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PROGRESS REPORT OF THE RESEARCH AND EXTENSION COMPONENT OF THE INTEGRATED AGRICULTURAL DEVELOPMENT PROJECT

PREPARED BY

THE INTERNATIONAL PROGRAM DEPARTMENT
HAITI TEAM OF
TEXAS A AND M UNIVERSITY

FEBRUARY 1982

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DAMIEN PORT-AU-PRINCE, HAITI

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C. Short term Technical Advisors (15 person/months)

The short-term advisors will assist the long-term advisors in specific areas. The short-term technical services envisioned in-

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de papas (CIP), to the International Institute of Tropical Agriculture (IITA) and to Center of Tropical Agriculture Investigations and Training (CATIE).

Since DARNDR had no office space and since the Damien Experiment

Acknowledgement

The progress made during 1981 in this Research and Extension component of the Integrated Agricultural Development Project (PIMI) is not only the result of the integration and collaboration among the various contractors of the various components of the project but also is due to the direct involvement and active participation of officials of the Department of Agriculture, Natural Resources and Rural Development (DARNDR) and the Faculty of Agronomy and Veterinary Medicine (FAMV) in this subproject. Each institution has representatives on the Agricultural Research and Extension coordinating board and their function is to help define the goals, locate areas in which to work, to make the necessary contacts within these districts, to assign dedicated and qualified Haitians as counterparts to the foreign scientists and to make a careful selection of candidates for both specialized short term and long academic training.

By their active involvement, this has truly become a Haitian project planned by Haitians to resolve Haiti's agricultural production problems and the Texas A & M University team members are providing temporary leadership until the Haitian counterparts are sufficiently experienced to assume this role. Whatever success this project has had is due to a great extent to their interest and active participation. We hereby acknowledge and greatly appreciate their contributions.

Robert L. CHEANEY
Chief of Party
Texas A & M University
USAID/Haiti

ABREVIATIONS USED IN THIS REPORT

TAMU	Texas A and M University, College Station, Texas
DARNDR	Department of Agriculture, Natural Resources and Rural Development, Port-au-Prince, Haiti
SERA	Agricultural Research Service, Port-au-Prince, Haiti
CIAT	International Center for Tropical Agriculture located in Cali, Colombia
CIMMYT	International Center for the Improvement of Corn and Wheat, located in Mexico City, Mexico
IITA	International Institute for Tropical Agriculture, located in Ibadan, Nigeria
CIP	International Potate Center, located in Lima, Peru
ICRISAT	International Crops Research Institute for the Semi Arid Tropics, located in Hyberadad, India
IRRI	International Rice Research Institute, located in Los Banos, Philippines
CATIE	Center of Tropical Agriculture Investigations and Training, Turrialba, Costa Rica
FAMV	Faculty of Agronomy and Veterinary Medicine, Port-au-Prince, Haiti

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SUMMARY

A contract was signed on December 1, 1980 between Texas A & M University, the Government of Haiti and the U.S. Agency for International Development giving Texas A & M University the responsibility of the Research and Extension component of the Integrated Agricultural Development project. The primary objective of this component is to increase the production of the basic food crops and to improve the economic situation of the operations of the small farmers in Haiti. (Period covered Jan. 1, 1981 to Jan. 31, 1984).

The first two members of the four-man team arrived in Haiti in February 1981. The remaining two members arrived in June 1981. The first step in the research program was to collect local varieties and to evaluate and compare them with introductions from the international agricultural centers and from other countries. During 1981, the following numbers of varieties and plant materials were grown and evaluated.

Crop	No. Varieties or Cultivars	Source of Material
Corn	12	CIMMYT - Haiti
Sorghum	80	ICRISAT-CIMMYT, Texas, Haiti
Cowpeas	53	IITA - Texas
Okra	1	Texas
Sweet Potato	66	Philippines, Dominican Republic, Taiwan, United States, Haiti
Cassava	43	Philippines, Dominican Republic, CIAT, Brazil, Haiti
Malanga	4	Dominican Republic, Costa Rica
Mazombel (Colocasia)	3	Philippines, Costa Rica, Haiti
Yam	2	Dominican Republic
Potato	7	CIP, Peru

The results obtained in 1981 show that within the introduced varieties and plant materials, there are present plant types which in preliminary tests appear to be superior to local Haitian varieties. Corn and sorghum varieties were found which were higher yielding and have good acceptability in Haiti. Some cowpea lines produced more than 3000 Kgs/Ha and mature in 2-3 months. Cowpeas are capable of supplying considerable amounts of Nitrogen for other crops such as corn,sorghum, sweet potato and others. Tropically adapted potatoes yielded 12-15 Tons in 75 days from planting and offer an alternate food crop for the lowlands.

Many cassava and sweet potato cultivars were collected, multiplied and are in evaluation trials which will be harvested during 1982.

Many cropping systems including corn, cassava, sweet potato, beans and cowpeas are under investigation.

A questionaire was prepared and used to collect economic data from farmers in les Cayes, Croix des Bouquets and the North West areas of Haiti. Cost of production Tables for 1981 are shown for plantains, corn,beans, rice and peanuts (Dominican Republic).

Four participants for long term academic training were processed and enrolled in the Master of Science degree program at Texas A & M University. One participant is majoring in Horticulture, one in Agricultural Economics and two in Irrigation Management.

PROGRESS REPORT OF THE RESEARCH AND EXTENSION SUBPROJECT, A PART OF THE INTEGRATED AGRICULTURAL DEVELOPMENT PROJECT

TEXAS A AND M UNIVERSITY, HAITI STAFF

FEBRUARY 1982

Haiti is an island nation of about 6 million people. Eighty percent of its people live in rural areas and depend almost entirely on agriculture for their livelihood. The total land area in Haiti is about 6,850,00 acres (2,772,470 Has) of which 80% is mountainous. Temperatures are generally favorable for most warm season crops all year round in the lowlands and cool season crops can be grown in the highlands. The average yearly rainfall may vary from under 20 inches per year in the semiarid areas to over 60 inches in the more humid areas. According to the 1981 Businessman's Guide to Haiti, there are 620,000 farms covering 2,150,000 acres. The average land holding is 3,5 acres (1.4 hectares) but many farms may be only 1/4 to 1/2 acre in size. The demand for land is so great, that the trees in the mountain sides have largely eliminated and crops are planted on steep slopes which should never have been cultivated. Trees and brush on mountain sides are also used for making charcoal, the principal fuel for cooking. This have caused serious erosion problems which has, in many areas, eroded the soil down to the bare rocks. Farms still in production on such areas cannot be taken out of production without serious consequences since they produce the only means of livelihood for their operators. The eroded soil is then deposited in the irrigation canals in the lowlands reducing their capacities and efficiencies. From this small garden-sized area, the farmer must produce food for his family on a year round basis and some money to buy other necessities. He plants a variety of crops so that if one fails due to adverse climatic conditions or other reasons, there will still be something produced from the other crops. Planting dates are timed so that there is moisture for germination and for the critical growth period. If there is poor distribution or deficient rainfall, then crops fail and this is a major catastrophe for the small farmers. Varieties planted, in many cases are those which have traditionally been grown for many years. Most farmers receive little or no credit and therefore use little or no fertilizer and other agricultural chemicals. Most cannot read and write and technical printed material would be

of no value. He depends on his eyes and word of mouth for his agricultural know how. Agricultural extension must therefore be on a personal contact basis. The farmer has not only to contend with floods and drought and other natural disasters but he also, loses sizable amounts of production to rats, birds and storage insects. Since the farmer has no financial reserves and has no collateral to secure loans, his crops and his land are his bank and his security depends on always having some food crops growing that can be harvested as needed.

A very high percentage of his production and his necessary requirements moves to and from the markets on the heads of the people, as other transportation either does not exist or is too costly. The end result is that not enough food is being produced in Haiti and must be imported. In 1982, these amounts of food will probably need to be imported.

	Cost/Ton	Metric tons	Approximate $ Value (in Hait
Rice $ 550/ton		25,000	13,750,000
Corn (for animal feed)	$ 133/ton	10,000	1,300,000
Soybeans (for oil)	$ 325/ton	10,000	3,350,000
Wheat for flour	$ 180/ton	173,000	31,000,000
		Total $	49,350,000

Agricultural exports make up more than 50% of the total exports from Haiti and coffee alone represents 35% of the total. However, coffee production is declining due to much of these areas being planted in food crops, sugar, formerly an export crop, has had to be imported during the last two years.

Aggravating the problem of shortage in food supply in the lack of appropriate technologies to improve the present level of crop production. There is virtually no source of technology packages to support extension activities on a continuing basis. Research work has been hampered by lack of trained scientists and facilities to do research. Extension activity is further limited by an inadequate number of personnel with each extension worker covering an area too big for him to carry out his work effectively.

There is no suitable available land in Haiti to put into production

that is not already in production and some of the areas presently used for cropping should be put into permanent vegetation. Increased production will have to come about by increasing yields/ha, on the same land.

The United States Agency for International Development and officials of the Haitian Ministry of Agriculture jointly developed an integrated Agricultural Development Project (PDAI) for Haiti. This project was divided into four component parts.

These are:
(1) Integrated Management Technology
(2) Soil Conservation
(3) Irrigation
(4) Agricultural Research and Extension

Each of the four components was given to a different contractor and on Dec. 1, 1980, Texas A and M University signed the contract for Technical Assistance for the Agricultural Research and Extension component The effective date of the project is January 1, 1981 through Jan 31, 1984. The general objective and statement of work as defined in the contract is repeated in the following pages:

STATEMENT OF WORK

The general objective of the contractor services to be provided is to assist the Research Service (SERA) of the Ministry of Agriculture, Natural Resources and Rural Development (DARNDR) in strengthening its capacity to conduct research in traditional Haitian crops and also develop a capacity to deliver the positive results of said research to the Haitian peasants. Performance period is thirty seven months.

A. Scope of Work

The Contractor will be responsible for providing technical assistance to strengthen the linkages between the SERA and the Extension Services through the development of technological packages of traditional Haitian food crops by the Research Service and the creation in the Extension Service of the

capacity to disseminate these production improvement techniques to the target farmers. In order to accomplish this, the contractor will field a long term advisory team comprised of four (4) senior advisors which will be supplemented as necessary by additional short term consultants. Three of the advisors will be production agronomists with extensive experience in tropical agronomy and specialists in Cereals production, Root and Tuber production and Pulses production. The fourth long term advisor will be a farm management specialist with experience in small farmer production systems.

The Contractor will assist SERA in the development of both in-service and overseas training programs for SERA personnel. The off-shore component will consist of both long term academic training and short term production training and seminars in research and extension; while the in-service training will focus on the planning and operational aspects of applied agricultural research. Also, the team will assist SERA in the delivery of selected production packages to the participating farmers through the design and utilization of appropriate farmer training programs.

The technical assistance team will utilize a collaborative and multidisciplinary approach in providing the required services to SERA, i.e. each advisor will coordinate his responsibilities as necessary to assure the success of the joint overall research effort.

Specifically, the technical advisory team will be responsible for providing the following assistance to SERA:

-- Assist in the development of an appropriate organizational and staffing plan, along with a manual defining duties and responsibilities for SERA personnel and extension agents assigned to the research program.
-- Assist in the preparation and execution of research plans to determine economically applicable production packages for Haitian farmers.
-- Assist in the preparation of yearly work plans and budgets (including procurements) for implementation of the project.
-- Assist in establishing two research stations, one at Damien Farm near the DARNDR headquarters, the other at Levy Farm or at another adequate place in the les Cayes plain.
-- Assist in forming farmer groups for training and for the establishment of cooperative on-the-farm, DARNDR-farmer trials and demonstration plots.
-- Assist in the coordination of problem solving and information exchange with the other components of the Integrated Agricultural Development Project.
-- Assist in the establishment of training programs for SERA personnel to off-shore training program will be comprised of sending a group of five (5) Research and Extension Service personnel each year, for each of the three years of the Project, for short-term training in research and extension. The courses will last four to six months. A long term training program (graduate level) is also planned for three candidates. All off-shore trainees will be selected jointly by SERA and the contractor, and approved by DARNDR and USAID.
-- Assist SERA in developing appropriate baseline data necessary to evaluate project progress and the impact of the research activities.

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B. The duties of the long-term advisory team members are as follows:

Production Agronomist-Cereals (37 person-months)

-- Act as team leader and be the advisor to the Chief of Research Service, the Director General of DARNDR and USAID on the overall management, coordination and implementation effort of the Research/Extension component of the Project. Offeror may propose another team member as team leader.

-- Assist in the re-structuring of the SERA to improve efficiency, allow for better program management and establish the appropriate linkages between SERA and the Extension Services.

-- Assist SERA in planning future activities, including schedules of work and defining duties and responsibilities for its personnel.

-- Assist in devising research to increase the quality and yields of traditional Haitian cereal crops (corn, millet, sorghum, rice, etc)

-- Assist in establishing demonstration plots to train farmers in the use of production packages and improved farming techniques.

-- Assist in establishing and/or strengthening linkages between the SERA and appropriate international institutions including U.S. universities and international research centers.

-- Assist in the coordination and development of the overall training effort for the project, plan for future training endeavors by the SERA, locate appropriate institutions and training facilities for all participant training, obtain candidate's documentation and prepare the necessary forms for participants overseas training.

-- Assist in establishing appropriate baseline data to evaluate progress and performance of the research activities.

-- Designate an acting team leader during his absence.

Production Agronomist-Pulses (37 person/months)

-- Assist the SERA in designing research plans for pulses traditionally grown by the Haitian peasant (cowpeas, kidney beans, pigeon peas, red beans, etc...)

-- Assist in designing both the appropriate technological packages for pulses production and adequate dissemination methods for the delivery of such to the targert farmers.

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-- Assist in establishing demonstration plots to train farmers in the use of production packages and improved farming techniques.
-- Assist in developing in-service training programs in research methodologies for irrigated and rainfed type agriculture (on flatlands and hillsides).
-- Assist in establishing, organizing and operation of two (2) Research stations

Production Agronomist-Root and Tuber Crops (37 Person/months)

-- Assist the SERA in designing research methodologies for traditional Haitian root and tubercrops (cassava, sweet potatoes, malanga, taro, potatoes, etc...).
-- Assist in designing both the appropriate technological packages for root and tubercrop production and adequate dissemination methods for the delivery of such to the target farmers.
-- Assist in establishing demonstration plots to train farmers in the use of production packages and improved farming techniques.
-- Assist in developing in-service training programs in research methodologies for irrigated and rainfed type agriculture (on flatlands and hillsides).

Farm Management Specialist (37 person-months)

-- Assist the SERA in designing and planning of research programs which are economically feasible and adaptable for target farmers.
-- Assist in the analysis and evaluation of the recommended technological packages in order to assure the development of research programs appropriate to the Haitian milieu in terms of selected technologies and inputs.
-- Assist in developing experimental designs for the study of variables involved in traditional Haitian farming systems (both on flatlands and hillsides)
-- Assist in conducting comparative studies of mono-culture cropping vs. multiple cropping techniques.
-- Assist in the training of counterpart economists/farm managers aimed at establishing a farm management and economic analysys unit in SERA

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C. Short term Technical Advisors (45 person/months)

The short-term advisors will assist the long-term advisors in specific areas. The short-term technical services envisioned include: entomology, plant pathology, soil fertility, farming systems, and extension delivery systems. The list of short-term specialist is meant to be illustrative, specific needs will be determined by the chief of the technical assistance team during the life of the project. The contracting of the short-term advisors is contingent upon the prior written approval of DARNDR and USAID/Haiti.

