

CONSORTIUM FOR INTERNATIONAL DEVELOPMENT



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007/76

Colorado State University
Oregon State University
Texas Tech. University
University of California
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QUARTERLY REPORT OF
CONTRACT NUMBER GOB/AID 511-92
BETWEEN
THE MINISTRY OF RURAL AFFAIRS AND AGRICULTURE
OF BOLIVIA
AND
CONSORTIUM FOR INTERNATIONAL DEVELOPMENT

Period Reported: October 1, 1976 thru
December 31, 1976

LA PAZ, BOLIVIA

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The following report of contract activities is submitted in accordance with Paragraph IV-A, Appendix B of said Contract.

ACCOMPLISHMENTS

Personnel and Administration

Dr. Charles Ward arrived October 19th to fill the position of Cereals Agronomist in Santa Cruz. He is the replacement for Mr. Max Long.

Agricultural Research and Technology Development

The activities reported herein generally represent a cooperative effort between CID and Bolivian technicians, which is the intended operational procedure for this Contract. The following agronomic experiments were initiated during this report period (letter references which follow refer to those presented in the Technical Plan of Work, CID Administrative Report 006/76).

Saavedra

Soya

1. Breeding

- a. Previous crosses were made and seed collected on a limited number of plants. Many of the first crosses failed to stick

due to unfavorable weather conditions and the inexperience of the Bolivian technicians in crossing techniques.

- b. Summer planting for additional crosses have been completed.
- c. & d. The F_1 crosses and mass selections of the variety Jupiter will be completed during the Winter growing season.

2. Variety tests

- a. The INTSOY variety test was planted and additional seed sent to Abapó-Izozog, Villamontes, and Yacuiba. CID and Ministry technicians designed a soya and peanut research program for this year at Villamontes and Yacuiba, and instructed local technicians regarding its implementation. A second variety test was planted at Saavedra using 20 varieties received from Taiwan.
- b. Yield tests - Ten of the best yielding varieties from last year's testing were planted at the Saavedra Station. The varieties include Bossier, Visoja, Santa Rosa, Mineira, V-1, IAC-2, Jupiter, Pelicano, Colombia, and Acadian. Another test of ten varieties has been planted at Okinawa # 3. Seed was delivered to cooperators for planting at Villamontes, Yacuiba, and Monteagudo.
- c. The date of planting studies with four varieties was initiated. Three of the eight planting dates are completed. Tests involving various plant populations were planted three times, but stand establishment was unsuccessful on the first two attempts due to poor seed quality. The third attempt with seed from a different source appears successful.

- d. Herbicide tests - Two herbicide tests were established at Saavedra in cooperation with the British Mission weed technician. The first test employs 12 different treatments or combination of treatments. The second is a screening test with various chemicals applied in preplanting, preemergence, and postemergence stages. The stand of soya for these tests is rather poor, but an evaluation of the chemicals should be possible.
- e. Insect collection and identification - Plans were made to initiate insect collection throughout the season.
- f. Seed multiplication - Not planted to date.

Peanuts

- a. Introduction and comparison of varieties - Two variety tests were planted, one involving twelve varieties previously tested at Saavedra and a second involving ten varieties received from Taiwan.
- b. Seed multiplication - One-half hectare of Perla de Saavedra variety was planted for seed increase. Varieties Spancross, Argentine, Spanish, and Tanash are also being multiplied with 1/10 hectare each.

Sunflower

- a. Introduction and comparison of varieties - A variety test using twelve varieties was planted. In addition, thirteen varieties from the United States have been planted for observation. Quantities of seed received were too small to complete standard yield trials.

Sesame

- a. Introduction and comparison of varieties - A variety test of twenty-four varieties was planted. This includes the better yielding varieties found last season.

Castorbeans

- a. Seed of castorbean varieties have not been available and no tests are planned for this season.

Rice

- a. Breeding - Plantings for use in the breeding program were made. Arrangements have been finalized for Dr. Manuel Rosero (CIAT-Colombia) to visit in mid-January to evaluate and assist in this program.
- b. Variety comparisons for yield for eighteen varieties were all planted.
- c. Regional trials - Regional rice trials were planted at San Pedro and Portachuelo using seventeen varieties. However, trials at other regions are being cancelled due to the failure of CIAT to provide transportation and the absence of trained local personnel. Emilio Salaues has left CIAT and only one Bolivian technician is now assigned to the rice work and he has had limited experience.
- d. Cultural practices - Cultural practice demonstration plots have been established at Portachuelo with replicated tests at Saavedra. The tests include row spacing, plant density, insect control, and chemical and nonchemical weed control practices.

