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INTERNATIONAL CONSULTING DIVISION

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THE MINISTRY OF RURAL AFFAIRS AND AGRICULTURE
BY
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TABLE OF CONTENTS

	<u>Page</u>
SECTION I	
INTRCDUCTION	1
SECTION II	
SEED IMPROVEMENT	4
SECTION II-A	
SANTA CRUZ	5
A. Background and Objectives	5
B. Progress	6
1. Foundation Seed Production	6
2. Seed Certification	7
3. Seed Conditioning	8
4. Production and Marketing of Commercial Seed	8
5. Orientation of Regional Program	9
6. Training	9
7. Other activities	10
C. Summary and Recommendations	10
SECTION II-B	
GRAN CHACO	12
A. Background and Objectives	12
B. Progress	12
1. Harvest and Conditioning of Seed Lots	12
2. Analysis and Quality Control	13
3. Feasibility Study for Conditioning Seed in the Chaco	14
4. Institutional Integration	15
5. Breeder and Foundation Seed Production	15
6. Seed Distribution and Marketing	17
7. Commercial Seed Multiplication 1983/84	17
8. Training	18
C. Summary and Suggestions	18
SECTION II-C	
CHUQUISACA/POTOSI	19
A. Background and Objectives	19
B. Progress	20
1. Foundation Seed Production	20
2. Production of Certified Seed	21
3. Seed Certification	22
4. Local Seed Program Orientation	22
5. Infrastructure Development	23
C. Conclusions and Suggestions	23

		<u>Page</u>
SECTION III	SOIL CONSERVATION	25
	A. Background and Objectives	25
	B. Progress	25
	C. Summary and Suggestions	28
SECTION IV	COTTON PRODUCTION	30
	A. Background and Objectives	30
	B. Progress	31
	1. Assistance with Harvesting, Ginning, and Marketing	31
	2. Preparation of Report on Pilot Plan	31
	3. Inputs for the 1983/84 Production Year	31
	4. Farmer Registration and Technical Assistance	32
	5. Recruitment and Training of Extension Agents	34
	6. Assistance to IBTA and the Comite in Research- related Activities	34
	C. Summary and Suggestions	34
SECTION V	INFORMATION SYSTEMS	37
	A. Background and Objectives	37
	B. Progress	37
	C. Summary and Suggestions	38
SECTION VI	CONSTRUCTIONS	40
	A. Background and Objectives	40
	B. Progress	41
	1. Warnes Seed Processing Plant-Small Con- structions	41
	2. IBTA Seed Drying Bins	41
	3. Access Roads and Dike for Warnes Seed Processing Plant	41
	4. CIAT/Saavedra Seed Processing Plant	41
	5. Toralapa Experimental Station - IBTA	41
	6. Seed Processing Plant in the Gran Chaco	42
	7. Agriculture Service Center-- Alalay, Cochabamba	42
	8. Computer Analysis of Construction Unit Prices	43
	C. Summary and Suggestions	43

		<u>Page</u>
SECTION VII	SPECIAL TRAINING COURSES	45
	A. Background and Objectives	45
	B. Progress	45
	C. Summary and Suggestions	46
SECTION VIII	COORDINATION, ADMINISTRATION AND PROCUREMENT	47
	A. Background and Objectives	47
	B. Progress	48
	C. Summary and Suggestions	50
SECTION IX	CONCLUSIONS	51

ANNEX	Table I	WORK-DAYS PAID DIRECTLY BY THE CONTRACT BY TECHNICAL AREA - May 1979 - December 1983	52
	Table II	WORK-DAYS PAID DIRECTLY BY THE CONTRACT BY TECHNICAL AREA - July - December 1983	53
	Table III	SUMMARY OF WORK-DAYS PAID DIRECTLY BY THE CONTRACT - May 1979 - December 1983	54
	Table IV	SUMMARY OF WORK-DAYS PAID DIRECTLY BY THE CONTRACT - July 1983 - December 1983	54

SECTION I

INTRODUCTION

This Progress Report is the tenth in a series since the beginning of the Agriculture Sector II Project, 511-T-059, between the Ministry of Rural Affairs and Agriculture (MACA) and the United States Agency for International Development (USAID). It covers the work of Chemonics International Consulting Division for the period July through December, 1983 under Technical Assistance Contract GOB/AID 511-059-008-HCC between MACA and Chemonics within the above mentioned Project.

Though this report focuses mainly on Chemonics' efforts, progress reported in the various components of the Project reflect the work of advisers in conjunction with their counterparts from local institutions, private and public, of USAID personnel, and also of support staffs of all institutions. In particular, we wish to acknowledge the efforts of several key individuals who, along with the Chief of Party, are responsible for Project implementation at the national level:

- * Ing. Raul Salas, Director General of Agriculture, MACA
- * Lic. Isabel Canedo, Head of the Office of Coordination for the T-059 Project, MACA
- * Mr. John Rifenburg, Project Manager, USAID

These individuals have devoted a great deal of time and attention to the furthering of project objectives, and in coordinating work with the Chemonics team.

At the end of the report period, MACA and USAID were beginning to develop a new strategy for implementation of disbursements for the Project under the pari-pasu system. For this purpose, three basic documents were required:

- * Implementation Plan by quarter for 1984 and 1985, including a disbursement schedule for USAID and the GOB,
- * Procurement Plan for 1984, and
- * Request for disbursements for the first quarter of normalized implementation, April through June of 1984.

Large amounts of time were required from the advisory team, especially the Chief of Party, during the period January through March, 1984 for development of these documents. For this reason, preparation of this report was postponed to April and May of 1984.

On next page, the advisers working under the technical assistance Contract during the semester are listed by technical area of work:

Technical Area	Long-term Advisers	Short-term Advisers
Seed Improvement	Adriel E. Garay Juan A. Landivar Edgar R. Cabrera	Luis Ampuero R.
Soil Conservation	E. Don Hansen	
Cotton Production	Victor Gonzales	
Constructions	Eddy Decormis C.	
Special Training Courses		Joseph Tosi Juan Carlos Quiroga
Sector Planning	Preston S. Pattie	Miguel Ibañez

In addition to the above, the Project Supervisor/Administrator from Chemonics' home office Ms. Candace Conrad, provided assistance in Bolivia for two weeks in November and December of 1983. Nine days of time of our Procurement Agent, Mr. Andrew Dobson, were also billed to the Contract, mainly to purchase and ship three new Project vehicles needed by the advisory team.

Juan Landivar joined the team in April of 1983 with the understanding that he would take a leave of absence after harvest season. This leave-without-pay was taken in July and August. Dr. Edgar Cabrera began his assignment in Bolivia in mid-August, and upon arrival, was immediately reassigned to the Chuquisaca/Potosi region.

Ing. Victor Gonzales' original contract as a short-term adviser was extended to September to complete an evaluation of the first year of effort under the cotton program in Yacuiba. With the extension of that program for a second year, he was employed as a long-term adviser for one year beginning September 14, 1983. This action was taken in amendment number 12 to the technical assistance Contract. Two extensionists were also hired by Chemonics to work in the cotton program. Both are employed as local staff technical assistants, and therefore they do not appear in the list of advisers above.

Amendment 12 also extended the Soil Conservation Adviser two additional months to December of 1983. After an inspection of this program by authorities of MACA and USAID, technical assistance in this area was continued into 1984.

During the semester, the Sector Planning component of the Project was strengthened with regard to Information Systems. Miguel Ibañez was hired as a short-term adviser to head a technical team formed from various institutions. His initial assignment is for 12 months, working half-time, or six person-months of work. The Chief of Party is also mentioned in the above list under Sector Planning because of his supervisory responsibilities involved in all Project activities where technical assistance is provided.

Finally, a new activity was added in the semester--Special Training Courses in Tarija in the area of natural resources. Two short-term advisers worked with a local coordinator and instructors from UNESCO to present a course on land use classification. During 1984, it is expected that as many as four additional courses will be offered in irrigation, soil conservation and other areas. Chemonics will continue to provide course instructors when

requested to do so by MACA.

The appendices to this report give an update on the exact number of days worked by advisers--long-term, short-term and home office--according to technical area of work, including administrative support and procurements. Breakdowns are given for the semester covered by this report as well as for the entire duration of the Contract, from May 1979 through December 1983. It should be emphasized that the total amount of technical assistance provided during the semester covered by this report is larger than that in any previous semester.

The next six sections of this report present progress achieved in each technical component of the Project--seed improvement, soil conservation, cotton production, constructions, special courses and information systems. Section VIII deals with coordination and administration of the Project and the technical assistance Contract. Section IX presents general conclusions pertaining to the progress attained during the semester. Normally, projections and objectives would be presented for the following semester as well. However, since the current report is being completed well into the first semester of 1984, it was felt unnecessary to show objectives here. Instead, they will in the next progress report for the period January through June of 1984.

SECTION II

SEED IMPROVEMENT

At the beginning of the semester covered by this report, two advisers were working under the Project in seed improvement in Santa Cruz and the Gran Chaco. MACA requested a third adviser to work in this field to expand the program to the valley areas. During the semester the team of advisers was consequently increased to three, as follows: Dr. Adriel Garay in Santa Cruz; Dr. Juan Landivar in Yacuiha; and Dr. Edgar Cabrera to attend the valley areas. After an evaluation of the regions both USAID and MACA agreed that the new adviser be posted in Sucre to work in the regions of Chuquisaca and Potosi.

Work plans were developed in a coordinated manner so as to best use the capabilities of all three advisers. Dr. Landivar takes major responsibility for development of the regional program in the Gran Chaco and also assists in Santa Cruz on cotton seed production. He also backstops the commercial cotton production program in the Gran Chaco. Dr. Cabrera works mainly in the Chuquisaca/Potosi region and is also responsible for seed plant designs and equipment specifications in the rest of the country. Dr. Garay continues to provide guidance in Santa Cruz, as well as serving as activity leader. In this regard, Dr. Garay assists the other regions on seed program development, especially related to seed certification. The coordinated effort has been implemented to integrate the program at the national level, not only in the technical aspects, but also to facilitate development strategies and exchange of seeds among regions.

In addition to the specific goals within the regions some goals related to the overall seed program were defined for the period as follows:

- * Develop a comprehensive work plan for all advisers in seeds,
- * Assist in coordinating the first national round table in seeds, scheduled for August 1983,
- * Coordinate distribution of wheat seed produced in Santa Cruz to other regions affected by drought in previous semester,
- * Identify and specify equipment and machinery required for regional seed programs.

All the above goals were met, though needs for equipment still required revision in light of available funds and results of feasibility studies. A comprehensive work plan was developed with the help of Ms. Candace Conrad during a routine supervisory trip from the home office in December of 1983.

The first National Round Table on Seeds was held in Pairumani, Cochabamba in August. Project funds were used to finance travel for representatives of several national and local institutions. About 40 persons attended the three-day event, including the Director General of MACA. The Round Table was successful in terms of defining strategies for development of regional programs

and coordinating efforts among regions. Specific policy recommendations were developed.

Considerable time of the advisers was dedicated to coordinating production, processing and shipment of wheat seeds from Santa Cruz for initiating seed program in Chuquisaca. The wheat seeds were produced and provided by ANAPO and private seed companies also for Cochabamba and Potosi.

The advisers also developed lists of equipment required for their respective areas of work for 1984 and 1985. This information, along with costs estimates for purchase and transportation, will be an important input into the overall Implementation Plan of the Project.

SECTION II-A SANTA CRUZ

A. Background and Objectives

In the semester covered by this report, a very aggressive emergency seed program was planned for soybeans. Despite the economic problems faced by local institutions, the Santa Cruz Seed Program and all its elements worked effectively and produced more certified soybean seed than had been thought possible. Specific objectives defined for the program during the semester were:

- * Assist MACA's Seed Certification Service to establish systematic quality control of seeds, including imported seeds.
- * Provide a 10-day training course for certification personnel.
- * Provide in-service training for personnel of the Foundation Seed Unit, Warnes Seed Conditioning Plant and the Seed Certification Service.
- * Help in developing improved seed certification standards.
- * Assist in planning of 1983/84 summer seed production of corn, soybeans, rice and wheat.
- * Provide guidance in the initiation of the cotton seed production program, coordinating with ADEPA and with local seed producers in the production and/or importation of registered seed.
- * Assist growers in the production of the 1983/84 cotton seed crop.
- * Prepare equipment specifications for seed conditioning plants and seed testing laboratory required in Santa Cruz.
- * Provide guidance to private seed companies on equipment requirements and installation of seed conditioning plants.

