe-prepared ridges compared with tractor-prepared flat land. The use of fertilizers also played an important role in determining cassava yields. The cassava-groundnut association did not significantly affect cassava yields whereas the association with maize resulted in higher cassava yield reductions. Yield increases were observed in 6 var. when straw coverage was used in the 2nd season; pest attack (mealybugs and green mites) was also reduced. Cassava yields were reduced when leaves were harvested in the dry season. A table is included with the characteristics and quality of young leaves from 30 clones evaluated for leaf production potential. The advantage of using straw mulch was confirmed when cassava was planted in the 2nd season. The use of straw mulch and fertilizers in the cassava-beans association resulted in increased cassava yields. (CIAT)

1190

31508 PROGRAMME NATIONAL MANIOC. ZAIRE. 1979. Agronomie de manioc. (Cassava agronomy). In Programme National Manioc. Zaire. Rapport Annuel 1979.

M'vuazi, Zaire, Institut National pour l'Etude et la Recherche Agronomiques. Département de l'Agriculture. pp.17-25. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; INTERCROPPING; GROUNDNUT; MAIZE; PLANTING; CUTTINGS; WEEDING; ROOT PRODUCTIVITY; TIMING; PLANT DEVELOPMENT; PLANT HEIGHT; HARVEST INDEX; LEAF AREA; ZAIRE.

Research on cassava agronomy carried out by the Institut National pour l'Etude et la Recherche Agronomiques (Zaire) in 1978- 79 are reported. Studies on associated crops and influence of time of planting are described as well as a field study of planting material commonly used by farmers. The performance of cassava is analyzed under different levels of cultural techniques (use of local or improved var., time of planting and weeding, combination of crops, fertilization, and pest control). Future activities are listed. (CIAT)

1191

31512 PROGRAMME NATIONAL MANIOC. ZAIRE. 1980. Agronomie du manioc. (Cassava agronomy). In Programme National Manioc. Zaire. Rapport Annuel 1980. M'vuazi, Zaire, Institut National pour l'Etude et la Recherche Agronomiques. Département de l'Agriculture. pp.19-26. Fr.

CASSAVA; CASSAVA PROGRAMS; WEEDING; INTERCROPPING; GROUNDNUT; ROOT PRODUCTIVITY; PEST CONTROL; CUTTINGS; PLANTING; TIMING; HCN CONTENT; LEAVES; CASSAVA AFRICAN MOSAIC VIRUS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; GLOMERELLA MANIHOTIS; RESISTANCE; DISEASE CONTROL; ZAIRE.

Research activities on cassava agronomy carried out by the Institut National pour l'Etude et la Recherche Agronomiques in Zaire in 1979-80 are reported. These dealt with cultural practices, cultivation systems, integrated pest control, appropriate age of cuttings, and HCN content of germplasm. Current research activities and projects are listed. (CIAT)

1192

31502 PROGRAMME NATIONAL MANIOC. ZAIRE. 1978. Amélioration: recombinaison. (Plant breeding: recombination). In Programme National Manioc. Zaire. Rapport Annuel 1978. M'vuazi, Zaire, Institut National pour l'Etude et la Recherche Agronomiques. Département de l'Agriculture. 15p. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; ROOT PRODUCTIVITY; PHENACOCCUS MANIHOTI; RESISTANCE; FOOFOO; CHICKWANGUE; PALATABILITY; CULTIVARS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; GLOMERELLA CINGULATA; CASSAVA AFRICAN MOSAIC VIRUS; ZAIRE.

Research conducted on cassava plant breeding in Zaire in 1978 is reported. Recombination was studied and a seedling nursery and preliminary yield trials were established. Other research areas were host plant resistance to the cassava mealybug, selection and seedling evaluation, and advanced yield trials. On-farm trials were carried out and the quality of processed products was also evaluated. BRW 23 TMI 6134, BRW 74-1, and BRW 117-1 TMI 6096 showed resistance to the cassava mealybug. A table is included with yields and resistance to major diseases of the cv. tested in the selection studies. Clones 30174/2, 30344/6, 30179/2, and 30070/4 performed best in the advanced yield trial. Yields from on-farm trials were similar to those from the Programme National Manioc exptl. plots. A table is included showing the suitability of clones from the Programme National Manioc for foofoo or chickwangue preparation. Finally, studies in progress and those planned for 1979 are listed. (CIAT)

1193

31306 PROGRAMME NATIONAL MANIOC. ZAIRE. 1983. Entomologie. (Entomology). In Programme National Manioc. Zaire. Rapport Annuel 1983. Zaire , Département de l'Agriculture et du Développement Rural. pp.E1-E24. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; PHENACOCCUS MANIHOTI; MAPS; PEST DAMAGE; MONONYCHELLUS TANAJOA; PREDATORS AND PARASITES; RAINFALL; ZAIRE.

Research conducted by the entomology section of the Programe National Manioc (Zaire) in 1982-83 is reported. Surveys were carried out on the cassava mealybug and the cassava green mite. The distribution and injuries caused by the cassava mealybug were determined. An analysis of temporary variations of injuries caused by the cassava mealybug is presented along with considerations on the biological control of the cassava mealybug. Maps are included showing the geographical distribution of cassava cultivation and of the cassava mealybug in Zaire, no. of mealybug generations during a 90-day dry season, severity of injuries caused by the pest during the same period, and areas of western Zaire threatened by mealybug outbursts during dry periods. Injuries involved parameters such as total rainfall during the 5 dry mo. (May-Sept.); rainfall distribution and RH at 15:00 for the same period; and no. of rainy days in the short dry season (25 dry days from Jan. to Feb.). Major results of releases of various mealybug natural enemies (i.e. Exochomus flaviventris, Hyperaspis senegalensis, Epidinocarsis lopezi, Diomus sp., Anagyrus sp.) are discussed. A diagram illustrating the relationships between mealybug parasites and predators within the trophic chain is included. The hyperparasitism rate of E. lopezi was also determined. (CIAT)

1194

31519 PROGRAMME NATIONAL MANIOC. ZAIRE. 1982. Entomologie. (Entomology). In Programme National Manioc. Zaire. Rapport Annuel 1982. M'vuazi, Zaire, Institut National pour l'Etude et la Recherche Agronomiques. Département de l'Agriculture. pp.E1-E11. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; MONONYCHELLUS TANAJOA; MAPS; ZAIRE.

Results of research conducted on cassava entomology by the Programme National Manioc (Zaire) in 1981-82 are reported. Topics covered distribution of the cassava mealybug in Zaire, its native natural enemies, imports and release of exotic natural enemies, and mass breeding of natural enemies. Other activities included dissemination of the cassava mealybug and study of the cassava mealybug x cassava green mite interaction. A map showing the cassava mealybug dissemination in Zaire from 1970 to 1982 is included. Dicrodiplosis manihoti, Exochomus flaviventris, and Hyperaspis senegalensis were the most abundant natural enemies. Preliminary results from releases of Diomus sp., Apoanagyrus lopezi, and Hyperaspis (?) jucunda, 3 exotic natural enemies of cassava mealybug, are presented and analyzed. A map is included with the sites in lower Zaire and Kinshasa where they were released from Feb. to Aug., 1982. Mass breeding of Diomus sp. was unsuccessful. A graph is included showing the dissemination of the cassava mealybug in Mbanza-Ngungu in 1981. Regarding the cassava mealybug x cassava green mite interaction, in greenhouse conditions cassava plants attacked by green mites became more susceptible to the attack of mealybug nymphs. Finally, research activities planned for 1983 are listed. (CIAT)

1195

31504 PROGRAMME NATIONAL MANIOC. ZAIRE. 1978. Entomologie. (Entomology). In Programme National Manioc. Zaire. Rapport Annuel 1978. M'vuazi, Zaire, Institut National pour l'Etude et la Recherche Agronomiques. Département de l'Agriculture. 21p. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; PREDATORS AND PARASITES; MAPS; ROOT PRODUCTIVITY; PLANTING; TIMING; CUTTINGS; INSECTICIDES; HOT WATER TREATMENTS; ZAIRE.

A list of the main cassava pests reported in Zaire is presented with information on the part of the plant attacked and estimates on yield losses. Phenacoccus manihoti and Mononychellus tanajoa were the major pests. A map showing their distribution in lower Zaire and Bandundu is included as well as a table indicating natural enemies and severity of the pests in both regions. M. tanajoa also occurs in upper Zaire and Kivu. The possible reasons for the presence of the cassava green mite are discussed. No significant yield decreases were observed when cassava was planted in Nov. (humid season) since the cassava mealybug is a dry-season pest. A list of the natural enemies associated with the cassava mealybug in Zaire is included; Chilocorus nigritus and Hyperaspis hottentotta were the predominant predators and Anagyrus sp. the predominant parasite. Preliminary results of the introduction of exotic natural enemies in Zaire in 1978 are given. The immersion of cassava cuttings in dimethoate at 0.1 percent during 5 min or in hot water at 50 degrees Celsius during 30 min was a good control measure for the cassava mealybug. The presence of Oligota sp., a cassava green mite predator, was reported. Trials to determine its effectiveness against M. tanajoa were unsuccessful. Current research projects on entomology are listed as well as activities for 1979. (CIAT)

1196

31561 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Entomologie. (Entomology). In Programme National Manioc. Zaire. Rapport Annuel 1984. Kinshasa, Zaire, Département de l'Agriculture et du Développement Rural. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.85-114. Fr., Il.

CASSAVA; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; PREDATORS AND PARASITES; BIOLOGICAL CONTROL; MAPS; PLANT INJURIES; ZAIRE.

Research on cassava conducted by the entomology section of the Programme National Manioc (Zaire) in 1984 are reported. The geographical distribution and injuries caused by the cassava mealybug were determined. Supplementary releases of natural enemies of the cassava mealybug and the cassava green mite were carried out. Studies on the distribution of Epidinocarsis lopezi were also conducted. Insect species associated with the cassava mealybug were identified and injuries caused by the cassava green mite in lower Zaire were assessed. A map showing the distribution of the cassava mealybug in 1982 is included as well as a graph indicating the rate of injuries caused. The natural enemies of the cassava mealybug introduced at different sites in Zaire in 1982 and 1983 are listed. The major results of studies on the adaptation, distribution, and effectiveness of E. lopezi in controlling the cassava mealybug are given and discussed. A diagram is presented with the trophic relationships between the natural enemy complex and the cassava mealybug. A map is also included showing the regions where the cassava green mite was detected in 1984. Oligota fageli and Neoseiulus fustis are reported as natural enemies of the cassava green mite in lower Zaire. (CIAT)

1197

31535 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Entomologie: biologie de la population de E. lopezi. (Entomology: E. lopezi population biology). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.96-104. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; PHENACOCCUS MANIHOTI; INSECT BIOLOGY; PREDATORS AND PARASITES; ZAIRE.

A survey was carried out in lower Zaire in 1984-85 to study the biology of Epidinocarsis lopezi populations. A graph showing the parasitism percentage of cassava mealybug colonies by E. lopezi is included. Av. parasitism av. rates ranged from 8.5 to 30.1 percent for the 2 seasons (dry and rainy, resp.). Density-dependence between E. lopezi and the cassava mealybug was also determined. The response of density-dependence of E. lopezi decreased when cassava mealybug colonies increased. This was possibly due to: (1) hyperparasitism, (2) superabundance of egg-laying cassava mealybugs, (3) changes in the density of cassava mealybug, and (4) limitations due to parasite egg-laying. No conclusions, however, may be drawn. (CIAT)

1198

31534 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Entomologie: distribution et dégats de la CFM. (Entomology: cassava mealybug distribution and injuries caused to the plant). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.91-96. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; PHENACOCCUS MANIHOTI; MAPS; PEST DAMAGE; ZAIRE.

Maps are included showing the locations and routes surveyed for the presence of the cassava mealybug in Zaire from 1982 to 1985, its current distribution and injuries caused to the crops, and its dissemination from 1973 to 1985. Comments on each map are also included. (CIAT)

1199

31533 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Entomologie: établissement et dispersion d'ennemis naturels. (Entomology: Establishment and dissemination of natural enemies). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.88-91. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; PHENACOCCUS MANIHOTI; PREDATORS AND PARASITES; MAPS; ZAIRE.

Postrelease surveys were conducted at different sites of lower Zaire and Bandundu. Neoseiulus anonymus and N. idaeus (imported natural enemies) released in 1984 were not recovered whereas Epidinocarsis lopezi (a natural enemy of the cassava mealybug) was found in western Zaire in an estimated area of 130,000 square kilometers. Its dissemination in southern Shaba seemed to be slow. A map showing the dissemination of the predator is included. Another imported predator of the cassava mealybug, Diomus sp., was recovered in Kinshasa. Since it had survived at this site for 2 yr, it can be considered as established. (CIAT)

1200

31536 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Entomologie: insectes et acariens nouvellement trouvés associés au manioc. (Entomology: insects and mites found for the first time in association with cassava). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.104-106. Fr.

CASSAVA; CASSAVA PROGRAMS; PREDATORS AND PARASITES; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; ZAIRE.

Fourteen new species of parasites observed in association with cassava in Zaire are listed. Several parasites and hyperparasites (although not found in cassava) are included because they are involved in the food chain of the cassava mealybug. The predator Typhlodromalus saltus (Acari:Phytoseiidae)

seems to be the most important species found in association with this crop; however, its effect on cassava green mite populations has not yet been determined. (CIAT)

1201

31532 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Entomologie: lachers d'ennemis naturels. (Entomology: releases of natural enemies). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.87-88. Fr.

CASSAVA; CASSAVA PROGRAMS; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; PREDATORS AND PARASITES; ZAIRE.

Six species of natural enemies of the cassava mealybug (Allotropa sp., Diomus sp., Epidinocarsis lopezi, Hyperaspis jucunda, H. notata, and Sympherobius maculipennis) and 2 species of natural enemies of the cassava green mite (Neoseiulus anonymus and N. idaeus) were released in Zaire from 1984 to 1985. A table is presented indicating the location, region, no. and date of releases. (CIAT)

1202

31537 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Entomologie: un plan d'échantillonnage pour la cochenille farineuse du manioc. (Entomology: a procedure for sampling the cassava mealybug). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.107-109. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; PHENACOCCUS MANIHOTI; STATISTICAL ANALYSIS; ZAIRE.

A procedure for sampling the cassava mealybug is proposed, illustrated with an example. The procedure involves the use of Taylor's coefficient. (CIAT)

1203

31526 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. La relation entre l'intensité de la couleur des feuilles et le rendement en racines tubéreuses du manioc. (Relationship between leaf color intensity and root yields in cassava). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. p.61. Fr.

CASSAVA; CASSAVA PROGRAMS; LEAVES; ROOT PRODUCTIVITY; SOLAR RADIATION; ZAIRE.

The relationship between leaf color intensity and fresh root yields in cassava was low and nonsignificant ($r = 0.24$). On the contrary, the relationship between leaf color intensity and dry root yields was found positive and significant ($r = 0.31$). Further studies will be performed to confirm these results. (CIAT)

1204

31564 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Multiplication et vulgarisation. (Multiplication and extension work). In Programme National Manioc. Zaire. Rapport Annuel 1984. Kinshasa, Zaire, Département de l'Agriculture et du Développement Rural. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.144-150. Fr., Il.

CASSAVA; CULTIVARS; CASSAVA PROGRAMS; CUTTINGS; PROPAGATION MATERIALS; ZAIRE.

Research conducted by the multiplication and extension section of the Programme National Manioc (Zaire) are reported. Work was concerned with the rapid multiplication of improved var., the distribution of improved planting material among farmers, and the establishment of demonstration fields in collaboration with rural development agencies. Technical assistance was given to different institutions interested in establishing multiplication fields to furnish improved material: 90 ha were devoted to the multiplication of var. Kinuani. Rapid multiplication was used for var. 40230/3, 30572, 61665/4, 30555, 41784/9, 50467/12, and 30344/6/2. Data are given on the amount of cuttings distributed among farmers in Mbanza Ngungu during 1984. The rural development agencies that collaborated with the Programme National Manioc are mentioned. Results of trials with demonstration fields indicated that with local var., compared with local var., Kinuani gave higher yields even when no fertilizers were used. (CIAT)

1205

31544 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Multiplication et vulgarisation au Bandundu. (Multiplication and dissemination in Bandundu). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.139-145. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; TECHNOLOGY TRANSFER; CULTIVARS; CUTTINGS; ZAIRE.

Cassava multiplication and dissemination activities in Bandundu (Zaire) in 1984-85 are briefly described. They included multiplication fields, distribution of improved material, and training. Var. multiplied at the Kiyaka expt. station were F100, F162, F150, and F156. Outside the station, on-farm multiplication and dissemination units were established. A table is included showing the destination of cuttings from improved var. distributed in Bandundu. Training courses dealt with grafting techniques, crop maintenance, harvesting, planting material preservation, and disease and pest control. (CIAT)

1206

31543 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Multiplication et vulgarisation au Bas-Zaire. (Multiplication and dissemination in lower Zaire). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.138-139. Fr.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; MAPS; TECHNOLOGY TRANSFER; CUTTINGS; ZAIRE.

Cassava multiplication and dissemination activities carried out in lower Zaire in 1984-85 are briefly described. These focused on multiplication fields, improved material distribution, and demonstration fields in the farmer's environment. Var. multiplied were Kinuani, F100, 02864, and 30572. A map is included showing the locations where cuttings of var. Kinuani were distributed as well as a table indicating the distribution of planting material in lower Zaire. (CIAT)

1207

31545 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Multiplication et vulgarisation aux Kasai. (Multiplication and dissemination in Kasai). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. p.145. Fr.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; CUTTINGS; TECHNOLOGY TRANSFER; ZAIRE.

The major activities carried out at the Gandajika expt. station in Zaire from 1984 to 1985 are highlighted. Activities focused on multiplication of promising cassava var. 33781/6, 5220/1, 4(2)0426/1, and 85/28/10, distribution of 41,150 m of cuttings, and installation of 13 demonstration fields in cooperation with farmers. (CIAT)

1208

31505 PROGRAMME NATIONAL MANIOC. ZAIRE. 1978. Pathologie. (Pathology). In Programme National Manioc. Zaire. Rapport Annuel 1978. M'vuazi, Zaire, Institut National pour l'Etude et la Recherche Agronomiques. Département de l'Agriculture. 14p. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CASSAVA AFRICAN MOSAIC VIRUS; GLOMERELLA CINGULATA; RESISTANCE; ZAIRE.

Major results from research on cassava pathology carried out in Zaire in 1978 are reported. A rapid method for CBB inoculation is described in detail. Tables show the resistance to main diseases (CBB, CAMV, and anthracnose) of the M'vuazi, Gandajika, Mulungu, and Kikaya cassava collections. Current and future research activities are listed. (CIAT)

1209

31560 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Pathologie. (Plant pathology). In Programme National Manioc. Zaire. Rapport Annuel 1984. Kinshasa, Zaire, Département de l'Agriculture et du Développement Rural. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.57-84. Fr., Il.

CASSAVA; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CASSAVA AFRICAN MOSAIC VIRUS; GLOMERELLA CINGULATA; POSTHARVEST LOSSES; CASSAVA LEAVES (VEGETABLE); PLANTING; TIMING; FERTILIZERS; K; ROOT PRODUCTIVITY; MOLDS; DETERIORATION; ZAIRE.

Research on cassava conducted in 1983-84 by the plant pathology subprogram of the Progamme National Manioc (Zaire) is reported. Studies were carried out on CBB, tip death (a disturbance reported at the M'vuazi exptl. station in 1980), CAMV, postharvest losses caused by fungi, and anthracnose. CBB, the major cassava disease in Zaire, caused marked losses of edible leaves in susceptible var. Tip death incidence decreased significantly with K fertilization (150 kg K_2SO_4/ha) and delayed planting time. A positive and significant relationship was observed between cassava leaves affected with CAMV in early stages and a decrease in root yields. The major microorganisms identified in cassava chips from the Gandajika market are listed; less fungal colonization occurred in steeped cassava than in unfermented cassava. Cassava stems left in the field after harvesting become a source of Glomerella cingulata. The susceptibility of a cassava clone to Pseudotheraptus devastans determined its susceptibility to ant[illegible]ose. The major results of research conducted at the Gandajika and Kiyaka [illegible] l. stations are also reported and work proposed for the 3 exptl. stations for 1984- 85 is mentioned. (CIAT)

1210

31305 PROGRAMME NATIONAL MANIOC. ZAIRE. 1983. Phytopathologie. (Phytopathology). In Programme National Manioc. Zaire. Rapport Annuel 1983. Zaire , Département de l'Agriculture et du Développement Rural. pp.P1-P20. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; CASSAVA AFRICAN MOSAIC VIRUS; GLOMERELLA CINGULATA; RESISTANCE; CULTIVARS; FERTILIZERS; N; K; ZAIRE.

Results of cassava research conducted by the plant pathology section of the Programme National Manioc (Zaire) in 1982-83 are reported. Regarding tip

death, activities dealt with symptomatology, causal agent determination, clonal reaction to plant injuries caused by the disturbance, effect of fertilization and straw mulch on disease incidence, and control measures. Aspects of CAMV studied were disease incidence at different plant developmental stages, influence of whiteflies on disease severity, and effect of planting time on vector population and on disease severity. Susceptibility of cv. to anthracnose was also studied. Clones 02864 and Coll 45 were found susceptible to tip death whereas local var. Mpelolongi and improved var. 30085/28 were disease-tolerant. K fertilization decreased disease incidence while N fertilization increased it; soil coverage reduced disease incidence by 50 percent. A table shows the variability of clones regarding resistance to anthracnose. (CIAT)

1211

31518 PROGRAMME NATIONAL MANIOC. ZAIRE. 1982. Phytopathologie. (Plant pathology). In Programme National Manioc. Zaire. Rapport Annuel 1982. M'vuazi, Zaire, Institut National pour l'Etude et la Recherche Agronomiques. Département de l'Agriculture. pp.P1-P5. Fr.

CASSAVA; CASSAVA PROGRAMS; CASSAVA AFRICAN MOSAIC VIRUS; GLOMERELLA CINGULATA; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; RESISTANCE; CULTIVARS; FERTILIZERS; PLANTING; ZAIRE.

The main results of research on cassava conducted by the plant pathology subsection of the Programme National Manioc (Zaire) in 1981-82 are reported. Studies dealt with tip death (a new disease that suddenly appeared in lower Zaire in 1980), CAMV, anthracnose, and disease-resistant var. The presence of a tolerance mechanism to tip death was observed on var. 30085/25. Colletotrichum manihotis was isolated from plant tissues affected by the disease; however, further isolation trials are recommended since the fungus is known for colonizing dead or injured tissues. No significant differences were observed regarding anthracnose severity when 3 types of cuttings were used (without cankers, with few cankers, and with numerous cankers). Kinuani (30085/28, Kivuvu (30070/4), 02864, and Mpelolongi were resistant to CAMV, CBB, and anthracnose at 4 different ecological sites. In Bandundu, research activities aimed at evaluating the major cassava diseases. Studies proposed for the 1982-83 period are listed. (CIAT)

1212

31531 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Phytopathologie: anthracnose. (Phytopathology: anthracnose). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.79-86. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; GLOMERELLA CINGULATA; SYMPTOMATOLOGY; RESISTANCE; HCN CONTENT; ZAIRE.

Seven cassava clones exposed to Pseudotheraptus devastans punctures were studied for reaction to anthracnose infection. The relationship between certain plant characteristics (HCN content, stem MC, and plant height) and disease incidence was also determined. Nonsucculent stems, plant height, and low HCN content determined cassava sensitivity to anthracnose. Other physical and chemical characteristics such as stem color and cuticle thickness and toughness should be studied. According to their reaction to the disease, the 7 clones were classified as very sensitive (30957/5); sensitive (Coll 45, 30344/6, and 30555/3); moderately sensitive (30122/2 and Mpelolongi); and tolerant (Kinuani). An evaluation scale for anthracnose is proposed on the basis of 6 degrees of severity. (CIAT)

1213

31528 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Phytopathologie: mort des sommités. (Phytopathology: tip death). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.64-70. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; DISEASES AND PATHOGENS; SYMPTOMATOLOGY; EPIDEMIOLOGY; MAPS; ZAIRE.

Studies were carried out to determine the causal agent, distribution, and epidemiology of a cassava disturbance denominated tip death, detected in lower Zaire in 1980. Results are given and analyzed. The causal agent of the disturbance was nonsystemic. A map is included showing the zones in lower Zaire where the disease was detected. (CIAT)

1214

31530 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Phytopathologie: pourriture des tubercules. (Phytopathology: root rot). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.75-79. Fr.

CASSAVA; CASSAVA PROGRAMS; HARVESTING; ROOTS; MYCOSES; TIMING; CULTIVARS; POSTHARVEST LOSSES; STORAGE; CASSAVA CHIPS; DETERIORATION; MOLDS; HCN CONTENT; CASSAVA MEAL; ZAIRE.

A trial was carried out to study the influence of different harvesting times (12, 16, 20, and 24 mo. after planting) on cassava root rot. The sanitary conditions of roots was still good when harvested 12 mo. after planting; rot incidence was high when roots were harvested 20 and 24 mo. after planting. Clones 30344/6 and Kinuani were tolerant while 02864 was highly susceptible to root rot. On the other hand, results of studies on postharvest cassava deterioration indicated a direct relationship between storage period and deterioration percentage of cassava chips. Studies on the contamination of cassava products showed the presence of various microorganisms (including Aspergillus spp.) considered dangerous for human consumption. A list is given with the different fungal species detected in CM samples. The HCN content is also given for the clones tested. (CIAT)

1215

31529 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Phytopathologie: résistance aux maladies. (Phytopathology: disease resistance). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.70-75. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CASSAVA AFRICAN MOSAIC VIRUS; GLOMERELLA MANIHOTIS; CULTIVARS; RESISTANCE; ROOT PRODUCTIVITY; ZAIRE.

Aspects involved in disease resistance studies of cassava are described and the main results are presented. Seed nurseries and clonal and demonstration fields trials were conducted, and the performance of the best selections was assessed. The reaction of var. Kinuani in monovarietal and multivarietal cropping systems was also studied. The reaction of the best selections (from the Programme National Manioc of Zaire and the International Institute of Tropical Agriculture of Nigeria) to CBB, CAMV, and anthracnose is given. In demonstration field trials, var. Kinuani was relatively less affected by the 3 major diseases than local var. The reaction of var. Kinuani to the 3 diseases was unmodified regardless of its proximity to a sensitive var. Furthermore, monovarietal cropping yields (10.2 t/ha) were higher than those

of associated clones. The association Kinuani/A56 gave the lowest yields, probably due to the rapid coverage of A56. (CIAT)

1216

31509 PROGRAMME NATIONAL MANIOC. ZAIRE. 1979. Protection de culture. (Crop protection). In Programme National Manioc. Zaire. Rapport Annuel 1979. M'vuazi, Zaire, Institut National pour l'Etude et la Recherche Agronomiques. Département de l'Agriculture. pp.25-26. Fr.

CASSAVA; CASSAVA PROGRAMS; PHENACOCCUS MANIHOTI; SPACING; PLANTING; ROOT PRODUCTIVITY; GLOMERELLA CINGULATA; ZAIRE.

Research on cassava crop protection carried out in Zaire in 1978-79 is reported. The cassava mealybug and anthracnose were studied. Higher reductions in tuber yields were observed when cassava was planted in June than when planted in Aug. Anthracnose incidence was high under high humidity conditions. Expt. to determine the effect of plant population on tuber yields and on anthracnose incidence in var. 02864 showed high disease incidence at high plant density. (CIAT)

1217

31513 PROGRAMME NATIONAL MANIOC. ZAIRE. 1980. Protection de manioc: phytopathologie. (Cassava protection: phytopathology). In Programme National Manioc. Zaire. Rapport Annuel 1980. M'vuazi, Zaire, Institut National pour l'Etude et la Recherche Agronomiques. Département de l'Agriculture. pp.26-31. Fr.

CASSAVA; CASSAVA PROGRAMS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CASSAVA AFRICAN MOSAIC VIRUS; GLOMERELLA MANIHOTIS; INTERCROPPING; MAIZE; ROOT PRODUCTIVITY; GROUNDNUT; ZAIRE.

Research on cassava protection describes the effect of associated cropping on the 3 major cassava diseases (CBB, CAMV, and anthracnose). Possible interactions between anthracnose and CBB were studied and an evaluation of yield losses caused by anthracnose was also made. Severity of CBB and CAMV was lower in cassava associated with maize compared with cassava associated with groundnut or as a sole crop. A correlation was found between CBB and anthracnose. Future research projects are listed. (CIAT)

1218

31501 PROGRAMME NATIONAL MANIOC. ZAIRE. 1978. Rapport Annuel 1978. (1978 Annual Report). M'vuazi, Zaire, Institut National pour l'Etude et la Recherche Agronomiques. Département de l'Agriculture. 89p. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; GLOMERELLA CINGULATA; CASSAVA AFRICAN MOSAIC VIRUS; PHENACOCCUS MANIHOTI; FOOFOO; CHICKWANGUE; PALATABILITY; RESISTANCE; MONONYCHELLUS TANAJOA; MAPS; PREDATORS AND PARASITES; SOIL FERTILITY; MULCHING; WEEDING; INTERCROPPING; MAIZE; GROUNDNUT; BEANS; ZAIRE.