- e. Chemical control - Two chemical weed control trials have been established with the assistance of Dr. Robert Frans (CID) and Dr. John Tollervey (British Mission). Eighteen chemicals or combinations are being tested in a randomized block design.
- f. Irrigated trials. The irrigated rice trials have not been planted due to the absence of a water supply at Saavedra. Unless this situation is rectified shortly, these experiments will be abandoned again this year. This will mark the second year in a row that these experiments have been lost due to poorly functioning physical facilities.
- g. The regional fertilizer trials have been largely abandoned due to the absence of transportation in CIAT and limited personnel. One smaller fertilizer test is included in the cultural practices tests (d above) and another phosphorus response test was set out as part of the fertility program of Dr. Smith.
- h. Disease control - No significant disease problems have been encountered to date in the cereals crops. These will be watched for later applications.
- i. Insect control - Three rice experiments have been planted for use in insect control treatments. These trials will be treated throughout the season as damaging pest levels appear.
- j. Seed production plots have been planted for Bluebonnet 50 sel and Dawn sel (two hectares each). However, severe weed problems are being encountered due to the lack of a tractor part to

operate the herbicide applicator and insufficient field laborers for hand removal.

- k. Other - Three experiments using two varieties were initiated to study the effects of date of weeding on rice yields.

Corn

- a. Breeding - All of the eleven breeding blocks have been planted and some crossing has been initiated in the earlier planted plots. This phase will probably suffer due to Ing. Torrico leaving the corn program at Saavedra.
- b. Introduction and comparison of varieties - Nine experiments including new variety introductions from CIAT (Colombia) and CIMMYT, and yield comparisons for Cuban Yellow, La Posta, Simeto, and Population Cristalina were completed. A total of 168 varieties are included in these studies.
- c. Regional trials - Only five of the regional trials have been planted (San Pedro, Portachuelo, Mairana, San Isidro, and Puerto Fernandez) due to the lack of adequate CIAT transportation and Bolivian personnel. Possibly one additional location will be planted using CID transportation, but this site is still provisional.
- d. Weed control - Two plots have been planted, and preplant and preemergence applications made. Postemergence applications will be made during the growing season.
- e. Insect control - No significant insect populations have been observed as yet on plots planted for the study of insecticides.

This work will continue during next quarter as two more plantings have been made specifically for insect control studies.

- f. Seed multiplication - Seed multiplication plots of Cuban Yellow variety on four hectares and La Posta and Simeto on four hectares was planted.

Others. Consortiated plants were made at Saavedra with interplantings of corn and beans at three seeding rates. A special planting of U. S. inbred lines has been made specifically to evaluate them for insect resistance.

Sorghum

- a. Planting of thirty-two varieties from the United States, Argentina, and other sources was completed in late December, but germination of some entries was very poor. Seed storage facilities are badly needed to prevent these problems at Saavedra.
- b. No tests on chemical insect control can be made due to the unavailability of planting seed. However, the United States All-Disease and Insect Nursery (ADIN) was planted to evaluate for disease and insect resistance, but germination was poor apparently due to the application of excessive amounts of methyl bromide by USDA personnel. The sorghum midge resistant nursery is to be planted in early January, but these seed also may have been damaged by the methyl bromide treatment.

Toralapa

1. Potatoes

- a. Breeding - Several potato varieties have been planted and are ready for making initial crosses for nematode and frost resistance, yield, and form. These consist of the following varieties:

- i. Wila Waca Lajra - resistant to Nacobbus nematode
 - ii. Tunti Imilla - resistant to Nacobbus nematode
 - iii. Sipancachi - resistant to Nacobbus nematode
 - iv. Condor Imilla - resistant to Nacobbus nematode
 - v. Imilla Negra - contains high solids
 - vi. Imilla Blanca - contains high solids
 - vii. Milagro - characterized by high yield, good form, and some cold tolerance
 - viii. Almacigo - tolerant to late blight and resistant to frost.
- An absence of a water supply has caused delays in initiating these crosses.

- b. Introduction of varieties as possible sources for future breeding materials -
- i. Phytophthora (late blight) resistance. Twelve varieties from CIP, grown in Pairumani last season and resistant to late blight, were planted in heavy disease areas east of the Toralapa Station. Seven native varieties were also included in the trials.