* Provide assistance to CIAT on planning of production and distribution of foundation seeds of soybeans, rice and corn, as well as initiate production of foundation wheat seed.

* Advise on the design and construction of a climatized seed storage facility in Warnes.

During this period, one additional objective emerged:

* Assist with developing the seed chapter as input to the overall Five Year Agricultural Plan for Santa Cruz (1984-89).

B. Progress

All elements of the seed program (foundation seed, certification, conditioning, seed production and distribution, and Regional Seed Council) were at work in this period with four basic crops: wheat, soybeans, corn and rice. The coordinated efforts of these groups resulted in substantial progress during the semester.

1. Foundation Seed Production

This activity is carried out only by CIAT (Centro de Investigacion Agricola Tropical) at this time. The responsibility of this unit is to supply high quality foundation seed according to requirements of seed growers. In the future, however, the regional seed supply system will allow other agricultural research institutions to recommend and provide foundation seed.

The main activities with the Foundation Seed Unit of CIAT were: a) roguing of wheat seed, b) distribution of foundation seeds to qualified seed growers, c) planning for production of foundation seed for following semester.

The first Round Table on Seeds, carried out in August, demonstrated that there was no pure wheat seed of the preferred variety, Saguayo, anywhere in the country. Consequently, the Adviser and his counterparts selected the best field of winter wheat in Santa Cruz, and intense roguing was carried out on five hectares to decrease varietal mixtures. The harvested seed is expected to have about 1 percent mixture, and will receive additional roguings in the summer (83/84) in Comarapa and Vallegrande.

All foundation seed of soybeans harvested in the previous semester was distributed during this semester to qualified seed growers for winter seed production. Foundation seeds of corn and rice were distributed in October for 83/84 seed crops. The distribution of these seeds was closely supervised by seed certification personnel with orientation from the Adviser.

Production of foundation seeds of four varieties of soybeans, four varieties of rice, two varieties of corn, and one of wheat were planned for 83/84 summer seed crop. The projected amount of foundation seed is 200 metric tons (MT). The incorporation of cotton into the foundation seed production program was discussed with CIAT and with ADEPA.

2. Seed Certification

This activity is carried out by the Seed Certification Service of MACA. During the semester, this Service has increased personnel and demonstrated great ability to execute planned activities despite its limited resources. The role of this Service in the region is exclusively seed quality control in all phases of production, conditioning, storage, distribution, tation, etc.

The main activities in which the Adviser provided technical assistance were: a) seed quality control, b) seed certification standards and c) specifications for laboratory equipment.

Technical assistance was provided on quality control for locally produced soybean, corn, rice, wheat and bean seeds, as well as imported seeds of hybrid corn, sorghum and soybeans. Certification has played an effective role in local seed production in winter. In doing the quality control work, the seed laboratory carried out 580 analyses of local and imported seeds. Technical assistance was also provided in field inspections of cotton seed in support of the newly initiated cotton seed production program.

Winter seed production consisted of 1,493 hectares of soybeans. Three previously grown varieties and one newly introduced variety were under certification. During field inspections it was noted that two varieties, Cristalina and IAC-8, showed good yield potential for winter seed production. Improved yields experienced in recent years can be attributed to superior variety, higher seed quality, better planting density, better weed and insect control and timely harvest.

At the end of the semester the total amount of tested and tagged seed was 774 MT. In addition, some seed was kept by farmers for their own use and some may have been sold directly to other growers at farm level. It is also estimated that 100-200 MT were mismanaged by drying and processing them ineffectively at other facilities. Warner's conditioning capacity was not enough to provide service requested, even though the plant operated on a 24-hour work schedule.

In cooperation with local seed producers and others, considerable effort went to improve seed certification standards. The new standards are based on local experience in the region. It is expected that the final corrections and publication will be done in February of 1984.

Specifications were prepared for laboratory equipment by the seed Adviser in Chuquisaca. It is hoped that this equipment can be purchased as soon as possible since it is urgently needed. For example, no equipment is currently available for purity and germination work in forage seeds. In addition, tests for corn, rice, wheat and soybeans are still being conducted under sub-standard conditions.

Some time was dedicated to renting new offices, furniture procurement and related support for seed certification. Since the office was not built with a seed testing laboratory in mind, additional time will be required to make the appropriate changes.

3. Seed Conditioning

This activity is carried out by the Warnes Seed Plant as a service to seed growers. During this semester, the plant provided conditioning services mainly for soybeans. However some rice, beans, corn and wheat produced in the preceding semester were also conditioned.

The following specific activities were carried out: 1) technical assistance on seed conditioning; 2) specifications for equipment; 3) orientation to private seed plants; 4) orientation on climatized seed storage in Warnes.

Periodic technical assistance was provided during conditioning of wheat, rice and soybeans. With increased capability of stable personnel in Warnes, assistance in this activity is sporadic and only at the request of the counterpart. This is an ideal situation and will allow the Adviser to provide assistance on newly emerging activities within the plant, such as internal quality control.

Warnes is currently receiving about 2,500 MT and is considered to be working at full capacity. Consequently, there is an urgent need to increase capacity of the plant. This would be achieved by adding driers and replacing the gravity table with a larger model. Specifications for this equipment were prepared with assistance of the Adviser from Chuquisaca.

Also in cooperation with Dr. Cabrera, assistance was provided to train personnel in the development of machinery requirements for a seed plant within a farmer cooperative, CAICO. This plant was already installed at the end of the semester. However, CAICO proceeded with the purchase of machinery without sufficient technical guidance, which led to errors in equipment specifications. As a consequence, the Regional Seed Council requested that T-059 provide technical assistance and guidance for the new seed conditioning facilities, including feasibility studies for interested seed growers.

Technical assistance was provided during the construction of the climatized storage facility in Warnes. At the end of the semester this activity was completed except for the electrical installation. This storage warehouse will be used as a seed bank and to demonstrate the effectiveness of this type of storage on maintaining seed quality. It is expected that the seed growers will be able to gain knowledge from this facility and construct similar units for their own use.

4. Production and Marketing of Commercial Seed

This activity is carried out by seed growers. During the semester mainly soybean seed and some wheat seed were produced. Growers involved in soybean seed production have already had a minimum of two years experience. The weather, both at growing and harvest time was favorable and allowed high quality seed production.

Utilization of seeds produced in the first and second semester of 1983 was encouraged through news media (local newspaper and T.V.) with the assistance of CAO (Camara Agropecuaria del Oriente) and the local university. It is recognized in the region that a more effective and comprehensive strategy will be needed in 1984 to promote utilization of certified seed among small

farmers.

Importation of soybean seed, coupled with the decrease in area planted, have caused lower utilization of local soybean seed. To decrease the discouraging effects of oversupply, the Adviser is recommending and providing guidance to store the excess seed in Warnes until next planting season. This situation demands the immediate electrical installation of the Warnes climatized storage facility.

Technical guidance was provided for the production of certified seed of soybeans, corn, rice and wheat for the following semester. The planned acreages were based on seed requirements and available conditioning infrastructure:

WARNES:	Can work with soybeans, corn, rice and with emphasis on wheat.
CAICO:	Can work with emphasis on soybeans.
HORIZONTE:	Will work only with rice.
SEMILLAS DEL SUR:	Possibly functioning by April or May; will work mainly with corn.

Because of unusually favorable climatic conditions during winter of 1983 in Santa Cruz, recovery of wheat seed was recommended following the Cochabamba Round Table. A total of 120 MT of Saquayo was recovered from the late harvest on an emergency basis. This seed (which did not reach certified grade) showed some varietal mixtures (3-5%), but achieved very high physical purity, high germination and was free of diseases. The seeds were distributed as follows for existing wheat seed programs: 45 MT for CIAT's seed program in Vallegrande and Comarapa; 53 MT for Chuquisaca; and 23 MT for Cochabamba.

5. Orientation of Regional Program

The regional program is guided by the Regional Seed Council (C.R.S.) with close cooperation from the Adviser. Recommendations and technical orientation were provided at regular monthly meetings of the board of directors. Seed certification standards were prepared with certification counterparts and presented to the board for their evaluation. Orientation meetings were held with ADEPA and cotton seed producers with the purpose of informing seed producers about certification standards and availability of technical assistance. Planning the 1983/84 cotton seed production program was also advanced.

6. Training

In-service training was carried out in the areas of field inspections, testing, labeling and viability testing with tetrazolium chloride. Training activities for the following semester will concentrate on:

* Certification--every Monday afternoon beginning January 27.

* Production--half-day short courses for seed growers; one for corn, six for wheat, and others.

* Conditioning--for new seed plants.

The participation of two candidates in the Foundation Seed Course at CIAT, Colombia was recommended. The heads of the Foundation Seed Units of CIAT, Santa Cruz and of IBTA, Yacuiba participated in the course with T-059 funding.

For the following semester, the Adviser will assist in identifying training needs and opportunities for training in CIAT, Colombia and other centers.

7. Other activities

Additional activities related to the seed work were carried out during the semester, such as preparation of bulletins. Bulletins prepared during the semester were:

* Aspects of basic seed production--prepared with the cooperation of CIAT's basic seed unit and published by CIAT.

* Warnes seed conditioning plant--prepared with the cooperation of the plant personnel and published by CIAT.

* What is seed certification?--prepared with the cooperation of the Regional Seed Certification Service and published by MACA.

At the request of the Regional Seed Council and CAO, assistance was given in elaboration of the Five-Year Seed Plan for Santa Cruz.

C. Summary and Recommendations

Objectives for the period were met successfully. The program has shown considerable improvement in production of high quality soybean seed. A comprehensive seed program, with close cooperation among regional institutions, is being established. The organizational strategy was presented and accepted in the first Round Table in Cochabamba. It is recommended that this strategy be adapted to other regions as well, to accelerate their seed program development.

There is need for a more careful planning of seed importations in the future so as to avoid damage to the emerging local seed supply system in soybeans, corn, rice, wheat and cotton.

The volume of seed currently produced and marketed in the region is about 2,000 MT/year. The seed requirement for 84/85 season according to the Five Year Plan, however, is about 6,000 MT and needs to be increased at a rate of 1,000 MT/year. This will require the following actions with T-059 funding within the first semester of 1984:

a) Purchase of machinery and installation of foundation seed plant. A feasibility study will be required to obtain financing for construction of the plant and installation of machinery.

b) Purchase of vehicles for Foundation Seed Unit, wheat seed program, and Certification Service.

c) Procurement of laboratory and related equipment for seed certification.

d) Completion of installation of equipment in Warnes and feasibility studies and orientation of private plants as requested by the Regional Council.

The 1983-84 summer seed crop plan is ambitious. About 4,500 hectares are currently registered in the certification program. Consequently, considerable technical assistance will be required for field inspections and testing. Greater assistance in field inspections will be provided to counterparts, especially on wheat (with 600 small seed growers), corn, rice and cotton.

Very intensive work is expected with the Regional Seed Council during the following semester, to organize and carry out the following activities in addition to many other activities that will emerge:

- * Five-year seed plan.
- * Second national seed development Round Table to be held in Santa Cruz.
- * Feasibility studies for conditioning facilities.

It is expected that wheat will require considerable time and effort from the Adviser during following semester since there is no available pure genetic seed.

The Foundation Seed Unit has achieved great acceptance by local seed growers. To maintain this acceptability and improve confidence on the quality of foundation seeds, the Adviser will provide closer guidance during the following semester on rice and wheat, where there is considerable room for quality improvement. We also recommend that the Foundation Seed Unit of CIAT include cotton in their program. Technical assistance is available through the Chemonics Adviser in Yacuiba for this purpose.