The main results of research on cassava conducted by the Programme National Manioc (Zaire) during 1977-78 are reported. Work dealt with plant breeding, agronomy, entomology, and plant pathology. (CIAT)

1219

31506 PROGRAMME NATIONAL MANIOC. ZAIRE. 1979. Rapport Annuel 1979. (1979 Annual Report). M'vuazi, Zaire, Institut National pour l'Etude et la Recherche Agronomiques. Département de l'Agriculture. 31p. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; CULTIVARS; SELECTION; RESISTANCE; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CASSAVA AFRICAN MOSAIC VIRUS;

GLOMERELLA CINGULATA; INTERCROPPING; GROUNDNUT; MAIZE; PHENACOCCUS MANIHOTI; ROOT PRODUCTIVITY; FOOFOO; CHICKWANGUE; ZAIRE.

Results of research on cassava carried out by the Institut National pour l'Etude et la Recherche Agronomiques (Zaire) in 1978- 79 are presented. Studies dealt with selection, agronomy, and crop protection. (CIAT)

1220

31510 PROGRAMME NATIONAL MANIOC. ZAIRE. 1980. Rapport Annuel 1980. (Annual report 1980). M'vuazi, Zaire, Institut National pour l'Etude et la Recherche Agronomiques. Département de l'Agriculture. 34p. Fr.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; SELECTION; PLANT BREEDING; RESISTANCE; ROOT PRODUCTIVITY; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; CASSAVA AFRICAN MOSAIC VIRUS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; GLOMERELLA MANIHOTIS; DISEASE CONTROL; INTERCROPPING; MAIZE; GROUNDNUT; HCN CONTENT; TECHNOLOGY TRANSFER; ZAIRE.

Results of research activities on cassava conducted by the Institut National pour l'Etude et la Recherche Agronomiques in Zaire in 1979-80 are presented. These dealt with selection, agronomy, phytopathology, and dissemination. (CIAT)

1221

31515 PROGRAMME NATIONAL MANIOC. ZAIRE. 1982. Rapport Annuel 1982. (1982 Annual Report). M'vuazi, Zaire, Institut National pour l'Etude et la Recherche Agronomiques. Département de l'Agriculture. 85p. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; CULTIVARS; IDENTIFICATION; SELECTION; PLANT ANATOMY; ROOT PRODUCTIVITY; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; CASSAVA AFRICAN MOSAIC VIRUS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; GLOMERELLA CINGULATA; INTERCROPPING; TECHNOLOGY TRANSFER; RESISTANCE; CULTIVATION; ZAIRE.

The main results of research on cassava conducted by the Programme National Manioc in Zaire in 1981-82 are reported. Aspects studied were selection, agronomy, plant pathology, and entomology. (CIAT)

1222

31302 PROGRAMME NATIONAL MANIOC. ZAIRE. 1983. Rapport Annuel 1983. (1983 Annual Report). Zaire, Département de l'Agriculture et du Développement Rural. 99p. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CASSAVA AFRICAN MOSAIC VIRUS; GLOMERELLA CINGULATA; RESISTANCE; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; PREDATORS AND PARASITES; TECHNOLOGY TRANSFER; PROPAGATION; ZAIRE.

Research conducted by the Programme National Manioc (Zaire) in 1982-83 is reported. Topics discussed are selection, agronomy, plant pathology, entomology, and dissemination. (CIAT)

1223

31558 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Rapport Annuel 1984. (1984 Annual Report). Kinshasa, Zaire, Département de l'Agriculture et du Développement Rural. Projet de Recherche Agronomique Appliquée et Vulgarisation. 165p. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; DISEASES AND PATHOGENS; ENTOMOLOGY; CULTIVATION SYSTEMS; ZAIRE.

The main results are reported of research on cassava conducted in 1984 by the Programme National Manioc (Zaire). Aspects studied were selection and plant breeding, plant pathology, entomology, cultivation systems, on-farm research, and multiplication and extension. (CIAT)

1224

31521 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Rapport Annuel 1985. (1985 Annual Report). M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. 154p. Fr., 20 Ref., Il.

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; CULTIVARS; SELECTION; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; GLOMERELLA CINGULATA; CASSAVA AFRICAN MOSAIC VIRUS; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; TECHNOLOGY TRANSFER; RESISTANCE; INSECT BIOLOGY; PREDATORS AND PARASITES; FOOFOO; CHICKWANGUE; POSTHARVEST LOSSES; ROOT PRODUCTIVITY; INTERCROPPING; WEEDING; SOCIOECONOMIC ASPECTS; WOMEN; LABOR; PRICES; CASSAVA MEAL; MAPS; ZAIRE.

Research on cassava carried out in 1984-85 by the Programme National Manioc (Zaire) is reported. Activities were carried out in the areas of plant breeding and selection, plant pathology, entomology, cultivation systems, and multiplication and dissemination. (CIAT)

1225

31563 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Recherche en milieu paysan. (On-farm research). In Programme National Manioc. Zaire. Rapport Annuel 1984. Kinshasa, Zaire, Département de l'Agriculture et du Développement Rural. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.127-143. Fr., Il.

CASSAVA; SOCIOECONOMIC ASPECTS; WOMEN; CULTIVARS; QUESTIONNAIRES; ON-FARM RESEARCH; CULTIVATION; ROOT PRODUCTIVITY; ZAIRE.

The objectives of on-farm research focused on the assessment of 3 improved var. (Kinuani, 02864, and Mpelolongi) and on the identification of the farmers' socioeconomic situation (family, land tenancy, task distribution according to sex, and diet). Exptl. sites were chosen in the Kisantu area and along the Kisantu-Ngidinga highway (90 km). For every site, a trial was established both in the valley and in the plateau. A total of 33 farmers was surveyed by means of a questionnaire. Farmers were classified in 4 groups, depending on the distance from the exptl. site to Kisantu. The role of women in the processing of foofoo and chickwangue is highlighted; in the rest of the agricultural tasks, both men and women participated equally. Foofoo is considered a staple food, followed by chickwangue. Information is also included on agronomic aspects such as land preparation (ridging) and planting (cutting length, interrow spacing, planting density, rooting percentage, percentage of harvested plants, and weeding). Root yields in the valley and in the 1st season were higher for the improved var. whereas in the 2nd season, the local var. commonly used by farmers gave higher yields (6.4 t/ha); Kinuani, 02864, and Mpelolongi yielded 3.9, 3.2, and 3.7 t/ha, resp., in the 2nd season. (CIAT)

1226

31503 PROGRAMME NATIONAL MANIOC. ZAIRE. 1978. Recherches agronomiques. (Agronomic research). In Programme National Manioc. Zaire. Rapport Annuel 1978. M'vuazi, Zaire, Institut National pour l'Etude et la Recherche Agronomiques. Département de l'Agriculture. 21p. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; SOIL FERTILITY; PHENACOCCUS MANIHOTI; FERTILIZERS; P; K; MANURES; MULCHING; WEEDING; TIMING; INTERCROPPING; MAIZE; GROUNDNUT; BEANS; SPACING; ROOTING; CUTTINGS; ZAIRE.

Research on agronomic aspects of cassava conducted in Zaire in 1978 is reported. Studies covered soil analysis, fertilization, the effect of straw mulch on cassava performance and on the incidence of the cassava mealybug, the effect of weeding on yields, the performance of intercropped cassava, planting distances, root no. increase, and effect of soil and cutting treatments on plant emergence. Soil fertility around M'vuazi exptl. station was low as shown in a table. Figures are included with suitable P levels for cassava development. Increases in cassava yields were obtained when lower N levels were combined with a supply of OM. No advantages were observed from cassava planted on ridges in a sandy soil whereas yields increased in nonsandy soil. Incidence of the cassava mealybug decreased when straw mulch was used. Plowing was necessary before planting. A min. of 3 weedings were determined for the cassava culture, preferably during the 105 days following planting. The performance of cassava intercropped with maize, groundnuts, or beans is explained in detail. The planting density recommended for cassava is 10,000 plants/ha. The process of root formation in cv. 02864 is described. Soil, drought, and pathogens were not the only causes found for death of cuttings planted in a sterilized soil. Finally, current research activities are mentioned as well as those planned for 1979. (CIAT)

1227

31303 PROGRAMME NATIONAL MANIOC. ZAIRE. 1983. Sélection. (Selection). In Programme National Manioc. Zaire. Rapport Annuel 1983. Zaire , Département de l'Agriculture et du Développement Rural. pp.S1-S30. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; CULTIVARS; SELECTION; RESISTANCE; CASSAVA AFRICAN MOSAIC VIRUS; PHENACOCCUS MANIHOTI; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; ROOT PRODUCTIVITY; GERMPLASM; HCN CONTENT; ADAPTATION; ZAIRE.

Results from research on cassava selection conducted by the plant breeding program in Zaire in 1982-83 are reported; emphasis was placed on the dissemination of CBB-resistant var. Kinuani. At M'vuazi exptl. station work dealt with hybridization and evaluation of the seed nursery, clonal evaluation, and preliminary, advanced, and uniform yield trials. Germplasm collection and maintenance were carried out and the resistance of clone 70453 to the cassava mealybug was studied. At Gimbi exptl. station uniform yield trials were conducted and at Gandajika exptl. station, projects were oriented towards the evaluation of the clonal nursery, preliminary and advanced yield trials, and screening for low HCN content. Work at Kiyaka exptl. station dealt mainly with the dissemination of CAMV-resistant var. F100, the evaluation of seed nurseries in the valley and the plateau, and root evaluation in savanna and forest areas (uniform yield and local adaptation trials). Germplasm maintenance was conducted at Mulungu exptl. station. Major botanic and agronomic characteristics of var. Kinuani and F100 are given. A table showing the resistance of cassava clones to CBB, CAMV, and the cassava mealybug in yield trials is also included. (CIAT)

1228

31516 PROGRAMME NATIONAL MANIOC. ZAIRE. 1982. Sélection. (Selection). In Programme National Manioc. Zaire. Rapport Annuel 1982. M'vuazi, Zaire, Institut National pour l'Etude et la Recherche Agronomiques. Département de l'Agriculture. pp.S1-S36. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; HYBRIDIZING; ROOT PRODUCTIVITY; FOOFOO; CHICKWANGUE; PALATABILITY; RESISTANCE; PHENACOCCUS MANIHOTI; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CASSAVA AFRICAN MOSAIC VIRUS; CULTIVARS; SELECTION; MONONYCHELLUS TANAJOA; FIELD EXPERIMENTS; ZAIRE.

The main results from research on cassava selection conducted by the Programme National Manioc (Zaire) in 1981-82 are reported. Studies dealt with nursery evaluation and hybridization, clonal nursery, and evaluation of

tubsr yields (preliminary, advanced, and final yield trials). Other topics included product quality testing, improved var. proposed for distribution, resistance to the cassava mealybug, and leaf pubescence as a resistance mechanism against the cassava mealybug. Scores from clones tested in the clonal nursery for CAMV, CBB, tip death, and green mite are presented in a table. Another table includes data on tuber yields and clone scores for major diseases and pests from preliminary, advanced, and final trials. Regarding product quality testing, foofoo from var. 30483 and No. 69 was highly appreciated; chickwangue from all var. was acceptable. Improved var. 30085/28 (high yielding and disease- resistant) was proposed for distribution. Cassava clone 70453 showed high resistance to the cassava mealybug. Research carried out on this clone is summarized. At Gandajika exptl. station, research was oriented towards the seed nursery, and preliminary, advanced, and uniform yield trials. At Kiyaka exptl. station, work dealt with uniform yield trials and local adaptation. A table presents the performance of clones tested at both Gandajika and Kiyaka exptl. stations; data on yields and scores for resistance to major diseases and pests are provided. (CIAT)

1229

31511 PROGRAMME NATIONAL MANIOC. ZAIRE. 1980. Sélection du manioc. (Cassava selection). In Programme National Manioc. Zaire. Rapport Annuel 1980. M'vuazi, Zaire, Institut National pour l'Etude et la Recherche Agronomiques. Département de l'Agriculture. pp.7-18. Fr.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; PLANT BREEDING; SELECTION; RESISTANCE; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; PEST DAMAGE; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CASSAVA AFRICAN MOSAIC VIRUS; GLOMERELLA CINGULATA; FOOFOO; ROOT PRODUCTIVITY; CHICKWANGUE; PALATABILITY; HYBRIDIZING; ZAIRE.

Research on cassava selection carried out in Zaire in 1979-80 is described and results are reported. Areas covered were: hybridizations, nurseries, and host resistance to the mealybug, an unidentified disease, CBB, CAMV, and anthracnose. Others were yield trials and quality evaluation of manufactured products (foofoo and chickwangue). Results from research activities on cassava selection carried out in Kasai and Bandundu are also reported; selection work proposed for 1980-81 is mentioned. (CIAT)

1230

31507 PROGRAMME NATIONAL MANIOC. ZAIRE. 1979. Sélection du manioc. (Cassava selection). In Programme National Manioc. Zaire. Rapport Annuel 1979. M'vuazi, Zaire, Institut National pour l'Etude et la Recherche Agronomiques. Département de l'Agriculture. pp.7-16. Fr.

CASSAVA; CASSAVA PROGRAMS; SELECTION; CULTIVARS; RESISTANCE; PHENACOCCUS MANIHOTI; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CASSAVA AFRICAN MOSAIC VIRUS; CROSSBREEDING; GLOMERELLA CINGULATA; ROOT PRODUCTIVITY; FOOFOO; CHICKWANGUE; PALATABILITY; ZAIRE.

Research activities on cassava selection carried out in Zaire in 1978-79 are described and results are reported. Areas covered were crossbreeding, seedling nurseries (host resistance to CBB, CAMV, mealybug, green mite, and anthracnose), yield trials, and quality evaluation of manufactured products (foofoo and chickwangue). Results from clonal evaluations at expt. stations are also reported; studies proposed for 1979-80 are listed. (CIAT)

1231

31559 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Sélection et amélioration. (Selection and plant breeding). In Programme National Manioc. Zaire. Rapport Annuel 1984. Kinshasa, Zaire, Département de l'Agriculture et du

Développement Rural. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.1-56. Fr., Il.

CASSAVA; PLANT BREEDING; CULTIVARS; RESISTANCE; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CASSAVA AFRICAN MOSAIC VIRUS; GLOMERELLA CINGULATA; PHENACOCCUS MANIHOTI; ROOT PRODUCTIVITY; HCN CONTENT; FOOFOO; CHICKWANGUE; ORGANOLEPTIC EXAMINATION; ZAIRE.

Research on cassava selection and plant breeding in Zaire during 1984 focused on the development of high yielding var., adaptable to different agroecological conditions, and disease- and pest- resistant. Seed nurseries, clonal trials, preliminary, advanced, and uniform yield trials, as well as multilocal trials were established at the M'vuazi, Gandajika, and Kiyaka exptl. stations. Tables are included with the resistance of clones and var. to CBB, CAMV, anthracnose, and cassava green mite. The agronomic and botanical characteristics of the clones selected from the uniform yield trials at the M'vuazi and Gandajika exptl. stations are also presented in a table. Data is also given on root yields (t/ha), HCN content, and the organoleptic characteristics of the products (foofoo and chickwangue) obtained from several cassava clones established in the uniform yield trial at the M'vuazi exptl. station and from others from multilocal trials. The percentage of cassava chips obtained from these clones was also calculated. (CIAT)

1232

31524 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Section d'amélioration génétique et sélection: sélection a Gandajika. (Plant breeding and selection section: selection in Gandajika). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.51-60. Fr.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; SELECTION; ROOT PRODUCTIVITY; CULTIVARS; ZAIRE.

The main results of research on cassava selection conducted at the Gandajika exptl. station (Zaire) in 1984-85 are summarized. The seed nursery, clonal trials, yield (preliminary, advanced, and uniform), and multilocal trials were established. In the seed nursery, germination was higher in seed from controlled pollination, followed by those from var. introduced from the International Institute of Tropical Agriculture (Nigeria). Tables are included on the performance of families established in the clonal trial and of clones in the preliminary, advanced, and uniform yield trials. In the multilocal trials, clones 60882/10, 85/28/10, 30093/6, 85/28/4, and 156/1 performed well in all localities. (CIAT)

1233

31523 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Section d'amélioration génétique et sélection: sélection a Kiyaka. (Plant breeding and selection section: selection in Kiyaka). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.42-50. Fr.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; SELECTION; ROOT PRODUCTIVITY; FOOFOO; CHICKWANGUE; PALATABILITY; CULTIVARS; ZAIRE.

The main results of research on cassava selection conducted at the Kiyaka exptl. station (Zaire) in 1984-85 are summarized. The seed nursery, clonal trials, preliminary and advanced yield trials, and multilocal trials were conducted. In the clonal trial (in both forest and savanna areas), CAMV and CBB were the major diseases; root yields ranged from 0 to 6 and from 0 to 3 kg/plant in forest and savanna areas, resp. A table is included showing the

performance of clones retained in the preliminary yield trial. In the advanced yield trial, 9 clones were evaluated on the basis of root yield and the quality of processed products (foofoo and chickwangue). Results are included. In the multilocal trial carried out at 3 sites (Kalanganda, Kiyaka valley, and Kapia), clone F100 gave the highest av. yields (10.03 t/ha), followed by clones F156 and F150 (7.86 and 7.5 t/ha, resp.). (CIAT)

1234

31525 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Section d'amélioration génétique et sélection: sélection a Mulungu. (Plant breeding and selection section: selection in Mulungu). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. p.60. Fr.

CASSAVA; CASSAVA PROGRAMS; SELECTION; ZAIRE.

Main results of research on cassava selection carried out in Mulungu, Zaire, in 1984-85, are summarized. Activities included seed nursery, clonal trials, and multiplication and collection of promising materials. (CIAT)

1235

31522 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Section d'amélioration génétique et sélection: travaux de sélection dans le Bas-Zaire et Kinshasa. (Plant breeding and selection section: research on selection in lower Zaire and Kinshasa). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.5-42. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; CULTIVARS; SELECTION; RESISTANCE; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CASSAVA AFRICAN MOSAIC VIRUS; PHENACOCCUS MANIHOTI; GLOMERELLA CINGULATA; ORGANOLEPTIC EXAMINATION; FOOFOO; CHICKWANGUE; ROOT PRODUCTIVITY; ZAIRE.

Research activities on cassava selection carried out in lower Zaire and Kinshasa in 1984-85 are briefly described. Hybridization studies were conducted and the seed nursery evaluated. Clonal trials, yield trials (preliminary, advanced, and uniform), multilocal and multiregional trials were also carried out. Major results are given and discussed. Most clones were tested for resistance to main diseases (CBB, CAMV, anthracnose) and pests (mealybugs). Results of organoleptic tests of cassava products such as foofoo and chickwangue are also given and analyzed. Other agronomic characteristics (no. of roots/plant, peduncle length, no of stems/plant, plant size at 4 mo., and branching height) are reported for both multilocal and multiregional trials. (CIAT)

1236

31562 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. System d'exploitation agricole. (Cultivation system). In Programme National Manioc. Zaire. Rapport Annuel 1984. Kinshasa, Zaire, Département de l'Agriculture et du Développement Rural. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.115-126. Fr., Il.

CASSAVA; MONOCROPPING; INTERCROPPING; GROUNDNUT; ROOT PRODUCTIVITY; SPACING; FERTILIZERS; K; MECHANIZATION; HERBICIDES; CULTIVARS; ZAIRE.

Cassava var. Kinuani (improved) and Mpelolongi (local) were monocropped and intercropped with groundnut at 10,000 and 20,000 plants/ha, 2 fertility levels, and with and without leaf harvesting. No significant differences in root yields were observed between both var.; however, yields decreased 33 and 64 percent for Mpelolongi and Kinuani, resp., when intercropped with groundnut, compared with yields obtained when monocropped. The application

of 100 kg K/ha increased the multiplication rate of the planting material up to 76 percent. N and P fertilization had no effect on root yields. No differences were observed between yields obtained from cassava planted on ridges and those from cassava planted on the flat on mechanically tilled land; however, root yields from manually tilled land were 2- to 3-fold higher than those from mechanically tilled land. Burning of plant residues and N application resulted in higher root yields. The cassava-groundnut association was 20 percent/area unit more productive than the cassava monocrop. Glyphosate, fluometuron, and metolachlor, alone or in mixtures, were not successful in controlling weeds. (CIAT)

1237

31538 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Systemes d'exploitation agricole: gestion de la culture. (Farming systems: cultivation). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.110-119. Fr.

CASSAVA; CASSAVA PROGRAMS; FARMING SYSTEMS; GROUNDNUT; INTERCROPPING; MAIZE; MONOCROPPING; FERTILIZERS; ROOT PRODUCTIVITY; SPACING; LEAVES; PRUNING; CULTIVARS; ZAIRE.

Studies were carried out to determine differences among improved cassava var. regarding reaction to different agronomic factors, namely: (1) 2 cultivation systems (monocropping and intercropping with groundnut in lower Zaire or with maize in Bandundu); (2) 2 fertility levels (no fertilizer and 600 kg 17-17-17/ha); (3) 2 planting densities (10,000 and 20,000 plants/ha); and (4) with or without leaf harvest. Results from comparisons between the performance of var. Kinuani (improved) and Mpelolongi (local) are summarized in a table. No negative interactions with the different agronomic factors analyzed were observed in the 2 improved cassava var. (Kinuani and F100) when compared with local clones. Results of trials on associated crops (cassava-groundnut and cassava-maize) are given in a table. (CIAT)

1238

31541 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Systemes d'exploitation agricole: lutte contre les mauvaises herbes. (Farming systems: weed control). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.125-126. Fr.

CASSAVA; CASSAVA PROGRAMS; HERBICIDES; WEEDING; ZAIRE.

Adequate control of Imperata cylindrica in cassava was obtained when a herbicide mixture (glyphosate + fluometuron + metolachlor) was used at a low dose (2.7 + 2.0 + 2.0 kg a.i./ha). Control of the same weed was almost total when a higher dose was used (3.6 + 2.5 + 2.5 kg a.i./ha). Weeds other than I. cylindrica were effectively controlled when fluometuron and metolachlor were mixed (2.0 + 2.5 kg a.i./ha). Manual weeding, however, is needed 2.5 mo. after planting to obtain good weed control. (CIAT)

1239

31540 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Systemes d'exploitation agricole: préparation du sol. (Farming systems: land preparation). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.121-125. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; LAND PREPARATION; PLANTING; ROOT PRODUCTIVITY; WEEDING; ZAIRE.

A trial was carried out to determine the effect of ridge planting on cassava yields. The tuber was planted on ridges or on flat land previously tilled with a hoe or a tractor. Two weeding levels (complete and late) were included. A significant interaction was found between land preparation methods. No significant difference was observed between ridge planting and planting on flat land after tractor tillage; however, when hoe tillage was used, yields obtained on ridges were 2-fold those from flat planting. Among the traditional land preparation methods, ridge planting presented 2 advantages: (1) the creation of better soil conditions in the cassava rooting area, and (2) a good control of the major cassava weed (Imperata cylindrica). (CIAT)

1240

31539 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Systemes d'exploitation agricole: réponse du manioc a l'azote, phosphore et potassium. (Farming systems: response of cassava to nitrogen, phosphorus, and potassium). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.119-121. Fr.

CASSAVA; CASSAVA PROGRAMS; N; K; FERTILIZERS; ROOT PRODUCTIVITY; CUTTINGS; ZAIRE.

The effect of NK fertilization on cassava root yields and cutting production was studied during 2 consecutive years in Zaire. Trials were carried out at the M'vuazi expt. station, in a sandy clay loam soil, and at the Kimpese expt. station, in a clay soil. No yield increases were observed in the 1st yr in M'vuazi. In the 2nd yr, significant responses were obtained with NK fertilization. The application of 75 and 200 kg N and K/ha, resp. increased tuber yields 2-fold in comparison with test plants. The interaction between the 2 elements was significant. In Kimpese, only N had a significant effect on cassava tuber yields. The application of 75 and 150 kg N/ha resulted in an increase of 50 and 69 percent, resp., in tuber yields compared with test plants. A significant response was also observed in cutting production when 75 and 100 kg N and K/ha resp., were applied. (CIAT)

1241

31542 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Systemes d'exploitation agricole: recherche en milieu paysan. (Farming systems: on-farm research). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.127-137. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; SOCIOECONOMIC ASPECTS; LABOR; CULTIVATION; PROCESSING; WOMEN; ROOT PRODUCTIVITY; CASSAVA LEAVES (VEGETABLE); CHICKWANGUE; FOOFOO; HUMAN NUTRITION; PRICES; CASSAVA MEAL; ZAIRE.

On-farm research activities carried out in Zaire in 1984-85 are briefly described and results are given and discussed. The effect of soil improvement and use of groundnut and improved cassava var. on farmers' cultivation systems was evaluated. Information collected in lower Zaire on socioeconomic aspects such as land tenancy and size of exploitation, labor distribution according to sex, and diets is given. Other information included prices of cassava chips, foofoo, and chickwangue in local markets. Higher yields were obtained with groundnut and local cassava var. compared with improved var. Women's is participation in the different agricultural tasks is highlighted. Cassava leaves constitute an important foodstuff, and chickwangue and foofoo are the major source of calories. Figures showing price variations of cassava chips, CM, and chickwangue in different markets are included. (CIAT)

1242

31527 PROGRAMME NATIONAL MANIOC. ZAIRE. 1985. Triage du manioc pour la source des matieres elaborées et la capacité d'accumulation. (Cassava screening for sources of root quality and accumulation capacity). In Programme National Manioc. Zaire. Rapport Annuel 1985. M'vuazi, Zaire, Département de l'Agriculture. Projet de Recherche Agronomique Appliquée et Vulgarisation. pp.61-63. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; SELECTION; ROOT PRODUCTIVITY; PLANT ASSIMILATION; ZAIRE.

Significant differences were observed among cassava clones tested as sources of root quality. Clone 61655/4 showed the highest potential (3.49 kg/plant). On the other hand, no statistical differences were observed among clones tested for their accumulation capacity; the highest accumulation capacity was found in clone 30555/5 (2.5 kg/plant). In spite of its resistance to the cassava mealybug, clone 70453 was the lowest source of root quality. (CIAT)

1243

31307 PROGRAMME NATIONAL MANIOC. ZAIRE. 1983. Vulgarisation. (Dissemination). In Programme National Manioc. Zaire. Rapport Annuel 1983. Zaire , Département de l'Agriculture et du Développement Rural. pp.V1-V9. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; TECHNOLOGY TRANSFER; PROPAGATION; CULTIVARS; ROOT PRODUCTIVITY; RESISTANCE; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CASSAVA AFRICAN MOSAIC VIRUS; GLOMERELLA CINGULATA; CUTTINGS; ZAIRE.

Results of research on cassava multiplication and dissemination conducted in 1982-83 by the Programme National Manioc (Zaire) are reported. Multilocal trials were conducted and demonstration and multiplication fields were established. Improved var., multiplication, and planting material distribution were studied. Yields of cassava var. tested at different sites and their resistance to CBB, CAMV, and anthracnose are given. Var. 30085/28 was selected for distribution among growers under the name of Kinuani. In M'vuazi and Kisantu, 30.0 and 4.5 ha, resp., were planted to this var. and 12 more ha were established in various collaborative projects. Seven moist chambers were set up in M'vuazi for rapid cutting multiplication. In 1983, 212,430 m of cuttings were distributed. In demonstration fields higher yields were obtained from var. Kinuani using fertilizers at different levels. (CIAT)

1244

31520 PROGRAMME NATIONAL MANIOC. ZAIRE. 1982. Vulgarisation. (Extension activities). In Programme National Manioc. Zaire. Rapport Annuel 1982. M'vuazi, Zaire, Institut National pour l'Etude et la Recherche Agronomiques. Département de l'Agriculture. pp.V1-V12. Fr.

CASSAVA; CASSAVA PROGRAMS; TECHNOLOGY TRANSFER; ROOT PRODUCTIVITY; FIELD EXPERIMENTS; CULTIVARS; RESISTANCE; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CASSAVA AFRICAN MOSAIC VIRUS; GLOMERELLA CINGULATA; EXPERIMENT DESIGN; ZAIRE.