- ii. Nacobbus aberrans (nematode resistance). Five clones from the Bolivian collection were planted in nematode disease regions in a continuing search for resistant materials.
 - iii. Cold tolerance. Approximately fifteen clones, including several promising materials from last year's trials, were planted to identify cold resistant materials for use in future breeding programs.
- c. Identification and cataloging of Bolivian clones collection - Approximately 150 new clones have been added to Bolivia's overall collection. About 230 clones have been partially cataloged with respect to agronomic and phenologic and genetic growth characteristics. This work is a continual process and more emphasis is now being given to taxonomic characteristics.
 - d. Yield trials - Eight varieties from the Netherlands and three Bolivian varieties were planted in yield comparison experiments.
 - e. National and regional variety trials - The varieties Sani Imilla, Imilla Blanca, and Runa have been planted at both Toralapa and Chinoli as a test of regional differences of these promising varieties.
2. Agronomic Practices
- a. Chemical soil treatment for nematode. These trials have been planted and will include a test of four nematicides.
 - b. Seed tuber treatment - Experiments with preplant treatment of seed with UC 21865 for nematode control was completed. The heat treatment experiment has not yet been completed.

- c. Tuber greening - This experiment was planted with greening of two varieties (Imilla Blanca and Sani Imilia) for four different time periods (0, 7, 21, and 28 days).
- d. Plant density - These trials were planted with five variations in row spacings and four variations within the row.
- e. Time of harvest - One trial with two varieties of S. andigena and one with two varieties of S. tuberosum were initiated. S. andigena experiments will have harvest dates of 105, 120, 135, 150, 165, and 185 days. S. tuberosum have dates of 90, 105, 120, 135, and 150 days.
- f. Chemical weed control - Trials were planted with seven pre-planting and preemergence treatments, one "at emergence treatment" and two postemergence treatments. Weed and plant growth has been slow due to lack of rainfall.
- g. Consortiated planting - Two experimental consortiated plantings were completed, i.e., potatoes and habas, and potatoes and barley.
- h. Fertilizer trials
 - i. A phosphorus level experiment with six levels of P from 0 to 200 Kg/hectare was completed.
 - ii. A residual phosphorus experiment involving five application rates, three of which will be applied in the second and third years on some plots was initiated. Barley will be planted the second and third years to reflect crop rotation results.

- iii. A fertility source trial involving five different levels of fertilizer was initiated to study the effect of fertilizer sources on both yield and quality of potatoes.
- iv. A fertilizer placement trial was completed with two methods of placements of fertilizer in the soil, i.e., broadcasting and covering vs. fertilizer placement in a band 5 cm below the seed.

3. Regional Trials

a & b. Variety trials - In cooperation with Extension agents, the following trials were established:

- i. Fertilizer trials at eight locations with six rates of phosphorus. Correlation trials for calibrating soil test methods for fertilizer rate recommendations will be made at all experimental stations and the eight regional locations.
- ii. Yield trials for twelve Netherlands and local varieties at five locations.
- iii. Nematode control using TEMIK 10G at Toralapa only.

4. Production of Basic Seed

a. Samples of Sani Imilla and Imilla Blanca were sent to CIP earlier this year to be cleansed of virus infections. These will not be returned in time for seed reproduction this year. However, these clean tubers will be used to initiate "clean seed" production next year.

- b. Approximately 500 tubers from last year's selections of Sani Imilla and Imilla Blanca are being screened for a second year at Toralapa and Chinoli to produce improved seed stock.
- c. Also, tuber indexing and stem cutting techniques will be carried out under greenhouse conditions.

5. Special Studies

- a. Quality determinations for protein and starch content have been completed for 33 varieties in cooperation with La Tamborada laboratories. Another 67 varieties and clones have been sent to the United States for amino acid analysis. Study is also underway to determine specific gravity on the introduced and local varieties.
- b. Same as work reported in Paragraph 1,c.
- c. A survey was made of potato insect pests in December by Dr. Ward.

San Benito

Wheat

1. Breeding

- a. New crosses - Wheat crosses for varietal improvement were commenced during this quarter. Approximately fourteen crosses have been made which involve the use of fourteen varieties.
- b. Variety introductions - All variety introductions were planted. Only those received from CIAT/Colombia and CIMMYT were planted. The total plantings were approximately 1000 introductions.

- c. Yield trials - Twenty-four comparative yield trials were set out using the varieties Chinoli 70, Jaral, Napo, Norteño, and Frocor²....
- d. Regional trials - None of the regional wheat trials were planted due to absence of rain. There are also complications in that Bolivian technicians lack funds for travel and per diem to accomplish this work.
- e. Seed production - Jaral and Chinoli 70 were planted to 3000 square meters each for basic seed multiplication.