In addition to quality improvement in the field, it should be emphasized that foundation seeds should no longer be conditioned in Warnes. Many crops and varieties of certified seed compete for Warnes processing services, creating risk of mixtures and loss of quality. Consequently, there is an urgent need for a feasibility study for a foundation seed plant in the region.

SECTION II-B
GRAN CHACO

A. Background and Objectives

Chemonics involvement in the seed program of Chaco region of Bolivia began in April of 1983, through the fielding of a long-term seed adviser in the region. An immediate objective of the Adviser was to salvage the maximum amount possible of soybean seed from commercial soybean fields. Unfavorable weather conditions during May and June caused harvest to be extended into July and contributed to the loss of many fields.

After harvest, the Adviser dedicated his efforts in assisting local institutions in developing a seed production program, with the following objectives:

- * Help in the drying and processing of the soybean seed harvest.
- * Analyze and tag all seed locally produced and imported available for sale in the region.
- * Provide assistance in quality control during storage of locally produced seed.
- * Orient and assist private seed producers.
- * Prepare a feasibility study, plant design and equipment specifications for a seed processing plant in the region.
- * Assist in the integration of local institutions to form a regional seed production program.
- * Cooperate with IBTA in the organization of a Foundation Seed Unit and in the planting of 20 hectares of foundation seed of soybeans and 10 hectares of corn.

In addition to the above, it was found that the institution base, both private and public, for marketing seed was inadequate. Hence, an added objective was to advise local institutions in this regard.

B. Progress

1. Harvest and Conditioning of Seed Lots

Harvest of the 1982/83 soybean crop lasted until July of 1983. The last soybean seed fields were inspected in cooperation with personnel of the Regional Seed Department of MACA. Conditioning of the seed was done at El Algarrobal experiment station of IBTA, using a grain dryer belonging to the Chinese mission and a Clipper 27 air-screen cleaner of MACA. Conditioning volume was limited by the drying capacity available. Quality was somewhat limited by the unavailability of adequate size screens, however all the locally conditioned seed met inert matter standards of the fiscalized seed category. Levels of inert matter found in the analyses of the different seed lots

are shown in Table 1.

2. Analysis and Quality Control

During this semester all seed available for sale (locally produced and imported) was analyzed for germination and purity, and tags were placed on each bag, showing information obtained from the analyses. Table 1 shows a summary of the quantity and quality of the seed inspected.

Table 1 RESULTS OF GERMINATION AND PURITY TESTS OF IMPORTED
AND LOCALLY PRODUCED SEED IN THE GRAN CHACO

Producer or Source	Crop	Quantity (MT)	Category	Inert matter (%)	Seed of other cultivars (#/kg)	Germination (%)
Julio Gumiel	Soybean	23.0	Fiscalized	0.82	93	85.0
Julio Gumiel	Soybean	25.0	Selected grain	1.34	658	90.4
MACA	Soybean	23.5	Fiscalized	0.22	90	93.4
Brazil	Soybean	104.3	Fiscalized	0.18	5	83.0
USA	Cotton	3.0	Certified	--	--	76.0
IBTA	Corn	3.0	Fiscalized	0.12	58	86.0
N. Armella	Safflower	10.1	Non-certified	--	--	88.0

A common practice in this region was to send seed to Tarija for processing and storage, then bring it back at the beginning of the planting season. However, an analysis of 32 years of temperature and humidity data showed that it is possible to store seed in Yacuiba. This alternative would have the advantage of avoiding damage to the seed due to excessive handling. Also seed inspectors, located in Yacuiba, could sample the seed as often as necessary without excessive traveling. Thus, it was recommended that seeds be stored locally.

Seed quality was successfully maintained from the period of harvest to planting. Results of germination tests of the locally produced seeds are shown in Table 2.

Table 2

QUANTITY AND QUALITY OF SOYBEAN AND CORN SEED
AFTER 6 MONTHS OF STORAGE IN YACUIBA

Producer	Crop	Category	No. of lots	Quantity	% Germ.
Julio Gumiel	Soybean	Fiscalized	4	23.5	84.5
Julio Gumiel	Soybean	Selected Grain	3	25.9	90.4
MACA	Soybean	Fiscalized	5	23.5	93.4
IBTA	Corn	Fiscalized	1	3.0	86.0

Germination percentages of locally produced and stored seeds show the potential of the area. Percentage of inert matter indicates that the seed comes relatively problem free from the field. However the amount of varietal mixtures found in the seed greatly reduced its quality and points out a major problem of seed production in the area, this being the contamination of the current material available in the area. Reducing mixtures is a major objective for the following semester.

3. Feasibility Study for Conditioning Seed in the Chaco

Local institutions and a group of farmers requested a feasibility study for the installation of a seed conditioning plant for the Chaco region. This request was later approved by MACA, and the task was assigned to Chemonics. The target date for completion was set for September 20, 1983. The main objective of the study was to recommend suitable management alternatives and machinery requirements to process soybean, corn and cotton seed needed to satisfy the local seed demand.

The feasibility study included an analysis of the possible seed production and consumption of the region, taking into account the potential increase in the area of production, as well as the possibility for the region to produce seed for other regions of the country. The study contemplated two types of plants. Each plant type was designed to accommodate different management alternatives of local institutions and the farmer group that requested the study. The capacity of the machinery, as well as the design of the two plant types, were the responsibility of the Seed Adviser in Chuquisaca. The design of the buildings and other infrastructure were added into the study with the help of the Chemonics Adviser in civil engineering. Dr. Luis Ampuero was hired as a short-term adviser to assist Chemonics' Chief of Party in the economic analysis of the different alternatives considered in the study. The internal rate of return was calculated to evaluate the feasibility of each alternative according to the available sources of funding.

The study concluded that the most feasible management alternative was a combination of public and private administration. In addition, the study

presented a series of specific recommendations regarding the organization and development of the seed program in the Gran Chaco. After careful review of the recommendations by local and national institutions, the study was accepted in its entirety. However, the Federation of Campesinos argued that MACA should participate in the operation of the plant. Since this arrangement is contrary to the conclusions of the Round Table, and is not consistent with the organization of the regional seed program, it was agreed that CODETAR will manage the plant. All other specific recommendations in the study were accepted. Figure 1 shows a preliminary design of the seed plant to be implemented in the Chaco.

4. Institutional Integration

The formation of the regional seed counsel was contemplated early in the development of the seed program. However, the ministerial resolution authorizing the formation of the counsel included institutions not represented in the region. A new resolution, specific for the Chaco was presented in the Round Table in Cochabamba. The proposed resolution was fully discussed and was included in the conclusions of the round table.

Regular meetings were held through the rest of the semester. Actions taken include planning of the seed production campaign for the 1983/84 crop year, approval of the work plan for the adviser and counterparts, and establishment of seed prices.

5. Breeder and Foundation Seed Production

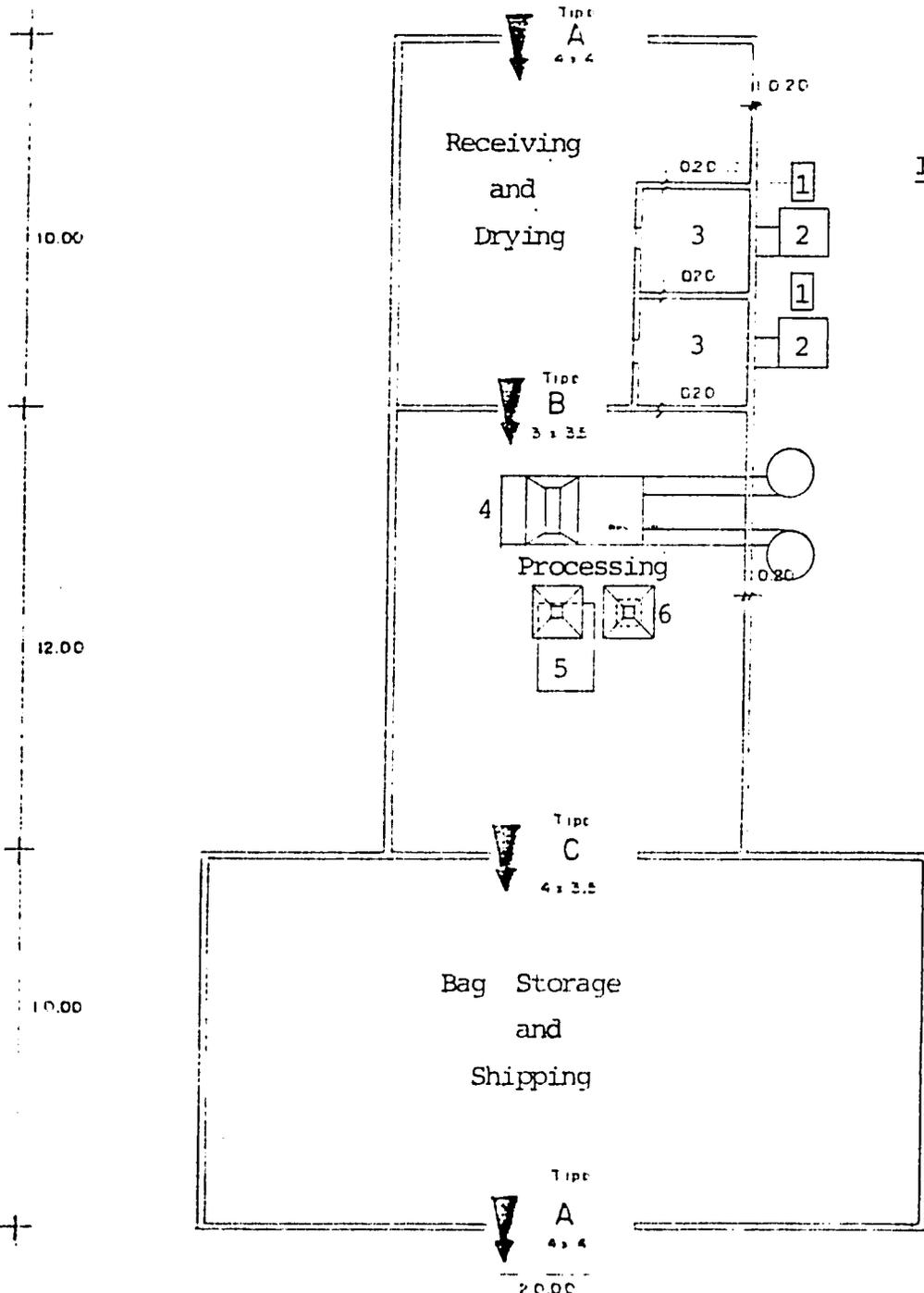
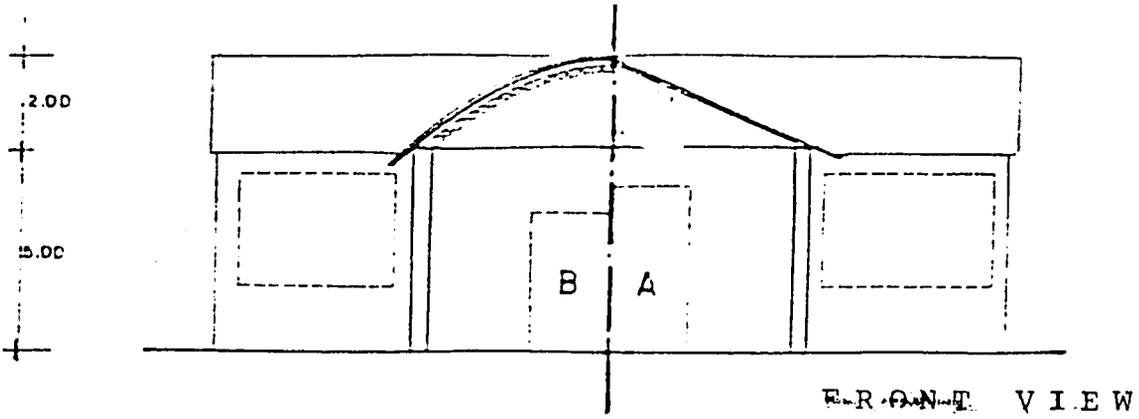
Production of breeder and foundation seed is an activity that falls under the responsibility of IBTA. They have made serious commitments to produce enough soybean seeds of the recommended varieties and corn seed of the variety Swan to distribute to all seed producers. The quality control of foundation seed will be under the control of the seed certification service and under the supervision of the Adviser.

