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CHEMONICS
INTERNATIONAL CONSULTING DIVISION

END OF TOUR REPORT
CLAUDIO BRAGANTINI AND JULIO LOREDO
ADVISERS IN SEED TECHNOLOGY

SUBMITTED TO

THE REGIONAL SEED COUNCIL - CHUQUISACA,
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1. Introduction

Chemonics began its support of the seed program in Chuquisaca in August, 1983, with an expatriate adviser, Dr. Edgar R. Cabrera. The original intention was that this adviser would work not only in Chuquisaca, but also in Potosí, as well as assist in the design and installation of seed conditioning plants throughout the country. However, time limitations did not permit him to give sufficient support to Potosí. Hence in May, 1985, a second adviser was added to the team for this region, Ing. Julio Loredo. Dr. Cabrera retired from the program at the end of July 1985 to accept a position with Mississippi State University. His end-of-tour report, previously published and distributed, covers progress for the 83/84 and 84/85 agricultural seasons.

Dr. Claudio Bragantini was recruited to take the position of expatriate adviser for the 1985/86 crop-year. The terms of reference for both Dr. Bragantini and Ing. Loredo were defined to provide support in the development of the Chuquisaca seed program, and additionally to support seed production in Potosí and Tarija. Further, Dr. Bragantini would follow up on installations of seed plants in all parts of the country.

The specific activities to be carried out were as follows:

- Provide advice to experiment stations in creating a unit for production of foundation seed;
- Provide advice on the installation and operation of seed conditioning plants in each region;
- Provide technical assistance to seed producers and seed production organizations;
- Cooperate in promoting the formation and strengthening of farmer organizations;
- Support the work of Regional Seed Certification offices according to the needs of each region;
- Provide advice to Regional Seed Councils in the planning and determination of policy and strategies to develop seed programs;

- Provide support in the development of specifications and installation of equipment in seed conditioning plants throughout the country;
- Train local personnel in all of the activities mentioned above.

The current report covers the activities of both advisers during the 1985/86 crop-year in the three regions mentioned. The following section presents the situation at the beginning of the season. Section 3 reports on progress achieved during this one year period and the progress made in seed conditioning plant installation around the country. The final sections present the conclusions and recommendations of the advisers.

2. Status of Seed Program, August 1985

2.1. Foundation Seed Production

2.1.1. Chuquisaca

The Bolivian Institute for Agriculture Technology, IBTA, is the governmental institute responsible for varietal testing and foundation seed production throughout the country. Unfortunately, IBTA does not have an experiment station in the region. Previous efforts resulted in the production of seven tons of wheat foundation seed, mostly of the Saquayo variety produced by Seed Certification Service personnel and CARE. This material was available for the seed fields during the 1985/86 season.

2.1.2. Potosí

Varietal testing and some foundation seed production were underway at the IBTA Experiment Station, Chinoli. The volumes of seed produced in Chinoli are shown in Table 1.

Table 1 VOLUMES OF SEED PRODUCED BY CHINOLI EXPERIMENT STATION IN 1984/85

Crop	Variety	Seed Class	Volume (kg)
Wheat	(2 varieties)	Foundation	690
Wheat	(2 varieties)	Registered	5,750
Barley	IBTA - 80	Genetic	368
Barley	IBTA - 80	Foundation	8,280
Barley	PATY	Genetic	414
Barley	PATY	Registered	1,840
Oats	(6 varieties)	Foundation	7,360
Potato	(3 varieties)	Selected *	80,910

* Selected potato seed is commercial potato, hand-selected by size and visibly free of disease.

2.1.3. Tarija

The IBTA Experiment Station in the region was under construction. Seven hectares of barley foundation seed and seven hectares of potato were planted during the 1984/85 season.

2.2 Commercial Seed Production

2.2.1 Chuguisaca

The severe 1983 drought forced several institutions to start emergency production programs. In the 1984/85 season, these institutions became small seed production companies. Their production during this season is shown in Table 2. These institutions produced seed with the aid of contract farmers. Farmer/cooperators received improved varieties of seed, fertilizers, and herbicides through the institutions.