The main results of research on cassava conducted by the extension section of the Programme National Manioc (Zaire) in 1981- 82 are reported. Activities in M'vuazi dealt with multilocal trials, multiplication of improved var., distribution of planting materials, and establishment of demonstration fields in cooperation with different agricultural enterprises. Tables are presented for yields from multilocal trials and var. resistance to CBB, CAMV, and anthracnose. The area established at different sites for

improved var. multiplication is indicated as well as the amount of planting material distributed in 1982. The exptl. design used in demonstration fields is briefly explained. Results from trials comparing 2 var. (30085/28 and a local var.) showed higher yields for var. 30085/28, even in nonfertilized plots. Therefore this var. is recommended for distribution among farmers. Research activities planned for 1982-83 are mentioned. In Kiyaka, activities carried out in 1982 were multilocal and demonstration trials, multiplication of improved var., and distribution of planting material among farmers. A table is included with sites and area planted to the 4 var. chosen for multiplication (F100, F150, F156, and F162). Data are also given on the amount of planting material distributed among farmers; research activities for 1983 are listed. (CIAT)

1245

31514 PROGRAMME NATIONAL MANIOC. ZAIRE. 1980. Vulgarisation de manioc. (Cassava dissemination). In Programme National Manioc. Rapport Annuel 1980. M'vuazi, Zaire, Institut National pour l'Etude et la Recherche Agronomiques. Département de l'Agriculture. pp-31-33. Fr.

CASSAVA; TECHNOLOGY TRANSFER; CULTIVATION; CULTIVARS; CASSAVA PROGRAMS; ZAIRE.

Research projects on the dissemination of cassava in Zaire in 1979-80 are briefly described and results are reported. These included multilocal yield trials and demonstrations, multiplication of improved clones, and distribution of planting material. Cassava clones 02864, Mpelolongi (local), 68 improved clones from the Programme National Manioc, and a clonal mixture were multiplied on a large scale. Research activities for 1980-81 dealing with cassava multiplication and dissemination are briefly described. (CIAT)

1246

31353 REUNION DE TRAVAIL SUR LES OBSTACLES A LA PRODUCTION ET A LA COMMERCIALISATION DES RACINES, TUBERCULES ET PLANTAINS EN AFRIQUE. KINSHASA, ZAIRE. 1985. Rapport. (Meeting on production and commercialization constraints of root crops, tuber crops, and plantains in Africa). Rome, Italy, Organisation des Nations Unies pour l'Alimentation et l'Agriculture. 11p. Fr.

CASSAVA; DEVELOPMENT; CULTIVATION; MARKETING; PROCESSING; PRODUCTION; RESEARCH; ZAIRE; CIAT-2.

The main constraints regarding general policies, production, commercialization, and transformation of root crops, tuber crops (including cassava), and plantain in Africa were identified during a meeting held in Kinshasa (Zaire) from Sept. 30 to Oct. 4, 1985. Eighteen African countries and different research institutes (including CIAT) participated in this meeting. Constraints were analyzed and recommendations are given. (CIAT)

1247

31603 SYMPOSIUM SUR L'AGRICULTURE ZAIROISE. KINSHASA, NSELE. 1976. Discours d'ouverture du symposium prononcé par le citoyen Kayinga Onsi N'dal commissaire d'état a l'agriculture. (Opening speech delivered by Kayinga Onsi N'dal, agricultural state commissioner). In Symposium sur l'Agriculture Zairoise, Kinshasa, Nsele, 1976. Proceedings. Zaire, Département de l'Agriculture. pp.27-32. Fr.

CASSAVA; CASSAVA CHIPS; PRODUCTION; CASSAVA ROOTS (VEGETABLE); ZAIRE.

Background information on the agricultural development policies for the 1970's is given and estimates for the production of major food crops

(including cassava) in 1976-80 are mentioned. In 1970 and 1975, the production of cassava chips reached 673,000 and 800,000 t, resp. For 1980, production objectives of fresh cassava roots were 13 million t. About 3 million t of the total production will be used as cassava chips and of these, 1 million t will be commercialized. (CIAT)

1248

31572 ZAIRE. DEPARTEMENT DE L'AGRICULTURE. 1980. Cultures principales: superficie, rendement, production 1974- 1978: manioc. (Main crops: area, yields, production during 1974-78: cassava). In Zaire. Département de l'Agriculture. Annuaire des Statistiques Agricoles 1977-1978. Kinshasa, Zaire, Direction des Etudes et Politique Agricole. Division de la Statistique. pp.52,60. Fr. Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; LEAVES; ZAIRE.

Statistical data are given on area planted (ha) to cassava, yields (t/ha), and production (t) of roots and leaves for the different regions of Zaire during 1974-78. Av. for the 1970-74 period are also included. (CIAT)

1249

30881 ZAIRE. DEPARTEMENT DE L'AGRICULTURE. 1979. Programme de production de principales denrées alimentaires au Zaire (1980-1985). (Production program for main commodities in Zaire (1980-85)). Zaire, 78p. Fr.

CASSAVA; PRODUCTION; STATISTICAL DATA; CASSAVA PROGRAMS; ZAIRE.

Data are given on area planted and production of the main food crops (including cassava) for the 1973-78 period in the various regions of Zaire. The major characteristics of the cassava production program are described in detail regarding the main action zones, objectives, operation, and means. Costs and infrastructure needed to implement the program are also presented. (CIAT)

1250

31569 ZAIRE. DEPARTEMENT DE L'AGRICULTURE. 1980. Superficie et production végétale. 1974-1978. A. Tableaux récapitulatifs. (Area and plant production. 1974-78. Comprehensive tables). In Zaire. Departement de l'Agriculture. Annuaire des statistiques agricoles 1977-1978. Kinshasa, Zaire, Direction des Etudes et Politique Agricoles. Division de la Statistique.. pp.8-17. Fr., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; CASSAVA LEAVES (VEGETABLE); ZAIRE.

Statistical data are given on area planted (ha) to different crops (among them cassava roots and leaves), yields (t/ha), and production (t) in Zaire during 1974-78. Av. for 1970-74 are also included. (CIAT)

1251

31570 ZAIRE. DEPARTEMENT DE L'AGRICULTURE. 1980. Superficie et production végétale. B. Tableaux regionaux. (Area and plant production. B. Regional tables). In Zaire. Département de l'Agriculture. Annuaire des statistiques agricoles 1977-1978. Kinshasa, Zaire, Direction des Etudes et Politique Agricole. Division de la Statistique. pp.18-41. Fr., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; CASSAVA LEAVES (VEGETABLE); ZAIRE.

Data are given on area (ha) planted to various crops (among them cassava roots and leaves), yields (t/ha), and production (t) for different regions of Zaire in 1974-78. Av. are also included for 1970-74. (CIAT)

1252

31571 ZAIRE. DEPARTEMENT DE L'AGRICULTURE. 1980. Superficie et production vegetale. C. Tableaux comparatifs. (Area and plant production. C. Comparative tables). In Zaire. Département de l'Agriculture. Annuaire des statistiques agricoles 1977-1978. Kinshasa, Zaire, Direction des Etudes et Politique Agricole. Division de la Statistique. pp.42-47. Fr., Dat.num.

CASSAVA; STATISTICAL DATA; CASSAVA LEAVES (VEGETABLE); PRODUCTION; ROOT PRODUCTIVITY; ZAIRE.

Statisties are presented on area planted (ha), yields (t/ha), and production (t) of various agricultural products (among them cassava) in different regions of Zaire in 1977 and 1978. (CIAT)

1253

31565 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1986. Annuaire des statistiques agricoles 1979-1985. (1979-1985 yearbook on agricultural statistics). Kinshasa, Zaire, Service d'Etudes et de Planification Agricole. Division de la Statistique Agricole. 102p. Fr., Dat.num., Il.

CASSAVA; STATISTICAL DATA; PRODUCTION; ZAIRE.

Statistics are presented on area planted (ha) with various crops (including cassava) and production (t) in Zaire from 1979 to 1985. Graphs showing the evolution of area planted and production for the same period are included as well as the distribution of cassava in the different regions of Zaire during 1985. (CIAT)

1254

31324 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1984. Evaluation de la campagne de commercialisation 1984. (Evaluation of the 1984 commercialization campaign). Zaire, Direction des Marchés, Prix et Crédits de Campagne. 36p. Fr., Sum. Fr.

CASSAVA; CASSAVA CHIPS; PRICES; CASSAVA ROOTS (VEGETABLE); CHICKWANGUE; CASSAVA LEAVES (VEGETABLE); ZAIRE.

The situation of commercialization of various commodities (including cassava chips) in 1984 is described and analyzed for different regions of Zaire. In Bandundu, a relative stability in cassava prices was observed while in Equator, a low increase in prices was detected. In Higher Zaire, cassava is less commercialized; in northern Kivu cassava prices showed a slight increase. Tables are included showing av. prices for producers according to region for 1984, monthly av. retail prices for the main Kinshasa markets for the same year, and supply of various food products (cassava roots and chips, chickwangue, and cassava leaves) from April to Sept. 1984. (CIAT)

1255

31338 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1983. Evaluation de la commercialisation des produits vivriers 1981, 1982, 1983. (Evaluation of food product commercialization in 1981, 1982, and 1983). Zaire, Direction des Marchés, Prix et Crédits de Campagne. 11p. Fr.

CASSAVA; STATISTICAL DATA; PRICES; CASSAVA CHIPS; ZAIRE.

Data on price evolution for various food products (cassava chips among them) in Zaire are presented for 1981-83. Since not all the cassava available is commercialized, no deficit is reported for this product. (CIAT)

1256

30894 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1985. Evolution et structure des prix des produits vivriers 1o. trimestre 1985. (Evolution and structure of food product prices 1st quarter 1985). Zaire, Direction des Marchés, Prix et Crédits de Campagne. 26p. Fr., Il.

CASSAVA; STATISTICAL DATA; PRICES; COSTS; CASSAVA CHIPS; CASSAVA MEAL; ZAIRE.

Data on av. retail and semi-wholesale prices, costs, and margins are presented for several food products (including cassava chips) in 9 markets of Kinshasa, Zaire, in the 1st quarter of 1985. Differences are compared and analyzed with data for the preceding quarter. Diagrams showing weekly variations of cassava chips and CM retail and semi-wholesale prices for the 1st quarter of 1985 are also included. (CIAT)

1257

30893 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1985. Evolution et structure des prix des produits vivriers 2o. trimestre 1985. (Evolution and structure of food product prices 2nd quarter 1985). Zaire, Direction des Marchés, Prix et Crédits de Campagne. 25p. Fr., Il.

CASSAVA; STATISTICAL DATA; PRICES; COSTS; CASSAVA CHIPS; CASSAVA MEAL; ZAIRE.

Data on av. retail and semi-wholesale prices, costs, and margins are presented for several food products (including cassava chips) in 9 markets of Kinshasa, Zaire, in the 2nd quarter of 1985. Differences are compared and analyzed with data from the 1st quarter. Diagrams showing weekly variations of cassava chips and CM retail and semi-wholesale prices for the 2nd quarter 1985 are also included. (CIAT)

1258

31323 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1984. Evolution et structure des prix des produits vivriers 3o. trimestre 1984. (Evolution and structure of food crop prices, 3rd quarter of 1984). Zaire, Direction des Marchés, Prix et Crédits de Campagne. 18p. Fr., Il.

CASSAVA; STATISTICAL DATA; PRICES; COSTS; CASSAVA CHIPS; CASSAVA MEAL; ZAIRE.

Data on av. retail and semi-wholesale prices, costs, and margins are presented for several food products (including cassava chips) in 9 markets of Kinshasa (Zaire) for the 3rd quarter of 1984. Differences are compared and analyzed with data for the 2nd quarter. Diagrams showing weekly variations of cassava chips and CM prices for the 3rd quarter of 1984 are also included. (CIAT)

1259

30892 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1985. Evolution et structure des prix des produits vivriers 3o. trimestre 1985. (Evolution and structure of food product prices 3rd quarter 1985). Zaire, Direction des Marchés, Prix et Crédits de Campagne. 20p. Fr., Il.

CASSAVA; STATISTICAL DATA; PRICES; COSTS; CASSAVA CHIPS; CASSAVA MEAL; ZAIRE.

Data on av. retail and semi-wholesale prices, costs, and margins are presented for several food products (including cassava chips) in 9 markets of Kinshasa, Zaire, in the 3rd quarter of 1985. Differences are compared and analyzed with data for the 2nd quarter. Diagrams showing weekly variations of cassava chips and CM retail and semi-wholesale prices for the 3rd quarter of 1985 are also included. (CIAT)

1260

31550 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1985. Les politiques de commercialisation et des prix dans le secteur agricole: organisation antérieure, systeme actuel, résultats obtenus et entraves actuelles a la commercialisation. (Commercialization and price policies in the agricultural sector: former organization, current system, results obtained, and current commercialization constraints). Zaire, Direction des Marchés, Prix et Crédits de Campagne. 10p. Fr.

CASSAVA; MARKETING; CONSUMPTION; CASSAVA CHIPS; PRICES; ZAIRE.

The role and importance of the commercialization of agricultural products (including cassava) in Zaire are analyzed; the commercialization system is also described in detail. New commercialization policies are described and results obtained are analyzed and discussed. The major constraints for commercialization are mentioned and described. Availability of cassava chips for commercialization at 1984 (900,000 t) was found enough to fulfill urban needs estimated at 400,000 t. That year 100,000 t of cassava chips were supplied to Kinshasa. A decrease was observed between distribution costs of retail and semi-wholesale prices for cassava chips (27.2-1.5 percent for the 1st and 4th trimesters of 1984, resp.). (CIAT)

1261

31575 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1982. Plan de relance agricole 1982-1984. (1982-84 Agricultural reactivation plan). Zaire, 210p. Fr.

CASSAVA; PRODUCTION; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; STATISTICAL DATA; ZAIRE.

Data are given on the 1980 cassava production, and production objectives for 1981-84, for the different projects of the 1982-84 agricultural reactivation plan for Zaire. A table is included with statistics on cassava production by region for 1978-81. Production objectives for 1982-84 are also presented for projects including cassava, such as the Eastern Kasai maize project, the Kwango-Kwilu integrated agricultural development project, and the Luala and Mbanza-Ngungu agricultural projects. (CIAT)

1262

31576 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1982. Situation actuelle de l'agriculture Zairoise. (Current situation of Zairian agriculture). Zaire, Division d'Etudes et de Programmation, Bureau de Planification Agricole. Projet 660-070 USAID. 331p. Fr., 79 Ref., Il.

CASSAVA; STATISTICAL DATA; CASSAVA PROGRAMS; PRODUCTION; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; CASSAVA AFRICAN MOSAIC VIRUS; GLOMERELLA CINGULATA; ROOT PRODUCTIVITY; PRICES; CASSAVA CHIPS; CASSAVA ROOTS (VEGETABLE); CASSAVA FLOUR; MAPS; HUMAN NUTRITION; ZAIRE.

Statistics are presented on production objectives established by the Zairian Agricultural Reactivation Plan for 1982-84 for various commodities

(including cassava). Lower Zaire, Bandundu, Equator, Western Kasai, Kivu, and Higher Zaire are the major cassava producing regions. The importance of cassava in human feeding is highlighted; both roots and leaves are eaten. A table showing the evolution of production and area planted to cassava for 1971-81 is included along with a graph for the 1961-81 period. Major diseases (CBB, CAMV, anthracnose, and green mites) are reported as the major constraints for cassava production. Statistics are given on av. yields from local and improved var. for different regions. Reasons for low yields are listed. Data are presented on the variation of av. retail prices of cassava chips in Kinshasa from 1976 to 1980 as well as prices in markets of other regions for 1982. Statistics are also included on the seasonal variation of av. prices of cassava tubers, chips, and flour for the 1976-81 period. Data for cassava tubers and flour are only given for 1980-81; a map showing the major cassava growing regions is included. A table is presented with the cassava program for the various regions for 1982-84. Data on estimates of demand for cassava and its products are given for 1982- 85. (CIAT)

1263

31577 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1987. Situation actuelle de l'agriculture Zairoise. (Current situation of Zairian agriculture). Zaire, Division de Stratégie et de Planification Agricole. Projet 660-070/USAID/PRAGMA CORP. 577p. Fr., 126 Ref., Il.

CASSAVA; STATISTICAL DATA; CASSAVA PROGRAMS; PRODUCTION; ROOT PRODUCTIVITY; PRICES; CASSAVA CHIPS; CASSAVA ROOTS (VEGETABLE); CASSAVA LEAVES (VEGETABLE); CHICKWANGUE; MAPS; HUMAN NUTRITION; ZAIRE.

Statistics from the Zairian Agricultural Reactivation Plan for 1982-84 are presented on production objectives and accomplishments for the major commodities (including cassava tubers and leaves). The importance of this crop in human feeding is highlighted; both roots and leaves are eaten. A table is included showing evolution of production and area planted to this crop from 1971 to 1984. Cassava is commercialized as fresh roots, chips, and leaves. Statistics are given on evolution of min. av. prices for the cassava chips produced from 1975 to 1984 and on the variation of av. retail prices of the same product in Kinshasa markets from 1976 to 1984. A map showing the major cassava growing regions in Zaire is included. Data are also presented on seasonal variations of retail prices for various cassava products (fresh roots, chips, leaves, and chickwangue) in Kinshasa from 1976 to 1984. A table is presented with data on the cassava program and accomplishments for the different regions for the 1982-84 period. Finally, estimates of demand for cassava and its products are given for the 1982-90 period. (CIAT)

1264

30871 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1983. Structure des prix des produits vivriers, 1o. trimestre 1983. (Structure of food product prices (1st trimester 1983)). Zaire, 12p. Fr., Il.

CASSAVA; STATISTICAL DATA; PRICES; COSTS; CASSAVA CHIPS; CASSAVA FLOUR; ZAIRE.

Data on av. retail prices, costs, and margins are presented and analyzed for several food products (among them cassava chips) in 9 markets of Kinshasa, Zaire, during the 1st trimester of 1983. A gross margin of 109 percent was found between the purchase price to producer and sale price to urban distributor for the harvester- transporter. Transport represented 60 percent of the purchase price. Net margin for harvester-transporter was found to be 20 percent. For cassava chips, a gross margin of 165 percent was found, and for fresh cassava, the net margin for the intermediary was 38 percent. Transport costs represented 70 percent. A diagram showing weekly variations

of cassava chips and CF prices for the 1st trimester of 1983 is also included. (CIAT)

1265

30888 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1984. Structure des prix des produits vivriers 1o. trimestre 1984. (Structure of food crops prices, 1st quarter 1984). Zaire, Direction des Marchés, Prix et Crédits de Campagne. 15p. Fr., Il.

CASSAVA; STATISTICAL DATA; PRICES; COSTS; CASSAVA CHIPS; CASSAVA MEAL; ZAIRE.

Data on av. retail and semi-wholesale prices, costs, and margins are presented for several food products (cassava chips included) in 9 markets of Kinshasa, Zaire, in the 1st quarter of 1984. Differences are compared and analyzed with data for the 3rd quarter of 1983. Diagrams showing weekly variations of cassava chips and CM prices are also included for the 1st quarter of 1984. (CIAT)

1266

30890 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1984. Structure des prix des produits vivriers 2o. trimestre 1984. (Price structure of food crops 2nd quarter 1984). Zaire, Direction des Marchés, Prix et Crédits de Campagne. 15p. Fr., Il.

CASSAVA; STATISTICAL DATA; PRICES; COSTS; CASSAVA CHIPS; CASSAVA MEAL; ZAIRE.

Data on av. retail and semi-wholesale prices, costs, and margins are presented for several food products (including cassava chips) in 9 markets of Kinshasa, Zaire, in the 2nd quarter of 1984. Differences are compared and analyzed with data for the 1st quarter. Diagrams showing weekly variations of cassava chips and meal prices for the 2nd quarter of 1984 are also included. (CIAT)

1267

31374 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1979. Synthese sur le programme de production de principales denrées alimentaires: manioc. (Synthesis on the staple food crop production program: cassava). In Zaire. Département de l'Agriculture et du Développement Rural. L'agriculture Zairose: situation courante et contraintes. Kinshasa, Zaire, pp.36,39. Fr., Dat.num.

CASSAVA; STATISTICAL DATA; PRODUCTION; ZAIRE.

Statistical data are given on cassava production (t) in Zaire for 1973-78 and production estimates for 1979-85. Cassava production constraints were deficient transportation facilities and lack of disease-resistant cv.; measures suggested to overcome them are included. (CIAT)

1268

26836 BASLER, A. 1984. KANN ZAIRE SICH SELBST ERNAHREN?. (¿CAN ZAIRE FEED ITSELF?). AFRIKA SPECTRUM 19(3):231-252. DE., SUM. EN., FR., 30 REF. (INST. FUR LANDWIRTSCHAFLICHE MARKTFORSCHUNG DER BUNDESFORSCHUNGSANSTALT FUR LANDWIRTSCHANFT, BUNDESALLEE 50, 33 BRAUNSCHWEIG, GERMAN FEDERAL REPUBLIC)

CASSAVA; DEVELOPMENTAL RESEARCH; PRODUCTION; PRODUCTIVITY; MARKETING; STATISTICAL DATA; CONSUMPTION; ZAIRE.

FOOD PRODUCTION AND MARKETING PATTERNS AND PROBLEMS IN ZAIRE ARE ANALYZED. FOOD PRODUCTION HAS INCREASED SLOWLY OVER THE PAST 20 YR; HOWEVER, ZAIRE

NEEDS TO IMPORT AGRICULTURAL PRODUCTS TO FEED HER POPULATION. SUCH IMPORTS FROM THE INDUSTRIALIZED COUNTRIES ARE PAID FOR THROUGH THE PRODUCTION OF EXPORT CROPS (E.G. COFFEE) AND RAW MATERIALS (CU) OR BY INCURRING MORE DEBTS. AFTER HIGH INCREASES OF FOREIGN EXPORT EARNINGS IN 1977-78, EXPORT TRADE HAS SLUMPED, WHILE FOOD IMPORTS CONTINUED TO INCREASE SO THAT THE TRADE SURPLUS HAD TURNED INTO A DEFICIT BY 1981. LAND AVAILABILITY CANNOT BE A REASON FOR FOOD DEFICITS IN ZAIRE, AS LARGE AREAS REMAIN UNCULTIVATED. SMALL FARM SIZES, LACK OF MECHANIZATION, AND TRADITIONAL PRODUCER BEHAVIOR ARE LIMITING FACTORS; HOWEVER, THE EXISTING INEFFICIENCIES OF THE MARKETING SYSTEM ARE MORE IMPORTANT, ESPECIALLY REGARDING CASSAVA. (AS)

1269

29028 BIGAWA, S. 1983. LES CHAMPIGNONS CONTAMINANT LE MANIOC FRAIS DANS LA VILLE DE KISANGANI. (FUNGI CONTAMINATING FRESH CASSAVA IN THE CITY OF KISANGANI). JOURNAL D'AGRICULTURE TROPICALE ET DE BOTANIQUE APPLIQUEE 30(3-4):193-196. FR., SUM. FR., EN., 17 REF. (FACULTE DES SCIENCES, UNIV. DE KISANGANI, B.P. 132, KISANGANI, ZAIRE)

CASSAVA; MYCOSES; ASPERGILLUS; FUSARIUM; MONILLA; MUCOR; PENICILLIUM; CASSAVA ROOTS (VEGETABLE); ZAIRE.

FUNGI FOUND CONTAMINATING FRESH CASSAVA EXPOSED TO AIR WERE IDENTIFIED AT 2 PERIPHERIC STATIONS OF KISANGANI, ZAIRE, DURING THE DRIEST PERIODS OF THE YEAR. GENERA FOUND WERE ASPERGILLUS, FUSARIUM, MONILLA, AND PENICILLIUM. THE FUSARIUM GENUS WAS THE LESS FREQUENT. (AS)

1270

28134 BRUDZYNSKI, A. 1985. L'INCIDENCE D'ASPERGILLUS FLAVUS ET D'AUTRES ESPECES DE MOISISSURES DANGEREUSES DANS LA MYCOFLORE DU MAIS, D'ARACHIDES ET DE COSSETTES DU MANIOC VENDUES SUR LE MARCHE DE KISANGANI. (THE OCCURRENCE OF ASPERGILLUS FLAVUS AND OTHER DANGEROUS MOLDS IN THE MYCOFLORA OF MAIZE, GROUNDNUTS, AND CASSAVA ROOTS SOLD AT THE KISANGANI MARKET). INDUSTRIES ALIMENTAIRES ET AGRICOLES 102(4):307-309. FR., SUM. FR., 9 REF.

CASSAVA; MYCOSES; ASPERGILLUS; PENICILLIUM; FUSARIUM; PHYTOPHTHORA; RHIZOPUS; CLADOSPORIUM; CURVULARIA; MONILIA; TRICOTHECIUM; NIGROSPORA; RHODOTORULA; AFLATOXIN; MOLDS; STORAGE; ZAIRE.

THE RESULTS ARE PRESENTED OF AN ANALYSIS OF MYCOTOXIN PRODUCING FUNGI, PATHOGENIC TO BOTH ANIMALS AND HUMANS, IN SOME PRODUCTS (AMONG THEM, CASSAVA) SOLD AT KISANGANI MARKET, ZAIRE, AFTER BEING STORED FOR 1 MO. OR MORE. TWELVE GENERA OF FUNGI WERE IDENTIFIED, THE MOST IMPORTANT BEING ASPERGILLUS, PENICILLIUM, AND FUSARIUM, FOLLOWED BY PHYTOPHTHORA, RHIZOPUS, CLADOSPORIUM, CURVULARIA, AND MONILIA; THE MOST UNCOMMON WERE TRICOTHECIUM, NIGROSPORA, AND RHODOTORULA. A. FLAVUS WAS FOUND IN 20 PERCENT OF THE CASSAVA SAMPLES ANALYZED AND THE SPECIES A. CANDIDUS, A. CLAVATUS, A. LUCHUENSIS, AND A. NIGER WERE EACH FOUND IN 13 PERCENT OF THE SAMPLES ANALYZED. THESE SPECIES ALSO FORMED PART OF THE AIR MYCOFLORA. CLIMATIC CONDITIONS IN KISANGANI (25 DEGREES CELSIUS AND 85 PERCENT RH) FAVOR THE DEVELOPMENT OF FUNGI; THIS, ALONG WITH THE PRESENCE OF SPORES IN THE AIR, INDICATE THAT MYCOTOXINS (ABOVE ALL AFLATOXINS) CONSTITUTE A PERMANENT DANGER TO FOOD PRODUCTS. (CIAT)

1271

26878 DAVIDSON, J.C. 1979. CYANIDE, CASSAVA, AND DIABETES. LANCET 22(2):635. EN., 4 REF.

CASSAVA; CYANIDES; HUMAN HEALTH; HUMAN NUTRITION; ZAIRE; ZAMBIA.

BRIEF INFORMATION IS PRESENTED ON THE INCIDENCE OF DIABETES IN AN AREA ON THE ZAIRE-ZAMBIAN BORDER, A PREDOMINANTLY CASSAVA-EATING ZONE. THIS IS IN

MARKED CONTRAST TO THE REST OF ZAMBIA WHERE MAIZE IS THE STAPLE FOOD AND DIABETES IS UNCOMMON. OVER 80 PERCENT OF THE MEN AND 60 PERCENT OF THE WOMEN HAD EVIDENCE OF MALNUTRITION. A DIETARY SURVEY SHOWED THAT THE AV. TOTAL CALORIE INTAKE WAS 1439 PER DAY, OF WHICH 1340 WAS FROM CASSAVA. (CIAT)

1272

30874 EZUMAH, H.C. 1980. Quelques recommandations sur les pratiques culturales du manioc au Zaire. (Some recommendations on cassava cultural practices in Zaire). Zaire, Département de l'Agriculture. Programme National Manioc. Monographe Pronam no.1 15p. Fr., 15 Ref., Il.

CASSAVA; TIMING; SPACING; LAND PREPARATION; WEEDING; CULTIVARS; STATISTICAL DATA; PRODUCTION; ROOT PRODUCTIVITY; PEST CONTROL; INTERCROPPING; GROUNDNUT; ZAIRE.

Some cassava cultural practices recommended by the national cassava program in Zaire are summarized. They deal with date of planting, disease and pest control, soil preparation, planting density and spacing, weed control, and planting material. General information is included on associated crops, leaf harvesting, and effect of land slope on tuber yields. Statistics are presented on cassava production (t), area planted (ha), and yields (t/ha) from 1970 to 1975 in the different regions of Zaire; a list is given with several outstanding cassava clones available at M'vuazi expt. station. (CIAT)

1273

32276 GUEFALA, Y.; TREUTEN, M. 1985. The commercial processing of cassava and utilization of its primary and by-products in the Congo, Zaire and Ivory Coast. Consultancy report. Addis Ababa, Ethiopia, Advisory Group on Food and Agricultural Industries. 45p. En., 30 Ref.

CASSAVA; USES; PROCESSING; ECONOMICS; CONSUMPTION; PRICES; CHICKWANGUE; COSTS; LABOR; PRODUCTIVITY; INDUSTRIALIZATION; SMALL-SCALE EQUIPMENT; CONGO; IVORY COAST; ZAIRE.