By the end of the semester, IBTA was in the process of planting the required area. Table 3 shows the foundation seed requirement for the Chaco region:

Table 3 REQUIREMENTS OF FOUNDATION SEED FOR GRAN CHACO
1983/84 GROWING SEASON

C r o p	V a r i e t y	Foundation Seed required MT	Area
Soybean	UFV-1 Cristalina	9.9	6.6
Corn	Swan	2.0	1.0
Cotton	Stoneville 825	1.0	2.0

ESQUEMA DE OBRAS CIVILES
PLANTA TIPO II



Legend

Item	Description
1	Heater
2	Fan
3	Drying bin
4	Air & Screen Cleaner
5	Gravity table
6	Bagger

TOP VIEW
esc. 1:200

The required cotton seed will be produced in fields selected by the seed certification service in cooperation with the cotton program. Conditioning, distribution and marketing will be handled by the local cotton program.

6. Seed Distribution and Marketing

For the 1984 harvest, local institutions will take responsibility for this activity. The Cooperativa Integral Gran Chaco agreed to purchase seeds from fields which have passed all field inspections and have maintained adequate levels of quality at harvest. The seed will be dried, cleaned and stored until the next planting season, when the seed will be distributed to farmers.

The Integral Cooperative proposed three seed purchasing alternatives for private seed producers, as follows:

* The Cooperative will pay producers the grain plus an incentive at harvest time. The Cooperative will pay the cost of drying, processing, storage and certification. Profits resulting from marketing of seed will belong to the Cooperative.

* The farmers would turn in all their seed production to the Cooperative. At this time the producer will receive the grain price. The Cooperative will pay the cost of conditioning, certification and marketing. In this alternative, profits would be shared between the Cooperative and the farmer.

* The farmer would pay the cost of conditioning and certification of the seed. The Cooperative will market the farmer's seed for a fee.

7. Commercial Seed Multiplication 1983/84

Commercial seed multiplication for Yacuiba has been undertaken by growers. Most of the farmers involved in seed multiplication are growers with experience in soybean and corn grain production. Cotton seed multiplication has been undertaken by selected growers participating in the regional cotton program. The criteria used to select suitable cotton fields was that it must be free of weeds and diseases transmitted by seeds.

Table 4 shows a summary of the crops planted for commercial seed multiplication.

Table 4 VOLUME OF FISCALIZED, REGISTERED AND CERTIFIED SEED TO BE PRODUCED COMMERCIALY

C r o p	V a r i e t y	Category	Has. planted	Expected Production
Soya	UFV	Fiscalized	200	300
	Cristalina	Fiscalized	30	60
Corn	Swan	Fiscalized	40	60
Cotton	Stoneville 825	Certified	15	12
	Stoneville 825	Registered	15	12

Registered cotton seed will be produced by selecting fields with adequate isolation and doing intensive purification and selection practices. This will be performed by the seed certification services of Yacuiba and Santa Cruz.

8. Training

Two types of training were offered this semester: technical training for the seed certification service personnel and a short introductory course for seedmen.

The technical training for the seed certification service personnel consisted of "on the job training" on soybean and corn analysis, reviewing the International Rules for Testing soybean and corn seeds.

The one day course for seed producers was offered to all person interested in participating in the regional seed program. A total of 24 seed producers attended the course. Several institutions participated in the presentation of the different topics. An IBTA technician presented the effects of weed on seed quality; the Cooperativa Integral presented the program of the Cooperative in the distribution and marketing of seed for the 83/84 season; the regional seed department of MACA presented the new role of the seed certification service of MACA; and finally, the Chemonics Adviser for the region presented a seed production scheme for the Chaco and practical tips on quality seed production.

In addition to local training, a technician from the Foundation Seed Unit of IBTA was sent to Colombia (CIAT) for a one month course on breeders and foundation seed production.

C. Summary and Suggestions

The regional Seed Certification Service was initiated this semester. Although all goals set for this semester were accomplished, limiting factors were present. Among the most serious ones was the lack of personnel requested to complete the certification team. A second limiting factor affecting the

formation of a strong certification service is the lack of credibility of the regional seed department due to past and present disputes between seed producers and MACA personnel.

During this semester, the structure of the seed program began to take shape. Local institutions became aware that the implementation of a seed program was possible and badly needed. Local leaders heavily contributed to its organization. However much work is needed in the fortification of the program. Further progress will depend of support to the program by the National Seed Department. Help is needed in incrementing the personnel of the regional seed certification service and in solving the local disputes among seed producers-seed certification personnel and among certification personnel.

Although severe limitations were present which slowed down the progress of the program all objectives were met. Recommendations for the following semester include:

- * In foundation seed production we recommend the rapid installation of the seed drying facility in El Algarrobal Experiment Station. Processing and storage facilities for IBTA are also needed.

- * That IBTA assign sufficient, permanent manual labor to cooperate with the foundation seed program in roughing, weed control, harvest and processing to assure the production of quality foundation seed.

- * With regard to the regional certification service, it is recommended once more that the personnel be increased to three technicians.

- * MACA and USAID should place high priority in the construction of the seed processing plant. It is also recommended that funds be made available to the Cooperativa Integral Gran Chaco to complete their seed warehouse and drying facility.

- * That MACA and USAID provide funds to train three CODETAR technicians. One of these should be trained as supervisor of plant and the other two as mechanic/operators.

SECTION II - C CHUQUISACA/POTOSI

A. Background and Objectives

This semester was initiated by MACA's approval of hiring of an additional adviser to work in seed improvement. Dr. Edgar Cabrera was selected and employed to fill this position. He arrived in Bolivia in August, 1983 in time to attend the first National Round Table on Seeds.

During the Round Table, institutions from each region prepared and presented their plans for development of regional seed programs. Cochabamba had been tentatively designated as the primary work-place for the new Adviser, however, the plan for this area demonstrated a major emphasis on potato seed production, rather than cereals for which the Adviser had been recruited.

Instead, efforts in cereals focused on the departments of Chuquisaca and Potosi. After completing a tour of these areas with Dr. Garay, the team leader in this activity, it became apparent that Chuquisaca and Potosi do indeed offer greater potential for developing a seed program in cereals. MACA and USAID agreed and approved the redesignation of the Adviser's workplace as Sucre.

Wheat was clearly the most promising crop for an organized seed program, and all the activities of this semester revolved around the institutions involved in the production of this crop.

The objectives identified for the August through December period were:

- * Explore methods for development of varietal improvement, as well as a foundation seed program in the area of Potosi.

- * Initiate the 1983/84 production campaign in commercial wheat seed.

- * Explore interest of local institutions of participating in a study to orient the seed program in the area, including study of the feasibility of a seed processing plant in Chuquisaca.

- * Orient local institutions in the formation of a regional seed board.

B. Progress

1. Foundation Seed Production

The lack of improved varieties adapted to the area and the absence of pure seed of the currently recommended varieties indicate the need for a strong program to test introduced varieties, as well as for an organized foundation seed program. Contacts were made with IBTA's experiment station "Chinoli" to study the possibility of establishing a breeder and foundation seed program for Potosi. There was a positive response on the part of the director of the experiment station, but strong financial and technical support will be required to implement such a program.

Chuquisaca does not have an experiment station for wheat production which could take responsibility for the testing and introducing new varieties. Some experimental data obtained in Chinoli can be used in Chuquisaca. However, it would be advisable to establish a foundation seed program specifically for that department. It is recommended that CORDECH assume this responsibility based on the following:

- a) CORDECH has contacts with farmers that can grow wheat following the production of potatoes.

- b) A foundation seed program could be carried out on 50 hectares of irrigated land with yields twice as high as in other areas. (Yields in other areas average 700 Kg/ha.).

- c) All production of foundation wheat seed would be concentrated in one area.

d) CORDECH has experience in foundation seed production in their experiment station in Muyupampa, where intense corn variety testing is conducted annually.

In addition, 50 hectares are planted for corn seed production and a conditioning plant should be operational by the end of June 1984 with a capacity of 2.0 metric tons per hour. Once wheat foundation seed is produced, corn would be easily incorporated into the same program.

CORDECH purchased 18 metric tons of wheat seed (Saguayo) from Santa Cruz during the semester. This will allow them to begin a foundation seed program. However, the high level of contamination of other varieties in this seed (five percent) will make it impossible to produce pure Saguayo seed in 1984.

2. Production of Certified Seed

Following the 1983 drought, there was a shortage of seed for farmers in the area. Several emergency plans were developed to overcome the situation, however wheat seed was still not available in the needed quantities. Wheat production in Santa Cruz was better than in other years, particularly because of the absence of fungi diseases. This provided the opportunity to buy wheat seed from Santa Cruz for planting in the Chuquisaca area. Institutions such as Caritas, CORDECH and Sequia 83 were eager to purchase wheat seed from Santa Cruz to supply their farmers (see Table 5).

TABLE 5: QUANTITIES OF WHEAT SEED (Saguayo)
PURCHASED BY DIFFERENT INSTITUTIONS
FOR THE 1984 PRODUCTION SEASON

Institution	Amount of seed purchased (MT)	Planting rate (Kg/Ha)	Expected surface planted (Ha)
CORDECH	18	113.4	160
CARITAS	9	90.7	100
PLAN SEQUIA 83	25	90.7	275 *

* According to contract with farmers this area will be mainly for production of commercial grain.

This situation provided a favorable for the Seed Department of MACA to function as a certifying agency. Although MACA will still produce some seed with farmers, their involvement in the program will focus on the provision of technical assistance, field inspections, and seed testing for other institutions which carry out seed production programs with farmers.

The wheat seed (Saguayo), that will be planted during the month of January 1984, is considered "fiscalized seed" (not certified quality). Germination rates of the different lots range between 85 and 93% percent. There

was, however, five percent contamination with other varieties, which makes it unsuitable for certified seed. Special care will be taken to concentrate efforts in small lots in order to lower contamination rates to about two percent. These lots, in turn, will be utilized to produce certified seed in 1985.

Institutions which implement seed production programs in the region provide the farmer with seed, inputs, and credit. During harvest they have traditionally recovered twice as much seed as was provided to the farmer. The farmer is then free to sell the rest of his crop elsewhere. Efforts will be made to encourage institutions to select farmers that will produce seed exclusively.

3. Seed Certification

The Seed Department of MACA has been involved in production, processing, certifying and marketing of seed, both in Potosi and Chuquisaca. Based on recommendations from the first Round Table conducted in Cochabamba last September, efforts are being made to allow the department to function exclusively as a certifying entity. For the present time, MACA will still produce some seed with farmers, but will also provide support to other institutions producing wheat seed.

The Adviser will dedicate time providing technical assistance to MACA's personnel during field inspections, harvest, processing and testing of wheat seed in Potosi and Chuquisaca. Elaboration of records and forms for seed certification will also require some assistance.

4. Local Seed Program Orientation

Establishing contact with the following institutions was a major activity during this period:

CORDECH
AGROCENTRAL
IBTA
CERVECERIA BOLIVIANA NACIONAL (CBN)
CARITAS
SEQUIA 83

The regional head of the MACA Seed Certification Department, Inq. Angel Clavijo, played an important role in establishing these contacts. All the above organizations expressed interest in MACA taking a normative role solely as a certifying agency.

The formation of Regional Seed Council in Chuquisaca is planned for 1984. During the 1983-84 crop year, an emergency committee is operating to coordinate efforts of local institutions.

A request was made by the institutions listed above for a study to determine the feasibility of installing seed conditioning facilities in Chuquisaca. The study will also contemplate the strategy for development of the regional seed program, including identification of the role for each interested institution. This study will be conducted during the coming semester.

