

PD-AAJ-174

ISN-374

526011800530



Multinational Agribusiness Systems Incorporated

PARAGUAY
MINIFUNDIA CROP INTENSIFICATION
PROJECT
QUARTERLY PROGRESS REPORT:
July 1—September 30, 1981

USAID-CREDICOOP-MASI

Work performed under Contract LAC-0118-C-00-1026-00

March 1, 1982

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I. INTRODUCTION

The objective of the project is to provide technical assistance to CREDICOOP, a cooperative central of Paraguayan credit unions.

This project with small farmers promotes the production, processing, and marketing of four horticultural products: tomato, pineapple, strawberry and banana. Prior to MASI's involvement in the project, these four crops were identified based upon a series of project identifications and analyses.

MASI is supposed to provide personnel highly qualified in many areas of specialization from soil scientists to marketing specialists and agribusiness specialists. These professionals are supposed to work with the personnel of CREDICOOP for short periods (1-3 months) with the exception of the Horticulturist who will remain for 22 months and also serve as Chief-of-Party.

II. PERSONNEL SCHEDULE OF WORK DURING THIS QUARTER

July 2 Messrs. R.C. Dawson and H. Wong, Video Specialists, finished their assignments. They had started their work on May 5, 1981.

- July 3 Dr. Francisco L. Jordan, the MASI Chief-of Party, arrived in Paraguay. He replaced Dr. Erwin T. Bullard, the Horticulturist and Acting Chief-of-Party.
- July 4 Mr. Earl Logan arrived in Asuncion serving as Agribusiness Management Specialist.
- July 9 Dr. Erwin T. Bullard left Paraguay after having served a two-month assignment as Acting Chief-of-Party.
- July 30 Mr. Earl Logan left Paraguay.
- August 4 Dr. M.K. Radwan and Mr. Robert Maloney arrived in Paraguay serving as Soil Chemist and Packing and Marketing Specialist respectively.
- August 11 Mr. Stephen Morgan, Agribusiness Specialist, joined MASI staff in Paraguay. He replaced Mr. Earl Logan.

Observations:

Dr. Radwan's and Mr. Morgan's assignments were extended until October 16, and November 6, respectively.

Dr. Radwan's work was mainly in the area of mechanical and chemical analyses of banana and tomato soils. He studied the laboratory facilities at I.A.N. and the Agricultural College. He made tentative recommendations on the fertilization of the four fruit crops. He collected

climatic data, especially those on rain and temperature which will correlate with those on soils and water so that he could come up with recommendations in his final report.

Mr. Robert Maloney worked mainly in the classification, packing and marketing of tomatoes, strawberries and bananas. He also participated actively in the cultivation of banana due to his prior experience with banana companies such as United Brands and United Fruit. He dedicated a large portion of his time to locate sources of material and equipment necessary for fruit packing and classification.

Mr. Earl Logan, the Agribusiness Management Specialist, was supposed to advise CREDICOOP on agribusiness. However, discontent with his professional behavior led to his substitution by Mr. Stephen Morgan. The latter studied price policy, processing arrangements, and possible marketing outlet. Given Mr. Morgan's experience in marketing and processing tomato he dedicated considerable time to the classification and packing of tomato.

Administrative Report

Meetings are held every Monday morning to discuss problems and plans for the project. Personnel of AID, MASI, CREDICOOP, the Peace Corps, SEAG and IAN participate in these meetings. Meetings among MASI team members take place at 5:00 p.m. every Friday to discuss

plans, problems and progress of the project. Whenever a new team member arrived, meetings were held with CREDICOOP personnel to present the specialist and discuss his terms of reference which were prepared previously by the Chief of Party. He was also presented to AID. At the conclusion of his assignment or prior to his departure, the technician presented a preliminary report to both CREDICOOP and AID.

Weekly meetings are held with the staff of the Agricultural Extension Service (SEAG), the National Seed Service (SENASER), the National Agronomic Institute (IAN), and CREDICOOP which include personnel dedicated to the propagation and production of pineapple and strawberry. In the same time, there was a series of meetings which discussed the research program on the 4 crops. The personnel of MAG, (the Agriculture and Livestock Ministry), and IAN particularly participated in these meetings.