Prospects for improving utilization and industrial transformation of cassava in Congo, Zaire, and Ivory Coast are analyzed. The analysis is based on the current state of cassava production; available technologies and economic conditions for traditional and industrial processing; and opportunities for cassava commercial and industrial utilization and by-products. Raw cassava production and costs, consumption, and price structure in each country are also analyzed. The traditional production of chickwangue and economic-related aspects are presented. The "Bertin" and "12T" processing systems of Congo and Zaire, resp., are described. Other economic uses of cassava, such as animal feeding, waste use, and energy recovery from waste are discussed. A series of recommendations is presented for each country regarding cassava production and processing aspects. (CIAT)

1274

32253 HENNESSEY, R.D. 1986. Report on cassava mealybug and cassava green mites in some African countries: Zaire. In Herren, H.R.; Hennessey, R.N., eds. International Workshop on Biological Control and Host Plant Resistance to Control the Cassava Mealybug and Green Mite in Africa, Ibadan, Nigeria, 1982. Proceedings. Ibadan, Nigeria, International Institute of Tropical Agriculture. pp.146-147. En. (PRONAM, B.P. 11635, Kinshasa 1, Zaire)

CASSAVA; PHENACOCCUS MANIHOTI; PRODUCTIVITY; MONONYCHELLUS TANAJOA; CULTURAL CONTROL; PREDATORS AND PARASITES; ZAIRE.

The importance of cassava as a food crop in Zaire is highlighted, indicating that both roots and leaves are eaten in various forms. The cassava mealybug

was 1st reported in Kinshasa in 1973, and during the dry seasons of 1976-77 it caused heavy root yield losses in the savanna region of lower Zaire (losses ranged from 54 to 85 percent). Losses in leaf yields, although not assessed, were also high. Since 1978 the pest has continued to spread, reaching the Bandundu region (western Zaire) and Likasi (southern Shaba region). In 1982 it was reported in the Kivu region and in northern Upper Zaire. The cassava green mite entered eastern Zaire in 1974 and is more widespread than the mealybug; however, root yield losses have not been assessed. Cultural practices aimed to reduce mealybug damage are listed. The release of 2 natural enemies (Epidinocarsis lopezi and Diomus sp.) is mentioned. (CIAT)

1275

30520 HENRY, J.M. 1976. Le manioc. (Cassava). In Henry, J.M.. Cahiers de la recherche en analogie agrobioclimatique. 1. Analyse d'acclimatation de végétaux en zone équatoriale zairose de basse altitude. Belgique, Centre d'Information Appliquée au Developpement et a l'agriculture Tropicale. pp.315-328. Fr.

CASSAVA; CULTIVARS; ADAPTATION; LIGHT; TEMPERATURE; CLIMATIC REQUIREMENTS; WATER REQUIREMENTS (PLANT); PRODUCTIVITY; CASSAVA AFRICAN MOSAIC VIRUS; RESISTANCE; ZAIRE.

The methodology used to determine the acclimatization criteria of cassava clones or var. is described in detail. Parameters considered include: degrees Celsius/day, total of calories, total hours of insolation, amount of available water, and range between absolute max. and min. temp. The value of each parameter was calculated for 5 plant developmental stages. Climatic criteria considered for each development stage of the cassava crop in Yangambi, Zaire, are included. Among outstanding clones were 0129/45/11, 0442/45/15, 02864, 02945, and X45/5, yielding 40.0, 36.4, 38.4, 39.4, and 39.8 t fresh roots/ha, resp., and 12.3, 11.0, 10.5, 10.3 and 9.9 t starch/ha, resp. Elite clones were also classified according to their degree of resistance to mosaic. Climatic expressions obtained in different ecological conditions (Brazil, Philippines, Malaysia, Madagascar, Indonesia, Colombia, and Zaire) for a same group of Brazilian clones were compared and analyzed. Resistance to mosaic and yields differed for 3 different regions in Zaire (Yangambi, Nioka, and Mulungu). Results indicated that the different environments compared should have a similar small area and almost the same alt., regardless of the distances between envirorments. The advantages of using cassava as indicator plant are highlighted. (CIAT)

1276

29046 HOLTZMAN, J.S. 1986. Annotated bibliography of cassava production, marketing, processing and consumption in Africa with particular attention to Zaire. Worcester, MA, Settlement and Resource Systems Analysis Cooperative Agreement. 42p. En., 95 Ref.

CASSAVA; BIBLIOGRAPHY; PRODUCTION; MARKETING; PROCESSING; HUMAN NUTRITION; ZAIRE; AFRICA.

The importance of cassava as a food crop in Zaire is highlighted and the situation of research of this crop is analyzed and discussed. Biblio-graphic references up to 1985 covering different aspects of cassava are included with their resp. abstracts. Particular emphasis was given to literature relevant to Zaire. The bibliographic material was divided into 5 groups: selected general reference material; cassava production, marketing, processing, and storage in African countries other than Zaire; socioeconomic studies of cassava production, marketing, and processing in Zaire; re-search on cassava production; and cassava consumption and nutrition. (CIAT)

1277

31620 KADER, A.; FAHEM, F. 1978. Agriculture. (Agriculture). In Atlas de la République du Zaire. Paris, France, Editions Jeune Afrique. pp.40-49. Fr., Il.

CASSAVA; MAPS; STATISTICAL DATA; PRODUCTION; ZAIRE.

General characteristics of agriculture in Zaire are described in detail as well as the different stages of agricultural development. Commonly used techniques in the traditional sector are described; cassava is mentioned as an important food crop for the population. Statistics on the evolution of the crop from 1961 to 1973 are given and a map is included showing the importance of cassava in relation to other crops and producing regions. (CIAT)

1278

31698 LUBINI, A. 1986. Végétation adventice et postculturale de Kisangani et de la Tshopo (Haut-Zaire). (Adventitious and postcultural vegetation in Kisangani and Tshopo (Upper Zaire)). Bulletin du Jardin Botanique National de Belgique 56(3-4):315- 348. En., Sum. En., 10 Ref. (Laboratoire de Biologie Végétale, Institut Supérieur Pédagogique de la Gombe, B.P. 281, Kinshasa, Zaire)

CASSAVA; WEEDS; ZAIRE.

Weed communities occurring in a no. of crops (among them cassava) and in postcultural situations in the areas of Kisangani and Tshopo, Zaire, were found to belong to 1 alliance, 18 associations, and 1 subassociation. Associations were grouped into those belonging to crops, fallow areas, and secondary forests, and subdivided according to soil type and predominant species. Main species associated with cassava were Bidens pilosa and Crassocephalum montuosum, and Paspalum conjugatum and Mariscus alternifolius. (CIAT)

1279

30884 LUTALADIO, N.B.; BROCKMAN, F.F. 1983. Les systemes culturaux de manioc en Afrique centrale. (Cassava cultivation systems in Central Africa). Zaire, Programme National Manioc. 11p. Fr., 8 Ref.

CASSAVA; INTERCROPPING; CULTIVATION SYSTEMS; RESEARCH; ZAIRE; CONGO.

A short bibliographic review and general information on the different cassava cultivation systems commonly used in Central Africa are given. The main results of research work on associated crops conducted by the national cassava program in Zaire are reported and some aspects on possible research work are suggested. (CIAT)

1280

32227 MAHUNGU, N.M. 1987. New priorities in cassava selection in Zaire (Abstract). In Terry, E.R.; Akoroda, M.O.; Arene, O.B., eds. Triennial Symposium of the International Society for Tropical Root Crops- Africa Branch, 3d, Owerri, Nigeria, 1986. Tropical root crops; root crops and the African food crisis: proceedings. Ottawa, Canada, International Development Research Centre. p.119. En. (Programme National Manioc, Kinshasa, Zaire)

CASSAVA; CASSAVA PROGRAMS; RESEARCH; ZAIRE.

Since 1974 and the creation of Programme National Manioc (PRONAM), cassava selection procedures have been reactivated in Zaire. The principal objectives of the program are the production of high yielding var. that are resistant to diseases and pests. At present, apart from these initial

selection criteria, particular attention is being given to the quality of the roots in terms of HCN content, dry wt., and the organoleptic qualities of products consumed as vegetables. Photosynthetic effectiveness of leaves at low sun exposures, morphologies suitable for intercropping, and the speed of growth of the clone at a young age have also been considered selection criteria in the present program. The methodology used to evaluate these various criteria is discussed. (Full text)

1281

30129 MUIMBA-KANKOLONGO, A.; PHUTI, K. 1987. Relationship of cassava mosaic severity in planting material to mosaic development, growth and yield of cassava in Zaire. Experimental Agriculture 23(2):221-225. En., Sum. En., Es., 16 Ref. (Programme National Manioc, B.P. 11635 Kinshasa 1, Zaire)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; PLANT DEVELOPMENT; PROPAGATION MATERIALS; CUTTINGS; ROOT PRODUCTIVITY; PLANT HEIGHT; STEMS; PEST DAMAGE; ZAIRE.

The performance of a CAMD-susceptible cassava clone was assessed over 2 successive years for disease development, plant vigor, and yield of fresh tuberous roots in M'Vuazi, Bas-Zaire. Cuttings from plants with different CAMD infection levels were used. There was a significant increase in mosaic incidence and severity, and in the proportion of leaves showing disease symptoms in the subsequent crop as the levels of CAMD primary infection in planting material increased. Plant height and stem diameter were also adversely affected and the yield of plants from severely affected cuttings was reduced by 60-70 percent. (AS)

1282

32213 MUIMBA-KANKOLONGO, A.; MUYOLO, G.; MAHUNGU, N.M.; PANDEY, S.J. 1987. Strategies of Programme National Manioc (PRONAM) of Zaire in screening cassava for resistance to major diseases. In Terry, E.R.; Akoroda, M.O.; Arene, O.B., eds. Triennial Symposium of the International Society for Tropical Root Crops- Africa Branch, 3d, Owerri, Nigeria, 1986. Tropical root crops; root crops and the African food crisis: proceedings. Ottawa, Canada, International Development Research Centre. pp.109-112. En., Sum. En., 13 Ref., Il. (Programme National Manioc, Kinshasa, Zaire)

CASSAVA; CASSAVA PROGRAMS; PLANT BREEDING; CULTIVARS; RESISTANCE; SELECTION; CASSAVA AFRICAN MOSAIC VIRUS; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; GLOMERELLA MANIHOTIS; ZAIRE.

The various strategies and procedures of Programme National Manioc (PRONAM) of Zaire in screening cassava for resistance to major diseases (CBB, CAMD, and anthracnose) are discussed. PRONAM has developed some good disease-resistant, high yielding var. that are recommended to farmers for general cultivation. (AS (extract))

1283

29512 NAIGEON, C. 1982. CONGO: LE BDPA ET L'INRA LANCENT LE FOUFOUDOU. (CONGO: THE BDPA AND THE INRA LAUNCH THE FOOFOODOU). AFRIQUE AGRICULTURE 83:22-23. FR., SUM. FR., IL.

CASSAVA; ATIEKE; FOOFOO; GARI; CULTIVARS; DEVELOPMENT; TECHNOLOGY TRANSFER; ZAIRE.

DIFFERENT FORMS OF CASSAVA CONSUMPTION IN VARIOUS WESTERN AND CENTRAL AFRICAN COUNTRIES ARE LISTED, POINTING OUT THE NEED FOR INDUSTRIAL TRANSFORMATION OF THE ROOT DUE TO ITS DIFFICULT CONSERVATION AS A FRESH PRODUCT. OF THE MAJOR PRODUCING COUNTRIES THAT HAVE INVESTIGATED SOLUTIONS TO THIS PROBLEM, ZAIRE STANDS OUT AS AN EXPORTER OF CASSAVA PASTE. ON THE

OTHER HAND, IN 1981 THE CONGO BUILT THE 1ST FACTORY FOR THE INDUSTRIAL TRANSFORMATION OF CASSAVA INTO FOOFOO. THE ADVANTAGES AND DISADVANTAGES OF SOAKED CASSAVA AND FOOFOO ARE COMPARED. IN WESTERN AFRICA (THE ATIEKE AND GARI ZONE), THE ADOPTION OF SWEET CASSAVA VAR. HAS BEEN SUCCESSFUL, ALTHOUGH THIS WAS NOT POSSIBLE IN CENTRAL AFRICA. FINALLY, ONCE THE LOW PRODUCTIVITY OF SWEET VAR. COMPARED WITH BITTER VAR., AND THE STICKY CONSISTENCY OF FOOFOO ARE OVERCOME, PLANS INCLUDE THE PLANTING OF 400 HA OF SWEET CASSAVA IN MANTSUMBA, WHERE THE FACTORY IS. IT IS LEFT TO BE SEEN IF THE NEW PRODUCT, CALLED FOOFOODOU, WILL CONQUER THE MARKET IN BRAZZAVILLE. (CIAT)

1284

26802 NAKU, M.; MAHUNGU, N.M.; SAMBA, M.T.A.; NTUMBA, N.; BAUWE, N.B. 1985. LE CAS DU ZAIRE. (THE CASE OF ZAIRE). IN WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAINS IN AFRICA, KINSHASA, ZAIRE, 1985. REPORT. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.248-259. FR., 3 REF.

CASSAVA; PRODUCTION; MARKETING; PROCESSING; PRICES; LEGAL ASPECTS; BACTERIOSES; SOCIOECONOMIC ASPECTS; CASSAVA PROGRAMS; DEVELOPMENTAL RESEARCH; PHENACOCCUS MANIHOTI; MONONYCHELLUS TANAJOA; CASSAVA MOSAIC VIRUS; ZAIRE.

THE SITUATION OF CASSAVA AND OTHER STARCHY CROPS IN ZAIRE IS DESCRIBED. IN 1974, THE PROGRAMME NATIONAL DE MANIOC WAS CREATED FOR THE DEVELOPMENT OF CASSAVA PRODUCTION (2,086,400 HA PLANTED AND 14,273,100 T/YR) AND WHICH ALSO PROMOTES THE USE OF IMPROVED VAR., THE IDENTIFICATION OF DISEASES AND PESTS, AND THE USE OF IMPROVED AGRICULTURAL PRACTICES. THE PAST AND PRESENT COMMERCIALIZATION SYSTEMS ARE DESCRIBED. IN 1984, 900,000 T CASSAVA CHIPS WERE COMMERCIALIZED. THE MAIN CONSTRAINTS TO PRODUCTION AND CULTIVATION ARE DISCUSSED, AMONG THEM LOW SOIL FERTILITY, INFLUENCE OF CLANS ON LAND TENURE PATTERNS, ANCESTRAL CROP SCHEDULES, DIVISION OF LABOR BY SEX, AND ABSENCE OF RESEARCH. (CIAT)

1285

30141 PACUMBABA, R.P. 1987. A method for selection of tolerance to African cassava mosaic virus. Phytopathologische Zeitschrift 118(4):312-316. En., Sum. En., De., 13 Ref. (Dept. of Natural Resources & Environmental Studies, Alabama Agricultural & Mechanical Univ., P.O. Box 183, Normal, AL 35762, USA)

CASSAVA; CASSAVA AFRICAN MOSAIC VIRUS; CULTIVARS; SELECTION; RESISTANCE; ZAIRE.

Detopping hastened the appearance of mosaic symptoms in shoots of cassava cuttings infected with CAMV. The degree of plant recovery from severe mosaic after each detopping was the basis for evaluation of CAMV tolerance. In field screening, detopping of cassava shoots infected with CAMV is recommended for selection of tolerance to the virus. One detopping of CAMV-infected shoots was sufficient to analyze tolerance level reliably. Out of 521 lines only 1 was found to be tolerant, while 144 lines were found to be moderately tolerant. These included the lines Gimbi MA 235, (02945S x 3119)S MA 219, and Kadanga Malombe previously described as resistant to CAMV. (AS)

1286

30136 PACUMBABA, R.P. 1987. A screening method for detecting resistance against cassava bacterial blight disease. Phytopathologische Zeitschrift 119(1):1-6. En., Sum. En., De., 6 Ref., Il. (Dept. of Plant & Soil Science, Alabama A & M Univ., Normal, AL 35762, USA)

CASSAVA; XANTHOMONAS CAMPESTRIS PV. MANIHOTIS; RESISTANCE; SELECTION; CULTIVARS; SYMPTOMATOLOGY; FIELD EXPERIMENTS; ZAIRE.

Inoculation of the CBB pathogen by using a modified pair of tongs on 1-mo.-old cassava shoots in the glasshouse and in the field (Mankewa, Zaire) resulted in symptoms within 24-48 h on susceptible cassava lines 02864 and M'pelolongi. Gum exudates on inoculated young stems and dieback appeared 7-12 and 20-25 days later, resp. No symptoms of CBB were observed on cv. Kadanga Malombe. Symptom development and CBB ratings on 3-mo.-old cassava shoots in the glasshouse and in the field were not consistent. Inoculation of CBB pathogen on 521 cassava shoots (1-mo.-old) using the tongs method gave 81 and 82 resistant and moderately resistant plants, resp. The tongs method is an excellent field-screening technique for detecting resistance to CBB on 1- mo.-old cassava shoots. (AS)

1287

32298 POURCHOT, J-P. 1983. Une expérience en production vivrière. L'exploitation agricole Renault-Zaire. (An experiment on food crop production. The Renault-Zaire farm). Le Havre, France, I.S.T.O.M.. 133p. Fr., Il.

CASSAVA; CASSAVA PROGRAMS; INDUSTRIALIZATION; CULTIVATION; PLANTING; COSTS; ECONOMICS; ZAIRE.

The main characteristics (location, area and topography, soils, vegetation, and climate) of a pilot farm for staple food production established in East Kinshasa, Zaire, in 1980 are described in detail. Trials carried out with maize, groundnuts, and cotton indicated that none was feasible. The different steps followed for planting cassava using the traditional method are described. Results of an economic analysis of this tuber crop indicated its feasibility and adaptability to the climatic and soil conditions prevailing on the farm. Different aspects of cassava cultivation were studied: area, objectives, parameters for meeting objectives, compatibility between production means and objectives, and a review of the traditional planting method. An improved planting method was implemented giving remarkable results. The establishment of a cassava processing unit is also suggested. Further information is presented on the major characteristics of herbicides for cassava weed control and on results of tests on its effectivity. A table showing the necessary investments for the establishment of a cassava research project is included and a project on a cassava processing unit is briefly described. (CIAT)

1288

32254 BEGET, P.F.; AB'EMEME IBEBE 1987. Techniques traditionnelles de transformation de manioc au Zaire. 1. Préparations pour usage domestique. (Traditional processing techniques of cassava in Zaire. 1. Products for domestic use). Microbiologie-Aliments-Nutrition 5:51-59. Fr., Sum. En., 30 Ref., 1l. (Laboratoire de Microbiologie Alimentaire, Ecole Polytechnique Fédérale, CH-8092 Zurich, Suisse)

CASSAVA; PROCESSING; SURVEYS; CASSAVA PASTES; FOOFOO; CASSAVA ROOTS (VEGETABLE); SWEET CASSAVA; BITTER CASSAVA; USES; STORAGE; ZAIRE.

Traditional processing techniques and recipes were studied to determine where a fermentation step could be introduced without considerably changing the organoleptic aspects of well-known cassava foods. Through a survey in all regions of Zaire, 70 recipes of traditional preparations of cassava foods for domestic use were identified. These are described and divided into 4 categories: fresh cassava roots, cooked cassava, cassava paste, and cassava porridge. For each category, a large flow sheet of the different processing techniques is included. The different products are compared regarding no. of recipes/region, use of bitter and sweet cassava roots, mixtures with other foodstuffs, nutritional importance, and shelf life. The results show a var. of traditional processing techniques. As more research

is undertaken to improve the nutritional value of cassava by improvements in technology and microbiology, it is recommended that priority be given to the study of established traditional techniques, if the products are to be acceptable to the local population. (AS (extract))

1289

32255 REGEZ, P.F.; MULUMBA, N. 1987. Techniques traditionnelles de transformation de manioc au Zaire. 2. Preparations commercialisees. (Traditional processing techniques of cassava in Zaire. 2. Products for commercial use). Microbiologie-Aliments-Nutrition 5:123-128. En., Sum. En., 14 Ref. (Laboratoire de Microbiologie Alimentaire, Ecole Polytechnique Fédérale, CH-8092, Zurich, Suisse)

CASSAVA; FOOFOO; CHICKWANGUE; GARI; BEVERAGES; FERMENTATION; SMALL-SCALE PROCESSING; ZAIRE.

A total of 132 cassava products, produced and sold in the local markets in Zaire, are described; products are grouped into 6 categories: cassava flour and paste (foofoo), cassava bread (chickwangue), cassava puree, cassava cakes, cassava semolina (gari), and fermented cassava beverages. Flow sheets have been developed and the different products are compared regarding no. of recipes/region, use of bitter and sweet cassava roots mixtures with other foodstuffs, nutritional importance, and shelf life. Since any improvement of the nutritional value of commercialized cassava products would have a major impact for the local people, it is suggested to reinforce and encourage the existing techniques of fermentation and mixing with cereals. Only with a good knowledge and use of traditional processing techniques can modifications through technology and microbiology be successful. (AS)

1290

30865 THORIGNE, J. 1983. Note sur le secteur vivrier au Zaire: politique et structure de prix (couts et marges de commercialisation-avril 1983). (Note on the Zaire food sector: price policy and structure (costs and commercialization margins --April 1983)). In Fromageot, M. Prix et politique des prix des produits vivriers en République Populaire du Congo: annexes. Rome, Italy, Food and Agriculture Organization of the United Nations. pp.35-48. Fr.

CASSAVA; CASSAVA CHIPS; PRICES; PRODUCTION; ZAIRE.

Price structure is analyzed for the major food products (including cassava chips) commercialized in Zaire in April 1983. gross margin of 109 percent for the collector-transporter was found between the purchase price to the grower and the sale price to the urban distributor. Transportation accounts for 60 percent of the purchase price and net margin for the collector-transporter for 20 percent. For the urban distributor, the gross margin was 26 percent (9 percent corresponding to net margin). Costs and margins between prices to grower and prices to consumer reached 165 percent; transportation accounts for 70 percent, net margin for 38 percent, and other costs for 57 percent. A table is included showing the area planted (ha) to cassava and production (t) in the different regions of Zaire in 1980, 1981, and 1986. (CIAT)

ZAMBIA

1291

29061 ZAMBIA. DEPARTMENT OF AGRICULTURE. 1973. Cassava. In Zambia. Department of Agriculture. Annual Report 1972/1973. Zambia, p.98. En.

CASSAVA; CULTIVARS; FERTILIZERS; PRODUCTIVITY; ZAMBIA.

The 1972/73 results of ongoing cassava trials, established at 3 different sites of Zambia, are briefly reported. In Mongu CAMD-resistant cv. were screened; however, a high proportion of materials were lost due to plant death. In Misamfu 1 trial assessed yields of fertilized or unfertilized cassava cropped continuously for different periods of time (harvesting at 15, 27, and 39 mo. after planting). At 15 mo. after planting, the fertilized plot outyielded the unfertilized one (16.0 and 15.2 t/ha, resp). Yield results are not yet available for the trial established in 1971 to investigate the long-term effects of crop rotations involving cassava and other crops in the presence of different fertilization levels. A cv. x fertilizer x cultivation methods trial was established in Mwinilunga to investigate the effects of mound and ridge planting in the presence and absence of fertilizer on yields and other characteristics of sweet cv. Kapumba and bitter cv. Matali. Results at 15 mo. after planting showed that fertilization significantly increased root no./plot from 47 to 121, root wt./plant from 0.46 to 1.18 kg, top wt./plant from 0.82 to 1.62 kg, and fresh wt. at harvest from 34.0 to 41.0. Starch yields of Kapumba at 4.97 t/ha with and without fertilizer (4.97 and 1.95 t/ha, resp.) were significantly higher (P less than 0.05) than those of Matali (3.17 and 0.99 t/ha, resp.). (CIAT)

1292

29062 ZAMBIA. DEPARTMENT OF AGRICULTURE. 1974. Cassava. In Zambia. Department of Agriculture. Annual Report 1973-1974. Zambia, pp.98-100. En.

CASSAVA; CULTIVARS; FERTILIZERS; PRODUCTIVITY; ZAMBIA.

The 1973/74 results of ongoing cassava trials, established at 3 different sites of Zambia, are briefly reported. In Mongu, harvests in July 1974 showed a tremendous yield variation between cv. (1480-44,440 kg/ha). In a cv. x fertilizer trial in Mwinilunga, sweet cassava cv. Kapumba proved to be superior and a large response to fertilization was observed at 2 different harvesting dates; in the absence of fertilizer, ridges improved root, top, and starch yields. Fertilizer increased starch yield by approx. 8830 kg/ha. In Misamfu, yields of fertilized or unfertilized cassava, cropped continuously and harvested 15, 27, or 39 mo. after planting, were assessed. At 27 mo. after planting, the fertilized plot (av. yield 28,470 kg/ha) outyielded the unfertilized one by approx. 1200 kg/ha. A trial established in 1971 studied the long-term effects of crop rotations (involving cassava, maize, beans, millet, and Stylosanthes) in the presence of different fertilization levels. Few results are available, but crop yields were increased by fertilization. (CIAT)

1293

29060 ZAMBIA. DEPARTMENT OF AGRICULTURE. 1971. Cassava. In Zambia. Department of Agriculture. Annual Report 1970-1971. Zambia, p.76. En.

CASSAVA; CULTIVARS; ZAMBIA.

In Kaoma, Zambia, an observation trial of 5 local cassava var. was established in Nov. 1970. The crop was to be harvested after 24 mo. Only 2 cv., Kapumba and Nalumino, were relatively virus-free. In addition to the above, 91 promising cv. were imported from Kenya for local assessment; of these, 87 still remain. (Full text)

1294

29059 ZAMBIA. DEPARTMENT OF AGRICULTURE. 1969. Cassava N x P x K fertilizer trial. In Zambia. Department of Agriculture. Annual Report 1968/1969. Zambia, p.338. En.

CASSAVA; FERTILIZERS; N; P; K; ROOT PRODUCTIVITY; ZAMBIA.

A cassava fertilization trial was established at Misamfu Regional Research Station, Zambia, on Nov. 23, 1966, to determine an appropriate fertilizer formulation to increase yields and induce faster growth. Fertilizer levels used were 0, 67.20, or 134.40 kg N/ha; 0, 7.28, or 14.56 kg P/ha; and 0, 17.92, or 35.84 kg K/ha in a confounded 3(3) factorial in incomplete blocks with 2 replications. A 1st section was harvested about 1 yr after planting and a 2nd section 2 yr later. There were no significant differences between treatments in the 1st yr; however, when the crop was harvested after 2 yr, P increased yields from 7.0 t/ha at 0 P to 9.6 t/ha at 14.56 kg/ha, and N from 7.8 t/ha at 0 N to 9.1 t/ha at 134.40 kg/ha. Both effects were small, and a commercial recommendation would not be sound. (CIAT)

1295

29058 ZAMBIA. DEPARTMENT OF AGRICULTURE. 1968. Cassava trials. In Zambia. Department of Agriculture. Annual Report of Research Branch 1968. Zambia, pp.375-376. En.

CASSAVA; FERTILIZERS; N; P; K; ROOT PRODUCTIVITY; ZAMBIA.

Two trials were carried out in Misamfu, Zambia. Cuttings from a collection of high yielding, semimosaic-resistant cassava selections were maintained and distributed in the 1st and in the 2nd trials. Cassava was fertilized with 3 rates each of N (0, 67.2, and 134.4 kg/ha as ammonium sulphate), P (0, 16.8, and 33.6 kg/ha as simple superphosphate), and K (0, 33.6, and 67.2 kg/ha as muriate of potash) in a 3(3) factorial design, in an attempt to define a realistic fertilizer dressing for the crop in the country. Cassava yields for all nutrients at all rates ranged between 7733.6 kg/ha at 0 K and 8501.9 kg/ha at 0 P; no significant effect of treatments on yield was observed. (CIAT)

1296

30818 CHANDRA, S. 1986. Tropical root crops and their potential for food in the less developed countries. Food Reviews International 2(2):143-169. En., Sum. En., 38 Ref., Il. (Development Studies Centre, Australian National Univ., Canterra, Australia)

CASSAVA; PRODUCTIVITY; CONSUMPTION; USES; NUTRITIVE VALUE; ECONOMICS; DEVELOPMENTAL RESEARCH; STATISTICAL DATA; PAPUA NEW GUINEA; FIJI; JAPAN; INDIA; ZAMBIA; BRAZIL; OCEANIA.

The production and consumption of tropical root crops (including cassava) by major world regions and individual countries are analyzed. Data are given on area harvested, production, yields, and main producers in 1984. The nutritional value of tropical root crops and their use are discussed; a review of several nutritional studies done in India, Zambia, Brazil, and the South Pacific is given. The importance of root crops to the economies of Papua New Guinea, Fiji, and Japan is considered. Finally, general conclusions and recommendations for research and development in tropical root crops are made in agronomy, production systems, germplasm, breeding, diseases and pests, storage, utilization, and marketing. (CIAT) cat J00

1297

26879 DAVIDSON, J.C. 1980. DIETARY CYANIDE AND TROPICAL MALNUTRITION DIABETES. DIABETES CARE 3(6):703. EN., 2 REF.

CASSAVA; CYANIDES; HUMAN NUTRITION; HUMAN HEALTH; DIETS; MALNUTRITION; ZAMBIA.