5. Infrastructure Development

The Adviser provided technical assistance in the design and development of equipment specifications for drying, processing and storage facilities in various areas of the country. His activities in support of other regions are mentioned in previous sections. The following cover efforts made in support of the Chuquisaca/Potosi region.

a. Corn Seed Processing Plant

Production of corn for feed purposes is concentrated in the Monteagudo area. CORDECH will receive a BID loan for the construction of a seed processing plant in Iboperenda. Upon arrival of the Adviser, revision of the list of equipment, yet to be purchased by CORDECH, indicated the need for substantial change based on an exact design. The Adviser provided CORDECH with a design for a multi-purpose seed processing plant and recommended changes in selected equipment. The Adviser plans to assist CORDECH during the installation of this equipment next semester.

b. Conditioning Plant for Forage Crops

CORDECH plans to produce 1525 metric tons of seed of different forage crops by 1990. At the request of CORDECH the Adviser developed specifications of needed seed processing equipment. The Adviser will cooperate with CORDECH during the construction of the plant.

c. Conditioning Plants in Zudañez and Betanzos

MACA's seed processing plant in Zudañez, Chuquisaca utilizes a 9 x 65 meter warehouse belonging to ENFE. A minimum amount of equipment is used to process wheat and some barley produced in the area. Additional equipment is still in boxes and has never been used. A similar situation is found in Betanzos, Potosi, even though MACA has an excellent building. An inventory of all equipment was taken on both plants and the Adviser developed specifications for complementary equipment to be added in both plants to improve processing. A few items were also specified to be used in the seed testing laboratory of these two areas.

C. Conclusions and Suggestions

There is a strong desire on the part of some institutions to become engaged in a seed program. A degree of awareness of the importance of a seed supply system exists. It is also important that MACA's role as a certifying entity is accepted and welcome. Objectives set for the semester were entirely met. Recommendations for specific aspects of the program are presented below.

It is recommended that a foundation seed program be started in Chinoli in cooperation with MACA in Betanzos. Chemonics will also seek the active participation of CORDECH in a foundation seed program. Two important objectives for the following semester are: a) to identify and recommend the needed infrastructure to store foundation seed of different varieties, in the volumes needed without the risk of contamination, and b) establish contacts with CIMMYT to promptly introduce new, better germplasm.

It is suggested that MACA provide technical assistance and certification services to any institution or individual with the capability of producing seed. For the January-June 1984 period the Adviser will assist in coordinating seed production in the following manner:

Institution	Role
IBTA-Chinoli Experiment Station	Variety testing, breeder seed production
MACA-Seed Unit/Potosi	Seed certification
MACA-Seed Unit/Chuquisaca	Seed certification
CORDECH	Foundation seed-wheat
CARITAS	Certified seed production
SEQUIA-83	Certified seed production

MACA's seed department in Chuquisaca currently employs only one technical person, who, although an excellent worker, cannot cover all the department's responsibilities. It is recommended that a driver and an additional technician be contracted. It is also suggested that the seed certification office be moved from Zudañez to Sucre to permit adequate contact with all institutions, allowing the seed testing laboratory to function properly.

The feasibility study is of great importance to determine the role of each institution involved in the regional seed program, as well as the economic feasibility of a seed processing plant. It seems convenient at this point for the emergency committee to continue to be active until a regional seed council is established.

The Adviser will provide technical assistance, both in the planning and construction stages of seed facilities in the region or in other parts of the country. Assistance will be needed to improve MACA's seed processing facilities in Zudañez and Betanzos.

SECTION III

SOIL CONSERVATION

A. Background and Objectives

The principal objective during this semester was to establish demonstrations of erosion control methods, especially contour canals or terraces, in areas of Yacuiba, Carapari and Villamontes. Emphasis was to be placed on locating demonstration parcels in sectors where visibility was highest, where erosion in fields was serious, and where the team could work cooperatively with farmers who desired to participate in a program to control erosion in their fields.

Specific objectives were defined as follows:

- * Implement terraces on 200 hectares of land with as many interested farmers as possible.

- * Develop a new work plan and budget for construction of terraces.

- * Coordinate with CODETAR regarding land clearing methods and use of equipment for soil conservation purposes.

- * Prepare bulletins, radio programs, and audiovisual materials for training programs in the Gran Chaco and elsewhere.

- * Continue to analyze meteorological data in the region for use in specific study areas where special erosion problems are evident.

- * Cooperate with interested institutions and communities in evaluating alternative methods of erosion control in small drainage basins.

- * Orient and supervise farmers during planting on methods of contour farming and maintenance of terraces.

B. Progress

Continual efforts oriented toward increasing awareness of the importance of soil conservation began to show positive results during the semester. Larger numbers of farmers expressed interest in construction of terraces on their land. To further stimulate smaller farmers, a shared-cost plan was devised in which the farmers paid half the cost for use of equipment and the T-059 Project paid the other half. By October of 1983, the IBTA-Chemonics team had more requests for terracing than could be handled.

Nearly 25 kilometers of broad-based terraces were surveyed and constructed for nine cooperating farmers in the Yacuiba area (see Table 6). Demonstration parcels were located in the most accessible and visible areas. Terraces were surveyed by technicians of IBTA and Chemonics, and were constructed under their supervision with a road grader and Caterpillar tractor D-7G. This heavy equipment was furnished by CODETAR.

Table 6

Locality	Cooperator	Hectares Terraced	Average Slope (%)	No Terraces Constructed	Length of Terraces (Meters)
Aguayrenda	1. Instituto Politecnico Campesino	10	2	4	1,657
Campo Grande	2. Guido Vasquez	15	4-6	6	2,280
Campo Grande	3. Eliodoro Flores	9	2-4	8	1,530
Lapachal	4. Felipe Gutierrez	10	4	8	1,855
La Grampa	5. Juan Castillo	40	2	8	2,300
Algarrobal	6. IBTA, Experi- mental Station	20	1-2	6	3,080
Caipitandi	7. Nicolas Choque	20	2-4	13	2,160
La Grampa	8. Antonio Mogro	20	4-6	6	2,980
Lapachal	9. Alberto Quiroqa	38	2-4	18	6,860
TOTALS (9)		182	3	77	24,702 or 24,7 Kilo- meters

The terraces were surveyed and constructed with the following characteristics:

- * Effective width used to construct terrace 7 meters
- * Slope in terrace toward point of drainage 0.3 %
- * Height of berm above associated drainage canal 0.7 meters
- * Height of berm on all lower terraces 0.4 meters
- * Distance between terraces, variable depending on slope 30-50 meters

A road-grader was utilized for construction of terraces, rather than farm tractors and plow, in order to save time in construction, decrease costs, and complete terraces of uniform and of stronger construction. In most cases the work was completed with the aid of a Caterpillar tractor at the ends of the terraces near the fences or on the side of the field where the terraces discharge excess water. Smaller gullies previously formed in fields were filled.

The principal limitation to accomplishing requested terrace construction was the lack of availability of heavy equipment. During the latter part of this semester Jose Olazabal was employed by CODETAR to assist in a coordinated plan for land clearing and soil conservation. His efforts in making equipment available were very important.

Problems resulted in plowing and planting on the contour after terraces had been constructed. Farmers using their own tractors or rented tractors learned methods of plowing and planting on the contour easily. Small farmers, however, using animal traction on the smaller parcels, encountered more difficulty. This may be due to inflexibility in following the curves of the terraces.

During October the soil conservation program received a visit from USAID and MACA representatives from La Paz:

- * Ing. Raul Salas, National Director of Agriculture (MACA)
- * Lic. Isabel Canedo, Coordinator of the 511-T-059 Project (MACA)
- * Mr. John Rifembark, Manager of T-059 Project (USAID)

These personnel were taken on visits to the demonstration areas of broad-based terraces, and were given an overview of the important work of surveying and construction of terraces.

At the request of the Civic Committee of El Palmar, the Chemonics Adviser and his IBTA counterpart inspected the lower area of the stream, "Ojo del Agua", which has been extensively affected by erosion during the past two years. After the inspection, a proposed plan of action was presented to solve this problem. The plan consists of rehabilitating the original channel by clearing it of trees, channeling, and cutting off the present channel.

At the request of the farmers of the San Isidro Community, the Adviser and IBTA counterpart visited the upper drainage area of the San Isidro Norte stream where much damage has been caused on a large number of fields. The Sausalito area was also visited at the request of farmers to observe the damages caused by the San Isidro Sur in the flooding of agricultural areas. In both of these instances neither funds nor equipment was available to correct the watershed problems.

The Communications Unit of IBTA has continued to present radio programs on erosion control over local radio stations each Thursday for a half-hour. This Unit has also assisted the Chemonics Adviser and IBTA counterpart with three technical bulletins, which are presently in IBTA/La Paz awaiting final publication. Funds have been obtained for publication of 1500 copies of the "Manual de Agricultura-1983/84" and the manual is in process of publication.

This is a cooperative venture for IBTA and Chemonics.

The Adviser, IBTA counterpart and a CODETAR technician in charge of land clearing operations made a trip to Santiago del Estero, Argentina to attend an international conference on land clearing methods sponsored by the FAO organization of the U.N. Since the field demonstrations were in the Chaco area of Argentina, many ideas were offered to assist participants in land clearing efforts in their own countries. Unfortunately, little emphasis was made on the erosion control methods that should follow land clearing.

Two trips were made to the Villamontes area to complete the goal of 200 hectares and to have at least one demonstration of erosion control by construction of broad-based terraces. However, due to poor weather conditions and failure of cooperators to have land ready for construction of terraces, the IBTA/Chemonics team was unable to conduct demonstrations in the area for 1983. Likewise in the Carapari area, in spite of several trips and contacts with farmers, it was not possible to establish our first good demonstration in this area. This was due to lack of availability of heavy equipment at the time needed, and also to strikes, which were prevalent at the time.

C. Summary and Suggestions

Interest among farmers for erosion control and construction of terraces on their lands became high during this period. Requests by farmers was greater than the availability of appropriate machinery.

Because of the scheduling of scarce heavy equipment, strikes, and heavy rains less was accomplished than was hoped for. The goal of 200 hectares was not attained, leaving a balance of 18 hectares. It is hoped that double this amount, or a total of 400 hectares, can be completed during the dry season of 1984. The principal problem facing the IBTA/Chemonics team in construction of terrace systems will be availability of appropriate machinery. In the future, it may be possible to utilize either the D-4 owned by CODETAR, which is in need of repair, or a large 80-100 horse power tractor. The latter option would necessitate the purchase of a reversible rear scraper with three point universal hydraulic suspension.

Project funds should continue to be made available as before on a shared-cost basis to carry out the construction of terraces. The farmer and the Project each would pay 10,000 pesos bolivianos for each hour of work of the road-grader. Even with the new price schedules for use of equipment, the cost should not be great for terrace construction. It is recommended that the D-7 be replaced with the D-4 to hold costs down.

There is sufficient field equipment for the IBTA/Chemonics team to use for survey of 400 hectares of broad-based terraces, but this can only be done if there are two field cars available for use with split field parties. During the past year the Chemonics Bronco was available, and during most of the time the IBTA Chevrolet Blazer was used. However, difficulties were encountered in obtaining funds for parts and repairs for the Blazer. It is urgent that dependable transportation be available.

Serious erosion during the past two years, which has occurred below the steep watersheds along the western side of the Valley next to the Serrania del

Aguarague, remains one of the most provoking problems. Until funds can be raised to combat these problems, extensive watershed erosion damages will be increasingly serious, affecting buildings, roads, railroad, agricultural land and the Yacuiba airport.

Plans are being made to add the principle of minimum tillage to the construction of broad-based terraces for more complete erosion control in the Humid Chaco. However this will necessitate purchase, introduction and use of several pieces of new equipment not yet introduced into Bolivia, including:

a) A tractor-drawn, hydraulically controlled seeder that seeds through a heavy cover of straw and crop residues. Wheat would normally follow soybeans.

b) A tractor-drawn, hydraulically controlled, chisel cultivator, which eliminates harmful weeds and shrubs, and opens narrow trenches in the subsoil which help retain rainwater and works cooperatively with incorporated plant residues to prevent soil erosion, especially during times of excessive rainfall.