2. Agronomic Practices

This experimental work has been delayed due to lack of rain.

3. Special Studies

- a. Identification of wheat rust races - This work has not been initiated since Ing. Crespo has not yet received training in this area and there is a lack of adequate laboratory facilities pending completion of the 053 loan.
- b. Identification of wheat virus vector. This work was initiated and will continue under greenhouse conditions.
- c. Identification of smut species - This work has been delayed pending receipt of identification material requested from the United States and arrival of the smut season for collecting material.

Barley

1. Breeding

- a. Variety introductions - About 65 introductions from the world collection were planted at San Benito.
- b. Comparative yield trials - Comparative yield trials with malting and forage varieties were planted using 15 malting and 13 forage varieties.
- c. New crosses - This work will be carried out later in the season when plants are ready.
- d. Regional trials - Regional trials were planted at Toralapa but the other trials are awaiting rain and travel funds for the Bolivian technicians.
- e. Seed production - Two recently released varieties Promesa 76 and San Benito 76 were planted in one-half hectare each.

Oats

1. Breeding

- a. Variety introductions - From the world collection, 223 varieties were planted at San Benito.
- b. Comparative yield - Trials involving seven new varieties and five standardized varieties were planted.
- c. Basic seed production - The two new released varieties, Tifton and Clinton, were planted to 2500 square meters each for seed production.
- d. Regional trials - No regional trials have yet been planted.

Fruit

As indicated in the Plan of Work, the fruit research program is entirely under the direction of a Bolivian and a Swiss technician and is not included in the scope of Contract GOB/AID 511-92. The projected work plan is about totally completed except for collection of yield data but is not reported in detail. However, bud wood of peach varieties adapted to 100-350 chilling units was received from Dr. Tony Hatch, a short-term consultant under Contract GOB/AID 511-96. From the eight peach and three nectarine varieties received, about 160 grafts were made. The survival rate is about 65 percent. Apple stock in the form of plants was also received from Argentina which include six new varieties and seven rootstock varieties. The latter will be used for grafting.

Chinoli

The national uniform potato variety trials were planted using Sani Imilla, Imilla Blanca, and Runa varieties from Toralapa plus two or three added local varieties from Chinoli. The Toralapa varieties are also being tested at Patacamaya and Belen stations. The national wheat trials were planted at Chinoli with five varieties from the San Benito Station, i.e., Chinoli 70, Jaral, Napo, Norteño, and Frocor²...

The national fertility trials were also initiated at Chinoli during this quarter.

Other research activities

CID technicians visited the area of Comarapa west of Santa Cruz to survey problems related to pesticide usage. A report was filed with the Ministry of Agriculture which suggests the presence of excessive pesticide application but likely not sufficient to endanger human consumption. Serious insect and nematode problems were found, however, which merit immediate attention by IBTA technicians.

The experimental weed research of Dr. Frans under Contract GOB/AID 511-96 was implemented and has added an important dimension to the overall program. His work at Saavedra, Toralapa, and San Benito are reported elsewhere. However, his assignment is national and includes experimental work at other stations.

Patacamaya. Plans were made to undertake experimental control of range weeds in weeping lovegrass, utilizing mixtures of 2,4,5-T with either 2,4-D or Dicamba, and spot treatments of 2,4-D and Dalapon. Due to unrepaired water pumps for irrigation, the area has not been prepared per previous agreement with station management.

Belen. Tests were established for oats, clover, alfalfa, and barley (established stands), and for newly established potatoes and barley. The tests involve pre- and postemergence herbicide applications and hand-weeded checks. Dry weather and failure of station personnel to apply needed irrigation to several test plots may confound the effects of the treatments.

Chipiriri. Demonstration herbicide treatments were established on bananas and citrus with preplant, preemergence, and postemergence treatments. A test for control of the weed Rogelia was established in November with 35 herbicides. Counts in December reveal no Rogelia was present in areas where heavy infestation was found last year. A rice test scheduled for Chipiriri or La Jota was not established this quarter since the station personnel did not prepare a test area.

Trinidad. A rice test was established (near Casarabe) which includes four preemergence and six postemergence treatments.

Coroico. Advisory work has been done with the Director and a member of the Florida team. Specific herbicides were suggested for coffee and peanut trials.

Caranavi. Advice was given on herbicide treatments for control of Rogelia which is generally infesting the station, and for broadleaf weeds in citrus.

