INTERNATIONAL
FOUNDATION
FOR SCIENCE

IFS WORK 1974 - 1983

FOOD CROPS

The International Foundation for Science, a non-governmental, non-profit organization, is established to promote and support in developing regions of the world meritorious research in the fields of the natural and social sciences and in technology.

The Foundation will provide young scientists and technologists of outstanding merit from developing countries with financial and other support in their work.

A condition is that the research activity shall take place in the territory of a developing country.

INTERNATIONAL
FOUNDATION
FOR SCIENCE

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FOREWORD

By 1972, the year the International Foundation for Science was founded, scientists, academics, and policy makers interested in development aid had long recognized the difficult situation faced by young scientists from developing countries. Research opportunities did not exist in their countries, or if they did, they were reserved for senior and well-established researchers.

The need for an organization that could enable young scientists to pursue a career of research in their homelands was clear, and in 1972 Sweden and Canada provided the initial funds to establish such an organization, the IFS. Since then France, the Federal Republic of Germany, the Netherlands, Belgium, Norway, Switzerland, Nigeria, the United States, Australia and UNESCO have joined as donors of the Foundation. Member Organizations--scientific academies, research councils, and royal societies--from 65 countries advise the IFS on policy and promote its activities.

In the past ten years the IFS has awarded grants to nearly 800 scientists in 78 developing countries for research within a granting programme that includes Aquaculture, Animal Production, Food Crops, Afforestation and Mycorrhiza, Fermentation and Applied Microbiology, Natural Products, and Rural Technology. The grantees were selected based on the recommendations of the IFS Scientific Advisers, specialists in the IFS scientific areas who serve the IFS voluntarily and in a personal capacity.

The grants are modest (normally not more than USD 10 000) and can be awarded up to four times per grantee. Since the institute of the grantee provides a salary and facilities, IFS grants are devoted to purchasing the basic tools of research--equipment, expendable supplies, literature. Because grantees often face isolated and difficult conditions, because they are young and inexperienced, the IFS provides more than financial support.

Workshops are arranged on behalf of the grantees and are attended by IFS Scientific Advisers. These advisers provide guidance to grantees on such occasions, as well as by mail and visits to research sites.

The IFS was founded because there was no other organization providing this kind of support to developing countries. Today, ten years later, the IFS is still unique among organizations. This was the conclusion reached by a 1981-82 evaluation of the

FOREWORD

IFS commissioned by the IFS Sponsors and conducted by an external panel headed by Dr Francisco Sagasti of Peru and Prof Geoffrey Oldham of the United Kingdom. The panel also concluded that the IFS had succeeded in reaching the intended target group of young and well-educated scientists and had provided them with research opportunities in their own countries that would not otherwise have been available. The panel was satisfied with the selection of grantees and the quality and relevance of the research done by these scientists.

The panel made a number of recommendations for future activities. The proportion of grants given to scientists in Latin America and Africa should be increased in order to balance the geographic distribution between these continents and Asia. Because of the importance of the IFS Scientific Advisers to the success of the IFS activities, their number should be increased. The Foundation has implemented both of these recommendations.

The most important recommendation was that the IFS increase the scope of its activities. The need for such an increase is reflected by the number of applications received by the Foundation. Today the IFS is able to provide support for only one out of every three applicants. The IFS is making concerted efforts to seek additional funds that such a recommendation, and such a need, imply.

Gordon Butler
President

GUIDE TO IFS WORK

FOOD CROPS

This report is a chapter of the IFS WORK, which includes chapters of all the scientific areas of the IFS granting programme: A, Aquaculture; B, Animal Production; C, Food Crops; D, Afforestation and Mycorrhiza; E, Fermentation and Applied Microbiology; F, Natural Products; G, Rural Technology. These other chapters have also been printed individually and are available from the IFS Secretariat.

The chapter FOOD CROPS presents in numerical order the names and institutions of grantees who have received grants in this scientific area during the years 1974 - 1983. The title, a short summary, and subject descriptors (taken from the OECD MACROTHESAURUS; those not found in the OECD publication are preceded by asterisks ***) are included as well as the amount of funding provided by the IFS. These amounts are given in SEK, Swedish Crowns. The funding dates coincide with the year of the award. Completed projects are indicated by a date; when no such date appears, the project is active as of 1983.

A brief introduction of the scientific area was written by the IFS Scientific Secretary Mr Jacques Gaillard. There are two indexes: one by subject descriptor, the other by country.

The summaries of the projects were written at the IFS Secretariat and submitted to the grantees for their approval.

The information contained in the IFS WORK is part of a database created for sharing project information, the International Development Research Information System (IDRIS). The system, in the pilot project stage, is being hosted by the International Development Research Centre (IDRC) of Canada. The database is stored in the Centre's minicomputer, which uses MINISIS software. MINISIS processors were used to extract the information for the printing of the IFS WORK.

Ms Judith Furberg, Information Secretary, was responsible for the compilation and editing of the IFS WORK 1974 - 1983.

FOOD CROPS

Food crops are the principal source of calories, protein, vitamins and minerals for millions of people, especially in the tropics, where rapidly expanding populations are predominantly vegetarian. Many vegetables also have a good balance of the essential amino-acids so important in diets low in animal protein.

Agricultural research in Third World countries has historically focused on staple cereals and export crops. This practice was established by colonial administrations and taken over by those of newly independent countries in need of foreign exchange. Research on leguminous, root, and horticultural crops, which provide the main food source for tropical peoples, was neglected or received limited attention.

The IFS recognized the need for research on just these crops when it first established its granting programme. While the programme has been enlarged over the years to include oilseeds, fruits, and almost all food crops, the emphasis is still on those crops of particular importance to subsistence agriculture.

Food Crops is the largest of the seven scientific areas in the IFS and accounts for one quarter of the total number of grantees. As a result of visits to Africa by members of the IFS Secretariat and scientific advisers, nearly two thirds of these grantees are located in Africa. About one fourth are in Asia and the rest in Latin America.

About one quarter of the grantees are working on tuber crops. These crops are better adapted than cereals to the climates of humid tropics and cooler regions of the developing world. In certain environments they also have a potential for producing a larger output of energy per hectare. For these reasons they are widely cultiviated in developing countries and provide the people with a major source of calories and nutrition.

Root crops of major importance to the programme are yams (*Dioscorea* spp.), edible aroids (*Colocasia* spp. and *Xanthosoma* spp.), and cassava (*manihot esculenta*). Other crops of importance are those that have been less researched, minor but promising root crops such as oca (*Oxalis tuberosa*) and arrachacha (*Arracacia xanthorrhiza*).

Previous Page Blank

FOOD CROPS

Research on grain legumes account for 20% of all projects. Although research efforts on these crops have increased during recent years, advances in the biology and physiology of yield and resistance to pests and diseases have not been spectacular. Grain legumes, also called beans or pulses, are of great importance both as a source of food and for soil fertility. They are second to cereals as a source of food and feed. Nutritionally, they are two to three times richer in protein than cereal grains. Many have protein contents between 20 and 40% with a few between 40 and 60%. Furthermore, they contain amino acids, such as lysine, which are deficient in most cereals and other edible plants.

Nearly 10% of the grantees are working on horticultural crops such as tomatoes, cucurbits, chillies, eggplants, and leafy vegetables. These crops provide valuable nutrients, vitamins, and fibres.

Nearly 40% of the grantees are conducting research on plant breeding of all the above crops. They often begin by establishing a germplasm collection for use in plant breeding programmes. The following are examples of what such programmes attempt to achieve: the development of grain legumes with higher yields and resistance to pests and diseases; the production of rapidly-maturing varieties of yams that can be cultivated without staking and high inputs of labour; and the development of heat-resistant tomatoes.

Another important area of research is the development of techniques to improve soil fertility and soil conservation. IFS grantees are studying the use of nitrogen-fixing organisms and plant microbial interrelationships in the soil. They are also conducting research to improve nitrogen-fixing efficiency. Once these techniques are developed, ways must be found to adapt them to local conditions and implement them in as many countries as possible. Another approach is intercropping grain legumes with cereals, thus taking advantage of the legumes' ability to fix atmospheric nitrogen. And yet another is mulching and composting, a technique that recycles plant wastes.

A recent trend has been the increasing number of applications submitted and grants approved in the fields of agricultural entomology and biological control of pests and disease, which account for considerable crop losses during production and storage.

FOOD CROPS

Biological control relies on natural agents--diseases or predators--to remove pests. Rather than attempting to eliminate pests, an important and recently-developed objective is to hold its incidence below the economic threshold. IFS grantees active in the area of biological control are working on the development of microbial insecticides utilizing bacterial, viral, or fungal species.

Three scientific workshops have so far been organized in the area of Food Crops. The first was the International Seminar on Yams, which was held in Buea, Cameroon, in 1978. The second was the International Symposium on Taro and Cocoyam, held in Baybay, Philippines, in 1979, which was planned to follow the Fifth Symposium of the International Society of Tropical Root Crops (ISTRC) held in Manila. The third was the Regional Meeting on Edible Aroids held at the University of the South Pacific, Suva, Fiji, in 1981.

Based on the papers presented at the first workshop in Buea, a book entitled "Yams.Ignames," edited by Prof J Miège and Dr S N Lyonga, was published in 1982 by the Oxford University Press. The papers of the second workshop have appeared in the proceedings of the Fifth Symposium of ISTRC. Finally, the papers presented at the third workshop in Fiji have also been accepted for publication by the Oxford University Press and entitled "Edible Aroids." This book is being edited by Dr S Chandra and is scheduled for publication in 1984.

FOOD CROPS

Grantee C006: Dr Bakary Touré, Laboratoire de Botanique, Faculté des Sciences, Université d'Abidjan, 04 B P 322, ABIDJAN 04, Ivory Coast

"Genetic improvement of yams"

IFS funding: 40950 SEK 1974 17600 SEK 1975
Completed 1978

Yams are important tubers in tropical West Africa where they are grown on 20% of the cultivated land. Dr Touré will initiate a study of genetic improvement of yams in West Africa. He will build up a collection of cultivated and wild yams and study their flowering and the possibilities for developing hybrids. The variability between and within the different clones of yams will also be investigated.

/wild plants/ /genetic improvement/

*** /plant collections/ /yams/

Grantee C007: Mr Padmanabhan Somasegaran, Department of Genetics and Cellular Biology, Universiti Malaya, Lembah Pentai, KUALA LUMPUR, Malaysia

"Rhizobia in tropical legumes"

IFS funding: 31576 SEK 1974 17600 SEK 1975
Completed 1977

The grantee will attempt to develop bacterial strains suitable for inoculation of local grain legumes, isolated from about 40 different legumes. He will also try to solve nodulation problems among commercialy-important legumes. The nitrogen-fixing capacity, the competitiveness and the persistence of promising rhizobia will be studied.

/leguminosae/ /soybeans/ /nitrogen fixation/

*** /inoculation/ /rhizobium/ /root nodulation/

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FOOD CROPS

Grantee C026: Dr Chew Ming Yao, Department of Biochemistry, Universiti of Malaya, Lembah Pantai, KUALA LUMPUR, Malaysia

"Protein value of cassava"

IFS funding: 9700 SEK 1974 Completed 1976

Dr Chew is carrying out a study of the protein values of locally-grown leaves, stems and tubers from cassava to improve their use for direct consumption or for production of leaf protein concentrates.

/cassava/ /proteins/ /nutritive value/

Grantee C027: Prof Simeon Imbamba, Department of Botany, University of Nairobi, P O Box 30197, NAIROBI, Kenya

"Chemical studies on local vegetable plants"

IFS funding: 36300 SEK 1974 26400 SEK 1975
22000 SEK 1977 21500 SEK 1979

Certain disorders, which are largely due to an inadequate supply of mineral elements, have been noted in Kenya. In some areas anaemia, due to insufficient supply of iron, is quite common. Abnormal development of teeth and bones and frequent occurrence of rickets, due to lack of calcium, have also been observed. Prof Imbamba will investigate the contents of protein, vitamins A and C, calcium and iron in selected local vegetable plants. The work will concentrate on Gynandropsis gynandra, Amaranthus lividus and Crotalaria brevidens.

/vegetable crops/ /nutritive value/ /proteins/ /vitamins/ /plant nutrition/

FOOD CROPS

Grantee C028: Dr Canute Khamala, Department of Zoology, University of Nairobi, P O Box 30197, NAIROBI, Kenya

"Pest management of grain legumes"

IFS funding: 25300 SEK 1974 26400 SEK 1976
24750 SEK 1978

Insect pests are a major limiting factor in grain legume production, but the insect-plant complex is not known. This study is intended to lay the foundation for an extensive pest management programme to ensure maximum production of grain legumes in East Africa. Dr Khamala will attempt to control pests of grain legumes, starting with soybean Glycine max which may become an important source of human food and animal feed in East Africa.

/leguminosae/ /soybeans/ /entomology/ /pest control/

Grantee C029: Dr Gerardo Martinez-Lopez, Virus Laboratory, Instituto Colombiano Agropecuario, (ICA), Apartado Aéreo 151123 (Eldorado), BOGOTA D E, Colombia

"New virus disease in maize"

IFS funding: 29500 SEK 1974 14100 SEK 1978

Maize is one of the most important crops in Colombia. It is used primarily for human food and also as feed for animals. A new disease (Maize Colombian Stripe) is transmitted by the leaf hopper Dalbulus maidis and it seems to be caused by a new, fast-spreading virus. It is causing serious losses and seems to be different from any other disease in maize previously described. Dr Martinez-Lopez will study the nature of the disease agent, the relationship between the insect vector, the pathogen and the maize plant, as well as means to control this new pathogen and its insect vector.

/maize/ /plant diseases/ /entomology/ /virology/ /pests of plants/

*** /crop losses/

FOOD CROPS

Grantee C030: Mr M Msabaha, Agricultural Research Institute, Ukiriguru, P O Box 1433, MWANZA, United Republic of Tanzania

"Improvement of cassava production"

IFS funding: 29500 SEK 1974

Cassava is grown all over Tanzania and consumed as primary, secondary and supplementary staple. In spite of its agronomical importance, no work on breeding and genetics has been undertake in the past in Tanzania. Mr Msabaha will carry out a study of cassava within the National Tuber Crops Research Programme. Breeding will be made by controlled crossing, inbreeding and outcrossing.

/cassava/ /plant breeding/

*** /plant collections/

Grantee C031: Dr G Oblisami, Agricultural College and Research Institute, Tamil Nadu Agricultural University, COIMBATORE 641 003, India

"Interrelationships between rhizobia and forage legumes"

IFS funding: 10200 SEK 1974

The interrelationships between rhizobia and forage legumes will be studied, with particular attention to efficient nitrogen fixation and transfer to associated fodder grasses. The surviva of the most efficient strains of rhizobia for forage legumes in different soil types will be studied, as well as their competitiveness with native rhizobia.

/leguminosae/ /grasses/ /nitrogen fixation/

*** /rhizobium/

FOOD CROPS

Grantee C032: Dr Setijati Sastrapradja, Botanic Gardens of Indonesia, Lembaga Biologi Nasional, P O Box 110, BOGOR, Indonesia

"Collection, evaluation and maintenance of tropical tuber crops"

IFS funding: 16900 SEK 1974 20240 SEK 1976
27000 SEK 1978

Though rice is the main staple food in Indonesia, tuber crops are a valuable source of carbohydrate, and some are also used medically. Many species of these genera grow wild in the forests and have not been evaluated scientifically. There are indications that many of them undergo erosion, and the existing varieties must be collected and evaluated before they are completely lost. By doing this, superior stocks which are disease resistant, good in taste and high in yield might be found. Dr Sastrapradja will conduct an inventory of Colocasia, Curcum and Dioscorea in Indonesia. Morphological as well as genetic variations will be studied and the genetic characters, which are important for cultivation, will be evaluated.

/root crops/ /wild plants/

*** /plant collections/ /crop improvement/

Grantee C033: Dr Amnat Suwanarit, Department of Soils, Faculty of Agriculture, Kasetsart University, BANGKOK 9, Thailand

"Soil factors limiting yield of some legumes"

IFS funding: 20700 SEK 1974 Completed 1977

Dr Amnat Suwanarit will carry out research on soil factors, mainly rhizobia, in relation to the growth of soybeans and mung beans in Thailand. Certain plant nutrients are suspected to be yield-limiting, but have not been elucidated and identified. The results will be used to find more economical methods to improve soil fertility and to minimize crop pests and diseases.

/leguminosae/ /soybeans/ /soil fertility/

*** /rhizobium/

FOOD CROPS

Grantee C038: Dr Margaret Mmbaga, Department of Botany, University of Dar es Salaam, P O Box 35060, DAR ES SALAAM, United Republic of Tanzania

"Studies on rust disease of beans and cowpeas in Tanzania: epidemiology and disease control"

IFS funding: 75000 SEK 1982

Dr Mmbaga will conduct a field survey on bean rust in the major bean growing areas of the country. In this survey, prevalence and severity of rust disease will be assessed in the different areas and isolates of the rust fungus will be collected and tested for physiological variability on differential cultivars selected from the commonly grown ones. The effect of bean rust on seed and vegetable yield will be assessed in field plots at the Faculty of Agriculture. To study economic control of bean rust, attempts will be made to balance chemical and biological methods. This will include the use of host resistance, cultural methods and fungicides.

/beans/ /plant diseases/ /fungi/

Grantee C052: Dr Abo Anno, Laboratoire de Botanique, Faculté des Sciences, Université d'Abidjan, 04 B P 322, ABIDJAN 04, Ivory Coast

"Improvement of cultivation of banana plantains in the Ivory Coast"

IFS funding: 15800 SEK 1975 33840 SEK 1978

Dr Anno will try to modify the floral cycle of banana plantains in order to assure better conditions for production all year round. The study also includes attempts to develop new varieties of plantains which are disease resistant and less sensitive to aridity. The research is of great importance to the Ivory Coast as banana plantains are consumed by large population groups as a main staple food.

/bananas/ /plant diseases/

*** /crop improvement/

FOOD CROPS

Grantee C053: Prof Nurudeen Adedipe, Department of Agricultural Biology, University of Ibadan, IBADAN, Nigeria

"Physiological aspects of of cowpeas and other grain legumes"

IFS funding: 25675 SEK 1975 18800 SEK 1978

The cowpea (Vigna unguiculata) is low yielding, because flowers and fruits fall off prematurely. Prof Adedipe will study the physiological basis of premature abscission of flowers and pods. Radioactive tracing techniques and chemical and biochemical analysis will be used to test hypotheses on the production of metabolic inhibitors in the mature fruits. Mineral fertilizers and commercially approved plant hormones will be tested as possibilities to control the abscission.

/cowpeas/ /chemical analysis/ /fertilizers/ /hormones/

*** /crop improvement/

Grantee C054: Dr Arumugam Gnanam, Department of Plant Sciences, School of Biological Sciences, Madurai Kamaraj University, MADURAI 625 021, India

"Photorespiratory control and productivity studies in leguminous crop plants"

IFS funding: 23700 SEK 1975 30450 SEK 1976
Completed 1980

Leguminous crops (of higher protein content) generally have a much lower yield than cereals (of lower protein content). One reason is a difference in metabolic activities and photosynthetic pathways (C3-type for legumes and C4-type for cereals). In India high-yielding varieties of maize and wheat tend to replace grain legumes and pulses. Dr Gnanam will use isolated leaf cells of Phaseolus, Dolichos and Glycine max (soybean) to determine photosynthetic, photorespiratory and nitrogen converting parameters. The feasibility of photorespiratory control and the induction of PEP-carboxylase will also be studied. The search for natural C - type germplasm among the legumes included for the project may lead to future hybridization for higher productivity within the leguminous crops.