PROJECT INITIATION

The first two members of the four man Texas A and M team arrived in Haiti on February 21, 1981 to begin their assignment. These members were Robert Cheaney, Chief of Party and Cereal Crop Specialist, and Mack Fuqua, Horticulture and Plant Breeder. They were accompanied by Bill Ross, Campus Coordinator and Assistant Director of International Programs.

Temporary offices were set up within the USAID main office until other arrangements could be made with the Ministry of Agriculture. Also, since no project vehicles has as yet been purchased, transportation had to be furnished by USAID.

The first few weeks were spent in reading reports on Haiti's problems in locating and furnishing houses. A number of meetings were held with Mr. Gustave Ménager, Director of the Division of Agriculture (DARNDR), Mr. Julio Barthelemy, Head of the Research Division of DARNDR (SERA), Mr. Montaign Cantave, Director General of DARNDR and Dean Réaillot Léveille of the Faculty of Agronomy and Veterinary Medecine.

The Texas A & M team prepared a list of criteria to be used in selecting participants for long term and short term training and requested a one hectar plot of land on the Damien Experiment Station on which to begin the plantings of varietal observational lines of sorghum, rice, cowpeas, and other vegetable crops.

Letters requesting seeds, plant materials and training information were sent to the Centro Internacional de Mejoramiento de Maiz Y Trigo (CIMMYT), the Centro Internacional de Agricultural Tropical (CIAT), the Centro Internationa

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de papas (CIP),to the International Institute of Tropical Agriculture (IITA) and to Center of Tropical Agriculture Investigations and Training (CATIE).

Since DARNDR had no office space and since the Damien Experiment Station was under the control of the FAMV, there had to be an agreement between the two organizations before an office could be established and the research plots planted. The two team members were assigned a temporary office in an unused classroom at the FAMV pending the conclusion of an agreement.

On April 8, 1981, DARNDR began furnishing transportation to and from Damien but no transportation was available during the day or to visit the interior of Haiti. During April and May, considerable time was spent in working on the organization of a Food Crops Research Service within DARNDR and FAMV and working out floor plans for converting an unused classroom into offices for the TAMU group and to soliciting prices for the construction of office petitions and for purchasing office furniture and equipment. Mr. Lionel Richard was named by Dean Leveille as head of the Damien Exp. Station and Haitian Coordinator for the TAMU project.

During May 1981, rice seed, from IRRI, sweet potato tubers, cassava cuttings and taro corms were received from the Philippines and corn variety tests and four bean varieties were received from CIMMYT.

On May 27, 1981, TAMU team received their first official vehicle, a jeep cherokee. The experimental station at Damien was severely infested with Johnson grass, Bermuda grass and purple nutsedge. These are three very hard control serious weed and require a special herbicide for their control which was unavailable in Haiti. The herbicide, Round Up, was ordered from the Dominican Republic.

In order to facilitate the purchasing of supplies and the training of long term participants, it was decided to amend the contract and to transfer these funds from DARNDR to Texas A and M University. Dr. Mack Fuqua hand carried these amendments to College Station, Texas and discussed procurement procedures with TAMU officials. He returned to Haiti on June 16 together with the TAMU root and tuber specialist, Dr. Marianito Villanueva. The fourth and last member of the team, the Agricultural Economist and farm management specialist, Dr. Merritt Taylor, arrived in Haiti on June 23, 1981.

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A Jeep CJ 7 was assigned to the TAMU Team during the latter part of June and the Jeep Cherokee was exchanged for a second jeep.

On July 7, 1981, Director General, Cantave by executive order announced the organization of the Food Crops Research Program clearing the way for the construction of the office, the purchase of the office furniture and the preparation of the one hectare research area on the Damien Farm. The organizational strutures is shown below.

Project Director
Montaigu Cantave
Dir. Gen. DARNDR

Coordinating Committe

Gustave Menager
Dir. Div. of Agr.

Rémillot Léveillé
Dean/FAMV

Wilner François
Adm. DARNDR

Responsible
Dam Exp. Station
Lionel Richard

TAMU Team

Head
Research Service
(SERA)
Julio Barthelemy

Mr. Richard was later replaced by Mr. Jacques Backer.

In this order, FAMV was given the responsibility for research on the Damien Farm and SERA will have the responsibility for all other locations. TAMU will work with both organizations.

On July 24th, the herbicide, Round Up, was applied to the one hectare experimental area, previously assigned to the TAMU staff. After allowing several weeks for the action of the herbicide, the land was prepared and irrigated prior to planting of the experiments.

Research Activities during 1981

The secondary objectives of the Research and Extension Program are as follows:

1- The identification of problems affecting crop production
2- Introduce and evaluate genetic plant material of the important food crops and to compare yields and acceptability with local Haitian plant material.
3- Compare various sequences of crops and cropping systems, including intercropping, mixed cropping and multiple cropping in order to find more effective ways to increase production and raise living standards of the rural Haitians.
4- Train potential Agricultural Program Leaders in US and other accredited universities and to train crop production specialists in research and extension methods at some of the International Agricultural Centers and by short courses and on the job training in Haiti.
5- Development of appropriate technologies which can be used on the small farms in various parts of Haiti.
6- Study production costs, and the economics of technology packages on small farms as compared to present low technology methods.
7- Conduct on farm demonstrations of varieties, cropping systems and other technology in the important agricultural regions of Haiti so that farmers can compare results with their traditional varieti and methods.
8- Multiply and purify the better adapted varieties for distribution to farmers and for use in farm demonstrations.
9- Purchase equipment for use in conducting field and laboratory trials on the Damien Experiment Station and at other locations in Haiti.
10- Construct office and or laboratory buildings for use at the Damien Exp. Station and at Les Cayes.

Cereals Research completed or in progress in 1981

Two corn variety tests (varieties received from CIMMYT and including two local varieties) were combined in a split plot experiment to check the performance of each of the varieties with and without fertilizer. Two hundred and seventy five Kgs/ha of the 12-12-20 fertilizer was incorporated by hoe in the soil on the fertilized blocks and these areas were sidedressed with one hundred and seventeen Kgs/Ha of Urea 20 days later. The corn was planted on Sept. 3, 1981.

The Yields of corn expressed in Kgs/Ha are shown in Table 1.

Table 1. Comparison of Yields of Ten CIMMYT Corn Varieties and two local Haitian corn varieties with and without Fertilizer.

UNFERTILIZED

Variety	Rep 1	Rep 2	Rep 3	Rep 4	Average
	Kgs/Ha	Kgs/Ha	Kgs/Ha	Kgs/Ha	Kgs/Ha
Poza Rica 7427	912	2079	2849	3150	2218
Across 7726	1582	2526	2009	3508	2406
Poza Rica 7726	2906	1504	2649	1070	2032
La Maquina 7827	2386	2751	1415	3104	2414
Siete Lagos 7728	2861	3224	2320	3247	2913
Poza Rica 7928	2060	3151	2184	3141	2634
Levy 7835	2794	1172	2986	2655	2402
Tocumen 7926/1	1800	3151	2407	2828	2547
La Maquina 7928	2514	2928	2725	2164	2583
Les Anglais	222	1894	1582	1279	1244
Chicken Corn	888	1151	1126	1685	1213

Table 1. Continued

Table 1. Continued

FERTILIZED N 87, P_2O_5 33, K_2O 55 Kgs/Ha

Variety	Rep 1	Rep 2	Rep 3	Rep 4	Average
	Kgs/Ha	Kgs/Ha	Kgs/Ha	Kgs/Ha	Kgs/Ha
Poza Rica 7427	1857	2085	2800	2247	2247
Across 7726	2083	1679	2684	2904	2338
Poza Rica 7726	3759	3498	4645	1665	3392
La Maquina 7827	3787	1662	2638	744	2208
Siete Lagos 7728	2790	2028	2314	1767	2225
Poza Rica 7928	3305	1735	3405	2904	2837
Levy 7835	3101	2406	2279	1332	2280
Tocumen 7926/1	3066	1448	4041	2250	2701
Tocumen 7931/1	1285	1800	2452	3471	2252
La Maquina 7928	1795	1578	1724	3396	2123
Les Anglais	823	1186	908	376	823
Chicken Corn	2339	241	1753	2466	1700

The experiment was planted by hand on September 2 and harvesting occured between November 27 and December 14. The experimental design used was a split plot with fertilizer as the main plot and varieties as the subplot.

The analysis of variance of the yield data is shown in Table 2

Table 2. Analysis of Variance of Corn Variety Experiments

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	Observed F
Block	3	1,849,122	616,374	NS
Fertilizer	1	114,955	114,955	NS
Error A	3	5,503,797	1,834,599	NS
Variety	11	23,336,454	2,121,496	3.90
Variety X Fertilizer	11	6,621,400	601,945	NS
Error B	66	35,929,873	544,392	

Table 3

Variety	Yields Kgs/Ha	Days from planting to silking	Panel Taste Results	
			Good	Inferior
Poza Rica 7427	2248	58	18	6
Across 7726	2372	55	12	12
Poza Rica 7726	2712	55	4	20
La Maquina 7827	2311	55	16	8
Siete Lagos 7728	2569	56	24	0
Poza Rica 7928	2736	55	24	0
Levy 7835	2341	54	0	24
Tocumen 7926/1	2624	55	24	0
Tocumen 7931/1	1956	52	24	0
La Maquina 7928	2353	56	24	0
Les Anglais	1034	60	0	24
Chicken Corn	1757	57	24	0

Although the statistical data indicate a highly significant difference between varieties and all of the CIMMYT varieties were superior to the two local varieties, les Anglais and Chicken Corn, care should be taken in the interpretation. The experiment was severely damaged by the parakeet, Aratina chloroptera, the woodpecker, Malanerpes striatus and was planted in an area surrounded by trees and was the only corn field in the area at that time. Haitian farmers usually all plant corn in March or April and avoid high bird populations.

Although, a worker was employed to protect the experiment from the birds, this was proved ineffective and it is estimated that the yields were reduced by about 40% by the bird damage. The greatest damage apparently occured in the fertilized areas since more corn was available for the birds to damage. Indications are that the fertilized yields of undamaged corn would have equaled or exceeded 4000 Kgs per Ha. The damage was so severe that no significant increases in yield due to fertilizer were detected. Rats were also a serious problem in nearby corn experiments but baiting by the USAID vertebrate control specialist, gave very good rat control in this experiment.

All of the corn varieties and some selected sorghum varieties were milled and cooked by farmers and their families from the Croix-des-Bouquets area who are cooperators in the Isralei extension project. Panels of 24 farmers and their wives rated both the corn and sorghum. The ratings were based on fineness of grinding and taste after cooking. A summary of the yield data together with days to 50% silking and results of the tasting panels are shown in Table 3.

Based on yields, taste preference and earliness, it would appear that Across 7726, Poza Rica 7726, Levy 7835, Tocumen 7931/1 could be eliminated from future tests, since each one has one or more undesirable characteristics. The remaining varieties are among those that gave superior results in the CIMMYT trials in the les Cayes Plain during the spring and summer of 1981.

II. Grain Sorghum Variety and Hybrid Tests

(a) Texas Variety Observation Nursery

This trial consisted of 17 varieties planted in one row plots and short and tall varieties, some of which could be used for food, forage or energy. These varieties were planted August 26, 1981. Only four varieties were harvested for further testing.

TABLE 4 Performance of Texas Sorghum Variety Observation Nursery

	Variety	Source	Days to Flowering	Height (cms)	Yield kg/Ha
1	77CS3	80T5021	70	132	Not harvested
2	77CS1	80T5001	70	150	" "
3	M35-1	79T24	70	312	" "
4	San Bernando	79T206	90	347	" "
5	SAP 0	79T212	-	229	" "
6	RTAM 428	80T5031	64	127	1637
7	CS 3541	80T510	61	152	3368
8	RT X 430	GT	58	132	Not harvested
9	Rio	80T121	64	253	" "
10	Keller	80T126	65	294	" "
11	BT X 623	FS	64	119	" "
12	BT X 624	FS	64	157	2920
13	Hegari	80T133	55	137	1170
14	BT X 3197	FS	58	109	Not harvested
15	Sugar Drip	80T143	62	262	" "
16	79 T 263-1	80T5054	65	155	" "
17	79 T 284-6	80T5058	64	191	" "

Date of planting: Aug. 26, 1981
Fertilization : N 92 P 17 K 43 Kgs/Ha
Date of Harvest : December 20, 1982

Since no threshing equipment was available and all samples had to be threshed by hand, only the more promising lines were selected. These were lines 6, 7, 12, and 13. Line 13 produced considerably less than the other lines but is earlier and more drouth resistent and will be included in tests in the drier regions of Haiti. Since the tall varieties could not be sprayed with insecticide by the available back pack sprayers, the sorghum midge damage to these varieties was very high and almost no grain was produced. Sacks were placed over some of the panicles at the beginning of flowering in order to maintain the purity of the line and only those panicles protected by the sacks produced satisfactory grain yields.

(b) Observation of 7 Israely Sorghum Varieties

TABLE 5 Performance of Israeli Sorghum Varieties

Variety		Days to 50%	Plant Height	Head Lenght	Exertion (cm)
18	HL4-1	65	152	33	5
19	HL4-3	65	142	29	5
20	HL3	64	142	31	6
21	HL5	64	150	31	10
22	HL2	63	142	28	2
23	HL 11	61	127	23	14
24	HL 8	61	226	22	14

Date of planting: August 26, 1981 Date of Harvest: December 20,1981

Only panicles protected by paper bags were harvested from these varieties. Three varieties HL4-3, HL 3 and HL 2 will be used in future trials.

(c) Variety Test of ICRISAT (CIMMYT) Grain Sorghum Varieties

Twenty eight varieties were received from Dr. Vartan Guirragossian, ICRISAT Sorghum Breeder stationed at CIMMYT in Mexico. These were compared on a replicated randomized block experiment with the two Haitian varieties, Madam Avocat and Gros Bougon. The experiment was planted on September 3, 1981 and harvested between 6-7 of January 1982. All plots were fertilized with 92-17-43 Kgs/Ha. of N,P, and K respectively.

This experiment was planted on September 2, 1981 and harvested on December 20, 1981. All varieties received N 92 P 17 K 43 Kgs/Ha of fertilizer. There was considerable rain during this period and some slight problems with mold in the panicles.

TABLE 6 CIMMYT Y.T.L.A. Yield of ICRISAT Grain Sorghum Varieties (Head in Kgs/Ha)

Station..Damien.....

ding date.....