The educational aspects of soil conservation which the IBTA/Chemonics team had planned to implement extensively during the early 1984 months has failed to materialize to the extent previously envisioned, because of a lack of materials and equipment.

An objective for next semester will be to prepare photos taken from low-level aerial flights which can be used for educational programs. This will allow more persons to actually see erosion damage in the area and the effectiveness of the broad-based terraces. We also hope to augment our educational program in soil conservation by preparing materials in video.

SECTION IV

COTTON PRODUCTION

A. Background and Objectives

In October of 1982, Chemonics was asked by MACA to undertake a Pilot Plan for demonstration of cotton production in the Gran Chaco. Under the direction of Chemonics' Adviser, Ing. Victor Gonzales, nine demonstration plots were planted with cooperating farmers in the area. Unseasonable rains caused the harvest of these plots to be prolonged until the end of July, 1983. For this reason, and to prepare an evaluation of the cotton program, Ing. Victor Gonzales' services as a short-term adviser were extended to September 30, 1983.

The objectives pertaining to the 1982/83 agricultural year were the following:

- * To orient farmers in the logistics of transporting cotton from field to market and to work with the Integral Cooperative in marketing cotton fiber and seed.

- * Prepare the final report on the results of the Pilot Plan to submit to the Comité Impulsor.

After review of the evaluation report by institutions concerned, the cotton program was renewed for a second year, 1983/84. During this production season, commercial cotton production was to be initiated up to a maximum level of about 200 hectares. Ing. Gonzales was hired as a long-term adviser starting September 14, 1983. In addition, Chemonics' Adviser in seed improvement in the Gran Chaco continued to provide technical support to this program. The following objectives were defined for the 1983/84 crop year:

- * Assist the Integral Cooperative in programming and planning the acquisition of inputs for the 1983/84 agricultural year.

- * Provide information required by the Integral Cooperative to obtain funding for a production credit program.

- * Provide training to farmers in different cultivation tasks with emphasis in soil preparation and pest control.

- * Assist the Comité with the recruitment of a second extension agent.

- * Provide in-service training to the extension agents hired for the program emphasizing aspects of pest control and extension methods.

- * Assist IBTA and the Comité Impulsor in tasks related to cotton research.

B. Progress

1. Assistance with Harvesting, Ginning, and Marketing

During harvest, cooperation was given to farmers and the Integral Cooperative in receiving cotton in the field, grading, testing for humidity and transporting cotton to the gin. This activity continued through the end of July. Ginning was performed by CODETAR at the gin belonging to the University of Tarija in Campo Pajoso. Although harvest was carried out under adverse weather conditions, yields obtained were excellent. From November plantings, 20.76 cwt per hectare of fiber were obtained, and from December plantings, 10.98 cwt of fiber per hectare. (See Chemonics report "Resultados y Proyecciones para el Plan Piloto de Algodon en el Gran Chaco de Bolivia.")

With the participation of FACSA (Fabrica de Aceites Comestibles Sociedad Anonima), assistance was provided to the Integral Cooperative in cotton seed marketing in Villamontes and fiber marketing Santa Cruz through ADEPA (Asociacion de Productores de Algodon).

Payments to the farmers were made by the Cooperative. The total value of inputs provided was deducted from the payments, including a fee for the technical assistance and marketing. This amount was deposited to a special fund created by the Comite. Farmers achieved a net return of \$b 117,609 per hectare on the average. This level was double the average return obtained from soybean production last year.

2. Preparation of Report on Pilot Plan

The final report was submitted to the Comite Impulsor in September. It described both production and marketing activities and included an economic analysis of cotton production. The report also presented a plan of activities for the following year.

3. Inputs for the 1983/84 Production Year

Inputs were obtained directly by the Integral Cooperative and APOGRA for the program through ADEPA (Asociacion de Productores de Algodon) in Santa Cruz. This allowed them to make use of official regulations in order to obtain dollar currency at the official rate. Thus, the cost of inputs during this year was relatively low in comparison with last year.

Seed was imported for 150 hectares, however this area was reduced because the germination rate of the seed was low and the quantity of seed per hectare had to be increased.

The Integral Cooperative distributed seed received from the United States (Stoneville 825) for 130 hectares from which 127 hectares were destined for commercial production.

Efforts were made to obtain ten varieties of cotton seed from the United States and Paraguay. Towards the end of the planting season, nine varieties arrived from the United States which were distributed among farmers who showed an interest in multiplying it. These varieties were: Tamgo Camo-E; Deltapine 90, 70, 61 and 41; Gumbo 500; Des 422; Stoneville 56; and Stoneville 7A. Unfortunately, only 5 of these varieties were planted.

Efforts were also made to obtain seed of Reba-IAN-1 from the Ministry of Agriculture in Paraguay. However, it proved impossible to obtain this variety.

4. Farmer Registration and Technical Assistance

Through radio communications and four meetings in different communities, the economic and technical aspects of cultivation were presented to farmers. At the same time, those farmers who showed interest were tentatively registered. As of August 6th, 106.5 hectares were signed up, and by October 23, 212 hectares were registered, comprising 92 interested farmers. The Integral Cooperative and APOGRA played an active role during this period. Later, visits were made to interested farmers to ask them to complete short questionnaires. The information assisted in planning cultivation according to each farmer's resources.

Several short courses were offered during the semester. These three-hour courses were given in six communities to teach cultivation practices and techniques of insecticide application with the ultra-low volume system. A total of 44 farmers attended, out of the 92 initially registered.

In order to make a final selection of farmers to be included in the cotton production program, the following factors were taken into consideration: 1) attendance at the training courses, 2) access to credit from the Agricultural Bank or from the Cooperative, and 3) interest shown at the short courses. Forty-two farmers were eventually selected for participation in the program.

The following Table shows registration of producers according to area planted by each farmer. Nearly all the participating farmers are members of the local cooperative.

Table 7 PRODUCERS REGISTRATION AND CULTIVATED AREA ACCORDING
TO SEED DISTRIBUTION DURING CROP YEAR 1983 - 1984

Cotton Area by property (Hectares)	Number of Farmers #	Total Hectares	Percentage of Hectares %
0.5	7	3.5	2.6
0.75	3	2.25	1.7
0.8	2	1.6	1.2
1.0	15	15	11.2
1.5	2	3	2.2
2	3	6	4.5
2.5	1	2.5	1.9
3	2	6	4.5
4	1	4	3
4.25	1	4.25	3.2
4.5	2	9	6.7
5	2	10	7.5
9	1	9	6.7
11	1	11	8.2
20	1	20	14.9
27	1	27	20.1
Total	45	134.1	100.

With regard to the characteristics of participating farmers, from the previous table it can be noted that more than 90 percent of farmers are small producers who planted between 0.5 and 5 hectares, 4 percent are medium sized producers, and the rest may be considered relatively large producers in the region. Thus, small farmers accounted for 50 percent of the cultivated area, the medium ones were responsible for 15 percent, and the relatively large producers for 35 percent.

Two bulletins were prepared: one, addressed to the farmer, gives planting recommendations; the other, a technical bulletin, explains the use of the ultra-low volume fumigator. These will be distributed in short course to be held in January 1984. During the last week of December, a 60-minute radio program was prepared discussing various agronomic aspects of cotton production.

Courses and technical assistance placed emphasis on the need to improve soil preparation practices, which are very poor in the region. These deficiencies are due, in part, to the lack of experience in commercial agriculture and inadequate management of available machinery.

In almost all of the cultivated area the soil was prepared mechanically. About 84 percent of the area was planted mechanically and 16 percent manually. The latter system was used by 20 farmers i.e. about half of those who were involved. The adviser assisted operators with calibration of tractor-drawn planters.

As a consequence of the poor preparation of soils, rapid weed growth was a problem on 44 percent of the cultivated area, affecting the crops in the first stage of growth. Six farmers used herbicides for weed control, obtaining satisfactory results. During this stage of work tractor drivers were assisted with equipment calibration.

Most plantings were done during November, which is considered to be the optimal period.

5. Recruitment and Training of Extension Agents

During October, the recruitment of extension agents was conducted in Yacuiba and Santa Cruz. Candidates were evaluated with the Comité Impulsor. Ing. Jose Luis Humerez, who participated in a training trip to Paraguay, was selected and began working on November 1, 1983. Agronomist Enrique Calizaya is considered a good candidate to fill the second vacancy as extension agent. He will join the group in mid-January.

The extension program consists of weekly visits to demonstration plots according to a schedule previously established and communicated to farmers. During these visits, recommended practices are shown and training is given, principally in pest control.

6. Assistance to IBTA and the Comité in Research-related Activities

Unfortunately, it has not been possible to work with IBTA in Yacuiba regarding cotton research during this production cycle. In the absence of a cotton research program, the Chemonics' Adviser is monitoring farm trials planted with imported varieties.

C. Summary and Suggestions

The proposed objectives for the commercial production program were achieved. Interest among technicians and producers has increased, and the program is receiving adequate support from institutions which are part of



Farmer Juan Quispe shows to cotton producers the tobacco bud worm egg which was placed in the terminal leaf of the plant, Campo Fajoso.

the Comité Impulsor, from the IPC (Instituto Politécnico Campesino), and from Radio Frontera. As mentioned above, cooperation with IBTA has not been all that was hoped.

The maximum number of hectares projected for this first year of commercial production (231 hectares) could have been reached except for two limiting factors. First, seed was available for only 130 hectares and second, the Agricultural Bank did not define a credit policy. This latter problem occurred in spite of the fact that questions pertaining to credit (provided by Ing. Mario Artunduaga, Credit Officer of the BAB) were included in the questionnaire of participating farmers.

As mentioned above, inadequate soil preparation on the part of about half of participating farmers created serious weed problems. Even though some parcels received the first plowing well before planting, subsequent practices were poorly timed and executed. Increased awareness is being created among farmers in order to improve this situation in the next season.

SECTION V
INFORMATION SYSTEMS

A. Background and Objectives

At the beginning of the semester covered by this report, Chemoni's did not have a specific adviser in this technical area, but was coordinating with local institutions to form a technical team which would provide information services. It had been recommended to MACA and IBTA that a short-term adviser be hired locally to lead the technical team and train personnel through their first year of work. After reaching agreement with MACA on this recommendation, Mr. Miguel Ibañez was hired to work half-time for a period of 12 months, beginning September 1, 1983. Mr. Ibañez had previously been assisting with this effort as a student in the Catholic University of Bolivia (UCB).

By the end of the first semester of 1983, the Registry of Professionals of the Agricultural Sector had been compiled and a publisher contracted to print 2000 copies. In addition, 6000 copies of a questionnaire were to be printed. This questionnaire would be distributed with the Registry to provide updated information for the second edition. However, the May 20 date for completing publication was not met. Upon hiring of the Adviser, the following objectives were established for the period:

- * Coordinate with MACA, IBTA and the UCB in formation of the technical team of CICTAR (Center for Scientific and Technical Information for the Agriculture and Rural Sectors).

- * Provide supervision and guidance to the technical team and provide training to its personnel in the areas of information systems and communications.

- * Distribute the first Registry of Agricultural Professionals in Bolivia, and prepare for future updated editions.

- * Initiate a series of annotated bibliographies on subjects of interest to Bolivian professionals in agriculture.

B. Progress

The technical group was organized in September and met several times that month to develop a work plan and a strategy for distributing the Registry of Agricultural Professionals. The following are the members of the technical group:

Gabriel Vladimir Gutierrez, Catholic University of Bolivia
Carlos Eduardo Brañez, Catholic University of Bolivia
Dilo Guillermo Valencia, Catholic University of Bolivia
Frida Maldonado, IBTA/Communications
Roxana Coss Tejada, MACA/Library

It was decided to distribute the first edition free of charge to reach the widest possible audience. The list of individuals and organizations to receive the Registry was organized and classified, selecting recipients from those registered by region and by institutional affiliation. Regional delegates were designated for six departments. Arrangements were made for CIAT and CORDEPANDO to cooperate in its distribution in Santa Cruz and Pando, respectively. The final distribution list was completed at the end of September.