During this quarter, the Horticulturist dedicated a major part of his time to get acquainted with the agencies related to CREDICOOP, the people, and to familiarize himself with the working system. He has participated in a large number of meetings with the staff of MAG, SEAG, IAN, AID, the Agricultural College, the National Institute of Technology and Standard (INTN) and several cooperatives belonging to CREDICOOP. In addition, he has visited areas of production of the 4 crops included in the program to familiarize himself with the systems and methods of production in Paraguay. He has visited laboratories, libraries, factories, and agricultural input manufacturers - all with the purpose of finding ways to resolve problems which can arise in the CREDICOOP minifundia project.

During the first two months, the Horticulturist worked directly with the Ing. Agr. Carlos G. Villalba, who was in charge of production; and later on he worked with the Ing. Agr. Gilberto Gonzalez of CREDICOOP, the Coordinator of the Agricultural Livestock and Extension Service.

During the quarter the Horticulturist has dedicated some time to review the literature on the 4 crops with special attention on research work and other important works which serve as a base for the production of the 4 crops. Unfortunately, little or no information on these crops is available. As expected, major priority is given to other important crops such as cotton, soybean, wheat, etc.

There is very little or no research which deals with the 4 crops. No personnel has been trained in the horticultural field either since the college of Ciencias Agronomicas does not offer any specialization in horticulture. Besides, not many people would go outside of the college to specialize in horticulture. It is suggested that a \$120,000 research program to study these 4 crops be implemented to initiate several research trials. These research trials began in 1980 and have been continued in 1981. Due to technical and climatic difficulties in the winter of 1981 (May-August) very few reliable data could be collected.

There exists an agreement among MAG, IAN, and CREDICOOP to implement research and extension work. During this first quarter there were changes in the technicians and the coordination does not appear to have been optimal. The implementation of research work is

carried out slowly. By the first of September Ing. Agr. Gilberto Gonzalez, the SEAG Coordinator, joined CREDICOOP. The coordinator Ing. Agr. Jose Bertoni, an IAN staff, was also recently added to CREDICOOP staff.

The lack of authority on the part of CREDICOOP in this agreement makes research and publication difficult. This lack of authority also makes the work of MASI technicians more difficult since they depend on CREDICOOP for counterparts, transportation facilities, office space and secretaries.

All of these facilities have been deficient during this quarter, especially those related to transportation.

The Horticulturist's report

The Horticulturist arrived in Paraguay on July 2, 1981. He was assigned to the department of Agricultural Technical Assistance to work with Ing. Agr. Carlos G. Villalba as his counterpart, according to the way Dr. Erwin T. Bullard had worked.

The major responsibilities of the Horticulturist have been:

1. To develop production practices of the 4 crops. When the Horticulturist arrived, tomato and banana seeds had been planted in the field. The banana has already started to bear fruit and the Santa Cruz tomato variety was blossoming. The

strawberry is still in the propagation plan. The pineapple plan has not begun yet. Research trials on propagation are being conducted in the National Agronomic Institute in Caacupe.

2. To locate dependable sources of seeds, equipment and materials necessary for production and research. To that end, visits have been made to different businesses specializing in seed sales, fertilizers, phytosanitary products, irrigation and sprinkling equipment. Various seed companies in California, Florida and Texas were contacted to solicit catalogs and seed samples.
3. To recommend varieties.
4. To assist CREDICOOP audiovisual unit in the preparation of videotape bulletins and booklets.
5. To assist CREDICOOP in the evaluation and selection of the 4 crops.
6. To coordinate the work of CREDICOOP with MASI, AID and other Paraguayan organizations such as the Agricultural College, the Agricultural and Livestock Extension Service, the National Agronomic Institute, the National Institute of Technology and Standard, the Agricultural and Livestock Ministry and others.

7. To train counterparts in the technical aspects of horticultural production.

The following topics associated with problems arising in the field were discussed and recommendations were made:

- a. Suckering tomatoes
- b. Fertilizing tomato and banana
- c. Pruning tomato to help recuperation after frost damage
- d. Mite control
- e. Tomato harvesting
- f. Nematode control on banana
- g. Foliage spot control on strawberries
- h. Hoeing of banana
- i. Raleo of banana
- j. Weed control on banana
- k. Sigatoka control on banana

All of these topics were discussed with the counterpart Ing. Carlos Villalba and later with the Coordinator of the Agricultural and Livestock Extension Service Ing. Gilberto Gonzalez, who joined the Department of Technical Assistance on Sept. 1, 1981.