..../21

Plot No.	Pedigree	Origin	YIELD - KGS/HECTARE HEAD WEIGHT R 1	R2	R3	AVE.
1	(IS12611xSC108-3)-1-1-2-1	Zac81A1530	4376	2614	5739	4243
2	" 1-2-1	1531	5966	3097	3068	4044
3	" 4-4-8	1533	3239	3920	3153	3439
4	" 7-2-1	1534	2852	6563	1733	3746
5	(TAM428xE35-1)-2-1	1536	3494	4119	3836	3816
6	(GPR168xSC170-6-17)-1-1	1538	3864	4261	2727	3617
7	(GPR148xE35-1)4-1xCS3541)5-1-2	1543	4801	4261	5341	4801
8	IS12611x(Bulk-YxGPR165)-4-3)8-2	4 1544	5369	4015	3438	4274
9	(2Kx17-1)(SC108-3xCS3541)-3-1) 1	-1 1545	5242	4943	5540	5243
10	(CS3541xET2039)-11-2x(SC-108-3) (GPR148)-12-10)-42-1-1	1547	1932	284	5057	2424
11	M90360	SEPON TL81A-729	3409	5057	3580	4015
12	M90608	SEPON 735	3125	3920	5000	4015
13	2027	D.T.56-759	2926	227	1250	1468
14	SEPON 80-6	SEPON 766	5852	4830	3864	4849
15	SEPON 80-38	778	5398	3892	4347	4512
16	M63656	849	2813	2188	2781	2595
17	D-71443	ICRISAT ISDRON29-1	131 2159	2500	2612	2131
18	D-71444	" 30-11	32 3097	313	1563	1533
19	D-71205	" 31-11	33 1395	2983	2188	2188
20	D-71448	" 33-11	35 4605	3892	5687	4224
21	M36285 (SC108xE35-1)	PR81A 61-63	3125	3835	1108	2689
22	M50009	190-195	5938	4659	4290	4962
23	M62641(SC108xCS3541)E-15-5	215-222	3778	4119	3807	3901
24	M63594(SC108xCS3541)-19	313-318	1534	4403	4261	3399
25	M50013 (S.B.)	432-435	4716	4517	3182	4138
26	SEPON 78 (Bulk)	453-466	3068	5028	2785	3627
27	SEPON 77	486-489	5597	3523	3324	4148
28	M90975	725-726	3295	2767	2606	2896
29	VARIEDAD LOCAL, MADAM AVOCAT		0	0	0	0
30	VARIEDAD LOCAL, GROS BOUGON		0	0	0	0

TABLE 7 Days to Flowering, Plant Height and Percent Lodging of ICRISAT Sorghum Varieties

Plot No.	Pedigree	Origin	Days to Flowering	Plot Ht. cm.	L g
1	(IS12611xSC108-3)-1-1-2-1	Zac81A1530	60	128	
2	" 1-2-1	1531	60	182	
3	" 4-4-8	1533	62	124	
4	" 7-2-1	1534	63	125	
5	(TAM428xE35-1)-2-1	1536	58	143	
6	(GPR168xSC170 6-17)-1-1	1538	63	186	
7	(GPR148xE35-1)4-1xCS3541)5-1-2	1543	60	122	
8	IS12611x(Bulk-YxGPR165)-4-3)9-2-4	1544	63	125	
9	(2Kx17-1)(SC108-3xCS3541)-3-1)-1-1	1545	63	1[illegible]2	
10	(CS3541xET2039)-11-2x(SC-108-3)(GPR148)-12-10)-42-1-1	1547	66	1[illegible]9	
11	M90360	SEPON TI 81A-729	62	163	
12	M90608	SEPON 735	56	139	
13	2027	D.T.56-759	68	228	
14	SEPON 80-6	SEPON 766	60	188	
15	SEPON 80-38	778	60	162	
16	M63656	849	64	[illegible]	
17	D-71443	ICRISAT ISDRON29-1131	65	[illegible]	
18	D-71444	" 30-1132	63	112	
19	D-71205	" 31-1133	65	[illegible]	
20	D-71448	" 33-1135	59	163	
21	M36285 (SC108xE35-1)	PR81A 61-63	63	188	
22	M50009	190-195	62	191	
23	M62641(SC108xCS3541)E-15-5	215-222	62	201	
24	M63594(SC108xCS3541)-19	313-318	62	196	
25	M50013 (S.B.)	432-435	60	212	
26	SEPON 78 (Bulk)	453-466	64	180	
27	SEPON 77	486-489	65	184	
28	M90975	725-726	69	185	
29	VARIEDAD LOCAL Madame Aucker		58	264	
30	VARIEDAD LOCAL Pitiri, Gros Bougou		80	309	

Analysis of variance of the yield data for the ICRISAT Latin American yield trials sorghum varieties test are shown in Table 8

TABLE 8 Analysis of variance of ICRISAT-CIMMYT Sorghum Variety Test

Source of Varieties	Degrees of Freedom	Sum of Squares	Mean Square	Observed F
Varieties	27	87,212,135	3,044,894	2.22 **
Replications	2	1,541,047	460,524	
Error	54	74,037,154	1,371,059	

The local varieties were not used in the analysis of variance since they grew very tall, matured later and produced no grain due to sorghum midge attacks. Because of the difficulty of hand threshing, head weights were used in the calculations. Grain weights are estimated to be about 65 to 75% of head weights. Thirteen of the thirty varieties had head weights of 4 metric tons per Hectare or more. The lower yielding varieties were those that grew tall and lodged before grains filling. Fourteen of the higher yielding varieties of this test and two from the Texas observation nursery were used in an acceptability preparation and taste testing experiment utilizing panels made up of 24 farmers and their families. The panels were chosen from residents of the Israeli project near Croix des Bouquets. The milling and taste tests results are shown in Table 9.

TABLE 9 Ratings of Acceptability of 16 Sorghum Varieties in Milling and Taste Tests

	Variety	Milling	Panel Taste Tests Good	Inferior
ICRISAT				
1	(IS12611 X SC108-3)-1-1-2-1	Inferior	17	7
7	(GPR148 X E35-1) 4-1-CS3541)5-1-2	"	23	1
8	(IS12611X(Bulk-YXGP12165)-4-3)-8-2-4	"	6	18
9	(2KX1701)(SC 108-3XCS3541)-3-1)-1-1	"	24	0
11	MD0360	Superior	24	0
12	MD0608	Inferior	6	18
14	SEPON 80-6	"	24	0
15	SEPON 80-38	Superior	24	0
20	D 71448	"	21	3
22	M 50009	Intermediate	25	0
23	M62641(SC108 XCS3541)E-15-5	Superior	15	9
25	M50013 (S.B.)	"	6	18
26	SEPON 78 (Bulk)	"	24	0
27	SEPON 77	"	24	0
Texas 7 CS3541		Superior	0	24
Texas 12 BT X 624		Inferior	24	0
Madam Charmant (check)		-	4	20

Twelve of these varieties received good rating in the tast tests as compared to the test variety Madam Charmant. The milling rating is less precise since the sorghum grain was prepared by a number of persons using the hollowed log morter and wooden pestle and certainly some samples were ground finer than others. Further testing will be carried out in other sorghum growing areas before making a final decision on which varieties to continue testing.

(d) Comparison of Yields of Hybrid Grain Sorghums from Texas

Twenty six hybrid sorghum varieties were received for testing in Haiti from Dr. Fred Miller, Texas A and M University, Sorghum breeder. Although hybrids are not being recommended for the Haitian farmer due to the cost and difficulty in purchasing new seed each year, hybrid seed may have to . imported at times because of hurricanes or severe drouths which destroy crops

and reduce seed supplies of varieties.

The results of this experiment is shown in table 10.

TABLE 10 Yields of Texas Hybrid Sorghum Varieties

	Variety	Yield in Kgs/Ha (head Weight)			
		Rep 1	Rep 2	Rep 3	Average
1	ATX623 X RT X 430	5292	2410	4329	4010
2	ATX378 X RT X 430	5670	5150	2836	4552
3	RS 610	4914	4017	3733	4222
4	AT X 624 X 77 CS3	5716	4017	4725	4819
5	A1388 X 77CS3	5434	4536	3497	4489
6	AT X623X77CS256TS	6237	4253	5103	5197
7	AR X 622 X 77CS 2	3685	4631	4017	4111
8	AT X 623 X 76 Cs 388	4064	3450	3685	3733
9	ATX623 X 76 Cs 5388	3497	5387	4820	4668
10	AR X 623X72T123-1	6095	4347	4186	4876
11	AT X 622XRTX7000	4394	3780	4678	4284
12	A ATLAS X RT X 430	4961	3780	2646	3796
13	AT X622XRTX430	4631	3213	2598	3481
14	ATX622XRTX2536	3024	3968	2693	3229
15	ATX622XRTX09	4017	3968	2883	3622
16	ATX622XRTAM428	3307	6945	4253	4836
17	AT905 X RTAM428	5339	6425	1513	4426
18	AR X 623 X Rio	5387	5150	5008	5008
19	AT X 622 X M35-1	5339	3733	2835	3968
20	AT X 623 X CS 3541	5481	5245	2598	4441
21	AT X 623 X ADN # 55	3780	4488	3213	3827
22	AT X 622 X 76CS 490	3685	3874	3733	3764
23	AT X 622 X 76CS 478	5339	2598	2930	3622
24	AT X 622 X 79 CS2091	4394	5434	4583	4804
25	AT X 623 X 77CS 1006	3733	5451	3591	4220
26	AT X 622 X 77CS1	3024	4914	3544	3827

Date of Planting : Sept. 4,1981

Date of Harvest : Jan. 8,1982

Fertilization : 92 N - 17 P - 43 K Kgs/Ha

Due to difficulties in hand threshing large numbers of samples, the yields of the hybrid sorghums were also, reported in terms of head weights in kilograms per hectare. The ratio of grain wt/head weight can be estimated at 0.65 to 0.75. There was no significant difference in the yields as shown in Table 11.

TABLE 11 Analysis of Variance of Yields of Hybrid Sorghum Varieties

Source of Variation	Degrees of Freedom	Sum of Squares	Mean of Squares	Observed F
Replications	2	11,740,391	5,870,196	7.29**
Varieties	25	16,929,978	677,199	NS
Error	50	40,236,975	804,740	

The days to 50% flowering, plant height and lodging data for the hybrid varieties are shown in Table 12

TABLE 12 Days to 50% flowering, Plant height and % Lodging of the Texas Hybrid Sorghums

Hybrid	Days to Flowering	Plant Height cms	Lodging %	
1	62	168	0	
2	53	170	67	Red
3	53	146	0	
4	61	214	0	
5	63	206	0	
6	63	159	0	Red
7	65	149	0	
8	60	142	0	
9	59	165	0	
10	60	150	0	
11	52	180	67	
12	58	273	0	
13	60	161	67	
14	61	163	0	
15	56	163	0	
16	61	157	33	
17	60	152	0	
18	60	271	67	
19	61	307	33	
20	59	232	67	
21	55	147	33	
22	63	152	0	Orange
23	60	155	33	
24	60	168	0	
25	60	167	0	
26	61	210	0	

Although there was no statistical difference in yields at the 5% level the earliness, yields, height, lodging resistance and color of Hybrid Nos. 9,10,16,24,25 appear to make them preferable over the other hybrids. Nos 2,6, and 22 avo either red or orange color and the Haitian consumer prefers a cream colored or white grain type.

CEREALS PROGRAM DURING 1982

A. Corn

The TAMU cereal crop specialist will collaborate with CIMMYT Scientists in conducting nine corn variety and agronomic trials in the Central Plateau. This is in addition to corn trials in the Les Cayes area and at Damien, Croix des Bouquets. Five new varieties are being introduced to replace the less productive varieties used in 1981. All varieties will be planted using traditional methods for the zone and their acceptability will be evaluated after harvest.

One promosing corn varieties from the 1981 experiments in Les Cayes and Damien are being incorporated into cropping systems and two others that are being multiplied at Damien should give a sufficient quantity of seed for farm demonstrations and for large scale multiplication during 1983.

B. Grain Sorghum

Two variety tests comprising 20 sorghum varieties will be planted in Gonaives and Damien to determine which varieties produce best under irrigation and under limited rainfall conditions.

Six to eight variety tests comprising 12 varieties will be planted in Les Cayes and in the Central Plateau utilizing traditional planting methods for the area. One system on better land is to plant corn and pigeon peas in the same hill and at about 60 days after planting, to interplant sorghum between the corn plants. Sorghum is planted as a monocrop on the poor sloping marginal land.

C. Corn and Grain Sorghum

Corn and Grain Sorghum will be planted as monocrops intercrops with cowpeas and in rotations with cowpeas in an experiment in Damien. The corn and sorghum will be planted without fertilizer to determine the effect of atmosphere nitrogen fixed by the cowpeas.

Corn, pigeon peas and sorghum will be intercropped in an experiment at Damien and will be compared to each of the crops grown as monocrops.

Training Plans - Cereals 1982

A. In country

A one week short course during the period March 1 to 6 on corn production was held at the Levy Farm in les Cayes for a number of the agronomes working in the Cayes and Central Plaetau region. The course was supervised by Hugo Cordova and Mike Yates of CIMMYT and by Haitian agronomes, Reynold Pierrelus and Elliassaint Magloire of the PDAI Program, Levy Farm.

B. Off-Shore

Two agronomes will be sent to CIMMYT to obtain training in corn production and agricultural extension procedures.

One agronome presently in training at CIMMYT in sorghum production and research methodology under Dr. Vartan Gurragossian, will return to Haiti and rejoin the cereal research program in July 1982.

One Agronome, presently working with corn seed production and processing will be sent to CIAT in July for a 6 weeks course in seed processing plant operation and adaptation of machinery to process other classes of seeds.

PULSE AND VEGETABLE RESEARCH COMPLETED -

Pulses belong to the large plant family leguminosae, many of which are a basic food for the population of Haiti. Pulses, in one form or another, are included in the daily diet of most citizens whether residing in the cities or country side; thus, pulses are a cash crop as well as a basic food for the small farmer.

The common Haitian-grown pulse, bean (Phasealus vulgarus), pigeon pea (Cajanus cajan), lima bean (Phaseolus lunatus) and cowpea (Vigna unguiculuta) supply the major portion of protein and essential amino acids in the native diet, such as lysine that is deficient in cereals and other edible plant families. Thus, the combination of pulses and cereals provides a good balance of amino acids, since cereals, such as corn, usually supply adequate methionine for a nutritious diet.

Legumes possess another biological attribute in converting atmospheric nitrogen into ammonia, a soluble form of nitrogen, which can be utilized by plants. This is accomplished by a symbiotic process between legumes and a soil bacteria belonging to the genus Rhizobium. These legumes usually meet their requirements for nitrogen without fertilizer. This attribute is very important in developing countries. The small farmer can utilize pulses and other legumes in a farming system whereby he does not have an expenditure for expensive nitrogen fertilizer and, yet, produce an average yield.

Cowpea is a grain legume that is versitile to a wide range of environmental conditions. Immature pods, mature green peas and dry peas are all used for food in many parts of the world. It is a short cycle, 2 to 3 months, crop and many cultivars can be grown throughout the year in subtropical and tropical regions.

The species is a rapid fixer of atmospheric nitrogen and is compatible as an intercropping legume. This report is an adaptability and performance study of 4 cowpea trials, 3 of which were from International Institute of Tropical Agriculture International trials and the other was from the breeding and development program at Texas A & M University.

Performance data are presented in Tables 13, 14, 15, 16

Field trials were initiated on the Faculty Agronomy and Veterinary Medecine research farm at Damien on September 2, 1981. Cowpea, Vigna unguiculata breeding line trials were planted in randomized blocks with 4 replications 4 meters long an beds 1 meter wide. Each row contained 25 to 30 seeds. Some 51 different genetic lines were planted in the 4 trials with a simple garden precision planter. Plant population averaged 5 per square meter.

Seed germination and plant emergence were complete within 7 days. Rhizobium spp. root nodules were present at 7 days of age. Vigna species are one of the more rapid fixers of atmospheric nitrogen in symbosis with Rhizobium spp.

All trials received 548.8 mm of water, including 4 irrigation during the growing cycle. The average daily temperature was 27.4^{o}C with the maximum extreme being 36.2^{0}C and the minimum extreme 21.3^{0}C. Insects were adequately controlled with 4 sprays at approximately 2 week intervals. There were no major disease problems.

