

**CHEMONICS**  
INTERNATIONAL CONSULTING DIVISION

PROGRESS REPORT  
JANUARY THROUGH JUNE 1984

5110465

SUBMITTED TO

THE MINISTRY OF RURAL AFFAIRS AND AGRICULTURE

BY

CHEMONICS INTERNATIONAL CONSULTING DIVISION

CONTRACT GOB/AID 511-059-008-HCC

NOVEMBER 1984

## TABLE OF CONTENTS

		<u>Page</u>
SECTION I	INTRODUCTION	1
SECTION II	SEED IMPROVEMENT	3
SECTION II-A	SANTA CRUZ	4
	A. Background and Objectives	4
	B. Progress	5
	1. Foundation Seed Production	5
	2. Seed Certification	6
	3. Installation and Use of Seed Conditioning Plants	7
	4. Production and Supply of Commercial Seeds	7
	5. Training	8
	6. Activities with the Regional Seed Council	9
	C. Summary and Recommendations	9
SECTION II-B	GRAN CHACO	11
	A. Background and Objectives	11
	B. Progress	11
	1. Foundation Seed Production	11
	2. Field Assistance to Seed Producers	12
	3. Assistance in the Design of Regional Seed Conditioning Facilities	13
	4. Seed Certification	13
	5. Training	14
	6. Cotton Seed Production	14
	7. Other Activities	14
	C. Summary and Recommendations	15
SECTION II-C	CHUQUISACA/POTOSI	16
	A. Background and Objectives	16
	B. Progress	17
	1. Seed Production	17
	2. Seed Certification	21
	3. Feasibility Study of a Seed Processing Plant	21

	<u>Page</u>
4. Foundation Seed	22
5. Training	22
6. Regional Seed Council	23
C. Summary and Suggestions	23
<b>SECTION III</b>	
SOIL CONSERVATION	24
A. Background and Objectives	24
B. Progress	24
C. Summary and Suggestions	28
<b>SECTION IV</b>	
COTTON PRODUCTION	30
A. Background and Objectives	30
B. Progress	32
1. Technical Assistance to Growers	32
2. Training of Producers and Extension Agents	32
3. Support of Local Institutions in Cotton Production	32
4. Visit from Representatives of CIAT/Hilandería/ADEPA	33
5. Planting of Varieties Introduced from United States	33
C. Summary and Suggestions	35
<b>SECTION V</b>	
INFORMATION SYSTEMS	36
A. Background and Objectives	36
B. Progress	37
1. Installation of Offices	37
2. Participation of the Committee	37
3. Trainees	37
4. Register of Professionals	38
5. Annotated Bibliographies	38
6. Information Bulletin	38
7. Training in Documentation Techniques	39
8. First Seminar of Regional Delegates	39
9. Other Activities	40
C. Conclusions and Recommendations	40

	<u>Page</u>
<b>SECTION VI</b>	
<b>CONSTRUCTIONS</b>	42
A. Background and Objectives	42
B. Progress	43
1. Small Constructions (Extension)	43
2. Seed Drying Bins	43
3. Access Roads	43
4. Foundation Seed Processing Plant	45
5. Completion of Civil Constructions	45
6. Seed Processing Plant	45
7. Computerized Analysis of Unit Construction Prices	46
C. Summary and Suggestions	46
<b>SECTION VII</b>	
<b>COORDINATION, ADMINISTRATION AND PROCUREMENT</b>	48
A. Background and Objectives	48
B. Progress	49
1. Implementation Plan	49
2. Progress Reports	50
3. Second National Round Table	50
4. Importation of New Project Vehicles and Office Supplies	50
5. Office Space	50
6. Delivery of Dehumidifiers	51
7. Preparation of Audio-Visual Materials	51
8. New Agreement with CODETAR on Land Clearing	51
9. Graduate Training in Natural Resources	51
10. Review of Policy Documents	52
C. Summary and Suggestions	52
<b>SECTION VIII</b>	
<b>CONCLUSIONS AND PROJECTIONS</b>	53
Seed Improvement, National	53
Seed Improvement, Santa Cruz	53
Seed Improvement, Gran Chaco	54
Seed Improvement, Chuquisaca/Potosí	54
Soil Conservation	55
Cotton Production	55

	<u>Page</u>
Information Systems	56
Constructions	56
Coordination, Administration and Procurement	57

\*\*\*\*\*

<b>ANNEX</b>	Table I	WORK-DAYS PAID DIRECTLY BY THE CONTRACT BY TECHNICAL AREA - May 1979 - June 1984	58
	Table II	WORK-DAYS PAID DIRECTLY BY THE CONTRACT BY TECHNICAL AREA - January 1984 - June 1984	59
	Table III	SUMMARY OF WORK-DAYS PAID DIRECTLY BY THE CONTRACT - May 1979 - June 1984	60
	Table IV	SUMMARY OF WORK-DAYS PAID DIRECTLY BY THE CONTRACT - January 1984 - June 1984	60

## SECTION I

### INTRODUCTION

The current report covers progress achieved by Chemonics International during the period January 1 through June 30, 1984 under technical assistance Contract GOB/AID 511-059-008-HHC with the Ministry of Rural Affairs and Agriculture (MACA). The Contract is financed by the United States Agency for International Development (USAID) under the Agriculture Sector II Project, 511-T-059. This Progress Report is the eleventh since the signing of the Contract in May of 1979.

The advisers who worked under the Contract during the first semester of 1984 according to technical responsibilities are as follows:

Technical Area	Long-term Advisers	Short-term Advisers
Seed Improvement	Adriel Garay Juan Landivar Edgar Cabrera	Nicholas Minot Gover Barja
Soil Conservation	E. Don Hansen	
Cotton Production	Victor Gonzales	
Constructions	Eddy Decormis	
Sector Planning	Preston Pattie	Miguel Ibañez

Mr. Miguel Ibañez, adviser in information systems, worked half-time through February and full-time beginning March 1. Also in addition to the adviser in cotton production, two extensionists were hired as local technical assistants. They are Ing. Jose Luis Humerez and Agr. Enrique Calizaya.

In terms of home office support reimbursed directly by the Project, the Project Administrator, Ms. Ellen Holguin, worked eight days in Bolivia and the procurement staff in Washington worked 18 days in total during the semester.

The appendices to this report provide an exact accounting of days worked by technical area for the life of the Project and for the first semester of 1984 which is covered in this report. The level of effort provided during this past semester, in terms of adviser-days worked, was greater than ever before--nearly double the average level during 1980 and 1981.

Total effort in the seed improvement component of the Project increased greatly with the employment of two agricultural economists, one local and one from outside the country. Their work is related to the preparation of a series of feasibility studies identified in Santa Cruz and Chuquisaca

related to seed production programs and investments in seed conditioning facilities.

A new area of work introduced during the second semester of 1983 did not materialize as planned. This refers to special training in natural resources. One course was given last year in land use classification. However, a second course in reforestation planned for the first semester of 1984 was not implemented by local institutions and USAID. Therefore, Chemonics did not receive a request to provide assistance in this area during the semester covered by this report.

The following five sections cover progress in the technical areas mentioned above, except for special training in natural resources for which no major activity occurred during the semester. The section on seed improvement is broken down into three sub-sections corresponding to the three regions where seed improvement receives Project support and technical assistance. Section VII deals with technical coordination of the Project and the advisory team. It also covers administrative support provided by Chemonics. Section VIII includes major conclusions and projections for the second semester of 1984.

## SECTION II

### SEED IMPROVEMENT

At the beginning of the semester covered by this report, three long-term advisers were working in the seed component of the project. Dr. Adriel Garay worked in Santa Cruz and acted as the activity leader; Dr. Juan Landivar was based in Santa Cruz and worked in Yacuiba and Santa Cruz; and Dr. Edgar Cabrera was based in Sucre working in the Chuquisaca-Potosi region. During the semester two short-term agricultural economists were hired in response to requests made by the regional seed councils of Santa Cruz and Chuquisaca and by MACA to assist on feasibility studies for new seed conditioning plants.

The long-term advisers coordinated activities that include common objectives such as: in-country seed courses, training outside of Bolivia, and exchange of seeds among regions. Several activities were carried out at the national level including finalizing of specifications for seed plants and laboratories and programming seed training courses for following semester. During the semester, MACA also requested the technical assistance of a communications expert to develop a seed and soil conservation film. The arrival of this technician from Chemonics' Home Office in Washington was originally scheduled for May. But due to delays in reaching an agreement with local institutions, this activity was postponed to next semester.

The level of interest in the program, as well as local participation on specific activities, has increased during the semester. The requests for orientation came from several groups: CIAT and IBTA that are involved in varietal research and foundation seed production; MACA that provides the seed testing and certification service; and seed growers which in some cases are institutions and in others are private seed growers. There were also new requests to design and orient seed plant installations. Regional seed councils and other interested groups participated in the evaluation and projections for their regions on a larger scale than previous years. This permitted better coordination of efforts and resources in the Project.

For training outside the country, specific courses at the Seed Unit of CIAT/Colombia were identified. Five Bolivian technicians from several regions were sent to an intensive seed technology course in April-May-June. Participation of five candidates from the private seed companies were also recommended for the seminar on marketing and administration of seed companies. The candidates were to go in the second semester of this year. Additional effort will be required to send candidates to six-month and on-job training to other centers starting the second semester of 1984.

In anticipation of the Second National Round Table on seed program development to be held in August, several actions were initiated in the semester: elaboration of the agenda, selection of a site to hold the meetings, and preparation of seed program evaluation guidelines. This was carried out by the Activity Leader in coordination with advisers in Yacuiba and Chuquisaca and with several institutions. Several in-country training activities were also identified for following semesters. At the time of writing this report considerable interest has been expressed for in-country

short-courses in a variety of specialized activities.

As a whole, it is considered that the seed component of the Project has worked on common goals with local institutions and has reached its objectives. Specific activities carried out by advisers in each region are presented below.

## SECTION II-A

### SANTA CRUZ

#### A. Background and Objectives

The semester covered by this report was characterized by intense activity, reaching approximately 1500 metric tons of seed produced and certified. This is significant considering that the first semester of the year is a small component of the yearly seed production program, mostly concentrating in wheat. Corn, rice and soybeans will be strong in the second semester.

The objectives for the program during this semester were:

- \* Conduct training in production of foundation seed placing emphasis on rice and wheat.
- \* Conduct a feasibility study of a conditioning plant for foundation seed in Saavedra.
- \* Finalize seed certification standards and improve office forms with the idea of obtaining better information about growers.
- \* Conduct training in laboratory testing and certification in wheat, rice, corn and soybeans.
- \* Help install air conditioners and dehumidifiers in the Warnes plant.
- \* Provide orientation on installation of two private seed conditioning plants.
- \* Help establish a system of internal quality control in Warnes seed plant.
- \* Conduct one-day short courses (cursillos) for corn and wheat seed growers.
- \* Begin a feasibility study for a seed processing plant, principally for wheat, in the valley areas of Santa Cruz.

During the course of the semester other objectives also emerged:

- \* Obtain foundation seed of local varieties of wheat by purifying fields in the valley areas.

\* Help in development of a five-year seed plan as part of a Regional Agricultural Plan.

\* Assist the Regional Seed Council on the development of a document regarding production and supply of seeds in Bolivia to be presented at the National Agricultural Symposium, held in Trinidad, Beni.

## B. Progress

### 1. Foundation Seed Production

A seminar on foundation seed production was organized with the head of the Foundation Seed Unit of CIAT. The seminar lasted one day with participation of 30 persons from CIAT and Seed Certification. It was useful in bringing about common objectives and coordination required among researchers, Foundation Seed Unit and Certification personnel. At the end of the seminar it was agreed that a similar seminar would be useful at a national level.

In response to the request of the Regional Seed Council and MACA, two agricultural economists, Mr. Nicholas Minot and Mr. Gover Barja, were employed to conduct a feasibility study for a seed plant to condition foundation seeds. Work on this study began in May. Seed advisers from Santa Cruz and Sucre assisted on technical aspects of seed production and seed plant design. The Chief of Party provided orientation on the technical analyses and on the general strategy.

The study not only contemplated the processing aspect of foundation seed production, but also the viability of the entire Seed Unit with and without the conditioning plant. Financing of the equipment for the plant is provided through the T-059 Project. However, local sources had to be found for financing of the construction. After exploring several possibilities, including CORDECRUZ, the study team was forced to rely on PL-480.

The original site considered for the plant was selected to make use of existing infrastructure, including driers and a small storage unit. However, the design of the plant was limited by the arrangement of existing buildings. As a result of preliminary analyses, it was apparent that a larger investment could be justified, therefore it was decided to locate the plant independently of other installations, but still on the Saavedra Experiment Station. Topographical work was conducted by the Chemonics Civil Engineer to recommend the best site. In the process of the study, several design options were considered, and the scale of the plant was changed several times.

The feasibility study was finished on June 6th and was submitted to CIAT for presentation to PL-480 for financing. Due to the consideration of various options regarding plant design and financing, the study required about five person-months of effort, instead of the two or three months originally programmed.