Printing of the Registry and questionnaire was delayed considerably due to problems with the firm contracted to do the job. Although the original deadline was May 20, none of the copies had been delivered by November. After numerous attempts to secure delivery of the materials, legal proceedings were begun in late November. In December, the publisher produced 500 copies without covers, some of them incomplete. Following the arrest of the manager, an agreement was reached to deliver 1000 complete copies of the Registry and 3000 copies of the questionnaire. These were finally delivered in early January.

In October, research was begun on the first annotated bibliography, the topic of irrigation having been selected. Initial research focused on the main library of MACA. Beginning in November, other sources were investigated such as the USAID library, the Divisions of Water Resources, Engineering, and Irrigation within MACA, the National Community Development Service, CIAT in Santa Cruz, and PERTT in Tarija. In late November, the adviser traveled to Tarija, Sucre, and Cochabamba to collect materials available in these cities. By the end of December, annotations of all the relevant materials found until that time were assembled in draft form.

Contacts were made with a CODETAR official who agreed to be the regional delegate of CICTAR, with CORDECH which is interested in developing a computerized regional documentation center, and with an office in Cochabamba which receives material from EMBRAPA (the Brazilian Agricultural Research Corporation) as part of a regular computerized bibliographic service.

In addition, CICTAR has developed contacts with CIMA (the Inter-institutional Committee on Environmental Issues) of the Ministry of Planning, for which it has agreed to serve as the information dissemination subcommittee. And finally, CIDRE (the Center for Information and Documentation on Regional Development) was contacted and has expressed interest in cooperating with CICTAR.

C. Summary and Suggestions

The primary goal of distribution of the first Registry of Professionals was not met because of serious problems faced by the Office of Coordination of MACA in publishing this document. Perhaps half of the available time of the Adviser was occupied in helping with this task. Further, not having the Registry caused serious setbacks in achievement of other goals of the CICTAR team. Progress was made in defining the direction of the new organization, CICTAR. Contacts have been made in various institutions, and the system of regional delegates has been nearly completed.

Activities planned for the following semester include the distribution of the Registry of Professionals, preparation of the annotated bibliography on irrigation, and distribution and initial collection of questionnaires. In addition, communication among agricultural professionals in Bolivia, as well as awareness of the activities of CICTAR, could be promoted with a periodic bulletin. Such a publication would contain articles and announcements of seminars, and would list job openings, and new publications of interest to agricultural professionals in Bolivia. As with all the activities of CICTAR, the goal would be to make such a publication self-financing through subscription fees. In this way, the service would be self-sustaining after the termination of Chemonics' contract.

SECTION VI
CONSTRUCTIONS

A. Background and Objectives

At the beginning of the semester, the Chemonics Adviser in civil engineering had worked for only one month. During that time the following objectives were identified for the July through December period:

* Support in the contracting process and supervision of the construction of a conditioned storage chamber and a metallic roof for the heater/fan for drying units in the Warnes Seed Plant. Construction of these was awarded to the firm CUNDECO LTDA in May.

* Redesign drying bins for the IBTA experiment station in the Chaco; prepare specifications and budget for MACA and USAID approval. Due to deficiencies of the previous design, a decision was made to revise the project so as to give it the functionality desired.

* Carry out topographical work and prepare designs, specifications and budgets for access roads for the Warnes Seed Plant.

* Initiate preliminary designs for seed processing facilities in the CIAT Experiment Station in Saavedra. This seed processing plant would be an extension to the already existing drying facility.

* Complete the evaluation of the construction in Toralapa Experiment Station. Construction of these buildings had been suspended since the end of 1980.

Several additional objectives were identified during the semester:

* During the design of the access roads (Warnes) project, CIAT requested that a dike be built to protect the plant from severe floods such as those experienced in March 1983. Therefore, the design of the dike was added as a current objective.

* In support of the feasibility study for seed processing in the Gran Chaco, the Adviser was requested to assist in the general design and estimation of construction costs of a plant.

* The Coordination Office of MACA requested an evaluation of progress made on constructions in the Agricultural Service Center at Alalay, Cochabamba.

* As a consequence of the continuous readjustments involved in the budgetary process, appraisal and supervision of constructions of the Project, especially in light of the current inflation in Bolivia, it became essential to search for a suitable method for cost analysis. An objective of this period was to create a system of construction unit price analysis by computer.

B. Progress

1. Warnes Seed Processing Plant-Small Constructions

On July 14, 1983 the construction contract between MACA and CINDECO LTDA was signed in the amount of \$b 4,379,858. Since that date and until November 10, 1983, construction was carried out under the general supervision of the adviser. Through change orders, substantial modifications were introduced in relation to the original outline. Despite these changes, a savings of over four percent was obtained in relation to the original budget. Correction of deficiencies was carried out until December 22, 1983. The final inspection was conducted and MACA received the construction facilities on January 11, 1984. At the end of the semester, the last payments were being processed by USAID.

2. IBTA Seed Drying Bins

General and detailed designs were made of the IBTA seed drying bins. The designs, including plans, metric calculations, budget, technical and administrative specifications, were presented to the Coordination Office on September 7th to follow the normal revision and approval process. USAID, through Implementation Letter No. 95 dated December 5, 1983, approved the use of funds necessary to carry out the project.

3. Access Roads and Dike for Warnes Seed Processing Plant

During July, background information on the project was compiled and a topographical survey was conducted in Warnes. In cooperation with Architect Garron, designs were developed for two separate options for the access roads and the dike. Plans, metric calculations and budgets for the project were delivered to the Coordination Office for processing. After review by all institutions involved, a third option for access roads was selected. New designs and budgets were developed for this option. Because of extremely high costs, caused by the inflationary situation in the country, it was decided not to proceed with construction of the dike.

Initially it was hoped that CIAT would undertake the construction of access roads prior to the rainy season. However, due to delays in budget approval by USAID, CIAT declined to administer the construction. This prevented work from beginning until early 1984, following the rainy season.

4. CIAT/Saavedra Seed Processing Plant

This activity was limited to development of general construction specifications and cost estimates for the plant. Additional work will be required in conjunction with the feasibility study to be carried out next semester.

5. Toralapa Experimental Station - IBTA

In August, a detailed study of background information pertaining to this construction was carried out. This project consists of five new buildings in the Station:

-	Training Center	222 m2 constructed
-	Tubercle Budding Room	235 m2 constructed
-	Technicians Housing	300 m2 constructed
-	Trainees Bedrooms	224 m2 constructed
-	Workers Housing	205 m2 constructed
	TOTAL	1,186 m2 constructed

An evaluation report including recommendations was presented to the Project T-059 Coordination Office in order to reactivate the construction process. The report indicated that construction was more than 50 percent completed. After obtaining legal advice from IBTA, the Coordination Office reinitiated the contract with CASEM LTDA. The Adviser conducted interviews with builders and visits to the construction site. A new budget is now being developed and steps are being defined to reinitiate the construction project.

6. Seed Processing Plant in the Gran Chaco

In September, Chemonics International presented the "Feasibility Study of Several Options for Seed Processing in the Gran Chaco". The study contains general specifications for construction of this plant, as well as the tentative budget and program to carry out construction. CODETAR agreed to finance the construction of the processing plant and T-059 Project funds will be used to purchase imported equipment. CODETAR will take responsibility for overall construction, with the support and supervision of the Coordinator Office and Chemonics.

7. Agriculture Service Center-- Alalay, Cochabamba

This project consists of seven blocks of buildings as follows:

-	Block A	376 m2 constructed
-	Block B	256 m2 constructed
-	Block C	375 m2 constructed
-	Block D	230 m2 constructed
-	Annex I	564 m2 constructed
-	Annex II	287 m2 constructed
-	Laboratory of Pathology	*
	Partial amount without "Laboratory"	2,086 m2 constructed

* Data missing since the respective plans do not appear in files.

At the end of October a preliminary evaluation visit was performed. The Adviser also made a preliminary contact with EMCO, which indicated a willingness to reinitiate the construction, pending authorization from MACA. Based on available information, we estimate that the work is approximately 70 to 80 percent complete.

8. Computer Analysis of Construction Unit Prices

During the period covered by this report, cost data from projects mentioned above was compiled and classified. The systematic organization of the information for the microcomputer program has been started by Architect Garron. However, due to the complexity of this task, it is expected that the results will not be ready until the first semester of 1984.

C. Summary and Suggestions

Objectives for the semester underwent considerable revision and expansion. As a result, priorities were changed among the various construction projects. Some of the original objectives were not reached due to emphasis placed on new tasks.

Construction of the storage chamber and protective roof over the heater/fan in Warnes was nearly completed by the end of the semester. Design of the selected option for access roads for this plant is in final revision. Steps are being defined for awarding a construction contract through public bid or by direct administration.

Regarding seed drying bins in the Gran Chaco, construction could be undertaken by a private company, or by one of the institutions involved in the T-059 Project. A decision is pending to this effect.

Further progress in relation to the CIAT/Saavedra Conditioning Plant is pending initiation of a feasibility study recently authorized by MACA. It is assumed that local institutions will develop specific plans and budgets for this plant. Chemonics' responsibility will be to present general designs.

Chemonics responsibilities for the Toralapa Experiment Station have been 80 percent fulfilled. Similarly, our objectives in regard to Alalay have been achieved. Decisions are pending with MACA and USAID to proceed with reinitiation of these projects.

CODETAR will finance construction of the processing plant in the Chaco. MACA and USAID must now define methods of supervision and disbursements during the construction phase.

With regard to the computer analysis of construction costs, a considerable investment of time is needed to complete this work. To accelerate this process, the cooperation of administrative personnel in the Coordination Office of MACA is needed to obtain up-to-date price information.

It is recommended that more care be taken in the planning process of construction projects. Special emphasis should be placed in: conception and justification of the project; location; method of contracting and execution, etc. For example, the protective dike for the Warnes Seed Plant would not have been necessary had an adequate location been chosen.

In particular cases (i.e., electrical installations, sanitary, etc.), we recommend obtaining technical advice from specialists.

Models for seed drying bins for small farmers and seed processing plants should be developed consistent with local conditions, availability of materials and cost considerations. These would be available to institutions and private companies interested in developing infrastructure.

SECTION VII

SPECIAL TRAINING COURSES

A. Background and Objectives

During the previous semester the need had been recognized for increased training of Bolivian technicians in the area of natural resources conservation and management. Three institutions in the Department of Tarija took the leadership with MACA and USAID in organizing a committee for the purpose of conducting a series of courses. These institutions are CODETAR (The Regional Development Corporation), PERTT (Program for Reforestation and Erosion Control in Tarija), and the UAJMS (The University of Tarija, Juan Misael Saracho). Funding of a portion of the technical assistance needed for the courses was to be provided through the T-059 Project. Also a local coordinator, Ing. Fernando del Carpio, was hired in Tarija with Project funds.

Unfortunately, several administrative and budgetary problems arose related to contracting adviser/instructors directly by the Coordinator and by USAID. The Coordinator was limited in capacity due to having his work-place in Tarija and not having sufficient funds nor authority to contract with advisers. However, USAID personnel were not available either to take on this additional task. As a result, MACA and USAID asked Chemonics to participate in the implementation of the courses.

Our initial objective was to employ two adviser/instructors, previously contacted by USAID, to assist in presenting a course on land use classification. However, an additional objective became to assist the local Committee plan curriculums for future course.

B. Progress

Dr. Joseph Tosi and Ing. Juan Carlos Quiroga were employed on very short notice from Costa Rica and Bolivia, respectively, to participate as instructors in the first of the series of courses. The course was taught on land use classification, and lasted three weeks during October and November. Twenty-five persons participated, half of which were from Tarija and the other half from other departments throughout the country. Course participants were primarily high-level technicians; some occupy positions of authority in local institutions and projects. All participants work in areas related to natural resources.

Chemonics' Chief of Party attended the course for two days and helped prepare a questionnaire for course participants regarding needs for future training. The results of this questionnaire show a great interest in the areas already identified by the Committee, but perhaps with some changes in priority. For instance, responses to the questionnaire showed soil conservation as the most frequently mentioned area of need for training; reforestation was fifth in frequency.