Table 2 COMMERCIAL WHEAT SEED PRODUCED IN CHUQUISACA, 1984/85

Seed Company	Seed Class	Volume (kg)
CORDECH	Fiscalized	55,200
CARITAS	Fiscalized	6,256
Total		61,456
=====		

The Seed Certification Service of MACA no longer produced seed at this point. During the 1984/85 season, they concentrated their efforts on seed certification. As was expected by the previous adviser in the area, only a small percentage of the seed fields approved by the Certification Service were recovered by the institutions. That is, after the crop was produced and harvested, the "seed companies" did not have the liquid capital available to purchase all of the crop. Therefore farmer/cooperators sold the remaining portion as best they could as seed, or as grain.

Barley seed production was still very dependent on the Bolivian Brewery (CBN), the only local producer and consumer for the improved varieties. Their production system was very similar to that of the other institutions mentioned above. However, they did not engage in the seed certification program. CBN does not market the seed, but instead redistributes it to farmers who produce barley grain. Hence the CBN technicians and directors were not convinced of the need to register their fields with the Certification Service.

2.2.2 Potosí

Potato was the lead crop in Potosí. Local Certification personnel and leaders were not convinced of the strategy of providing support to the private sector. Therefore they continued producing and certifying their own seed. The volume of commercial seed produced in the region is shown on Table 3.

Table 3 COMMERCIAL SEEDS PRODUCED IN POTOSI, 1984/85

Crop	Variety	Seed Class	Volume (kg)
Potato	Sanimilla	Selected *	24,334
Potato	Alpa	Selected *	9,200
Wheat	Chinoli-70	Fiscalized **	1,886
Wheat	Chinoli-65	Registered	1,058
Wheat	Saguayo	Fiscalized **	2,484
Wheat	Jaral	Fiscalized **	920
Wheat	Florentino	Fiscalized **	4,968
Barley	IBTA -80	Registered	6,164
Barley	PATY	Registered	690
Oats	Texas	Fiscalized **	1,380

* Selected potato seed is commercial potato, hand-selected by size and visibly free of disease.

** Fiscalized seed is seed produced without genetic control.

2.3 Seed Conditioning

2.3.1 Chuquisaca

The seed conditioning equipment in Chuquisaca was purchased under a previous project (T-053): two air-screen cleaners Clipper 27; two elevators; parts of a seed treater; a bagger and an electric sewing machine. Only part of this equipment was in use in a warehouse in Zudáñez, which belongs to the railroad company. The rest of the equipment was still unassembled. This small plant had been administered by the Seed Certification Service. It was the only plant in the region and was exclusively used for conditioning seeds from certified fields. The previous adviser had prepared a design for a conditioning plant and new equipment was on order.

2.3.2 Potosí

In Betanzos, an excellent seed conditioning building was left by the previous project. Most of the equipment, however, was left unassembled. Only one Clipper 27 and one elevator were temporarily installed. New equipment was ordered but the plant was not ready for installation.

2.3.3 Tarija

This region had a very good warehouse with unassembled equipment including: two air-screen cleaners Clipper 27, two elevators, a seed treater, a vacuum cleaner and a sewing machine. Only one Clipper 27 was in use. Even with two unassembled elevators available, they were feeding the air-screen cleaner by hand and with buckets. Since the Seed Certification Service was just starting its activities, there were no plans to implement this plant.

2.4 Seed Certification Service

2.4.1 Chuquisaca

In September 1985, the Seed Certification Service (SCS) in Chuquisaca was composed of two technicians: the Regional Director, an agronomist with approximately 30 years of service in MACA; and a recently graduated field technician. In the past year, the SCS has changed its field technician three times, mainly as a result of the low salary paid by MACA. These constant changes made it impossible to establish a local in-service training program. At the beginning of the 1985 crop year, the field technician once more left the SCS looking for a better paying job. At this time, the regional seed office of MACA was working exclusively on certification services as follows: inspection of fields, sampling seed lots, laboratory testing and labelling. Even though conditioning of seeds is not a typical certification service, the SCS was also providing it. The administration of funds from the regional office of MACA was independent from the Regional Seed Council (RSC).