BRIEF INFORMATION IS PROVIDED ON A DIABETIC SURVEY CARRIED OUT IN A CASSAVA-EATING AREA OF ZAMBIA. A PREVALENCE OF 1 PERCENT DIABETES WAS FOUND IN SURVEYED HOUSEHOLDS. THE DIAGNOSIS OF DIABETES WAS CONFIRMED IN 23 OF 69 PATIENTS REGISTERED AT A SMALL MISSION HOSPITAL. AN ASSESSMENT OF THE NUTRITIONAL STATUS OF THE POPULATION BY WT., HEIGHT, AND SKINFOLD THICKNESS REVEALED THAT 3/4 OF THE MEN AND ALMOST HALF OF THE WOMEN WERE BELOW THE 60 PERCENT STANDARD SKINFOLD THICKNESS. A TOTAL DAILY CALORIE INTAKE OF 1439, 93 PERCENT OF WHICH WAS CASSAVA, WAS ALSO FOUND. A POSSIBLE INVOLVEMENT OF CASSAVA CYANIDE IS SUGGESTED. (CIAT)

1298

31684 HOPKINSON, D. The North Western Province Area Development Project, Zambia. In Holmes, J.C., ed. Improving food crop production on small farms in Africa. Rome, Food and Agriculture Organization of the United Nations. pp.192-195. En., Sum. En.

CASSAVA; SHIFTING CULTIVATION; FARMING SYSTEMS; COSTS; PLANTING; TIMING; CULTIVATION; INTERCROPPING; ZAMBIA.

The physical environment, socioeconomic setting, main farming systems, problems, approaches, and early results of the North Western Province Area Development Project of Zambia are described. There are 2 traditional subsistence systems based on shifting cultivation and with no use of purchased inputs: sorghum-based and cassava-based systems. Both of these systems are similar in their characteristics. Cassava has a long planting season (Oct.-Feb.) with a different intercrop as the season passes (maize, vegetable, sweet potatoes, beans), use of mounds, only weeded once at 12-18 mo., and complete dependence on hand cultivation; cassava is also a component of the sorghum-based system. Land is generally cultivated for 2 cycles of cassava before being abandoned, but fallows may be as short as 5 yr. The project aims at producing packages to make crop production economically attractive, enhance land fertility, and reduce shifting cultivation. The release of improved var. for widespread testing has not been possible. (CIAT)

1299

26803 MOONGA, R.M.; CHALABESA, A. 1985. OUTLINE PAPER ON SITUATION OF ROOTS, TUBERS AND PLANTAINS IN ZAMBIA. IN WORKSHOP ON PRODUCTION AND MARKETING CONSTRAINTS ON ROOTS, TUBERS AND PLANTAIN IN AFRICA, KINSHASA, ZAIRE, 1985. REPORT. ROME, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. V.2,PP.260-266. EN.

CASSAVA; PRODUCTION; CASSAVA PROGRAMS; LEGAL ASPECTS; PRICES; MARKETING; DEVELOPMENTAL RESEARCH; ZAMBIA.

THE SITUATION OF CASSAVA AND OTHER SUBSISTENCE CROPS IN ZAMBIA IS DESCRIBED. NO ACCURATE DATA ARE AVAILABLE BUT IN A SURVEY CONDUCTED IN 1977, IT WAS ESTIMATED THAT 70 PERCENT OF THE FARMERS HAD CASSAVA FIELDS (APPROX. 371,000 HOUSEHOLDS). CASSAVA YIELDS IN ZAMBIA ARE AMONG THE LOWEST IN THE WORLD (APPROX. 6 T/HA IN 2-3 YR) AND PER CAPITA CONSUMPTION HAS DECREASED BY 25 PERCENT, ATTRIBUTED TO THE LACK OF EARLY MATURING, DISEASE- AND PEST-RESISTANT VAR., POOR CULTURAL PRACTICES, AND THE ABSENCE OF PROCESSING TECHNOLOGY AND MARKETING FACILITIES. OTHER PRODUCTION CONSTRAINTS ARE THE HIGH LABOR REQUIREMENTS AND PRICES AND THE LACK OF INCENTIVES. RESEARCH WORK CARRIED OUT AT MAUSA REGIONAL STATION IS BRIEFLY DISCUSSED. (CIAT)

1300

25514 SIMWAMBANA, M.S.C. 1983. A PRELIMINARY SURVEY OF THE CASSAVA MEALYBUG INFESTATION IN LUAPULA PROVINCE. MANSA, ZAMBIA, LUAPULA REGIONAL RESEARCH STATION. 8P. EN., IL.

CASSAVA; INSECT CONTROL; PHENACOCCUS MANIHOTI; MAPS; ZAMBIA.

RESULTS OF A PRELIMINARY SURVEY OF PHENACOCCUS MANIHOTI INFESTATION IN CASSAVA IN LUAPULA PROVINCE, ZAMBIA, ARE PRESENTED. THE PEST WAS REPORTED TO BE MORE SEVERE IN ERODED SOILS AND ON SLOPES IN KIMPESE, AS WELL AS IN SANDY AREAS WITH LOW SOIL MOISTURE. P. MANIHOTI INFESTATIONS WERE RECORDED IN THE MWENSE AND NCHELENGE DISTRICTS. THE PEST APPEARS TO HAVE BEEN INTRODUCED INTO THE COUNTRY BY NATURE (WIND) AND MAN ALONG THE LUAPULA RIVER AND THEN SPREAD TO THE NORTH THROUGHOUT THE LUAPULA VALLEY. IT IS THOUGHT THAT THE ABSENCE OF THE PEST IN THE KAWAMBWA DISTRICT COULD BE DUE TO HIGH RAINFALL (AV. 1255 MM/YR) COMPARED WITH THE OTHER DISTRICTS IN THE PROVINCE. SOME RECOMMENDED CULTURAL PRACTICES ARE MENTIONED. A MAP INDICATING INFESTED AREAS IS ALSO INCLUDED. (CIAT)

1301

27645 STROMGAARD, P. 1984. FIELD STUDIES OF LAND USE UNDER CHITEMENE SHIFTING CULTIVATION, ZAMBIA. GEOGRAFISK TIDSSKRIFT 84:78-85. EN., SUM. EN., DA., 22 REF., IL. (GEOGRAPHICAL INST., UNIV. OF COPENHAGEN, HARALDSGADE 68,2100 COPENHAGEN, DENMARK)

CASSAVA; SHIFTING CULTIVATION; LAND USE; MAPS; ZAMBIA.

LAND USE ASPECTS OF CHITIMENE (SHIFTING) CULTIVATION, IN WHICH CROPS ARE GROWN IN THE ASH AFTER BURNING STACKED BRANCHES LOPPED FROM TREES OVER AN AREA 5-8 TIMES THAT OF THE CULTIVATED GARDEN, WERE STUDIED IN NORTHERN ZAMBIA OVER A 250-HA AREA. CULTIVATION FOLLOWED A CYCLE INCLUDING WOODLAND FALLOW, GROUNDNUTS, CASSAVA, AND MAIZE. NEW GARDENS WERE OPENED IN ALTERNATE YEARS. SELECTED SINGLE HOUSEHOLDS WERE STUDIED FOR LAND USE AND HECTARAGE OF ALL CULTIVATED FIELDS. (AS)

ZIMBABWE

1302

28106 SPEAR, P.T.; RODEL, M.G.W. 1982. SUBSTITUTION OF MAIZE BY CASSAVA IN HIGH-ENERGY DIETS FOR FATTENING STEERS. IN ZIMBABWE. DEPARTMENT OF RESEARCH AND SPECIALIST SERVICES. DIVISION OF LIVESTOCK AND PASTURES. ANNUAL REPORT 1981-1982. ZIMBABWE. PP.83-85. EN.

CASSAVA; CASSAVA MEAL; ANIMAL NUTRITION; DIETARY VALUE; DIETS; FEEDS AND FEEDING; ECONOMICS; ZIMBABWE.

HIGH-ENERGY, MAIZE-BASED DIETS IN WHICH CM WAS SUBSTITUTED FOR MAIZE AT LEVELS OF 33, 67, AND 100 PERCENT WERE FED TO FATTENING STEERS DURING AN 83-DAY PERIOD. IN TERMS OF BODY MASS, DIETS WITH 33 AND 67 PERCENT CM RESULTED ' SLIGHTLY GREATER GAINS (144.6 AND 144.1 KG, RESP.) COMPARED WITH THE STANDARD HIGH-ENERGY DIET (142.2 KG), THE DIET WITH 100 PERCENT CM BEING SLIGHTLY LESS (133.3 KG). CARCASS GAINS WERE, HOWEVER, LOWER AT ALL SUBSTITUTION LEVELS (94.1, 90.8, AND 79.9 KG, RESP.) COMPARED WITH THE STANDARD DIET (94.9 KG). THE ECONOMICS OF SUBSTITUTING CASSAVA FOR MAIZE IN FINISHING RATIONS WILL DEPEND ON THE RELATIVE COSTS OF BOTH FEEDS BUT 33 PERCENT CM COULD BE SUBSTITUTED FOR MAIZE WITHOUT LOSSES IN ANIMAL PERFORMANCE. (CIAT)

ABBREVIATIONS AND ACRONYMS

A	Angstrom(s)
ABA	Abscisic acid
ac	Acre(s)
Af.	Afrikaans
a.i.	Active ingredient
alt.	Altitude
AMV	Alfalfa mosaic virus
approx.	Approximate(ly)
Ar.	Arab
atm.	Atmosphere
ATP	Adenosine 5'-triphosphate
av.	Average
BAP	6-Benzylaminopurine
BBMV	Broad bean mosaic virus
BCMV	Bean common mosaic virus
Bg.	Bulgarian
BGMV	Bean golden mosaic virus
BGYMV	Bean golden yellow mosaic virus
BOD	Biochemical oxigen demand
BPMV	Bean pod mottle virus
BRMV	Bean rugose mosaic virus
BSMV	Bean southern mosaic virus
BV	Biological value
BYMV	Bean yellow mosaic virus
ca.	About (circa)
CAMD	Cassava African mosaic disease
CMV	Cassava African mosaic virus
CBB	Cassava bacterial blight
CBSD	Cassava brown streak disease
CEC	Cation exchange capacity
CER	CO2 exchange rate
CF	Cassava flour
CGR	Crop growth rate
Ch.	Chinese
CLM	Cassava leaf meal
CLV	Cassava latent virus
CM	Cassava meal
cm	Centimeter(s)
COD	Chemical oxigen demand
concn.	Concentration
CP	Crude protein
Cs.	Czech
CSL	Calcium stearyl lactylate
CSW	Cassava starch wastes
C.V.	Coefficient of variation
cv.	Cultivar(s)
2,4-D	2,4-dichlorophenoxyacetic acid
Da.	Danish
DM	Dry matter
DNA	Deoxyribonucleic acid
EC	Emulsifiable concentrate
EDTA	Ethylenediaminetetraacetic acid
EEC	European Economic Community
e.g.	For example
ELISA	Enzyme-linked immunosorbent assays
EMS	Ethyl methane sulfonate
En.	English
EP	Preliminary Trials, CIAT
Es.	Spanish
expt.	Experiment(s)
exptl.	Experimental
Fr.	French
ft-ca	Foot candles (10.76 lux)
FYM	Farmyard manure
g	Gram(s)
G	Giga (109)
GA	Gibberellic acid
gal	Gallon(s)
GE	Gross energy
GERs	Glucose entry rates
GLC	Gas-liquid chromatography
Gr.	Greek
h	Hour(s)
ha	Hectare(s)
HCN	Hydrocyanic acid
HDP	Hydroxypropyl distarch phosphate (modified cassava starch)
He.	Hebrew
Hi.	Hindi
HI	Harvest index
hp	Horsepower
Hu.	Hungarian
IAA	Indoleacetic acid
IBA	Indolebutyric acid
IBYAN	International Bean Yield and Adaptation Nursery, CIAT
Il.	Illustrations
in.	Inches
In.	Indonesian
It.	Italian
IU	International unit
J	Joule
Ja.	Japanese
kat	Katal(amount of enzymatic activity that converts 1 mole of substrate/s)
kcal	Kilocalorie(s)
kg	Kilogram(s)

De.	German
km	Kilometer(s)
KNap	Potassium naphthenate
Ko.	Korean
kR	Kiloroentgen(s)
La.	Latin
LAD	Leaf area duration
LAI	Leaf area index
lat.	Latitude
lb	Pound(s)
LD50	Mean lethal dose
LER	Land efficiency ratio
LPC	Leaf protein concentrate
lx	Lux
M	Mega
m	Meter(s)
Mal.	Malay
max.	Maximum
MC	Moisture content
ME	Metabolizable energy
meq	Milliequivalent(s)
met.	Methionine
mg	Milligram(s)
mho	Reciprocal ohm
min.	Minimum
min	Minute(s)
ml	Milliliter(s)
mm	Millimeter(s)
mo.	Month
mol. wt.	Molecular weight
m.p.	Melting point
NAA	Alpha-naphthalene acetic acid
NAD	Nicotinamide adenine dinucleotide
NADH	Nicotinamide adenine dinucleotide, reduced form
NAR	Net assimilation rate
NCE	Net CO_2 exchange
NE	Northeast
NER	Net energy ratio
Nl.	Dutch
nm	Nanometer(s) (10-9 m)
no.	Number(s)
No.	Norwegian
NPFs	Negative production factors
NPR	Net protein ratio
NPU	Net protein utilization
NW	Northwest
OM	Organic matter
oz	Ounce(s)
p.	Page
P	Probability
Pa	Pascal(s)
PAN	Peroxyacetic nitrate
PCNB	Pentachloronitrobenzene
PDA	Potato dextrose agar
PER	Protein efficiency ratio
pH	Hydrogen ion concentration
Pl.	Polish
kJ	Kilojoule
pp.	Pages
pphm	Parts per hundred million
PPI	Preplanting incorporation
ppm	Parts per million
PSA	Potato sucrose agar
Pt.	Portuguese
pv.	Pathovar
Ref.	Reference
resp.	Respective(ly)
Rf	Retardation factor-chromatography
RGR	Relative growth rate
RH	Relative humidity
RNA	Ribonucleic acid
Ro.	Romanian
rpm	Revolutions per minute
Ru.	Russian
s	Second
SBM	Soybean meal
SCN	Thiocyanate
SCP	Single cell protein
SDS	Sodium dodecyl sulfate
Sk.	Slovak
Sn.	Slovene
sp.	Species
spp.	Species
SSL	Sodium stearyl-2-lactylate
Sum.	Summary
Sv.	Sweddish
t	Ton(s)
TDN	Total digestible nutrients
temp.	Temperature
TIA	Trypsin inhibitor activity
TIBA	2,3,5-Triiodobenzoic acid compound with N-methylmethanamine
TLC	Thin-layer chromatography
TMV	Tobacco mosaic virus
Tr.	Turkish
TSH	Thyroid-stimulating hormone
UDPG	Uridine diphosphate glucose
Uk.	Ukrainian
UMS	Unmodified cassava starch
Ur.	Urdu
UV	Ultraviolet
var.	Variety(ies), varietal
VEF	Bean Team Nursery, CIAT
VFA	Volatile fatty acids
vol.	Volume
VPD	Vapor pressure deficit
vpm	Volume per million
vs.	Versus
W	West, watt
wk.	Week
WP	Wettable powder
wt.	Weight
yr	Year(s)
/	Per

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EMEHUTE, J.K.U.
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INSTITUT FRANCAIS DE RECHERCHE SCIENTIFIQUE POUR LE DEVELOPPEMENT EN COOPERATION
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NAFPP NATIONAL CASSAVA WORKSHOP, 5TH., UMUDIKE, NIGERIA
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NAFPP NATIONAL CASSAVA WORKSHOP, 6TH., UMUDIKE, NIGERIA
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PRICES
0025 0224 0233 0241 0248 0249 0250
0370 1069 1096 1102 1110 1174 1176
1254 1255 1256 1257 1258 1259 1260
1262 1263 1264 1265 1266 1290
PROCESSING
0055 0065 0221 0234 0336 0352 0637
0683 0841 0842 1003 1077 1102
STORAGE
0055 0065 0336 0841 0842 0929 1077
1214
INJURIOUS INSECTS
0352 0403
SWINE
0842
TRADE
0025 0055 0313 0366 0368 1110

CASSAVA FLOUR
0197 0322 0417 0839 0903
COMPOSITION
0163 0182 0236 0637 0669 0740 0741
0743 0896 1003
CONSUMPTION
0221 0224 0236 0366 0368 0396 0458
0686 0821 1065 1077 1110 1176

COSTS
0053 0234 0669 0686 0821 0952 0969
1077 1264
DRYING
0053 0182 0669 0741 0743 0832 0833
0842 0969
INDUSTRIAL MACHINERY
0669
INDUSTRIAL MICROBIOLOGY
0182
INDUSTRIALIZATION
0221 0228 0234 0366 0368 0396 0669
0841 0939 1110
MARKETING
0019 0055 0073 0095 0096 0105 0132
0133 0134 0135 0136 0137 0138 0139
0140 0141 0142 0143 0144 0145 0146
0147 0148 0149 0150 0151 0152 0153
0154 0155 0313 0366 0368 0458 0514
0563 0564 0565 0566 0567 0568 0569
0570 0579 0580 0581 0582 0583 0584
0585 0586 0587 0588 0591 0592 0593
0594 0595 0596 0597 0598 0599 0600
0601 0609 0686 0731 0821 1065 1077
1110 1125
NUTRITIVE VALUE
0163 0182 0627 0799 1003
ORGANOLEPTIC EXAMINATION
0528 0669 0740 0741 0743 1018
PALATABILITY
0193
PRICES
0095 0096 0105 0110 0111 0112 0114
0115 0116 0117 0118 0119 0120 0121
0122 0123 0124 0125 0126 0127 0128
0129 0130 0132 0133 0134 0135 0136
0137 0138 0139 0140 0141 0142 0143
0144 0145 0146 0147 0148 0149 0150
0151 0152 0153 0154 0155 0224 0458
0514 0592 0593 0594 0595 0596 0597
0598 0604 0605 0606 0607 0608 0609
0627 0686 0731 0837 0838 1110 1125
1176 1262 1264
PROCESSING
0019 0053 0055 0065 0163 0182 0221
0234 0336 0458 0514 0637 0669 0686
0731 0740 0741 0743 0745 0745 0781
0821 0832 0833 0835 0837 0838 0841
0842 0844 0952 0969 1003 1031 1077
1125
PRODUCTION
0055 0065 0221 0224 0313 0366 0396
0458 0514 0579 0580 0581 0582 0583
0584 0585 0586 0587 0588 0627 0686
0731 0745 0821 1065 1077 1110 1125
1262
PROTEIN CONTENT
0236 0741
STORAGE
0055 0065 0336 0741 0832 0841 0842
1077
INJURIOUS INSECTS
0458 0669
SWINE
0799 0842
TRADE
0055 0072 0073 0095 0096 0105 0148
0149 0150 0151 0152 0153 0154 0155
0163 0313 0366 0368 0514 0604 0605
0606 0607 0608 0686 0731 1110

CASSAVA LEAF MEAL
0878

CASSAVA LEAVES (VEGETABLE)
0201 0224 0241 0322 1041 1080 1176
1189 1209 1250 1251 1252 1254
COMPOSITION
0062 0232
HUMAN NUTRITION
1241 1263

CASSAVA MEAL
0240 0322 0417 0681 0903 0976 1219
1283 1302
BOILING
1031
COMPOSITION
0025 0196 0232 0236 0267 0637 0669
0737 0740 0741 0742 0743 0782 0783
0816 1214 1231
CONSUMPTION
0232 0236 0241 0247 0251 0288 0366
0368 0371 0396 0458 0686 1176 1273
DETERIORATION
0929 1214
DRYING
0196 0669 0741 0742 0743 0842 0969
FACTORIES
0303
FEED MIXTURES
0744
INDUSTRIALIZATION
0025 0056 0058 0217 0243 0247 0303
0366 0368 0377 0396 0419 0669
NUTRITIVE VALUE
0023 0627 0744
ORGANOLEPTIC EXAMINATION
0194 0328 0350 0354 0669 0740 0741
0742 0743 0900 1042 1231 1235
PALATABILITY
1192 1218 1228 1229 1230 1233
PELLETS
0055 0637
PRICES
0025 0095 0096 0105 0110 0111 0112
0114 0115 0116 0117 0118 0119 0120
0121 0122 0123 0124 0125 0126 0127
0128 0129 0130 0132 0133 0134 0135
0136 0137 0138 0139 0140 0141 0142
0143 0144 0145 0146 0147 0148 0149
0150 0151 0152 0153 0154 0155 0159

0200 0201 0232 0241 0250 0251 0458
0627 0686 0731 1176 1224 1241 1254
1256 1257 1258 1259 1263 1265 1266
PROCESSING
0055 0056 0065 0194 0196 0243 0247
0251 0267 0303 0329 0336 0350 0449
0458 0637 0669 0682 0686 0731 0740
0741 0742 0743 0781 0816 0842 0844
0969 1031 1042 1241 1273 1288 1289
STORAGE
0055 0065 0328 0336 0350 0354 0458
0669 0741 0842 0929 1214 1288
SWINE
0501 0831 0842
TRADE
0025 0055 0073 0095 0096 0105 0148
0149 0150 0151 0152 0153 0154 0155
0159 0366 0368 0686 0731

CASSAVA MOSAIC VIRUS
0991 0997 1083 1284
RESISTANCE
0628

CASSAVA PASTES
0055 0056 0058 0065 0194 0196 0200
0232 0236 0241 0243 0247 0250 0251
0267 0288 0303 0322 0328 0329 0336
0350 0354 0366 0368 0377 0396 0417
0419 0449 0458 0669 0682 0686 0731
0737 0740 0741 0742 0743 0781 0783
0816 0842 0844 0900 0903 0929 0969
0976 1031 1042 1176 1192 1218 1219
1224 1228 1229 1230 1231 1233 1235
1241 1254 1263 1273 1283 1288 1289

CASSAVA PRODUCTS
0030 0037 0045 0210 0812 0882 1289
1290 1302
FRESH PRODUCTS
0738
CASSAVA LEAVES (VEGETABLE)
0062 0201 0224 0232 0241 0322 1041
1080 1176 1189 1209 1241 1250 1251
CASSAVA ROOTS (VEGETABLE)
0106 0107 0108 0109 0132 0134 0135
0140 0141 0143 0144 0169 0187 0200
0313 0350 0366 0458 0627 1065 1096
PROCESSED PRODUCTS
0020 0049 0093 0094 0097 0098 0099
0100 0101 0102 0103 0104 0131 0156
0157 0804
CASSAVA BEER
0023
CASSAVA BREAD
1031
CASSAVA CHIPS
0025 0055 0065 0215 0221 0224 0233
0234 0238 0240 0241 0248 0249 0250
0464 0637 0683 0783 0841 0842 0896
1265 1266 1290

CASSAVA FLOUR
0019 0053 0055 0065 0072 0073 0095
0096 0105 0110 0111 0112 0115 0116
0124 0125 0126 0127 0128 0129 0130
0153 0154 0155 0163 0182 0193 0197
0741 0743 0745 0781 0799 0821 0832
CASSAVA MEAL
0023 0025 0055 0056 0058 0065 0073
0095 0096 0105 0110 0111 0112 0115
0123 0124 0125 0126 0127 0128 0129
0152 0153 0154 0155 0159 0194 0196
0900 0903 0929 0969 0976 1031 1042
CASSAVA STARCH
0017 0025 0055 0068 0111 0113 0115
0116 0117 0118 0119 0120 0121 0122
0130 0159 0163 0169 0201 0313 0329
1077 1093 1102 1109 1110 1111 1116
FOOFOO
0055 0056 0058 0194 0196 0236 0241
0243 0247 0250 0251 0267 0288 0303
0419 0669 0682 0686 0731 0737 0740
1230 1231 1233 1235 1241 1283 1288
GARI
0017 0019 0055 0056 0169 0313 0322
0328 0329 0336 0352 0366 0368 0396
0781 0783 0821 0837 0838 0841 0842
PELLETS
0055 0637
PULP
1018
TAPIOCAS
0111 0113 0115 0116 0117 0118 0119
0120 0121 0122 0123 0124 0125 0126
0313 0329 0352 0417 0514 0781 1093

CASSAVA PROGRAMS
0005 0013 0024 0044 0057 0060 0075
0188 0189 0190 0206 0217 0237 0240
0253 0264 0266 0267 0268 0272 0277
0283 0291 0292 0293 0296 0300 0303
0306 0335 0337 0343 0346 0368 0377
0378 0383 0384 0385 0386 0389 0442
0445 0455 0467 0494 0528 0642 0644
0645 0646 0647 0648 0649 0650 0651
0652 0653 0656 0657 0658 0659 0660
0661 0662 0663 0664 0665 0667 0668
0688 0701 0707 0730 0739 0748 0750
0751 0784 0785 0805 0807 0817 0819
0827 0891 0893 0895 0904 0934 0956
0966 0987 0991 0994 1011 1053 1058
1059 1079 1080 1083 1097 1110 1119
1133 1146 1151 1188 1189 1190 1191
1193 1194 1195 1197 1198 1199 1200
1201 1202 1203 1204 1205 1206 1207
1208 1210 1211 1212 1213 1214 1215
1216 1217 1222 1226 1230 1232 1233
1234 1235 1237 1238 1239 1240 1242
1243 1244 1245 1249 1280 1287
ANIMAL NUTRITION
0369 1004

DEVELOPMENTAL RESEARCH
0018 0019 0020 0021 0022 0040 0172
0182 0208 0218 0219 0221 0223 0235
0241 0261 0294 0295 0312 0349 0355
0362 0364 0366 0449 0452 0497 0513
0684 0735 0841 0992 0997 0999 1022
1034 1127 1261 1284 1299
GERMPLASM
0064 0284 0493 0495 0632 0669 0735
0826 0999 1004 1075 1098 1099 1100
1102 1103 1104 1227
HUMAN NUTRITION
0037 0182 0396 0499 0745 0746 0821
1004 1241 1262 1263
PLANT BREEDING
0014 0021 0029 0045 0165 0193 0194
0195 0196 0197 0203 0246 0281 0286
0288 0289 0295 0302 0312 0372 0421
0452 0634 0684 0820 0826 0990 1004
1020 1099 1101 1103 1130 1187 1192
1218 1219 1220 1221 1223 1224 1227
1228 1229 1282

CASSAVA ROOTS (VEGETABLE)
0106 0107 0108 0109 0132 0134 0135
0140 0141 0143 0144 0169 0200 0201
0224 0243 0288 0313 0350 0458 0553
0554 0605 0607 0608 1065 1096 1174
1176 1247 1254 1262 1263 1269 1288
ANIMAL NUTRITION
0366 0627
COMPOSITION
0187 0232 0236 0267

CASSAVA STARCH
1093
ALCOHOL
0017 0055 0353
CONSUMPTION
0368 0686 1077 1109 1110
COSTS
0686 1077
DRYING
0834 0842 0843
FERMENTATION
0353 0842 1077
GELATINIZATION
0823
HYDROLYSIS
0353
INDUSTRIAL STARCHES
0353 0368 0377 0823
INDUSTRIALIZATION
0017 0025 0068 0368 0377 0841 1110
MARKETING
0025 0055 0068 0163 0313 0368 0486
0514 0686 1077 1109 1110 1116 1119
1125
METABOLISM
0850
PRICES
0025 0111 0113 0115 0116 0117 0118
0119 0120 0121 0122 0123 0124 0125
0126 0127 0128 0129 0130 0159 0169
0201 0486 0514 0686 0837 0838 1102
1109 1110 1111 1119 1125
PROCESSING
0017 0055 0163 0329 0336 0352 0353
0486 0514 0637 0686 0781 0823 0834
0837 0838 0841 0842 0843 1077 1102
1119 1125
STORAGE
0055 0336 0352 0841 0842 0843 1077
TRADE
0017 0025 0055 0159 0163 0313 0368
0514 0686 1109 1110 1116 1119
USES
0017 0055 0068 0169 0201 0313 0329
0336 0352 0353 0368 0377 0417 0480
0637 0686 0686 0781 0837 0838 0841
0842 0851 0910 1102 1110 1111 1119
1125

CATTLE
0351 0954

CENTRAL AFRICAN REPUBLIC
0174 0217 0219 0220 0222 0225 0226
0229 0231 0234
MARKETING
0228 0233
PRODUCTION
0215 0218 0221 0223 0224 0227 0230
SOCIOECONOMIC ASPECTS
0218
STATISTICAL DATA
0214 0216 0221 0224 0232
TRADE
0223

CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL
0004 0013 0014 0066 0070 0257 0287
0309 0380 0399 0499 0629 0786 0811
0846 0888 1246