TABLE 13. IITA 1981 Cowpea International Performance Trial No. 1

	Plant Height cm	Plant Height cm	Days to 50% Flw.	Days to 50% Mature	Yield Gm/plant	Yield Kg/Ha
1. VITA 4	60	100	48	58	9.54	2814
2. VITA 5	70	80	48	57	7.49	1929
3. TV x 3236-01G	70	70	50	61	7.49	1855
4. TV x 3516-09G	60	50	44	55	9.18	1629
5. TV x 3627-012F	50	50	44	55	7.67	1534
6. TXu 3671-3C-04D	50	30	46	58	8.04	1649
7. TVu 3671-14C-01D	40	200	48	61	9.61	1539
8. TVu 4072-1C-01D	40	200	48	60	10.85	1980
9. TV x 4262-09D	50	40	42	55	9.18	1675

TABLE 14. IITA 1981 Cowpea International Performance Trial No. 2

LINE	Plant Height cm	Plant Height cm	Days to 50% Flw.	Days to 50% Mature	Yield gm/Plant	Yield Kg/Ha
1. VITA 4	50	100	49	61	4.94	2341
2. VITA 7	45	88	48	60	10.25	2639
3. TVu 3629	50	85	46	61	5.93	1469
4. TVu 1948-01F	50	90	48	59	18.19	3229
5. TV x 2724-01F	66	85	50	58	10.95	2190
6. TV x 3048-02J	50	75	47	58	9.73	1995
7. TV x 3871-02F	50	84	48	59	9.30	1487
8. TV x 4262-014D	48	56	46	58	11.39	2080
9. TV x 4272-05D	35	80	46	58	11.95	2181

TABLE 15. IITA 1981 Cowpea International Performance Trial No. 3

LINE	Plant Height cm	Plant Height cm	Days to 50% Flw.	Days to 50% Mature	Yield gms/plant	Yield Kg/ha
1. VITA 1	40	90	47	59	6.32	1234
2. VITA 3	40	100	47	61	11.46	2149
3. VITA 4	35	80	47	62	8.69	1890
4. VITA 6	50	80	47	61	9.54	1837
5. TV x 1576-01E	70	90	46	59	8.15	1855
6. TV x 1836-013J	45	90	45	55	6.81	1838
7. TV x 2394-02F	66	100	48	59	7.46	1715
8. TV x 2912-011D	65	120	47	59	10.19	1834
9. TV x 2938-02G	52	63	48	61	12.31	2616
10. TV x 3368-03K	50	59	47	61	10.94	1669
11. TV x 4262-01E	48	60	45	58	12.11	1937
12. TV x 4272-013D	30	35	45	55	7.82	1193
13. TV x 4571-07D	43	65	47	57	4.99	1385
14. TV x 4577-02D	70	72	47	56	5.36	1514

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TABLE 16 TAMU Cowpea Breeding Line Performance Trial No. 4

LINE	Days to 50% Flw.	Days to 50% Mature	Yield gm/plant	Yield Kg/ha
1. TX-56-B	44	53	9.05	1607
2. TX-31-B-1	44	52	4.04	1071
3. TX-55-B	45	56	8.24	1814
4. TX-23-B	45	57	11.87	2374
5. TX-3-B	42	50	4.48	919
6. TX-31-B-2	46	56	4.43	1175
7. Elite	47	59	6.14	1274
8. TX-PE # 7	44	51	4.23	1026
9. TX-31-B-3	45	55	6.39	1870
10. TX-31-B-4	45	52	3.69	885
11. TX-52-B	46	51	5.34	1416
12. TX-86	46	52	3.83	1026
13. TX-68	44	50	4.43	1405
14. TX-18	46	53	3.82	335
15. TX-63	47	55	4.63	729
16. TX-9	45	53	6.23	1495
17. TX-80	46	53	4.64	778
18. TX-37	47	59	9.75	1049
19. TX-L-573	45	55	5.85	1696

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An associated crop trial was planted in September, 1981 which included sweet potato, Ipomea batatas, and cowpea, Vigna unguiculata in a randomized complete block with 4 replications in cooperation with M.R. Villanueva. Treatments were cowpea monocrop, sweet potato nomocrop, cowpea-sweet potato associated.

Sweet potato cuttings were stuck on beds 1 meter wide and 5 meters long apart on September 1981. Cowpea were seeded in the row on September 23, 1981 20 cm apart. Insects were adequately controlled with 3 sprays of "Malathion" insecticide. The cowpea received 4 supplemental irrigations before harvest and the sweet potatoes received an adlitional 3 before they were harvested. No fertilizer was applied tc the plots. The cowpeas were harvested on December 3, 1981 as dry grain. The sweet potatoes were harvested on January 25, 1982.

Monocrop cowpeas yielded 1100 Kg/ha of dry grain. Monocrop sweet potato yielded 9,659 Kg/ha of fresh roots. Associated yield of cowpea was 790 Kg/ha and associated sweet potato yield was 8,763 Kg/ha.

Vegetable and animal oils are a very important component of the diet of the population for cooking purposes and a source of protein. Okra, Abelmoschus esculentus, a commonly grown vegetable crop in Haiti can also produce as much or more vegetable oil per land area than other well known oil seedcrops. In fact, it has been reported that the production of vegetable oil from okra seed can exceed all other vegetable oil crops except the African Oil Palm.

At the present time, commercial vegetable oil producings crops are not grown in the country. Thus, the development of an oil seed crop technical production package for the small farmers could mean much to the economy.

On September 9, 1981, an okra seed production trial was planted with one variety, "Clemson Spineless". The trial was planted in a complete randomized block design with 4 replications. The plant population was approximately 20 plants per square meter. Insects were controlled with 3 sprays of "Malathion" insecticide. No fertilizer was applied. A single harvest of dry pods was made on December 1, 1981. The yields was 1251 Kg/Ha of dry seed. Seed from the trial are presently being processed in a local oil seed laboratory.

Legume, Oil Seed and Vegetable Research and Extension

1982 Plan

1. Continue to evaluate new legume, oil seed, and some major vegetable crop germplasm for adaptability under the small farmer environment and socio-economic means in farming systems.

2. Establish a small farming system research-demonstration project near Jacmel in cooperation with the District Extension Agronome and some small farmers utilizing proven germplasm and cultural techniques.

3. Continue to evaluate okra seed production for oil extraction in association and on intercropping system with food legumes.

4. Plant soybean and peanut adaption and yield trials for nitrogen fixation and vegetable oil production.

5. Plant proven pigeon pea germplasm lines, day-lenght sensitive and non-sensitive, adaptive trials in small farming systems.

6. Plant some 40 winged bean varieties for adaptive and food acceptance trials.

7. Increase seed of selected legumes for dissemination to small farmers.

8. Establish a simple microbiology laboratory for the determination of legume species and varieties ability to fix atmospheric nitrogen in symbiosis with Rhizobium species.

9. Dr. Fenel Felix, my Haitian counterpart, will be the leader in conducting the above research and extension plans for 1982. I continually stress this program is for Haitians conducted by Haitian Agronomes and Technologists for the small farmers under the supervision of the project legume and vegetable specialist.

ROOT AND TUBER CROPS

Based on the annual production output, the tropical root crops (sweet potato, manioc, malanga, mazombel and yams) combined are the major sources of carbohydrates in Haiti. They are grown throughout the country and in certain regions they are under more intensive cultivation than others.

Potato is also grown in a few localities, but unlike the other tuber crops, potato is more of a commercial crop catered mostly to the rich sector of the population. Its production is still limited to the cool highlands using varieties from temperate countries.

According to the available statistics (1979) the average production of root and tuber crops in Haiti ranges from less than 2 to about 5 tons per hectare. These figures are among the lowest in the world and very low compared to the production potential of the crops. The low production levels can be attributed to a few factors like adverse growing conditions, poor cultural management and use of low yielding varieties. Apart from the agronomic factors affecting production, the discriminating preference for specific quality characteristics often results in the use of varieties with suitable quality but not necessarily high yielding. Consequently, the research strategies adopted to improve root and tuber crop production are directed toward the problems mentioned above considering also the socio-economic conditions of the Haitian farmers.

I. Varietal Improvement

In terms of research, highest priority was given to varietal improvement. This is a standard approach to increasing food production. To harness the most benefits from production inputs such as fertilizers and insecticides and from improved cultural management such as better land preparation and weed control, the variety used must have a high genetic potential.

A. Germplasm collection

The first step undertaken was to collect germplasm materials from local and international sources. Contacts were established with international centers such as the Centro Internacional de Agricultura Tropical (CIAT), Colombia, Centro Internacional de Papa (CIP) Peru, International Institute of Tropical Agriculture (IITA), Nigeria and with individual institutions. A trip was also undertaken to the Dominican Republic for the same purpose. Planting materials were obtained in forms of true seeds, tubers and stem cuttings. The materials were planted immediately at the Damien Farm for seed multiplication and in preparation for screening. As of the end of February 1982, the germplasm collections consisted of the following:

1. Sweet potato (Ipomea babata Linn)

Source	Number of accessions
Philippines	7
Dominican Republic	16
Taiwan	3
Haiti	34
United States	6
Total	66

2. Cassava (Manihot esculenta Crantz)

Source	Number of Accessions
Philippines	2
Dominican Republic	11
CIAT, Colombia	4
Brazil	1
Haiti	24
	42

3. Malanga (Xanthosoma sp)

Source	Number of Accessions
Dominican Republic	2
Costa Rica	2
	4

4. Mazombel (Colocasia esculente)

Source	Number of Accessions
Philippines	1
Costa Rica	1
Haiti	1
	3

5. Potato (Solanum tuberosum)

Source	Number of Accessions
Peru	7

6. Yam (Dioscorea alata)

Source	Number of Accessions
Dominican Republic	2

B. Varietal Screening

1. Sweet Potato

One replicated trial with 20 entries(accessions) was planted on December 15, 1981. Each accession was planted in two-row plots at spacing of one meter between rows and 25 cm between plants in the row equivalent to 40,000 plants per hectare. All accessions are replicated three times in a randomized complete block design. The entries in this test are distributed as follows:

Source	Number of Accessions
Philippines	6
Taiwan	3
Haiti	11
Total	20

This trial will be harvested on or about April 15, 198s. The data to be gathered will include weight and number of marketable and non-marketable tubers, incidence of sweet potato weevil (Cylas formicarius), taste acceptibility, and physical characteristics.

A preliminary quality test was conducted on the six (6) Philippine varieties harvested from the seed multiplication plot. Testing was done by the field workers and a few employees from the Faculty of Agronomy and from the Ministry of Agritulture. Two of the six varieties met the requirements of those who participated in the evaluation in terms of physical characteristics and eating quality. Although the other four varieties were inferior in quality based on the initial testing, they were included in the replicated production test for further evaluation.

On February 25, 1982, (8) local accessions were brought to Les Cayes for regional evaluation in a replicated test following the same procedure used at the Damien Farm. These eight (8) entries were also in the replicated test above at Damien. The trial at Les Cayes will be harvested at about the end of June 1982. In addition to yield data and acceptability for food, incidence of insects and diseases will be noted.

2. Cassava

One replicated trial with nine (9) accessions was set up on December 8, 1981. Each accession was planted in three-row plots at a spacing of 1 X 1 m, equivalent to a population of 10,000 plants per hectare. Each plot was replicated three (3) times arranged in randomized complete block design. The entries in this test are distribured as follows:

Source	Number of Accessions
Brazil	1
Colombia	4
Dominican Republic	1
Philippines	1
Haiti	2
Total	9

In addition, there were three (3) sets of preliminary screening in single-row unreplicated trials as follows:

a) local materials with 19 entries planted on September 8, 1981.
b) CIAT materials with five (5) entries planted on September 8, 1981.
c) Dominican Republic materials with six (6) entries and local materials with nine (9) entries planted on October 20, 1981.

Harvesting and preliminary evaluation will be done one year after planting. However, harvesting one of the varieties (CMC 40 from Brazil)will be done at 6, 8, 10 and 12 months after planting to determine its optimum cycle. This was the only variety for which enough materials were obtained to allow periodical harvesting.

3. Potato

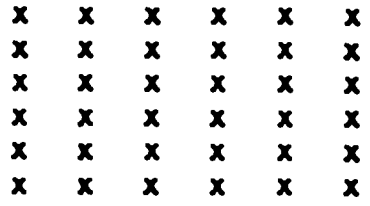
Seven (7) tropical lines of potato were obtained from Centro Internacional de Papa (CIP), Peru. They were planted on Nov. 17, 1981 in single rows for preliminary observation. Harvesting of all varieties was done on February 1, 1982. There was heavy infestation of ants from the vegetative stage until harvest that resulted in loss of some plants and harvesting earlier than necessary for some of the varieties. The data obtained are presented in Table 17.

Table 17. Yield and other agronomic characters obtained for some selected CIP potato lines

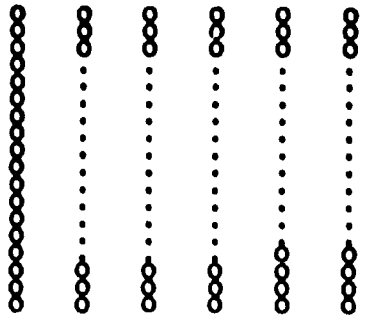
Line	No. of plants harvested	Ave. No. of Stem/Plant	Ave. No. of Tubers/Plant	Average tuber wt/plant (grams)
DTO 33	7	1.71	4.00	134.60
LT-1	4	1.75	3.75	173.30
LT-2	4	2.00	4.75	143.53
ASN-69-1	3	1.00	4.33	88.85
SERANNA	4	1.50	3.75	211.48
B-71-240.2	2	1.00	1.50	35.80
DTO-28	3	1.66	5.66	141.93

x x cassava
ooooo beans

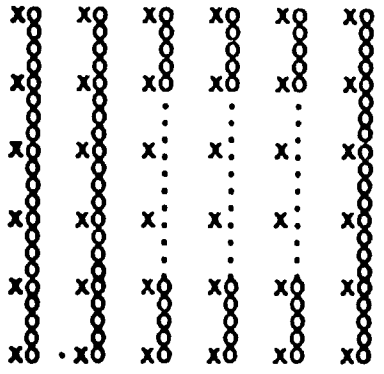
Treatment 1 - Cassava monoculture



Treatment 2 - Bean monoculture



Treatment 3 - Cassava-bean intercropping



Treatment 4 - Cassava-bean double row intercropping

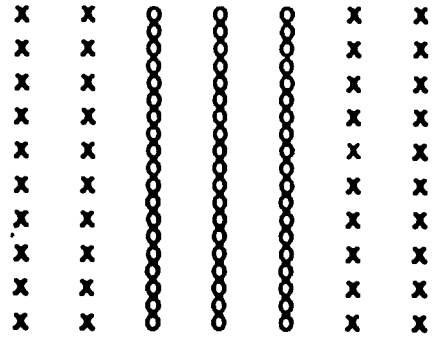


Figure 1 - Field layout for each of the treatments in the cassava-bean association experiment.

Despite the ant infestation yield of about 12 tons per hectare was obtained for the variety Serrana. Although this level of production is low when compared to production levels in the highlands, it opens up a new venue for the production of potato in the lowland, which does not exist in Haiti. All potatoes in Haiti are grown in the highlands using European and American varieties.