2.4.2 Potosí

The activities of the SCS in this region basically concerned production of potato seed, wheat seed and barley seed either in MACA fields or through contract with local farmers. They also certified all seed they produced. SCS personnel in the area consisted of one Regional Director, one field technician, one administrator and several workers. Surprisingly, even with a low salary scale there were no frequent changes in personnel as in Chuquisaca. There was no private sector presence involved in seed production.

2.4.3 Tarija

The SCS in Tarija also certified only its own seed due to the lack of private seed production. Working mainly with wheat, the SCS also consisted of a regional director, one field technician, one administrator, one driver and a few workers.

2.5 Regional Seed Council Organization

2.5.1 Chuquisaca

The Regional Seed Council (RSC) in Chuquisaca consisted of thirteen institutions and an executive committee. Meetings were held regularly. However, most of the decisions made were not carried out due to the multiple activities of each member in his own institution. The RSC and SCS were two separate organizations even though the Regional Director of SCS and the Secretary of RSC were one and the same. The RSC had no funds to support Certification and was not aware of the financial problems that SCS might be having.

2.5.2 Potosí

The RSC in this region was almost entirely composed of public institutions. During the first RSC meeting, in which the advisers participated, it was apparent that the organization was very dependent on its

president for decision making. It was also clear that little interest existed in developing a solid private sector role in seed production. On several occasions, interest in establishing the National Seed Company was expressed. The government would be responsible for total seed production in this case. In addition, it was frequently mentioned that the T-059 Project was unable to support the region either technically or financially as was done in other regions.

2.5.3 Tarija

The weakness of the RSC in this region was evident, and because of this meetings were hard to organize. The absence of a private sector was probably the main cause of the lack of interest in the seed production program.

2.6 Seed Marketing

The three regions were characterized by the predominance of small farmers. Under these circumstances, local seed production was scattered throughout the regions and the local consumption of high quality seed was very limited.

2.6.1 Chuquisaca

In Chuquisaca, local seed producers were aware of the large demand for wheat seed in Santa Cruz. Harvest in Chuquisaca begins in April, the same month in which winter planting begins in Santa Cruz. Hence there is a severe time constraint in reaching this market. Ideally, seed companies would have enough funds to purchase all their certified seed from contract farmers and wait until the following season to sell it. However, funds were scarce and only a small part of the approved wheat fields were recovered. As a result, recovery of seeds after harvest was not only slow but also partial.

2.6.2 Potosí

Even with very limited production of potato seed in the region, the demand for this material was strong. Every season farmers from La Paz and other regions come to Potosí looking for good seed. Unfortunately, no little seed of certified quality exists. The small quantities of wheat seed produced locally were also easily sold, but complaints about its quality were severe.

3. Progress on Seed Programs

3.1 Foundation Seed Production

3.1.1 Chuquisaca

The Bolivian Institute for Agriculture Technology (IBTA) had two constraints to foundation seed production: lack of land and lack of funds to establish a foundation seed program in Chuquisaca. The Project channeled funds through the RSC, and they reached IBTA as a loan. With these funds IBTA rented the necessary land and covered other expenses. Two hectares of wheat, of the Saquayo variety, and five hectares of barley, of

the IBTA-80 variety, were planted under the technical supervision of SCS and under the financial supervision of the RSC. About three metric tons of good wheat foundation seed were produced. This quantity will probably multiply in the winter under irrigation in order to have enough registered seed in the summer. This achievement will make it possible to establish a sound seed multiplication system.