/leguminosae/

*** /crop improvement/ /plant metabolism/ /photosynthesis/

FOOD CROPS

Grantee C055: Ms Sing Ching Tongdee, Agricultural Products Development Dvn, TISTR, 196 Phahonyothin Road, Bangkhen, BANGKOK 9, Thailand

"Study of postharvest diseases of root crops in the tropics and their control"

IFS funding: 15800 SEK 1975 24200 SEK 1977
19140 SEK 1979 Completed 1981

Postharvest diseases in potato, sweet potato, cassava and yam are responsible for great losses of food in tropical countries. Ms Sing Ching Tongdee will isolate and identify the organisms from diseased crops. Possibilities for improved storage conditions will be studied with emphasis on chemical control and the use of fumigants.

/cassava/ /potatoes/ /sweet potatoes/

*** /postharvest losses/ /postharvest systems/ /yams/

Grantee C069: Dr Kwon Yong Woong, Department of Agronomy, Seoul National University, SUWON, Republic of Korea

"Improvement of plant nutrition and root growth for cropping on sandy barrens"

IFS funding: 39600 SEK 1975

Sandy barren lands are common in Korea and their exploitation for cropping would add considerably to the country's food production. Dr Kwon will develop a control system of crop growth in sandy soils to reach maximum efficiency in the use of water and nutrients. With due attention to physiological and agronomical properties of different plants, optimum nutritional environments will be studied and the consequences of different root growth patterns investigated. The following plants will be tested: peanut, melon, asparagus, spinach, radish, potato, sweet potato and rice.

/vegetable crops/ /plant nutrition/ /cultivation systems/

FOOD CROPS

Grantee C072: Dr Ischak Lubis, Laboratorium Treub, Lembaga Biologi Nasional, P O Box 110, BOGOR, Indonesia

"Variation of grain legumes of Indonesia"

IFS funding: 26400 SEK 1975 Completed 1981

Studies of minor grain legumes have received little attention up to now despite their economic importance. Dr Lubis will conduct an inventory of Indonesian minor legumes with emphasis on the following genera: Canavalia ensiformis (jack bean), Mucuna pruriens (velvet bean) and Psophocarpus tetragonolobus (winged bean). They all grow in regions of poor soil fertility, where soybeans cannot be grown. The beans are mainly used to produce food fermentation products. The chemical compounds in collected material will be studied, particularly protein and methionine content, phenolic compounds and isozymes.

/leguminosae/ /chemical analysis/

*** /plant collections/

Grantee C073: Dr Jalani Sukaimi, Centre for Graduate Studies, Universiti Kebangsaan Malaysia, BANGI, Selangor, Malaysia

"Improvements of selected vegetable crops in Malaysia"

IFS funding: 39600 SEK 1975

Work at the Universiti Kebangsaan Malaysia includes conservation and breeding studies of vegetable crops, cultivated or growing wild, and especially Brassicas, Solanaceae, leguminous crops and mushrooms. Some may be endangered, and the possibilities genetic improvement and better cultivation techniques should be examined. As part of this project, Dr Jalani will collect two leguminous crops, Vignai sesquipedalis (asparagus bean) and Psophocarpus tetragonolobus (winged bean), and on one solanacea, Solanum melongena (eggplant). He will then carry out breeding and genetic experiments (inbreeding and outcrossing).

/leguminosae/ /vegetable crops/ /plant breeding/ /genetic improvement/ /cultivation practices/

*** /plant collections/

FOOD CROPS

Grantee C074: Mr Felix Camarena M, Departamento de Fitotecnia, Universidad Nacional Agraria, Apartado 456, La Molina, LIMA, Peru

"Selection of grain legumes for crop rotation and crop association under highland conditions"

IFS funding: 17600 SEK 1975 44000 SEK 1977
31240 SEK 1979

The main aims of the research are to create high-yielding varieties of grain legumes adapted to highland conditions and provide farmers with seeds of the improved varieties. The main legumes involved will be Vicia faba, Phaseolum vulgaris, Pisum sativum and Lupinus sp. The project also includes experiments on the association of selected grain legumes with other crops (mainly maize and grain legumes) in order to improve the nitrogen economy of highland farming.

/leguminosae/ /maize/ /intercropping/ /genetic improvement/ /nitrogen fixation/

*** /seed production/

Grantee C075: Mr B W A Odhiambo, Egerton College, NJORO, Kenya

"Growing tomatoes in plastic protected environments at a high altitude during rainy and dry seasons"

IFS funding: 13200 SEK 1975

Many farmers have taken up tomato production in Kenya, but often in areas which are wet and cool during the rainy season. Successful production is therefore difficult. Mr Odhiambo will attempt to assess the effects of plastic protected environments, compared with open ground cultivation, on yield and quality of tomato production. Demonstrations will be carried out in the fields of farmers, in order to show how large-scale production of tomatoes under plastic can be possible and economical.

/tomatoes/ /crop yield/ /cultivation practices/ /agricultural training/

FOOD CROPS

Grantee C077: Mr Francisco Citelly P, Facultad de Ciencias Agrícolas, Universidad de Nariño, Apartado Aéreo 626, PASTO, Nariño, Colombia

"Handling system, postharvest treatment, storage and transport of fruits of Passiflora mollissima)"

IFS funding: 22000 SEK 1975 Completed 1978

Mr Citelly will study the scientific and technological basis for a handling system, postharvest treatment, storage and transport of P. mollissima (Curuba). Curuba is at present cultivated traditionally in backyards, or grown on a large scale without well developed techniques. He expects to reduce losses due to bacteria and fungi, to improve quality for marketing and to gain some experience in establishing storage facilities useful for other crops commonly planted in the district of Nariño.

/fruits/ /food storage/ /food spoilage/

*** /postharvest systems/

Grantee C078: Dr Moses Fawole, Department of Biological Sciences, University of Ilorin, P M B 1515, ILORIN, Nigeria

"Biochemical studies on Xanthomonas manihotis, causing bacterial wilt of cassava in Nigeria"

IFS funding: 22000 SEK 1975 33600 SEK 1977
34400 SEK 1979

Cassava is one of the most important staple food crops in Nigeria. It is attacked by a number of microorganisms of which Xanthomonas manihotis is the most important. Bacterial wilt occurs on all edible cassava varieties, causes severe crop losses and may even kill the plant. Dr Fawole intends to isolate the bacterium Xanthomonas manihotis from the cassava plant, and to make biochemical studies on the bacterium in a search for methods to control the parasite.

/cassava/ /plant diseases/ /parasites/

FOOD CROPS

Grantee C079: Dr Brij Gopal, Department of Botany, University of Rajasthan, JAIPUR, India

"Studies on the role of legumes in nitrogen economy of desert soils, and the production of forage grasses"

IFS funding: 22000 SEK 1975

Desert soils are very poor in nutrients; and, where irrigation facilities are available, heavy fertilizer inputs are required. A major difficulty is the reduced nitrogen fixation by legumes in hot and dry climates. Dr Gopal will try to identify legumes and grasses which, grown together, may improve forage crop production and prevent desertification. Among the legumes and grasses identified, Dr Gopal will especially try to select those with well developed root/rhizome systems in order to improve the nitrogen economy of the soil.

/forage crops/ /grasses/ /leguminosae/ /desertification/ /soil improvement/

Grantee C123: Mr Luzindana Kara-Baranga, Division de Radiobiologie, Centre Régional d'Etudes Nucléaires de Kinshasa, B P 868, KINSHASA XI, Zaire

"Plant-soil relation as affected by the symbioses between leguminous crops and rhizobium"

IFS funding: 35200 SEK 1976

Mr Kara-Baranga will make a study of how cultivation of some leguminous crops in Zaire may be improved by application of appropriate rhizobium techniques. The efficiency and the competitive ability of different combinations of tropical rhizobium strains with leguminous crops will be tested and compared and the most efficient strains will be selected. A practical inoculation method to be used by farmers will also be worked out.

/leguminosae/

*** /inoculation/ /rhizobium/

FOOD CROPS

Grantee C124: Mr Om Prakash Singh, Nimbkar Agricultural Research Institute, PHALTAN, District Satara, Maharashtra State, India

"Research project for increasing the agricultural productivity of areas under lift irrigation schemes in Nira Valley"

IFS funding: 13200 SEK 1976 7120 SEK 1978
11946 SEK 1979 Completed 1979

The Nira Valley is severely affected by drought. The river and an adjacent dam provide water during the monsoon to provide lift irrigation for about 20 000 hectares of land from July 15-October 15. About 800 hectares are already lift irrigated, but due to poor soil and an absence of land contouring, the productivity of these lands is very low. The project aims at finding means of increasing productivity. Soil analyses will be undertaken to determine the deficiencies, and land contouring will be undertaken to increase water efficiency. The most profitable cropping system for this area will be worked out and appropriate crops and crop varieties adapted to the cropping system selected.

/irrigation/ /cultivation systems/ /soil analysis/

Grantee C125: Mr Frédéric Guede Guina, Département de Biochimie, Faculté des Sciences, Université d'Abidjan, 04 B P 322, ABIDJAN 04, Ivory Coast

"Study of enzymes affecting quality and conservation of yams"

IFS funding: 35200 SEK 1976

Mr Guede Guina will extract and purify enzymes from yams during different stocking conditions, with humidity, temperature, pressure and irradiation as the main variables. Based on a study of the nature of their activity and their evolution, Mr Guede Guina hopes to find a correlation between enzymatic and storage properties. The results will be of importance to improve storage processes for yams in particular, but it may also contribute to the development of food technology in general in Ivory Coast.

/enzymes/ /food technology/ /food storage/

*** /yams/

FOOD CROPS

Grantee C126: Dr Niwat Hirunburana, Department of Soil Science and Conservation, Faculty of Agriculture, Chiang Mai University, CHIANG MAI, Thailand

"An investigation of potassium availability and liming as affecting some crops on Lampang and Hang Dong soils"

IFS funding: 22000 SEK 1976

Potassium (K) deficiency and leaching are severe problems in the Lampang and Hang Dong soils. This study will be made to determine a suitable amount of extractable K at varied contents of calcium (Ca) and manganese (Mg) to cultivate soybean, peanut, sweet corn, garlic, strawberry, wheat and rice. The correlation between soluble and exchangeable K will be observed to determine the level where soils will absorb the largest amount of K. This will prevent excess of K fertilization, which will be subjected to leaching loss. The experiment will also provide evidence whether liming has any effect on K availability in these soils.

/vegetable crops/ /leguminosae/ /soil analysis/ /potassium/ /lime/ /soil improvement/

Grantee C127: Ms Sherry Bien, Department of Botany, Universiti Malaya, Lembah Pantai, KUALA LUMPUR, Malaysia

"Development of botanical resources citrus and citroids"

IFS funding: 25080 SEK 1976 21500 SEK 1979

Citroids are abundant in Malaysian forests, but are threatened by land development and logging. So far no thorough attempt has been made to develop the native citroids for cultivation purposes. The recent discovery of the wild species Citrus halimii suggests that it may offer crucial information on the evolutionary story of the genus, as well as supplying material for both genetic and rootstock uses. Ms Bien will make an inventory of the citroid stock, investigate the botanical systematics, cultivation properties and propagation. The project aims to make better use of resources and to reduce the cost of citrus imports.

/citrus fruits/ /wild plants/ /plant breeding/ /plant ecology/ /cultivation practices/

*** /plant collections/ /germplasm conservation/

FOOD CROPS

Grantee C128: Dr Mamadou Ndiaye, Centre National de Recherches Agronomiques, Institut Sénégalais de Recherches Agricoles, (ISRA), B P 53, BAMBEY, Senegal

"Inoculation of rhizobium in groundnuts, soybeans and cowpeas in Senegal"

IFS funding: 30800 SEK 1976 30160 SEK 1982

Dr Ndiaye intends to improve the nitrogen fixing symbiosis in groundnuts, soybeans, and cowpeas. Efficient rhizobium strains will be selected to replace naturally occurring, less active strains. In this way the symbiotic nitrogen fixation will be increased and the need for expensive nitrogen fertilizers will be reduced. An appropriate conservation method for the inoculum will be worked out and the inoculation technique will be improved.

/groundnuts/ /soybeans/ /cowpeas/ /nitrogen fixation/

*** /inoculation/ /rhizobium/

Grantee C131: Dr Tshiteng wa Kanana, Centre Régional d'Etudes Nucléaires de Kinshasa, B P 868, KINSHASA XI, Zaire

"Genetics of nitrogen fixation symbiosis"

IFS funding: 35200 SEK 1976

This study aims at verifying aspects of the genetic structure of rhizobium. The genes of main importance are those which influence penetration and induction of rhizobia in root nodules, and those which contribute to the nitrogen-fixing process itself. The outcome of this verification will serve as a base for genetic manipulation of rhizobium and application to other economically important crops to increase the nitrogen fixing capacity.

/food crops/ /genetic improvement/ /nitrogen fixation/

*** /rhizobium/ /root nodulation/

FOOD CROPS

Grantee C133: Ms Fatou Gueye, Centre National de Recherches Agronomiques, Institut Sénégalais de Recherches Agricoles, (ISRA), B P 53, BAMBEY, Senegal

"Study of crop residues composting in Senegal"

IFS funding: 22000 SEK 2975 21120 SEK 1979
34160 SEK 1981

Ms Gueye will study the agronomical value of compost made out of different crop residues on farm level as well as on an industrial basis in connection with large plantations (vegetable crops, rice, sugar cane, cotton, etc.). A comparative study of different composts under greenhouse conditions will also be carried out. Inoculation of nitrogen fixing agents and biochemical analyses will be included in the project, as well as an attempt to use the compost to support rhizobium activity in groundnuts.

/groundnuts/ /fertilizers/ /agricultural wastes/ /chemical analysis/ /nitrogen fixation/

*** /rhizobium/

Grantee C135: Dr René Rabezandrina, Département d'Agriculture, Université de Madagascar, ANTANANARIVO, Madagascar

"Applied research on recycling of organic wastes from towns and villages"

IFS funding: 39600 SEK 1976 40500 SEK 1978

Dr Rabezandrina will try to develop simple techniques for fast decomposition of wastes from towns and villages in Madagascar. The final product will be used as fertilizer and in order to improve its quality, experiments adding different minerals during the fermentation process will be carried out. In particular, Dr Rabezandrina envisages the possibilities to use apatites, which are abundant in some soils of Madagascar, as phosphate enrichment, and in this way reduce the need for expensive superphosphates in agriculture.

/waste recycling/ /fertilizers/ /fermentation/

FOOD CROPS

Grantee C166: Ms Bhavati Patel, Mount Makulu Research Station, P O Box 7, CHILANGA, Zambia

"Studies on the protection of maize from nematodes and insects"

IFS funding: 8700 SEK 1976 Completed 1981

To reduce damage of maize caused by various pests, Ms Patel will make a detailed survey of nematodes and insect pests. To formulate chemical methods, preliminary trials on nematode control will be carried out, and suitable crop rotation patterns will be tried. Ms Patel will also investigate the efficiency of carbofuran, which is active both as an insecticide and as a nematicide, and if possible use it to replace some undesirable pesticides that are now commonly used in Zambia.

/maize/ /plant diseases/ /entomology/ /pests of plants/ /cultivation practices/

Grantee C167: Prof Oghenetsavbuko Edje, Bunda College of Agriculture, P O Box 219, LILONGWE, Malawi

"Development of high yielding disease resistant Phaseolus bean varieties in Malawi"

IFS funding: 34800 SEK 1976 36000 SEK 1978
32480 SEK 1982

Beans (Phaseolus vulgaris) are an important food crop and source of protein in Malawi. To improve yield and disease resistance of beans, seeds will be collected and evaluated to obtain breeding material. This work will be carried out in cooperation with the germplasm bank at Bunda College of Agriculture. Varieties developed from this breeding programme will be evaluated as to performance, fertilization, disease resistance, etc., under different agroclimatic conditions. Crop protection trials with fungicides, insecticides and herbicides will also be carried out. The high-yielding and disease-resistant cultivars along with cultivation technique information will be made available to farmers through national authorities.

/beans/ /plant breeding/ /plant protection/ /cultivation practices/

*** /germplasm conservation/ /seed production/

FOOD CROPS

Grantee C168: Mr Festus Mwenda, Agricultural Research Institute, Naliendele, P O Box 509, MTWARA, United Republic of Tanzania

"Groundnut and sesame varietal screening"

IFS funding: 26100 SEK 1976 25000 SEK 1981

Due to a low production of oilseed, there is very often a lack of cooking oil in Tanzania. To improve this situation, Mr Mwenda will evaluate and select the best local strains of groundnut and sesame with regard to yield, oil content, disease resistance and adaptability to different environments. Based upon the results, Mr Mwenda will work on producing improved strains to be released to farmers.

/groundnuts/ /oilseeds/ /plant breeding/

*** /seed production/

Grantee C169: Dr Chin Hoon Fong, Department of Agronomy and Horticulture, Universiti Pertanian Malaysia, (UPM), SERDANG, Selangor, Malaysia

"Production and storage of vegetable seeds"

IFS funding: 26100 SEK 1976 18800 SEK 1978
6450 SEK 1979

It is estimated that production of grain legumes and horticultural crops can be increased by at least 10% by improvement of cultivated species. Dr Chin will initiate his work by screening and identifying varieties from different locations, and hopes that certain varieties with known characteristics will be obtained. The selected varieties will be propagated, and their genetic purity will be ensured at the University farm and seed bank. Dr Chin will also investigate the physiological causes of seed deterioration and work out methods for ideal, long-term storage.

/leguminosae/ /plant breeding/ /genetic improvement/

*** /germplasm conservation/ /seed production/

FOOD CROPS

Grantee C170: Mr Jonathan Okafor, Forestry Development and Investigation Branch, P M B 1028, ENUGU, Nigeria

"Studies on woody plants of nutritional importance in traditional farming systems of the lowland humid tropics in Nigeria"

IFS funding: 8700 SEK 1976 15400 SEK 1980

Many woody food plants (cultivated, protected or wild) are good sources of cheap plant proteins, carbohydrates and other essential nutrients, e.g., vitamins. They are usually available when annual staples that are difficult to store are not. Mr Okafor will identify the species in question and determine their nutritive value. Information about their yield and time of availability will be collected, and their association with different field systems in traditional agriculture will be determined. Botanical keys will be worked out to enable non-specialists to identify these plants.

/wild plants/ /nutritive value/ /cultivation practices/

*** /taxonomy/

Grantee C175: Mr Kalaluka Munyinda, Mount Makulu Research Station, P O Box 7, CHILANGA, Zambia

"Effect of varying levels of lime on acid soils as to availability and plant uptake of manganese, aluminium and other trace elements"

IFS funding: 21750 SEK 1976

Maize is a staple food in Zambia. Previous research work has shown that application of ammonium sulphate causes a decrease of pH in the soil, and a consequent long-term decrease of crop yield. To reestablish the fertility of the soils, Mr Munyinda will carry out experiments to determine the critical levels of soil manganese, aluminium, zinc, boron and pH for different soil types. He will also try to correlate the above soil parameters with the plant uptake of manganese, aluminium, zinc, molybdenum, boron, sulphur, nitrogen, phosphorus, and potassium. The principal aim of the project is to assess the soil amendments (lime requirement) necessary for the rehabilitation of soils used for maize cultivation.