CERCOSPORA VICOSAE
DISEASE CONTROL
1160 1161
EPIDEMIOLOGY
1130 1156
RESISTANCE
1130 1159 1162

CERCOSPORIDIUM HENNINGSII
0161 0195 0317 0991 0997
DISEASE CONTROL
0173 0636 1160 1161
EPIDEMIOLOGY
1130 1156

ETIOLOGY
0173
RESISTANCE
0173 0289 0292 0300 0315 0990 1130
1162
SYMPTOMATOLOGY
0162 0173

CEREALS
0194 0195 0196 0197 0203 0227 0338
0339 0393 0424 0431 0440 0466 0482
0498 0528 0613 0622 0623 0641 0642
0646 0648 0649 0651 0652 0656 0657
0659 0667 0668 0669 0677 0678 0679
0680 0689 0693 0701 0708 0729 0735
0778 0785 0797 0798 0802 0805 0807
0818 0862 0863 0868 0882 0890 0891
0892 0893 0911 0912 0913 0922 0949
0966 0976 0977 0978 0979 0981 0995
1013 1017 1075 1114 1115 1119 1124
1132 1189 1190 1217 1218 1219 1220
1226 1237

CHAD
MARKETING
1109
PRODUCTION
1109
TRADE
1109

CHICKS
0850

CHICKWANGUE
0241 0243 0247 0250 0251 0288 0329
1176 1192 1218 1219 1224 1228 1229
1230 1233 1235 1241 1254 1263 1273
1289
COMPOSITION
0232 0236 1231

CLADOSPORIUM
1270

CLIMATIC REQUIREMENTS
0158 0297 0327 0406 0454 0639 0655
0696 0798 0963 0988 1037 1044 1150
GROWTH
1045
PRODUCTIVITY
0050 0184 0484 0801 0935 0951 1045
1275

CLONES
0189 0380 0650 0657 0727 0807 0811
0814 0847 0991 1049

COCONUT
0456

COLLETOTRICHUM MANIHOTIS
0194
DISEASE CONTROL
0848

COLOMBIA
0383
GERMPLASM
0826

COMPOSITE FLOURS
0017 0480

COMPOSITION
0030 0033 0035 0045 0048 0062 0167
0168 0180 0183 0187 0195 0283 0302
0305 0365 0372 0381 0382 0400 0402
0423 0446 0448 0478 0491 0632 0673
0685 0694 0695 0696 0698 0812 0824
0826 0836 0878 0882 0905 0919 0925
0926 0936 0975 1002 1030 1130 1169
1184 1185 1212 1220 1227
CASSAVA FLOUR
0163 0182 0236 0637 0669 0740 0741
0743 0896 1003
CASSAVA MEAL
0025 0196 0232 0236 0267 0637 0669
0737 0740 0741 0742 0743 0782 0783
0816 1214 1231
CASSAVA STARCH
0025 0068 0163 0637 1102
LEAVES
0204 0637 0669 0780 0852 0933 0973
0988 1072 1179 1191
ROOTS
0204 0327 0331 0443 0726 0728 0736
0763 0780 0825 0852 0853 0886 0909
0950 0961 1004 1214
STEMS
0725 0780
TAPIOCAS
1102

CONGO
0174 0238 0239 0244 0245 0246 0252
0253 0254 0255 0256 0257 0258 0259
0260 0261 0263 0264 0265 0266 0267
0268 0269 0270 0271 0272 0273 0274
0276 0277 0278 0279 0280 0281 0282
0283 0285 0286 0287 0288 0289 0290
0291 0292 0293 0294 0295 0296 0297
0298 0299 0300 0301 0302 0303 0304
0305 0309 0450 0630 0631 1273 1279
GERMPLASM
0284
MARKETING
0055 0093 0094 0095 0096 0097 0098
0099 0101 0102 0106 0107 0108 0109
0243 0248 0249 0250 0251 0313

PRODUCTION
0055 0235 0237 0240 0241 0243 0251
0262 0306 0307 0313
SOCIOECONOMIC ASPECTS
0247 0275
STATISTICAL DATA
0093 0094 0095 0096 0097 0098 0099
0101 0102 0106 0107 0108 0109 0236
0241 0242 0248 0249 0250 0308 0313
TRADE
0055 0093 0094 0095 0096 0097 0098
0099 0101 0102 0106 0107 0108 0109
0313

COOKING
0062 0354 1018

CORTEX
0957
COMPOSITION
0886 0909 0961
HCN CONTENT
0961
USES
0851 0886 0909 0960 0962

CROSSBREEDING
1085 1086 1230

CRYOPRESERVATION
0354

CULTIVARS
0041 0055 0065 0173 0174 0186 0187
0206 0229 0260 0267 0288 0290 0295
0297 0300 0312 0313 0320 0352 0372
0374 0411 0439 0440 0466 0477 0485
0496 0498 0499 0507 0516 0524 0535
0538 0539 0540 0552 0642 0644 0645
0646 0647 0648 0649 0650 0656 0657
0659 0660 0663 0664 0665 0672 0691
0709 0717 0724 0728 0729 0730 0731
0742 0743 0772 0777 0790 0796 0812
0846 0847 0889 0893 0894 0895 0928
0936 0942 0949 0950 0967 0971 0976
0992 0994 1018 1023 1031 1042 1046
1047 1051 1058 1081 1108 1109 1119
1131 1136 1156 1163 1168 1187 1204
1205 1206 1207 1210 1211 1212 1214
1245 1283 1291 1292 1293
ADAPTATION
0184 0185 0188 0189 0261 0380 0467
0482 0654 0666 0667 0668 0671 0688
0692 0701 0713 0739 0775 0779 0801
0805 0807 0814 0888 0891 0892 0904
0956 0966 1049 1227 1275
AGRONOMIC CHARACTERS
0461
ECOLOGY
0412 0413 0654 0692 1149
GERMPLASM
0284 0315 0381 0388 0461 0491 0493
0495 0632 0669 0735 1004 1075 1098
1099 1100 1102 1103 1104 1227
IDENTIFICATION
0203 0318 0461 0632 1024 1103 1221
ROOT PRODUCTIVITY
0035 0193 0194 0195 0196 0197 0203
0209 0212 0241 0283 0292 0302 0306
0315 0316 0319 0381 0382 0383 0395
0402 0431 0446 0458 0462 0473 0491
0493 0495 0508 0511 0517 0518 0519
0520 0522 0523 0529 0669 0673 0686
0690 0718 0760 0773 0774 0775 0776
0865 0869 0870 0871 0912 0914 0916
0917 0920 0921 0923 0943 0990 0997
0998 1004 1008 1019 1020 1075 1076
1077 1078 1079 1080 1098 1101 1102
1107 1110 1130 1155 1158 1159 1164
1178 1179 1188 1192 1215 1219 1220
1224 1225 1227 1228 1229 1230 1231
1235 1236 1237 1243 1244 1272
SELECTION
0189 0194 0195 0196 0197 0283 0287
0289 0292 0293 0294 0400 0402 0450
0491 0492 0495 0521 0628 0632 0654
0669 0702 0713 0775 0794 0852 0891
0916 0925 0926 0984 0991 1010 1061
1078 1079 1080 1101 1135 1155 1159
1169 1178 1179 1180 1181 1182 1183
1184 1185 1186 1219 1220 1221 1224
1227 1228 1229 1230 1232 1233 1235
1282 1285 1286
STARCH PRODUCTIVITY
0293 0915 1183 1184
TOXICITY
0316 0478 0669 0741

CULTIVATION
0014 0017 0029 0040 0044 0045 0048
0050 0055 0077 0078 0079 0080 0081
0082 0083 0084 0085 0086 0087 0088
0089 0090 0091 0092 0158 0160 0165
0167 0168 0172 0174 0181 0184 0186
0194 0195 0196 0197 0203 0209 0218
0219 0234 0235 0246 0251 0261 0265
0285 0290 0297 0306 0308 0312 0315
0316 0327 0338 0339 0340 0352 0355
0365 0372 0379 0387 0394 0397 0401
0402 0406 0422 0423 0424 0425 0431
0435 0440 0441 0442 0445 0446 0447
0451 0454 0455 0457 0458 0464 0466
0467 0469 0472 0475 0484 0491 0492
0493 0494 0495 0496 0497 0498 0499
0502 0504 0509 0510 0512 0516 0517
0518 0520 0523 0524 0528 0529 0530
0621 0628 0635 0638 0639 0642 0643
0645 0646 0647 0648 0649 0650 0651
0652 0655 0657 0660 0666 0667 0669
0670 0673 0674 0675 0676 0677 0678

0679 0680 0683 0686 0687 0688 0689
0693 0696 0697 0701 0705 0707 0709
0710 0714 0716 0718 0721 0724 0727
0729 0730 0736 0738 0739 0755 0756
0759 0764 0765 0766 0773 0774 0777
0778 0779 0785 0797 0798 0801 0802
0805 0807 0810 0812 0815 0818 0819
0821 0852 0853 0861 0862 0863 0864
0865 0866 0867 0868 0870 0872 0875
0877 0887 0888 0889 0890 0891 0892
0893 0894 0895 0897 0898 0899 0901
0902 0912 0913 0914 0915 0917 0918
0919 0920 0922 0923 0924 0928 0931
0932 0935 0942 0943 0946 0947 0948
0949 0951 0954 0956 0963 0966 0977
0978 0979 0980 0981 0982 0983 0985
0988 0990 0991 0993 0995 0999 1004
1013 1019 1022 1023 1028 1030 1035
1036 1037 1043 1044 1045 1046 1071
1075 1077 1079 1080 1083 1085 1089
1097 1099 1101 1102 1115 1119 1130
1132 1138 1139 1148 1150 1151 1153
1154 1157 1160 1161 1162 1165 1166
1168 1170 1171 1177 1178 1185 1186
1187 1188 1189 1190 1191 1195 1209
1210 1211 1216 1218 1221 1222 1224
1225 1226 1236 1237 1238 1239 1240
1241 1243 1245 1246 1272 1275 1287
1291 1292 1294 1295 1298

CULTIVATION SYSTEMS
0014 0040 0050 0176 0206 0220 0224
0325 0380 0421 0431 0445 0475 0655
0802 1009 1083 1151 1168 1223
FALLOWING
0394 0422 0915 1030
INTERCROPPING
0020 0045 0174 0193 0194 0195 0196
0197 0203 0215 0227 0242 0339 0376
0393 0424 0440 0452 0456 0466 0482
0498 0499 0525 0528 0613 0616 0622
0623 0627 0641 0642 0646 0648 0649
0651 0652 0656 0657 0659 0668 0669
0670 0677 0678 0679 0680 0689 0693
0697 0701 0705 0708 0724 0729 0735
0778 0785 0791 0797 0798 0805 0812
0818 0853 0862 0863 0868 0890 0891
0892 0893 0901 0902 0911 0912 0913
0922 0949 0966 0976 0977 0978 0979
0980 0981 0995 1012 1017 1063 1067
1071 1075 1077 1079 1080 1081 1082
1089 1106 1114 1115 1119 1124 1130
1132 1139 1146 1148 1167 1177 1187
1188 1189 1190 1191 1217 1218 1219
1220 1221 1224 1226 1236 1237 1272
1279 1298
ROTATIONAL CROPS
0160 0338 0422 0440 0441 0456 0471
0525 1013 1044 1071 1100 1177
SECONDARY CROPS
0020
SHIFTING CULTIVATION
1298 1301

CULTURE MEDIA
0286 0674
TISSUE CULTURE
0285

CURVULARIA
1270

CUTTINGS
0160 0173 0219 0318 0372 0459 0492
0697 0721 0755 1154 1162 1204 1205
1206 1207
GERMINATION
0193 0759 0760 0765
TIMING
0669
GRAFTING
0736
PROPAGATION
0638 0674 0736 0928 0999 1004 1243
ROOT PRODUCTIVITY
0167 0168 0193 0194 0195 0196 0203
0315 0469 0491 0493 0495 0523 0669
0675 0736 0759 0760 0765 0766 0773
0871 0965 0990 0999 1004 1010 1130
1166 1169 1170 1189 1190 1191 1195
1240 1243 1281
ROOTING
1004 1226
SPACING
0196 0464 0493 0669 0675 1130 1153
1157 1160 1161 1165 1166 1187 1226
STORAGE
0495 0669
VIRUS INHIBITION
0158 1195

CYANIDES
0825
DETOXIFICATION
0030 0728
HUMAN HEALTH
0030 1271 1297
MALNUTRITION
0975 1297
THIOCYANATES
0629 0975
TOXICOLOGY
0629 0959

CYANOGEN
0351 0700 0734 0743 0907 0958 0959

CYANOGENIC GLUCOSIDES
0804 0816 0824 0826 0907 0974 0975

CYTOGENETICS
0691

DETERIORATION
0747 0986 1209
CASSAVA MEAL
0929 1214
ROOTS
0327 0331 1214

DETOXIFICATION
0030 0033 0351 0478 0728 0816 0835
0836 0842 0909

DEVELOPMENT
0002 0005 0013 0014 0017 0018 0019
0020 0021 0022 0024 0025 0029 0037
0040 0044 0045 0053 0055 0056 0057
0058 0060 0064 0068 0071 0075 0164
0165 0177 0182 0188 0189 0190 0193
0194 0195 0196 0197 0203 0206 0208
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0246 0247 0253 0261 0264 0265 0266
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0362 0364 0366 0368 0369 0372 0377
0378 0383 0384 0385 0386 0389 0396
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0455 0467 0493 0494 0495 0497 0499
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0663 0664 0665 0666 0667 0668 0669
0684 0686 0688 0699 0700 0701 0706
0707 0730 0735 0739 0745 0746 0748
0749 0750 0751 0784 0785 0801 0805
0807 0817 0819 0820 0821 0822 0826
0827 0833 0834 0836 0837 0841 0843
0845 0873 0876 0880 0891 0892 0893
0895 0904 0906 0934 0939 0953 0956
0966 0970 0976 0983 0987 0990 0991
0992 0994 0997 0999 1004 1011 1020
1022 1025 1028 1034 1038 1053 1058
1059 1075 1077 1079 1080 1083 1095
1097 1098 1099 1100 1101 1102 1103
1104 1109 1110 1117 1119 1120 1127
1130 1133 1146 1151 1187 1188 1189
1190 1191 1192 1193 1194 1195 1197
1198 1199 1200 1201 1202 1203 1204
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1237 1238 1239 1240 1241 1242 1243
1244 1245 1246 1249 1261 1262 1263
1273 1280 1282 1283 1284 1287 1299

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0024 0057 0732 0999 1151

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0426
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0194 0203 0640 0951 1080
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0951
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0193 0669 0759 0760 0765 1178 1186
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0423 0447 0640 0736 0815 0866 0889
0947 0948 0951 1046
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1004 1226

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0434 1126

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0501 0631 0734 0831 0842 0882 0903
0937 0940 0974
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0933 0959 0960 1302
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0945 0975 1297
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0799 0851 0908

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0933 0960

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0067

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0698 0724

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1195
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0001 0173 0259 0636 0708 0711 0735
0808 0826 0848 0963 1047 1160 1161
1191 1220
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0173 0712 0848 0869 0870 0871 0942
0944
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0001 0158 0174 0407 0436 0459 0507
0630 0777 1191 1220

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0253 0404 0405 0412 0413 0415 0420
1048 1087
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1085
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0406

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0351 0369 0501 0681 0685 0744 0799
0831 0842 0850 0851 0878 0882 0909
0910 0937 0954 0957 0959 0961 0962
1081

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0678

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0023 0049 0065 0215 0221 0234 0238
0240 0241 0336 0352 0370 0403 0464
0637 0683 0783 0841 0842 0896 0929
1003 1069 1096 1102 1174 1176 1214
1247 1254 1255 1256 1257 1258 1259
1262 1263 1264 1265 1266 1290
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0224
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0025 0055 0093 0094 0095 0096 0097
0098 0099 0100 0101 0102 0103 0104
0131 0132 0134 0135 0136 0137 0138
0139 0140 0141 0142 0143 0144 0145
0146 0147 0150 0151 0152 0153 0156
0157 0200 0233 0248 0249 0250 0313
0366 0368 0563 0564 0565 0566 0567
0568 0569 0570 0581 0582 0583 0584
0591 0594 0595 0596 0597 0598 0599
0600 0609 1077 1110 1260

DRYING
0020 0030 0187 0195 0196 0698 0742
0876 0909 0960 0961 1072
CASSAVA CHIPS
0842
CASSAVA FLOUR
0053 0182 0669 0741 0743 0832 0833
0842 0969
CASSAVA STARCH
0834 0842 0843
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0669 1117

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0029 0037 0050 0057 0716 0883 0987
1029 1139 1146 1150
CULTIVARS
0412 0413 0654 0692 1149

ECOSYSTEMS
0029 0037 0654 0716 0883

ECUADOR
0023

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0681 0937 0957

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0205
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0204 0960

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0978

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1048

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0026 0031 0047 0054 0069 0269 0271
0273 0274 0276 0277 0278 0279 0410
0418 0733 0756 0762 0771 0779 0789
0795 0800 0813 0848 0849 0883 0938
0964 1105 1130 1149 1150 1152 1154
1187 1197 1223 1224

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0288 0296 0404 0407 0412 0413 0415
0468 0483 0630 0963 1086 1130 1156
1213

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0633 0846 0856 0857 0883

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0057 0446 0639 0976

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0161

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1048

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0055 0353

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0054

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0811

EXOCHOMUS FLAVIPUS
0716

EXPERIMENT DESIGN
0641 0650 0666 0856 0887 1244

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0303 0700
CASSAVA FLOUR
0053
GARI
1120

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0394 0422 0915 1030

FARM SIZE
0192 0214 0358 0359 0360 0361 0376
0424 0488 0490 0525 0620 0686 1009
1012 1014 1015 1017 1041 1067 1070

FARMING SYSTEMS
0376 0525 0686 1017 1084 1237 1298

FAT CONTENT
0236 0685 0782 0782 0896 0905 0936

FEDERAL REPUBLIC OF GERMANY
0072 0074 0093 0094 0095 0096 0097
0098 0099 0100 0101 0102 0103 0104
0106 0107 0108 0109

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0685 0744 0958 0960 0961

FEED MIXTURES
0744 0958

FEEDS AND FEEDING
0055 0061 0062 0065 0068 0106 0107
0108 0109 0132 0134 0135 0140 0141
0143 0144 0169 0180 0182 0183 0187
0188 0200 0201 0224 0232 0236 0241
0243 0267 0288 0303 0313 0322 0350
0351 0366 0458 0501 0627 0637 0681
0685 0744 0799 0831 0842 0851 0878
0882 0886 0908 0909 0937 0958 0960
0962 1041 1065 1080 1081 1096 1174
1176 1189 1209 1241 1247 1250 1251
1252 1254 1262 1263 1269 1288 1302

FERMENTATION
0033 0196 0353 0682 0703 0782 0804
0816 0836 0842 0896 0900 0960 1077
1100 1117 1289
PROTEIN ENRICHMENT
0065 0180 0182 0183

FERMENTED PRODUCTS
0017 0023 0055 0132 0134 0135 0136
0137 0139 0141 0143 0144 0146 0147
0180 0205 0353 0816 0903 0960

FIELD EXPERIMENTS
0270 0405 0410 0412 0485 0493 0495
0815 1228 1244 1286

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1296

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0826 0951

FOLIAGE
0457 0491 0493 0717 0898

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0712 0848
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0712 0848

FOOD ENERGY
0236 0905

FOOD PRODUCTS
0017 0019 0033 0037 0045 0055 0056
0065 0071 0169 0177 0180 0182 0183
0188 0206 0313 0322 0328 0329 0336
0342 0343 0344 0345 0346 0347 0348
0352 0357 0366 0368 0396 0417 0419
0480 0637 0654 0669 0671 0682 0686
0694 0695 0696 0704 0734 0737 0745
0747 0752 0781 0783 0817 0821 0825
0828 0829 0830 0836 0837 0838 0839
0841 0842 0844 0845 0865 0879 0881
0886 0903 0929 0936 0939 0940 0941
0950 0952 0968 0976 1003 1018 1031
1038 1042 1077 1096 1099 1100 1101
1102 1110 1111 1117 1119 1120 1123
1125 1283 1289

FOOD SECURITY
0002 0005 0029 0037 0164 0337 0440
0444 0686 0745 0746 0819 0822 0953
1077

FOOFOO
0058 0241 0250 0288 0322 0328 0354
0368 0417 0419 0903 0929 0976 1192
1218 1219 1224 1228 1229 1230 1233
1235 1283
COMPOSITION
0196 0236 0267 0669 0737 0740 0741
0742 0743 0783 0816 1231
PROCESSING
0055 0056 0194 0196 0243 0247 0251
0267 0303 0336 0350 0669 0682 0686
0731 0740 0741 0742 0743 0781 0816
0842 0844 0900 0969 1031 1042 1241
1288 1289

FORESTRY
0358 0422 0689 0697

FRANCE
0013 0014 0041 0093 0094 0095 0096
0097 0098 0099 0100 0101 0102 0103
0104 0106 0107 0108 0109

FRENCH GUIANA
0380

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0068 0780

FRUITING
0951

FUSARIUM
0161 1269 1270
SYMPTOMATOLOGY
0162

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0314 0316 0317 0318 0319
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0315
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0312 0313 1109
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0312 0313 1109
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0310 0311 0313
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0312 0313 1109

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0320

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0071 0169 0177 0313 0322 0345 0357
0366 0396 0419 0654 0671 0704 0734
0752 0828 0829 0830 0865 0903 0940
0976 1038 1096 1099 1110 1111 1123
1283
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0637 0669 0695 0696 0737 0783 0825
0936 0950 1003 1102
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0836
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1120
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0033 0836 0842 1100 1289
HCN CONTENT
0033 0045 0669 0783 0950
INDUSTRIAL MACHINERY
0669 0939 1117
MECHANIZATION
0055 0342 0368 0669 0838 0845 1100
1101 1102 1117
NUTRITIVE VALUE
0881 1003
ORGANOLEPTIC EXAMINATION
0328 0669 1042
PROCESSING
0017 0019 0055 0056 0329 0336 0342
0343 0344 0346 0347 0348 0352 0637
0669 0682 0686 0694 0745 0745 0781
0817 0821 0837 0838 0841 0842 0844
0845 0879 0936 0941 0952 0968 1003
1031 1042 1100 1102 1117 1119 1125
1289
STORAGE
0019 0055 0328 0336 0352 0669 0747
0841 0842 0929

GELATINIZATION
0696 0823

GENETICS
0025 0032 0234 0432 0630 0671 0858

GERMINATION
CUTTINGS
0193 0669 0759 0760 0765
SEED
1178 1186
TIMING
0669

GERMPLASM
0064 0284 0315 0381 0388 0461 0491
0493 0495 0632 0669 0735 0826 0858
0859 0999 1004 1075 1098 1099 1100
1102 1103 1104 1227

GHANA
0174 0321 0322 0325 0326 0327 0328
0329 0330 0331 0333 0334 0335 0336
0337 0338 0339 0340 0344 0346 0350
0351 0353 0354
MARKETING
0055 0342 0343 0348
PRODUCTION
0055 0341 0345 0349 0352 0355 0356
SOCIOECONOMIC ASPECTS
0347
STATISTICAL DATA
0323 0324 0332
TRADE
0055

GLOEOSPORIUM MANIHOTIS
0943
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0869 0870 0871 0942 0944 1160 1161
EPIDEMIOLOGY
1130 1156
RESISTANCE
0669 0692 0921 0972 1130 1131 1155
1159 1162

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0161 0222 0246 0261 0442 1209 1216
1262
DISEASE CONTROL
0173 0636
EPIDEMIOLOGY
0296
ETIOLOGY
0173 0398
RESISTANCE
0173 0283 0289 0292 0297 0302 0315
1099 1187 1188 1192 1208 1210 1211
1218 1219 1221 1222 1224 1229 1230
1231 1235 1243 1244

SYMPTOMATOLOGY
0173 0296 1212

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0196 0317 0673 1217
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0636 1191 1220
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0984
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1191 1215 1220 1282
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0162

GRAFTING
0735 0852 1085 1178 1185

GRINDING
0329 0833 0834 0842 1100

GROWTH
0383 0502 0674 0727 0765 0766 0780
0815 0853 0925 0947 0948 1045 1132
1166

GROWTH CHAMBER EXPERIMENTS
0951

GUINEA
0362
MARKETING
0313
PRODUCTION
0313 0363 0364
STATISTICAL DATA
0313 0357 0358 0359 0360 0361
TRADE
0313

HARVEST INDEX
0167 0502 1080 1190

HARVESTING
0160 0379 0466 0516 0683 0876 0889
0941 0992 0993 1185
AGRICULTURAL EQUIPMENT
0399 0437 0669 0687 0820 0872 0874
1183
TIMING
0050 0077 0078 0079 0080 0081 0082
0083 0084 0085 0086 0087 0088 0089
0090 0091 0092 0186 0196 0197 0315
0340 0372 0380 0381 0442 0446 0469
0502 0508 0520 0522 0523 0528 0637
0669 0687 0697 0973 0990 1044 1080
1187 1189 1214

HCN ABSORPTION
0734 0958

HCN CONTENT
0030 0031 0033 0045 0048 0187 0195
0305 0478 0632 0812 0824 0836 0882
0936 1185 1212 1220 1227
CASSAVA CHIPS
0783 1214
CASSAVA FLOUR
0669 0740 0741
CASSAVA MEAL
0196 0267 0669 0740 0741 0742 0783
0816 1214 1231
CORTEX
0909 0961
LEAVES
0204 0669 0852 0973 1179 1191
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0204 0728 0763 0825 0852 0909 0950
0961 1214

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0194 0195 0196 0315 0316 0402 0435
0445 0458 0635 0652 0778 0805 0875
0977 0978 0980 0982 1097 1099 1102
1236 1238

HISTORY
0029 0065 0337

HOT WATER TREATMENTS
0158 1195

HUMAN NUTRITION
0020 0023 0025 0030 0037 0065 0163
0174 0182 0183 0225 0236 0243 0307
0351 0366 0396 0434 0498 0499 0500
0501 0627 0629 0678 0681 0686 0745
0746 0799 0804 0806 0810 0821 0831
0839 0842 0851 0882 0903 0905 0908
0933 0937 0945 0959 0961 0974 0975
0993 1003 1004 1016 1077 1095 1109
1126 1241 1262 1263 1271 1276 1296
1297 1302

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0204 0629

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0290 0388 0971

HYDROLYSIS
0907
CASSAVA STARCH
0353

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0811

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0716

ILLUMINATION
0935 0951

INCOME
0308 0342 0348 0456 0697 0714 0745
0785 0821 0952 0967 1017 1028 1033
1035 1038 1041 1063 1075 1079 1080
1102 1151

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0427
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1296

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0365
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0074
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0074
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0074

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0669 0939 1117

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0353 0366 0368 0377 0823 0885

INJURIOUS INSECTS
0049 0174 0184 0194 0195 0226 0234
0245 0263 0391 0403 0409 0454 0485
0735 0854 0884 0964 0970 1021 1023
1139
AONIDOMYTILUS ALBUS
0474 1039
BEMISIA
0261 0636 1039 1087 1130 1154
PHENACOCCUS GOSSYPII
0026
PHENACOCCUS MANIHOTI
0001 0006 0015 0024 0027 0028 0036
0039 0046 0047 0059 0066 0067 0069
0171 0193 0196 0197 0212 0219 0222
0231 0246 0255 0258 0261 0266 0269
0270 0271 0272 0273 0274 0276 0277
0278 0279 0280 0289 0291 0292 0300
0304 0309 0314 0315 0317 0319 0320
0321 0325 0334 0429 0458 0503 0528
0631 0632 0633 0636 0650 0666 0669
0690 0692 0704 0716 0717 0718 0720
0721 0722 0723 0725 0726 0733 0739
0753 0754 0755 0756 0757 0758 0759
0760 0761 0762 0763 0764 0765 0766
0767 0768 0769 0770 0771 0773 0774
0775 0776 0813 0820 0848 0849 0855
0856 0857 0864 0883 0891 0916 0917
0920 0921 0927 0972 0983 0989 0990
0993 0997 1004 1005 1032 1039 1099
1100 1103 1105 1108 1112 1113 1187
1189 1192 1193 1194 1195 1196 1197
1198 1199 1200 1201 1202 1216 1218
1219 1220 1221 1222 1224 1226 1227
1228 1229 1230 1231 1235 1274 1284
1300
ZONOCERUS VARIEGATUS
0031 0173 0252 0253 0254 0261 0325
0352 0636 0848 0921 0938 1039 1104
1130 1154

INJURIOUS MITES
0006 0054 0067 0234 0258 0317 0391
0631 0787 0884 0964 0970 1023
MONONYCHELLUS TANAJOA
0001 0024 0028 0034 0036 0046 0047
0066 0184 0185 0186 0193 0196 0197
0212 0222 0261 0291 0300 0309 0315
0321 0325 0429 0479 0491 0496 0526
0527 0528 0529 0632 0636 0650 0666
0669 0690 0692 0704 0715 0719 0723
0726 0735 0739 0753 0755 0772 0773
0774 0775 0776 0779 0788 0789 0790
0791 0792 0793 0794 0795 0796 0803
0820 0847 0848 0864 0865 0891 0916
0917 0920 0921 0927 0972 0987 0988
0989 0990 0991 0993 0996 0997 0998
1020 1039 1058 1073 1076 1077 1078
1079 1080 1081 1084 1099 1112 1130
1131 1134 1149 1150 1152 1153 1154
1164 1189 1193 1194 1195 1196 1200
1201 1218 1220 1221 1222 1224 1228
1229 1274 1284
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1150