Research

Every Monday afternoon was reserved for visiting the experimental trials at the IAN. Here trials are conducted on the cultivation of tomato, banana and strawberry.

Tomatoes - varieties, fertilizer

Strawberries - variety trials

Bananas - variety trials

The reports of 1980 on these trials were studied and one report based on these studies was given to AID. There are certain deficiencies in designing and technics, which will be corrected for the year 1981-1982.

A list of trials was prepared giving priority to the following:

- Tomato: 1) Varieties
 2) Fertilization
 3) Planting System
 4) Irrigation System
 5) Vegetable Sanitation (insects and diseases)
- Bananas: 1) Varieties
 2) Fertilization
 3) Sigatoka control
 4) Irrigation
 5) Nematode and barrenador control
- Pineapples: 1) Selection of the Abacachi pineapple
 2) Fertilization
 3) Density of the planting
- Strawberry: 1) Varieties
 2) Irrigation
 3) Fertilization

- 4) Planting system
- 5) Mite control
- 6) Disease control

The trials for 1981 do not provide much information due to frost damage which seriously affected banana and tomato. In the case of tomato, the absence of line limits, of the great number of plants for replication and of the best research techniques makes these trials less dependable.

Steps have been taken to locate research in particular farms or in the Agricultural College.

The varieties of tomatoes with possible resistance to frost were introduced and have been planted in the IAN. They are also observed for other horticultural characteristics.

Varieties with resistance to marchitez bacterial from Taiwan and Hawaii were also introduced.

Other series of varieties of the Peto Seed Company and the Dessert Seed Co., both from California, were also introduced.

Strawberry varieties such as Fresno Tioga, Aliso and Sequoia from California, and Dover, and Florida Belle were brought from the United States. The last two varieties have little capacity to survive.

III. CROP BY CROP REPORT

TOMATO

The climate for growing tomato has not been beneficial since tomato crop has been affected by drought, frost and prolonged periods of low temperature. These factors have reduced the crop as well as the yield, and the quality. The frost has been said to be the worst in the cycle of 5 years. The second frost of July 18 affected 70% of the tomato seeds planted.

In Caacupe (IAN) trials of the Nozomi, Platense, Santa Cruz, Homestead and Call Ace varieties among others, are conducted. In addition, a trial of fertilizer and another on fitosanitario were carried out. However, the number of plants observed is limited; experimental design is unsatisfactory.

Tomato varieties supposedly tolerant to frost brought from the U.S., the Netherlands, Czechoslovakia, Italy, Germany, the U.S.S.R. and Bolivia are observed. In addition, varieties from the Peto Seed Company in California brought by Mr. Stephen Morgan was observed. Due to inadequate care of these plants, favorable results are not expected.

The damage caused by virus is extremely high and is a constraint. Also in these trials the incidence of blossom-end rot and attack by leafminers are severe.

The major problems on the farms were low temperature, frost, drought, virus and mites. The frost damage accounted for 40% of the loss.

The Santa Cruz variety, planted 30 days before the Nozomi variety, was more affected by frost. Its foliage was damaged which reduced fruit setting and deformation. 2 kilogram yield per plant is estimated.

The research program should emphasize resistance to virus, frost, and low temperature. The tomato harvesting season began in September and was expected to continue till the end of October.

Of the original seeds planted 25% was replanted after the frost and this will probably prolong the harvest.

Instructions regarding the planting, fertilizing, mite and insect control, harvesting and tomato classification were given.

Two video-tapes on tomato on these topics were prepared as a means of teaching the farmers.

In summary, the project involved 46 farmers with a total holding of 17 hectares.

CREDICOOP began to use its new warehouse facilities to receive, classify and pack tomatoes and peppers.

BANANAS

The cultivation of banana was seriously affected by frost which eliminated the production expected for 1981. The frost damage to bananas has been the most severe considering the 4 crops under the project. Based on this and on the fact that banana does not appear to be economically viable on small farms (1 to 2 hectares) the prospects for this crop are being reconsidered.

It has been concluded that the area planted to banana will not be expanded. The Government of Paraguay supports the planting of banana.