II - Production Techniques

A. Cassava-Bean association

This is designed to intensify land use and find out the most economically productive system of growing cassava and beans in association. Traditionally, when two or more crops are grown in association, they are planted at about the same time and share equally the same land space. Consequently when grown with cassava, a tall, long maturing crop, only one cropping of a short-season intercrop can be grown in one season.

In this study, growing vegetable legumes as intercrop with cassava is being done continously by planting beans in strips between double rows of cassava. The plant population for cassava is maintained at the same levelas in monocrop system.

Both cassava and mung beans a Pois mong (Vigna radiata) were planted on October 7, 1981 in four (4) treatments: 1) monocrop of cassava 2) monocrop of beans 3) cassava-bean intercrop wherein one row of bean was planted next to cassava in the same row and 4) cassava-bean intercrop wherein three (3) rows of bean between double rows of cassava. These treatments are illustrated in Figure 1. Although the population of cassava per unit area remains the same for treatments 2 and 3, the population of beans in treatment 3 is only two-thirds of treatment 2. The first crop of bean was harvested on December 8, 1981. In the second cropping of the bean intercrop, the species was changed to black beans (Phaseolus vulgaris) var. Tamazulapa from CIAT, Colombia.

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The yields of beans harvested from the first crop are presented in Table 18.

Table 18. Yield of beans (Vigna radiata) grown in various systems as intercrop to cassava.

Treatment	Bean Yield (Kg/Ha) *
Monoculture (check)	911.70
Intercrop (traditional practice)	825.96
Double -row	413.52
* Average of three replications	LSD.01 = 224.76

The partial results show that highly significant reduction in bean yield occurred by using the double-row method as compared to the monoculture and traditional method of intercropping. There was no significant difference between the monoculture and the traditional intercropping. Inasmuch as the total population of beans and cassava in all systems are the same, the yield reduction in the double-row method must have resulted from the greater intraplant competition in this system considering that the same population was planted in an area one-third smaller compared to the other. However, while a second intercropping has become impossible for treatment 2, it is still possible for treatment 3. Hence, the second crop was planted on December 21, 1982 in the double-row treatment. Further cropping will be continued whenever feasible until cassava is harvested.

B. Cassava-corn association

This kind of associatied cropping is one of the most widely practiced in Haiti. However, it has been observed that when intercropped to cassava, farmers do not use the same population of corn as in monoculture although the population of cassava appears to be about the same. It was, therefore, the objective of this study to determine the maximum population of corn that can be grown with cassava without jeopardizing the production of the latter.

A randomized complete block design with three (3) replications was used in this study. The treatments were as follows:

1. Monoculture for cassava (check 1)
2. Monoculture for corn (check 2)
3. 25% of corn population (1 plant per meter row)
4. 50% of corn population (2 plants per meter row)
5. 75% of corn population (3 plants per meter row)

Cassava populations in treatments 1, 3, 4 and 5 were the same at 10,000 plants per hectare. Planting was done on January 12, 1982. Harvesting is expected in May 1982 for corn and at the end of 1982 for cassava.

C. Spatial distribution and effect of length of cuttings used on cassava production

In some parts of Haiti, the traditional practice is to use short cuttings (10 cm long) planted in pairs at 1m apart. The usual recommendation is to use about 25 cm long cuttings planted at 1m apart. Since those farmers have not tried the latter or any other method, the advantage or disadvantages of the traditional practice could not be determined, hence, this study.

Apart from comparing the traditional system with the recommended method, a modification of the traditional system was introduced. The treatments were as follows:

1. 10 cm cuttings planted in pair at 1m apart within the row (farmer's practice)
2. 10 cm cuttings planted singly at 50 cm apart within the row
3. 25 cm cuttings planted singly at 1m apart within the row (recommended practice)

The treatments were arranged in randomized complete block design with three replications. Rows were spaced at 1 m apart in all treatments. Each treatment consisted of six (6) rows 5 m long. This experiment was planted on January 14, 1982 and expected to be harvested at about the end of 1982. Rate of growth and productivity between the systems will be compared.

III. Other Activities

A. In-country training

In cooperation with CIAT, Colombia a training course on cassava production was formulated in mid-February 1982. This training course was tentatively scheduled to be conducted at Cap-Haitien from July 26-31, 1982. For the second time, Mr. Carlos Dominguez of CIAT came to Haiti to assist in the preparation of the course program.

A maximum of twenty (20) participants from the research and extension divisions of the Ministry of Agriculture are slated to take the course. Selection of the participants will be done by the Ministry of Agriculture.

The course will cover land preparation, selection and storage of planting materials, planting methods, nutritional requirements, weed control, harvesting and post-harvest technology, economics of cassava production and transfer of technology. The objective of the course is to update extension, workers and young researchers on current techniques in cassava production.

B. Off-Shore Training

Some Haitian agronomists and technicians have identified for short-term training on root and tuber crops. Two agronomist were slated to go to IITA in Ibadan, Nigeria to participate in a two-month training course on root and tuber crop production covering sweet potato, yam, aroids (cocoyam) and cassava. This course will start on May 10, 1982.

A lady technician has been slated to go to CIAT, Colombia in mid-1982 to train on meristem culture. When she returns to Haiti, she will set ups a simple laboratory that can handle materials introduced by meristem culture from international centers.

C. Linkages

Through communication and personal contacts, linkages in behalf of the Haitian Ministry of Agriculture have been reestablished with the following institutions:

1. IITA, Ibadan, Nigeria
2. CIAT, Cali, Colombia
3. U.S. Department of Agriculture
4. CIP, Lima, Peru
5. North Carolina State University, U.S.A.
6. Louisiana State University, U.S.A.
7. CATIE, Turrialba, Costa Rica
8. Philippines, Root Crop Research & Training Center, Philippines
9. Department of Agriculture, Dominican Republic

Personal contacts were established and reestablished with some scientists from IITA, CIAT and CIP. One June 28, 1981, Dr. Roger Cortbaoi of CIP visited Haiti and as soon as he got back to Peru some potato materials were sent to Haiti. In September 1981, Dr. Julio Toro and Mr. Carlos Dominguez of CIAT came to Haiti to follow up on their intented program in Haiti which had been suspended for some years until they learned about the Texas A and M University-USAID project. Finally, in the third week of October 1981, Dr. Miriks Alvar of IITA, Nigeria came in response to the Projects' request for possible assistance in terms of germplasm materials. This visit subsequently led to the plan to send trainees to Nigeria.

IV. Future plans

A. Varietal Improvement

1. Germplasm collection

Collection of local and introduced materials will be continued to have a broad genetic diversity in the collection.

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Collection of at least the predominant local cultivars should be completed by the mildle of 1983. Introduction of exotic materials with genetic characteristics desired by the Haitians will be a continuing activity. Collection of existing varieties and lines will be supplemented with collection of open pollinated seeds from the nursery and field tests. A nursery will be established where all the collections can be maintained.

B. Varietal Screening

Although preliminary tests will be a continuing activity at Damien, more efforts will be concentrated in the next year to evaluation of materials at regional level. At the same time, on-farm field testing will be started in the second year.

At least two regional tests for sweet potato and one regional test for cassava will be established in the second year. If more than one regional site is identified, all regional tests will be duplicated in each site. One on-farm variety test for sweet potato is targeted for the next year. Varietal screening for tropical potatoes will be expanded until replicated trials are possible.

Apart from the traditional screening of varieties, on farm trials will be also established to identify materials that can overcome certain agronomic problems. For instance, some farmers from Les Cayes have reported that at certain time of the year, production of sweet potato is bad although vegetative growth appears to be quite favorable. This can be a problem associated with variety, climatic pattern and soil fertility.

B. Production Technique

Increasing production levels using improved techniques with minimal input will be the main concern. More agronomic trials will be set up to determine optimum planting densities, appropriate time and method of planting, productive cropping systems and desirable crop combinations.

Visits to major production areas will be done early the following year to understand more the traditional practices and determine specific areas where improvement in the present system can be accomplished.

The following trials are targeted to be set up at the Damien Farm:

Sweet Potato

1. Fertilizer-population study using two or three popular varieties
2. Monthly planting
3. Comparison of type of planting materials used
4. Effect of cropping system on sweet potato weevil population and pattern of infestation.

Cassava

1. Comparison in yield between positions of planting
2. Fertilizer-population study having two or three popular varieties

Crop association

1. Cassava-sweet potato association
   a) population combination
   b) spatial distribution
2. Sweet potato-bean association
   a) population combination
   b) spatial distribution

3. Cropping pattern on the hillside using sweet potato and cassava

C. Other Activities

1. Training

Two extension workers have been identified to undergo training on "Root and Tuber Crop Technology" at the International Institute of Tropical Agriculture in Nigeria. They are Mr. Brunel Garçon and Mr. Ernst Theano. The course is scheduled for May 10 - July 9, 1982. The training aims to teach research and extension workers improved methods of tropical root and tuber crop production and acquaint them relevant applied research and technology of these crops.

Likewise, sometime in mid 1982, another candidate, Miss Myrlène Dorsainville, will be sent to CIAT, Colombia to undergo training on meristen culture.

An in-country training course on cassava production will be conducted at Cap-Haitien, Haiti from July 26-31, 1982 under the sponsorship of the Ministry of Agriculture-Intergrated Agricultural Development Project, CIAT, Colombia and USAID/Texas A & M University. Twenty (20) participants from the Ministry of Agriculture research and extension service will be in the course.

2. Travels

Local and international trips will be undertaken to continue establishing linkages for the project and to further increase the germplasm collection. For local trips, the major root crop growing areas will be visited during planting time, in the middle of the season and at harvest to study tratidional production practices and collect materials.

Because root and tuber crops are propagated using vegetative parts like tubers and stems, it is very difficult to secure them by mail from international source. This is primarily due to the high cost of mailing bulky and heavy vegetative materials. In addition, vegetative parts are more delicate to send by mail

they detetoriate so fast. Consequently, those who have been contacted for materials can only supply them if somebody could get them personnaly. It will be also a good opportunity for Haitian counterparts if they can visit institutions abroad so that the linkage can continue beyond the life of the project.

D. Research in Agricultural Economics

1. Basic Data

Information concerning the present state of the agricultural systems and individual farmer cultural practices was considered to be of major importance at the outset of the research/extension project. To this end, the agricultural economist sought the colloboration of indigenous economists and statisticians to assist in the design of a questionnaire that would enable the collection of data that would not only provide information concerning costs of production but also provide a basis for comparative analysis of future technologically superior packages.

The initial trial tests of the ability to obtain useful information through the direct interview process were evaluated utilizing two forth year students from the Faculty of Agronomy and Veterinary Medicine (FAMV) and advice from Mr. Bill Ross and Mr. Jim Murphrey. The agricultural economist field tested the questionnaire at les Cayes utilizing two agricultural technicians. As a result of this field trial further modifications were made resulting in the present questionnaire titled, Etude de Cote de Production Haiti 1981. This questionnaire was utilized on a survey of the Northwest at Saint Louis du Nord, Jean Rabel and Bombardopolis with the voluntary assistance of Agronome Sorel Jacques,(Tables 19 to 21).

On February 4, 1982, George Werleigh was officially appointed to the Project as agricultural economist and counterpart with Merritt Taylor. From February 15, to February 17, the two agricultural economists evaluated improved techniques for interviewing subsistance farmers in the mountainous region of les Platons Nortwest of Les Cayes. The decision was made to revise the questionnaire for more general usage by agronomes throughout the 22 agricultural districts.

TABLE 19

BUDGET UNDER CONDITIONS OF LOW PRICE AND HIGH PRICE
SAINT LOUIS DU NORD - Plantain 1981

Variable Expense	per hectare
Land preparation	$ 260.47
preplant insecticide applications -40 grm diazinone X 233 plants	204.65
Plant (January)	24.81
First Fertilizer - Ammonium Sulfate @ $ 12.40/Cwt - 100 grm/plant	65.12
Labor for fertilization	9.30
First weeding	93.02
2nd fertilizer 12-24-12 @ $ [illegible].00/cwt 100 grms/plant	52.71
Labor for fertilization	9.30
2nd weeding	93.02
12 irrigation = @ $ 7.75 ea	93.00
labor	3.10
harvest (1st @ 12 mos)	6.20
Total variable expenses	914.70
Land expense	121.03
TOTAL EXPENSE	$ 1038.73

	Low Price	High Price
Revenue 1938		
Marketable	1.20	3.00
Plants	2325.60	5814.00
Less expenses	1038.73	1038.73
	$ 1286.87	$ 4775.27

TABLE 20

BUDGET UNDER CONDITIONS OF LOW PRICE AND HIGH PRICE

JEAN RABEL - Dry land Corn-Beans associated crop 1981

Variable Expense		Per Hectare
Oct - Nov	Land Preparation	$ 74.42
Dec	Plant corn	49.61
Dec	Plant Beans	49.61
Jan	Weed	93.02
March-April	Harvest Beans	49.61
April-May	Harvest Corn	49.61
	Total variable expense	$ 365.88
Land expense		124.03
	TOTAL EXPENSE	$ 489.91

	Beans	Corn
Yield	310 marmites	310
Saved for seed	124 marmites	50
Available for Sale	186 marmites	260

Returns	Low Price	High Price	
Beans	$ 1.00 /mt X 186 = 186.00	$2.40/mt X 186	$ 446.40
Corn	.50 /mt X 260 = 75.00	$1.20/mt X 260	312.00
Gross Returns	261.00		$ 758.40
less costs	489.91		489.91
	<228.91>		268.49

Note: One marmite weighs 56 pounds

TABLE 21

Budget - under conditions of Low price and High Price

BOMBARDOPOLIS, Haiti - (dry land Beans and Corn), 1981

Variable Expense		$/Hectare
April	Preplant weeding and land preparation	$ 86.82
May	Plant corn	99.2[illegible]
May	Plant Beans	86.82
June	Weed	86.82
Aug	Harvest Beans	37.21
Oct-Nov	Harvest Corn	37.21
		$ 434.10
Fixed Expense		
Land Rent @ 16.66 % of Market Value		124.03
Total Expenses		$ 558.13

	Beans	Corn
Yield/Hectare	310 marmites	373 marmites
Less seed saved	121 marmites	62
Available for sale	186 marmites	311 marmites

Potential Revenue per Hectare

	Low Price		High Price	
Beans	@ $ 1/mt X 186 marmite =	$ 186.00	Beans $2.40/mt X 186 mt =	$ 44[illegible]
Corn	@ $.20/mt X 311 marmite =	$ 62.20	Corn $1.20/mt X311 mt =	$ 37[illegible]
		$ 248.20		$ 81[illegible]
Less Total Expenses		558.13		55[illegible]
		$ (309.93)		$ 26[illegible]

2. Field Level Experimentation

The initial stage of research was centrally located at Damien to enable the agronomists to evaluate many local and imported varieties of corn, grain sorghum, beans, sweet potato, manioc, etc... The second stage will be to multiply promising varieties and to implement farmer field trial experiments.

The agricultural economists began the necessary personal contacts with Ministry of Agriculture personnel and district agronomes where future experimentation may be planned. Contact was made with the District Agronome, Research and Extension personnel in ten agricultural districts. An explanation of the Research Extension program was presented with emphasis placed on the necessity for participation of the district personnel and the potential benefit that may develop from a coordinated national research-extension program.