/maize/ /plant nutrition/ /soil fertility/ /soil improvement/

FOOD CROPS

Grantee C180: Mr Mohammed Aminuddin, School of Biological Sciences, Universiti Sains Malaysia, MINDEN, Penang, Malaysia

"Metabolism of nitrogen and sulphur compounds in rice and soil"

IFS funding: 26100 SEK 1976

Rice is the staple food in Malaysia and is mostly of the wet paddy type. During this first period of growth the plants are submerged and exposed to various anaerobes, such as denitrifying bacteria. Mr Aminuddin will study the metabolism of the early stages of growth and the interrelationship of the plants and the microorganisms in the soil. The microorganisms involved in the metabolic chain of compounds of nitrogen and sulphur will be identified, isolated and purified. The growth patterns of these bacteria, particularly in relation to their metabolism of sulphur and nitrogen compounds, will be studied as well as the utilization of sulphate and nitrate in rice seeds and seedlings. Special interest will be paid to the early stages involving ATP-sulphurylase and nitrate reductase enzyme systems.

/rice/ /microorganisms/ /plant nutrition/ /sulphur/ /nitrogen/

Grantee C181: Mr Wadi Utomo, Faculty of Agriculture, Universitas Brawijaya, Jalan Mayjen Haryono 163A, MALANG, Indonesia

"Determination of water requirement of soybean"

IFS funding: 10875 SEK 1976 36000 SEK 1981
Completed 1983

The soybean is cultivated in the Indonesian lowlands during periods when water is insufficient for rice cultivation. Because of lack of water in upland areas, soybeans are not cultivated, but it might be possible. Mr Utomo will study the relationship between plant, soil and water, especially the effect of soil/water potential on growth and yield of soybeans and factors affecting this relationship. The minimum water requirement determined and an efficient method of measurement will be worked out. It is hoped that the results can be used for managing water supply efficiently in the irrigated areas, or to determine suitable planting dates in relation to the climate.

/soybeans/ /cultivation systems/ /irrigation/ /water requirements/ /plant breeding/

FOOD CROPS

Grantee C182: Dr Slamet Setijono, Faculty of Agriculture, Universitas Brawijaya, Jalan Majen Haryona 163A, MALANG, Indonesia

"The lime requirement of acid soils in Indonesia"

IFS funding: 4350 SEK 1976

More than 50% of the land area of Indonesia is covered by acid soils which must be limed to obtain high yields. Dr Setijono will use samples from East Java soils to measure the effects of various levels of liming on exchangeable and extractable aluminium, exchangeable manganese, organic matter content, clay content, and pH. Aluminium and manganese in combination with acidity are suspected to be toxic for soybean plants, the second most important crop in East Java. This study will be followed by greenhouse experiments to investigate the response of soybean to varied rates of liming. The ultimate aim of the project is to assess a suitable chemical method for estimating the lime requirement of different types of soils.

/soil analysis/ /soil types/ /lime/ /soil improvement/

Grantee C188: Dr Jacob Ayuk-Takem, Institut de la Recherche Agronomique, (IRA), Bambui Station, B P 80, BAMENDA, United Republic of Cameroon

"Selection and production of improved clones of yams"

IFS funding: 35200 SEK 1977 44000 SEK 1979

Dr Ayuk-Takem aims at improving yams to obtain species with higher yield and protein contents, and better disease resistance. Previous research has resulted in a large collection which will be used to produce elite cultivars and clones. Dr Ayuk-Tamek will attempt to determine economic fertilizer doses for the species. It is also intended to produce a package of technical information and some improved planting material for us by national authorities in their efforts to improve yam production.

/nutritive value/ /fertilization/ /agricultural training/

*** /plant collections/ /crop improvement/ /seed production/ /yams/

FOOD CROPS

Grantee C199: Mr Ganashyam Kolhe, Agricultural Institute, KOSBAD HILL 401 703, District Thana, Maharashtra State, India

"Evolution of nutritionally superior cultivars of horse gram (Dolichos biflorus)"

IFS funding: 22000 SEK 1977 39600 SEK 1979
4000 SEK 1981

Horse gram is a pulse popular in India. It contains about 22% protein and also has a high calcium content. The nutritional quality is, however, marred by the high content of oxalic acid. Mr Kolhe will make a collection of horse gram cultivars, which will be chemically analysed for proximate composition, minerals and oxalic acid. Those having a better ratio of Ca/oxalic acid will be further examined for their amino acid and hemaglutenin contents. Nutritionally superior types will be subjected to field trials for about three seasons to compare yield potential and other characteristics, e.g., disease resistance. The best types will be selected for large-scale trials on farmers' fields in Maharashtra. Seed will also be provided for a larger distribution in India.

/leguminosae/ /plant breeding/ /nutritive value/ /chemical analysis/ /toxic substances/

FOOD CROPS

Grantee C201: Dr Yap Thoo Chia, Department of Agronomy and Horticulture, Universiti Pertanian Malaysia, (UPM), SERDANG, Selangor, Malaysia

"Breeding vegetable crops"

IFS funding: 17600 SEK 1977 20925 SEK 1978
19350 SEK 1979

Little breeding work has been done on local vegetable crops in Malaysia, and generally the seeds are not of high quality. Imported vegetable seeds do not always adapt well to local conditions. Dr Yap will concentrate on long beans. Initially, basic studies on the genetic variability of local cultivars will be carried out. Promising varieties will be grown in different parts of Malaysia in order to get more information on varietal stability and adaptation. With the genetic information available, superior genotypes will be developed either through selection from local varieties or through cross-breeding. Varieties with higher yield than the existing commercial varieties will be released to farmers after regional field trials.

/beans/ /plant breeding/ /genetic improvement/

*** /seed production/ /germplasm conservation/

FOOD CROPS

Grantee C202: Mr Nestor Pido, Philippine Root Crop Research and Training Center, Visayas State College of Agriculture, (VisCA), BAYBAY, Leyte 7127, Philippines

"Collection, evaluation and culture of local and exotic varieties of yams (Dioscorea sp.)"

IFS funding: 26400 SEK 1977 45000 SEK 1978
41500 SEK 1980 Completed 1981

Yams are a popular root crop in the Philippines, but because of limited information about cultivation practices, production does not meet the demand. Mr Pido will collect native and exotic species of yams and evaluate them for yield and other desirable agronomic characteristics. Potential genotypes of yams will be identified and maintained, and promising varieties for commercial production will be selected. Cultivation management practices for yams local farming systems will be developed.

/root crops/ /cultivation practices/

*** /plant collections/ /crop improvement/ /yams/

Grantee C203: Dr Juma Kapuya, Department of Botany, University of Dar es Salaam, P O Box 35060, DAR ES SALAAM, United Republic of Tanzania

"Abscission of flowers in leguminous plants"

IFS funding: 27280 SEK 1977

Abscission of flowers often causes considerable reduction of yield from legumes. Studies show that certain hormones play an important role in the control of the abscissions process. Dr Kapuya will make a survey of legume varieties grown in Tanzania and collect data on the ecology of these crops. The varieties will be experimentally cultivated to establish adequate culture techniques. The effect of environmental conditions, such as drought and water stress, on flower abscission will be tested. The endogenous levels of hormones will be determined, and the effect of these hormones on abscission when exogenously applied will be tested.

/leguminosae/ /plant ecology/ /hormones/ /drought/ /cultivation practices/

FOOD CROPS

Grantee C205: Ms Maria del Carmen de Arriola, Instituto Centroamericano de Investigación y Tecnología Industrial, (ICAITI), Apartado Postal 1552, GUATEMALA, Guatemala

"Storage of tropical fruits under modified atmospheres"

IFS funding: 13200 SEK 1977 13200 SEK 1979
Completed 1980

It is already known that it is possible to increase the shelf-life of fruits by storing them in polyethylene bags. To develop suitable storage methods for tropical fruits, such as avocados and bananas, Ms de Arriola will study changes that occur in the modified atmosphere developed in the bags. Experiments will be carried out with and without refrigeration. The organoleptic, physical and chemical changes when stored under fixed conditions will be investigated to learn the best ripening conditions. It is expected that the results of this study will create technologies for extending the shelf-life of avocados and bananas without refrigeration.

/food storage/ /fruits/

Grantee C206: Dr David Ampratwum, Agricultural Engineering Division, Faculty of Agriculture, University of Ghana, P O Box 159, LEGON, Ghana

"Grain drying and storage under humid tropical conditions"

IFS funding: 26400 SEK 1977

Paper drying and storage of grain are important but rarely achieved. Storage losses up to 75% have been reported. Dr Ampratwum will study the functional and structural aspects of traditional methods for drying and storage, and determine the optimum heat, air and moisture conditions for grain drying and storage in the humid tropics. Based upon this information, attempts will be made to improve the drying and storage systems to reduce losses.

/cereals/ /drying/ /food preservation/

FOOD CROPS

Grantee C207: Mr Buxton Cooper, Partnership for Productivity Foundation/Liberia, c/o LAMCO, Roberts International Airport, NIMBA, Liberia

"PFP experimental and demonstration farm"

IFS funding: 37840 SEK 1977 37440 SEK 1978
29550 SEK 1980

PFP's (Partnership for Productivity) experimental and demonstration farm is a 50-acre project for experimentation with varieties of tubers, grains, grasses, vegetables, tree crops and fish farming. It is also a county centre for farmer training. Mr Cooper will investigate the most applicable ways to gain the participation and cooperation of the subsistence farmers to convert present destructive land use methods into improved soil conservation methods. Demonstrations will be arranged and training will be given. Technical assistance in land preparation, involving surveying skills and implementation will be provided to ensure effective follow-up.

/soil conservation/ /experimental farms/ /agricultural training/

Grantee C208: Mr Michel Ndabihore, Station de Recherches Agronomiquees de Kisozi, Institut des Sciences Agronomiques du Burundi, (ISABU), B P 75, BUJUMBURA, Burundi

"Improved stocking methods for corn, peas and wheat at high altitudes in Burundi"

IFS funding: 26400 SEK 1977

Mr Ndabihore will initially make a survey of the different traditional storage methods and collect data about the extent of losses. A study of the different causative factors (humidity, insects, etc.) will be made, and based on the data obtained, suitable stocking methods will be developed. Different types of silos will be tried, as well as different preservation methods. The effect of insecticides will also be investigated.

/food preservation/ /pests of plants/ /food storage/ /silos/

FOOD CROPS

Grantee C209: Dr Alphonso Anusiem, University of Harcourt, P M B 5323, PORT HARCOURT, Nigeria

"Calorimetric investigation of soil microorganism activity"

IFS funding: 44000 SEK 1977

The activity of soil microorganisms is closely related to soil fertility. Based on previous reserach, Dr Anusiem will try to develop a calorimetric technique as an alternative sampling method of soils. Correlation between heat output and soil condition will be made to establish calorimetric methods for laboratory studies of improvement of soils. The method may also be used to check the effects of pesticides, herbicides or pollutants on soil productivity. Results obtained from this work should provide information about amounts and types of nutrients required by the soils to optimize the productivity.

/soil improvement/ /microorganisms/ /soil pollutants/

Grantee C244: Dr Arumugakannu Narayanan, Department of Plant Physiology, Agricultural College, Andhra Pradesh Agricultural University, BAPATLA, Andhra Pradesh 522 101, India

"Physiological aspects of horse gram (Dolichos biflorus)"

IFS funding: 19200 SEK 1977 17200 SEK 1979

Horse gram (Dolichos biflorus) is extensively grown in semi-arid regions of South India as a forage crop, grain legume, soil cover crop or as green manure. The grain is mostly used as animal feed. Horse gram is resistant to pests, diseases and water stress, but the yield is usually poor. Dr Narayanan will try to identify factors limiting the yield, and to optimize grain and forage yield under stress conditions. Genotypes will be compared for their yield and the mechanisms of resistance to pest disease and drought will be investigated. Suitable agronomical practices for intercropping systems will be elaborated. The use of horse gram for weed management in dry land agriculture will also be investigated.

/leguminosae/ /plant breeding/ /pest control/ /cultivation practices/

*** /crop improvement/

FOOD CROPS

Grantee C247: Mr Idrissa Soumana, Département d'Agronomie, Ecole Supérieure d'Agronomie, Université de Niamey, B P 237, NIAMEY, Niger

"Vigna-Pennisetum intercropping and nitrogen fertilization of the duny soils in Niger"

IFS funding: 26400 SEK 1977 22000 SEK 1980

Most of the cultivated soils in Niger are sandy soils known to be N and P deficient. Pennisetum typhoideum and Vigna unguiculata are the two main stable crops in Niger and are mostly grown in association to improve the nitrogen supply. Mr Soumana will study this association to determine conditions of cultivation optimal for an effective nodulation and better nitrogen nutrition of the two crops. He will then try to develop an economic P-K fertilizer and to improve the nitrogen fixing capability of Vigna for a better growth of the two crops. Experimental results obtained in culture trays will be used in field trials.

/food crops/ /crop yield/ /nitrogen/ /soil improvement/

Grantee C248: Dr Frank Gumbs, Department of Soil Science, University of the West Indies, (UWI), ST AUGUSTINE, Trinidad and Tobago

"Soil water conservation on sloping land and the growth and yield of corn and vegetables"

IFS funding: 24000 SEK 1977 37500 SEK 1981

Trinidad has a dry season from January to May, and a wet season from June to December. During the wet season, top soil is lost by sheet erosion and nutrients by leaching. Investigations of these problems are already initiated. Dr Gumbs will study the conservation of water in the soil under different mulches and with channel terraces in the dry season. Growth and yield of crops will be measured, and the feasibility of the different practices will be evaluated. The results will be applied on a demonstration farm and may improve culture techniques on local farms.

/food crops/ /soil erosion/ /water conservation/ /cultivation practices/ /agricultural training/

FOOD CROPS

Grantee C249: Dr Sabharatna Kulasooriya, Department of Botany, University of Peradeniya, PERADENIYA, Sri Lanka

"Nitrogen fixation in rice paddy fields and grasslands"

IFS funding: 39840 SEK 1977 15050 SEK 1979
42500 SEK 1981 19125 SEK 1982

Dr Kulasooriya will survey the blue-green algae flora of rice soils in Sri Lanka to find the distribution of nitrogen-fixing species. Species with rapid growth, high nitrogen-fixing ability under field conditions, tolerance to soil types and herbicides, and storage viability will be selected, in laboratory and in outdoor field culture trials. They will be tested in different paddy soils and their effect on different rice varieties will be compared with that of chemical nitrogen fertilizer to determine the extent to which it could be replaced.

/rice/ /grasses/ /fertilizers/ /algae/ /soil fertility/ /cultivation practices/ /nitrogen fixation/

Grantee C250: Dr Augustine Isichei, Department of Botany, University of Ife, ILE-IFE, Nigeria

"Nitrogen presence in relation to grass species, plant part, season, soil, vegetation and management in Nigerian savanna"

IFS funding: 28800 SEK 1977 33110 SEK 1979

More than half of Nigeria is covered by savanna, which is burnt several times a year. Nitrogen in the grass biomass above ground is lost in the burnings. Dr Isichei will seek grass species which have nitrogen translocated and/or differentially stored in the rhizomes and roots, and thus relatively protected from the burning. These grasses - if they exist - will be tested as animal feed, and, if suitable, seeding and burning management will encourage the dominance of such species. The nitrogen loss by run-off and leaching will be investigated. An estimation of the algal growth and *Spirillum* associations will also be made. Finally, the contribution of the legume species to the savanna soil fertility will be investigated and recommendations will be made on optimum densities of population between legumes and other plant species.

/grasses/ /feed/ /soil fertility/

FOOD CROPS

Grantee C269: Dr Farah Ghani, Department of Botany, Universiti Kebangsaan Malaysia, BANGI, Selangor, Malaysia

"Study of morphology, ecology and distribution of root crops"

IFS funding: 9400 SEK 1978 25300 SEK 1979
93750 SEK 1982

Ms Ghani will make a collection of wild and marginally grown varieties of taro (Colocasia esculenta). This collection will serve as the basis for taxonomical identification and local distribution of varieties. A gene pool will be established to ensure a supply of each variety. Comparative studies will be carried out to determine the life cycle difference of the varieties. Investigations on cyto-genetics and floral morphology will be carried out to start a hybridization programme with Colocasa and related genera (Xanthosoma, Alocasia) to produce an improved variety. Field trials on planting times and methods, suitable planting material and space and fertilizer needs will be conducted to increase yield and quality.

/root crops/ /wild plants/ /hybridization/ /fertilization/ /cultivation practices/

*** /taro/ /plant collections/ /germplasm conservation/ /taxonomy/

Grantee C270: Prof Wilhelm Godfrey-Sam-Aggrey, Faculty of Agriculture, University College of Swaziland, P O LUYENGO, Swaziland

"Agro-economic studies on cassava in Swaziland"

IFS funding: 10810 SEK 1978 3735 SEK 1980

Prof Godfrey-Sam-Aggrey will collect, characterize and evaluate local cassava cultivars to provide germplasm for future breeding work. These varieties will be compared with imported cultivars as to adaptability, disease and pest resistance, and yield. Agronomic studies of yield will follow, as well as intercropping studies with Phaseolus, Vigna, sweet potato and pumpkins, and cassava as a dominant crop. These experiments will be carried out in different ecological zones of Swaziland. The economics of production and market demand will also be evaluated.

/leguminosae/ /root crops/ /intercropping/

*** /plant collections/ /crop improvement/

FOOD CROPS

Grantee C271: Mr Abdul Karim, Department of Botany, Fourah Bay College, University of Sierra Leone, FREETOWN, Sierra Leone

"Dry matter production, growth rate, chlorophyll and energy content of tropical leafy vegetables"

IFS funding: 51700 SEK 1978 29260 SEK 1979
22285 SEK 1980 13750 SEK 1981

Cultivation of leafy vegetables, traditionally been grown in gardens and used as a protein supplement to rice, maize, and yams is decreasing. To improve cultivation practices, Mr Karim will investigate the plant-soil-water relationship of a few leafy vegetables, e.g., Amaranthus hybridus, Hibiscus sabdariffa and Cochorus olitorius. The effect of different watering cycles on growth and dry matter production will bo investigated, with special emphasis on leaf production and distribution of dry matter between different parts of the plant.

/vegetable crops/ /water requirements/ /cultivation practices/

Grantee C272: Dr Edward Rhodes, Department of Agronomy, Njala University College, University of Sierra Leone, Private Mail Bag, FREETOWN, Sierra Leone

"Cropping systems for an upland soil type"

IFS funding: 32900 SEK 1978 35000 SEK 1981
30000 SEK 1982

Much of the crop production in Sierra Leone is carried out by a bush fallow system of shifting cultivation. Because of population pressure, fallow periods are down to 4 - 5 years in some parts of the country. A suitable cropping and land use system based on experience from the humid tropics will be developed and demonstrated to farmers. Crop rotation of fertilized maize, cassava, cowpea or groundnut will be compared to maize only and different tillage and crop residue management strategies used on an upland soil type. Soil, plant and yield samples will be collected to monitor changes in the soil and assess crop nutrient uptake.