In this semester, the Foundation Seed Unit showed an acceptable level of effectiveness on soybean, corn and rice seed production but seemed weak

on wheat. Consequently closer assistance was provided to purify selected fields of wheat c.v. Saguayo in Comarapa and Jague.

This activity demanded greater effort than previously foreseen. The first fields purified by the Adviser in collaboration with wheat seed program personnel did not meet purity standards of foundation seed. Other fields were immediately selected with more progressive farmers. Intense and repeated roguing were carried out with farmers and foundation seed personnel, finally reaching an acceptable purity. The five hectares of purified seed fields produced enough seed for 80 hectares, which was being planted in June in the lowlands of Santa Cruz. This, in turn, will produce the seed to be redistributed for 1000 hectares of commercial seed production in Comarapa in 1984/85. Strict purification in 10 hectares will need to be carried out again to repeat the new cycle of purer seeds. This procedure is carried out by the Foundation Seed Unit each year with every crop.

## 2. Seed Certification

Seed certification standards were finished and published in January. The final form has been evaluated by seed growers in the region and by the Regional Seed Council. Positive observations were obtained from these groups. The certification standards were used by Seed Certification Service during the semester. However, the standards will need improvement depending on the level of local experience, problems encountered or changes in market conditions. Revisions will be made every year after the last seed crop of the year has been harvested.

Some office forms used in seed certification work were updated. The form that received considerable change was "Registration of Seed Growers", with the objective of obtaining better information about the seed growers' experience, infrastructure and willingness to comply with seed certification guidelines.

The activity that normally demands more attention from the Adviser is technical assistance on field inspections, analyses and certification. This activity is gradually increasing since certification is becoming the executing arm of the Regional Seed Council. Activities are coordinated every Monday since certification and the Chemonics Adviser share offices and work as an integrated team.

Assistance was provided on seed certification of wheat, rice, corn and soybeans. For seed testing purposes, a low-cost germination chamber has been implemented to germinate all crops in sand-trays at controlled temperature. The results obtained with the germination chamber are multiple: 1) better germination tests, 2) greater amounts of samples can be tested at any time, 3) room is used for routine testing as well as for training and demonstration to clients. The laboratory has analyzed 463 samples in the semester, which almost equals the amount of samples analyzed in the entire year in 1983.

A great many requests have been received by the certification laboratory for testing of pasture seeds. However neither purity nor germination tests can be offered to clients since the laboratory lacks equipment for doing specialized tests. The equipment needed was specified to be purchas-

ed by T-059 and is needed before March of 1985.

### 3. Installation and Use of Seed Conditioning Plants

At the beginning of the semester the storage room had already been built. However it could not be used since the equipment to control temperature and relative humidity had not yet been installed. The Adviser took the initiative and personally drew the electrical design, wrote specifications, and obtained price quotations from several firms for CIAT approval. The equipment was installed and the climatized room, the first of its kind in Santa Cruz, was put in operation. As soon as it began functioning, it was utilized to maximum capacity with valuable carry-over seeds of different institutions, as well as the April-May harvest of foundation seeds.

It is recommended that the relative humidity be kept at 55-65 percent and the temperature at 18-22 degrees Centigrade. This range is considered enough to keep carry-over seeds up to a year, providing they are of good quality initially. The room is not for long-term storage.

Assistance was provided to Semillas CAICO and Semillas Cordillera during the installation of equipment at their new conditioning plants. The CAICO plant was already finished at the beginning of the semester, however, advice was needed to detect problems and suggest improvements. Some improvements were carried out during the semester including the change of one air-screen cleaner for a better model. This plant is expected to work mostly with soybean seeds in the near future due to the lack of flexibility of equipment acquired and other technical limitations.

Assistance on installation of Semillas Cordillera was also provided. The original design that was made in Brazil was changed to improve the flow of seeds to be more suitable for a small market such as Santa Cruz. Mistakes on selection of equipment were detected and changes were recommended. Corrections were underway during the semester.

In addition to assisting on seed plant designs and orientation on seed plant installations, the adviser based in Sucre designed a conditioned storage warehouse with a capacity for 250 metric tons and standard seed driers using local materials. The designs were distributed to interested seed growers.

### 4. Production and Supply of Commercial Seeds

Commercial seeds in the region are produced by private seed growers. There is seed production in the following order by magnitude: soybeans, wheat, corn, rice, cotton and beans. Wheat seed is produced by CIAT with financial assistance from PL-480. Other seeds are produced by private seed growers using traditional lines of credit.

During the semester, a seed plan was developed by the Adviser and his local counterparts to be included as a separate chapter of the Five-year Agricultural Production Plan. The Plan includes corn, rice, wheat, and soybeans in a stepwise manner in regard to increased needs and institutional responsibilities in the regional seed program. However, the plan is not considered infallible, since major economic factors are changing and

will affect agricultural development. Consequently a yearly adjustment will be required.

The Adviser was able to assist the wheat seed program of CIAT for the first time since the beginning of the project. This was possible only because other activities such as foundation seeds, Warnes processing plant and seed certification did not require permanent technical assistance as before. Assistance provided consisted in short courses for small farmers that were the seed producers in the highlands of Santa Cruz.

Repeated trips were made to the Comarapa and Vallegrande region to provide half-day short courses to farmers in cooperation with CIAT personnel. Before harvest time, the Adviser urged ANAPO to meet and discuss the wheat seed price with the growers. The outstanding wheat seed crop of the year is attributed in part to the fact that the interested groups were able to obtain attractive prices for the grower, and good rainfall in the season that permitted high yields.

The wheat seed program worked with 537 small farmers on 1065 hectares. CIAT reached the farmer with a complete package (seed, fertilizer, herbicide, harvesting service) and assured the purchase of seeds. This resulted in 700 metric tons of seed in the season. The region of Santa Cruz used most of this seed for the winter wheat crop of nearly 9,000 hectares. Furthermore 250 metric tons are being stored for early plantings of 1985.

Assistance was provided to orient corn and soybean production also. Soybean seeds were produced mainly for planting winter seed fields. Lack of adequate storage as well as lack of financing for storage and marketing of soybean seeds are limiting factors to increase summer seed production.

The amount of seed produced, processed and bagged in the semester is estimated at 1500 metric tons with 10 percent being conditioned in CAICO and 90 percent in Warnes. The greater drying and processing capacity in the region guarantees a greater supply of commercial seeds beginning the second semester.

In response to a request from the Regional Seed Council and MACA to carry out a feasibility study for processing wheat seed in Vallegrande and Comarapa, Mr. Minot worked in Santa Cruz starting June. At the end of the semester, some information had been gathered regarding projections of demand for wheat seed in the lowlands. This is especially complex since production of commercial wheat in the lowlands of Santa Cruz is relatively new.

##### 5. Training

Two factors that are contributing to the effectiveness of the seed program in the region are: amount of trained personnel and their job stability. Keeping this in mind, several activities related to training were carried out: 1) training outside the country, 2) training inside the country, and 3) preparation of seed courses for second semester of 1984.

Training inside the country included half-day a week training courses for the Santa Cruz seed certification personnel for two months. This training is always followed up by training-by-doing, which has proved to be

a very effective way of preparing personnel. Half-day courses were also provided for small wheat seed growers in Comarapa, Jague and Santa Ana with an average attendance of 30 farmers. Three additional courses in other communities were cancelled due to damage of roads caused by heavy rains.

#### 6. Activities with the Regional Seed Council

The Adviser continually assists the Regional Director of Seed Certification in identifying subjects that need to be addressed by the Regional Seed Council and attends the monthly meetings of the Council. One activity, carried out as a follow-up to the Cochabamba Round Table, was elaboration of a resolution about production and supply of seeds in Bolivia. The document was prepared in collaboration with local counterparts, and presented by a delegation of the Seed Council at the II National Agricultural Symposium in the Beni. The document was approved and it should be useful for all seed activities in Bolivia.

#### C. Summary and Recommendations

The objectives planned previous to the semester and the ones identified during the semester coincided with the objectives of counterparts and institutions and were met successfully. The wheat seed program was very successful.

Two private seed conditioning plants were completed, which brings the installed capacity to approximately 3-4 metric tons per hour. This will be a positive factor for the effectiveness of the program in future years. However, as the program advances some limiting factors are being identified and will need to be addressed. Some of the limiting factors are:

\* Seed certification is in desperate need of vehicles and laboratory equipment. Vehicles are needed for December of 1984 and laboratory equipment by March 1985.

\* Technical assistance will be needed to study storage and marketing of seeds with emphasis on wheat and soybeans. For this task an agricultural economist will be necessary for about six months starting January of 1985.

\* There is a need of greater effort to promote the use of high quality seeds. The campaign should start in September of 1984.

\* Chemonics, MACA and Regional Seed Councils should promote exchange of positive experiences and seeds among the regions of Bolivia.

The seed program in Santa Cruz is reaching the expected level of complexity and sophistication. There are more interested institutions; there are more farmers participating in seed production; the amount of seed required is increasing every year, reaching about 4000 metric tons in 1984; there is a greater awareness about the need of higher quality seeds which demands better production technology. As a consequence there is a much greater demand for technical assistance. The activity is big enough and successful enough as to merit the assistance of: one expert on seed production and certification; another on seed plant design, installations, man-

agement and internal quality control; and a third person on seed marketing, distribution and promotion. This should be addressed by MACA-Chemonics and USAID in the near future to assure continued progress.

## SECTION II-B

### GRAN CHACO

#### A. Background and Objectives

During the semester covered in this report, the work strategy proposed by representatives of the Gran Chaco in the Round Table of Cochabamba were to be put in effect. The new seed production strategy for the region included the formation of the regional seed council, the reorganization of the Seed Certification Service, and the inclusion of private growers into the multiplication component of the program. Local institutions were enthusiastic about the new seed production strategy for the region.

Two activities were carried over from the last semester of 1983 into the semester covered in this report. These activities were (1) the registration of private seed producers, and (2) quality control of seed lots available for late planting.

Once these activities were completed, the Adviser's time was used in fulfilling the following objectives:

- \* Assist IBTA in the production of 16 tons of foundation seed of soybeans, and 2 tons of corn seed.
- \* Work with private seed producers in fulfilling seed certification regulations related especially to quality standards and in solving problems encountered in the field.
- \* Assist CODETAR in the design and implementation of the drying, processing and storage facilities of the seed conditioning plant in El Palmar, and IBTA's drying facilities.
- \* Work with the regional Seed Certification Service in organizing the new work structure of the Service and in improving its effectiveness.
- \* Offer a course in seed production to the technicians of the region.
- \* Coordinate with the regional cotton program in the production of 12 tons of cotton seed.

#### B. Progress

##### 1. Foundation Seed Production

At the beginning of the semester, plans were made with the IBTA technician in charge of production to produce 10 hectares of soybeans of the cultivars UFV-1 and Cristalina, and a minimum of one hectare of corn of the cultivar Swan. Sources of seed for both varieties of soybeans and for corn were produced previously by the experiment station.

Once planted, the cultivar UFV-1 showed varietal mixtures for which intensive roguing practices were recommended. Roguing was partially per-

formed, but the problem was not completely solved. Therefore this field was not classified as foundation seed. The Cultivar Cristalina was free of contaminants. Weather permitting, there would be enough seed of this cultivar to distribute to growers for multiplication in 1984/85. For corn IBTA planted the necessary area in foundation seed. The fields showed excellent characteristics; high yield is expected. However, the field was not harvested by the end of the semester. Seed quality may be affected by late harvest.

## 2. Field Assistance to Seed Producers

This was the main activity for the Adviser during the semester covered in this report. Seed multiplication fields were inspected three times on the average. The inspections were performed by the Adviser and by MACA counterpart, Oscar Zubiaurre. Field visits were used mainly to have direct contact with the producers, and to train certification personnel in field sampling and inspection techniques.

Results of the inspections were discussed with producers, placing emphasis on the relationship between field problems and effects on yield and on seed quality. Advice was given on how to solve the problems, and cultural practices were suggested to obtain good quality seed.

Seed multiplication was the strongest component of the program mainly because of the willingness of the producers to accept recommendations given during the inspections. Table 1 shows a summary of the growers that participated in the 1983/84 season.

Table 1. SUMMARY OF SEED PRODUCERS PARTICIPATING IN THE 1983/84 SEASON

Producer	Crop	Variety	Number of Hectares	Number of Inspections
IBTA	soybean	UFV-1	6	4
IBTA	soybean	Cristalina	4	4
IBTA	corn	Swan	2	1
J. Lara	corn	Swan	10	1
W. Delfin	corn	Swan	7	3
W. Delfin	soybean	cristalina	12	3
V. Armella	soybean	UFV-1	12	2
J. Vallejos	soybean	UFV-1	10	2
J. Gumiel	soybean	UFV-1	27	2
R. Gumiel	soybean	UFV-1	20	4
A. Quiroga	soybean	UFV-1	50	3
R. Pantoja	soybean	UFV-1	20	2
G. Vasquez	soybean	UFV-1	20	2
J. Quispe	soybean	UFV-1	6	2
P. Grageda	soybean	UFV-1	30	4

No. of producers: 12

Total hectares registered: 238

Average number of inspections/producer: 3.08

Adverse weather conditions during the month of April severely affected yields. However field inspections showed that there was enough seed fields to cover local requirements (about 150 metric tons).