Bolivian and CID technicians are participating in the international meloidogyne (nematode) program. Approximately \$800 has been granted to them to defray in-country travel and incidental costs related to the program.

Supplemental Research

Soil Fertility. The national fertilizer and variety trials were partially initiated this quarter. Those related to potatoes were

set out in Cochabamba, Chuquisaca, Potosí, and La Paz. (Those experiments reported previously for Chinoli are included in this grouping.) The national wheat trials have been delayed, but will be planted with sufficient rain. Collection of soil samples for experimental plots at all stations in the project area have been completed and submitted for soil analysis. An accounting system for recording annual usage of fertilizer and other chemicals plus their residuals is in process of development. Residual fertilizer-crop rotation studies using two experimental designs were established at Toralapa and at regional locations in the departments of Chuquisaca and Cochabamba.

A three-year study of foliar vs. soil applied fertilizer on peaches was initiated at San Benito. Experimental tests to establish a soil test phosphorus value were initiated this year, primarily with potatoes. However, tests with other crops such as corn, sorghum, and rice will be established later depending on the availability of people and time resources.

Insect and Diseases. A survey made during this quarter of the Saavedra, San Benito, and Toralapa stations found no satisfactory reference insect collections. A minimal collection was found at Saavedra, but the lack of suitable storage facilities has resulted in the loss of most of the collection. Sources and prices of suitable equipment have been obtained and minimal needs requisitioned through CID. But the total needs should be made part of the 053

loan request or other sources found immediately if this work is to progress.

Insect collections at Saavedra have been given increased emphasis as a continuing activity in order to develop a basic collection. Collection work at all of the project stations is lagging due to the absence of Bolivian technicians. Several U. S. entomologists known to have collected insects in Bolivia have been contacted by letter and asked to contribute identified insects to a national collection. No assistance has yet been given in the development of a national collection due to the lack of museum personnel and facilities.

Identification and mapping of plant diseases, insects, and weeds in Bolivia is continuing. Information is being collected on a continuing basis and no special program is being initiated especially for these purposes.

Host plant resistance studies were initiated at the Saavedra station involving the introduction and evaluation of varieties and hybrids. Observations are also being initiated on currently used varieties. Studies of the natural biological control and pest systems have been initiated. Progress on this program phase will depend on the assignment of entomology counterparts. Those promised have not been assigned to date.

A survey of disease problems in Saavedra was conducted by a CID technician. Corn, peanuts, and rice were surveyed and found to be generally "clean" for this time of year with only minimal

problems which can be handled by the local technicians.

Greenhouse work has been initiated to identify a wheat virus vector, but has been impeded by lack of adequate equipment and facilities.

CID has requested two short-term consultants to assist with the plant quarantine and sanitation problems. They have been identified, approved by Ministry and USAID officials, and will come to Bolivia during the next quarter.

Other Activities

Responsibility for the initial development of a manual of policies and procedures for research and extension has been given/ to a consulting team for IICA. This group is studying the organization of IBTA and will provide policy guidelines as part of their assignment. CID technicians will assist in an advisory role. The evaluation of the research and extension personnel situation in the Ministry will be accomplished as part of this overall policy study.

Efforts continued on the 053 loan requests in cooperation with USAID and Ministry personnel. The vehicle and farm machinery lists have been bid and contracts signed. The seed equipment and shop equipment lists are approved and out for bid. All other lists are still in various stages of completion within the Ministry.

The soils laboratory in La Paz has been renovated and is now physically very adequate for providing soil test services. However, it still lacks several basic equipment items necessary for doing a wide range of soils analysis. A recent test conducted for fertilizer trials at

Saavedra did not include results on nitrogen. CID Central Office has been asked to assist in the purchase of some urgently needed items.

Extension Technology

Administration and Policy

The handbook of policies and procedures to be developed for the Extension Service is to be included in the IICA study team report of IBTA. CID personnel have collaborated in discussions with the IICA team and will assist in the final version of the report.

Visits were made to several provinces during the quarter to discuss the need for increased extension programming. As a result, the Ministry has budgeted for two additional agents during the first quarter of 1977, but final approval is still pending.

Training and Supervision

Plans were initiated during the quarter for a seminar series for both research and extension personnel in the Cochabamba region. Initially, the seminars will be held the last Friday afternoon of each month. An expanded schedule may be developed later if the interest and needs of the technicians warrant such. Presentations will be made by both Ministry Extension and Research personnel and CID technicians. The series will commence in January. A similar series is being planned for the Saavedra station. Slide series are being prepared for use in these seminars and eventual reproduction for extension agent use.