/agricultural practices/ /crop rotation/ /maize/ /cassava/ /cowpeas/ /groundnuts/ /soil management/

FOOD CROPS

Grantee C273: Dr Karippaprmbil Sebastian, Njala University College, University of Sierra Leone, Private Mail Bag, FREETOWN, Sierra Leone

"Tissue culture and somatic hybridization studies of cowpeas (*Vigna sinensis*)"

IFS funding: 37600 SEK 1978 Completed 1980

Cowpeas are extensively cultivated in West Africa and are an important source of protein for people of semi-arid tropical Africa. Cowpea Yellow Mosaic Virus (CYMV) is the major constraint to production. CYMV is mainly transmitted through seeds from infected plants and such infections appear to supply the inoculum for secondary spreading in the field. Dr Sebastian aims to develop a multiple resistant variety of cowpea by meristem tip culture, cloning and somatic hybridization techniques to raise a disease-free stock of plants.

/cowpeas/ /plant breeding/ /plant diseases/ /virology/

*** /tissue culture/

Grantee C274: Mr N'goran Ahoussou, Département de Botanique et Biologie Végétale, Faculté des Sciences, Université d'Abidjan, 04 B P 322, ABIDJAN 04, Ivory Coast

"Study of propagation methods of yams with regard to crop variation"

IFS funding: 23500 SEK 1978 26400 SEK 1980

Yams are usually propagated by using parts of the tuber or whole small tubers. The yield is very uneven in size and maturity, even from cultivars originating from the same plant. It is also possible to use aerial tubers and cuttings for propagation, but these methods are not widely used. Mr Ahoussou will make a comparative study of different propagation techniques, with regard to crop size and variability. Plants from the same clones will be investigated, e.g., effects of different weights and depths on growth.

/root crops/

*** /vegetative propagation/ /crop improvement/ /yams/

FOOD CROPS

Grantee C304: Dr José Gomez C, Departamento de Ciencias Biológicas, Universidad Nacional Mayor de San Marcos, Apartado 1109, LIMA 1

"Rhizobium selection for tropical legumes and studies of peat as inoculum carrier"

IFS funding: 36000 SEK 1978 30000 SEK 1981

To develop a cattle industry in the tropical regions of Peru, improved production of forage is necessary. Dr Gomez C will collect naturally-occurring rhizobium strains with big nodules and evaluate their nodulation capacities in field trials. Promising strains will be isolated and investigated under greenhouse conditions with Stylosanthes guyanensis, Centrosema pubescens and Pueraria phaseoloides. Field trials with these species will also be conducted. A suitable peat medium will be tried out for the preparation of inoculum.

/leguminosae/ /forage crops/ /bacteria/ /cultivation practices/ /nitrogen fixation/

*** /rhizobium/

Grantee C305: Mr Fong Hoo Meng, Department of Botany, Universiti Malaya, Lembah Pantai, KUALA LUMPUR, Malaysia

"Nitrogen-fixing blue-green algae in West Malaysia"

IFS funding: 45000 SEK 1978 14730 SEK 1980

Shortage of commercial fertilizer has increased the interest in use of nitrogen-fixing blue-green algae. Mr Fong will investigate the nitrogen-fixing ability of local strains of blue-green algae in paddy fields. Growth and fixing ability will be tested by pigment analyses and by acetylene reduction techniques. Trials will be carried out under both laboratory and field conditions. Ecological factors and farming practices affecting the distribution and growth of the blue-green algae will also be studied.

/rice/ /plant nutrition/ /fertilizers/ /algae/ /nitrogen fixation/

*** /green manures/

FOOD CROPS

Grantee C306: Dr K Saliya Kumarasinghe, Department of Botany, University of Peradeniya, PERADENIYA, Sri Lanka

"Search for vegetable legumes and rice with low rates of photorespiration and chemical inhibition of photorespiration"

IFS funding: 36000 SEK 1978 18675 SEK 1980

Approximately 25% of the carbon fixed by photosynthesis in plants that fix CO2 by the RuBP-carboxylase reaction (C-3 plants) is lost in photorespiration. Many of the major crop species, such as rice, wheat, barley, lentils, soybeans, groundnut, peas, grams, etc., belong to the C-3 plants. So far, no benefit from the photorespiration has been determined, and the process seems to be a waste of carbon and energy. Dr Kumarsinghe will investigate the function of the photorespiration and try to increase growth capacity by searching for photorespiratory deficient individuals and to inhibit photorespiration by means of chemicals. Trials with inhibitors will be made under field conditions in different climatic zones.

/cereals/ /leguminosae/

*** /crop improvement/

Grantee C307: Dr Albert Otokore, Département de Biochimie, Faculté des Sciences, Université d'Abidjan, 04 B P 322, ABIDJAN 04, Ivory Coast

"Study of respiration of yam tubers; extraction and respiration in the mitochondria"

IFS funding: 45000 SEK 1978 Completed 1982

Injury to the respiratory system of yam tubers during cold storage is common. The damage is caused by changes in the membrane structure of the mitochondria, which has a negative effect on the storage properties. Dr Otokore will investigate the respiratory system of yam tubers, with particular attention to the changes in the mitochondrial membranes and their effects during cold storage. The effect of the atmospheric composition and humidity will also be taken into consideration. By determining minimum temperature and other factors influencing the shelf-life of the yam tuber, better storage methods can be developed.

/root crops/

*** /postharvest losses/ /postharvest systems/ /yams/

FOOD CROPS

Grantee C308: Dr Mohammad A Salam, Silk Research and Training Institute, P O Ghoramara, RAJSHAHI, Bangladesh

"Improvement of yield, oil contents and quality characteristics of rape seed and mustard in Bangladesh"

IFS funding: 40500 SEK 1978 75000 SEK 1983

Rape and mustard are the major vegetable oil producing crops of Bangladesh. The nutritional value of the oil is impaired by the high degree of erucic acid in the fatty acid composition. Meal from rape and mustard is rich in protein, but the presence of glucosinate makes it useless for food or animal feed. To improve quantity and quality of the oil and the meal, Dr Salam will study the variation of erucic and linolenic acid contents in the fatty acids, as well as the contents of glucosinolate. Varieties which contain little or none of these compounds will be selected and improved by hybridization with foreign varieties.

/plant breeding/ /genetic improvement/ /oilseeds/

Grantee C309: Ms N R Mugabe, Faculty of Agriculture, Forestry and Veterinary Science, University of Dar es Salaam, P O Box 643, MOROGORO, United Republic of Tanzania

"A study of Aphelenchoides bessevi 1942 on rice in Tanzania"

IFS funding: 7200 SEK 1978

Aphelenchoides bessevi is a nematode pest of rice, mainly disseminated through infested seeds. It feeds ectoparasitically on young growing points of rice plants resulting in considerable crop losses. Some seeds may harbour up to 120 nematodes per seed. Ms Mugabe will assess whether A. bessevi is a pest of economic importance in Tanzania and endeavour to develop control methods suitable for Tanzanian conditions. The effect of A. bessavi on growth, yield and grain protein will be studied as well as the nature of the host/parasite relationship. Varietal resistance in rice, and nematode survival will also be investigated.

/rice/ /plant diseases/ /plant breeding/ /pests of plants/

FOOD CROPS

Grantee C310: Dr Innocent Onwueme, School of Agriculture and Agricultural Technology, Federal University of Technology, P M B 1526, OWERRI , Nigeria

"Research into agronomic and physiological problems in yams"

IFS funding: 36000 SEK 1978 37400 SEK 1980

Yams are the staple foods for most people in Nigeria where about 75% of the world yam crop is produced. Mainly due to labour-intensive cultivation methods, prices are high while the production is fairly constant. Dr Onwueme will begin field experiments on commercial yam cultivation and try to eliminate the need for staking. Spacing, soil preparation and fertilizers will be varied to test suitable propagation methods. Physiological studies will be conducted to improve the multiplication rate to understand hormonal influences and changes during sprouting and to determine the effects on the tubers. Suitable herbicides will be selected to decrease the labour input.

/fertilization/ /herbicides/ /cultivation practices/

*** /yams/

Grantee C311: Dr Daniel Jayasingh, Storage and Infestation Division, Ministry of Industry and Commerce, 20 Hope Road, KINGSTON 10, Jamaica

"Admixture of inert dusts and local plant materials to pulses and grains to prevent insect infestation"

IFS funding: 36000 SEK 1978 Completed 1981

Postharvest losses of food grains range between 30-40% in Jamaica, mainly because of insect attacks. The application of insecticides is expensive and may also be unacceptable from the point of view of the consumer's health. Preliminary studies have shown that mixing grains with inert dusts, e.g., sand, mud, lime, cement or wood ash, reduces storage losses considerably. Dr Jayasingh will make an in-depth study of the effectiveness of inert dusts on stored cowpeas, beans, corn, wheat and rice. The most important pest insects will be used for testing. Germination and temperature will also be studied. Similar studies will be carried out with plant material, such as leaves, flowers and citrus fruit peelings.

/cereals/ /leguminosae/ /pests of plants/

*** /postharvest losses/

FOOD CROPS

Grantee C324: Mr Naceur Hamza, Institut National de la Recherche Agronomique de Tunisie, (INRAT), Avenue de l'Indépendance, ARIANA, Tunisia

"Selection and improvement of local varieties of capsicum"

IFS funding: 26400 SEK 1979 26975 SEK 1980
36400 SEK 1981

Capsicum (Capsicum annum) is cultivated on about 14 400 hectares, which is about 19% of the total market-garden area of Tunisia. The varieties, produced from local seeds, are low-yielding.Mr Hamza will collect seeds from the most common local varieties and make a genetic selection to develop homogenous varieties with improved yield and quality of the fruits for the different cultivation conditions of the country. At the same time selection for disease resistant varieties will be made.

/vegetable crops/ /plant breeding/ /seeds/ /cultivation practices/

*** /plant collections/ /seed production/

Grantee C325: Ms Hager Jebari, Laboratoire des Cultures Légumières, Institut National de la Recherche Agronomique de Tunisie,(INRAT), Avenue de l'Indépendance, ARIANA, Tunisia

"Selection and improvement of local varieties of Cucurbitaceae (Cucumis melo and C. melo flexuosus)"

IFS funding: 26400 SEK 1979 27390 SEK 1980
36960 SEK 1981

Different kinds of melon (Cucumis spp.) are produced and consumed in considerable amounts in Tunisia. There are many different varieties, since seeds are produced locally by the farmers. These varieties are often low yielding and of inferior quality. To improve the production, Ms Jebari will make a selection of local varieties with desirable characteristics and develop better and more homogenous seed material. The selected varieties will also be bred for disease resistance.

/vegetable crops/ /plant breeding/ /seeds/

*** /seed production/

FOOD CROPS

Grantee C337: Mr Sitapha Diatta, Centre National de Recherches Agronomiques, Institut Sénégalais de Recherches Agricoles, (ISRA), B P 53, BAMBEY, Senegal

"Effect of organic matter (dung, compost) on the solubility of natural phosphates"

IFS funding: 26400 SEK 1979

Exploitation of arable land in Senegal necessitates more careful soil management. To try to decrease the need for chemical NPK fertilizers, Mr Diatta will investigate the influence of dung or compost on the solubility of phosphorus from natural phosphates. Chemical and biochemical analyses will be carried out and the uptake of soluble phosphorus will be measured. Trials under greenhouse conditions and in the field will be carried out with corn, millet or rice.

/soil management/ /fertilizers/

Grantee C338: Dr Battan Khaemba, Department of Zoology, University of Nairobi, P O Box 30197, NAIROBI, Kenya

"Resistance of cowpeas to major pod-sucking hemipteran bugs"

IFS funding: 26400 SEK 1979 45000 SEK 1981
Completed 1982

The cowpea (Vigna unguiculata) is an important pulse crop in Kenya. It is consumed as shoots, leaves, pods, green beans or as dry seeds. To decrease losses of crops and to improve storage properties, Mr Khaemba will make a collection of germplasm to identify pest resistant cultivars. The mechanisms of resistance will be investigated. Hemipteran bug populations will be studied to learn the seasonal abundance, as well as the nature and level of damage they cause. The goal is to develop a resistant variety of cowpea that can be released for large-scale cultivation.

/cowpeas/ /pests of plants/ /entomology/

*** crop improvement/

FOOD CROPS

Grantee C339: Mr Alphonso Nwankiti, National Root Crops Research Institute, Umudike, P M B 1006, UMUAHIA, Nigeria

"Studies on the leaf and vine blight of yam, Dioscorea alata"

IFS funding: 39600 SEK 1979 30800 SEK 1980
26320 SEK 1981 69200 SEK 1983

Dioscorea alata is one of the major yam species cultivated in Nigeria. During the wet season a large part of the crop is destroyed by blight, possibly caused by Colletotricum spp. Mr Nwankiti will isolate and identify all organisms on diseased plants and investigate their pathogenicity to find the blight-causing agent. Cultivars will be collected from different regions in Nigeria and screened for resistance to obtain resistant stock. Better cultivation and chemical methods for disease control will be developed.

/plant diseases/ /cultivation practices/

*** /yams/ /crop improvement/

Grantee C340: Dr Theodore Ferguson, Department of Crop Science, University of the West Indies, (UWI), ST AUGUSTINE, Trinidad and Tobago

"The evaluation of amaranths as a vegetable and grain crop in the Caribbean area"

IFS funding: 44000 SEK 1979

Amaranths are used mainly as a green vegetable in the Caribbean, have a potential to provide grains for human and animal consumption. Dr Ferguson will select varieties for use as either vegetable, forage or grain production. Promising lines will be tested for susceptibility to pests and diseases, and cultivation trials will be carried out in different parts of the Caribbean. Suitable agronomic practices will be developed and in collaboration with specialists, utilization and nutritional studies will be made.

/vegetable crops/ /plant breeding/ /plant diseases/ /cultivation practices/

FOOD CROPS

Grantee C341: Mr Michel Sedogo, Institut de Recherche Agronomique Tropicale, (IRAT), Saria, B P 633, OUAGADOUGOU, Upper Volta

"Effects of compost and sorghum straw on nitrogen mineralization and organic matter balance in the soil"

IFS funding: 44000 SEK 1979 50000 SEK 1981

Due to high population density, arable soils are not allowed to lie fallow as often as would be desirable, and more careful soil management practices are therefore needed. Mr Sedogo will analyse the effect of organic matter on nitrogen dynamics and their variations during the year. Experimental plots where different substrate combinations have been applied will be compared, and the mechanism for nitrogen uptake of sorghum will be investigated. A laboratory study will be made of the decomposition of sorghum straw and its general effect on microbial activity in the soil and on nitrogen mineralization.

/sorghum/ /soil management/ /nitrogen/ /microorganisms/

Grantee C342: Mr Casimir Makambila, Département de Biologie et Physiologie Végétale, Faculté des Sciences, Université Marien NGouabi, B P 69, BRAZZAVILLE, Congo

"Study of anthracnose and putrefaction of cassava in Congo"

IFS funding: 39600 SEK 1979 44000 SEK 1980
60000 SEK 1982

Cassava is the most common tuber crop in Congo and is important as a staple food. Large losses are caused by anthracnose and putrefaction. Mr Makambila will study the epidemiology of the disease as well as the relation between parasite-host plant, and climatic factors. The mode of transmission of anthracnose will also be investigated. A selection of cultivars will be made to obtain disease-resistant stock.

/cassava/ /plant diseases/

*** /crop improvement/

FOOD CROPS

Grantee C343: Mr Désiré Dzaba, Centre de Recherches Agronomiques de Loudima, B P 28, LOUDIMA, Congo

"Improvement of soil fertility under different cultivation systems"

IFS funding: 30800 SEK 1979 35200 SEK 1980
80000 SEK 1983

The Congo is heavily dependent on agricultural production and improvement of cultivation practices is a national research priority. Mr Dzaba will determine the present and potential carrying capacity of the soils by making laboratory and field studies of soil deficiencies. Nutritional requirements of different crops will be investigated under different cultivation systems, and suitable fertilization formulas will be developed.

/food crops/ /fertilization/ /soil improvement/ /cultivation practices/

Grantee C344: Dr Fidèle Mialoundama, Faculté des Sciences, Université Marien NGouabi, B P 69, BRAZZAVILLE, Congo

"Propagation and cultivation of Gnetum africanum"

IFS funding: 22000 SEK 1979 35200 SEK 1980
46400 SEK 1982

The leaves of Gnetum africanum are considered a delicacy in Congolese cooking. The plant grows wild and, due to exploitation, it is almost extinct in some areas. Dr Mialoundama will investigate the biology of Gnetum varieties and make cultivation experiments under greenhouse and nursery conditions and in vitro. Phenological studies of varieties will be made and the influence of climatic factors investigated. Cross-breeding experiments will be carried out with relation to growth, mineral requirements and climatic factors. Based on this research, it is foreseen that Gnetum can be rationally cultivated.

/vegetable crops/ /wild plants/ /plant breeding/ /genetic improvement/ /cultivation practices/

FOOD CROPS

Grantee C345: Dr Chelston Braithwaite, Department of Biological Sciences, University of the West Indies, (UWI), ST AUGUSTINE, Trinidad and Tobago

"Studies on the biological control of tropical plant pathogens with antagonistic bacteria or their products"

IFS funding: 37400 SEK 1979 Completed 1980

In the Caribbean, as in most tropical countries, the considerable quantity of pesticides used annually for plant disease control causes noxious side-effects. Dr Braithwaite will attempt to establish a biological plant disease control system. Preliminary work has shown that there appear to be substances produced by bacteria which inhibit fungal growth. The effect of these antibiotic producing bacteria on plant pathogens, the non-pathogenic soil micro-flora and plant growth will be studied. A method for preparation and application of the bacteria on the plant will also be developed.

/plant diseases/ /fungicides/ /bacteria/

Grantee C346: Dr Apisit Eiumnoh, Departement of Soils, Faculty of Agriculture, Kasetsart University, BANGKOK 9, Thailand

"Effects of long-term cassava planting on soil properties and micronutrient uptake"

IFS funding: 17160 SEK 1979 22000 SEK 1980

Cassava is a major export of Thailand. The effect on the soils of intensive cassava cultivation has not been fully investigated. Dr Apisit Eiumnoh will grow cassava during three years on soil of controlled good physical and chemical properties, and compare the status of the soil after the experiments. The trials will also include returning plant residues to the soil. Various soil properties, e.g., pH, particle size and density, moisture retention, and content of organic matter will be investigated as well as micronutrient uptake of the cassava.

/cassava/ /soil management/ /soil fertility/

FOOD CROPS

Grantee C347: Mr Param Sivan, Koronivia Research Station, P O Box 77, NAUSORI, Fiji

"Taro production systems study in Fiji"

IFS funding: 33000 SEK 1979

Taro is an important staple crop in Fiji and is mostly cultivated by semi-subsistence farmers by hand and with draught animals. Mr Sivan will carry out a study of the present production systems, and design and evaluate new systems including low technology that can be adapted by the farming community without recourse to heavy capital investments. A large-scale trial will be carried out and the results will be included in recommendations to farmers through the agricultural extension services.