The variety and quality of banana in Paraguay are not suitable for export. The Paraguayan products cannot compete with banana production of Ecuador, Central America and Brazil which now exports to Argentina and Uruguay.

Banana cultivation is risky due to drought and lack of supplementary irrigation.

The banana producing areas of Loreto, Cnel, Oviedo and Itacurubí were visited to assess frost damage and make recommendations. Mr. Robert Maloney, the Packing and Marketing Specialist, participated in these activities.

Deficiencies were observed in such areas as seed quality, soil conservation, planting method and pruning. Nematode was observed as

well as mixed cropping and associated cropping. It was evident that additional training is needed for both extension agents and farm workers in this area. Local established varieties were also deficient.

The banana variety Oro is preferred to the variety Carape by the Paraguayan consumer. However, the Oro variety is susceptible to Fusarium wilt and is being replaced by Mysore, an inferior variety of lower yield. Mysore is more resistant to diseases and frost. Carape is a small banana of low quality and it is being recommended that this variety be replaced by Cavendish, Nanicao, Congo, Lacatoin and Montecristo. The recommendation that the Mysore variety be promoted is questionable since this variety has a flavor and aroma which are inferior to the Oro variety. Currently the Mysore variety commands a higher price than the Oro. It is said that this higher price will disappear once the consumer finds that he is being taken advantage of. Morphologically the Mysore is similar to the Oro.

Recommendations have been made regarding thinning, fertilizing, cultivation and control of sigatoka and nematode.

Tests were run on 2 types of atomizers at IAN to determine their effectiveness in the control of sigatoka.

Several meetings have been held with personnel from the Extension Service to revise the publication on banana cultivation. This publication should be prepared in a way that will demonstrate concordance of recommendations made by SEAG and CREDICOOP. This will reduce confusion among the farmers.

Marketing trials were made with banana produced in Loreto (10 hours from Asuncion) to determine if this variety could be transported successfully by truck. The results appear to be satisfactory.

The banana research program included test plots at IAN. These plots will be harvested and the results analyzed in spite of the fact that frost damage was substantial.

The varieties included in the test plot are: Montecristo, Nanicao, Congo, Lacatan, Gnana and Carape. Today the project includes 66 farmers with total holdings of 35 hectares.

STRAWBERRIES

Strawberry program has not yet begun under the project. It is hoped over the next 2 months farmer participants will be selected for the 1982 planting. It is hoped that 50 farmers can be found to participate in the project; each would plant 1/4 hectare for a total of 12.5 hectares of strawberry.

Strawberry plants of the variety Campinas 2712 have been introduced from Brazil to serve as the basis for a seed propagation program to be conducted by the National Seed Service and SEAG. This program will provide plant materials for the project.

Work has commenced with these entities and with the planting maintained at IAN. The strawberry has had problems with *Mycosphaerella Fragariae* and mites. Spraying with benomyl, ditano M-45, acaricid and keltana has controlled in part these plagues and diseases.

Another serious problem with strawberry has been the irrigation system. The most common practice is to water the strawberry with a garden hose which splashes soil onto the fruit since mulch is not utilized. This implies that the fruit must be washed after harvest and this greatly reduces its marketability.

MASI Marketing Specialists planned marketing trials for Buenos Aires but these trials were not carried out due to problems with shipping containers and the poor quality of the harvested berries.

The IAN maintains 50,000 plants of Campinas 2712 as well as variety trials which include Florida 2712, Campinas and Montealegre. Certain varieties from California are propagated such as Sequoia, Aliso, Tioga and Fresno.

From Florida the Florida Belle and Dove varieties were introduced but failed in propagation.

Regularly scheduled meetings are held among the strawberry specialists of SEAG, SENASE, IAN, and CREDICOOP to discuss, plan and resolve the problems of the crop.

PINEAPPLE

The pineapple component of the project has not yet begun.

During this quarter, the Horticulturist participated in a series of meetings with the personnel of SEAG, SENASE, IAN and CREDICOOP to

revise a bulletin which will be used in courses to instruct extension workers in pineapple cultivation. He has also participated in another series of meetings for the purpose of preparing a plan to introduce and propagate the Cayena Lisa variety of pineapple. This variety will be brought from Brazil in the amount of 25,000 slips and a similar number of pineapple main stems will also be brought from Brazil to be intensively propagated in order to expand planting of Cayena Lisa.