A seminar was conducted by the CID Extension technician with Cochabamba Valley agents on scientific methodology applicable to their regional trials and demonstration plots. The intent was to improve

research design and data recording. He also attended two extension agent activities with campesino groups concerned with pesticide use on potatoes and weed control on rice.

Two types of personnel evaluation forms to be used by both agents and supervisors were prepared. They are being translated and reproduced for use beginning next quarter. One for supervisors is already in use.

Dissemination of Information

Two extension bulletins were published this quarter, i.e., "Produce more rice" by Max Long, Emilio Salaues, and Larry Bond; and "Test for Seed Germination--A Key for Improved Harvests" by Larry Bond and Anibal Guzmán Herbas. Several other publications have met with delays and were not published in time to assist producers during this crop season.

Two issues of an Extension newsletter were published this quarter. However, there was some delay between the two issues. We need a stronger commitment within the Ministry to the need for publication of both research results and extension type information. A planned marketing newsletter still has not been published.

Plans were initiated this quarter to have extension booths established on market days in various rural communities. The initial trial was made at Punata in the Cochabamba Valley with two agents available to discuss agricultural production problems, and distribute extension literature. Eventually, slide and tape recording presentations are planned. No report has yet been received on the results of this first session. Ten cassette recorders are being purchased by CID to initiate a pilot project in Cochabamba using this media.

Program Planning and Evaluation

Agencies in the Cochabamba Valley participated in a workshop in which they developed their plans of work for the coming year and participated in projecting their budget requirements for each major program.

New forms for reporting the activities of extension agents were developed and distributed this quarter.

Other Programs and Activities

1. Seed Cleaning - The small hand screens constructed previously have been distributed to nine agents in the Cochabamba Valley for demonstration activities. Data are being collected from these demonstrations on weed seed removal. Demonstration plantings have also been made and will serve for demonstration days and an extension publication. The cost of the hand wheatsseed cleaner is an estimated \$b. 20.-
2. Youth Programs - One group of twelve youth interested in sheep improvement has been organized by a local agent. A national meeting on youth programs is scheduled for mid-January.
3. Range trials - All range cages have been set out at 30 locations with campesino participation. No noticeable growth has yet occurred due to the delayed rains.
4. Sheep improvement and wool program - An agent has been assigned responsibility for this program. He has held several shearing demonstrations and dipped some animals. He has orders for 20 purebred rams. FOTRAMA has agreed to purchase all available wool and have purchased 200 llamas and alpacas for lease to campesinos.

5. Socio-economic survey - A socio-economic survey of the rural sectors in Cochabamba has been approved. The questionnaire is in preparation.
6. Potato Producers Association - An extension agent with guidance from the CID extension technician has organized a Potato Marketing Co-operative. Over 1400 producers have paid dues and 600 more have indicated their intentions to join. Films have been obtained from Perú to stimulate interest. The Municipality in Cochabamba has given the Association a shed where they can market, thus eliminating the middleman. The first sale was held December 4th.

Sector Management

A final set of research projects to be carried out by personnel of the Sectorial Planning Office (OSP) this year was outlined. The programs are: (1) zonification of production, (2) production programs, (3) substitution for wheat, and (4) plan quinquenal and operative plans (updated). Special studies to be carried out are: (1) feasibility studies in designated rural development areas, (2) evaluation of erosion in the valley areas and recommendations for control, (3) agricultural development sector model, and (4) study of farm efficiency. The present OSP staff have been assigned to three units, i.e., planning, economic studies, and administration and control. The CID technician was assigned responsibility for the planning unit and has three office personnel assigned for training and research purposes. The program as outlined should satisfy the requirements of CONEPLAN as well as MACA research needs.

Agricultural Planning

1. A draft of a preliminary linear program model of the agricultural sector was completed. Much of this work was previously done under AID Contracts AID Csd/2459-2167 and AID ta-c/1103. A Spanish summary of results is contemplated in a CID working paper. The basic data will be transferred to CENACO computer when resources are available.
2. The work plan for the production zonification studies was initiated and about one-half completed.
3. A report was completed by the CID technician on rural and urban income distribution in Bolivia. It is the first such estimate in Bolivia. The study suggests that agricultural sector development efforts can emphasize general income increasing activities at the expense of concerns for greater equality of income distribution.