/root crops/ /cultivation practices/ /agricultural training/

*** /taro/

Grantee C378: Dr Tung Heng Fong, Department of Botany, Universiti Malaya, Lembah Pantai, KUALA LUMPUR, Malaysia

"The Azolla-Anabaena complex; growth studies and its utilization in rice paddies in West Malaysia"

IFS funding: 8600 SEK 1979 35840 SEK 1981

The water fern Azolla grows in symbiosis with the blue-green algae Anabaena. The algae fixes molecular nitrogen and supports the growth of the water fern on a nitrogen-free medium. Dr Tung will make a survey of the occurrence of Azolla in rice paddies and study the growth and nitrogen fixing ability of local Azolla spp. and their symbiont under different environmental and cultural conditions. The effect of the growth of Azolla on the fertility of the paddy soil in terms of mineralization and nitrogen availability will be assessed.

/rice/ /algae/ /nitrogen/ /nitrogen fixation/

FOOD CROPS

Grantee C379: Dr Mustafa Imam, Faculty of Agriculture, Assiut University, ASSIUT, Egypt

"Studies on breaking dormancy in potato tubers"

IFS funding: 30100 SEK 1979 29000 SEK 1982

Potatoes are grown during both spring and autumn. Seed for the autumn crop is obtained from the previous spring harvest, while seed for the spring crop is imported. The yield of the autumn crop is usually lower than that of the spring, mainly because of virus infection and of incomplete breaking of dormancy of the seed tubers. Dr Imam will study the factors that affect the reduction in yield of the autumn crop. Varietal differences of dormancy periods will be investigated, and various chemical treatments will be tried to break dormancy at a suitable time. The impact of different storage techniques and growing conditions of the parent plants will also be studied.

/potatoes/ /plant diseases/ /viruses/

*** /seed storage/

Grantee C380: Mr Abdelmuti O M Salih, Food Research Centre, P O Box 213, KHARTOUM NORTH, Sudan

"Postharvest improvement of handling and storage of Sudanese oranges"

IFS funding: 21500 SEK 1979

Good quality oranges (Citrus sinensis) are produced in the Sudan during the winter. For about six months of the year oranges are imported. Proper handling and storage of oranges during the peak of the season are needed to decrease importation. Mr Salih will improve the storage techniques by developing better harvesting methods, transportation and pre-treatment of the fruit. Different fungicides will be applied and the fruits will then be kept in cold storage for different periods of time. Microbiological studies will be made on infected fruits, and necessary improvement of the pre-treatment or storage methods will be made.

/citrus fruits/ /food storage/ /food spoilage/

*** /postharvest systems/

FOOD CROPS

Grantee C381: Mr José Pardales Junior, Philippine Root Crop Research and Training Center, Visayas State College of Agriculture, (VisCA), BAYBAY, Leyte 7127, Philippines

"Evaluation and management of promising varieties of taro"

IFS funding: 30100 SEK 1979 19600 SEK 1981
Completed 1981

Taro, Colocasia esculenta, is consumed in the Philippines either as a vegetable or as a tuber, or used as animal feed. There is a wide discrepancy in yield performance between different regions, probably due to variations in soil properties, cultivation practices, and utilization of different taro varieties. To improve the taro yield in the different regions, Mr Pardales Junior will study the performance of promising taro varieties under different climates and economic conditions. Suitable management practices will then be developed.

/root crops/ /crop yield/ /climatic influence/ /cultivation practices/

*** /taro/ /crop improvement/

Grantee C382: Mr Fernando Evangelio, Philippine Root Crop Research and Training Center, Visayas State College of Agriculture, (VisCA), BAYBAY, Leyte 7127, Philippines

"Production of foliage and effects of defoliation on cassava"

IFS funding: 30100 SEK 1979

Unlike many parts of the world, farmers in the Philippines do not use cassava as livestock feed. So far, cassava is used little as livestock feed in the Philippines. Mr Evangelio will study the varietal differences of the effect of defoliation treatments and nitrogen fertilizers on the production of cassava tubers and foliage. The optimum age, shoot length and frequency of topping, plant density and level of nitrogen will be determined to maintain a favourable balance between quality and yield of foliage and tubers. A package technology to encourage farmers to utilize cassava for animal production will be formulated.

/cassava/ /feed production/ /cultivation practices/ /agricultural training/

FOOD CROPS

Grantee C383: Dr Gamil Shalaby, Faculty of Agriculture, Assiut University, ASSIUT, Egypt

"Production of heat-resistant tomato varieties"

IFS funding: 19350 SEK 1979

The development of heat-resistant tomato varieties could increase production during the summer, especially in Southern Egypt. Dr Shalaby will collect tomato cultivars from different parts of Egypt, and also introduce new heat-resistant varieties. Varietal trials will be carried out, as well as hybridization experiments. The effects of different agricultural practices will also be investigated. Strains with desirable characteristics will then be released to tomato growers.

/tomatoes/ /plant breeding/ /genetic improvement/ /cultivation practices/

Grantee C384: Dr Manee Wivutvongvana, Faculty of Agriculture, Chiang Mai University, CHIANG MAI, Thailand

"Breeding and improvement programmes of heat-tolerant tomatoes for Northern Thailand"

IFS funding: 23650 SEK 1979 28000 SEK 1981

The tomato yield is usually very low in the summer, since most varieties fail to set fruit at high temperature. Furthermore, insect attacks and diseases are prevalent in the summer. Dr Manee Wivutvongvana will select both disease and heat-tolerant varieties, which will be crossed in order to obtain a more productive and disease-resistant strain. Fungicides and different soil management practices will be tried to control diseases in traditional varieties. The effects of fertilizers will be investigated and recommendations formulated for the different strains of heat-tolerant tomatoes.

/tomatoes/ /plant breeding/ /fertilizers/ /soil management/ /cultivation practices/

*** /crop improvement/

FOOD CROPS

Grantee C385: Mr Victor Hien, Institut de Recherche sur le Coton et les Textiles, B P 574, OUAGADOUGOU, Upper Volta

"Utilization of crop residues in tropical agriculture"

IFS funding: 30100 SEK 1979 75000 SEK 1983

Soil degradation, linked with increasing demographic pressure, is a serious problem in the Sahel countries. Chemical fertilizers are expensive and formulae for better soil management, using locally-available material to improve soil properties, are needed. Mr Hien will carry out experiments at two different research stations on soil types representative of Upper Volta. Different methods of utilization of crop residues will be tried, and the resulting soil properties, in particular nitrogen availability, will be evaluated. Management systems for different soil types will then be formulated.

/soil management/ /soil improvement/ /agricultural wastes/ /nitrogen/

Grantee C386: Mr José Martinez, Estación Experimental de Cagua, Fundación Servicio para el Agricultor, Apartado 162, CAGUA 2122, Venezuela

"Investigations on *Citrus* spp."

IFS funding: 30100 SEK 1979 80000 SEK 1983

Citrus fruit production is rapidly increasing in Venezuela. Most species are grafted on *Citrus aurantium* which has good agronomical properties, but is sensitive to tristeza virus disease. Mr Martinez will test other *Citrus* species and hybrids tolerant to tristeza and other diseases, based on their agronomic properties. Micrografting experiments will be carried out with field-selected *Citrus* stock to obtain virus-free plants for further propagation. Techniques to diagnose the prevalent virus infections will also be tested.

/citrus fruits/ /plant breeding/ /plant diseases/ /virology/

FOOD CROPS

Grantee C387: Mr Narcisse Djegui, Département de la Recherche Agronomique, B P 884, COTONOU, Benin

"Improvement of techniques to grow corn in association with cowpeas"

IFS funding: 38700 SEK 1979

Corn and cowpeas are among the most important staple crops in Benin. They are usually grown in association with each other to decrease weed occurrence, conteract soil erosion and get the highest possible yield per plot area. Mr Djegui will make cultivation experiments with two varieties of cowpeas in association with corn. Sowing distance and the ratio corn/cowpeas will be varied and the differences in yield evaluated. Suitable cultivation practices for small farmers will then be formulated.

/cowpeas/ /maize/ /intercropping/ /erosion control/ /cultivation practices/

Grantee C388: Mr Endy Pais, Department of Agriculture, University of Papua New Guinea, Box 4820, PORT MORESBY, Papua New Guinea

"Yams of Papua New Guinea"

IFS funding: 38700 SEK 1979

The yam is common as a staple food in Papua New Guinea, but so far no agricultural investigations have been carried out on the local yam varieties. Mr Pais will collect germplasm of wild and domesticated yams, and screen them for high-yielding and disease-resistant varieties. The selected varieties will be tried in experiments with different spacing, fertilizing, staking and cultivation methods. Their propagation ability, storage properties, nutritional content and size will also be evaluated. Suitable cultivation practices will then be developed for the varieties selected on the basis of physical properties, nutritive value, and yield.

/cultivation practices/

*** /germplasm conservation/ /crop improvement/ /yams/

FOOD CROPS

Grantee C389: Mr Sady Majino B, Universidad Nacional de Huanuco, "Hermilio Valdizan", Apartado 278, HUANUCO, Peru

"Biosystematic studies to improve oca (Oxalis tuberosa) production"

IFS funding: 18490 SEK 1979

Oca (Oxalis tuberosa) is a tuber with high contents of starch and glucoside. There are no serious disease problems for oca cultivation and it stores well. Mr Majino B will develop new cultivation techniques to increase oca production. A selection for high producing strains will be made, and their response to various agronomic factors, such as temperature, soil humidity, light and fertilizers will be investigated. Different systems of crop rotation will also be tried.

/root crops/ /crop rotation/ /cultivation practices/

*** /crop improvement/

Grantee C390: Ms Luz Mattos, Departamento de Fitopatologia, Universidad Nacional Agraria, Apartado 456, La Molina, LIMA, Peru

"Identification of broad bean pathogens prevalent in the highlands of Peru"

IFS funding: 30100 SEK 1979

Broad beans (Vicia faba) have long been an important food crop in Peru. During the last two decades diseases have caused a drastic decrease in broad bean production. Ms Mattos will identify the pathogens affecting Vicia faba under greenhouse and laboratory conditions and evaluate the damage. A selection of strains of broad beans resistant to the pathogens will be made. Chemical control of the prevalent diseases will also be tested.

/beans/ /plant pathology/ /plant breeding/

FOOD CROPS

Grantee C391: Mr Tevita Holo, Agricultural Research Division, Department of Agriculture, Ministry of Agriculture, Forestry and Fisheries, P O Box 14, NUKU'ALOFA, Tonga

"Study on Xanthosoma and Colocasia leaf blight"

IFS funding: 38700 SEK 1979

Tubers are the most important staple food in Tonga, and are also important export products. Xanthosoma and Colocasia leaf blight occur widely and cause crop losses. Mr Holo will investigate the causative agents of the leaf blight and make an evaluation of crop losses. An economical way of controlling the disease will also be sought.

/root crops/ /plant diseases/

*** /taro/ /crop losses/

Grantee C403: Mr Abner Chavez L, Universidad Nacional de Huanuco, "Hermilio Valdizan", Apartado 278, HUANUCO, Peru

"Agricultural and economic aspects of crop production systems"

IFS funding: 8600 SEK 1979

In many parts of Latin America, particularly in the highlands, soil degradation and erosion are increasingly important problems. Mr Chavez L will develop suitable soil management systems by trying crop rotation and associations with yams, potato, corn and beans. Light, temperature and humidity will also be recorded. Production will be evaluated in terms of quality, quantity and economics.

/vegetable crops/ /soil management/ /erosion control/ /cultivation practices/

FOOD CROPS

Grantee C404: Dr James Teri, Department of Crop Science, University of Dar es Salaam, P O Box 643, MOROGORO, United Republic of Tanzania

"Cassava improvement in Tanzania"

IFS funding: 28900 SEK 1980

Cassava has been cultivated for a long time in Tanzania. The yield is low and does not meet the demand. Dr Teri will make surveys in different areas to determine yield, cultivars, management practices and constraints that limit high yields. A collection of cultivars will be established and work on quantitative and qualitative improvement of cassava will then be carried out based on the most promising cultivars.

/cassava/

*** /plant collections/ /crop improvement/

Grantee C419: Dr Samuel Nzietchueng, Institut de la Recherche Agronomique, (IRA), B P 44, DSCHANG, United Republic of Cameroon

"Improvement of root disease resistance in cocoyam, Xanthosoma sagittifolium, in Cameroon"

IFS funding: 26975 SEK 1980 44800 SEK 1981

A complex disease causing cocoyam roots to rot and the foliage to deteriorate has become common in Cameroon. Cocoyam is normally propagated by cloning and flowering is rare under natural conditions. Dr Nzietchueng will select resistant species and cross-breed them by induced flowering and artificial pollination. Methods of germinating the seeds will be tried in established nurseries to obtain hybrids to be utilized in selection programmes. Pathological studies of the root rot will also be made to better understand the mode of contamination.

/root crops/ /plant breeding/ /hybridization/ /plant diseases/

*** /cocoyams/ /crop improvement/

FOOD CROPS

Grantee C420: Mr Simon Karikari, Department of Crop Science, Faculty of Agriculture, University of Ghana, P O Box 44, LEGON, Ghana

"Studies on the cropping systems of tropical root crops"

IFS funding: 29050 SEK 1980

Cassava and cocoyams are the major root crops in the forest zones of Ghana. These crops are either planted in pure stands, or intercropped with plantains and vegetables. Mr Karikari will study the effect of intercropping on the structure and exhaustion of the soil. Different combinations of plantains, cocoyam and cassava will be compared with monoculture of the same crops, with regard to plant development, quantity and quality of yield, fertilizer and labour input. Suitable cropping methods will be determined, to be recommended in extension programmes.

/root crops/ /vegetable crops/ /intercropping/ /crop yield/ /soil fertility/

Grantee C421: Mr Made Sri Prana, Botanic Gardens of Indonesia, Lembaga Biologi Nasional, P O Box 110, BOGOR, Indonesia

"Collection and evaluation of taro, (*Colocasia esculenta*) from Irian Jaya and Mentawi islands"

IFS funding: 16600 SEK 1980

Taro is native to Southeast Asia. Apart from a large number of cultivated varieties, wild taro populations can also be found in many parts of the region. Mr Sri Prana will collect germplasm of wild taro from Irian Jaya and Mentawi islands, to ensure the supply of original taro varieties, and also gather information on the utilization of taro by the native people. The variation in protein content will be investigated. It is expected that some valuable genetic material with desirable characteristics for breeding purposes will be found.

/root crops/ /wild plants/ /nutritive value/

*** /taro/ /plant collections/ /germplasm conservation/

FOOD CROPS

Grantee C422: Dr Mohamed Marrakchi, Laboratoire de Génétique et Biometrie, Faculté des Sciences, Campus Universitaire, TUNIS, Tunisia

"Evaluation of the genetic resources of sulla and sunflower"

IFS funding: 36315 SEK 1980 31900 SEK 1982

Sulla (Hedysarum sp.) grows wild in Tunisia and has potential as a forage crop. Three species, H. coronarium, H. carnosum and H. flexuosum will be investigated with regard to propagation, genotypical and phenotypical characteristics. Analyses of the nucleic acid composition and enzyme occurrence will also be carried out. Dr Marrakchi will also work with sunflower, which is important for Tunisian oil and press cake production. The variability in strains of theoretically identical genotype will be investigated by means of electrophoresis.

/wild plants/ /forage crops/ /genetics/ /oilseeds/

Grantee C423: Dr Abdel Kader Cherif, Institut de Recherche Scientifique et Technique, 1, Avenue de France, TUNIS, Tunisia

"The effect of salinity on the physiology of the olive tree"

IFS funding: 37350 SEK 1980 97500 SEK 1982

Olive production is very important in Tunisia and depends largely on irrigation. The salinity of the water is often quite high. Dr Cherif will make experiments with olive trees in hydroponic cultivation and cultivated on sand. The salinity tolerance limit will be determined and structural and metabolic modifications caused by salt will be studied. The effect of salinity on the quantity and quality of the olive oil will also be investigated.

/oil crops/ /olive oil/ /irrigation/

*** /saline water/

FOOD CROPS

Grantee C424: Ms Akissa Bahri, Centre de Recherche du Génie Rural, (CRGR), B P 10, ARIANA, Tunisia

"A study of the productivity of halogen soils irrigated with saline water"

IFS funding: 40255 SEK 1980 53760 SEK 1982

Water shortage is a severe problem in Tunisia, and many crops depend on irrigation. The water available for that purpose is, however, usually saline. Ms Bahri will investigate the productivity of soils irrigated with saline water, and study the influence of environmental factors, such as different water and soil properties, and cultivation techniques. A study of the commonly used techniques will be made as well as experiments to improve them. Pepper will be used as the reference crop in the cultivation trials.

/pepper/ /irrigation/ /soil improvement/ /cultivation practices/

*** /saline water/

Grantee C425: Dr Mohammed Rashid, Horticulture Division, Bangladesh Agricultural Research Institute, (BARI), P O BRRI Joydebpur, DACCA, Bangladesh

"Survey, collection and evaluation of sweet potato and edible aroids in Bangladesh"

IFS funding: 25520 SEK 1980 Completed 1982

Dr Rashid will carry out a survey to determine the state of root crops in Bangladesh, especially sweet potatoes and aroids. He will also collect germplasm of these crops from inside the country as well as abroad. The collected materials will be evaluated for yield and quality with the ultimate purpose of developing improved varieties. It is expected that improvement of varieties will lead to an increase in the yields of these crops and thereby add to the total food production in the country.

/root crops/

*** /plant collections/ /germplasm conservation/ /crop improvement/

FOOD CROPS

Grantee C446: Dr Peter Onesirosan, Department of Plant Science, University of Ife, ILE-IFE, Nigeria

"Production of the winged bean, Psophocarpus tetragonolobus"

IFS funding: 16600 SEK 1980 49300 SEK 1982

The winged bean, Psophocarpus tetragonolobus, is a rather new crop in Nigeria, and its production in the new environment has not been investigated. Dr Onesirosan will study the problems associated with large-scale production of the crop. Efforts will be made to boost yield through selection and breeding, improve agronomic practices, and control diseases and pests. The yield of leaves, pods, seeds as well as tubers will be taken into consideration. Recommendations based on the cultivation of the winged bean for different purposes will be passed on to growers in extension programmes.

/beans/ /plant breeding/ /plant diseases/ /cultivation practices/ /agricultural training/

Grantee C449: Dr Kouamé Miezan, ORSTOM, Centre d'Adiopodoumé, Laboratoire de Génétique, B P V-51, ABIDJAN, Ivory Coast

"Genetic study of indigenous rice varieties"

IFS funding: 33200 SEK 1980 56000 SEK 1981
75000 SEK 1983

Rice is the staple food in Ivory Coast, and is to a large extent imported. The local rice varieties are low yielding, but have good disease resistance compared to the improved high-yielding varieties. Dr Miezan will collect germplasm from local rice varieties and study their phenotypic and agricultural properties. Suitable varieties will be selected for improvement to obtain a high-yielding, local variety, which is better adapted to West African conditions.

/rice/ /crop yield/

FOOD CROPS

Grantee C471: Dr Miguel Moran R, Departemento de Fitotechnia, Universidad Nacional Agraria, Apartado 456, La Molina, LIMA, Peru

"Collection and evaluation of some native Solanaceae spp."

IFS funding: 26400 SEK 1981

Several species of native Solanaceae found in the Andes are important for the nutrition of the local people. They are, however, not commonly cultivated and it is feared that some of these species might disappear in the near future. Such species are: tree tomato (Cyphomandra betacea), Peruvian groundcherry (Physalis peruviana), pepino (Solanum muricatum), naranjilla (Solanum quitoense) and cocona (Solanum topiro). Dr Moran R will determine their geographical distribution as well as their genetic variability and establish a germplasm collection. He will also select some promising types for breeding purposes.