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0984
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0260 1048

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0026 0031 0047 0049 0054 0269 0271
0273 0274 0276 0277 0278 0279 0410
0418 0733 0756 0762 0771 0779 0789
0795 0800 0813 0848 0849 0883 0938
0964 1105 1130 1149 1150 1152 1154
1197 1224

INSECTICIDES
0031 0047 0252 0318 0334 0458 0474
0493 0669 0716 0717 0718 0720 0721
0722 0723 0753 0767 0768 0786 0914
0920 0918 1074 1108 1195

INTERCROPPING
0020 0045 0174 0193 0215 0242 0376
0452 0456 0499 0525 0616 0627 0670
0697 0724 0791 0812 0901 0902 1012
1063 1067 1071 1077 1079 1080 1081
1089 1106 1139 1146 1177 1187 1221
1224 1279 1298

BEANS
0227 0613 0614 0622 0623 0995 1132
1188 1189 1218 1226
COWPEA
0194 0195 0196 0197 0466 0482 0705
0853 0888 0911 0913 0977 0978 1075
1148
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0194 0195 0196 0197 0227 0393 0424
0466 0482 0613 0622 0623 0705 0798
0818 0853 0911 0913 0976 0977 0978
0995 1075 1082 1114 1115 1124 1132
1148 1188 1189 1190 1191 1217 1218
1219 1220 1226 1236 1237 1272
MAIZE
0194 0195 0196 0197 0203 0227 0339
0393 0424 0440 0466 0482 0528 0613
0614 0622 0623 0641 0642 0646 0648
0649 0651 0652 0656 0657 0659 0668
0669 0677 0678 0679 0680 0689 0693
0701 0708 0729 0735 0778 0785 0797
0798 0805 0818 0862 0863 0868 0888
0890 0891 0892 0893 0911 0912 0913
0922 0949 0966 0976 0977 0978 0979
0981 0995 1017 1075 1114 1115 1119
1124 1132 1189 1190 1217 1218 1219
1220 1226 1237
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0498 0648 0911 1017 1115
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0528 0613 0622 0623
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0195 0196 0980 1130 1167
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0393 0424 0689 0778 0913 0976

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0204 0958 0959

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0184

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0181 0423

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0257 1048

IVORY COAST
0174 0245 0276 0309 0373 0374 0377
0379 0380 0382 0383 0384 0385 0386
0387 0389 0390 0391 0393 0394 0397
0398 0399 0400 0401 0402 0403 0404
0405 0406 0407 0408 0409 0410 0411
0412 0413 0414 0415 0416 0417 0418
0419 0420 0422 0423 0424 0425 0426
0427 0429 0430 0431 0432 0434 0435
0437 0438 0439 0440 0441 0443 0445
0447 0448 0449 0450 0451 0454 0456
0457 0630 0809 1273
GERMPLASM
0381 0388
MARKETING
0055 0366 0368 0452 0458
PRODUCTION
0055 0366 0370 0372 0376 0378 0395
0396 0421 0433 0442 0446 0455 0458
STATISTICAL DATA
0366 0367 0369 0370 0371 0375 0376
0392 0395 0396 0428 0458
TRADE
0055 0366 0368 0444

JAPAN
1296

KENYA
0174 0427 0459 0460 0462 0464 0466
0467 0468 0469 0470 0471 0472 0473
0474 0475 0476 0477 0479 0480 0482
0483 0484 0485 0630 1049 1068
GERMPLASM
0461
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0486
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0463 0465 0478 0481

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0654 0941

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0945 0975

LABOR
0016 0037 0040 0218 0250 0333 0376
0498 0635 0714 0967 1017 1028 1033
1040 1041 1063 1151 1224
HARVESTING
0669 0697 1044 1185
LAND PREPARATION
0499 0669
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0669 0697
PROCESSING
0020 0053 0669 0745 0745 0821 0841
0845 0968 0969 0970 1185 1241 1273

LABORATORY ANIMALS
0734 0881 0882 0908 0933 0940 0958
0959 0960

LABORATORY EXPERIMENTS
0041 0257 0268 0270 0276 0277 0285
0286 0296 0301 0353 0674 0698 0787
0794 0816 0824 0896 0984 1048

LAND PREPARATION
0160 0372 0394 0401 0499 0638 0932
0985 0993 1154 1162 1187

AGRICULTURAL EQUIPMENT
0669 0687
MECHANIZATION
0442 0445 0669 0687
ROOT PRODUCTIVITY
0193 0315 0402 0442 0669 0898 0899
0947 0999 1106 1170 1239 1272

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1070 1301

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0034

LEAF AREA
0196 0669 0853 0925 0926 0935 1190

LEAVES
0194 0209 0260 0383 0447 0502 0637
0640 0790 0988 1035 1036 1048 1187
1203 1237
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0409 0669 0780 0852 1179
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0204 0669 0852 0973 1179 1191
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0726
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1248
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0933 1072

LEGAL ASPECTS
0020 0223 0312 0452 0497 0513 0684
0731 1116 1118 1127 1133 1284 1299

LIBERIA
0174 0492 0494 0496 0500 0501 0502
0503 0504
GERMPLASM
0491 0493 0495
MARKETING
0499
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0497 0505 0506
SOCIOECONOMIC ASPECTS
0493 0498 0499
STATISTICAL DATA
0487 0488 0489 0490
TRADE
0497

LIGHT
0798 0935 0951 1275

LINAMARASE
0825 0907

LINAMARIN
0816 0824 0907 0974 0975

LODGING
0383

MADAGASCAR
0427 0507 0508 0509 0510 0511 0628
0630
MARKETING
0513 0514
PRODUCTION
0514
TRADE
0513 0514

MAGNESIUM
0492 0726 0866 0887 0888 0892
ROOT PRODUCTIVITY
0446 0491 0495 0673 0898 1019 1030

MALAWI
0174 0427 0516 0517 0518 0519 0520
0521 0522 0523 0524 0526 0527 0528
0529 0530
SOCIOECONOMIC ASPECTS
0525
STATISTICAL DATA
0604 0607 0608
TRADE
0515 0604 0607 0608

MALI
1109

MALNUTRITION
0020 0225 0434 0945 0975 1297

MALTOSE
0780

MANIHOT DICHOTOMA
0772 1085 1086

MANIHOT GLAZIOVII
0266 0281 0285 0421 0432 0772 1024
1085 1086

MANURES
0669 0924 1019 1226
DUNG
0394 0475

MAPS
0040 0048 0052 0059 0158 0170 0174
0178 0193 0197 0200 0204 0218 0227
0254 0255 0262 0273 0300 0345 0348
0356 0374 0376 0392 0396 0402 0421
0430 0438 0439 0442 0445 0493 0494
0495 0496 0498 0504 0505 0506 0527
0626 0627 0855 1032 1065 1069 1077
1090 1091 1121 1122 1128 1172 1173
1175 1193 1194 1195 1196 1198 1199

1206 1213 1218 1224 1262 1263 1277
1300 1301

MARKETING
0002 0003 0005 0018 0020 0052 0057
0074 0093 0094 0097 0098 0099 0100
0101 0102 0103 0104 0106 0107 0108
0109 0131 0156 0157 0172 0191 0198
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0433 0444 0452 0497 0498 0499 0513
0515 0602 0603 0684 0751 0880 0906
0992 0993 1034 1059 1062 1090 1095
1118 1122 1127 1133 1151 1175 1246
1268 1276 1284 1299
CASSAVA CHIPS
0025 0055 0233 0248 0249 0250 0313
0366 0368 1077 1110 1260
CASSAVA FLOUR
0019 0055 0072 0073 0095 0096 0105
0132 0133 0134 0135 0136 0137 0138
0139 0140 0141 0142 0143 0144 0145
0146 0147 0148 0149 0150 0151 0152
0153 0154 0155 0163 0228 0313 0366
0368 0458 0514 0563 0564 0565 0566
0567 0568 0569 0570 0579 0580 0581
0582 0583 0584 0585 0586 0587 0588
0591 0592 0593 0594 0595 0596 0597
0598 0599 0600 0601 0609 0686 0731
0821 1065 1077 1110 1125
CASSAVA MEAL
0025 0055 0073 0095 0096 0105 0132
0133 0134 0135 0136 0137 0138 0139
0140 0141 0142 0143 0144 0145 0146
0147 0148 0149 0150 0151 0152 0153
0154 0155 0159 0200 0243 0250 0251
0366 0368 0458 0686 0731 0976
CASSAVA STARCH
0017 0025 0055 0068 0159 0163 0313
0368 0486 0514 0686 1077 1109 1110
1116 1119 1125
GARI
0017 0019 0055 0313 0342 0343 0348
0366 0368 0686 0752 0821 0941 0976
1038 1110 1119 1123 1125
PELLETS
0055
ROOTS
1041
TAPIOCAS
0159 0313 0514 1116 1119 1125

MATHEMATICAL MODEL
0695

MATURATION
0286 0382

MAURITANIA
MARKETING
1109
PRODUCTION
1109
TRADE
1109

MAURITIUS
PRODUCTION
0531 0533 0552
STATISTICAL DATA
0532 0534 0535 0536 0537 0538 0539
0540 0541 0542 0543 0544 0545 0546
0547 0548 0549 0550 0551

MECHANIZATION
0241 0368 0385 0422 0875 0897 1097
HARVESTING
0399 0437 0442 0446 0669 0687 0872
0874 0876
LAND PREPARATION
0442 0445 0669 0687
PLANTING
0261 0379 0445 0446 0669 0683 0687
0872 0877 1101 1236
PROCESSING
0055 0342 0455 0458 0669 0683 0731
0838 0845 0872 0876 1100 1102 1117

MINERAL DEFICIENCIES
0919

MINERALS
0340 0441 0528 0652 0666 0726 0729
0866 0887 0890 0892 0897 0915 0919
1030 1046

MITE BIOLOGY
0526 0787 0788

MITE CONTROL
0001 0[illegible] 0258 0526 0636 0735 0753
0755 0773 0774 0779 0786 0789 0791
0826 0917 0998
ACARICIDES
0669 0715 0719 0792 0793 0920 0996
1149

MOLDS
1209 1214 1270

MOLYBDENUM
0491 0492

MONILLA
1269

MONOCROPPING
0242 0616 1115 1124 1236 1237

MONONYCHELLUS
0054 0633 0803

RESISTANCE
0846

MONONYCHELLUS PROGRESIVUS
0043 0258 1058

MONONYCHELLUS TANAJOA
0024 0028 0034 0036 0184 0186 0196
0197 0222 0261 0291 0309 0321 0325
0429 0479 0496 0526 0527 0528 0715
0719 0735 0739 0772 0786 0788 0789
0791 0792 0793 0795 0803 0848 0864
0927 0987 0988 0989 0991 0993 0997
0998 1020 1039 1058 1073 1077 1081
1084 1112 1134 1150 1152 1154 1189
1194 1196 1200 1201 1274 1284
INSECT CONTROL
0636 0755 0773 0774 0917 0990 1153
BIOLOGICAL CONTROL
0001 0047 0669 1195
INSECTICIDES
0047 0669 0723 0753 0920 1195
PEST DAMAGE
0046 0212 0650 0666 0704 0726 0775
0779 0865 0891 0916 1193 1229
RESISTANCE
0066 0185 0193 0212 0300 0315 0491
0529 0632 0669 0690 0692 0774 0776
0790 0794 0796 0820 0847 0865 0921
0972 0990 0996 1076 1078 1079 1080
1099 1130 1131 1149 1164 1218 1220
1221 1222 1224 1228 1229

MOZAMBIQUE
0030 0628 0629
MARKETING
0093 0094 0095 0101 0102 0106 0107
0108 0109 0159 0163 0563 0564 0565
0566 0567 0568 0569 0570 0579 0580
0581 0582 0583 0584 0585 0586 0587
0588 0591 0592 0593 0594 0595 0596
0597 0598 0599 0600 0601 0609
PRODUCTION
0159 0579 0580 0581 0582 0583 0584
0585 0586 0587 0588 0616 0626 0627
STATISTICAL DATA
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0108 0109 0159 0163 0555 0556 0557
0558 0559 0560 0561 0562 0563 0564
0565 0566 0567 0568 0569 0570 0571
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0579 0580 0581 0582 0583 0584 0585
0586 0587 0588 0589 0590 0591 0592
0593 0594 0595 0596 0597 0598 0599
0600 0601 0602 0603 0604 0605 0606
0607 0608 0609 0610 0611 0612 0613
0614 0615 0616 0617 0618 0619 0620
0621 0622 0623 0624 0625 0627
TRADE
0093 0094 0095 0101 0102 0106 0107
0108 0109 0159 0163 0553 0554 0604
0605 0606 0607 0608

MULCHING
0493 0495 0639 0669 0812 0815 0897
0898 0899 0932 0947 0948 1188 1189
1218 1226

MYCORRHIZAE
0727

MYCOSES
0054 0161 0162 0184 0194 0195 0222
0246 0258 0261 0296 0317 0398 0442
0633 0803 0943 0986 0991 0997 1021
1088 1156 1209 1214 1216 1262 1269
1270
DISEASE CONTROL
0173 0636 0712 0848 0869 0870 0871
0942 0944 1160 1161
RESISTANCE
0173 0283 0289 0292 0297 0300 0302
0315 0669 0692 0921 0972 0990 1099
1130 1131 1155 1159 1162 1187 1188
1192 1208 1210 1211 1212 1218 1219
1221 1222 1224 1229 1230 1231 1235
1243 1244

NEMATODES
0244 0724

NEOSEIULUS ANONYMUS
0184

NETHERLANDS
0093 0094 0095 0096 0097 0098 0099
0100 0101 0102 0103 0104 0106 0107
0108 0109

NEW CALEDONIA
0380

NIGER
MARKETING
1109
PRODUCTION
1109
TRADE
1109

NIGERIA
0174 0257 0292 0309 0419 0427 0630
0631 0633 0634 0635 0636 0637 0638
0639 0640 0644 0645 0646 0647 0648
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0659 0668 0670 0671 0672 0673 0674
0675 0676 0677 0678 0679 0680 0681
0682 0683 0685 0687 0688 0689 0690

0691 0692 0693 0694 0695 0696 0698
0700 0701 0702 0703 0708 0709 0710
0711 0712 0713 0714 0715 0716 0717
0718 0719 0720 0721 0722 0723 0724
0725 0726 0727 0728 0729 0730 0733
0734 0736 0737 0738 0740 0741 0742
0743 0744 0747 0753 0754 0755 0756
0757 0758 0759 0760 0761 0762 0763
0764 0765 0766 0767 0768 0769 0770
0771 0772 0773 0774 0775 0776 0777
0778 0779 0780 0781 0782 0783 0786
0787 0788 0789 0790 0791 0792 0793
0794 0795 0796 0797 0798 0799 0800
0801 0802 0803 0804 0805 0807 0808
0809 0811 0813 0814 0815 0816 0818
0823 0824 0825 0827 0831 0832 0833
0834 0835 0836 0837 0838 0839 0840
0843 0844 0846 0847 0848 0849 0850
0851 0852 0853 0854 0855 0856 0857
0860 0861 0862 0863 0864 0865 0866
0867 0868 0869 0870 0871 0872 0873
0874 0875 0876 0877 0878 0879 0881
0882 0883 0885 0886 0887 0888 0889
0890 0892 0893 0894 0895 0896 0897
0898 0899 0900 0901 0902 0903 0904
0907 0908 0909 0910 0911 0912 0913
0914 0915 0916 0917 0918 0919 0920
0921 0922 0923 0924 0925 0926 0927
0928 0929 0930 0931 0932 0933 0934
0935 0936 0937 0938 0939 0940 0942
0943 0944 0945 0946 0947 0948 0949
0950 0951 0953 0954 0955 0956 0957
0958 0959 0960 0961 0962 0963 0964
0965 0968 0969 0971 0972 0973 0974
0975 0977 0978 0979 0980 0981 0982
0984 0985 0986 0987 0988 0989 1049
1187

GERMPLASM
0632 0669 0735 0826 0858 0859

MARKETING
0684 0686 0731 0751 0821 0906 0941
1109

PRODUCTION
0643 0686 0697 0705 0731 0732 0745
0810 0812 0821 0822 0880 0967 0970
1109

SOCIOECONOMIC ASPECTS
0641 0642 0650 0658 0660 0661 0662
0663 0664 0665 0666 0667 0686 0699
0706 0731 0739 0745 0746 0748 0749
0750 0785 0817 0819 0820 0821 0841
0842 0845 0891 0905 0952 0966 0976
0983

STATISTICAL DATA
0655 0686 0704 0707 0784 0806 0821
0828 0829 0830

TRADE
0684 0686 0731 0752 1109

NIGROSPORA
1270

NITROGEN
0194 0340 0365 0441 0446 0447 0491
0492 0493 0495 0516 0517 0520 0635
0652 0666 0669 0670 0673 0678 0679
0693 0718 0725 0726 0729 0736 0774
0861 0862 0863 0866 0867 0887 0888
0890 0892 0897 0898 0899 0914 0915
0920 0923 0924 0960 0980 1013 1019
1030 1035 1036 1080 1188 1210 1226
1240 1294 1295

NORTH AMERICA
0052 0093 0094 0096 0097 0098 0099
0100 0101 0102 0103 0104 0106 0107
0108 0109

NOXIOUS ANIMALS
0001 0006 0015 0024 0026 0027 0028
0031 0034 0036 0039 0046 0047 0049
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0174 0184 0[illegible] 0186 0193 0194 0195
0196 0197 0212 0219 0222 0226 0231
0234 0244 0245 0246 0252 0253 0254
0255 0258 0261 0263 0266 0269 0270
0271 0272 0273 0274 0276 0277 0278
0279 0280 0289 0291 0292 0300 0304
0309 0314 0315 0317 0319 0320 0321
0325 0334 0352 0391 0403 0409 0429
0454 0458 0474 0479 0485 0491 0496
0503 0526 0527 0528 0529 0631 0632
0633 0636 0650 0666 0669 0690 0692
0704 0715 0716 0717 0718 0719 0720
0721 0722 0723 0724 0725 0726 0733
0735 0739 0753 0754 0755 0756 0757
0758 0759 0760 0761 0762 0763 0764
0765 0766 0767 0768 0769 0770 0771
0772 0773 0774 0775 0776 0779 0787
0788 0789 0790 0791 0792 0793 0794
0795 0796 0803 0813 0820 0847 0848
0849 0854 0855 0856 0857 0864 0865
0883 0884 0891 0916 0917 0920 0921
0927 0938 0964 0970 0972 0983 0987
0988 0989 0990 0991 0993 0996 0997
0998 1004 1005 1020 1021 1023 1032
1039 1058 1073 1076 1077 1078 1079
1080 1081 1084 1087 1099 1100 1103
1104 1105 1108 1112 1113 1130 1131
1134 1139 1149 1150 1152 1153 1154
1164 1187 1189 1192 1193 1194 1195
1196 1197 1198 1199 1200 1201 1202
1216 1218 1219 1220 1221 1222 1224
1226 1227 1228 1229 1230 1231 1235
1274 1284 1300

NUTRIENT UPTAKE
0268 0657 0693 0866 0888 0915 0918
0919

NUTRITIONAL REQUIREMENTS
0160 0194 0246 0340 0365 0372 0394
0401 0422 0441 0442 0446 0447 0475

0491 0492 0493 0495 0516 0517 0520
0528 0635 0642 0646 0647 0648 0649
0650 0651 0652 0655 0657 0660 0669
0670 0673 0678 0679 0680 0688 0701
0707 0718 0729 0730 07[illegible] 0739 0774
0777 0779 0801 0807 0861 0862 0863
0866 0867 0868 0887 0890 0891 0892
0893 0895 0897 0898 0899 0914 0915
0917 0918 0920 0923 0924 0928 0942
0943 0956 0980 1013 1019 1030 1035
1036 1046 1080 1177 1188 1189 1209
1210 1211 1226 1236 1237 1240 1291
1292 1294 1295

OCEANIA
0002 0003 0007 0008 0009 0010 0011
0012 0052 0057 0068 1296

OLIGONYCHUS
0054 0184

OLIGONYCHUS GOSSYPII
0787 0795 0848
MITE CONTROL
0786

ON-FARM RESEARCH
0206 0416 0424 0498 0499 0512 0525
0714 0802 1009 1017 1025 1026 1027
1028 1063 1148 1168 1171 1225

ORGANOLEPTIC EXAMINATION
0331 0461 1189
CASSAVA FLOUR
0528 0669 0740 0741 0743 1018
CASSAVA MEAL
0194 0328 0350 0354 0669 0740 0741
0742 0743 0900 1042 1231 1235
CASSAVA STARCH
0480
COMPOSITE FLOURS
0480
GARI
0328 0669 0936 1042

PACKAGING
0197

PALATABILITY
0193 0302 0331 0354 0466 1080 1192
1218 1228 1229 1230 1233

PAPUA NEW GUINEA
STATISTICAL DATA
1296

PARAGUAY
0849

PEELING
0187 0329 0683 0700 0832 0836 0842
0843 0872 0876 0941 1100 1185

PELLETS
PROCESSING
0055 0637

PENICILLIUM
1269 1270

PERICONIA MANIHOTICOLA
0317 1088

PERU
0023

PEST CONTROL
0001 0047 0070 0158 0173 0174 0186
0252 0255 0258 0259 0273 0274 0291
0318 0334 0407 0436 0445 0458 0459
0474 0493 0507 0526 0630 0636 0650
0657 0666 0669 0704 0708 0711 0712
0715 0716 0717 0718 0719 0720 0721
0722 0723 0735 0738 0739 0753 0754
0755 0759 0760 0764 0766 0767 0768
0772 0773 0774 0777 0779 0789 0791
0792 0793 0800 0808 0811 0826 0846
0848 0855 0869 0870 0871 0914 0917
0920 0938 0942 0944 0963 0964 0990
0996 0998 1044 1047 1074 1079 1108
1113 1149 1153 1160 1161 1191 1195
1220 1272 1300

PEST DAMAGE
0026 0046 0195 0212 0258 0317 0414
0516 0650 0666 0704 0726 0775 0779
0800 0847 0854 0865 0871 0891 0916
0943 0964 1032 1105 1113 1163 1193
1198 1229 1281
DEFOLIATION
0725 0736 1035

PESTS
0001 0006 0015 0020 0021 0024 0026
0027 0028 0031 0034 0035 0036 0038
0039 0041 0046 0047 0049 0051 0054
0059 0066 0069 0070 0158 0161 0162
0171 0172 0173 0174 0184 0185 0186
0193 0194 0195 0196 0197 0203 0212
0219 0222 0226 0231 0234 0244 0245
0246 0252 0253 0254 0255 0256 0257
0258 0259 0260 0261 0263 0264 0266
0269 0270 0271 0272 0273 0274 0276
0277 0278 0279 0280 0281 0283 0284
0285 0287 0288 0289 0291 0292 0293
0295 0296 0297 0299 0300 0302 0304
0309 0314 0315 0316 0317 0319 0320
0321 0325 0334 0352 0373 0374 0391
0395 0398 0403 0404 0405 0406 0407
0408 0409 0410 0411 0412 0413 0414

0415 0416 0418 0421 0427 0429 0430
0436 0438 0439 0442 0444 0446 0452
0454 0458 0459 0460 0461 0462 0467
0468 0470 0474 0476 0477 0479 0483
0485 0491 0496 0497 0499 0503 0507
0516 0517 0521 0523 0526 0527 0528
0529 0627 0628 0630 0631 0632 0633
0635 0636 0644 0645 0650 0666 0669
0671 0672 0690 0692 0704 0708 0709
0710 0711 0712 0713 0715 0716 0717
0718 0719 0720 0721 0722 0723 0724
0725 0726 0733 0735 0739 0753 0754
0755 0756 0757 0758 0759 0760 0761
0762 0763 0764 0765 0766 0767 0768
0769 0770 0771 0772 0773 0774 0775
0776 0777 0779 0787 0788 0789 0790
0791 0792 0793 0794 0795 0796 0800
0803 0808 0809 0812 0813 0820 0826
0847 0848 0849 0854 0855 0856 0857
0864 0865 0869 0870 0871 0883 0884
0891 0904 0907 0916 0917 0920 0921
0927 0938 0942 0943 0944 0949 0955
0963 0964 0970 0972 0982 0983 0986
0987 0988 0989 0990 0991 0993 0996
0997 0998 1004 1005 1006 1020 1021
1023 1032 1039 1047 1048 1049 1052
1058 1068 1073 1076 1077 1078 1079
1080 1081 1083 1084 1085 1086 1087
1088 1099 1100 1103 1104 1105 1107
1108 1112 1113 1130 1131 1134 1136
1139 1149 1150 1152 1153 1154 1155
1156 1157 1159 1160 1161 1162 1163
1164 1165 1179 1183 1184 1185 1186
1187 1188 1189 1191 1192 1193 1194
1195 1196 1197 1198 1199 1200 1201
1202 1208 1209 1210 1211 1212 1213
1214 1215 1216 1217 1218 1219 1220
1221 1222 1223 1224 1226 1227 1228
1229 1230 1231 1235 1243 1244 1262
1269 1270 1274 1275 1278 1281 1282
1284 1285 1286

PH
0680
SOIL ANALYSIS
0441

PHAEORAMULARIA MANIHOTIS
DISEASE CONTROL
1160 1161
EPIDEMIOLOGY
1130 1156
RESISTANCE
1130 1162

PHENACOCCUS
0069 0970 1087

PHENACOCCUS GOSSYPII
PEST DAMAGE
0026

PHENACOCCUS HERRENI
0026

PHENACOCCUS MADEIRENSIS
0754

PHENACOCCUS MANIHOTI
0006 0015 0024 0027 0028 0036 0039
0059 0067 0069 0070 0171 0196 0197
0219 0222 0231 0246 0261 0266 0269
0270 0271 0272 0276 0277 0278 0279
0280 0291 0304 0309 0314 0321 0325
0429 0503 0528 0631 0633 0733 0739
0754 0756 0757 0758 0761 0762 0763
0765 0769 0770 0771 0813 0848 0849
0856 0857 0864 0883 0927 0983 0989
0993 0997 1005 1039 1112 1189 1194
1196 1197 1199 1200 1201 1202 1216
1226 1274 1284
INSECT CONTROL
0258 0636 0755 0759 0760 0766 0773
0774 0917 0990 1113 1300
BIOLOGICAL CONTROL
0001 0047 0255 0273 0274 0669 0716
0764 0855 1195
INSECTICIDES
0047 0334 0458 0669 0716 0717 0718
0720 0721 0722 0723 0753 0767 0768
PEST DAMAGE
0046 0212 0258 0317 0650 0666 0704
0725 0726 0775 0891 0916 1032 1105
1193 1198 1229
RESISTANCE
0066 0193 0212 0289 0292 0300 0315
0319 0320 0458 0632 0669 0690 0692
0774 0776 0811 0820 0846 0921 0972
0990 1004 1099 1100 1103 1108 1187
1192 1218 1219 1220 1221 1222 1224
1227 1228 1229 1230 1231 1235

PHENOLOGY
0036

PHOSPHORUS
0194 0268 0340 0365 0441 0446 0447
0491 0492 0493 0495 0516 0517 0520
0635 0652 0666 0669 0673 0679 0718
0726 0729 0774 0866 0887 0888 0890
0892 0897 0898 0899 0914 0915 0920
0923 0924 0980 1013 1019 1030 1080
1226 1294 1295

PHOTOPERIOD
0951

PHYLLOSTICTA
DISEASE CONTROL
0636

PHYSIOLOGY
0014 0204 0286 0383 0406 0629 0640
0669 0674 0710 0727 0734 0736 0765
0766 0780 0814 0815 0826 0850 0853
0860 0866 0881 0889 0908 0919 0925
0926 0928 0935 0947 0948 0957 0958
0959 0960 0961 0962 0974 0985 1045
1130 1132 1166 1169 1179 1190 1281