About seven metric tons of barley foundation seed were also produced. The main purpose of this program was to bring the Bolivian Brewery (CBN) into the certification program. IBTA put a lot of effort into the roquing of these fields, producing a very purified foundation seed. CBN, however, did not show a great deal of interest, insisting on buying it at the price of regular barley grain.

3.1.2 Potosí

Even without external financing the Chinoli experiment station implemented its seed multiplication program in 1985/86 as shown in Table 4.

Table 4 FOUNDATION SEED PRODUCTION AREAS,
CHINOLI EXPERIMENT STATION, 1985/86

Crop	Variety	Seed Class	Hectares
Wheat	Chinoli 65	Foundation	2
Wheat	Saguayo	Foundation	3
Barley	IBTA-80	Foundation	2
Barley	PATY	Foundation	4
Oats	(4 varieties)	Foundation	5.5
Potato	(3 varieties)	Selected	11.5

Unfortunately, the climatic conditions in the region were extremely unfavorable this summer. Poor distribution of rain and early frost caused almost total loss of these fields.

3.1.3 Tarija

The foundation seed program in Tarija was still in its beginning stages, in spite of specific training of personnel on the subject. This situation is probably caused by the weakness of the other components of the program such as the Seed Certification Service, commercial seed production, marketing, and others.

3.2 Commercial Seed Production

3.2.1 Chuquisaca

Chuquisaca started the 1985/86 season with a new seed production company, the Association of Vegetable and Horticultural Crop Producers

(ASOPROHL). Together with CORDECH and CARITAS, they established a record of field registrations for Certification Services. Table 5 shows a summary of field registrations in Chuquisaca in the 1985/86 season.

Table 5 SEED FIELDS REGISTERED FOR CERTIFICATION SERVICES, CHUQUISACA, 1985/86

Seed Producer	Crop	Total Area (hectares)	Number of Farmers	Average Field Size (hectare)	Approved Fields
CORDECH	Wheat	286.0	165	1.7	123.0
CARITAS	Wheat	53.0	41	1.3	0.0
ASOPROHL	Wheat	6.0	4	1.5	6.0

About 30 percent of these fields (mostly from CORDECH) were planted early in the season. The purpose of early planting was to reach the Santa Cruz market on time. Of 345 registered hectares, 129 hectares were approved by certification. The large percentage of unacceptable fields was due to problems with varietal purity and bad weather during the season.

Up to July 1986, only 40 percent of seed produced had been recovered by the seed companies. Almost all this seed was conditioned, tested and labeled on time to be sold in Santa Cruz. The authors believe that another 20 percent of approved fields will still be recovered.

3.2.2 Potosí

During the 1985/86 season, this region had 59 hectares of fields registered in the Certification Program as seen in Table 6. The significance of this information is that the SCS in the region is beginning to provide services for other institutions.

Table 6 SEED FIELDS REGISTERED FOR CERTIFICATION SERVICES,
POTOSI 1985/86

Seed Producer	Crop	Total Area (ha)	Number of Farmers	Average Field Size (ha)	Approved Fields (%)
CIAC	Potato	15.0	8	1.9	100%
C.A.P.	Potato	12.0	3	4.0	100%
Com.Europ.	Potato	7.5	2	3.7	100%
Priv.Farm.	Potato	2.5	4	0.6	0%
MACA	Potato	6.0	1	6.0	100%
MACA	Wheat	4.0	1	4.0	100%
MACA	Barley	2.0	1	2.0	100%
P.D.A.I.	Wheat	10.0	8	1.2	75%

3.2.3 Tarija

For the first time, the Tarija region had 54.5 hectares of fields registered for Certification. CARITAS (in Chuquisaca) demonstrated its interest by starting a seed production program in Culpina, which is inside the department of Chuquisaca but is much closer to the City of Tarija. The advisers persuaded this institution to join the Tarija Certification Program. The field results of CARITAS wheat production, in this particular region, are shown in Table 7.