/vegetable crops/ /plant breeding/

*** /solanaceae/ /plant collections/ /germplasm conservation/

Grantee C472: Dr Francis Agble, Crops Research Institute, P O Box 3785, KUMASI , Ghana

"Vegetable improvement: processing and fresh market tomato breeding"

IFS funding: 30800 SEK 1980 73600 SEK 1983

The tomato is an important vegetable in the daily diet of Ghanaians. It is either consumed fresh or processed for consumption during the off-season. Production is however far below demand. Dr Agble will breed and select the most suitable cultivars for fresh consumption and for the processing industry, taking into consideration their tolerance to heat. The selected cultivars will be multiplied and supplied to the farmers for cultivation.

/tomatoes/ /plant breeding/

*** /seed production/

FOOD CROPS

Grantee C473: Mr Salawi Asimi, Ihro-Sahria, B P 1345, OUAGADOUGOU, Upper Volta

"Inoculation studies of cowpeas (Vigna unguiculata) in Upper Volta"

IFS funding: 39160 SEK 1980

The cowpea is a popular vegetable in Upper Volta, and is often cultivated in association with millet, sorghum or maize. Improvement of its capacity to fix nitrogen is necessary to increase the production. Mr Asimi will inoculate plants with efficient and competitive rhizobium and study the local ones in order to select the better ones. When the problems with rhizobium inoculation are solved, the influence of endomycorrhiza on the growth and production of the plants will be studied.

/cowpeas/ /bacteria/ /soil fertility/ /nitrogen fixation/

*** /rhizobium/ /endomycorrhizae/

Grantee C474: Mr John Ikeorgu, NRCRI Sub-Station, IGBARIAM, P O Box 142, AWKUZU, Anambra State, Nigeria

"The use of two common Nigerian vegetables (okra and melon) to maximize benefits from intercropped cassava and maize"

IFS funding: 30800 SEK 1980 39200 SEK 1981
52500 SEK 1983

Cassava and maize are major Nigerian food crops often intercropped with various vegetables, among which are okra (Abelmoschus esculentus) and melon (Colosynthis vulgaris). Research has shown that melon intercropped with cassava or maize improved yields and that okra hardly affected the yields. Mr Ikeorgu will investigate in what way the micro-environment, i.e., soil moisture, water use potential, yield/plot, yield components, soil temperature, etc., is affected by these different cropping systems at optimum populations with a view to improving the methods employed by small farmers.

/cassava/ /maize/ /vegetable crops/ /intercropping/ /crop yield/

FOOD CROPS

Grantee C475: Mr Soemarno, Department of Soil Science, Faculty of Agriculture, Universitas Brawijaya, Jalan Majen Haryono 163A, MALANG, Indonesia

"The influence of potash fertilization with different soil moistures on the growth, production and quality of groundnuts"

IFS funding: 22000 SEK 1980 56000 SEK 1983

The groundnut is an important source of protein, especially for the rural community of East Java. Production depends very much on water supply and potash fertilization, which is expensive. Mr Soemarno will determine potash requirements of groundnuts at different soil moisture regimes. The experiments will be made in pots with five different rates of potash, three different moisture contents and two soil types. The aims of this research are the improvement of the production and quality of groundnut and the rational use of potash fertilizer according to soil and rainfall conditions.

/groundnuts/ /fertilizers/ /potash/

Grantee C476: Dr Nguyen Van Uyen, Ho Chi Minh City Branch of the National Research Centre for Scientific Research of Vietnam, 1 Mac Ding Chi, HO CHI MINH CITY, Viet Nam

"Mass propagation (on industrial scale) of some important tropical crop plants by tissue culture"

IFS funding: 44000 SEK 1980 63750 SEK 1982

Plant propagation by tissue culture represents a promising approach for providing large numbers of elite seed materials in a relatively short time. Dr Nguyen will study the major technical and economic factors involved in the scaling-up of the micropropagation procedures recently established for sweet potato and taro to improve their production in Viet Nam.

/sweet potatoes/

*** /taro/ /seed production/ /tissue culture/

FOOD CROPS

Grantee C516: Dr Emmanuel Dongala, Département de Chimie, Faculté des Sciences, Université Marien NGouabi, B P 69, BRAZZAVILLE, Congo

"Cassava improvement by reduction of the rate of cyanhydric acid"

IFS funding: 45000 SEK 1981

Cassava is a staple food in Congo and constitutes the main source of carbohydrates for a large part of the population. Dr Dongala will make a systematic analysis of the various cassava varieties occurring in the Congo in order to identify varieties with a low content of cyanhydric acid. Further agronomic studies of the selected varieties will then be done in order to improve their cultivation. He will also study the influence of different treatments (steeping, drying, cooking) on the content of hydrocyanic acid.

/cassava/ /toxic substances/ /food preparation/ /cultivation practices/

Grantee C517: Dr Arvindkumar Joshi, Department of Botany, Sir P P Institute of Science, Bhavnagar University, BHAVNAGAR 364 002, India

"Reclamation of saline soils by halophytes having economic potentials"

IFS funding: 50000 SEK 1981 80000 SEK 1983

Few attempts have been made until now to reclaim coastal saline areas in India by using halophytes. Many species grow there, some of them of economic potential (fodder, fibres for paper pulp, raw food, etc.). Dr Joshi will study the salt tolerance of these species at the germination stage. He will also investigate the physico-chemical characteristics of soils of natural habitats on the one hand, and of barren areas where these plants could be introduced, on the other hand. With these results, pot experiments will be carried out to grow these halophytes from seeds. Ultimately, these plants will be introduced to barren rural coastal areas in India.

/forage crops/ /soil analysis/

*** /saline soils/ /plant collections/

FOOD CROPS

Grantee C518: Mr Paul Mbouemboue, Département d'Agriculture, Ecole Nationale Supérieure Agronomique, Centre Universitaire de Dschang, B P 138, YAOUNDE, United Republic of Cameroon

"Improvement of cowpea cultivation (Vigna unguiculata"

IFS funding: 63000 SEK 1981 75000 SEK 1982

Leguminous plants are an important source of vegetable proteins but are more expensive than cereals and tuber crops. The high price of leguminous plants is partly due to their low yields. Mr Mbouemboue will develop high-yielding cultivars, adapted to daylight conditions and resistant to the main diseases and pests existing in the region.

/cowpeas/ /plant breeding/

*** /plant collections/ /crop improvement/

Grantee C519: Dr Sathit Wacharakitti, Faculty of Forestry, Kasetsart University, BANGKOK 9, Thailand

"Land use planning for highland agriculture development"

IFS funding: 44000 SEK 1981

The hill tribes living in the watershed mountainous areas of Northern Thailand practice shifting cultivation, thereby destroying the ecological balance of these highland areas. Dr Sathit Wacharakitti will devise adequate land use planning and permanent land allocation in order to solve these problems and simultaneously improve agricultural production and the standard of living of these hill tribes.

/shifting cultivation/ /land use/ /land tenure/

FOOD CROPS

Grantee C520: Mr Ahmed Warfa, Faculty of Agriculture, Somali National University, P O Box 801, MOGADISHU, Somalia

"Domestication of Frankincense and Myrrh species"

IFS funding: 40000 SEK 1981 60000 SEK 1983

Somalia is the largest producer of Frankincense and Myrrh in the world. However, their production is from wild species and the methods have not changed for centuries. A scientific study of these species is needed before they can play an economic role. Mr Warfa will collect and review existing literature on Frankincense and Myrrh species and study their ecology. He will attempt both seed and vegetative propagation of the most promising species and study the most economical and safe tapping methods. He will also attempt the commercial propagation of these species.

/wild plants/ /essential oils/ /sowing/

*** /plant propagation/

Grantee C521: Dr Wilfredo Moscoso, Instituto Superior de Agricultura, Apartado 166, SANTIAGO DE LOS CABALLEROS, Dominican Republic

"Study of some factors affecting the development of the hard-to-cook phenomenon in stored dry beans"

IFS funding: 40000 SEK 1981

Stored dry beans seem to lose cookability due to a decrease in their phytic acid content and to alterations in the ratio of monovalent to divalent cations due to an increase in the leakage of K and Mg ions during soaking. It is suspected that the polyphenols in the beans may have an effect on the membrane permeability and cause an increase in the leakage of solutes during soaking. However, there is no proof of this theory. Dr Moscoso will study the effect of polyphenol oxidation on dry bean leakage during aging at high temperature and relative humidity. He will also study the effect of heat treatment on the prevention of the hard-to-cook characteristic of dry beans. The results of these studies could be used to design simple storage methods for dry beans.

/beans/ /food storage/ /food preparation/

FOOD CROPS

Grantee C522: Dr Joseph George, Department of Agronomy, Njala University College, University of Sierra Leone, Private Mail Bag, FREETOWN, Sierra Leone

"Development of simple methods of handling, storing and ripening of fruits and vegetables in Sierra Leone"

IFS funding: 40000 SEK 1981

Investigations will be carried out on the losses of bananas, plantains, citrus and tomatoes during marketing and storage in Sierra Leone. From these studies the magnitude and major causes of wastage will be established. Methods which can be economically applied within the marketing system to reduce losses will be compared with those currently used. By minimizing losses during marketing and storage, Dr George hopes to encourage an increased utilization of these products. He also hopes to reduce or at least stabilize their cost in urban areas.

/bananas/ /citrus fruits/ /tomatoes/

*** /postharvest losses/ /postharvest systems/

Grantee C523: Dr Eldad Tukahirwa, Department of Zoology, Makerere University, P O Box 7062, KAMPALA, Uganda

"A study of pest management involving intra-crop diversity"

IFS funding: 33250 SEK 1981

Due to the increasing number of pests resistant to pesticides and the ever-rising costs of the latter, the study of natural enemies to control pest population has a very practical character. Dr Tukahirwa will assess the existence of pest regulatory attributes in traditional intercropping systems, and investigate how they could best be exploited to control pests in subsistence farming. He will also study the possibility of integrating the use of such natural control with the use of pesticides for achieving cheap and effective pest control at a reduced risk of environmental damage.

/beans/ /cassava/ /maize/ /intercropping/ /pest control/ /pesticides/ /biological control/

FOOD CROPS

Grantee C524: Dr Samuel Ogundana, Department of Microbiology, University of Ife, ILE-IFE, Nigeria

"Studies on the storage rot of yams (Dioscorea sp.) in Nigeria"

IFS funding: 40000 SEK 1981

Storage rot is one of the most serious diseases of yams and causes substantial losses. Dr Ogundana will carry out the extraction and characterization of naturally occurring anti-fungal compounds from the peel of yam tubers. He will also study the synthesis of the anti-fungal compounds with a view to manufacturing them for use as fungicides to protect yams from storage rot.

/plant diseases/ /fungicides/

*** /postharvest losses/ /yams/

Grantee C557: Dr Philippe Sankara, Institut Supérieur Polytechnique, Université de Ouagadougou, B P 7021, OUAGADOUGOU, Upper Volta

"Studies on groundnut rust in Upper Volta"

IFS funding: 56000 SEK 1981 63750 SEK 1983

Cases of groundnut rust were observed in Upper Volta for the first time in 1977. The effects of this disease, caused by Puccinia arachidis, can be extensive and destroy the whole harvest in cases of early infestation. The studies carried out by Dr Sankara will aim at a better understanding of the morphological and biological characters of the causative fungus as well as at selecting and creating high-yielding varieties resistant or tolerant to rust. Chemical control methods will also be developed.

/groundnuts/ /plant diseases/ /fungi/

*** /crop improvement/

FOOD CROPS

Grantee C558: Mr Assefa Gebre-Amlak, Awassa Junior College of Agriculture, Addis Ababa University, P O Box 5, AWASSA, Ethiopia

"Survey of lepidopterous maize borers in Ethiopia"

IFS funding: 44800 SEK 1981

Maize is grown as one of the major cereal crops in Ethiopia. However, its production is affected by pests such as lepidopterous stalk borers which are recognized as the most important limiting factors of maize production. Mr Assefa Gebre-Amlak will conduct a survey of lepidopterous maize borers in all maize growing regions of Ethiopia. He will study their ecological distribution, collect and identify parasites and predators of borers from different ecological zones and attempt to select local cultivars tolerant or resistant to borers.

/maize/ /pests of plants/

*** /crop improvement/

Grantee C559: Dr Mohamed Dahniya, Department of Agronomy, Njala University College, University of Sierra Leone, Private Mail Bag, FREETOWN, Sierra Leone

"Sweet potato improvement programme in Sierra Leone"

IFS funding: 50400 SEK 1981

The sweet potato is the most important crop in Sierra Leone after rice and cassava. Besides the consumption of the tubers themselves, sweet potato leaves are very important in the diet of Sierra Leoneans. The average national yield, approximately 1.2 t/ha, is however, low. Dr Dahniya will establish a genetic improvement programme for sweet potatoes to develop cultivars that are high yielding, disease and pest resistant, acceptable to consumers, and adaptable to different environments. He will also determine the nutritive value of local and improved sweet potato varieties and develop improved agronomic practices for maximum sweet potato leaf and tuber production.

/sweet potatoes/ /plant breeding/ /genetic improvement/ /nutritive value/ /cultivation practices/

FOOD CROPS

Grantee C560: Mr Sampao Pataragetvit, Thailand Institute of Scientific and Technological Research, (TISTR), 196 Phahonyothin Road, Bangkhen, BANGKOK 9, Thailand

"Prevention of postharvest losses of tropical fruits"

IFS funding: 56000 SEK 1981 Completed 1983

Fungi are known to attack a wide range of tropical fruits, including bananas, mangoes, and papayas, and latent infection is probably one of the most important causes of postharvest losses. The grantee will develop and test postharvest treatments to control latent infection, including fungicidal treatment and manipulation of ripening fruits to slow down disease development. He will also study the varietal susceptibility and the influence on disease development of fruit maturity and delayed ripening. Treatments will be commercially tested.

/fruit crops/ /fungi/ /plant diseases/ /fungicides/

*** /postharvest losses/ /postharvest systems/

Grantee C596: Ms Yvonne Pourrat, Département d'Ecologie Végétale, Institut Agronomique et Vétérinaire Hassan II, B P 6202, RABAT-INSTITUTS, Morocco

"Ecophysiological and comparative studies on pasture species of arid regions in Morocco"

IFS funding: 49300 SEK 1982

These studies will concern four pasture species: Artemisia herba-alba, Moricandia arvensis, Helianthemum lipii and Salsola vermiculata. Ms Pourrat will first analyse the environmental conditions which control germination, vegetative growth, flowering and fructification with a view to elucidate the phenological cycle of these plants and then devise standardized methods for regional and practical application. The mechanisms of adaptation to drought, the level of resistance and the potential productivity of each species will also be investigated.

/forage crops/ /plant ecology/ /physiology/ /cultivation practices/

*** /crop improvement/

FOOD CROPS

Grantee C597: Mr Oumar Niangado, Institut d'Economie Rurale, Section de Recherches sur les Cultures Vivrières et Oléagineuses, B P 438, BAMAKO, Mali

"Better utilization of minor cereals of Mali"

IFS funding: 69600 SEK 1982

During the last few years of drought a more extensive utilization of some minor cereals has been noted. Mr Niangado will first collect, evaluate and maintain the following species: fonio, (Digitaria exilis), diadié (Panicum Laetun and Brachiaria deflexa, éleusine (Eleusin corocana) and Sétaire (Sétaria italica). His aim is to select the best ecotypes for cultivation. More extensive studies will then be carried out (hybridization, selection, domestication) to obtain improved genotypes for distribution to farmers.

/cereals/ /genetic improvement/

*** /plant collections/ /seed production/

Grantee C598: Mr Jules-Jacques Kome, Institut des Techniques Agricoles, Centre Universitaire de Dschang, B P 110, DSCHANG, United Republic of Cameroon

"Study of Busseola fusca, a lepidopter attacking maize"

IFS funding: 58000 SEK 1982

Busseola fusca is the most common pest attacking maize crops in Cameroon and causes considerable losses. Mr Kome will study the population dynamics and the biology of Busseola fusca as well as the relation of host to parasite. He will carry out his project in close collaboration with advanced research laboratories in France, in particular for the identification of specific sexual pheromones. The final aim is to establish efficient biological control techniques.

/maize/ /entomology/ /pest control/ /biological control/

*** /pheromones/

FOOD CROPS

Grantee C599: Dr Nazaire Nkouka, Direction Générale de la Recherche Scientifique, B P 2499, BRAZZAVILLE, Congo

"Ecological study of the Bruchidae attacking leguminous plants in the Congo"

IFS funding: 55100 SEK 1982

Important parts of the harvests of leguminous plants (beans, peas and groundnuts) are destroyed by Bruchidae coleopters during storage. Dr Nkouka will study the ecology and population dynamics of one Bruchidae, Callosobruchus maculatus or Carvedon serratus (the most common species in the Congo), that contaminate leguminous plants in the fields and continue to develop during storage. He will compare the importance of the attacks due to C. maculatus or C. serratus under different cultivation systems and investigate seasonal variability. The results will be used to develop protection methods which can be implemented by small farmers.

/leguminosae/ /entomology/ /pest control/

*** /postharvest losses

Grantee C600: Mr Agueguia, Institut de la Recherche Agronomique, (IRA), Centre de Recherches Agronomiques, B P 13, NYOMBE, United Republic of Cameroon

"Study on the hardening of yam (Dioscorea dumetorum)"

IFS funding: 58000 SEK 1982

Dioscorea dumetorum is intensively cultivated in Cameroon. Their tubers harden rapidly after harvesting, thereby causing conservation problems. One known cultivar 'Muyuka' has a low yield but good storing properties (up to three weeks after harvesting); another cultivar 'Jakiri' has a high yield but must be consumed within 24 hours after harvesting. Mr Agueguia will attempt to produce clones from the two above-mentioned cultivars with high yield and conservation potentials, using artificial hybridization and seed germination methods already developed.

/plant breeding/ /genetic improvement/ /hybridization/

*** /crop improvement/ /yams/

FOOD CROPS

Grantee C601: Mr Clemente Fernandez C, Faculdad de Biología, Universidad de la Habana, Av 25 esq I Y J, Vedado, HABANA 4, Cuba

"Plant-microbial interrelationships on the rhizoplane of sugar cane"

IFS funding: 23200 SEK 1982

It is believed that seed inoculation will contribute to solving some important problems of modern agriculture, like nitrogen fertilization and protection of plant roots against soil-borne pathogens. Mr Fernandez C will try to adapt this practice to sugar cane agriculture. He will study the role that some streptomycete and bacterial species - selectivity stimulated by sugar cane roots - play on the nutrition or on the defence mechanisms of the plant. Among others, Beijerinckia-sugar cane roots and Streptomyces griseorubiginosus-sugar cane root associations will be investigated.