During the month of May, ANAPO expressed interest in purchasing seed from the Chaco region to overcome a shortage of seed in Santa Cruz. This seed purchase was discussed in a meeting of the Regional Seed Council. It was approved, and plans were made with the Integral Cooperative to incorporate additional fields in the program to produce at least 500 metric tons of soybean seed of the category "fiscalized". This amount would cover the local requirements and the remainder would be sold to Santa Cruz (ANAPO).

In coordination with a technician hired temporarily by the Cooperative and ANAPO, commercial fields were inspected. The best ones were incorporated into the program. The new fields made a total of approximately 500 hectares, with an estimated production of 750 tons, potentially surpassing the goal previously established.

Although, limited drying and processing equipment was available, conditioning of seed was possible. IBTA had two portable fans and burners provided by the T-059 Project and MACA had two Clipper 27 air screen cleaners in the region. The estimated capacity of the equipment was approximately one ton per hour. However, a disagreement arose with the Director of IBTA on the destination of the seed and the varieties to be included in the program. Specifically, he objected to any seed being sold to Santa Cruz and to the inclusion of the IAC-8 variety in the seed program. Over the objections of the Regional Council, IBTA refused to allow access to the conditioning equipment mentioned above. The resulting delays left the majority of seed in the field into the month of June. Excessively late rains in June contributed to the failure in achieving the projected goals.

### 3. Assistance in the Design of Regional Seed Conditioning Facilities

This activity was carried on in coordination with technicians of CODETAR, the seed adviser for Chuquisaca, Dr. Edgar Cabrera, and Chemonics' Civil Engineer, Ing. Eddy Decormis. Preliminary designs showing details of the equipment as well as materials to be used in the construction was prepared by this team for both the seed conditioning facilities of El Palmar and the IBTA drying facilities. By the end of the semester some of the materials were purchased for the El Palmar plant and the drying facilities of IBTA were under construction.

The initiation of the El Palmar seed processing plant was delayed pending the definition of legal procedures to be used, i.e., public bid, invitation of construction firms or direct execution by CODETAR. The Coordination Office of MACA along with USAID and the Chemonics Chief of Party assisted CODETAR in this regard.

### 4. Seed Certification

Work continued this semester in the reorganization and strengthening of this Service. The National Seed Department of MACA did not provide the region with the necessary personnel to provide efficient service.

There was only one field technician available for training and for performing field inspections. A work schedule was developed to inspect every registered seed field at least once per month. This plan was followed during the season except during the months of April and May (rainy season) when inspections were possible only when road conditions permitted. A great deal of advisory time was misused in performing routine inspections rather than training and supervisory activities.

Field inspections were used for on-the-job training for the one technician working in certification. Field problems were analyzed at the different stages of development of the crop. Fields were analyzed through sampling techniques to detect varietal mixtures, planting density, presence of noxious weeds and insect populations.

On-the-job training was practically terminated when the only field inspector available was transferred to Tarija. This had a negative impact on the program because we were not able to complete our training objectives and because it left the region with no field inspector to complete the 1983/84 seed production season.

#### 5. Training

A seed production course was planned for the Gran Chaco in cooperation with the seed advisers for Santa Cruz and Chuquisaca, as well as CIAT and seed certification of Santa Cruz. It was cancelled due to excessive rain during the months of April and May. All means of transportation to Yacuiba were closed.

#### 6. Cotton Seed Production

In coordination with the regional cotton program, fields were selected for seed production. These fields were inspected by the cotton program technicians. At harvest some of the selected fields were damaged by excessive rains and others by delayed harvest. However, the remaining area was sufficient to cover the projected goals. The cotton program technicians were trained in laboratory techniques of quality control, and were able to carry on this activity successfully.

#### 7. Other Activities

Additional activities related to the seed work during the semester included coordinating a major seed purchase of ANAPO with the Integral Cooperative Gran Chaco Limitada. Much of the Adviser's time during the month of May was used in this activity. It later failed because of poor weather conditions and IBTA's opposition to the use of seed conditioning equipment. The attempt to produce enough seed to fulfill local needs and to export to other regions of the country was beneficial in the sense that awareness was created among seed producers and marketing institutions of the potential economic benefit that could be obtained in the seed production business.

### C. Summary and Recommendations

Of the six objectives set for this semester, only three were met satisfactorily. There is no foundation seed of the soybean cultivar UFV-1 to distribute to seed producers for the following season. The availability of foundation seed of the cultivar Cristalina and of the corn cultivar Swan depends on rapid harvest. However, IBTA does not have the harvesting equipment, nor the hand labor for performing this activity efficiently.

Our objective of strengthening the Seed Certification Service was only partially completed. This was due to the failure of the National Seed Department to provide sufficient personnel. Only one field technician was assigned to the region, and he was later transferred to Tarija, leaving the area with only the head of the regional certification office. The time of the regional head is absorbed in administrative responsibilities.

Our training activities were limited to on-the-job training of the seed certification field inspector. Severe weather conditions interrupted all means of transportation and caused the cancellation of a formal seed production course.

Considerable progress was made, however, in incorporating private growers into the seed multiplication program. Farmers were very receptive of the program and willing to work with and accept the recommendations of the seed certification personnel. Our objectives were also completed satisfactorily in providing assistance to CODETAR in designing seed conditioning facilities for the region.

Our original objective on cotton production was to produce 12 metric tons. However, the Integral Cooperative wanted to begin its cotton seed production program with only 4 tons of seed. No other institutions were available to buy and market the remaining seed. The best lots were selected and purchased by the Cooperative.

The unusual rains during the 83/84 season, reduced considerably the harvest time. Therefore the limited availability of harvest equipment was more obvious this year than others. It is of prime importance to help seed producers in obtaining credit to purchase combines. For this Chemonics should assist interested producers in doing feasibility studies to present to financial institutions. It is highly recommended that financial institutions consider these requests, carefully analysing the social and economic benefits of achieving the goals of the regional seed production program.

This semester the need was also obvious for speeding up the construction of the seed drying facilities of El Palmar. For this it is highly recommended that CODETAR build the infrastructure for the plant according to the work schedule presented to CODETAR by the Regional Seed Council. The seed conditioning plant must be in operation by April of 1985.

## SECTION II-C

### CHUQUISACA/POTOSI

#### A. Background and Objectives

In the past few years, the Ministry of Agriculture (MACA) has been directly involved in the production, processing and marketing of wheat seed in the Chuquisaca-Potosi area. Because of the broad range of activities, lack of operating funds and lack of personnel, the quantity and quality of the seed produced has not had an impact on agriculture of the area. During the first National Round Table to deal with the status of seed programs around the country, it was recommended that other institutions, as well as private farmers, participate in the production and marketing of seed. By removing MACA from these activities, their Seed Department can more effectively comply with its role as a certifying agency.

A disastrous drought that hit Chuquisaca-Potosi in 1983 forced different institutions to set up emergency programs. A primary objective of these programs was to produce seed of the main crops, wheat and potatoes. This provided an excellent opportunity for the reorganization of the regional seed program, since more institutions in the agricultural sector became involved. MACA is still engaged in seed production but dedicated more time to assist other institutions.

Accordingly, the main objective during this semester was to reorganize the seed production and certification schemes. To achieve this main objective the following goals were set:

- \* Produce 660 metric tons of wheat seed with small farmers under the emergency plans of CARE, CARITAS and CORDECH.
- \* Initiate a feasibility study of a seed processing plant, which would help determine the role of each institution involved in the regional seed program.
- \* Set up a foundation seed program which could become active for the 84/85 season, identifying the most suitable institution to adopt this activity, estimating the volumes of foundation seed required and suggesting needed infrastructure.
- \* Develop and carry out a methodology for the inspection of wheat seed fields produced by programs under CARE, CARITAS, MACA and CORDECH.
- \* Design surge bin and framing to be installed above air and screen cleaners in Betanzos and Zudañez.
- \* Conduct a short course focusing in seed technology, for field personnel of the different institutions.

As work on the feasibility study progressed, it became necessary to focus on a series of intermediate projects needed to develop the seed program. The first of these was a project for production of certified wheat seed with CORDECH and CARE.

B. Progress

1. Seed Production

Planting of wheat in Chuquisaca is normally accomplished between December and January. This season was characterized by an extremely dry December and wet January, postponing planting of most wheat to February. Four institutions were engaged in seed production, growing six different varieties as shown in Table 1.

Table 1 1983/84 WHEAT SEED PRODUCTION BY INSTITUTION AND VARIETY

Variety	Institution	Area planted (ha.)
Chinoli-65	CARITAS	30
	CORDECH	20
Chinoli-70	CARITAS	111
	CORDECH	40
	MACA	117
Jaral	CARE	30
	CARITAS	75
	CORDECH	50
	MACA	93
Kimori	CARITAS	40
	MACA	57
Napo	CORDECH	10
	MACA	22
Saguayo	CARITAS	100
	CORDECH	150
TOTAL		945

Most of this wheat was grown under the emergency plan following the drought. All of the seed to be multiplied, excluding Saguayo, was obtained from MACA Seed Departments in both Chuquisaca and Potosi and from the Chinoli Experiment Station. Two hundred and fifty hectares were planted with Saguayo seed produced in Santa Cruz. The contamination levels of all varieties with other varieties were high. This is particularly true in the case of Saguayo which had 5 percent of other varieties. This amounts to 100,000 plants of contaminants per hectare with a population of two million plants (see Figure 1). All wheat was grown with small farmers, for example an average of 0.66 hectares/farmer in the case of CARITAS. Most growers did not have the desired characteristics of good seed men (good land, good farming abilities, some infrastructure, etc.). Production areas were scattered from Yamparaez to Redencion Pampa. CARITAS, for instance, produced wheat seed in 32 communities.

Figure 1



Wheat field in Redención Pampa highly  
contaminated with other varieties.

Weed control was good in some places and there was no control at all in others. In general, broad leaf weeds were present in most fields. Moisture was available during most of the growing season and yields were higher than usual. Saguyo behaved very well compared to the other varieties. When planted in fields where potatoes had been grown, and where irrigation was available, yields as high as 3 tons/hectare were estimated.

Harvesting and threshing were conducted by traditional methods, cutting by hand and threshing with animals. Seed threshed in this manner usually contains rocks which cannot be removed by the air and screen cleaner later on in processing. It was suggested that CARITAS and CORDECH purchase stationary threshers to prevent these problems. CORDECH had even budgeted for this item, but was not able to obtain the machines.

With 945 hectares of wheat grown for seed and yields of 1-1.5 tons/hectare, there were around 1000 tons produced. However, CARITAS, CORDECH and MACA have only committed themselves to purchase and market the amounts that farmers owed them for the seed given to them (and value of inputs in the case of CORDECH). As shown in Table 2, this commitment represents only 14 percent of total production.

Table 2 FISCALIZED WHEAT SEED TO BE RECOVERED IN 1984, BY INSTITUTION

Institution	Volume of seed (tons)
CARITAS	56.6
CORDECH	45.5
MACA	38.6
<b>TOTAL</b>	<b>140.7</b>

Technical assistance to the seed growers on the part of CORDECH was very weak. Some farmers were not visited at all during the growing season, mainly because of the limited number of field technicians. CORDECH had only one person to supervise the 270 hectares of wheat seed under production. This technician was also responsible for CORDECH's emergency plan, so the number of visits to the fields was very limited. CARITAS faced the same problem, e.g., one person for 356 hectares during most part of the growing season.

MACA's seed unit in Chuquisaca made its first visit to the fields the third week of February. Because of the large number of farmers, small lots, many producing areas, and bad roads, it was soon apparent that inspection of all fields was impossible. MACA had only one field technician for their 289 hectares under production with farmers, and the same person was to inspect the other fields (Figure 2). It was then decided for MACA to only visit the most promising fields, however it was impossible to provide the necessary assistance to farmers. Most farmers did not agree to carry out roguing of fields, mainly because they doubted that they would get a better profit for their product.

Figure 2



MACA's Seed Division technician, Angel Clavijo inspecting a wheat field contaminated with oats.

## 2. Seed Certification

MACA's hiring of Ing. Renan Rosas in the seed division greatly contributed to assist in the activities later in the season. He directly rogued with farmers about 3 hectares of Saguayo seed which will be multiplied in the 84/85 season.

MACA's seed unit in Potosi had 116 hectares of wheat seed and 63 hectares of barley seed with farmers and in Rumihuiñaska (MACA's farm) under their seed production program. Fields were inspected twice on the average from planting to harvest by Ing. Guido Revollo and Ing. Francisco Zubieta of MACA in Potosi.

## 3. Feasibility Study of a Seed Processing Plant

It is obvious that all institutions recognize the need for a seed processing plant in the area. However with past and actual volumes of seed produced, a well equipped plant would not be feasible. It has been shown in other areas that the existence of plants will not necessarily foment production. As stated in the objectives, the purpose of the feasibility study is two fold: (1) to determine and coordinate the role of each institution (seed production, processing, certification and commercialization) and (2) to study the feasibility of a seed processing plant in the area.