On February 17, 1982, a meeting was held at Dubray with 72 Haitian community leaders and animators. The primary objective was to familiarize the leaders with present activities of the Ministry of Agriculture concerning the cooperative activities of the Soil Conservation/Reforestation projects and the Research/Extension projects. The farmers were encouraged to become acquainted with the team members, cooperate with them in their activities and to communicate specific problems and beneficial ideas that they may be aware of.

3. International Agency Cooperation

Much work has been done in the past and is presently being done by people from other International Agencies. USDA Agencies and Private Volunteer groups. Contact has been made with representatives of FAO, OAS, IICA, BID, the Israeli Mission, the Taiwanese Mission, the French Mission and several private religious agencies to gather information for a centralized library and to cultivate contacts for

dissemination of information as it develops from research efforts.

Data was provided by Mr. Chow, of the Taiwan Mission in the Artibonite Valley on rice costs and returns under intensive management practices (Tables 22 to 24). The analysis indicated that great potential for improved profitability was available given that the selling price remained constant.

A trip taken by Mr. Mack Fuqua and Merritt Taylor to the Dominican Republic on the week of January 24 - 30, 1982. There were two goals delineated. One was to obtain information on costs of producing peanuts in the Dominican Republic and to make professional contact with Dominican scientists for future cooperative efforts. Information was obtained from a representative of Sociedad Industrial Dominicana (MANISERA). This information provided figures that indicated a small profit could be obtained by growing peanuts (Table 25). Data was provided from the central research center (CENDA) of the Ministry of Agriculture on eight cost of production trials (Tables 26 - 28). The results indicated that in the reporting period, dryland production of peanuts was not profitable while irrigated peanut production was highly profitable, given the technology involved. As peanuts are generally grown under dryland conditions on marginal land, a price for peanuts as high or higher than the present controlled price of RD $ 20.00/cwt would probably be required to induce increased production of peanuts by the Haitian farmer.

Contact was made with 37 people involved in Agricultural activities throughout the country. Invitations were issued to the Dean of FAW and his staff to promote educational development at Universidad Nacional Pedro Henriques Urena (UNPHU). The directors and staff of Instituto Superior Agropecuario (ISA), Northern Zone Experiment

TABLE 2?

RICE PRODUCTION COSTS - ANTIBONITE VALLEY - 1981

(Estimated by Mr. [illegible], [illegible] Mission)

ITEM	$ US/Ha
1. Seed Bed Preparation	18.00
2. Land Preparation with Small 2-wheeled tractor	110.00
3. Transplanting	62.00
4. Weeding	80.00
5. Seed	21.00
6. Water	27.50
7. Fertilizer	140.00
8. Insect Control	20.00
9. Rat Control	20.00
10. Harvesting	106.00
	604.50

Estimated Total Cost = $ 642.00

Fertilizer Used

200 lbs/Ha Sulphate of Ammonia

200 lbs/Ha 15-15-20

Principal Variety: Madame Cougousse (= Lé Dawn)

New Variety: [illegible] 65

	Average Yield
[illegible]dium Technology	4 Tons/Ha
[illegible]igh Technology	5[illegible] Tons/Ha
[illegible]untry Average	2 Tons/Ha

TABLE 23 62

RICE IN ARTIBONITE VALLEY

COST ANT RETURNS (HIGH YIELDS) 1981

Product	Yield	Price	Value
Irrigated Rice	6 tons (M)/Ha	$.33/6lb marmite or $.15/lb or $330.69/ton (M)	$ 1984.14
Costs at high technology*			642.00
Potential profit per hectare			$ 1342.14

* Taiwan Mission Data

1000 Kg = 1 metric ton = 2204.6 lb
6 lb/marmite = 367.43 marmites/ton (M)

1 carreau = 1.29 Ha or 12900 m^2
average size rice farm between 2/16 - 1/16 Carreau (Ca)

2/16 = 1612.5 m^2 or .16125 Ha

2/16 Ca potential profit from high yield = $ 216.42

TABLE 24

RICE IN ARTIBONITE VALLEY

COSTS AND RETURNS (AVERAGE YIELDS) 1981

PRODUCT	YIELD	PRICE	VALUE
ntegrated Rice	2 tons/ha or 4409.2 lb	$.90/6 lb marmite or $.15/lb or $330.69/Ton (M)	$ 661.38
osts at average Technology*			508.20
			$ 153.18

Rapport de la Mission Technique Agricole Chinoise en Haiti pour la période Juillet 1980 - Juin 1981, pge 42 appears to be high technology cost rather than low technology

1000 Kg = 1 metric ton - 2201.6 lb
6 lb /marmite = 367.43 marmites/Ton (M)

1 carreau = 1.29 ha or 12900 m^2

Average size rice farm between 2/16 - 4/16 Carreau (Ca)

2/16 ca = 1612.5 m^2 or .1612.5 Ha

2/16 Ca potential profit from average yield = $ 24.70

TABLE 25

DRYLAND PEANUT COST AND YIELD PER HECTARE
in the Dominican Republic 1981
Data from Industry Source 2

Yield 2098 - 2973 lb/ha		Low Yield	High Yield
@ controlled price $ 18.18/cwt	=	$ 381.45	540.55

Land preparation	$ 55.65
Seed	66.78
Fertilizer	47.70
Insecticide and fungicide	15.90
	$186.03

	Low Yield	High Yield
Harvest $ 1.00 /12 sack	49.95	70.70
Sacks	9.99	14.16
Transport $ .50/sack	24.98	35.40
Harvest & Post Harvest Costs	$ 81.92	$ 120.35

Returns per Hectare	at Low Yield	at High Yield
Income	381.45	$ 540.55
Pre harvest costs	<186.03>	<186.03>
Harvest $ Post Harvest Costs	<81.92>	<120.35>
Profit possible /Ha	110.50	234.17

Profit possible/Carreau	$ 112.55	$ 302.05

1 Source: Sociedad Industrial Dominicana (SID) ie (Minisera)

TABLE 26

COSTS AND RETURNS FOR 1 HECTARE OF PEANUTS 2/
(Under Irrigation)
in the Dominican Republic 1981

Product	Yield	Price	Value RD $ per hectare
Peanuts in hull	3975 lb RD $	.1815/lb RD $	721.46

Costs

Components of Cost	detail	units	unit price	Value RD $	%
Machinery					
Preparation of land	Plow, disc and furrow	/hectare	RD$ 75.53/Ha	75.53	
plant	60 cm/row 10 cm/plant	/hectare	28.35/Ha	28.35	
	subtotal			99.38	19.8
Variable Costs					
Seeds	RF-123; Valencia	191 lb	.27/lb	51.57	
Fertilizer	20-20-0	557 lb	.1445/lb	80.49	
Insecticide	Azodrin 40 2/	1431 CC	7.20/lt	10.30	
			Subtotal	142.36	28.4
Labor Costs					
Irrigation	5 times	1272.2 man hours	4.00/day	63.60	
fert. application	1 time	39.76 man hours	4.00/day	19.88	
weed and cultivate	2 times	127.2 man hours	4.00/day	63.60	
Insecticide application 3/	2 times	12.72 man hours	6.36/ha	12.72	
Harvest 4/	3975 lb	127.2 man hours	2.50/100 sack	99.38	
			Subtotal	259.92	51.8
Total Expenditures				500.92	100

Profitability: of one Hectare: RD$ 721.46 - RD$ 500.92 = RD$ 220.51
of one Hectare/month RD$ 220.51 / 3 = RD $ 73.51

1/ Source: Secretaria de Estado de Agricultura
Departamento de Investigaciones Agropecuarias
Centro de Desarrollo Agropecuario - Zona Norte
(CEDAV) de La Republica Dominicana
Costos de Produccion y rentabilidad de los cultivos, 1981

2/ It is possible to use Nuvacron and Lannite

3/ The use of fungicide is rare ; never the less Brestan or Dithane M-45 can be used

4/ Includes pecking, stripping and sacking

TABLE 27

COSTS AND RETURNS FOR 1 HECTARE OF PEANUTS 1/
under dryland conditions
in the Dominican Republic 1981

Produce	Yield	Price	Value RD $ per hectare
Peanuts in hull	1980 lb	RD$ .1815/lb	RD$ 346.30

COSTS

Components of Costs	details	units	unit price	Value RD	%
Machinery					
Land preparation	plow, disc and furrow	1 hectare	51.68/ha	51.68	
planting (animal traction)	60 cm/row 10 cm/plant	1 hectare	3180/funds	13.83	
		Subtotal		65.51	19.91
Variable Costs					
Seed	R E-123; valencia	191 lb	.27/lb	51.57	
Fertilizer	20-20-0	398 lb	.1445/lb	57.51	
Insecticide	Azodrin 40 2/	1.431 liters	7.20/lt	10.30	
				119.38	36.3
Labor					
Fertilizer application	1 time	39.75 man hr	4.00/day	19.88	
weed and cultivate	2 times	127.2 man hour	4.00/day		
insecticide application	2 times	12.72 man hr	6.36/hr		
harvest	1980 lb	127.2 man hr	2.50/100 lb sack	47.70	
		Subtotal		143.90	43.8
Total Expenses				328.79	100.00

Profitability of One hectare

RD $ 346.30 - RD $ 328.79 = RD $ 17.51

Profitibality per month

RD $ $\frac{17.51}{3}$ = RD $ 5.84

Best Available Document

1/ Source: Secretaria de Estado de Agricultura
Departamento de Investigaciones Agropecuarias
Centro de Desarrollo Agropecuario -Zona Norte
(CENDA) de la Republica Dominicana
Costos de Produccion Y Rentabilidad de los Cultivos 1981

2/ It is possible to use Nuvracron and Lannate

Center (CLNDA) and the Central Zone Experiment Center (CESDA). All expressed willingness to provide highly technical and specific training programs for interested Haitian agronomes. The equipment was modern with living facilities available at the experiment station.

E. Training

During 1981 processing began for long term advanced education of four agronomes and short-term technical training of one agronome. Ronald Vulcain arrived at Texas A & M University in August, 1981 for English Language Training in preparation for the master program in Agricultural Economics. In January 1982, Harold Latortue and Patrick Caccière began English Language Training at Texas A & M University in preparation for the masters program in Agricultural Engineering. In the same month Emmanuel Prophète was entered into the Texas A & M master programs for Horticulture.

In January Colette Blanchet was admitted to the intensive era sorghum program at the centro del Mejoramiento de Maís y Trigo (CIMMYT) in Mexico. Also, in January two agronomes Gabrielle Prévillon Baudin and Mona Fils Aime Caston were admitted to the Haitian American Instit to learn English in preparation for future short course participation the U.S. or other training facilities.

Additional short-term training has been recommended for the following agronomes:

Names	Specialized training	location
Edward Demetrus	Corn	CIMMYT
Louis Marie Laventure	Millet	CIMMYT
René Bellevue	Corn	CIMMYT
Serge Edmel	Corn	CIMMYT
Brunel Garzon	Taro, Igname, etc...	IITA
Ernest Theano	Manioc	IITA
Gabrielle Prévillon Baudin	Beans	CIAT
Myrlène Dorsainville	Tissue Culture	CIAT
Mona Fils Aime Baudin	Cropping Systems	CATIE

Training Facility	Country
CIMMYT	Mexico
IITA	Nigeria
CIAT	Colombia
CATIE	Costa Rica

Haiti 1981

A. OBSERVATIONS

1. Nom de l'Enquêteur _____
2. Adresse du bureau de l'Enquêteur _____
3. Date _____
4. Nom du Fermier _____
5. Location de la Ferme:

District: _____
Commune: _____
Section Rurale: _____
Distance de la route: _____

6. Description de la Ferme

a. Elevation _____ mètres
b. Dimension de la Ferme en carreaux ou en centième _____

1. Moins de 0 à .25 ca _____
2. .25 à .50 _____
3. .51 à .75 ca _____
4. .76 à 1 ca _____
5. 1.01 à 1.5 ca _____
6. 1.51 à 2 ca _____
7. 2.01 à 4 ca _____
8. Plus de 4 ca _____

c. Forme de la ferme:

d. Position par rapport à la montagne _____
e. Pente de la ferme (%)

Categorie

1. Moins de 10% _____
2. de 11 à 25% _____
3. 26 à 50% _____
4. Plus de 50% _____

f. Importance de l'Erosion:

1. Pas d'érosion _____ 2. Erosion _____

g. Végétation Environnante _____

_____

h. Vent dominant _____

i. Quels sont les 3 mois les plus secs de l'année _____

j. Quels sont les 3 mois les plus humides de l'année _____

k. Types de cultures et de végétation et surface dans chaque ferme?

	Type Associé	Type monoculture	Surface
1. Racines et Tubercules			
2. Cereales			
3. Legumes			
4. Arbres			
5. Fourrages			
6. Autre Culture			
7. Vegetation Naturelle			
8. Surface totale cultivée			

9. Surface Totale en Cultures Perennes _____ _____ _____

10. Surface totale perdue ou inutilisée _____ _____ _____

_____ _____ _____

_____ _____ _____

7. Bétail (nombre d'Unités) sur la ferme

	Visible		Non Visible
	Propriétaire		Contrat
a. Boeufs	_____		_____
b. Cabris	_____		_____
c. Poules	_____		_____
d. Cochons	_____		_____
e. Boeufs attelés	_____		_____
f. Bourriques	_____		_____
g. Mules ou chevaux	_____		_____
h. Autres	_____		_____

7.1. Quels genres d'animaux sont nourris du produit de la ferme?

_____

7.2. Quels genres d'animaux sont nourris de produits achetés?

_____

8. Famille vivant de la Ferme qui sont aussi des fermiers-travailleurs

a. Nombre de dépendants _____ b. Nombre d'hommes _____ c. Nombre de femmes

d. Nombre d'enfants (10 à 17 ans) _____

e. Nombre d'enfants de 5 à 10 ans _____

f. Nombre d'enfants de moins de 5 ans _____

9. Vivez-vous sur la ferme _____

10. Depuis combien de temps cultivez-vous cette ferme _____

11. Etes-vous propriétaire _____

12. Etes-vous fermier _____

a. Si oui, payez-vous en espèces _____

b. ou partagez-vous la récolte _____

13. Distance de la ferme à votre résidence _____

14. Parcelle proche de la maison _____

15. a. Parcelle située à 10 ou 14 minutes de marche _____
    b. " " de 15 à 20 minutes de marche _____
    c. " " de 30 à 40 minutes de marche _____
    d. " " située à plus de 40 minutes de marche _____

16. Citez les problèmes les plus importants observés _____

_____

17. De quel moyen de transport disposez-vous?

    a. de la maison à la ferme _____
    b. de la ferme au marché _____

18. Avez-vous un revenu du travail de la ferme? _____

19. Estimation des dommages causés par les insectes et animaux nuisibles (%)

    a. Moins de 10% _____
    b. 11 à 25% _____
    c. 26 à 50% _____
    d. Plus de 50% _____

20. Estimation des infestations de mauvaises herbes

    a. Propre _____
    b. Infestation légère _____
    c. Infestation modérée _____
    d. Forte infestation _____
    e. Infestation très sévère _____

21. Estimation des dommages causés par les maladies

    a. Aucune _____
    b. Légère _____
    c. Modérée _____
    d. Forte _____
    e. Sévère _____

Culture _____

Culture plantée avant _____

Culture plantée après _____

Depuis combien de temps exploitez-vous cette culture? _____

Outils Utilisés	Date (Calendrier)	Date (Chronologique)	Date (Chronologique)	Date (Chronologique)	Animal Jours	Homme Jours (Famille)	Homme Jours (Employés)	Unités Intrantes	Coût de nourriture	Cout/ Unité Intrante	Unités Extrante	Valeur/Unité Ex