Economic Studies

1. The priority studies for this year were determined as previously indicated. The scope of work has been finalized for the wheat substitution study. Assistance was given in revising a proposed submission for partial wheat program financing through FAO.
2. Reviews were made of the work plans of a 3-man team for obtaining primary field data as part of the study of farm efficiency and comparative advantage.
3. Letters requesting technical information on soya flour mill costs and wheat flour reduction potentials in bakery products were sent to two U. S. groups. No replies have yet been received.

4. The CID technician completely edited and suggested additions to the Bruce Brown Consultant Report.

Statistics

On the basis of a November 15th meeting with Helen Soos (RDD), Hector Nogales (MACA) and C. Dunkerly (SRS/USDA), the CID technician will no longer be responsible for monitoring and coordinating the MACA/USAID program development of the sample frame for agricultural data collection (p. 25 of Plan of Work). Instead the CID technician will relay requests for data necessary for sectorial planning to this group. This alteration in responsibility has the verbal approval of the Chief RDD/USAID.

1. The CID technician requested from the Statistics Section a copy of the first sample frame questionnaire (not yet received). He also recommended that the first round of questioning obtain information on total farm areas percent cultivated, major crops produced and area assigned to the major crops. These data are needed for the agricultural planning program.

Marketing

A request for a short-term marketing consultant has been approved by MACA and USAID. He will be brought to Bolivia during the next quarter.

Training

Training activities during the quarter were primarily of the informal type. With the initiation of the agronomic planting season, most time was devoted to this activity and the related informal training relationships.

We have attempted to summarize the training activities for the year July 1, 1975 to June 30, 1976, and for the first two quarters of this year (July 1, 1976 to December 31, 1976). (See Tables 1 and 2.)

Contacts with the University of San Simón and Gabriel René Moreno were made. The final version of an agreement between MACA and the University was prepared and is under review. Two University students were assigned to CID technicians for thesis work. Contacts were also made with the Economics Faculty to program student thesis and plan seminar involvement. We expect more formal relationships to develop with this University during the coming quarter.

Three formal training sessions were held with Planning Office personnel on the relationships between sector programs and special studies or projects.

Official announcement of the Bolivian Agricultural Journal was made. Associate editors have been named. Instructions for manuscript preparation have been sent to various Bolivian agencies requesting papers. The initial issue will include initial papers on a wide variety of topics assigned by the Journal editors. The determination of these papers was initiated this quarter.

Dr. Patricio Malagamba, CIP/Lima, spent two days in Cochabamba discussing further collaboration with Bolivia. Tentatively, a CIP training session is scheduled for Toralapa in February or March.

Dr. Arthur Kaltt of CIMMYT spent one week here discussing the small grains program in Bolivia. He also offered CIMMYT funds for short-term training and two Bolivian technicians have been identified.

TABLE 1. CID Training Activities--July 1, 1975 - June 30, 1976 (Summary)

	Formal Credit Courses	Short- Term Courses	Seminars	Informal Training	In- Service Training	Super- visory Training	Campesino Meeting & Short Courses	Exp. Station Field Days
	No. attend.	No. attend.	No. attend.	No. Tech.	No. Tech.	No. Tech.	No. Tech.	No. Held
Technical Development & Sector Management			16	13	48	19		2*
Extension			16	76	83		98	
University	20	80						

* Estimated 550 attended.

Other Activities

<u>Number Student Thesis Supervised</u>	<u>Studies Conducted in Collaboration with University Professors</u>	<u>Studies Recommending Improved University Curriculum</u>	<u>New or Substan- tially Improved Courses</u>
8	0	0	0

TABLE 2. CID Training Activities--July 1, 1976 to December 30, 1976

	Formal Credit Courses	Short- Term Courses	Seminars	Informal Training	In- Service Training	Super- visory Training	Campesino Meeting & Short Courses	Exp: Station Field Days
	No. attend.	No. attend.	No. attend.	No. Tech.	No. Tech.	No. Tech.	No. Tech.	No. Held
Technical Development & Sector Management		3	1	4	30	21		0
Extension			27	164	84		9	0
University	117							

Other Activities

<u>Number Student Thesis Supervised</u>	<u>Studies Conducted in Collaboration with University Professors</u>	<u>Studies Recommending Improved University Curriculum</u>	<u>New or Substan- tially Improved Courses</u>
2	0	0	0

Ing. Fernando Rodriguez, a weed scientist from CIAT/Colombia, visited La Paz and Cochabamba to make arrangements for a one-year research program with corn and sorghum scheduled for next year in Cochabamba.

Short-term consultants were requested for assistance with marketing, animal research, and vegetable sanitation. All have been identified and will arrive during the next quarter.