Table 7 FIELD RESULTS OF CARITAS WHEAT PRODUCTION
SAGUAYO VARIETY, TARIJA, 1985/86

Total Area (ha)	No. of Farmers	Average Field Size (ha)	Approved Field (ha)
54.5	73	0.7	27.0

The high percentage of unacceptable fields was due mainly to the inexperience of local farmers who did not comply with the roguing recommended by Certification technicians.

Seven tons of the wheat seed were sent to the conditioning plant in Tarija and then sold to Yacuiba. As mentioned before, the SCS in the region also produced and certified 7 tons of wheat seed, variety Jaral,

which was sold in Yacuiba.

3.3 Seed Conditioning

3.3.1 Chuquisaca

New equipment was installed in the seed conditioning plant in Chuquisaca according to the designs prepared by the previous adviser in the first phase of the Project. The plant is situated inside the railroad warehouse in Zudáñez. With the agreement of the railroad company, a new reception area was added and necessary changes were made on the floor. By the end of August of this year, the plant had conditioned 62 metric tons of wheat. All the seed that arrived at the plant before the first week of June was conditioned on time to be sold in Santa Cruz.

3.3.2 Potosí

As already mentioned in this report, the local production of cereal seed is very small. At the end of August, there were only 2.5 tons of wheat seed to be conditioned in the plant. As requested by the Regional Seed Council, the seed conditioning equipment was assembled and installed in such a way that other conditioning equipment can be added later, if cereal seed production grows in the area.

Since there are no cereal fields registered with SCS, this plant will probably be used for grain conditioning until a complete seed program is established. The interest of the CBN in conditioning barley grain produced in the area has been expressed.

3.3.3 Tarija

In September 1985, two elevators and a seed treater, provided by a previous USAID project, were assembled and temporarily installed to start conditioning 40 tons of barley seed for the National Brewery (CBN). In addition, seven tons of wheat seed from CARITAS and another seven tons of wheat seed from MACA were also conditioned in June 1986.

3.4 Seed Certification Service

At the beginning of the 1985 season, the SCS consisted of only one technician and the Regional Director. Two other field technicians were hired through the RSC for a six month period, using funds from the T-059 Project. In spite of the fact that seed fields were very small (1.7 hectares average) and located in areas of difficult access, all fields received two visits from the advisers and Certification personnel. About 80 percent of the approved fields received three visits.

3.4.2 Potosí

The SCS in Potosí did not progress as might have been hoped. The lack of interest in developing private seed producers was readily apparent. Since the SCS is also a seed producer, this behavior is to be expected. They were trying to protect their market.

3.4.3 Tarija

For the first time in the region, the Seed Certification Service inspected fields other than its own. Unfortunately, part of this material was sold without conditioning, which may have damaged the reputation of the region as a source of seed in the eyes of the consumer.

3.5 Regional Seed Council Organization

3.5.1 Chuquisaca

The main problem of the RSC was the lack of operability regarding funding. Though the concept of local funding for the Certification Service was accepted, and seed producing institutions were willing to contribute, the RSC had no means of managing funds. Instead, the MACA Seed Department continued to administer the Certification Service as before, with all authority in La Paz. It was extremely difficult for local leaders to obtain information on funding levels and to participate in decisions over use of resources.

Since the T-059 Project had put in funds for hiring of local technicians and other operating expenses, accounting for these funds had to be reported to the Coordination Office. This opened the way to gaining access to MACA accounts. At this point, the RSC took responsibility for local funds and for financing of Certification. An administrator was hired in November for six months using Project funds. He was to sit in on the RSC meetings and carry out its decisions. In addition, he was also in charge of administering RSC and SCS funds.

3.5.2 Potosí

The private sector's lack of interest in seed production was ascertained through the RSC and SCS. Surprisingly, during the short course on seed marketing held in Potosí, there was a growing interest among private and other public institutions to join the certification program. During this course, detailed explanations were given about the role of the SCS and RSC in the program.

3.5.3 Tarija

In Tarija, the Chamber of Agriculture has shown more interest in RSC decisions lately. This could represent more active participation by the private sector in the region.