Also, a listing of persons with interest in technical areas related to natural resources was made from the Registry of Professionals. The listing was done by computer, and was complete with addresses, institutional affiliations, and other pertinent information.

C. Summary and Suggestions

Four courses are tentatively planned for 1984 in areas such as reforestation, irrigation, soil conservation and others. When funds of the T-059 Project are involved, Chemonics may continue to assist with employing of instructors, both those recruited from Bolivia and from outside the country.

However, it is felt that more careful planning of future courses is still needed. We intend to help the local Committee in Tarija in this regard during the next semester.

SECTION VIII

COORDINATION, ADMINISTRATION AND PROCUREMENT

A. Background and Objectives

During the previous semester, the Agriculture Sector II Project and the technical Assistance Contract between MACA and Chemonics were both given their first long-term extension since the freezing of the Project in 1980. The Project was also reactivated in late May. However, as a result of the long period of uncertainty while the Project was frozen, there remained a considerable backlog of administrative tasks required to fully revitalize activities in each of the technical components of the Project. Objectives set for the July through December period are as follows:

- * Complete pending Project procurement of seed equipment.
- * Carry out Contract procurements of office supplies, vehicles, office equipment, drafting equipment and field supplies.
- * Train Chemonics and MACA personnel in computer applications for accounting and other administrative purposes.
- * Assist two new long-term advisers in locating housing; carry out shipments of household effects.
- * Assist MACA in obtaining adequate office space for Certification Service and Chemonics in Santa Cruz and for IBTA and MACA counterparts in Yacuiba.
- * Assist MACA in carrying out the first Round Table on Seed Improvement in Cochabamba.
- * Assist MACA and USAID in the development of implementational plans, budgets, and specifications for the Project for 1984.
- * Carry out a supervisory trip with the Project Coordinator/Supervisor from Chemonics' home office in Washington.
- * Advise local institutions, MACA and USAID on training opportunities outside the country in all areas where Chemonics is involved.
- * Transfer a secretary from La Paz to Sucre where she will work with the new seed adviser, Dr. Edgar Cabrera.
- * Work with MACA in extending the short-term adviser in cotton production to the end of August of this year.

B. Progress

A supplier for industrial dehumidifiers was located after considerable search by the procurement staff in Washington. Orders were placed for two units. However, the units had to be especially manufactured, and were not ready for shipment until December.

A major fire in Chemonics home office destroyed several documents related to the procurement of Project vehicles. These were replaced from La Paz, minimizing delay in the purchase. The vehicles were shipped to Arica, Chile, arriving on December 21. They will be picked up for transfer to La Paz next semester.

A drafting table and stool was provided by MACA for the Adviser in civil engineering and his MACA counterpart. Shortly afterwards, additional drafting equipment was purchased locally and from the United States. Two micro-computers and printer were purchased and put to use in conjunction with the Coordination Office of MACA. A shipment of office supplies was delivered, along with field equipment consisting of moisture testers for seed and cotton fiber. In addition, a larger, more comprehensive, list of equipment and materials required for the following year was composed by the advisers with the Project supervisor from Chemonics home office.

In July, it became apparent that the IBTA/Chemonics team in soil conservation would not be able to keep up with the demand for surveying of terrace systems in the Gran Chaco. An automatic level was purchased on an emergency basis in the United States and delivered to the team the same month. This instrument has allowed the team to move the surveying work ahead at a rate that surpassed the availability of heavy equipment to build the terraces.

A course in computer applications was given by the Chief of Party to seven persons, three from Chemonics and four from MACA. The course covered CP/M and SUPERCALC. The latter was applied in budgeting for the Project Implementation Plan in the Coordination Office and accounting in the Chemonics Office. It was also used for developing construction budgets by the Adviser and his counterpart in civil engineering. Programs were developed in BASIC for tabulation of names and addresses of persons included in the Registry of Professionals. In addition, the two Chemonics secretaries in La Paz, Mrs. Magda Alborta and Mrs. Malena Pacheco de Losantos, began working in word processing.

Because of the heavy administrative load being placed on local staff, an administrative assistant, Mr. Miguel Piaggio, was hired in Santa Cruz to provide logistical support to the offices in Santa Cruz, Yacuiba and Sucre. He also helps carry out local procurements and importations of Project materials under Chemonics' responsibility. Administrative staff in La Paz, consisting of Mr. Corsino Baptista and Mrs. Monica Calderon de Hidalgo, will focus most of their efforts on accounting and financial management.

Local staff helped two new long-term advisers in locating housing. Shipments of household effects were carried out. A new office was rented in Santa Cruz with Project funds. The office will be utilized by Chemonics and by the Certification Service in that department, including the seed laboratory. In total, more than fifteen persons occupy the new offices, including technical and administrative staffs. Plans were also made to rent offices in Yacuiba

for advisers in the Gran Chaco and their IBTA and MACA counterparts.

Assistance was provided to the Office of Coordination and the National Seed Department in organizing the first National Round Table on Seeds. The agenda was first prepared in La Paz and later reviewed with various local institutions. Disbursements for travel and per diems were handled by the Coordination Office. All three advisers in seed improvement and the Chief of Party attended the Round Table and participated with representatives of local institutions in the formulation of regional plans.

Discussions were held with USAID regarding procedures to be employed in implementation of the pari-pasu system of disbursements for the Project. A tentative understanding was first reached in the sense that this new system would not apply to the T-059 Project, because the Project was in its fourth year of implementation. Unfortunately, it was not until November that USAID informed the Project team that the pari-pasu system is a requirement which must be carried out. Furthermore, personnel was not available to prepare the plans and disbursement schedules required for this system. A series of agreements were reached to simplify the system and also to distribute the work-load among persons in the Coordination Office, USAID and Chemonics. Assistance was requested of the Office of Controllers of USAID.

Unfortunately, it was not possible to simplify these plans sufficiently, and the Controller's Office of USAID was not able to provide the time of its personnel, as had been hoped. As a result, the Coordination Office, the Project Manager of USAID and the Chief of Party are dedicating increasing amounts of time to this activity. On December 22 a draft Implementation Plan was completed and delivered to MACA by the Chief of Party. However, it was recognized that many institutions involved in the Project at the Regional and National level had to be consulted in detail before the Plan could be considered operational.

The home office Supervisor, Ms. Candace Conrad, visited the Project in December and traveled to the various field offices, Yacuiba, Sucre and Santa Cruz. She took primary responsibility for development of a comprehensive work-plan for the seed improvement component of the Project and for the preparation of specifications for materials and equipment required by the advisers for the following year. Later in Washington, the home office prepared revised budgets for the continuation of technical assistance for the remainder of the Project.

Two persons were sent to a seed course in CIAT/Colombia with Project funds. They were Ing. Diogenes Chavez of CIAT/Santa Cruz and Ing. Enrique Ballesteros of IBTA in Yacuiba. Difficulties arose in coordinating arrangements with the training institution due to the short lead-time given to USAID. A comprehensive training plan will help avoid these problems in the future.

With the opening of a new office in Sucre, a secretary from the La Paz office, Mrs. Antonieta Montañó, and a driver from the Yacuiba office, Mr. Luis Fernandez, were transferred. This office was temporarily established in CORDECH. MACA counterparts have offices in Zudañez, Chuquisaca and Betanzos, Potosi. Other institutions involved in the seed program in the region are located in Sucre.

The Adviser in cotton production in the Gran Chaco was extended through

September. The Chief of Party participated with the Adviser in the preparation of the final report covering the first year's experience with cotton production in the region. Upon receiving the report, MACA and USAID agreed to continue with this component of the Project for an additional year. The Adviser, Ing. Victor Gonzales, was hired on a long-term basis for this purpose.

C. Summary and Suggestions

Although official reactivation of the Project was reflected in a Project Implementation Letter in May of 1983, actual implementation of the Project requires the development of implementation plans. Since these were not completed by the end of the semester, the objective of identifying training opportunities and developing a comprehensive training plan was postponed for the following semester. All other objectives were reached.

Serious problems and doubts remain related to the implementation of the pari-pasu system of disbursements and the specific requirements for presentation of implementation and procurement plans. At the end of the semester, these documents were not yet near completion, and personnel was not available to dedicate full-time to this activity. The Project team used large amounts of time in developing these plans, to the detriment of support of the Project in the field.

SECTION IX

CONCLUSIONS

During the semester, July through December 1983, two new areas of activity were initiated, 1) Seed Improvement in Chuquisaca and Potosi, and 2) Special Training Courses. Also an adviser was employed to work in Information Systems. A greater overall level of effort was provided by the advisory team than ever before since the beginning of the Project. (See the appendices for details.)

In 1984, it is expected that the level of effort, measured in person-months of time worked by advisers, will increase even more. The administrative burden placed on the Coordination Office, the USAID Project Manager and Chemonics has grown accordingly. However, it is hoped that after plans are completed for implementation of the new system of disbursements, administrative procedures can be streamlined.

Because the current report is being presented well into the first semester of 1984, projections and objectives for each technical component of the Project are not given. Instead they will appear in the following progress report corresponding to January through December, 1984.

ANNEX

Table I

WORK-DAYS PAID DIRECTLY BY THE CONTRACT BYTECHNICAL AREAMAY 1979 - DECEMBER 1983

Technical Area	Long-Term		Short-Term Advisers and Acquisi- tion Agents	Home Office	TOTAL
	Advisers	Chief of Party			
(Work-Days)					
<u>Field Programs</u>					
Seeds	1173.5	202.8	161.0	21.5	1558.8
Land Clearing and Machinery Maintenance	1512.0	163.0	--	17.3	1692.3
Soils	508.0	39.7	--	4.2	551.9
Cotton	78.0	27.2	232.0	2.9	340.1
Production and Marketing Studies	--	51.8	197.5	8.5	257.8
Construction	--	5.3	153.0	0.6	158.9
Special Courses	--	7.4	24.0	0.8	32.2
<u>Institutional Strength- ening</u>					
Planning	--	130.0	328.0	13.8	471.8
Data Processing	--	16.4	36.0	1.7	54.1
Institutional Reform	541.0	83.3	143.3	8.8	776.5
<u>Support</u>					
Administration	--	413.7	9.0	43.8	466.5
Procurement	--	59.4	57.5	47.1	164.0
TOTAL	3812.5	1200.0	1341.3	170.8	6524.6

Table II

WORK-DAYS PAID DIRECTLY BY THE CONTRACT BYTECHNICAL AREAJULY - DECEMBER 1983

Technical Area	<u>Long-Term</u>		<u>Short-Term</u>		TOTAL
	Advisers	Chief of Party	Advisers and Acquisi- tion Agents	Home Office	
	(Work-Days)				
<u>Field Programs</u>					
Seeds	345.0	43.3	7.0	3.6	398.9
Land Clearing and Machinery Maintenance	--	8.0	--	0.7	8.7
Soils	131.0	2.2	--	0.2	133.4
Cotton	78.0	10.4	53.0	0.9	142.3
Production and Marketing Studies	--	--	--	--	--
Construction	--	4.0	131.0	0.9	142.3
Special Courses	--	7.4	24.0	0.6	32.0
<u>Institutional Strength- ening</u>					
Planning	--	7.8	43.5	0.7	52.0
Data Processing	--	--	--	--	--
Institutional Reform	--	--	--	--	--
<u>Support</u>					
Administration	--	41.2	--	3.5	44.7
Procurement	--	6.7	--	9.6	16.3
TOTAL	554.0	131.0	258.5	20.0	963.5

Table III

SUMMARY OF WORK-DAYS PAID DIRECTLY BYTHE CONTRACTMAY 1979 - DECEMBER 1983

	Work-Days	Percentage
Field Programs	4591.8	70.4
Institutional Strengthening	1302.3	20.0
Administrative Support	630.5	9.6
	6524.6	100.0

Table IV

SUMMARY OF WORK-DAYS PAID DIRECTLY BYTHE CONTRACTJULY 1983 - DECEMBER 1983

	Work-Days	Percentage
Field Programs	850.6	88.3
Institutional Strengthening	52.0	5.4
Administrative Support	60.9	6.3
	963.5	100.0