/sugar cane/ /plant nutrition/ /microorganisms/ /plant protection/

Grantee C602: Dr Messaoud Mohamed Lahbib, Ecole Normale Supérieure, B P 241, BAMAKO, Mali

"Utilization of a leguminosae Sesbania rostrata to fertilize paddy fields in Mali"

IFS funding: 55100 SEK 1982

Preliminary experiments carried out in Senegal showed that S. rostrata (leguminous plant of African origin) used as a green manure in rice fields can double the yield of the crop without any additional input of nitrogen fertilizer. This is due to its high nitrogen-fixing capacity. Dr Lahbib will duplicate these experiments under local conditions in Mali in order to verify the effect of this green manure on the rice yield. He will also investigate the possibility of using S. rostrata as a green manure or as a compost in millet and sorghum fields. At the same time, he will attempt to develop simple methods to introduce the use of this green manure into traditional crop rotation systems.

/leguminosae/ /rice/ /fertilizers/ /nitrogen fixation/

*** /green manures/ /crop improvement/

FOOD CROPS

Grantee C603: Mr Augustin Bere, Institut Supérieur Polytechnique, Université de Ouagadougou, B P 7021, OUAGADOUGOU, Upper Volta

"Studies on postharvest conservation of tuber crops"

IFS funding: 63800 SEK 1982

Due to their seasonal production and the lack of appropriate postharvest conservation methods in Upper Volta, tuber crops have to be imported from neighbouring countries at high prices most of the year. To remedy this situation, Mr Bere will study the causes of losses during storage and attempt to develop improved postharvest conservation methods. He will also control the nutritive value of the tubers throughout the storage period. His studies will first be concentrated on yams and sweet potatoes and later on other tuber crops of minor importance.

/sweet potatoes/ /nutritive value/ /food storage/

*** /postharvest systems/ /postharvest losses/ /yams/

Grantee C604: Mr Jimi Saelea, Dodo Creek Research Station, Ministry of Home Affairs and National Development, P O Box G13, HONIARA, Solomon Islands

"Selection of superior taro (Colocasia esculenta) cultivars through seed propogation"

IFS funding: 28800 SEK 1977 17200 SEK 1979
19720 SEK 1982

Taro is the major staple food in the Pacific Islands. The varieties commonly cultivated in the Solomon Islands are vulnerable to attacks by fungi and virus. Mr Saelea will collect taro varieties which are resistent in varying degrees to fungi and virus. These often low-yielding varieties will be crossed with high-yielding vulnerable varieties. Seedlings with desirable agronomic characteristics and showing resistence will be cultivated and distributed to farmers.

/root crops/ /plant breeding/ /plant diseases/ /fungi/ /viruses/

*** /taro/

FOOD CROPS

Grantee C635: Mr Bocar Badji, Direction Générale de la Production Agricole, Ministère du Développement Rural, B P 486, DAKAR, Senegal

"Study of the organic matter deficit in soils under cultivation in Senegal"

IFS funding: 75000 SEK 1982

Soils of cultivated areas in Senegal are mainly tropical ferruginous soils. The organic matter content of these soils becomes rapidly impoverished by heat. Mr Badji will evaluate the organic matter deficit in soils of cultivated areas, mostly vegetable gardens, and during fallow periods, mainly by taking analyses of soil samples. Experimental cultivation plots will then be established in order to determine the optimum application of organic manure to be returned to the soil.

/vegetable crops/ /soil analysis/ /soil improvement/ /fertilization/ /manures/

Grantee C636: Mr George Otim-Nape, Serere Research Station, Department of Agriculture, P O Serere, SOROTI, Uganda

"Collection and evaluation of cassava germplasm for resistance to cassava bacterial blight (CBB)"

IFS funding: 30000 SEK 1982

Cassava is the most important staple root crop in Uganda and its use as an industrial crop is becoming increasingly important. Recently, CBB has threatened the production of this crop in the country. Yield losses ranging from 70 - 100% have been observed in infected, CBB-susceptible varieties. Mr Otim-Nape will collect cassava varieties from the Lake Victoria region (Uganda, Kenya, Tanzania and the border with Zaire) and screen them for resistance to CBB and other desirable agronomic attributes. The selected resistant varieties will then be released to farmers for growing. It is now believed that planting CBB-resistant cassava varieties would be the most appropriate control measure.

/cassava/ /plant diseases/ /plant breeding/ /genetic improvement/

*** /plant collections/

FOOD CROPS

Grantee C637: Mr Chalermpone Sampet, Department of Agronomy, Faculty of Agriculture, Chiang Mai University, CHIANG MAI, Thailand

"Sesbania grandiflor and Gliricidia muculata as fodder crops"

IFS funding: 27000 SEK 1982

Leucaena leucocephala has long been used in Thailand as a source of protein for animals; its utilization is however limited by its mimosine content, which is toxic, and this project will attempt to find substitute crops. Mr Chalermpone Sampet will study the productivity and the nutritive value of Sesbania grandiflora and Gliricidia muculata under different cutting regimes and compare them with L. leucocephala. The plants will be cut successively over two years, the frequency of cutting depending on the growth or regrowth of the plants. The accumulated edible dry matter yield and the nutritive values of the harvested materials will be determined.

/leguminosae/ /toxic substances/ /feed production/ /forage crops/ /nutritive value/

Grantee C638: Dr Nimal Adikaram, Department of Botany, University of Peradeniya, PERADENIYA, Sri Lanka

"Latent infection of fruits and vegetables"

IFS funding: 7500 SEK 1982

Much of the rot which causes serious losses in fruit and vegetable crops during transit and storage originates from latent infections by fungi long before harvest. Dr Adikaram will carry out an initial survey of the occurrence of such infections and of the resulting economic loss. He will then isolate and identify the causal organisms and make microscopic studies on the germination of spores at the host surface, as well as study the mode of infection and host response.

/fruit crops/ /vegetable crops/ /plant diseases/ /fungi/

*** /postharvest losses/

FOOD CROPS

Grantee C639: Dr Nandasiri Weerasinghe, Department of Agronomy, Ruhuna University College, MAPALANA, Kamburupitiya, Sri Lanka

"Survey of saline soils in Sri Lanka"

IFS funding: 37500 SEK 1982

Dr Weerasinghe will carry out a survey of the saline soils in Southern Sri Lanka, in the recently irrigated zone of Mahaveli and Northern Sri Lanka, including Mannar. The studies will include an evaluation of saline land distribution, type and degree of salinity, physical properties of the soils and mineralization of irrigation water. Following this survey, experiments will be conducted under laboratory conditions and in model plots to select the most suitable crops for cultivation in these soils.

/irrigated land/ /crop prospects/ /soil analysis/

*** /saline soils/

Grantee C640: Mr Fidèle Tetio-Kagho, Ecole Nationale Supéreieure Agronomique, Centre Universitaire de Dschang, B P 96, DSCHANG, United Republic of Cameroon

"Improvement of mixed cropping in traditional farming systems in Cameroon"

IFS funding: 45000 SEK 1982

In order to get a better understanding of traditional mixed cropping systems, Mr Tetio-Kagho will first carry out a survey in one of the major agricultural areas of the United Republic of Cameroon. Among the different systems, he will study in particular the associations maize-cowpeas and maize-groundnut. Following this survey, a series of experimental cultivation plots will be established. They will mainly aim at studying the effects of sowing dates and densities, the geometrical set-up of the different species in association, the tolerance of dwarf species to shade and the period of weeding.

/cowpeas/ /groundnuts/ /maize/ /intercropping/ /cultivation practices/

FOOD CROPS

Grantee C641: Dr Leodegario Padua, National Institutes of Biotechnology and Applied Microbiology (BIOTECH), University of the Philippines at Los Banos, (UPLB), College, LAGUNA 3720, Philippines

"Isolation and screening of Bacillus thuringiensis for control of Plutella xylostella and other pests of crucifers"

IFS funding: 46500 SEK 1982

The diamond-back moth Plutella xylostella is one of the most serious pests of crucifiers in most parts of the world and especially in Southeast Asia. As these pests have built up resistance to chemical insecticides, they are difficult to control by this means, so alternative control measures must be found, such as the use of microorganisms. Among the microorganisms attacking insects, Bacillus thuringiensis has the best potential for controlling insect pests. Dr Padua will make a comprehensive survey of B. thuringiensis in the Philippines and isolate it from dead insects, soil and silkworm litters. The isolates obtained will be used in screening against the diamond-back moth and other pests of crucifers.

/vegetable crops/ /pests of plants/ /microorganisms/

FOOD CROPS

Grantee C642: Mr Jean-Fenel Felix, Faculté d'Agronomie et de Médecine Vétérinaire, Université d'Etat, Damien, PORT-AU-PRINCE, Haiti

"Improvement of biological nitrogen fixation in field beans in Haiti"

IFS funding: 90000 SEK 1982

The field bean (Phaseolus vulgaris) is the most widely grown legume in Haiti. However its nitrogen-fixing capacity is very low and as a consequence the yield and nutritive value of the harvest are low as well. Following the observation and identification of the most important limiting factors of field bean cultivation in different agricultural areas, Mr Felix will establish a germplasm collection of local cultivars. He will then compare the performance of the most promising local varieties with the elite cultivars selected at CIAT. He will also carry out microbiological studies and establish inoculation trials in order to improve nitrogen fixation, comparing highly efficient local strains of rhizobium with strains obtained from CIAT. Cross-breeding experiments will also be performed in order to obtain field varieties with a high nitrogen-fixing capacity.

/beans/ /plant breeding/ /nutritive value/ /microbiology/ /nitrogen fixation/

*** /inoculation/ /rhizobium/ /plant collections/ /germplasm conservation/

FOOD CROPS

Grantee C643: Mr Romain Massala, Département de Biologie Cellulaire et Moléculaire, Faculté des Sciences, Université Marien NGouabi, B P 69, BRAZZAVILLE, Congo

"Study on cassava mosaic in Congo"

IFS funding: 72000 SEK 1982

Cassava mosaic is a viral disease which induces important physiological and structural modifications as well as disturbances in the metabolism of the plant. As a result, this disease is responsible for substantial crop losses. Mr Massala will make field observations in order to determine the contamination rate as well as the natural mode of transmission of the mosaic. He will then research in the laboratory the factors which promote or prevent its occurrence. Finally, he will study the properties of the pathogenic agent in order to identify it as well as to establish adequate control methods.

/cassava/ /plant diseases/

Grantee C671: Mr Moses Kwapata, Crop Production Department, Bunda College of Agriculture, University of Malawi, P O Box 219, LILONGWE, Malawi

"Improvement and development of production practices of major indigenous vegetables in Malawi"

IFS funding: 69750 SEK 1983

This project will involve the collection and the evaluation of three major indigenous vegetables: Amaranthus spp., Hibiscus spp. and Gynandropsis gynandra throughout the country. Once the collection is finished, Mr Kwapata will conduct a series of field trials to select high-yielding, disease-resistant, low input varieties which are also nutritious and acceptable. Appropriate production practices will also be developed and demonstrated.

vegetable crops/ /plant diseases/ /cultivation practices/

** /plant collections/ /crop improvement/

FOOD CROPS

Grantee C672: Ms Wu Xaio-jun, Department of Virology, Institute of Microbiology, Academia Sinica, BEIJING, China

"Identification and control of the pathogen of the stunt disease of the Symphytum officinale"

IFS funding: 75000 SEK 1983

Symphytum officinale,, a nutritious perennial forage crop, which was introduced into China from Australia in the 1960s, has become very popular and is now cultivated on about half a million hectares. It has, however, been affected recently by a stunt disease which is spreading rapidly. Ms Wu will attempt to identify the pathogen which is suspected to be a virus or a mycoplasma. A survey in several affected districts will be carried out. The pathogen will be isolated from the diseased leaves collected in natural fields and purified. Biological tests will be performed. Disease control experiments will be designed depending upon the nature of the pathogen identified.

/forage crops/ /plant diseases/

Grantee C673: Mr Mateugue Diack, Institut Sénégalais de Recherches Agricoles, (ISRA), Station Rizicole de Djibelor, B P 34, ZIGUINCHOR, Senegal

"Utilization of Sesbania rostrata as green manure"

IFS funding: 60000 SEK 1983

Sesbania rostrata is a leguminous plant of North Senegal able to fix atmospheric nitrogen efficiently, not only through its root nodules as other leguminous crops, but also through its numerous and efficient nodules located on the stalk. In coordination with ongoing trials in Senegal and in Mali, Mr Diack will work out field experiments in order to confirm the beneficial use of S. rostrata as a green manure in rice fields. Ways to adapt this farming practice to farmers' needs will be made.

/leguminosae/ /rice/ /nitrogen fixation/ /cultivation practices/

*** /green manures/

FOOD CROPS

Grantee C674: Mr Jean-Pierre Makita-Madzou, Faculté des Sciences, Université Marien NGouabi, B P 69, BRAZZAVILLE, Congo

"Study of the wild-growing edible fruits and seeds in Congo"

IFS funding: 75000 SEK 1983

This project aims at studying all ethnobotanical aspects of the most popular non-cultivated fruits and seeds. Mr Makita-Madzou will carry out a survey in four regions in South Congo: Kouilou, Lekoumou, Niari and Pool. Questionnaires will be designed to identify and record the local names of fruits and seeds, their biotope, their organoleptic properties, and the way they are stored. The grantee will also record the extent to which these fruits have been domesticated and the results. Each sample will be photographed, described and preserved. A chemical analysis of their nutritive value will also be carried out. The most interesting species will be introduced in human and animal feeding and domestication trials will be initiated.

/wild plants/ /fruits/ /seeds/ /nutritive value/

Grantee C675: Dr Andrew Tesha, Department of Botany, University of Dar es Salaam, P O Box 35060, DAR ES SALAAM, United Republic of Tanzania

"Testing and improving drought resistance in maize varieties"

IFS funding: 67500 SEK 1983

Maize is the main subsistence crop in Tanzania. Irrigation is not possible and production is low. The selection and improvement of drought-resistant varieties is desirable.
Dr Tesha will carry out a survey to collect and identify the major maize varieties grown in Tanzania. He will record information on the conditions under which the plants are normally grown. Several screening methods will then be used. Seeds will be germinated under simulated drought conditions, using polyetylene glycol solutions at low osmotic levels and sodium chloride; seedlings will be exposed to low osmotic levels and high temperatures; the amount of carbohydrates will also be measured after subjecting the seedlings to water and osmotic stress.

/maize/

*** /plant collections/ /crop improvement/

FOOD CROPS

Grantee C676: Mr Ahmed Birouk, Département de Génétique et Amélioration des Plantes, Institut Agronomique et Vétérinaire Hassan II, B P 6202, RABAT-AGDAL, Morocco

"Agronomical and genetical evaluation of indigenous lucerne varieties in Morocco"

IFS funding: 75000 SEK 1983

Lucerne is the most important cultivated forage crop in Morocco where a large variety of local cultivars adapted to different regions have been used for many centuries. Mr Birouk will carry out an agronomic and genetic evaluation of cultivars of lucerne collected in different regions of Morocco. The agronomic evaluation will be based on factors such as dry matter yield and the resistance to frequent cuttings and to diseases. The genetic evaluation will be based on quantitative factors as well as on the study of genic or genotypical structures using enzymatic markers.

/forage crops/

*** /plant collections/ /crop improvement/

Grantee C677: Mr Francis Bule, Department of Agriculture, Agriculture Office, P O Box 100, SANTO, Vanuatu

"Yam germplasm collection in Vanuatu"

IFS funding: 18750 SEK 1983

Yam is a staple crop in most of the islands of Vanuatu. A root crop improvement programme was initiated a few years ago but so far no work has been done on yam. Mr Bule will carry out a survey during the yam harvesting season, covering the most important yam-growing areas in Vanuatu. Yam samples will be collected and recordings will be made of local names and all aspects of yam culture in subsistence agriculture, especially identifying major production constraints. The different varieties will then be identified, described and screened for desirable characters.

/root crops/

*** /plant collections/ /crop improvement/ /yams/

FOOD CROPS

Grantee C678: Ms Fatimata Amadou, Institut Supérieur Polytechnique, Université de Ouagadougou, B P 7021, OUAGADOUGOU, Upper Volta

"Study of the biology of indigenous seeds in Upper Volta"

IFS funding: 54750 SEK 1983

Ms Amadou will make a collection and an inventory of the indigenous vegetable species in Upper Volta with an emphasis on weeds. The morphology, the distribution, the dormancy and the germination of the seeds, as well as the competition at the plantlet stage, the growth of the plantlets and the flowering will then be studied. An investigation of the development cycle will enable her to produce seeds. One of the aims of this project is to develop methods to control the weeds harmful for cultivated crops.

/wheat/ /seeds/ /weed control/

*** /plant collections/

Grantee C679: Dr Mahmud Duwayri, Department of Plant Production, Faculty of Agriculture, University of Jordan, AMMAN, Jordan

"Effect of water stress on cereals"

IFS funding: 75000 SEK 1983

Wheat is the main food crop in Jordan. However, the national production is below the annual consumption. One of the main limiting factors to increased production is drought. The development of drought-tolerant varieties is therefore desirable. Dr Duwayri will screen wheat germplasm for different drought-tolerant mechanisms. The promising lines will be crossed to combine the different favourable agronomic characteristics. Further screening of the progeny will be tested. The promising lines will be grown in the Ramtha Research Station where drought conditions occur very often. Selection will be practised under field conditions.

/wheat/

*** /plant collections/ /crop improvement/

FOOD CROPS

Grantee C680: Dr Larbi Najim, Département de Biologie, Faculté des Sciences, Université Mohamed V, B P 1014, RABAT, Morocco

"Biological control of the early blight of apple"

IFS funding: 75000 SEK 1983

Various post-harvest diseases appeared in cold stores in Morocco following the extension of apple tree cultivation. Among them early blight can affect up to 25% of the stored production. Dr Najim will study the morphology and the taxonomy of two fungi: Alternaria and Gonatobotrys, in order to understand some of the aspects involved in the mycoparasitism. He will then carry out a physiological study in order to obtain a substance that could promote or stimulate the development in pure culture of Gonatobotrys. An experiment on the biological control of the early blight will then be initiated in the field using spores of Gonatobotrys to limit the development of Alternaria. A similar experiment will be done in cold stores.

/apples/ /plant diseases/ /biological control/

*** /postharvest losses/ /postharvest systems/

Grantee C681: Dr Ali Zouba, Département de Protection des Végétaux, Institut National Agronomique de Tunisie, 43 Avenue Charles Nicolle, TUNIS, Tunisia

"Biological control of Agrobacterium tumefaciens pathogenic agent of Crown gall"

IFS funding: 75000 SEK 1983

Crown gall is a severe bacterial disease attacking tree nurseries and orchards. Traditional control methods are costly and not very efficient. Biological control has already given positive results with a bacterium, Agrobacterium radiobacter 84, which is able to produce an active substance that controls the pathogenic agent. Dr Zouba will study the behaviour of different Tunisian biotypes of Agrobacterium tumefaciens sp. He will also search for other microorganisms able to inhibit the agent.

/fruit trees/ /plant diseases/ /biological control/

FOOD CROPS

Grantee C716: Mr Mamadou Coundoul, Département de Biologie Végétale, Faculté des Sciences, Université de Dakar, DAKAR, Senegal

"Biological function of lectine in Psophocarpus palustris"

IFS funding: 62400 SEK 1983

Psophocarpus palustris is a grain legume with seeds rich in proteins. Of them, lectine seems to play an important role in different phases of the development of the plant and could have toxic effects. A preliminary study is therefore needed before further developing the cultivation of this plant or selecting varieties of agronomic interest. Mr Coundoul will study the role of lectine during germination, the seedling stage, and the interaction roots-rhizobium. Its role in the protection of the plant against pathogenic agents and insects will also be studied.