B. CULTURE INDIVIDUELLE

1. Irrigation avant semis Oui_____ non_____

   a. Si oui, cout de l'irrigation_____

   b. Source de l'eau_____

2. Irrigation après la plantation: Oui_____ non_____

   a. Si oui: Nombre de fois_____

      Quantité d'eau_____

      Prix de l'eau_____

3. Semences

   a. Variété_____

   b. quantité plantée par point_____

   c. Prix par unité_____

   d. Profondeur du semis_____

   e. Distance entre les sillons (buttes_____

   f. Distance entre les plantes_____

   g. Origine de la semence_____

   h. Recommandation de la semence_____

   i. Traitement ou préparation de la semence_____

   k. Culture sauvage_____

4. Types de plantoirs_____

_____

5. Engrais oui_____ non_____

   Si oui: a. Type d'engrais_____

   b. Dose par application_____

   c. Origine de l'engrais_____

   d. Méthode d'application_____

   e. Cout unitaire_____

   f. Recommandation_____

   g. Nombre d'application_____

6. Herbicide oui_____ non_____

   Si Oui: a. Type d'herbicide_____

   b. Quantité par application_____

   c. Origine de l'herbicide_____

   d. Méthode d'application_____

   e. Cout unitaire_____

   f. Recommandation_____

7. Insecticide Oui_____ Non_____

   a. Type_____
   b. Quantité par application_____
   c. Nombre d'application_____
   d. Origine de l'insecticide_____
   e. Méthode d'application_____
   f. Cout unitaire_____
   g. Recommandation_____

8. Fongicide Oui_____ Non_____
   Si Oui:

   a. Type_____
   b. Dose par application_____
   c. Nombre d'application_____
   d. Origine du Fongicide_____
   e. Méthode d'application_____
   f. Cout unitaire_____
   g. Recommandation_____

9. Autres: pratiques nécéssitant des dépenses d'argent (piquetage, couvertures de plantes, ensachage)

   a. Date:_____
   b. Volume du matériel_____
   c. Coût du matériel_____

10. Quelle était la dépense totale en argent comptant ou le coût pour cette culture?

    _____

11. Récolte

    a. Date de la première récolte_____
    b. Quantité recueillie à la première récolte_____
    c. Nombre de récoltes successives_____
    d. Date de la dernière récolte_____
    e. Récolte totale_____

12. Manipulation après la récolte

    a. Volume emmagasiné_____
    b. Durée du stockage_____
    c. Type de structure de stockage_____
    d. Méthode de stockage (en vrac, en sac, etc.)

e. Quantité consommée _____

f. Dommage estimé _____

g. Quantité vendue _____

h. Quantité conservée comme semence, nourriture humaine, nourriture pour le bétail

_____

13. Commercialisation

a. Quantité vendue à la ferme _____

b. Quantité vendue au marché local _____

c. Quantité vendue en ville _____

d. Méthode de conditionnement _____

e. Coût des paquets ou des marmites _____

f. Type de transport _____

g. Coût du transport _____

14. Seriez-vous intéressés à coopérer à une amélioration de la production agricole en acceptant des essais agronomiques sur votre ferme?

_____

_____

MAJOR PROBLEMS

When the TAMU team arrived in Haiti, there was no office space, no vehicles, no land nor Haitian staff assigned to the project. For the first few months, the two team members occupied some unused offices in the Saliba Building (USAID headquarters) and had to depend on USAID transportation for trips to and from Damien. On April 6, 1981, DARNDR arranged for a station wagon to pick the TAMU team members and some of the MIT staff. This arrangement, however, was unsatisfactory due to frequent breakdowns of the vehicle and to the driver having other responsibilities at Damien and lasted only a few weeks. We then began to ride with Mr. Lionel Richard, Professor of FAMV, and reimbursed him for some of the extra costs.

The team was assigned a temporary office in an unused classroom in May 1981 and two small desks and chairs were purchased from the Canadian Technical Assistance Mission. Floor plans and prices on office petitions, office furniture and local suppliers but there was to delay of several months in giving the approval for the use fo the classroom and for the purchase of the furniture and equipment.

The first project transportation, a jeep cherokee, was assigned to the TAMU team on May 27th. However, it had been used by the Damien coffee project and had some mechanical problems and had to be repaired before it could be used.

The remaining two TAMU team members arrived in Haiti on June 16th and June 23rd. At this time, there were only two desks and only one vehicle. A second vehicle, a CJ diesel Jeep, was assigned to the project on June 30th. and at the same time the Jeep Cherokee was exchanged for another jeep.

On July 7th, the Director General of DARNDR announced the organization of the Food Crops Research Service and with this also cleared the way for the conversion of the classroom into office for the TAMU staff and for the use of land on the Damien Farm for planting of the crop research plots and

gave approval for the office construction and purchases of office furniture and supplies.

The one hectare plot of land on the Damien Farm which was severely infested with three noxious hard to control weeds. These were Johnson Grass (Sorghum halepense), Bermuda grass (Cyanadon dactylon) and Purple Nustedge (Cyperus rotundus). The most efficient herbicide, Round Up, could not be found in Haiti and had to be imported from the Dominican Republic.

On August 27, the jeep Cherokee was reassigned to the project and in October 1981 an old jeep, formerly used by the Chief of Party of the Soil Conservation subproject, was assigned to the project. However, this latter jeep had problems with the transmission and has been in the garage for more than 3 months awaiting parts.

A serious problem for most of 1981 was the lack of assigned counterparts. The first counterpart was named and began work on Oct. 12 or about 10 weeks after planting of the experiments. The names of the counterparts, their date of appointment and the part of the program to which they were assigned are shown below

NAME	DATE OF ENTRY	PROGRAM	TERMINATED
[illegible]	Oct. 12, 1981	Cereals	Jan 1,1982 (Study)
[illegible]	Nov. 11, 1981	Pulses	Jan 1, 1982 "
[illegible]	Nov. 11, 1981	"	
[illegible]	Nov. 11, 1981	"	
[illegible]	Jan. 27, 1982	"	
[illegible]	Jan. 27, 1982	Agr. Economics	
[illegible]	Jan 27, 1982	Roots ant Tubers	
[illegible]	Jan 27, 1982	Ag. Economics	
[illegible]	Jan 27, 1982	Cereals	
[illegible]	Jan 27, 1982	Roots and Tubers	
[illegible]	Jan 27, 1982	Cereals	
[illegible]	Jan 27, 1982	"	
[illegible]	Ja 27, 1982	"	
[illegible]	Aug. 2, 1981(Study)	Agr. Economics	

Although not all of these are committed at this time to the project. This is a great improvement over 1981. However, to utilize them effectively and to work in various parts of Haiti will require more vehicles. Three more vehicles have now been requested.

Another serious problem has veen the lack of suitable work room and equipment for preparing land, threshing and for cleaning and weighing samples. Most of the sorghum samples could not be thresehed due to the great amounts of time required for hand threshing and therefore headweights were used in the yield data. This year an unused classroom was used for the shelling and threshing of the samples but due to the increasing needs of the LWV, this may not be available during the next crop cycle.

Since the land preparation of the Damien Farm is dependent upon the availability and condition of tractors from the Agr. Michinery, considerable delays in land preparation and planting of experiments has occured.

A list of equipment has been submitted to Texas A and M University for purchase and when it arrives at the Project site, the situation should improve considerably. However, there will have to be located space to store the equipment until more permanent arrangements can be obtained.

During most of the year, there was no office and it was not until August 1, 1981, that a secretary was employed and an operating office could be established. A second secretary will be employed by March 1, 1982.

VISITS BY SHORT TERM CONSULTANTS DURING 1981

Two visits were made by short term consultants during 1981. Jim Murphrey's visit (Sept 27 to October 9th). The purpose of his visit was to advise on the preparation of a questionaire to be used in the economic studies on small farms. Mr. Murphrey is an agricultural Economist and was associated with the small farmer cropping systems research program of the Center for Agricultural Research and Training (CATIE) located in Turialba, Costa Rica. While in Haiti, he contracted many of the Haitian Government agencies collecting statistical data on production and production costs estimates.

Mr. Murphrey met on various occasions with the administrators of DARNDR, FAMV and USAID and made recommendations on other lines of research to be considered in the future. A copy of his report is attached at the end of the report. Mr. Murphrey spent 12 days at post in Haiti.

Daniel Levandowsky's visit Nov. 23 to Dec. 2nd)

Mr. Levandowsky is a tropical fruit and plantation crop specialist with many years experience in many parts of the world. He was brought to Haiti to determine if there is a potential and a need for increasing fruit crop production in Haiti and also, to determine if climatatic and soil conditions are suitable for palm oil production. Mr. Levandowsky has to cut short his visit due to serious illness. He states that in the case of mangos and avocados, the local situation can be described as glut and famine. His report states that of the fruit crops, only mangos are important as an export crop. The quantity exported could probably be increased by the introduction of better quality varieties. He also believes that there might be a possibility to export some avocados and is particularly interested in introducing the pamplemus, which could be processed in Haiti and exported as grapefruit sections to the U.S. There is a great demand and price in the U.S. but hand labor is too expensive. The processing and canning could be done with cheap Haitian labor.

Conditions are good for growing cacao and coffee but there is little interest in rural Haiti to plant new cacao and coffee trees. Mr. Levandowsky states that conditions are good (but not ideal) for the production of African

palm oil. The African oil palm trees now growing in Haiti produce low amounts of oil. The high yielding hybrids could produce 1 to 2 tons/ha of oil as compared to 200 to 300 Kgs from the local oil palm trees. A copy of Mr. Levandowsky's report is attached to this report.

VISITS OF BILL ROSS, TAMU CAMPUS COORDINATOR

Feb. 21 to Feb 27, 1981

Mr. Ross accompanied the first two TAMU team members to Haiti to initiate the project and to negotiate living and working conditions in Haiti.

March 9 to Feb 11, 1981

Bill Ross passed by Haiti on his return from the Dominican Republic in order to determine if any problems had developed during the first few weeks after initiation of the project.

May 19, 1981

Dr. T.R. Greathouse and Bill Ross visited Haiti on a stepover en-route to the Dominican Republic. Meetings concerning project objectives and operation were held with officials of IAMV, DARNDR and USAID.

Sept. 8 to Sept. 12, 1981

This visit was planned for the purpose of assisting Merritt Taylor in developing a questionaire for use in determining cost of production data and level of technology on small farms.

Sept. 23 to Sept. 29, 1981

A stepover was made in Haiti to consult with Merritt Taylor and Jim Murphrey on improving the questionaire and to discuss methodology to use in dealing with the small Haitian farmer.

Jan 24 to January 30, 1982

Bill Ross met with Mick Luque and Merritt Taylor in the Dominican Republic to assist them in making the desired contacts in their study of peanut production problems in the Dominican Republic. They were trying to assess the feasibility of starting a campaign to increase peanut production in Haiti.

Feb. 1 to Feb. 3, 1982

Bill Ross, accompanied by Dr. Frank Vandiver, President of Texas A and M University and Dr. T.R. Greathouse, Vice President for International Affairs of TAMU arrived in Haiti for meetings with TAMU-HAITI staff, officials of DARNDR, FAMV and USAID. The purpose of the visit was to familiarize the President's with the operation of International Projects and to offer support and closer collaboration with the Haitian project.

Feb. 11 to Feb. 23, 1982

This visit was made for the purpose of checking on the progress of the TAMU-HAITI Project and to discuss with USAID and DARNDR-FAMV the possibility of expanding the project, include more staff members and to give wider service and attention to Haiti's Agricultural problems.

INVITATIONAL TRAVEL BY HAITIANS

Five Haitian administrators from DARNDR and FAMV were invited to visit the campus of Texas A and M University in College Station in order to become acquainted with the facilities of the University and to improve the cooperation between University Officials Professors and Scientists and the Haitian Scientists and Administrators.

The visitors spent from August 2 to August 7 at the University. Their names and positions are shown below:

Gustave MANIGER, Director, Division of Agriculture, DARNDR
Julio BARTHELEMY, Head, Research Service (SERA), DARNDR
Rémillot LEVELLE, Dean, FAMV
Lionel Richard, Professor, FAMV
Jacques ALEXIS, " "

All visitors returned very enthusiastic about the visit and their contacts and interested in having closer relations with the University.

TRAVELS BY TEXAS A AND M HAITI STAFF DURING THE PERIOD FEB. 21, 1981 TO FEB 28, 1982.

June 1, to June 16, 1981

Dr. Mick Duqui traveled to Texas A and M University to hand carry Project amendments permitting Texas A and M University to purchase equipment for use in laboratory and field research in Haiti. While in the U.S. he contacted a number of suppliers for specifications and current prices.

August 8 to August 16, 1981

Robert Cheaney participated in the International Rice Testing Conference for Latin America held at CIAT in Cali, Colombia. While at CIAT, contacts were made for receiving plant materials and seeds for testing in Haiti and arrangements were discussed for training Haitians in Cassava, Beans, Rice and Seed Production and Processing.

October 14 to October 17, 1981

Marianito Villanueva visited key experiment stations in the Dominican Republic for the purpose of collecting the better varieties and cultivars of sweet potatos, cassava, yams and taro. These will be evaluated under Haitian conditions.

November 19 to December 2, 1981

Marianito Villanueva participated in the meetings of the International Root and Tuber Crops Association in Fiji and later visited Hawaii and College Station, Texas. He also, collected taro and sweet potato varieties for introduction into Haiti.

October 20 to Nov. 12, 1981

Mick Fuqua left on emergency sick leave for medical examination and treatment in the U.S. He had been hospitalized in the Canape Vert Hospital during the period October 5 to October 8.

Nov 1 to Nov 6,1981

Robert Cheaney attended the annual meeting of the Caribbean Food Crops Society meetings in Caracas, Venezuela. Contacts were made with scientists from most of the islands in the Caribbean area and a number of papers were presented on cropping systems on small farms.

Jan 9 to January 17, 1982

Merritt Taylor returned to Texas A and M University on personal business.

Jan. 24 to January 30, 1982

Mick Fuqua and Merritt Taylor visited the Dominican Republic and together with Bill Ross contacted scientists and industrial plant officials concerning peanut production. Peanuts are being considered as a source of oil for Haiti.