PHYTOPHTHORA
0317 1270
DISEASE CONTROL
0712 0848

PLANT ASSIMILATION
1242

PLANT FERTILITY
0650 0666 0667 0691 0887 0918

PLANT GEOGRAPHY
0048 0070 0640 1089 1129

PLANT GROWTH SUBSTANCES
0286

PLANT HEIGHT
0383 0669 0815 0853 0925 0926 0951
1130 1169 1190 1281

PLANT INJURIES
0291 0297 0300 1076 1183 1196

PLANT PHYSIOLOGICAL PROCESSES
0268 0457 0657 0693 0826 0866 0915
0918 0919 1242

PLANT REPRODUCTION
0286 0691 0860

PLANT TISSUES
0725
TISSUE CULTURE
0282 0285 0859 1046

PLANTING
0077 0078 0079 0080 0081 0082 0083
0084 0085 0086 0087 0088 0089 0090
0091 0092 0160 0184 0186 0219 0339
0372 0380 0466 0467 0484 0492 0497
0638 0643 0645 0650 0676 0688 0693
0705 0721 0724 0727 0755 0764 0779
0797 0798 0888 0889 0942 0993 1139
1148 1154 1162 1177 1211
AGRICULTURAL EQUIPMENT
0669 0687 0872 0877
COSTS
0669 0697 0999 1099 1287 1298
LABOR
0499 0669 0697
MECHANIZATION
0261 0379 0442 0445 0446 0669 0683
0687 0872 0877 1101
ROOT PRODUCTIVITY
0167 0168 0194 0195 0196 0197 0203
0315 0442 0446 0469 0472 0491 0493
0495 0518 0523 0528 0529 0669 0675
0689 0736 0756 0759 0765 0766 0773
0774 0853 0870 0912 0922 0923 0990
0999 1004 1019 1075 1079 1101 1115
1130 1166 1170 1188 1189 1190 1191
1195 1209 1236 1237 1239 1272
SPACING
0196 0401 0445 0464 0493 0509 0518
0528 0530 0669 0675 0677 0689 0729
0802 0818 0853 0887 0890 0912 0913
0922 0923 0946 0949 1079 1130 1132
1153 1157 1160 1161 1165 1166 1187
1216 1226 1272

PLOWING
0394 0897 0947

POLLINATION
0691

PORTUGAL
0163

POSTHARVEST LOSSES
0065 0223 0326 0349 0452 0458 0497
0731 0986 1034 1209 1214 1224

POSTHARVEST TECHNOLOGY
0188 0195 0210 0211 0876 0941 1003

POTASH
1030

POTASSIUM
0194 0340 0365 0441 0446 0447 0491
0492 0495 0516 0517 0635 0652 0666
0669 0673 0679 0680 0693 0718 0726
0729 0774 0863 0866 0868 0887 0888
0890 0892 0897 0898 0899 0914 0915
0917 0919 0920 0923 0924 0943 0980
1013 1019 1030 1080 1188 1209 1210
1236 1240 1294 1295

POTATOES
0234 0393

POULTRY
0351 0501 0681 0744 0831 0842 0850
0851 0878 0910 0937 0957 1081

PREDATORS AND PARASITES
0001 0006 0015 0024 0027 0028 0034
0036 0039 0047 0059 0067 0184 0185
0255 0261 0266 0269 0271 0272 0273
0274 0276 0277 0278 0280 0291 0304

0314 0319 0321 0479 0631 0633 0716
0756 0757 0758 0761 0762 0764 0769
0770 0787 0788 0789 0793 0811 0813
0849 0855 0856 0857 0883 0989 0996
1105 1149 1187 1193 1194 1195 1196
1197 1199 1200 1201 1218 1222 1224
1274

PRESSING
0187 0329 0669 0695 0836 0842 0873
0876 1100 1117

PRICE MAINTENANCE
0752

PRICES
0005 0019 0020 0025 0053 0061 0093
0094 0095 0096 0097 0098 0099 0100
0101 0102 0103 0104 0105 0106 0107
0108 0109 0110 0111 0112 0113 0114
0115 0116 0117 0118 0119 0120 0121
0122 0123 0124 0125 0126 0127 0128
0129 0130 0131 0132 0133 0134 0135
0136 0137 0138 0139 0140 0141 0142
0143 0144 0145 0146 0147 0148 0149
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0157 0159 0169 0172 0198 0200 0201
0202 0207 0208 0213 0216 0223 0224
0232 0233 0241 0248 0249 0250 0251
0308 0332 0333 0342 0345 0348 0349
0364 0370 0428 0433 0452 0458 0463
0486 0497 0499 0513 0514 0515 0553
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0598 0604 0605 0606 0607 0608 0609
0627 0684 0686 0731 0752 0806 0828
0829 0830 0837 0838 0879 0970 0992
1000 1002 1062 1063 1065 1069 1090
1096 1102 1109 1110 1111 1119 1122
1125 1127 1151 1174 1175 1176 1224
1241 1254 1255 1256 1257 1258 1259
1260 1262 1263 1264 1265 1266 1273
1284 1290 1299

PROCESSING
0017 0019 0048 0055 0056 0062 0163
0172 0194 0206 0210 0213 0221 0223
0243 0247 0251 0308 0336 0342 0343
0344 0346 0347 0348 0349 0350 0352
0449 0452 0455 0458 0486 0513 0514
0637 0657 0686 0694 0731 0740 0745
0745 0781 0817 0821 0835 0837 0838
0840 0841 0844 0845 0879 0936 0952
0968 0970 0992 1003 1034 1042 1102
1119 1120 1125 1127 1138 1139 1241
1246 1273 1276 1284 1288
BOILING
1031 1077
DRYING
0020 0030 0053 0182 0187 0195 0196
0669 0698 0741 0742 0743 0832 0833
0834 0842 0843 0909 0961 0969 1072
FERMENTATION
0033 0065 0180 0182 0183 0196 0353
0682 0703 0782 0804 0816 0836 0842
0900 0960 1077 1100 1117 1289
GELATINIZATION
0696 0823
GRINDING
0329 0833 0834 0842 1100
PEELING
0187 0329 0683 0700 0832 0836 0842
0843 0872 0876 0941 1100 1185
PRESSING
0187 0329 0669 0695 0836 0842 0873
0876 1100 1117
RASPING
0187 0834 0836 0842 0843 0872 0941
1117
SCREENING
0834 0836 0842 0843 1100
STEEPING
0234 0267 0303 0728 1185
WASHING
0836 0842 0843 1100

PROPAGATION
0285 0290 0628 0638 0651 0652 0674
0688 0701 0709 0736 0739 0798 0801
0805 0807 0852 0888 0889 0894 0895
0928 0966 0983 0999 1004 1085 1178
1185 1186 1222 1243

PROPAGATION MATERIALS
0286 0485 0638 0657 0688 0697 0701
0702 0739 0805 0807 0826 0827 0895
0906 0928 0951 0966 0983 1004 1044
1178 1183 1186 1204 1281

PROSTEPHANUS TRUNCATUS
0049
INSECT CONTROL
1074

PROTEIN CONTENT
0180 0236 0741 0878 0905
LEAVES
0933 1072 1179
ROOTS
0763
STEMS
0725

PROTEIN DEFICIENCIES
0958

PROTEIN ENRICHMENT
0188 0886
ECONOMICS
0065
FERMENTATION
0065 0180 0182 0183

PROTEINS
0962

PRUNING
0194 0196 0675 0710 0736 1023 1036
1045 1237

PSEUDOTHERAPTUS DEVASTANS
0854

PULP
1018

QUESTIONNAIRES
0174 0210 0247 0525 1006 1014 1050
1171 1225

RABBITS
0685 0909

RAINFALL DATA
0355 0441 0946

RASPING
0187 0834 0836 0842 0843 0872 0941
1117

RECIPES
0839 0841

RELAY CROPPING
0802

RESEARCH
0004 0006 0013 0014 0018 0019 0020
0021 0022 0024 0036 0037 0038 0040
0041 0044 0055 0064 0065 0066 0075
0076 0165 0172 0175 0177 0182 0199
0208 0211 0218 0219 0220 0221 0223
0235 0239 0241 0243 0257 0261 0268
0270 0276 0277 0285 0286 0294 0295
0296 0301 0312 0335 0349 0352 0353
0355 0357 0362 0364 0366 0384 0389
0405 0410 0412 0421 0444 0449 0452
0467 0485 0493 0495 0497 0513 0525
0674 0684 0698 0714 0733 0735 0787
0794 0808 0815 0816 0820 0824 0841
0984 0988 0992 0994 0995 0997 0999
1007 1022 1034 1048 1058 1059 1075
1127 1184 1228 1244 1246 1261 1268
1279 1280 1284 1286 1296 1299

RESISTANCE
0042 0450 0724 0811 0984
DISEASES AND PATHOGENS
0021 0035 0041 0051 0066 0173 0174
0193 0256 0260 0264 0281 0283 0284
0285 0287 0288 0289 0292 0293 0295
0297 0300 0302 0315 0316 0373 0374
0395 0411 0413 0439 0458 0460 0461
0462 0468 0470 0476 0477 0483 0491
0507 0516 0517 0521 0523 0529 0628
0632 0669 0672 0692 0709 0713 0777
0808 0809 0820 0826 0846 0921 0972
0990 1004 1076 1078 1079 1080 1099
1107 1108 1130 1131 1155 1159 1162
1179 1183 1185 1186 1187 1188 1191
1192 1208 1210 1211 1212 1215 1218
1219 1220 1221 1222 1224 1227 1228
1229 1230 1231 1235 1243 1244 1275
1282 1285 1286
INJURICUS INSECTS
0031 0173 0212 0319 0320 0458 0669
0690 0774 0776 0820 1004 1100 1103
1104 1130 1187 1218 1222 1224
INJURIOUS MITES
0185 0669 0790 0794 0796 0820 0847
0865 0996 1080 1149 1164 1218 1222
1224

RHIZOPUS
0162 1270

RHIZOPUS NIGRICANS
0161

RHODOTORULA
1270

RIBOFLAVIN
0975

ROOT CROPS
0065 0352 0964 1151

ROOT DEVELOPMENT
0423 0447 0640 0736 0815 0866 0888
0889 0947 0948 0951 1046

ROOT PRODUCTIVITY
0005 0016 0020 0021 0035 0045 0047
0165 0166 0167 0168 0172 0193 0194
0195 0196 0197 0202 0203 0209 0212
0214 0216 0230 0234 0240 0241 0242
0283 0292 0302 0306 0315 0316 0319
0338 0340 0349 0366 0369 0370 0375
0376 0377 0381 0382 0383 0385 0391
0392 0395 0399 0400 0402 0408 0422
0424 0431 0441 0442 0446 0458 0462
0469 0471 0472 0473 0475 0491 0493
0495 0502 0508 0509 0510 0511 0517
0518 0519 0520 0521 0522 0523 0527
0528 0529 0530 0546 0547 0548 0549
0550 0551 0669 0670 0673 0675 0677
0678 0679 0680 0686 0689 0690 0712
0713 0722 0723 0725 0736 0756 0759
0760 0765 0766 0767 0768 0773 0774
0775 0776 0791 0792 0793 0826 0853
0861 0862 0863 0864 0865 0868 0869
0870 0871 0898 0899 0901 0906 0912
0914 0916 0917 0920 0921 0922 0923
0924 0925 0926 0943 0944 0946 0947

0948 0965 0982 0990 0997 0998 0999
1000 1004 1007 1008 1019 1020 1030
1035 1036 1075 1076 1077 1078 1079
1080 1098 1101 1102 1106 1107 1110
1115 1124 1130 1132 1143 1155 1158
1159 1164 1166 1169 1170 1178 1179
1180 1181 1182 1183 1184 1186 1188
1189 1190 1191 1192 1195 1203 1209
1215 1216 1217 1219 1220 1221 1224
1225 1227 1228 1229 1230 1231 1232
1233 1235 1236 1237 1239 1240 1241
1242 1243 1244 1248 1250 1251 1252
1262 1263 1272 1281 1294 1295

ROOTING
1004 1226

ROOTS
ANALYSIS
0780 0825 0852
BIOCHEMISTRY
0763
DETERIORATION
0327 0331 1214
DIETARY VALUE
0354
DRY MATTER
0443 0728 0736 0763 0853 0950
DRYING
0909 0961
GROWTH
0780 0853
HCN CONTENT
0204 0728 0825 0852 0909 0950 0961
1214
NUTRITIVE VALUE
0851 1004
PALATABILITY
0354
PLANT ANATOMY
0204 0296 0326 0327 0328 0330 0331
0352 0354 0443 0640 0726 0728 0736
0763 0780 0825 0840 0851 0852 0853
0886 0909 0950 0957 0961 0962 1004
1041 1214
PLANT PHYSIOLOGY
0640 0736 0780 0853
PRODUCTION
0352 1041
SILAGE
0909
STARCH CONTENT
0728 0763 0950
STORAGE
0326 0327 0328 0330 0331 0352 0354
0840 1214
SUGAR CONTENT
0728 0780

ROSELLINIA NECATRIX
0712

ROTATIONAL CROPS
0160 0422 0456 0471 0525 1044 1071
1100 1177
GROUNDNUTS
0441
MAIZE
0338 0440 1013

RWANDA
0174 0990 0991 0994 0996 0997 0998
GERMPLASM
0999
MARKETING
0992
PRODUCTION
0993
STATISTICAL DATA
0995

SAO TOME AND PRINCIPE
MARKETING
0095 0096 0105
STATISTICAL DATA
0095 0096 0105
TRADE
0095 0096 0105

SAVANNAS
0227 0340 0412 0954

SCLEROTIUM ROLFSII
DISEASE CONTROL
0712
SYNFTOMATOLOGY
0712

SCYMNUS
0811

SECONDARY CROPS
0020

SEED
0263 0286 0638 0657 0688 0701 0739
0805 0807 0827 0895 0906 0951 0966
0983 1183
COMPOSITION
0826
GERMINATION
1178 1186

SENEGAL
1005 1008
GERMPLASM
1004
MARKETING
1109
PRODUCTION
1006 1007 1109
SOCIOECONOMIC ASPECTS
1003

STATISTICAL DATA
1000 1001 1002
TRADE
1109

SHEEP
0369

SHIFTING CULTIVATION
1298 1301

SHOOTS
1046 1079 1080 1160 1166

SIERRA LEONE
1010 1013 1018 1019 1020 1024 1030
1031 1032 1033 1035 1036 1037 1039
1042
MARKETING
1034 1038 1041
PRODUCTION
1021 1022 1040 1041
SOCIOECONOMIC ASPECTS
1011 1016 1026 1027 1029
STATISTICAL DATA
0512 1009 1012 1014 1015 1017 1023
1025 1028 1041

SILAGE
0351 0909

SIMULATION MODELS
0988

SMALL-SCALE EQUIPMENT
0053 0195 0328 0329 0347 0669 0833
0834 0836 0837 0841 0843 0873 0876

SMALL-SCALE PROCESSING
0053 0056 0213 0247 0343 0346 0347
0352 0449 0832 0834 0836 0840 0841
0842 0843 0844 0845 0873 0941 0952
1003 1125

SOCIOECONOMIC ASPECTS
0003 0005 0014 0016 0018 0019 0020
0021 0022 0037 0053 0208 0223 0242
0247 0275 0347 0348 0349 0364 0493
0497 0498 0499 0513 0525 0626 0641
0642 0650 0655 0658 0660 0661 0662
0663 0664 0665 0666 0667 0684 0699
0704 0705 0706 0707 0731 0739 0748
0749 0750 0751 0752 0784 0785 0817
0819 0820 0821 0822 0842 0880 0891
0905 0966 0976 0983 0995 1003 1011
1016 1022 1026 1027 1029 1034 1041
1084 1127 1130 1146 1147 1151 1168
1171 1284

WOMEN
0040 0178 0218 0342 0376 0686 0745
0746 0841 0845 0952 1038 1077 1224
1225 1241

SODIUM
0726

SOIL AMENDMENTS
0261 0315 0635 0669 0680 0738 0864
0865 0866 1013 1030

SOIL ANALYSIS
0394 0422 0441 0815 0898 0931 0946
0947 0948 1163

SOIL CONSERVATION
0431 0442 0525 0815 0897 0918

SOIL CONSERVATION PRACTICES
0431 0815 0897

SOIL FERTILITY
0265 0338 0402 0422 0424 0650 0666
0667 0887 0897 0901 0902 0915 0918
0919 0923 1083 1218 1226

SOIL IMPOVERISHMENT
0402 0424 0918

SOIL MOISTURE
0425 0457 0639 0669 0798 0931 0932
0946

SOIL PHYSICAL PROPERTIES
0265 0380 0394 0397 0639 0815 0897
0918 0919 0946 0948 0985

SOIL REQUIREMENTS
0050 0160 0209 0261 0265 0315 0338
0372 0394 0397 0422 0424 0425 0440
0441 0457 0484 0635 0639 0650 0666
0667 0669 0678 0680 0738 0798 0815
0864 0865 0866 0887 0897 0901 0902
0915 0918 0919 0923 0931 0932 0946
1013 1030 1037 1044 1083 1218 1226

SOIL WATER
0390 0423 0426 0669 0931 0932

SOLAR DRYING
0030 0187 0669 0741 0742 0743 0832
0833 0961 0969 1072

SOLAR RADIATION
1203

SOMALIA
1043

SOUTH AFRICA
0427 1044 1045 1046 1047 1048
MARKETING
0095
STATISTICAL DATA
0095
TRADE
0095

SOUTH AMERICA
0013 0014 0023 0041 0052 0383 0631
0826 0849 1296

SPHAEROSTILBE REPENS
0161 0298

SRI LANKA
0427

STARCH CONTENT
0035 0167 0168 0180 0302 0305 0331
0381 0382 0491 0728 0741 0763 0780
0826 0919 0936 0950 1102

STARCH PRODUCTIVITY
CULTIVARS
0293 1183 1184
FERTILIZERS
0915
HARVESTING
1183
TIMING
0293

STATISTICAL ANALYSIS
0698 1202

STATISTICAL DATA
0003 0007 0008 0009 0010 0011 0012
0016 0020 0022 0025 0035 0037 0040
0052 0068 0072 0073 0074 0093 0094
0095 0096 0097 0098 0099 0100 0101
0102 0103 0104 0105 0106 0107 0108
0109 0110 0111 0112 0113 0114 0115
0116 0117 0118 0119 0120 0121 0122
0123 0124 0125 0126 0127 0128 0129
0130 0131 0132 0133 0134 0135 0136
0137 0138 0139 0140 0141 0142 0143
0144 0145 0146 0147 0148 0149 0150
0151 0152 0153 0154 0155 0156 0157
0159 0163 0164 0165 0166 0169 0170
0172 0178 0190 0191 0192 0198 0199
0200 0201 0202 0207 0208 0214 0216
0218 0221 0224 0227 0230 0232 0236
0237 0241 0242 0248 0249 0250 0308
0310 0311 0313 0323 0324 0332 0345
0357 0358 0359 0360 0361 0363 0364
0366 0367 0369 0370 0371 0375 0376
0392 0395 0396 0428 0433 0458 0463
0465 0478 0481 0487 0488 0489 0490
0512 0531 0532 0533 0534 0535 0536
0537 0538 0539 0540 0541 0542 0543
0544 0545 0546 0547 0548 0549 0550
0551 0552 0555 0556 0557 0558 0559
0560 0561 0562 0563 0564 0565 0566
0567 0568 0569 0570 0571 0572 0573
0574 0575 0576 0577 0578 0579 0580
0581 0582 0583 0584 0585 0586 0587
0588 0589 0590 0591 0592 0593 0594
0595 0596 0597 0598 0599 0600 0601
0602 0603 0604 0605 0606 0607 0608
0609 0610 0611 0612 0613 0614 0615
0616 0617 0618 0619 0620 0621 0622
0623 0624 0625 0627 0655 0686 0704
0706 0707 0731 0745 0784 0785 0806
0821 0828 0829 0830 0976 0992 0995
1000 1001 1002 1009 1012 1014 1015
1017 1023 1025 1028 1034 1040 1041
1053 1054 1055 1056 1057 1059 1062
1064 1065 1066 1067 1069 1073 1077
1084 1092 1093 1094 1095 1102 1110
1111 1121 1122 1127 1128 1134 1137
1140 1141 1142 1143 1144 1145 1146
1164 1174 1175 1176 1248 1249 1250
1251 1252 1253 1255 1256 1257 1258
1259 1261 1262 1263 1264 1265 1266
1267 1268 1272 1277 1296

STEEPING
0234 0267 0303 0728 1185

STEMS
0203 0260 0297 0640 0702 0726 1080
ANALYSIS
0725 0780
PLANT DEVELOPMENT
0383 0502 0674 0780 1281

STETHORUS
0184

STORAGE
0019 0020 0049 0055 0061 0065 0172
0210 0245 0326 0327 0328 0330 0331
0336 0350 0352 0354 0403 0448 0458
0495 0669 0741 0747 0832 0840 0841
0842 0843 0889 0929 0986 1074 1077
1214 1270 1288

SUBSTITUTES
0882

SUCROSE
0780

SUDAN
1049

SUGAR CONTENT
0068 0180 0728 0780 0896

SULPHUR
0652 0729

SUPPLEMENTS
0933

SURVEYS
0174 0210 0211 0214 0424 0498 0499
0686 0822 0905 1011 1016 1025 1026
1027 1028 1029 1050 1063 1168 1171
1288

SWEET CASSAVA
0058 1288

SWEET POTATOES
0195 0196 0234 0980 1130 1167

SWINE
0351 0501 0799 0831 0842 0882 0910
0959
ROOTS
0961 0962

SYMPTOMATOLOGY
0526 0779
DISEASES AND PATHOGENS
0162 0173 0226 0258 0296 0398 0409
0483 0708 0712 0777 0808 0848 0963
0964 1048 1068 1212 1213 1286

TANZANIA
0470 1050 1051 1052 1058 1060 1061
1068 1071 1072 1074 1076 1078 1079
1080 1082 1085 1086 1087 1088 1089
GERMPLASM
1075
MARKETING
0486 1062 1065 1077 1090
PRODUCTION
1057 1063 1065 1067 1070 1073 1077
1081 1083 1084 1091
SOCIOECONOMIC ASPECTS
1077
STATISTICAL DATA
1053 1054 1055 1056 1059 1064 1065
1066 1067 1069 1092

TAPIOCAS
0111 0113 0114 0115 0116 0117 0118
0119 0120 0121 0122 0123 0124 0125
0126 0127 0128 0129 0130 1093
LEGAL ASPECTS
1116
PROCESSING
0329 0352 0514 0781 1102 1119 1125
STORAGE
0352
TRADE
0159 0313 0514 1116 1119
USES
0169 0201 0313 0329 0352 0417 0781
1102 1111 1119 1125

TAXONOMY
0640

TECHNOLOGY
0014 0017 0052 0064 0188 0189 0246
0247 0346 0348 0419 0641 0642 0643
0647 0648 0649 0650 0655 0657 0659
0660 0661 0662 0663 0664 0665 0666
0667 0688 0702 0706 0732 0735 0746
0748 0750 0751 0777 0785 0801 0807
0819 0827 0840 0845 0880 0891 0892
0893 0895 0897 0906 0928 0930 0953
0976 0983 0999 1009 1038 1082 1151
1151 1205 1206 1207 1220 1221 1222
1224 1243 1244 1245 1283
TECHNOLOGICAL PACKAGE
0180 0493 0499 0669 0729 0967 1011
1026 1027 1029 1033
TECHNOLOGY EVALUATION
0040 0050 0331 0336 0342 0343 0344
0347 0350 0421 0687 0820 0841 0914
1017 1022 1025 1026 1027 1028 1029
1148

TECHNOLOGY TRANSFER
0052 0064 0070 0188 0189 0499 0641
0642 0643 0647 0648 0649 0650 0655
0657 0659 0660 0661 0662 0663 0664
0665 0666 0667 0688 0702 0706 0729
0732 0735 0746 0748 0750 0751 0777
0785 0801 0807 0819 0827 0845 0880
0891 0892 0893 0895 0897 0906 0928
0930 0953 0976 0983 0999 1009 1017
1025 1026 1027 1028 1029 1038 1082
1151 1205 1206 1207 1220 1221 1222
1224 1243 1244 1245 1283

TEMPERATURE
0158 0297 0327 0406 0454 0480 0696
0988 1045 1150 1275

TERMITES
0493 0527 0636

TETRANYCHUS
0054 0184
MITE CONTROL
0258

TETRANYCHUS CINNABARINUS
1150

TETRANYCHUS TELARIUS
1039 1150

THAILAND
MARKETING
0055 0074
PRODUCTION
0055
STATISTICAL DATA
0074
TRADE
0055 0074

THIAMIN
0974

THIOCYANATES
0205 0629 0958 0960 0975

TILLAGE
0687 0815

TISSUE CULTURE
0064 0261 0264 0281 0282 0285 0288
0290 0295 0299 0301 0420 0494 0630
0859 0860 1046

TOBACCO
0338

TOGO
0174 0419 1096 1097 1101 1105 1106
1107 1108 1112 1113 1114 1115 1117
1120 1124 1126
GERMPLASM
0632 1098 1099 1100 1102 1103 1104
MARKETING
0055 1109 1110 1116 1119 1123 1125
1127
PRODUCTION
0055 1102 1109 1110 1111 1119 1121
1125
STATISTICAL DATA
1093 1094 1095 1110 1111 1122
TRADE
0055 1109 1110 1116 1118 1119 1127

TOXICITY
0025 0030 0033 0183 0204 0316 0351
0478 0627 0669 0700 0734 0741 0804
0821 0938 0958

TOXICOLOGY
0204 0629 0940 0959 0960

TRADE
0002 0003 0005 0020 0052 0057 0074
0093 0094 0097 0098 0099 0100 0101
0102 0103 0104 0106 0107 0108 0109
0131 0156 0157 0191 0208 0223 0308
0312 0433 0444 0452 0497 0513 0515
0553 0554 0602 0603 0684 1095 1118
1127 1133 1175 1284 1299

CASSAVA CHIPS
0025 0055 0313 0366 0368 1110
CASSAVA FLOUR
0055 0072 0073 0095 0096 0105 0148
0149 0150 0151 0152 0153 0154 0155
0163 0313 0366 0368 0514 0604 0605
0606 0607 0608 0686 0731 1110
CASSAVA MEAL
0025 0055 0073 0095 0096 0105 0148
0149 0150 0151 0152 0153 0154 0155
0159 0366 0368 0686 0731
CASSAVA STARCH
0017 0025 0055 0068 0159 0163 0313
0368 0514 0686 1109 1110 1116 1119
GARI
0017 0055 0313 0366 0368 0686 0752
1110 1119
PELLETS
0055
TAPIOCAS
0159 0313 0514 1116 1119

TRANSPIRATION
0457

TYPHLODRAMALUS LIMONICUS
0631

UGANDA
0182 0476 0884 1049 1129 1131 1132
1135 1136 1138 1148 1149 1150 1152
1153 1154 1155 1156 1157 1158 1159
1160 1161 1162 1163 1165 1166 1167
1169 1170 1173
MARKETING
0486 1133
PRODUCTION
1139 1140 1151 1164 1172
SOCIOECONOMIC ASPECTS
1130 1146 1147 1168 1171
STATISTICAL DATA
1128 1134 1137 1141 1142 1143 1144
1145 1146

UNITED KINGDOM
0006 0093 0094 0096 0097 0098 0099
0100 0101 0102 0103 0104 0106 0107
0108 0109 0515 0631

UPLAND FARMING
1009

USA
MARKETING
0093 0094 0096 0097 0098 0099 0100
0101 0102 0103 0104 0106 0107 0108
0109
STATISTICAL DATA
0093 0094 0096 0097 0098 0099 0100
0101 0102 0103 0104 0106 0107 0108
0109

TRADE
0093 0094 0096 0097 0098 0099 0100
0101 0102 0103 0104 0106 0107 0108
0109

VIRUS INHIBITION
0158 1195

VITAMIN B
0974 0975

VITAMIN CONTENT
0062 0975

WASTE UTILIZATION
0303 0738 0850 0885 0886 0957 1120

WASTES
0815

WATER ABSORPTION
0426

WATER CONTENT
0305
GARI
0694 0695

WATER REQUIREMENTS (PLANT)
0050 0181 0423 0946 1275

WATER STRESS
0457

WEEDING
0160 0194 0195 0196 0261 0315 0316
0372 0380 0401 0402 0435 0442 0445
0446 0458 0635 0650 0652 0666 0730
0778 0779 0805 0875 0888 0889 0978
0979 0980 0981 0982 1043 1044 1075
1097 1099 1102 1187 1190 1191 1218
1224 1226 1236 1238 1239 1272
HOEING
0977

WEEDS
0172 0446 0635 0800 0812 0949 0982
1043 1278

WOMEN
0040 0178 0218 0342 0376 0686 0745
0746 0841 0845 0952 1038 1077 1100
1224 1225 1241

XANTHOMONAS CAMPESTRIS PV. CASSAVAE
DISEASE CONTROL
0001 0636

XANTHOMONAS CAMPESTRIS PV. MANIHOTIS
0015 0196 0222 0246 0254 0257 0261
0263 0291 0317 0438 0442 0710 0983
1209 1217 1262
DISEASE CONTROL
0001 0173 0259 0636 0708 0711 0808
1191 1220
DISEASE TRANSMISSION
0253
EPIDEMIOLOGY
0288 1156
ETIOLOGY
0173 0808
RESISTANCE
0041 0066 0173 0193 0256 0260 0264
0281 0283 0284 0285 0287 0288 0289
0292 0293 0295 0300 0302 0373 0374
0439 0458 0808 0990 1099 1107 1187
1188 1191 1192 1208 1211 1215 1218
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0322

YAMS
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0816

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TRADE
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0252 0938
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