/leguminosae/ /plant protection/

*** /crop improvement/

Grantee C717: Mr Ahmed Mazih, Département de Zoologie et d'Ecologie Animale, Institut Agronomique et Vétérinaire Hassan II, B P 438, AGADIR, Morocco

"Survey and study of population dynamics in some sedentary orthoptera, noxious for field crops and pastures"

IFS funding: 80000 SEK 1983

An in-depth knowledge of the bio-ecology of noxious insects and their relationship to the environment is necessary before establishing pest control measures. Mr Mazih has recorded almost 0 orthoptera species and will now proceed with the taxonomy of the main species in fields as well as in non-cultivated areas. At the same time he will make an in-depth study of one of the most important species, Eugaster sp. Population dynamics of this insect will be studied at different stages of its biological cycle. The relationship between population dynamics and the structure of the biotope, climatic conditions and agricultural activities will also be investigated.

pests of plants/ /entomology/

** /taxonomy/

FOOD CROPS

Grantee C718: Dr Agustin Molina Junior, National Crop Protection Center, (NCPC), UPLB, College, LAGUNA 3720, Philippines

"Development of disease forecasting techniques for the disease management of potato late blight"

IFS funding: 71250 SEK 1983

Potato late blight caused by the fungus Phytophothora infestans, is generally the most destructive disease of the potato Solanum tuberosum. In mountain provinces in the Philippines many farmers apply protective fungicides every 4-5 days to control this disease. In order to better time the applications of the fungicides, Dr Molina Junior will attempt to develop a potato blight disease management system through disease forecasting techniques. The possible use of cheap and small computers and/or non-computerized system will be explored. Pilot projects will be established in fields as part of a campaign to demonstrate the system to farmers.

/potatoes/ /plant diseases/ /fungus diseases/ /agricultural training/

Grantee C719: Mr Elijah Akunda, Department of Botany, University of Nairobi, P O Box 30197, NAIROBI, Kenya

"Nitrogen fixation in intercropping systems"

IFS funding: 80000 SEK 1983

Mr Akunda will study the influence of environmental factors on the ability of inoculated soybeans to fix nitrogen when grown alone and when grown together with sorghum. These crops will be grown in monoculture and mixed culture at different densities in order to ascertain yields and identify the most promising optimum cropping system in which neither nitrogen fixation nor yield is drastically reduced. The influence of environmental factors such as soil moisture, air and soil temperature, total soil-nitrogen, nodule activity and photosynthesis on nitrogen fixation will also be studied. The main objective is to find the optimum plant population density.

/intercropping/ /soybeans/ /sorghum/ /nitrogen fixation/

FOOD CROPS

Grantee C720: Dr Sadok Bouzid, Laboratoire de Biologie Végétale, Faculté des Sciences de Tunis, Campus Universitaire, Belvédère, TUNIS, Tunisia

"Use of *in vitro* tissue culture for the rapid multiplication of disease-free *Citrus* clones"

IFS funding: 96000 SEK 1983

Citrus cultivation plays a vital role in the national economy in Tunisia. Its improvement and expansion is however hindered by serious agronomical problems such as virus diseases, aging plantations and rooting difficulties of the cuttings. In order to overcome these problems, Dr Bouzid will attempt to work out a reliable and efficient *in vitro* culture method to obtain homogenous and disease-free clones.

/citrus fruits/ /plant diseases/

*** /tissue culture/

Grantee C721: Mr Salvatore Kaburungu, Faculté des Sciences Agronomiques, Université du Burundi, BUJUMBURA, Burundi

"Research on the humic ferralitic soils of Burundi"

IFS funding: 64000 SEK 1983

In Burundi the humic ferralitic soils cover very large highland areas and are intensively exploited for food crop production. Such cultivation practices are degrading soils already low in fertility. Mr Kaburungu will carry out a field survey of these soils under different ecological systems such as forests, pastures and cultivated land. These observations will be complemented by laboratory test on the micro-morphological composition of the soils. The physico-chemical properties as well as the organic content of these soils will also be studied. The final objective is to arrive at a better understanding of these soils in order to establish soil fertility improvement programmes.

/food crops/ /soil sciences/ /soil fertility/ /cultivation practices/

FOOD CROPS

Grantee C722: Dr Boua Diarra, Section de Recherches Fruitières et Maraîchères, Institut d'Economie Rurale, B P 30, BAMAKO, Mali

"Biological and ecological studies on fruit flies in Mali"

IFS funding: 80000 SEK 1983

Fruit flies Diptera-Trypetidae cause severe losses to mangoes, a much-appreciated fruit in Mali which is also cultivated for export. The larvae, when feeding, burrow into the fruits and destroy them before they are harvested. Mr Diarra will first study the biological cycle of the flies and the importance of the varietal characteristics of the mango trees and of ecological factors in the development of the parasitism. The survival of the flies between the harvesting of mangoes will be studied by investigating the role of intermediary host plants. The main objective would then be to propose control methods.

/fruits/ /pest control/ /entomology/

Grantee C723: Mr Toudou Adam, Ecole Supérieure d'Agronomie, Université de Niamey, B P 10960, NIAMEY, Niger

"Study of cowpea diseases (Vigna unguiculata) in Niger"

IFS funding: 80000 SEK 1983

The cowpea (Vigna unguiculata) is at present the third most important food crop in Niger, and its cultivation is expanding rapidly. It is vulnerable to insects and diseases, resulting in considerable production losses. Mr Adam will first carry out an inventory of the pathogenic agents of the cowpea in Niger and assess their importance and geographical distribution. A more in-depth study will then be made on the most virulent parasite. Its incidence and severity in different ecological zones, under different cultivation systems, and on different cowpea cultivars will be determined. A better understanding of the ecology and epidemiology of the disease would then suggest possible control measures.

/cowpeas/ /plant diseases/

FOOD CROPS

Grantee C724: Ms Thalía Romany P, Department of Plant Biology, Centro Nacional de Investigaciones Cientificas, Av 25 y 158, Cubanacán, HABANA, Cuba

"Effect of tissue culture growth conditions on the improvement of a sugar cane variety"

IFS funding: 76000 SEK 1983

It is estimated that more than one million tons of sugar is lost per year in Cuba due to sugar cane diseases. Disease control could be achieved through resistant varieties. However, classical genetic improvement of sugar cane can take many years. The use of tissue culture is a very promising approach to quickly regenerating disease resistant varieties of sugar cane. Ms Romany P will attempt to establish optimal medium conditions for massive production of subclones from one of the most important commercial varieties in Cuba. Regeneration of the callus, physiological growth conditions and genetic variability of the plants obtained will be studied. The agronomic performance of the best subclones will also be tested under field conditions.

/sugar cane/

*** /crop improvement/ /tissue culture/

Grantee C725: Abdeslam Benazoun, Complexe Horticole d'Agadir, Institut Agronomique et Vétérinaire Hassan II, B P 438, AGADIR, Morocco

"Study of the bioecology of the skolytids of fruit trees"

IFS funding: 56000 SEK 1983

As a consequence of the recent drought in Morocco, a massive invasion of xylophagous coleopters has taken place. Among them the skolytids have caused the most serious damage and resulted in the destruction of thousands of almond and olive trees. Mr Benazoun will study the biological cycle, geographical distribution and population dynamics of three main skolytids: Ruguloscolytus amydali of the almond tree as well as Phloetribus scarabeoides and Hylesinus oleiperda of the olive tree. The ultimate aim is to develop control measures.

/fruit trees/ /pest control/ /entomology/

INDEX BY SUBJECT DESCRIPTORS

This index is comprised of the subject descriptors used at the end of each grantee's research summary. Most of the terms are taken from the OECD MACROTHESAURUS. Asterisks *** indicate that they are not from this source.

Previous Page Blank

INDEX BY SUBJECT DESCRIPTORS

AGRICULTURAL PRACTICES
C272

AGRICULTURAL TRAINING
C075 C188 C207 C248 C347 C382 C446 C718

AGRICULTURAL WASTES
C133 C385

ALGAE
C249 C305 C378

APPLES
C680

BACTERIA
C304 C345 C473

BANANAS
C052 C522

BEANS
C038 C167 C201 C390 C446 C521 C523 C642

BIOLOGICAL CONTROL
C523 C598 C680 C681

CASSAVA
C026 C030 C055 C078 C272 C342 C346 C382 C404 C474 C516 C523
C636 C643

CEREALS
C206 C306 C311 C597

CHEMICAL ANALYSIS
C053 C072 C133 C199

CITRUS FRUITS
C127 C380 C386 C522 C720

CLIMATIC INFLUENCE
C381

COCOYAMS
C419

***

Previous Page Blank

INDEX BY SUBJECT DESCRIPTORS

COWPEAS
C053 C128 C272 C273 C338 C387 C473 C518 C640 C723

CROP IMPROVEMENT ***
C032 C052 C053 C054 C188 C202 C244 C270 C274 C306 C339 C342
C381 C384 C388 C389 C404 C419 C425 C518 C557 C558 C596 C600
C602 C671 C675 C676 C677 C679 C716 C724

CROP LOSSES ***
C029 C391

CROP PROSPECTS
C639

CROP ROTATION
C272 C389

CROP YIELD
C075 C247 C381 C420 C449 C474

CULTIVATION PRACTICES
C073 C075 C127 C166 C167 C170 C202 C203 C244 C248 C249 C269
C271 C304 C310 C324 C339 C340 C343 C344 C347 C381 C382 C383
C384 C387 C388 C389 C403 C424 C446 C516 C559 C596 C640 C671
C673 C721

CULTIVATION SYSTEMS
C069 C124 C181

DESERTIFICATION
C079

DROUGHT
C203

DRYING
C206

ENDOMYCORRHIZAE ***
C473

ENTOMOLOGY
C028 C029 C166 C338 C598 C599 C717 C722 C725

INDEX BY SUBJECT DESCRIPTORS

ENZYMES
C125

EROSION CONTROL
C387 C403

ESSENTIAL OILS
C520

EXPERIMENTAL FARM
C207

FEED
C250

FEED PRODUCTION
C382 C637

FERMENTATION
C135

FERTILIZATION
C188 C269 C310 C343 C635

FERTILIZERS
C053 C133 C135 C249 C305 C337 C384 C475 C602

FOOD CROPS
C131 C247 C248 C343 C721

FOOD PREPARATION
C516 C521

FOOD PRESERVATION
C206 C208

FOOD SPOILAGE
C077 C380

FOOD STORAGE
C077 C125 C205 C208 C380 C521 C603

FOOD TECHNOLOGY
C125

INDEX BY SUBJECT DESCRIPTORS

FORAGE CROPS
C079 C304 C422 C517 C596 C637 C672 C676

FRUIT CROPS
C560 C638

FRUIT TREES
C681 C725

FRUITS
C077 C205 C674 C722

FUNGI
C038 C557 C560 C604 C638

FUNGICIDES
C345 C524 C560

FUNGUS DISEASES
C718

GENETIC IMPROVEMENT
C006 C073 C074 C131 C169 C201 C308 C344 C383 C559 C597 C60
C636

GENETICS
C422

GERMPLASM CONSERVATION ***
C127 C167 C169 C201 C269 C388 C421 C425 C471 C642

GRASSES
C031 C079 C249 C25(

GREEN MANURES ***
C305 C602 C673

GROUNDNUTS
C128 C133 C168 C27:

HERBICIDES
C310

HORMONES
C[illegible]53 C203

INDEX BY SUBJECT DESCRIPTORS

HYBRIDIZATION
C269 C419 C600

INOCULATION ***
C007 C123 C128 C642

INTERCROPPING
C074 C270 C387 C420 C474 C523 C640 C719

IRRIGATED LAND
C639

IRRIGATION
C124 C181 C423 C424

LAND TENURE
C519

LAND USE
C519

LEGUMINOSAE
C007 C028 C031 C033 C054 C072 C073 C074 C079 C123 C126 C169
C199 C203 C244 C270 C304 C306 C311 C599 C602 C637 C673 C716

LIME
C126 C182

MAIZE
C029 C074 C166 C175 C272 C387 C474 C523 C558 C598 C640 C675

MANURES
C635

MICROBIOLOGY
C642

MICROORGANISMS
C180 C209 C341 C601 C641

NITROGEN
C180 C247 C341 C378 C385

NITROGEN FIXATION
C007 C031 C074 C128 C131 C133 C249 C304 C305 C378 C473 C602
C642 C673 C719

INDEX BY SUBJECT DESCRIPTORS

NUTRITIVE VALUE
C026 C027 C170 C188 C199 C421 C559 C603 C637 C642 C674

OIL CROPS
C423

OILSEEDS
C168 C308 C422

OLIVE OIL
C423

PARASITES
C078

PEPPER
C424

PEST CONTROL
C028 C244 C523 C598 C599 C722 C725

PESTICIDES
C523

PESTS OF PLANTS
C029 C166 C208 C309 C311 C338 C558 C641 C717

PHEROMONES ***
C598

PHOTOSYNTHESIS ***
C054

PHYSIOLOGY
C596

PLANT BREEDING
C030 C073 C127 C167 C168 C169 C181 C199 C201 C244 C273 C308
C309 C324 C325 C340 C344 C383 C384 C386 C390 C419 C446 C471
C472 C518 C559 C600 C604 C636 C642

PLANT COLLECTIONS ***
C006 C030 C032 C072 C073 C127 C188 C202 C269 C270 C324 C404
C421 C425 C471 C517 C518 C597 C636 C642 C671 C675 C676 C677
C678 C679

INDEX BY SUBJECT DESCRIPTORS

PLANT DISEASES
C029 C038 C052 C078 C166 C273 C309 C339 C340 C342 C345 C379
C386 C391 C419 C446 C524 C557 C560 C604 C636 C638 C643 C671
C672 C680 C681 C718 C720 C723

PLANT ECOLOGY
C127 C203 C596

PLANT METABOLISM ***
C054

PLANT NUTRITION
C027 C069 C175 C180 C305 C601

PLANT PATHOLOGY
C390

PLANT PROPAGATION ***
C520

PLANT PROTECTION
C167 C601 C716

POSTHARVEST LOSSES ***
C055 C307 C311 C522 C524 C560 C599 C603 C638 C680

POSTHARVEST SYSTEMS ***
C055 C077 C307 C380 C522 C560 C603 C680

POTASH
C475

POTASSIUM
C126

POTATOES
C055 C379 C718

PROTEINS
C026 C027

RHIZOBIUM ***
C007 C031 C033 C123 C128 C131 C133 C304 C473 C64

INDEX BY SUBJECT DESCRIPTORS

RICE
C180 C249 C305 C309 C378 C449 C602 C673

ROOT CROPS
C032 C202 C269 C270 C274 C307 C347 C381 C389 C391 C419 C420
C421 C425 C604 C677

ROOT NODULATION ***
C007 C131

SALINE SOILS ***
C517 C639

SALINE WATER ***
C423 C424

SEED PRODUCTION ***
C074 C167 C168 C169 C188 C201 C324 C325 C472 C476 C597

SEED STORAGE
C379

SEEDS
C324 C325 C674 C678

SHIFTING CULTIVATION
C519

SILOS
C208

SOIL ANALYSIS
C124 C126 C182 C517 C635 C639

SOIL CONSERVATION
C207

SOIL EROSION
C248

SOIL FERTILITY
C033 C175 C249 C250 C346 C420 C473 C721

SOIL IMPROVEMENT
C079 C126 C175 C182 C209 C247 C343 C385 C424 C635

INDEX BY SUBJECT DESCRIPTORS

SOIL MANAGEMENT
C272 C337 C341 C346 C384 C385 C403

SOIL POLLUTANTS
C209

SOIL SCIENCES
C721

SOIL TYPES
C182

SOLANACEAE ***
C471

SORGHUM
C341 C719

SOWING
C520

SOYBEANS
C007 C028 C033 C128 C181 C7

SUGAR CANE
C601 C724

SULPHUR
C180

SWEET POTATOES
C055 C476 C559 C603

TARO ***
C269 C347 C381 C391 C421 C476 C604

TAXONOMY ***
C170 C269 C717

TISSUE CULTURE ***
C273 C476 C720 C724

INDEX BY SUBJECT DESCRIPTORS

TOMATOES
C075 C383 C384 C472 C5

TOXIC SUBSTANCES
C199 C516 C637

VEGETABLE CROPS
C027 C069 C073 C126 C2
C474 C635 C638 C641 C6

VEGETATIVE PROPAGATION
C274

VIROLOGY
C029 C273 C386

VIRUSES
C379 C604

VITAMINS
C027

WASTE RECYCLING
C135

WATER CONSERVATION
C248

WATER REQUIREMENTS
C181 C271

WEED CONTROL
C678

WHEAT
C678 C679

WILD PLANTS
C006 C032 C127 C170 C269 C344 C421 C422 C520 C674

YAMS
C006 C055 C125 C188 C202 C274 C307 C310 C339 C388 C524 C600
C603 C677

***

INDEX BY COUNTRIES

This index presents grantees by country.

INDEX BY COUNTRIES

BANGLADESH
C308 C425

BENIN
C387

BURUNDI
C208 C721

CHINA
C672

COLOMBIA
C029 C077

CONGO
C342 C343 C344 C516 C599 C643 C674

CUBA
C601 C724

DOMINICAN REPUBLIC
C521

EGYPT
C379 C383

ETHIOPIA
C558

FIJI
C347

GHANA
C206 C420 C472

GUATEMALA
C205

HAITI
C642

INDIA
C031 C054 C079 C124 C199 C244 C517

Previous Page Blank

INDEX BY COUNTRIES

INDONESIA
C032 C072 C181 C182 C421 C475

IVORY COAST
C006 C052 C125 C274 C307 C449

JAMAICA
C311

JORDAN
C679

KENYA
C027 C028 C075 C338 C719

LIBERIA
C207

MADAGASCAR
C135

MALAWI
C167 C671

MALAYSIA
C007 C026 C073 C127 C169 C180 C201 C269 C305 C378

MALI
C597 C602 C722

MOROCCO
C596 C676 C680 C717 C725

NIGER
C247 C723

NIGERIA
C053 C078 C170 C209 C250 C310 C339 C446 C474 C524

PAPUA NEW GUINEA
C388

PERU
C074 C389 C390 C403 C471

INDEX BY COUNTRIES

PHILIPPINES
C202 C381 C382 C641 C718

REPUBLIC OF KOREA
C069

SENEGAL
C128 C133 C337 C635 C673 C716

SIERRA LEONE
C271 C272 C273 C522 C559

SOLOMON ISLANDS
C604

SOMALIA
C520

SRI LANKA
C249 C306 C638 C639

SUDAN
C380

SWAZILAND
C270

THAILAND
C033 C055 C126 C346 C384 C519 C560 C637

TONGA
C391

TRINIDAD AND TOBAGO
C248 C340 C345

TUNISIA
C324 C325 C422 C423 C424 C681 C720

UGANDA
C523 C636

UNITED REPUBLIC OF CAMEROON
C188 C419 C518 C598 C600 C640

INDEX BY COUNTRIES

UNITED REPUBLIC OF TANZANIA
C030 C038 C168 C203 C309 C404 C675

UPPER VOLTA
C341 C385 C473 C557 C603 C678

VANUATU
C677

VENEZUELA
C386

VIET NAM
C476

ZAIRE
C123 C131

ZAMBIA
C166 C175