3.6 Seed Marketing

3.6.1 Chuquisaca

In February 1986, the high demand for wheat seed in the Santa Cruz region became evident. Intermediate seed brokers and truck drivers, who were usually customers of wheat seed produced by MACA, began asking SCS personnel for information on seed supplies. In order to avoid speculation and competition among local private seed producers, which could put the program in jeopardy, the RSC decided to market all its seed under the brand name of "Chuquisaca Wheat Seed" with the price they had established. This

marketing system was very important because the seed companies individually were not prepared with an organized marketing structure. The RSC then signed a contract with ANAPO (National Association of Oil Crop Producers) for 50 tons of wheat seed. This was delivered on time and, at 62 tons, surpassed the amount required by the contract.

Unfortunately, the seed companies were not organized in their recovery program. Therefore, the region lost the chance of selling at least another 100 tons of wheat seed requested not only by ANAPO but by several other private farmers that came to the office looking for the "Chuquisaca Wheat Seed". Local consumption of quality seed is small due to the characteristics of the local farmers. They have small pieces of land, of one or two hectares, and they practice a rudimentary type of agriculture.

3.6.2 Potosí

The potential of this region to become the leader in potato seed production has already been mentioned in this report. There is an open market for the product, which needs to be expanded using a better quality potato seed.

Barley, which is also an important crop in the region, is still totally dependent on the National Brewery (CBN), which distributes material for planting to contract grain producers. The CBN still, however, does not understand the benefits the seed certification program could bring both to the farmer and to the Brewery itself. Consequently, they are not yet convinced of the need to enter the seed production program.

3.6.3 Tarija

The small quantity of wheat seed produced locally was sold through the SCS, which was also the seed producer. In addition, the SCS was used as an intermediate contact for the sale between CARITAS and the "El Chaco" Cooperative. The biggest marketing error of the region was the sale of wheat seed to ANAPO in Santa Cruz without conditioning. It is well known that product presentation plays a very important role in marketing.

4. Progress on Seed Conditioning Facilities in Various Regions

One of the specific activities of Dr. Braçan'ini was to support the installation of seed conditioning plants throughout the country. Five different regions of the country received orientation from the advisor on this matter.

4.1 Chuquisaca

The seed conditioning plant in Zudáñez was working for years with an air-screen cleaner, Clipper 27, and one elevator. Some other equipment from a previous project was still in its original boxes. The previous adviser in the area designed a seed conditioning and storage facility. He also prepared all the specifications for seed equipment necessary to implement the plant.

The original design was maintained and the plant was installed inside the railroad warehouse, which MACA had used for years. Due to the presence

of a noxious weed seed in the area, an indented cylinder was later added to the plant. In March 1986, the new plant started conditioning wheat seed.

4.2 Potosí

Unlike Chuquisaca, Potosí did not have a design for a conditioning plant. It did, however, receive some seed equipment from this Project. This included a gravity table, an elevator and a holding bin which, together with some other equipment already available, made the installation of a conditioning plant possible.

In March 1986, the elevators were assembled and recommendations on floor preparation and electrical installation were provided. In May, all equipment was installed and the internal electrical wiring was about to be finished. The plant is now working with a one/hour capacity, which is plenty for the current local cereal seed production.

4.3 Tarija

This was the region that received less equipment from the Project. It had two small air-screen cleaners, two elevators, and one treater, but were using only one Clipper 27 for conditioning. In October 1985, assembly began of the equipment they had kept in boxes for years. With two elevators, one air-screen cleaner and the seed treater temporarily installed, they started conditioning barley seed for the CBN. Tarija received a holding bin for the air-screen cleaner and will have to have another one for the seed treater.

4.4 Yacuiba

Unlike the other regions mentioned above, the construction and installation of a seed conditioning and storage plant in Yacuiba was the responsibility of CODETAR, the Regional Development Corporation with close assistance from the adviser. Assembly of equipment started in January 1986. Two visits from the adviser and one visit from the plant designer (the previous adviser in the area) was enough to provide the necessary instructions. A final course to orient operators on machine adjustment was given in June 1986 during the conditioning season.