Chemonics cooperated with CORDECH in writing a three-year wheat seed production project. This project was presented by CORDECH to CARE for the financing of inputs and equipment. CARE has approved the budget of US\$ 35,000 for the first year. It is expected that they will continue to provide financing depending on the progress of the project. The marketing of improved seed appears to be a key element. Due to the character of farmers and low economic level, it seems unlikely that they will buy improved seed, unless it is channeled through an institution offering credit until harvest.

So far the feasibility study has identified CORDECH as the institution to be involved in seed production. CORDECH plans to produce 150 metric tons of certified wheat seed with small farmers on irrigated land in 1984/1985. The study has also identified Tomina as the recommended location of the seed processing plant.

The conditioning plant should be strategically located in relation to the production areas and should be easily accessible. It could make use of one of the three 500 metric ton bulk storage facilities existing in the region which belong to MICT (Ministerio de Industria, Comercio y Turismo). The recommended 1.0 ton/hour processing capacity, according to the volumes of seed which are expected to be processed, would allow for the plant to be financially feasible when reaching 400 tons of processed seed in a year.

The demand of wheat in the area is limited, mainly because mills utilize imported wheat to produce flour. Even though there is a government decree which calls for the mills to manufacture 33 percent of their flour with locally produced wheat, very few buy but a small volume of local wheat. As long as there is no demand for wheat it is impossible to go far with a wheat seed program. Efforts will be made to work with CARITAS in their production/milling/marketing program and also at the policy level in

order to improve markets for local wheat.

#### 4. Foundation Seed

An effort was made by Chinoli, IBTA's experiment station in Potosi, to produce two varieties of foundation seed, Chinoli-65 and Chinoli-70. One hectare of each variety was planted, expecting to produce about 1.0 ton of each. Both varieties are recommended by the station, even though it is expected for Chinoli-65 to replace Chinoli-70 in the next few years. This is because Chinoli-65 yields a better quality flour. The fields were rogued many times by the wheat breeder and workers. Plants were uniform during the flowering stage. Unfortunately, on July 9 frost destroyed a large number of kernels that had not yet reached physiological maturity. It was estimated that about 50 percent of foundation seed was damaged.

In Chuquisaca, three hectares of Saguayo were rogued and 3.36 metric tons of seed may qualify as foundation seed, even though it appears very difficult to completely eliminate the high number of contaminants. Six metric tons of Jaral seed will most likely meet foundation seed standards giving a total of 9.36 tons of foundation seed this year.

#### 5. Training

At the beginning of the semester a short course was programmed to train field personnel in seed technology. It soon became apparent that the most urgent need was to discuss the organization of a seed program, rather than just technical aspects of it. Fourteen participants from eight institutions were involved in one day of presentations, one day visiting production fields and one-half day round-table. Later on the conclusions of the round table were distributed to participants. Among the most important conclusions were:

- a. Wheat, barley and potatoes are priority crops in the area for the next few years.
- b. Foundation seed of all the above should be produced by Chinoli Experiment Station. A Foundation Seed Unit should be formed in the station.
- c. The Seed Unit in MACA should become the Seed Certification Service, withdrawing itself from production and marketing of seed.
- d. The price of wheat seed paid to growers should be up to 20 percent higher than grain.
- e. Most wheat seed produced this year would be fiscalized seed, taking only a few fields for intensive roguing to obtain foundation seed.

The degree of involvement of the participants was high and it was considered a very successful course.

Ing. Guido Revollo, MACA's seed inspector in Potosi, was sent by the T-059 Project to Colombia, to participate in the Seed Technology Course conducted in CIAT. He underwent further training in forage seeds for an

additional month.

#### 6. Regional Seed Council

The Regional Seed Council was formed the 14th of June, twelve institutions from Chuquisaca being members of it. It is believed that the Seed Council will be useful in setting production goals for the area as well as organizing the Seed Certification Service.

#### C. Summary and Suggestions

Production of wheat seed was initiated this semester with the participation of other institutions besides MACA. Approximately 1000 tons of fiscalized seed were produced but only 14 percent were being recovered for processing. This was mainly due to the lack of funds on the part of CARITAS, CORDECH and MACA to purchase the farmers' production. It has been estimated that about 50 percent of the foundation seed produced this year was lost as a consequence of frost damage. This will certainly limit the program next season. Another source of foundation seed (Santa Cruz or Cochabamba) should be considered. Because of these factors initial goals were only partially met.

Inspection of fields became extremely difficult given the large number of farmers, inaccessible places, bad roads and lack of selection of the farmers involved. The experiences of 1983/84 will definitely influence future production schemes. It is expected that in the 1984/85 season 120-157 hectares will be planted. Selection will be made on the basis of size, availability of irrigation, accessibility and capability of farmers.

Regional policies in seed production must go hand in hand with government decisions. As long as flour mills continue to obtain imported grain with soft credit, local production will remain at a low. It is possible to introduce improved wheat varieties with excellent milling characteristics within a few years' time, through a well organized seed multiplication program. But the demand for local wheat has to provide production incentives.

The seed Adviser assigned to Chuquisaca-Potosi has the responsibility for designing and supervising installation of equipment in seed facilities in all the regions. Therefore his time available for the regional programs is limited to less than full-time. Because of the increasing demand for design of facilities and foreseeing a greater involvement in the installation of equipment in the near future, the hiring of a local short-term adviser/assistant is suggested. The assistant would cooperate with the long-term Adviser in organizing the seed programs in Chuquisaca and Potosi.

MACA's technical personnel in the Seed Division is adequate for providing certification services in the next growing season. However, in Chuquisaca they do need to be provided with a driver and at least one worker to assist in the processing of seed.

For any seed project, foundation seed is one of the most important components. It is therefore recommended that the Project assist IBTA's personnel in Chinoli-Potosi in the development of a foundation seed project to be submitted to PL-480 for funding.

## SECTION III

### SOIL CONSERVATION

#### A. Background and Objectives

During the last semester of 1983 nine demonstration areas of terraces were established for cooperating farmers on their lands which have been producing soybeans and maize. This entailed survey and construction of broad-based terraces with contour canals and associated main drainage ways to safely discharge excess waters. Supervision by the IBTA-Chemonics team was necessary to assure that farmers planted crops on the contour following the guidelines established by the terraces.

Specific objectives for the first semester of 1984 were defined as follows:

- \* To propose a new work plan and budget for the construction of terraces by use of a road-grader and D-7 or D-4 Caterpillar-Bulldozer owned by CODETAR.
- \* Continue preparing bulletins, radio programs, and audio-visual materials for educational promotion of erosion control programs in the Gran Chaco.
- \* Help organize local people toward more interest and active participation in erosion control programs.
- \* Continue to cooperate with interested institutions and communities in evaluating and developing technically sound methods for erosion control in the most adversely affected drainage basins of the Yacuiba valley.
- \* Continue to orient and supervise farmers during the period of land preparation, planting on the contour, and maintenance and repair of terraces each year. This is to insure normal functioning of terraces during the periods of rainfall which follow near the end of the planting season.
- \* Follow up on planned aerial flights of the Humid Chaco to take photos and video tapes of the existing terrace areas and of the eroded areas, particularly those badly damaged during the past two years.

#### B. Progress

Unprecedented intense and heavy rains which occurred during this period tested the effectiveness of the constructed terraces. The terraces performed well in almost all cases, controlling runoff water and directing it into main drainage ways. Damage to existing terraces usually took place where terrace canals were not cleared of weeds and trash which impeded normal drainage through the terrace canals.

Requests for construction of terraces continued to be received into the beginning of the rainy season. However, it was not possible to accomplish more because of the persistent nature of the rainy season which

intensified in January and reached the record high of 725 millimeters in March of this year. Most of the precipitation fell during an eleven-day period during March, an occurrence of once in 50 years.

Table 1 SUMMARY OF WEATHER DATA, DECEMBER 1983 AND JANUARY-JUNE 1984 IN THE YACUIBA AREA \*

	Dec.	Jan.	Feb.	March	April	May	June	Total/Ave (6 mos-1984)
Average Air Temp °C	27.4	29.3	25.6	23.4	21.1	18.7	11.7	-
Average Dew Point °C	19.7	21.3	21.4	21.4	17.2	16.8	9.2	-
Relative Humidity % **	72.0	74.4	84.0	91.5	81.5	89.8	78.3	83.3
Ave. Max. Temp. °C	32.6	30.4	29.3	26.5	23.1	21.4	14.0	-
Ave. Min. Temp. °C	19.1	20.4	19.2	19.6	15.2	14.8	8.7	-
Precip. mm	255.0	460.0	330.0	724.9	148.3	7.7	84.0	1,754.9
Days w/Precip.	17	14	10	20	13	15	14	86

\* Source - AASANA - Yacuiba Airport  
 \*\* Calculated

Weekly radio programs on soil conservation continued to be given for a half-hour each Thursday over Radio Frontera. These have been prepared and given by the communications Unit of IBTA. This Unit is also assisting the Chemonics Adviser and the IBTA counterpart in the final design of a 450 x 750 centimeter colored wall chart on soil conservation. Also in the final planning stage is a folded colored brochure on soil conservation for the Chaco area. These have been prepared with the object of distributing them widely around the three principal centers of activity--Yacuiba, Carapari and Villamontes--and to other parts of the country.

The IBTA-Chemonics team has also prepared and partially distributed questionnaires for potential cooperators in the program of construction of terraces for erosion control on individual farms. When the results of this questionnaire are tabulated, there should be a cross-section of some 300 producers of corn, soybeans, and cotton expressing presence of erosion on their farms and their desire to take advantage of the erosion control plan

offered by the IBTA-Chemonics-CODETAR cooperative program. This same questionnaire will also establish a better approximation of the crop losses occurred by the heavy rains and the extensive erosion this past rainy season.

A budget was prepared and presented for construction of terraces on 400 hectares during the second semester of 1984 according to the following schedule of service costs by CODETAR (per hour of use):

- 1 hour of road grader at \$b 80,000/hour
- 1 hour of Caterpillar (D-7) to fortify terraces at gully crossings and at field ends at a cost of \$b 120,000/hour.
- 1 hour of Caterpillar (D-4) for \$b 80,000/hour depending on availability in place of D-7.

One of the most important developments of this period has been the organization of the first "Regional Committee for Soil Erosion Control" for the Yacuiba valley area. The destructive and extensive damages which occurred this year as a result of the unprecedented rainfall gave rise to much greater interest, not only by the farmers, but other community leaders as well who have expressed a renewed interest in erosion control. Members of the local Committee, who were elected and charged with fostering and assuming leadership in promoting soil erosion control within the Yacuiba area, are as follows:

1. Jorge Balderrama (IBTA Counterpart) - President
  2. Francisco Maldonado (Centro Desarrollo Forestal) - Vice President
  3. Dr. Gerardo Aracena (Juez Agrario) - Secretary
  4. Pablo Cazon (Inspector Trabajo Agrario) - Treasurer
  5. To be appointed later - Press and Propaganda
- Additional Committee-Members (Vocal)
6. Victor Crespo - Mayor of Yacuiba (Ex-agronomo de SAI and MACA)
  7. Representative- Association of Producers of Oil Seeds and Grains (APOGRA)
  8. Representative-Federation of Campesinos
  9. Representative-National Service of the Development of Communities
  10. E. Don Hansen-Chemonics International

This Committee proposes to organize local committees in the other centers of activity--Carapari and Villamontes --which would also be charged with promoting soil conservation measures in their respective communities.

Three colored slide sets were purchased from the United States from the Department of Agriculture by Chemonics:

Agriculture in the U.S.A. (C-197)	137 slides
Conservation Tillage (A-69)	78 slides
Consider the Soil First (C-183)	73 slides

The commentaries accompanying each slide set have been translated to Spanish. These with other visual materials will be used in educational meetings in communities and schools for informing and educating the general populace in the importance of implementing a program of soil erosion control in each community in the Gran Chaco.

The Chemonics Adviser and his counterpart have finished the following bulletins and extension material with the exception of some drafting which remains to be completed before they are printed:

1. "Problems in Implementing a Program of Erosion Control"
2. "Design, Construction and Maintenance of Terrace Systems"
3. "Use of the Universal Equation of Soil Loss for Estimating Losses of Soil by Erosion"
4. "Design of Methods of Conservation Compatible with Modern Agricultural Methods"
5. A folder entitled "What is Erosion"
6. A second folder entitled "Protect our Soils from Erosion"
7. A wall poster entitled "How to Take Care of Our Soils"

Planting was continued into January. The Adviser and counterpart provided advice to producers with regard to control of weeds in fields and terrace canals. This can be accomplished by animal traction, manual control, or by herbicides. Only terrace channels free of weeds and debris can prove effective.

The completed plantings in the demonstration areas at the beginning of this semester are summarized in the following Table 2:

Table 2 SUMMARY OF PLANTINGS ON THE EROSION CONTROL DEMONSTRATION AREAS

Cooperator	Locality	Area (hectares)	Crops
Antonio Mogro	La Grampa	20.1	Soya, maize
Alberto Quiroga	Lapachal	33.5	Soya
Nicolas Choque	Caipitandi	20.0	Soya
I.P.C.	Aguayrenda	10.0	Soya, maize
Guido Vasquez	Campo Grande	15.0	Soya
Eliodoro Flores	Campo Grande	9.0	Soya
Felipe Gutierrez	Lapachal	15.0	Soya
Juan Castillo	La Grampa	40.0	Soya
IBTA	Algarrobal	20.0	Soya, maize
TOTAL		182.6	

\* Instituto Politecnico Campesino.