Publications

1. E. H. Paschal, Short-Term Consultant Report. CID Working Paper 008/76 (Spanish and English).
2. Allen LeBaron, Bruce Brown, and Raúl Ortiz. Estimates of the Distribution of Urban and Rural Family Incomes in Bolivia. CID Working Paper 10/76.
3. Max G. Long, Emilio Salaues, and Larry K. Bond. Produzca Más Arroz... Siga Estos Pasos. Extension Bulletin, Serie Agricultura/1.
4. Larry K. Bond and Anibal Guzmán Herbas. Prueba de Germinación de Semillas. Extension Bulletin, Serie Agricultura/2.
5. Charles Ward, Ken Ellis, and David Villarroel. Recommendations for the Solution to the Pest Problems in the Comarapa Tomato Producing Area. (Preliminary).

PROBLEMS ENCOUNTERED

Administrative

The problem of tax exempt status for the Consortium persists as it has since the beginning of the Contract. The Contraloría still insists that the Consortium pay "consular taxes" on official vehicles. The matter was handed to MACA who were also unable to resolve the problem. This general problem

has existed from the beginning of the Contract and has now reached the point where something must be done at high levels of USAID and the GOB to resolve the issues.

Program

1. The issue of counterpart funding for the Planning Office personnel is still unresolved after about one year. The absence of these people is and will continue to reduce the effectiveness of the planning work.
2. The situation in Santa Cruz and the Saavedra station require immediate attention by MACA and USAID. The effectiveness of the CID technicians in carrying out contract obligations have been seriously reduced by the resignation of the corn and rice specialists. CIAT has not replaced these technicians with people of commensurate qualifications. Other promises of counterpart personnel have not been fulfilled. Likewise, physical facilities at Saavedra have not been developed or maintained, some of which are absolutely critical to research efforts. For example, the water pump has not been repaired for more than one year and it appears for the second year in a row, irrigated rice experiments will have to be abandoned. The station still is without a Bolivian Director and transportation deficiencies have limited the research program this year, especially as it relates to regional trials. In general, the conditions which existed last year persist and have even intensified with the loss of several key Bolivian personnel. There is a serious question now as to whether or not the Consortium can now accomplish the objectives of this program given the working conditions which have developed in Santa Cruz.

3. There is a general lack of equipment and facilities for accomplishing and sustaining a minimal insect management research program. Cabinets for storing insect collections are inadequate in quality and insufficient in number. Several existing collections have been destroyed by "dermestids." Limited number have been ordered by CID, but these requirements should be included in the 053 loan. No effort has been made to provide adequate seed storage facilities at Saavedra even though CID offered the use of an air conditioner for this purpose.
4. The greenhouse at Toralapa is now completed except for temperature control which renders the facility only partially useful. The station requires a heat source inside and ventilation fans.
5. Water pumps at Saavedra and Toralapa are inoperative and repairs have been delayed for lack of funds.
6. There is little evidence that improvements have occurred in the budgeting and disbursement process of MACA/IBTA, and this deficiency continues to be detrimental to the on-station research projects. The budgeting process appears not to recognize the need for emergency items and is very inflexible in meeting the realities of daily operations. The matters mentioned in the two previous items of this report are examples of the inability of the administrative process to respond to daily program needs. Also, the disbursement of IBTA and MACA funds to individual stations is still subject to the rigidities of general public administration in Bolivia. For example, fourth quarter allocations to the San Benito station were delayed until mid-November at which time the local "sub-treasury" in Cochabamba announced that only one-half of the

quarter's allotment would be allocated due to the shortage of time for using the funds. The end result of both processes is still to impose limitations on the individual station technicians in the performance of his research assignment.

7. Delays are still being experienced in the publication of both research and extension materials. In addition to postponements caused by the lack of materials, etc., other delays are occurring in the Ministry/IBTA review process. Publications have been delayed as much as 3 - 4 months pending official decisions.
8. The reorganization of the Planning Office has still not been officially formalized.
9. There is a need for closer coordination between CID technicians and Ministry officials in program planning related to crops within the CID contract. For example, recent visits by a CIMMYT technician and a CIAT technician from Colombia and their proposed collaboration with Bolivian programs were not known to CID personnel until after their arrival.

BIBID: 5110451003501

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ORGN: Consortium for International Development

ABSTRACT: Consortium for International Development^(CID) is contracted to carry out a project to provide agricultural assistance in Bolivia. CID will provide technical assistance and training in agricultural research and technology development, extension service and other information dissemination activities, market research, and program planning and administration.