VISITS BY SCIENTISTS AND OFFICIALS FROM OTHER INTERNATIONAL CENTERS AND EDUCATIONAL ORGANIZATIONS

March 30, 1981 Visitors from CIMMYT

Juan Carlos MARTINEZ
Hugo CORDOBA
Michael YATES

May 19, 1981 Visitor from Texas A and M University

Dr. T.R. GREATHOUSE

June 27, 1981 Visitor from CIP

Roger Courtbour

June 29, 1981 Visitors from CIMMYT

Juan Carlos MARTINEZ
Michael YATES
Vartan GUERRAGOSSIAN

August 24, 1981 Visitors from CIAT

Julio CESAR ROJO
Carlos DOMINGUEZ

October 19, 1981 Visitor from IITA

Martin ALVAREZ

October 29, 1981 Visitors from CIMMYT

Willy VILLENA
Juan Carlos MARTINEZ
Hugo CORDOVA

November 15, 1981 Visitors from Florida

Kenneth BETTERTHER, U. of Florida
Joseph GORAD " "
John SELLES Fla. Dept. Of Agriculture

February 1, 1982 , Visitors from Texas A and M

Dr. Frank VANDIVER
Dr. T.R. GREATHOUSE

TABLE 28

REPORT ON COSTS OF PRODUCTION FROM THE PROGRAM FOR PEANUT SEED MULTIPLICATION AT THE FARM LEVEL

Location	Sonador	El Ingenio	Quinigua	V. Gonzalez	Banegas 4	Banegas 5	Palmarajo	Total
Land Area (Tarea)	100	350	150	84	70	90	100	944
Machinery Costs	583.00	3,014.00	1,059.50	666.20	493.50	753.00	592.50	7,191.70
Land Preparation	-1/	962.00	112.50 1/	275.00	297.50	330.00	512.50	2,289.50
Planting	150.00	525.00	225.00	126.00	105.00	135.00	150.00	1,416.00
Herbicide Application	50.00	175.00	75.00	42.00	35.00	45.00	50.00	472.00
Pesticide Application	136.00	420.00	180.00	67.20	56.00	72.00	80.00	1,011.20
Cultivation	75.00	-	-	-	-	-	-	75.00
Harvest of plants	172.00	932.00	497.00	156.00	-	171.00	-	1,928.00
Inputs	1,288.04	5,891.88	2,881.13	1,101.26	963.30	1,491.30	1,276.35	14,893.[illegible]6
Seed 2/	780.00	2,730.00	1,170.00	655.20	546.00	702.00	780.00	7,363.20
Fertilizer	-	868.00	725.00	-	-	252.00	-	1,848.00
Herbicide	178.25	623.88	267.38	178.25	194.53	251.10	178.25	1,871.64
Insecticide	187.89	657.56	281.81	105.22	87.92	112.50	125.26	1,558.16
Fungicide	134.88	987.84	423.36	158.66	131.86	169.20	188.16	2,193.96
Surfactant	7.02	24.60	10.58	3.93	2.99	4.50	4.68	58.30
Labor Costs	1,584.65	6,126.04	4,024.10	1,525.86	891.07	1,899.83	1,525.00	17,576.55
Fertilization	-	112.40	96.00	-	-	27.00	-	235.40
Weeding and tilling	670.55	1,642.03	1,133.94	482.16	181.00	588.00	433.00	5,130.68
Irrigation	25.00	677.40	1,213.02	71.50	-	105.00	30.00	2,121.92
Harvest and strip the plants	889.19	3,694.21	1,581.14	972.20	710.07	1,179.83	1,062.00	10,088.55
Cost of Production	3,455.69	15,031.92	7,994.73	3,293.32	2,347.87	4,144.13	3,393.8[illegible]	39,661.51
Cost/Tarea	34.56	42.95	53.30	39.21	33.54	[illegible].05	33.94	40.51
Production in 100 lb	128.00	816.82	377.04	132.70	111.46	[illegible].80	74.02	1,873.84
Yield/Tarea (100 lb)	1.28	2.33	2.51	1.58	1.59	2.60	0.74	1.80*
Value of Production 3/	3,200.00	20,420.50	9,426.00	3,317.50	2,786.50	2,845.00	1,850.50	46,846.00
Net Return	(-255.69)	5,388.58	1,431.27	24.18	438.63	1,700.87	(-1,543.35)	7,184.49

Net to Producers.....RD$ 8.983.53

.../8

1/ In Sonador, land preparation was done by the owner;
In Quinigua, part of the land preparation was done by the owner.

2/ Value assigned to the seed by the Department of Agriculture (SEA) was RD $ 60.00/cwt or RD $ .60/lb

3/ Selling price of peanuts in the shell was considered to be RD $ 25.00 per 100 lb
* Average yield of all areas was 1.98

Source: Secretaria de Estado de Agricultura
Departamento de Investigaciones Agropecuarias
Centro de Desarrollo Agropecuario - Zona Norte
(CENDA) de la Republica Dominicana
Costs of Production and yields for 1981

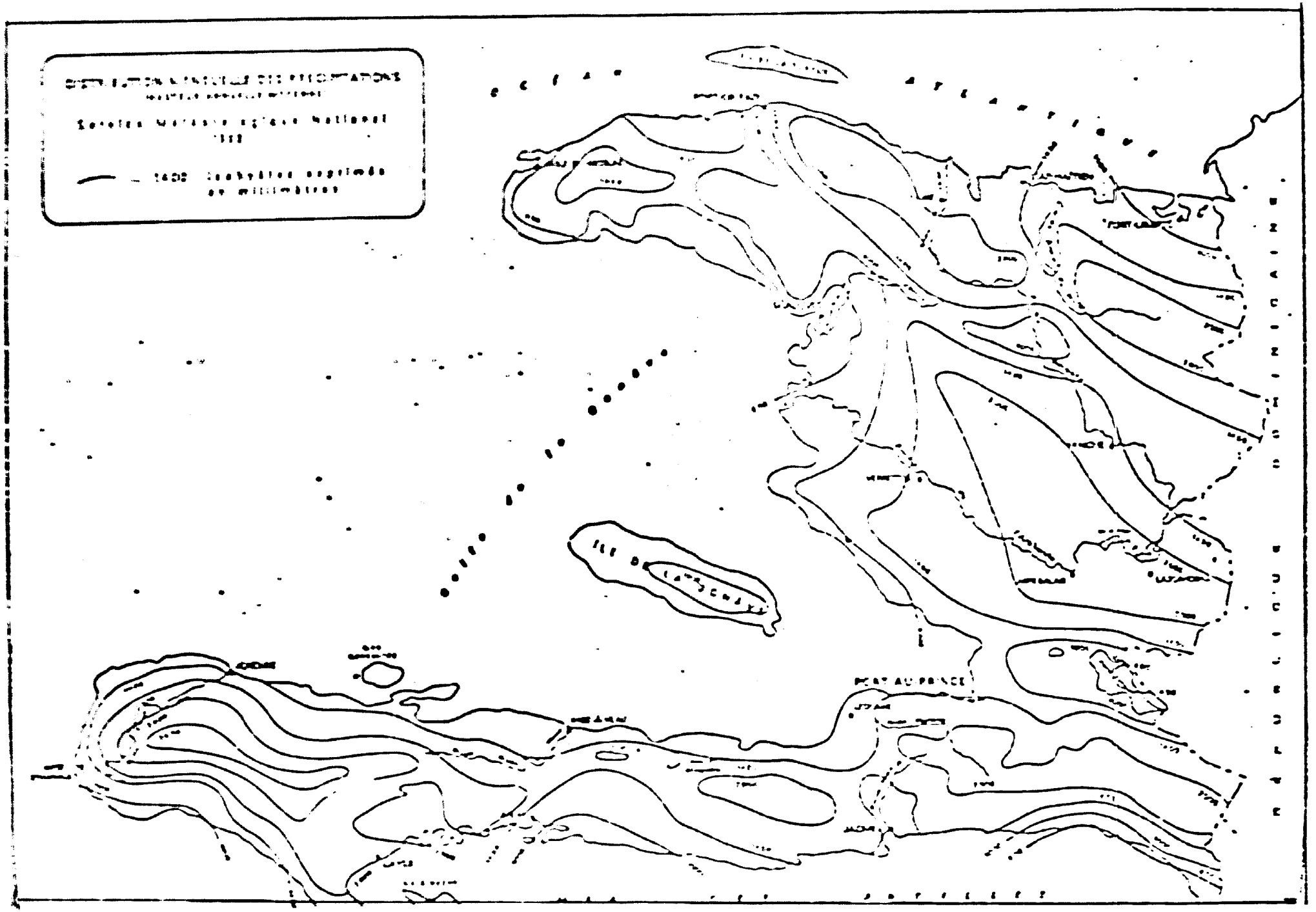

FIGURE NO. 1 ANNUAL PRECIPITATION

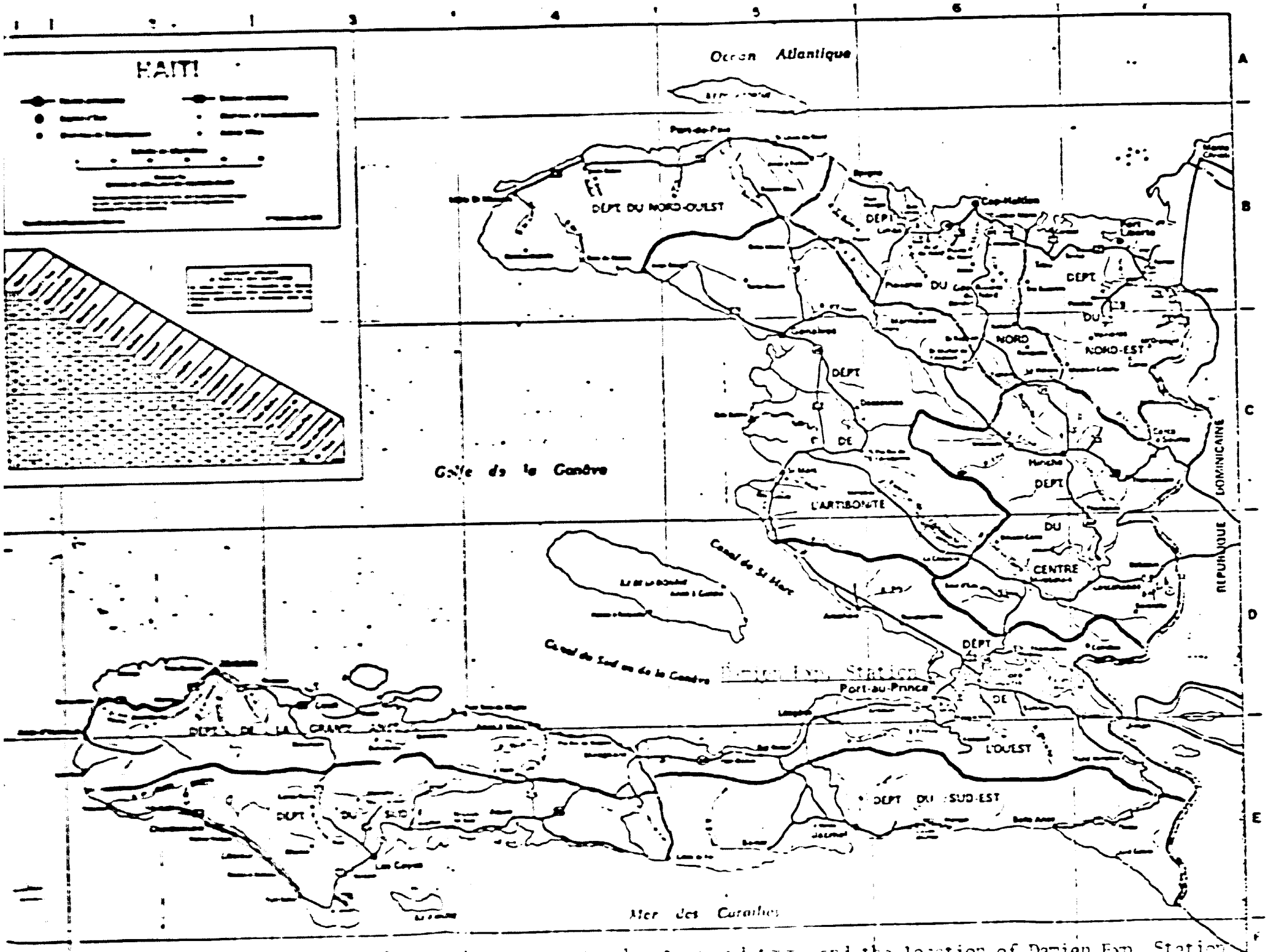

FIGURE No. 2 Map showing principal cities and towns and the location of Damien Exp. Station

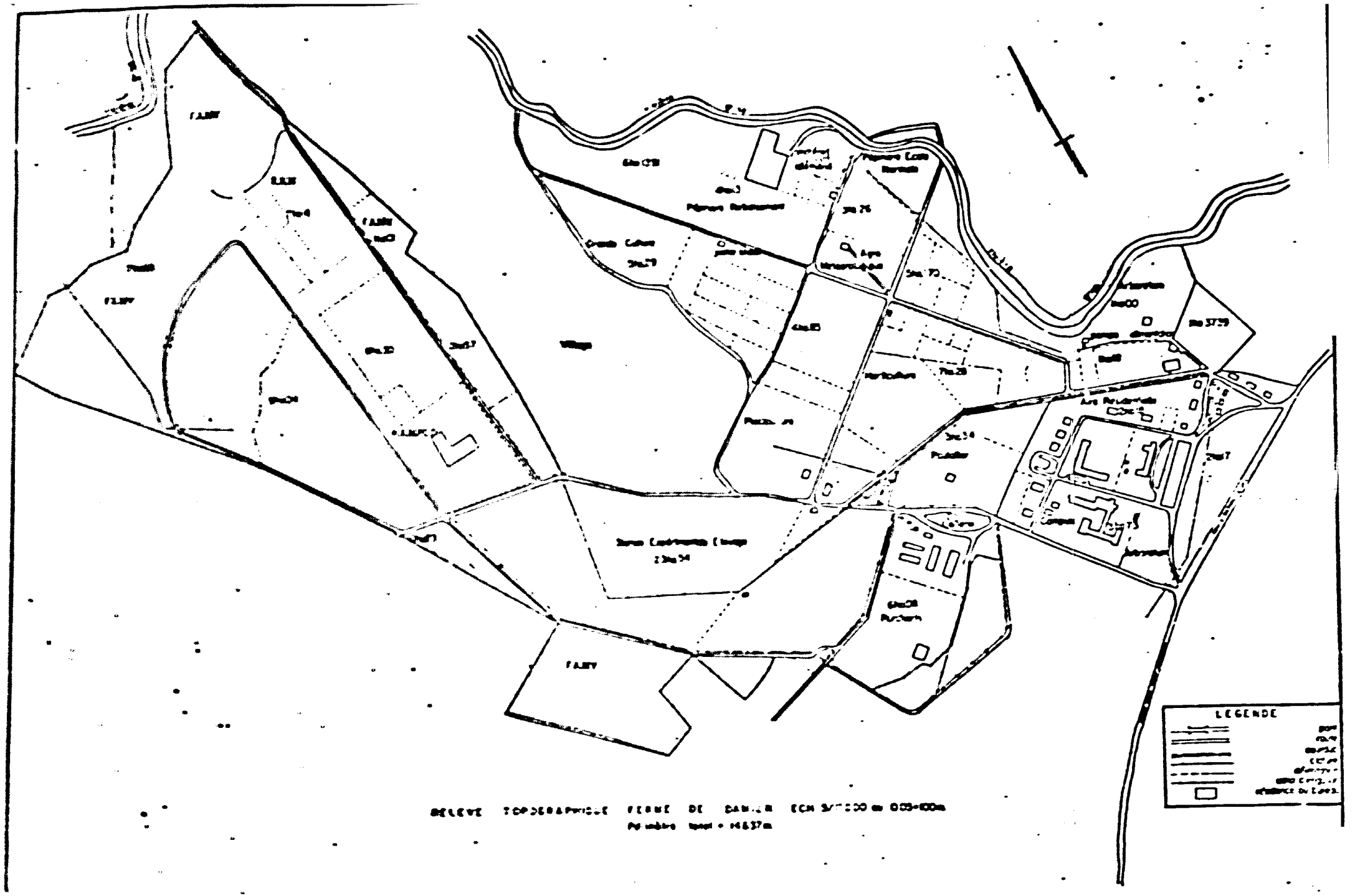

FIGURE NO. 3 Map of the Dunion International Station farm and of the building of DANGOR AND FAMY