A flight schedule was formulated which will be used to take photos and video-cassettes of erosion damage in the Gran Chaco and of the established terraces.

### C. Summary and Suggestions

A prolonged rainy season has occurred this year throughout the Chaco and the extensive damage from soil erosion has created a greater interest in erosion control measures. Many more farmers have been seeking technical assistance for the construction of terraces on their lands for the coming cropping season. Several are ready to commence construction of terraces as soon as it is dry enough to get into the fields to do so. Even on a cost-shared basis with the operation costs of the road grader and Caterpillar being somewhat greater this year, it is felt that terraces construction can go forward.

All of the goals in this technical area have been accomplished during the semester.

Scheduling heavy equipment of CODETAR will continue to have a high priority. It is believed that the Manager of the Multi-Purpose Project will give priority to soil conservation efforts. Another factor that gives some uncertainty to the work is the difficulty previously encountered in obtaining funds for parts and repair for the IBTA vehicle so that the two field cars will always be available. The urgency of field transportation and availability of heavy equipment cannot be over-emphasized if the goal of 400 hectares of terraces is going to be realized for 1984.

The cooperative effort of IBTA-Chemonics-CODETAR envisions training two to three individuals from IBTA, CODETAR or the University of Tarija on

(1) the technique of survey with level and plane table for terrace construction, (2) the supervision in the use of road grader and bull-dozer Caterpillar tractor in actual terrace construction, and (3) assisting farmers in planting their crops on the contour. It is also planned to train another operator of CODETAR to operate a road-grader with the same expertise and efficiency which has been exhibited this past year by Raul Orellana Armella.

Plans have not yet materialized to introduce the principle of minimum tillage to reinforce the construction of broad-based terraces for more complete erosion control in the Humid Chaco. Consequently, an equipment catalog and price F.O.B./Yacuiba has been requested of a manufacturer in Brazil for tractor-drawn direct seeder and a chisel cultivator. Once the information is available from the Brazilian manufacturer it may be possible to induce a producer to purchase and utilize this equipment on his own lands. The combination of terraces and minimum-till is proving effective in the USA and Brazil.

The serious erosion that has occurred below the steep watersheds along the western side of the valley next to the Serrania del Aguarague, particularly in the communities of San Isidro, Campo Pajoso and Algarrobal remains one of the most provoking and critical of problems. Until funds can be raised to combat these problems, extensive watershed erosion damages will continue to increase, adversely affecting buildings, roads, railroad, agricultural land and the Yacuiba airport.

It is hoped that the regional and local committees for control of erosion will be able to exert pressure and influence to secure funds necessary to promote the important work of erosion control in the future.

The eventual goal should be to extend knowledge of the importance of conservation of natural resources throughout the country and to organize effective programs in each area to conserve soils, forests and other renewable natural resources. Only as citizens became aware of the present damages that are occurring in the loss of soils and forests will any attempt be made to conserve them.

## SECTION IV

### COTTON PRODUCTION

#### A. Background and Objectives

Activities carried out during the past semester were principally oriented to help to local institutions in the planning and programming of commercial cotton production. An area of up to 200 hectares was fixed by the Guidance Committee. Technical assistance to producers was to be provided through extension agents hired for the program. For this reason one of the most important responsibilities of the Adviser is training of the extension agents.

Ing. Victor Gonzales carries the principal responsibility for this component of the Project. However, Dr. Juan Landivar, adviser in seeds in the Gran Chaco, also helps with the program.

Unfortunately the extension agent that was working for the program showed little capability for the work. For this reason the Committee considered it necessary to make a change in personnel. Ing. Jose Luis Humerez, a professional that was recruited in the area, began work in November 1983. In addition, the hiring of a second extension agent for 1983/84 crop year was required. Consequently, another task of the Adviser was to help to the Committee in recruiting a second extension agent. Agronomist Enrique Calizaya, recruited in Santa Cruz, occupied this post in January 1984.

Objectives we saw for this semester were:

- \* Provide extension services to the growers regarding different farming practices with emphasis in insect and weed control, and in harvest.
- \* Conduct training for extension agents hired by the program, placing emphasis aspects of insect and weed control and extension methods.
- \* Give a two-day short course for professionals involved in the agricultural sector in the area, focusing on physiology, insects and techniques of insecticides application. This will be in cooperation with the Cooperative and APOGRA.
- \* Carry out in different communities three demonstrations in use of spraying equipment and train cooperating farmer assistants in methods.
- \* Help and guide Integral Cooperative in the planning for harvest, collection from the field, and in marketing of fiber and seed of cotton.
- \* Help the Integral Cooperative in programming and planning for the purchase of inputs for 1984/85 agricultural year.
- \* Cooperate with farmers that planted five varieties of cotton introduced from the Unites States.



Upper Photo: Calibration test using a manual sprinkler made by a small farmer, during a demonstration carried out at El Barrial community.

Lower Photo: Ing. Jose Luis Humerez, extensionist of the program explains the rate of humidity of cotton for harvest to 3 cotton producers. All of them are members of the Ortiz family.

## B. Progress

### 1. Technical Assistance to Growers

Planting of 125 hectares of cotton finished in January. All through this semester Chemonics Adviser gave permanent help and technical orientation to the extension team, to cotton producers and local institutions. Extension services were carried out according to a plan established and communicated previously to producers. The plan consisted of direct assistance in the field and in demonstration parcels located in each community in representative places easily accessible to the producers of the area. This work was developed in close cooperation and coordination among extension agents of the program and the advisers.

Regarding technical assistance, insect control deserved special importance. In each stage the dates resulting of methodical and systematic checks were analyzed for all the team, also the decisions for the taking of therapeutical measures. It was gotten that the producers of cotton have a just rule about the importance of these factors in the cotton production.

### 2. Training of Producers and Extension Agents

Progress made by the two extension agents during the training that they received were notable. This refers mainly to in-service training, while orientation was being given to the producers.

In late January a two-day short course was given to technicians and agronomists in the Yacuiba area. Dr. Juan Landivar helped present this course with participation of the Integral Cooperative and APOGRA. This course covered aspect of cotton physiology, pests and spraying techniques. A total of 19 professionals from seven institutions attended the course. At that time, a bulletin containing instructions for use of the ultra low volume sprayer was prepared and distributed. At the end of the short course certificates of attendance were presented.

In February demonstrations of spraying methods were made in three communities. Twenty five farmers received practical training in the handling of their spraying equipment.

### 3. Support of Local Institutions in Cotton Production

The institution which has been most involved in cotton production is the Integral Cooperative. This institution encompasses this year almost the totality of farmers that now produce cotton; it has taken responsibility for the cotton gin and marketing services of fiber and seed. In this regard efforts were made to help the Cooperative carry out meetings in Tarija with authorities of the University and CODETAR with respect to cotton gin.

Also guidance was provided to the Cooperative in planning for cotton harvest and collection from the fields of producers and in marketing of fiber and seed.

Unseasonable rains during harvest again this year made it evident that heavy losses in yields could be expected. It was also apparent that these

losses could be even greater unless several obvious problems with the cotton gin are not solved. Ginning was begun in the second half of May, after a series of delays and improvisation on the part of the Tarija University and misunderstandings with CODETAR.

In spite of the problems described, farmers expect to obtain good yields. Also interest in expanding the area cultivated with cotton for the next agricultural year is noticeable among farmers. Accordingly, the Cooperative has already begun taking steps to purchase inputs for 600 hectares of cotton, which was decided on by the Guidance Committee. For this purpose, the Adviser worked with this institution in the planning and execution of purchase orders in Santa Cruz.

Cooperation was also given to the Seed Department in conducting laboratory tests to determine germination rates of cotton seed.

#### 4. Visit from Representatives of CIAT/Hilanderia/ADEPA

During the last week of May, Ing. Manuel Chain and Mr. Tarradelles (Hilanderia Santa Cruz) visited the area of the project. Meetings were held among these persons, farmers, and also representatives of local institutions. Hilanderia Santa Cruz presented information on film about the development of their enterprise. Issues about industrial processes of cotton, storage in bales, and especially handling of cotton before and during ginning were approached. The Hilanderia showed interest in obtaining all local production. They also offered financial help for production.

Representatives of CIAT and ALEPA offered orientation on technical and commercial aspects.

It should be indicated that the visit of these persons was in answer to a request made by the Guidance Committee. Travel of the CIAT representative was financed by the T-059 Project.

#### 5. Planting of Varieties Introduced from United States

Not all producers that planted for multiplication the five cotton varieties introduced from the United States, gave an adequate level of attention to their crops. Unfortunately one of the five varieties was lost because the farmer plowed the crop under. Harvest of the Deltapine 40 and 61 varieties was started at the end of the semester. However this was not true for Deltapine 71 and GUMBO 500, which did not receive proper attention in the field.

The insecticides for insect control in these varieties were given to farmers by Chemonics.

The favorable behavior shown by the three varieties that achieved maturity for harvest points out that these materials are very promising for the area. These varieties are: Deltapine 40, Deltapine 71 and GUMBO 500.



Upper Photo: Group of professionals who participated in the short course on cotton given by Chemonics' advisers.

Lower Photo: Personnel of CIAT and of Hilandería Santa Cruz in the middle of a field tour, inspecting the crop of farmer Julian Pereira.

C. Summary and Suggestions

The objectives defined for this semester were achieved in their totality. We have made important advances in the training of extension agents of the program. Similarly, most of producers show changes in attitudes.

Integral Cooperative has gone to great efforts in order to provide ginning services in the Cotton Gin of Campo Pajoso. However deficiencies in the machinery and infrastructure prevented carrying out efficient ginning.

The interest this program has awakened among farmers and technicians of the area is shown in the registration of future growers, even before completion of harvest. In view of this, the Committee has determined a maximum cultivated area of 600 hectares of cotton for 1984/85 agricultural year. Farmers from the Villamontes area have also applied. For this reason, an inspection to obtain information of this area will be made for consideration by the Committee.

SECTION V  
INFORMATION SYSTEMS

A. Background and Objectives

At the beginning of this semester installation of CICTAR offices in a new location promised by the Catholic University (UCB) was still pending, as well as the definition of local counterpart contributions in relation to USAID financing.

The number of trainees was increased from five to six. During the last year, two UCB students and two employees of MACA and IBTA participated in this program with Project funds. Later on, one additional member was incorporated with a contribution of the University. During this semester three UCB students and three from MACA and IBTA are participating, all of them with Project financing.

During the prior semester Regional Delegates were named. They work on an ad-honorem basis.

Another subject still pending was related to the distribution of the Registry of Professionals. A local firm was contracted to publish 2000 copies of the Registry and 6000 questionnaires. However, on January 23, the publisher delivered only 1000 copies of the Registry and 1000 questionnaires. These quantities were accepted as a solution due to the constant delays in regard to delivery. In order to accomplish the distribution of questionnaires, an edition of 5000 additional copies was proposed.

The process of collection of information for annotated bibliography on irrigation was still underway. This activity had been initiated last semester.

The following objectives were established for the semester:

- \* Installation of CICTAR offices.
- \* Practical training for the technical group regarding information systems.
- \* Distribution of the first Registry of Professionals.
- \* Distribution of 6000 questionnaires for the second Registry.
- \* Preparation of annotated bibliography on irrigation.

Trips performed during 1983 were useful in order to gain knowledge about the interests of technicians and professionals of the sector. As a result of this process, the need for an instrument to facilitate interchange of scientific-technical information was identified. Consequently, the idea of publication of a bulletin emerged. Likewise, through direct conversations, it was possible to verify the needs to classify and select information in each region, and also to establish a shared work relationship with Regional Delegates. Hence, three additional objectives were

identified:

- \* Initiate a bimonthly publication of the Information Bulletin.
- \* Perform workshops regarding documentation techniques.
- \* Organize the first meeting of regional delegates.

Through March of this year the Adviser in Information Systems worked under a half-time contract. Thanks to the change of his contract to a full-time basis, the additional objectives were incorporated.

## B. Progress

### 1. Installation of Offices

The Catholic University fulfilled its local counterpart commitment by providing office space, located in the Esperanza building, 11th floor. The UC also provided some office equipment, which is not included in the agreement. Likewise, the UCB has the responsibility to pay for electricity, maintenance, water services and telephone. No expenses for salary payment to the computer operator were incurred because the equipment was not yet available.

IBTA paid salaries to its trainees and lent a conference table to CICTAR. It should also be mentioned that the MACA Librarian was assigned to CICTAR to work half time as a counterpart to the Adviser. One other person was selected as a trainee. Also MACA nominated a secretary who was assigned to CICTAR under a special commission. Unfortunately, these latter efforts were not carried out on a continuous basis, and as the work progressed, they became less effective.