4.5 Saavedra (Santa Cruz)

The construction of the seed drying, conditioning and storage facilities for the Saavedra Experiment Station in Santa Cruz was finished in February 1986. A local company was contracted to assemble and install the equipment. Construction was financed by PL-480. The previous advisor, who was also the plant designer, was present at the beginning of the assembly and installation. The author visited the plant three other times during the period of installation.

5. Conclusion

The evolution of the seed production program in Chuquisaca is a reality. Continuous technical and financial support, however, is still necessary, probably for another two or three years, or until all program components reach maturity. The seed programs in Potosí and Tarija are

still in an embryonic stage. All program components are very weak and dependent, more on technical than financial support. A solid base for seed program development is needed. After twelve months of working in the area, the following conclusions can be drawn:

a) The Project was able to create an awareness and interest in the seed production program, much more in Chuquisaca than in Potosí or Tarija. Perhaps more importantly, it was able to demonstrate the feasibility of developing seed programs in these regions.

b) The uneven development among the three regions was partially due to the more consistent presence of the advisors in the Chuquisaca region.

c) Genetic and foundation seed production needs the support of a specific project in order to supply the program with pure, high quality seed. The high percentage of unacceptable fields in the area was due to genetic purity problems, which reinforces the need for a stronger genetic and foundation seed program.

d) The Seed Certification Service in Chuquisaca will be self-financed in one or two years, depending on the ability of local personnel to promote their services and increase seed quality.

e) The local consumption of quality seed will remain low in the area. This is due to the fact that the very small farmer is not able to visualize the benefits he could receive from seeds of an improved variety and therefore will not pay a higher price for such material.

6. Recommendations

a) The Chinoli Experiment Station should be in charge of breeder seed production, primarily for wheat and potato. The need for barley seed is presently dependent on the interest of the CBN in joining the certification program. In order to achieve this, the experiment station needs some specific training and financing.

b) The production of foundation seed should be the responsibility of IBTA in Chuquisaca and Tarija and the Chinoli Experiment Station in Potosí. IBTA should concentrate efforts on products that the SCS requires, such as wheat, potato and barley. They should start with just a few varieties, in order to simplify the program at the start and avoid varietal mixtures. The necessary funds for this program could be in form of a loan and controlled by the Regional Seed Council.

c) The Seed Certification Service in Chuquisaca should encourage seed companies like CORDECH and CARITAS to select their farmers. The companies should look for farms with better infrastructure, and in more accessible areas where production is concentrated.

d) The RSC in Potosí should select potato seed as its main crop, but at the same time establish a smaller program for certification of wheat seed.

e) The RSC should urge the formation of a local organization of seed producers, probably through already existing cooperatives. Necessary funds

could be channeled through the RSC.

f) The RSC should physically and technically separate certification from any other service they provide. Examples of other services are conditioning of seeds and grains, transportation, etc. This point is very important because it creates the image of what certification should be.

g) The Potosí and Tarija regions still need a full-time adviser for seed program consolidation. Potosí specifically requires a potato seed expert.

h) A solution for the repeated problem of slow recovery of produced seed for the Santa Cruz market would be the allocation of funds, in the form of a loan, to local seed companies.

i) The local utilization of high quality seed is very important, not only for the seed production program, but also for local agriculture. In order to achieve this objective, projects should be funded and implemented for small farmers. The farmers would receive certified seed and fertilizer, which could be paid for with grain (or tubers). The sale of this product, in turn, would finance part of the following year's program. The Regional Seed Council could administer such a program.

j) The institutions that already work with small farmers, such as FIDA, IPTK, Foster Parents Plan, and CARE, should be oriented to distribute certified seed.

k) In order to increase the demand of "Chuquisaca Wheat Seed", the Regional Seed Council should organize a marketing and publicity campaign in Santa Cruz and Yacuiba.