### 2. Participation of the Committee

Committee meetings established the basic patterns for the work to be performed during the semester. In this period, the most important decisions were the following: budget approval, increasing number of trainees, system for the distribution of the Registry, approval for the publication of the Bulletin and approval for the First Seminar of Regional Delegates. Likewise, it should be noted that all work performed during the semester was carried out with participation and support of the Committee.

### 3. Trainees

UCB maintained two trainees, Carlos Brañez and Guillermo Valencia. Vladimir Gutierrez was replaced by Rene Zaballos. The performance of these students was acceptable and they fulfilled their responsibilities satisfactorily. IBTA named Frida Maldonado and Mildred Camacho. Only the former accomplished the assigned tasks; the second one had to leave the Project due to health problems. MACA designated Carola Espinoza who left the Project because of internal problems with the institution.

Through the work performed by the technical group, training of personnel in information systems is being achieved. It should be noted that the

country does not have technicians in this specialized area. Under the supervision and assistance of the Adviser in Information Systems the technical group is accomplishing tasks of analysis and treatment of information, data processing, format and composition of publications.

#### 4. Register of Professionals

Distribution of the Registry was organized according to a resolution by the Committee. Eight hundred copies were distributed to libraries and documentation centers in institutions represented by persons included in the Registry. Also, 200 copies were kept separate in order to deliver them to other institutions and interested persons. At the present time, copies have been delivered to all parts of the country.

Questionnaires were not distributed at the same time because the additional printing of 5000 items was received late in February. Since that time they were distributed throughout the country, taking advantage of seminars, conferences and other meetings, and also directly to public and private institutions. Collection is not yet following a specific plan. However, regional delegates and technicians have been sending filled-out questionnaires to Chemonics and CICTAR offices.

#### 5. Annotated Bibliographies

By March the material collected at a national level for an annotated bibliography in the area of water resources was already prepared. At present, this material is ready to begin work on formats for publication.

#### 6. Information Bulletin

During the month of March the first edition was prepared. Form and content were approved by the Committee. The collection of information related to bibliographic references and articles, and also the distribution of the Bulletin and collection of subscriptions, are under the responsibility of Regional Delegates. It is important to mention that the bulletin requires special effort, almost that of a correspondent. This is because delegates must gather bibliography, articles and subscriptions, as well as distribute the Bulletin. The delegates in Potosi and Santa Cruz have accomplished this work very well, periodically sending available material for publication and also taking responsibility for distribution of the Bulletin.

Since the conception of the Bulletin several sections, such as the presentation, articles and bibliographic references have been defined. Announcements of events and commercial advertisements are included in the last section. With the purpose of giving the bibliographic section better composition and facilitating its use, during the Meeting of Regional Delegates it was decided to organize this section in cards. Subscribers can cut out cards to create their own filing system. Cards contain a short indicative summary of the content of each document.

Due to the lack of a classification system for publications in the country, the material being included in the bibliographic card section is that which is readily available to the technical group. In order to develop a better system for gathering information it is hoped that the technical

group in La Paz and other regions can be strengthened.

Materials for the publication of the Bulletin have been financed by the Project. Presently, Chemonics/Washington is providing materials required under the budget designated for technical assistance. However, specifications and budgets for materials and equipment have been prepared for the future. The MACA Coordination Office is in charge of this procurement.

Electronic stencils are being used for reproduction. Formatting, composition and editing are being performed in Chemonics using a micro-computer, typewriters and Gestetner mimeograph. After a final design is prepared for the cover and the coupon for subscription, printing of these portions will be performed using offset system.

Four numbers were published by the end of the semester. High receptivity on the part of subscribers was noted in terms of their desire to receive their copies regularly and also to participate in the writing of articles. Likewise, some articles were composed by Regional Delegates. However, up to June the amount of subscriptions was very low--less than fifty.

It is difficult to measure costs due to the inflation level which has reached to 300 per cent during the last three months. However, the price of a subscription has been maintained at \$b 2400 since the first number.

#### 7. Training in Documentation Techniques

According to definitions of the agreement and conclusions of the Meeting of Regional Delegates, in-service training has been initiated for personnel working in documentation. The first of a series of workshops was carried out with various institutions in Santa Cruz. The most important benefit of the workshop was the establishment of the Ideological Center for Agricultural Documentation based on the Documentation Center of CORDECRUZ. All available material belonging to different institutions of this department is being processed through a card for information collection.

The content of the short courses is based on a working paper presented by the Adviser in Information Systems during the Seminar of Regional Delegates. This paper includes a proposal for organization of a system, identification of tasks to be carried out by documentation and information centers, and technical guidelines for treatment of information.

#### 8. First Seminar of Regional Delegates

In a meeting held with the Coordination Office of the Project, an organizational basis was approved for the seminar that took place in La Paz from May 16 to 20. Most of the delegates attended this meeting, despite the general strike in the country during that period.

Antonieta Montaño, Chemonics Secretary, was in charge of administrative and logistical aspects. She came from Sucre in order to provide this support.

Participation of Dr. Luis Ampuero served to encourage the participants about the needs to improve the present situation regarding information flow. Dr. Ampuero is author of the study "Análisis del Sistema Nacional de Información Agropecuaria", prepared when he was working as Chemonics Adviser in Sector Planning,

Discussions and work in group sessions allowed Delegates to identify with project objectives. As a result different steps were defined to be followed after the seminar's conclusion.

Main conclusions reached were the following:

- \* Change the title "Registry of Professionals" to "Registry of Professionals, Institutions and Other Users of Agricultural Information in Bolivia",

- \* Request support for work performed by Regional Delegates, especially to IBTA,

- \* Provide a petty cash and provide office supplies to regional offices.

Similarly, a regional work plan was defined aside from the Bulletin to reach the following objectives: (1) identification of information sources, (2) preparation of promotional seminars, (3) organization of regional committees, (4) preparation of short courses, and (5) development of information inventories.

Another aspect was identified referring to the need for the Chemonics Adviser to organize short-courses for personnel working in documentation centers in different regions. In some cases, the Delegates themselves indicated their total ignorance of with this topic.

#### 9. Other Activities

CICTAR is functioning as a sub-committee for Promotion, Distribution and Publication of the Comité Interinstitucional del Medio Ambiente (CIMA). In this regard, a plan was designed to disseminate information about CIMA activities through the Bulletin. Currently, work developed by this entity is based on reformulations and applications of the Freeman Project "Perfil Ambiental de Bolivia" ("Environmental Outline of Bolivia").

#### C. Conclusions and Recommendations

Almost all objectives were reached. However, questionnaires for the Second Registry of Professionals were not gathered and the Bulletin was not published with the frequency of two weeks as originally hoped.

Work performed by Regional Delegates confronted some ups and downs. Delegates of Gran Chaco, Potosí and Santa Cruz fulfilled their tasks more effectively in comparison with those in other departments. A manual of functions would help Delegates in performing their work more effectively.

Institutions participating in the agreement showed limitations in regard to naming of personnel for the technical group. This situation implied the fact that work assigned to MACA and IBTA trainees had to be performed by the Adviser.

The Bulletin is reaching its original objectives, especially because of the constant interest demonstrated by people in order to receive a copy. This communication method is one of the most important activities to consolidate CICTAR as a central motor of information flow. An evaluation of the effectiveness of this work should be made according to the number of subscriptions received during the following months.

There is a great predisposition in the country to continue receiving training on documentation techniques. This interest is due to the activity performed by the Regional Delegates.

It is important to mention the work fulfilled by Ing. Francisco Pereira, President of the Committee. Despite several difficulties and delays, Ing. Pereira has remained active in helping accomplish the objectives established by the agreement.

Work accomplished up to now is beginning to take better form, regarding both the organization and also technical skills. The initial conception has changed gradually, in accordance with users' interests. More extensive participation is being obtained, which will permit the establishment of a more balanced flow and access to scientific and technical information.

SECTION VI  
CONSTRUCTIONS

A. Background and Objectives

Most of the objectives fixed for the previous semester (July-December 1983) prevailed throughout the present one (January-June 1984). They are as follows:

- \* Construction project in the Warnes Seed Processing Plant was finished during previous semester. Final reception was on January 14, 1984. However, processing of the last vouchers for payment to the construction company CINDECO Ltda. was still pending. Despite being a purely legal-administrative procedure, the involvement of the Civil Engineering Adviser, Ing. Eddy Decormis C., was necessary.
- \* Designs of drying bins for IBTA in Yacuiba and the disbursement by USAID were approved on December 5, 1983. The objective was to have bins ready to be utilized by the end of April, prior to harvest season.
- \* Designs and budget for the construction of access roads into the Warnes Plant entered into a waiting period beginning September of last year. They required approval by USAID and an inter-institutional decision concerning the way in which to proceed with implementation of the project. The objective was established of reaching decisions on these issues before the end of the rainy season in order to continue with work during the dry season.
- \* The feasibility study for the Foundation Seed Processing Plant of CIAT in the Saavedra Experiment Station was scheduled for this period. The Adviser will provide support throughout the study in developing preliminary designs and budgets for these facilities.
- \* The new budget for the completion of the project in the IBTA Experiment Station in Toralapa was pending definition of financing channels. In this case reinitiation of the project was also planned after the end of the rainy season.
- \* With the commitment on the part of CODETAR to take responsibility for financing, design and construction of the Gran Chaco Processing Plant, the year began with a schedule which contemplated completion and reception of the project in the month of August.
- \* The computerized analysis of unit prices for construction was again restated as an objective for this semester.

**B. Progress**

1. Project: SMALL CONSTRUCTIONS (EXTENSION)

Location: SEED PROCESSING PLANT. WARNES

Shortly after final reception of the buildings, the electrical installation and the installation of air conditioning in the climatized storage chamber were initiated. With these installations completed, the chamber entered into operation beginning the month of February. In addition, the Adviser formulated a series of recommendations which should be executed by MACA and/or CIAT with the purpose of overcoming some technical aspects which had been omitted from the design.

Unfortunately, legal-administrative divergences among USAID, the Coordination Office of T-059 Project and the construction company CINDECO Ltda. continued to take place with regard to payment of vouchers for readjustments due to inflation.

2. Project: SEED DRYING BINS

Location: IBTA EXPERIMENT STATION. GRAN CHACO

After reaching agreement between MACA and CODETAR, the latter accepted responsibility for carrying out construction of the drying bins in IBTA Experiment Station located at El Algarrobal. The T-059 Coordination Office appointed Ing. Carlos Castellon of IBTA/Yacuiba, as Construction Supervisor on the part of MACA.

On March 30, USAID made the initial disbursement of 4.5 million pesos bolivianos as an advance for initiation of construction. An up to date budget is required to make a second disbursement.

During a visit made to Yacuiba at the end of February, the Adviser obtained a formal commitment on the part of CODETAR's office in Yacuiba in the sense that work would be initiated in March. Despite this commitment, work was not begun until the end of June. The delay was due mostly to the heavy rains that took place during the months of March through June. CODETAR was only able to make some progress in the purchase of construction materials.

3. Project: ACCESS ROADS

Location: SEED PROCESSING PLANT, WARNES

The design prepared by the Adviser during the second semester of 1983 was returned by USAID in January in order to make corrections, which included technical modifications, new metric calculations and updating the budget. These were carried out by the Adviser and his counterpart, Architect Garron, by March. After a final review, USAID sent back the approved design documents in the month of May.

In the meantime, through negotiations between the T-059 Project and PL-480 it was decided at the beginning of March that the financing and supervision of construction would be carried out by the latter. In a

CHARACTERISTICS OF CIVIL CONSTRUCTIONS UNDER ASSISTANCE OF THE ADVISER IN CIVIL ENGINEERING

IDENTIFICATION Nr.	PROJECT	LOCATION	BENEFICIARY ENTITY	PARTICULAR QUANTITY OF WORK TO BE CARRIED OUT	ORIGINAL BUDGET		ESTIMATED DURATION (ca).days)	PERCENTAGE OF WORK PROGRESS BY JUNE 1984	PRESENT STATUS
					AMOUNT (\$b)	DATE			
1.	Small Constructions (extension)	Warnes	CIAT - MACA	182 m2 constructed	4379858.00	May 83	60 days	100 %	Payment of vouchers of pending readjustments
2.	Seed Drying Bins	Yacuibá	IBTA	67 m2 covered	4164813.60	Aug 83	80 days	5-10 %	Works in the initial sta- ge at CODETAR's charge
3.	Access Roads	Warnes	CIAT - MA A	1460 m2 paving	64221084.00	Mar 84	70 days	0 %	In stage of financing through PL-480 Project
4.	Foundation Seed Proces- sing Plant	Saavedra	CIAT	816 m2 covered 704 m2 graveled (+106 m2 covered)**	374825000.00 (+73656000.00)**	May 84	200 days	0 %	In feasibility study sta- ge
5.	Completion of Civil Constructions	Toralapa	IBTA	1186 m2 constructed	2742579.84 (58153000.00)*	Aug 78 (Dec 83)*	365 days (150 days)*	50-60 %	In stage of taking steps for the reinitiation of works with PL-480
6.	Defensive Dike Against Floods	Warnes	CIAT - MACA	length : 198 m height : 1-3 m top width : 2 m	8734429.87	Sep 83	60 days	0 %	Left out due to change in priorities
7.	Seed Processing Plant	Yacuibá	CODETAR	534 m2 covered	78452335.00	Jan 84	180 days	0 %	In bidding stage at CODE- TAR's charge
8.	Completion of Civil Constructions	Alalay	MACA	2086 m2 constructed***	10885693.17	May 79	357 days	70-80 %	Left out due to change in priorities

\* Updated budget corresponding to the balance of work to be executed

\*\* Budget corresponding to the second stage proposed in the feasibility study

\*\*\* Indicated area does not include the Laboratory of Pathology because of lack of information

meeting held in May 22, Lic. Isabel Canedo and the Adviser made official delivery of the design documents to the PL-480 Office. Since that time, PL 480 has taken steps with CIAT for implementation of the project.

4. Project: FOUNDATION SEED PROCESSING PLANT

Location: CIAT EXPERIMENT STATION. SAAVEDRA

The Adviser provided support in the feasibility study which was being performed by Chemonics Int. with the purpose of installing capacity for seed processing at the Station. Initially, an expansion of existing infrastructure at the Station was contemplated by annexing the processing room and warehouses to the existing building where drying bins are located. However, as a result of the adviser's observations and suggestions, it was seen that construction of a new independent plant was more favorable.

With this new conception, through an united effort between adviser Edgar R. Cabrera and Eddy Decormis, the preliminary design and budget for construction of buildings and for installation of equipment were developed. The budget reached 450 million pesos bolivianos to cover only local inputs. At the end of May it was submitted to Lic. Minot for inclusion in the economic feasibility study.

At the same time, the Adviser carried out a topographical survey of two alternative sites proposed by CIAT for plant location. His recommendation in this regard was presented to CIAT.

5. Project: COMPLETION OF CIVIL CONSTRUCTIONS

Location: IBTA EXPERIMENT STATION. TORALAPA

The Adviser continued working on the basis of the guidelines established by IBTA at the end of last year. These consist of studying and negotiating with the construction company CASEM Ltda. in order to achieve reactivation of the project. In this regard, the following materials were prepared: 1) metric calculations regarding the portion of the construction which is completed and the portion left to go, 2) cost analysis and budget for conclusion of the project, and 3) a proposal of legal-administrative procedures for reinitiation of constructions.

On March 27, the above documents were delivered to IBTA. Since that date, up to the end of this semester, the proposal for conclusion of the construction was in process of study and review in IBTA's offices.

The USAID Project Manager requested a report on progress made. After reviewing this document, he gave his approval to continue in the proposed manner until the project was put in operation.

6. Project: SEED PROCESSING PLANT

Location: EL PALMAR. GRAN CHACO

Based on the agreement between MACA and CODETAR, the final plant design, including specifications, metric calculations and budget were received in February. These were developed by the Planning and Execution

Provincial Office (OPPEJ) of CODETAR in the Gran Chaco.

The Adviser reviewed these documents and immediately informed CODETAR of a series of observations and recommendations to correct and complete the design. It still presented many deficiencies.

CODETAR accepted the commitment to make the corrections within a reasonable period. However this process required far more time than expected, which is the main reason for not complying with the implementation schedule of this project.

Efforts were concentrated on the way in which bidding for the project would be carried out. CODETAR was taking steps with the Central Government with the purpose of reaching a decree of exception. This would allow direct execution of the project by CODETAR. At the end of June, this decree was not dictated, and in practice, valuable time was lost.

In March 16, the Coordination Office of the T-059 Project named Ing. Olazabal to represent MACA as Construction Supervisor of this project.

7. Project: COMPUTERIZED ANALYSIS OF UNIT CONSTRUCTION PRICES

Location: OFFICE OF CHEMONICS INTERNATIONAL. LA PAZ

In the measure that the remaining time of the Adviser permitted, and having the valuable help of Architect Raul Garron, it was possible to finish compilation and organization of information of a data base ready to be entered into the computer. As a result, a first stage was obtained with a matrix of input yields of 180 lines (items) x 250 columns (inputs).

C. Summary and Suggestions

Implementation of the new construction projects and installations outlined in the Implementation Plan of the T-059 Project for the present year has not yet begun. Hence activity in the semester was concentrated on following up on-going projects. Some conclusions and specific suggestions about these projects are the following:

\* Referring to the readjustments presented in execution of project in the Warnes plant, it is recommended to seek for a transactional formula with the construction company CINDECO LTDA. In the same way, it is reiterated the recommendation given in January to the Project's Coordination Office in the sense that should be made outside isolated painting of the perimeter wall of the conditioned storage chamber.

\* Steps being taken by CIAT and PL-480 should be accelerated in order that construction of access roads to the Warnes Plant begin as soon as possible. This project should be completed before the rainy season at the end of this year.

\* It is of primary importance to secure strict supervision in the construction of drying bins in Yacuiba, and of the future construction of the plant in El Palmar. Only in this manner, quality work can be guaranteed, as well as the fulfillment of the respective work schedules.

\* The final design of the plant projected for the CIAT Experiment Station in Saavedra should be entrusted to a local consulting company. This should be one of recognized technical solvency which is aware of the conditions of the site in order to avoid mistakes already seen in previous projects, such as Warnes plant, project in Toralapa, Agricultural Service Center in Sucre, etc.

\* To achieve completion of the project in Toralapa, what is lacking is to expedite administrative steps, presently in IBTA and later in USAID.

## SECTION VII

### COORDINATION, ADMINISTRATION AND PROCUREMENT

#### A. Background and Objectives

Beginning in November of last year USAID required the development of plans and disbursement schedules to facilitate financial management of the Project. Chemonics had agreed to help MACA in the preparation of the implementation Plan and the equipment specifications for the Procurement Plan. The first draft of the text for the Implementation Plan was completed by the end of 1983. However a series of meetings were pending in the various regions to refine the Plan and gather information for the procurement plan. Thus our objectives were to:

- \* Consult with clients and counterparts in various regional programs to refine the Implementation Plan.

- \* Develop a list of equipment and materials required by the Project in 1984/85 and develop specifications for the portion of this list related to seeds and information systems.

- \* Help orient MACA regarding the overall disbursement schedule and the specific schedule for the first quarter of 1984.

Coupled with these documents, there was a need to proceed with the development of an overall training plan and with local procurements, especially of materials for offices and publications. The training plan should be developed by Chemonics advisers and local procurements would be done by the Coordination Office of MACA.

Other objectives related to coordination and administration of the Project were:

- \* Prepare the Progress Report for the second semester of 1983.

- \* Help prepare for the Second National Round Table on Seeds to be held in Santa Cruz in August.

- \* Introduce three new Project Vehicles into the country and dispatch them to field offices.

- \* Complete the purchase of office supplies for all four Chemonics offices in Bolivia.

- \* Set up adequate offices in Yacuiba and Sucre for Chemonics personnel and local counterparts.

- \* Deliver two industrial dehumidifiers to MACA and CIAT for installation in the Warnes Seed Plant.

- \* Initiate an agreement with local institutions for preparation of audio-visual materials, especially video films, in soil conservation and seed production.

\* Orient MACA in reaching a new working arrangement with CODETAR that would permit the procurement of badly needed spare parts and insure fiscal responsibility of that institution.

\* Work with local institutions in Tarija, MACA and USAID in finding the best way to continue with graduate training in natural resources.

\* Provide policy guidance when requested by MACA and/or USAID.

## B. Progress

### 1. Implementation Plan

This Plan was to have been completed in 1983 in order to operate under the new system of disbursements beginning with the first quarter of 1984, January through March. However, serious work on the Plan did not begin until January of this year. Confusion as to the nature and content of the Plan caused a great deal of time to be wasted in redoing portions prepared earlier. Also, a great deal of time was required to consult with various institutions in several regions of the country which are directly involved in Project activities. These include regional offices of MACA and IBTA, CIAT, CODETAR, CORDECH, regional seed councils, committees which guide our work in cotton production, soil conservation and information systems, and others. At the national level, discussions were held with USAID and PL 480.

The Chemonics Chief of Party prepared the text and the overall disbursement schedule for the Project. The Coordination Office did the breakdowns of the disbursement Schedule and the local counterpart disbursement plans. The overall Plan was presented by MACA in March and approved promptly by USAID.

MACA, USAID and Chemonics prepared the Procurement Plan during March. Dr. Edgar Cabrera, seed adviser in Chuquisaca, prepared the specifications for seed equipment. Mr. Miguel Ibañez prepared those for materials needed for his work in information systems. MACA proposed that all Project procurement be carried out by Chemonics, rather than by MACA itself. However, USAID agreed to do the procurement directly. This is facilitated by having exact specifications for the specialized seed equipment. However, it will take a great deal of effort to complete the procurements by the deadlines indicated in the Procurement Plan, i. e., December of 1984 to March of 1985.

Meanwhile, MACA prepared and presented the request for disbursements for the first quarter of the year. These plans were approved by USAID in April, however the first disbursement was not made until May.

Several advisers began preparation of short courses to be offered in Bolivia. These were to be included in an overall training plan as a complement to the Implementation Plan for the Project. However, time did not permit the preparation of the training plan.

## 2. Progress Reports

Due to the large amount of time required for the Implementation Plan, preparation of the Progress Report for the second semester of 1983 was postponed until April and May. A new method of preparation of this Report was employed whereby each adviser prepared the first draft of the Chapter that corresponds to him. Before, the Chief of Party had prepared the entire report based on monthly reports from the advisers.

Ms. Ellen Holguin helped in the editing of this report, which was completed on May 15. Due to an excessively heavy load in report production and other secretarial tasks in La Paz, the Spanish version of the Report was not published until much later. Translation of the Progress Report for the first half of 1983 was completed in January and distributed in February of 1984.

## 3. Second National Round Table

This event is crucial to coordination of efforts in various regions regarding seed production and offers a very important opportunity for creation of awareness and general training. It was planned for the last week in August, one year following the First Round Table in Cochabamba. The Chief of Party was a member of the committee formed for preparation of materials and invitations for this event. Chemonics' Activity Leader in Seeds also took on a major responsibility.

## 4. Importation of New Project Vehicles and Office Supplies

Three new Project vehicles had arrived in Arica, Chile last December. After looking at several alternatives for transporting them to La Paz, it was decided to send a Chemonics administrator and drivers to bring them by road. The vehicles arrived in La Paz in January. After customs clearances, they were distributed to Sucre, Yacuiba and Santa Cruz in February. An older vehicle was transferred from Yacuiba to La Paz for repair and for use by the La Paz office.

An office supplies shipment also arrived in La Paz in December and was cleared from customs in January. The new vehicles were used to transport supplies to field offices.

In addition, several individual procurements were underway related to computer equipment, typewriters, audio-visual equipment and others. These were scheduled for arrival early next semester.

## 5. Office Space

Last Semester an office was rented by Chemonics with the local Certification Service in Santa Cruz. MACA had also given approval for a similar arrangement in Yacuiba for advisers and counterparts in seeds and soil conservation. This semester, a similar arrangement was agreed upon by MACA for Sucre. New offices were established with local counterparts in both these locations.

## 6. Delivery of Dehumidifiers

Chemonics had undertaken a purchase of equipment for the T-059 Project last year, including two industrial dehumidifiers. However, these units were not available in the United States and had to be special ordered from factory. They were delivered to MACA/CIAT for use in the seed storage warehouse at the Warnes Processing Plant in February of this year. After being installed, it was found that one of the units did not work properly. Repairs were made with the help of Chemonics' local administrative assistant in Santa Cruz. Mr. Miguel Piaggio.

After making constant checks on relative humidity and seed condition in the warehouse, it became apparent that one of the units is sufficient for the Warnes Plant. Therefore it was recommended that the other unit be transferred later on to the CIAT/Saavedra plant.

## 7. Preparation of Audio-Visual Materials

MACA and USAID requested that Chemonics undertake the task of developing materials for training and for creation of awareness among the general public in the areas of soil conservation and seed production. It was felt that this work should begin in May to capture the end of harvest and the beginning of terracing. Ms. Ellen Holguin from Chemonics Home Office visited Bolivia in April to develop an agreement among MACA, IBTA, NOTIAGRO, FAO and Chemonics for this purpose. Chemonics' technician, Mr. Omar Serritella scheduled time for the trip.

However, several delays were encountered including a national strike, severe weather conditions in the Gran Chaco, and signing of the agreement by NOTIAGRO. Also, the purchase of audio-visual equipment, including a commercial video camera had to be purchased. Because of these problems, filming was postponed until August.

## 8. New Agreement with CODETAR on Land Clearing

A new arrangement was reached with MACA, USAID, and CODETAR regarding the purchase of spare parts for Caterpillar tractors and other heavy equipment and amortization of the tractors. Purchase of parts would depend on CODETAR making payments on time during 1984 and 1985. The funds become Project funds, and are to be placed in a special account for use in Project activities in the Gran Chaco and elsewhere. Programming of use of the funds can be initiated by local committees involved in the Project, but require MACA and USAID approval for disbursement.

This new arrangement was agreed upon readily by CODETAR and MACA. It has several advantages for the Project. CODETAR will take full possession of the tractors as soon as all payments are made and the Project continues to provide long-needed spare parts. CODETAR also agreed to hire a capable manager for the "Multipurpose Project" and give him the authority and means to operate efficiently.

## 9. Graduate Training in Natural Resources

The second course in reforestation which had originally been suggested by institutions in Tarija did not come about. USAID, MACA and

Chemonics continued to be involved with local institutions in that area to define a viable strategy for carrying on this activity. A decision was made, however, for Chemonics to present a course next semester in the Gran Chaco in soil conservation. USAID was seeking resources, human and financial, to present two courses in the area of water management. These would be presented with technical assistance of Universities in the United States. Chemonics' role in these courses was not yet defined.

#### 10. Review of Policy Documents

At the request of USAID, an emergency Project proposed by BID in seed improvement was reviewed. Discussions were held with BID and local institutions on several aspects of the Project, especially regarding involvement of local seed councils. At our request, BID representatives traveled to Santa Cruz to meet with the Regional Council and Chemonics.

A policy paper prepared by the World Bank was reviewed and comments offered to the author.

A national meeting on potato production was attended in which the National Potato Association was formed. The center for the Association is to be in Sucre.

#### C. Summary and Suggestions

Not all objectives were met during the period, especially with regard to Progress Reports and the training plan. In addition, supervision of administrative staff by the Chief of Party was reduced to nearly zero during the semester because of the increased work load. For this reason, during a visit by the Chief of Party (COP) to the Chemonics Home Office in Washington DC in June, the Project Supervisor, Ms. Candace Conrad, suggested the employment of a Deputy Chief of Party who would handle Project Administration, leaving the COP more time for technical backstopping of advisers in the field. This action should take top priority.

## SECTION VIII

### CONCLUSIONS AND PROJECTIONS

Chemonics advisers who work under the T-059 Project are involved in five different major areas of work located in four different parts of the country. Nevertheless, the style of our firm is to work as a team: among advisers, with home office personnel, and with representatives of Bolivian institutions and local farmers. During the semester covered by this Report, this strategy of work was developed still more.

Our overall goal for the Project is to achieve increases in net income for farmers and other rural residents by making improvements in production systems. Due to the short planning horizon which has continually been imposed on the advisory team, we try to insure that our efforts lead to tangible short-run gains which 1) can be measured, 2) benefit large segments of the population, and 3) provide healthy returns on investments made by the Project, by the Government of Bolivia, and by the private sector.

Our work has provided incentives for the formation and strengthening of farmer groups, local institutions (public and private), and also some central government institutions. We try to organize in such a way that public institutions can be responsive to local needs in areas where the productive sector participates. We hope these overall goals and work strategy for the Project are equally shared by MACA and USAID.

Objectives for the second semester of 1984 are as follows:

#### Seed Improvement, National

\* Help organize and carry out the Second National Round Table on Seed Program Improvement in Santa Cruz the last week of August.

\* Support the National Seed Department in following up on a series of recommendations that come out of the Second Round Table.

\* Increase training activities through: 1) Round Table, 2) short courses for local technicians, 3) seminars, 4) dissemination of information to growers and the general public, and 5) identification of training opportunities outside the country.

#### Seed Improvement, Santa Cruz

\* Follow through with corn seed crop which is expected to reach about 250 tons, equal to the local demand for non-hybrid seed. Harvest of the crop begins in July.

\* Assist growers with the winter soybean crop of about 1500 hectares. Planting of commercial soybeans in November depends upon the success of winter soybean seed. Otherwise, importation of seed will be necessary.

\* Purify wheat seed fields in lowlands and Comarapa area with the goal of obtaining pure foundation seed. Some of this may be used for the

### Chuquisaca program.

\* Provide guidance to certification personnel in field inspections, record keeping, and testing of seed lots of local wheat, corn, soybeans and rice, as well as imported seed.

\* Orient owners and managers of new seed plants on methods of seed conditioning, internal quality control and design and building of climatized storage units.

\* Review certification standards in December after an evaluation of the 1984 production year.

\* Help local institutions and Regional Council in planning for the 1984/85 seed crops.

### Seed Improvement, Gran Chaco

\* Help the Integral Cooperative in conditioning 50 tons of soybean seed produced by their growers.

\* Assist and orient certification personnel in analyzing and tagging local seed as well as imported seed.

\* Work with local institutions in preparing a work plan for the 1984/85 seed production season, and in developing strategies for the program.

\* Work with the Integral Cooperative and with other institutions involved in seed production in promotion of the seed program, and inform their cooperating growers about the scope of the program.

\* Work with the Regional Seed Certification Service in establishing an office with two technicians and a secretary/bookkeeper. The goal is to offer an efficient service, and in the future reach the point of self-financing of its operation.

\* Help in the registration of seed producers and prepare for inspections of 400 hectares of seed fields.

\* Offer a course on seed production of tropical crops, and organize a three-day technical meeting in seed production and related areas.

### Seed Improvement, Chuquisaca/Potosi

\* Assist the local Seed Department of MACA and CORDECH in the selection of farmers and in the planting of 120 to 157 hectares for certified wheat seed.

\* Support the Chinoli Experiment Station in preparing a foundation seed project to produce wheat, barley and potato seed for Potosi and Chuquisaca.

\* Select farmers and plant 20 hectares for production of wheat foundation seed.

- \* Conduct on-the-job training of MACA personnel in Chuquisaca/Potosi in the area of seed analysis for the labeling of the 1983/84 production.
- \* Design a seed processing plant to be recommended in the feasibility study being conducted in Chuquisaca.
- \* Collect and process 140.7 metric tons of wheat seed produced in the area during the January-June period.
- \* Transfer the Certification Service office, including the seed testing laboratory, from Zudañez to Sucre.
- \* Present a document requesting the transfer of MICT silos in Tomina to the regional seed program.
- \* Present a feasibility study of the seed processing plant to the Regional Seed Council.
- \* Install surge bins above the seed cleaner and bagger in Zudañez.

#### Soil Conservation

- \* Survey and construct terraces with the use of roadgrader and Caterpillar with dozer blade on 400 hectares in the Yacuiba valley, Carapari and in Villamontes.
- \* Carry out aerial flights with small plane in August-September to take photos and video tapes of the existing terraces and of the areas in the Gran Chaco where the greatest damages exist in the various small watersheds from the unprecedented rainfall of the past two years.
- \* Provide in-service training in soil conservation for two persons from CODETAR, IBTA or the University "Juan Misael Saracho" Tarija. They will work with the Chemonics-IBTA technicians in the field survey of terraces with a level; supervise the construction with the road grader and Caterpillar; advise and supervise farmers and tractor-drivers in land preparation and planting soya and other crops on the contour; and participate in annual maintenance of terrace canals.
- \* Guide and assist trainees in preparing their thesis for university credit, and also for pursuing the field of soil erosion control for future careers.
- \* Prepare educational materials in soil conservation for television and radio. These will be used for general education of farmers, students in secondary schools and the agricultural universities and for the general public.

#### Cotton Production

- \* Follow up with the Integral Cooperative and growers during the period of harvest.
- \* Carry out a technical and economic evaluation of the results of the

1983/84 crop year.

\* Help the Integral Cooperative obtain inputs for 600 hectares of cotton for the 1984/85 year.

\* Provide support to the Guidance Committee in contracting a third extensionist in cotton.

\* Continue with the process of training the extensionists and cotton growers. It is expected that growers could increase in number from 50 last year to 150 this year.

\* In collaboration with institutions in Santa Cruz, carry out the conditioning of cotton seed purchased by the Cooperative.

\* Supervise and orient farmers during planting.

\* Support the Cooperative in reaching an agreement with the University in Tarija regarding the cotton gin in Campo Pajoso.

#### Information Systems

\* Reach at least 250 subscriptions of the Bulletin by the time 10 numbers have been published nationally.

\* Increase the capacity to obtain articles with greater technical content. Search for more effective methods of presentation and formatting.

\* Inventory information in various institutions in order to prepare an annotated bibliography on water resources.

\* Collect questionnaires and prepare the second edition of the Registry of Professionals.

\* Organize bi-monthly meetings of the Guidance Committee to adopt general resolutions. Establish that specific technical decisions be adopted by the technical team.

\* Change the system of selection of scholarship holders to one of free competition, rather than selection according to the institution in which they work.

\* Continue with workshops on techniques of documentation in Chuquisaca, Tarija and Oruro.

\* Achieve an awareness of Project activities on the part of the public related to the agriculture sector.

#### Constructions

\* Arrive at a definitive solution to the conflict among CINDECO Ltda., MACA and USAID regarding payments for readjustments.

\* Conclude the construction of drying bins for IBTA, El Algarrobal, by November at the latest (before the rainy season).

\* Follow up with CIAT and PL 480 regarding the construction of access roads into the Warnes plant before the rainy season.

\* Provide support, as required in the supervision of construction of the foundation seed processing plant in CIAT/Saavedra.

\* Support MACA and IBTA in order to reactivate the construction project of facilities in the Toralapa Experiment Station.

\* Collaborate with and push CODETAR to comply with the Schedule of activities for the seed processing plant in the Gran Chaco (provisional reception: March of 1985).

\* Conclude in December the first phase of a program for analysis of unitary prices for constructions.

\* Provide engineering support relative to the Chuquisaca seed processing plant which is currently under study with regard to feasibility, design, and location.

#### Coordination, Administration and Procurement

\* Employ a Deputy Chief of Party who would be responsible for supervision of administrative staff, budgeting and contractual matters, and also for coordination of training activities.

\* Complete a training plan by the end of October, 1984.

\* Manage special accounts of the Project for MACA in cases where these have direct relation to advisers' activities and when requested to do so by MACA.

\* Develop a complete inventory system of equipment and furniture under Chemonics' responsibility.

\* Present the Progress Report for the second half of 1983 to MACA. Prepare the Report for the first semester of 1984.

Other specific objectives in this area will be defined in conjunction with the new Deputy Chief of Party upon his arrival in Bolivia.

TABLE I

WORK-DAYS PAID DIRECTLY BY THE CONTRACT BYTECHNICAL AREAMAY 1979 - JUNE 1984

Technical Area	<u>Long-Term</u>		<u>Short-Term</u>	Home Office	TOTAL
	Advisers	Chief of Party	Advisers and Acquisition Agents		
(Work-Days)					
<u>Field Programs</u>					
Stads	1563.5	213.1	327.0	24.9	2158.5
Land Clearing and Machinery Maintenance	1512.0	165.3	--	16.9	1694.2
Soils	638.0	43.2	--	4.4	685.6
Cotton	208.0	30.1	232.0	3.1	473.2
Production and Marketing Studies	--	51.8	197.5	8.3	257.6
Construction	--	8.1	280.0	.8	288.9
Special Courses	--	11.9	24.0	1.2	37.1
<u>Institutional Strengthening</u>					
Planning	--	142.5	436.5	14.6	593.6
Data Processing	--	16.4	36.0	1.7	54.1
Institutional Reform	541.0	83.3	143.3	8.5	776.1
<u>Support</u>					
Administration	--	459.9	9.0	47.0	515.9
Procurement	--	74.4	57.5	66.4	198.3
<b>TOTAL</b>	<b>4462.5</b>	<b>1330.0</b>	<b>1742.8</b>	<b>197.8</b>	<b>7733.1</b>

TABLE II

WORK-DAYS PAID DIRECTLY BY THE CONTRACT BYTECHNICAL AREAJANUARY 1984 - JUNE 1984

Technical Area	<u>Long-Term</u>		<u>Short Term</u>		TOTAL
	Advisers	Chief of Party	Advisers and Acquisition Agents	Home Office	
(Work-Days)					
<u>Field Programs</u>					
Seeds	390.0	40.3	166.0	2.5	598.8
Land Clearing and Maintenance	--	2.3	--	.1	2.4
Soils	130.0	3.5	--	.2	133.7
Cotton	130.0	2.9	--	.2	133.1
Production and Marketing Studies	--	--	--	--	--
Construction	--	2.8	127.0	.2	130.0
Special Courses	--	4.5	--	.3	4.8
<u>Institutional Strengthening</u>					
Planning	--	12.5	108.5	.8	121.8
Data Processing	--	--	--	--	--
Institutional Reform	--	--	--	--	--
<u>Support</u>					
Administration	--	46.2	--	2.8	49.0
Procurement	--	15.0	--	18.9	33.9
TOTAL	650.0	130.0	401.5	26.0	1207.5

TABLE III

SUMMARY OF WORK-DAYS PAID DIRECTLY BYTHE CONTRACTMAY 1979 - JUNE 1984

	Work-Days	Percentage
Field Programs	5595.1	72.4
Institutional Strengthening	1423.8	18.4
Administrative Support	714.2	9.2
TOTAL	7733.1	100.0

TABLE IV

SUMMARY OF WORK-DAYS PAID DIRECTLY BYTHE CONTRACTJANUARY 1984 - JUNE 1984

	Work-Days	Percentage
Field Programs	1002.8	83.0
Institutional Strengthening	121.8	10.1
Administrative Support	83.0	6.9
TOTAL	1207.6	100.0