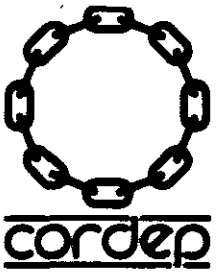
RETURN TO: -PD-ABZ-340



Evaluation of IBTA/Chapare Research, Extension and Production Programs

Prepared for the United States Agency for International Development
under contract number 511-0617-C-00-2201-00

By : John O'Donnell
Lawrence Szott

August, 1993
Cochabamba, Bolivia

Development Alternatives, Inc.
7250 Woodmont Avenue Suite 200
Bethesda, MD 20814
Edif. Los Tiempos 4° Piso
Cochabamba Bolivia

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Terms of Reference

This evaluation of IBTA/Chapare research, extension and production programs was carried out between July 16 and August 4, 1993 by John O'Donnell, a retired AID agricultural officer and Lawrence Szott, a CATIE scientist. The objective of the evaluation was to "assess the appropriateness and effectiveness of all three programs (i.e., research, extension and propagation of planting materials) in meeting the overall objectives of CORDEP in the Chapare, which is to increase farm income by increasing crop and animal (mostly crop) production within the context of sound management of farmers' resources." The two person team reviewed relevant project documents, interviewed representatives of the various organizations involved in Chapare agricultural development and visited research stations, packing sheds, community nurseries and a number of individual farms and community agricultural projects in the Chapare region. The team found a consensus on many of the conclusions contained in the report, although there were diverse opinions on other points which are so noted.

The overall impression of the team was that much valuable work has been done by IBTA/Chapare, under less than optimal conditions, in identifying and testing crops that are adapted to production in the area, in developing management systems for the most promising of those crops, in providing planting materials and technical advice to area farmers, and in building farmer confidence in the institution. IBTA's staff is experienced and has had some good training through academic and short-term technical training abroad and via visiting technical consultants.

IBTA's Structure and Objectives

The team found that IBTA/C has gone through several internally and externally motivated programmatic and organizational changes in recent years. The most recent reorganization under condideration calls for integrating research, extension and plant propagation in four priority commodity programs in pineapple, bananas, black pepper and palmito and four other programs in agroforestry, miscellaneous crops (including food crops and second level priority crops such as maracuya and citrus), forage/large ruminants, and swine/small animals. The team strongly endorses this approach. It provides a structure to focus IBTA/C's resources and energies on the expansion of production of crops which have good market prospects and the potential to increase significantly incomes and employment in the region, while ensuring food security and environmental sustainability.

We believe that each priority crop should be considered as the leading element of an individual farm production system which also include agroforestry technologies, food crops, and secondary cash crops to order to spread farmer risk, assure availability of food and some income if the primary crop encounters market, disease or weather related problems, and enhance the productivity and the ecological sustainability of the individual production systems. This requires that IBTA's extension staff, as well as the extension personnel of NGO's, farmers' associations and private firms, be well-versed in management of the priority crops, as well as the other food, tree/forage . l secondary cash crops which constitute the farmer's production system.

In order to effectively carry out its new strategy, the team believes that IBTA/C needs to develop and internalize an institutional methodology which integrates research, extension and production activities in support of market-led agricultural expansion of high priority crops; which provides for a greater level of participation of farmers and agroindustrial processors and exporters in IBTA/C planning, prioritization and program implementation and evaluation; and which emphasizes quality, volume and timing considerations in meeting market requirements. Specific short-term technical assistance is recommended for that purpose.

Research

With the emphasis on the four priority crops and the supporting elements in the farmer's production system, other lower priority activities will have to be reduced or eliminated. Research and extension in secondary crops, such as maracuya and citrus, should be continued, but at a reduced level. Activities in other lower priority secondary crops such as achiote, ginger and tumeric should be reduced even further, but could be increased at a later date as market and other conditions warrant. The team suggests that IBTA/C suspend all research and extension activities in crops such as coffee, cacao, macadamia, coconut, rubber, carambola, mulberry, and guanabana, and limit any further activity in those crops to maintenance of germplasm collections.

The team concluded that IBTA/C's present method of research planning should be replaced by one based more on a diagnosis of farmers' problems and constraints and that there be much more emphasis on on-farm adaptive research. We recommend that DAI contract one person-month of qualified external technical assistance to work with IBTA in reviewing the results of their current research program and evaluating farmer-identified constraints on production and market opportunities in order to develop a revised research action plan. We also recommend that additional funds be provided or that funds be taken from the IBTA/C budget to establish an Agricultural Research Grants Fund to provide competitive matching grants for research proposals from both the private and public sectors. Eligible organizations would include San Simon University, the NGO community, private agroindustrial firms and IBTA itself. We recommend that the Fund be administered by a Chapare Agricultural Development Foundation which is discussed in more detail later in this Summary.

Extension

In reviewing IBTA/C's extension program, the team concluded that it could benefit greatly from the direction and organization that could be provided by the institutional methodology discussed above. The Project should continue to emphasize a major extension role for IBTA in the short term, although the team felt that this role could be reduced over time as IBTA/C's budget declines and the NGO's, farmers' associations and private firms become more active in the area. IBTA's role could then be redefined to conducting research to solve problems identified by farmers and the agroindustrial firms, coordinating extension efforts and passing on technology to extensionists from participating organizations through training courses and written materials.

Plant Propagation

Production of sufficient quantities of planting materials for expansion of the area planted in high priority crops continues to be a major bottle-neck. Because of the long period required to produce materials from tissue culture or vegetative propagation techniques, there may be no alternative but to continue to import high-cost planting materials from other countries for the next one or two years. However, a strong effort should be made to involve more organizations and individuals in production of planting materials; this should be a major activity of the NGO's, farmers associations and private firms. In order to stimulate increased private sector production of materials, the team recommends that USAID set aside $100,000 per year (taken from the IBTA/C budget) for the next two to three years to competitively contract with private sector suppliers of pre-determined amounts of planting materials for the four priority crops. The team also recommends that USAID, DAI and IBTA/C bring in at least two experts in pineapple diseases to advise the Project on how best to deal with the Fusarium problem which is a serious threat to pineapple production in the zone.

Inter-Institutional Relationships

The team was struck by the large amount of actual and potential resources at play in the Chapare. In order to make the most effective use of these resources in achieving Project objectives, it is imperative that mechanisms by found to bring the various actors together in a coordinated production/marketing program. The Grupos Tecnicos Operativos (GTO's) in pineapple and bananas are a good step in the right direction. They should be instituted for black pepper and palmito as soon as possible. The designation of DAI product managers and field coordinators are also important innovations. The field coordinators should be given responsibility for only one priority commodity so that they can spend all of their time interacting with the various groups in the production/marketing chain, identifying bottle-necks and proposing solutions and ensuring the flow of information among all parties involved. To aid the field coordinators, a commodity-specific action plan which specifies actions, timing and responsible parties should be developed for each priority commodity as soon as possible. The DAI product managers and field coordinators should then "ride herd" on the actions plans, calling meetings or recommending actions as appropriate Commodity specific production/marketing committees should be organized; they should meet periodically to measure progress and discuss problems and opportunities.

Private Sector Participation

The team felt that there should be much more private sector participation in the planning, prioritization, implementation and evaluation of the IBTA/C program. One suggestion involves establishing an institutional methodology which provides for an increased level of participation by farmers, private firms and other private sector parties. The team also recommends that an Agricultural Research Grants Trust Fund be established, with additional USAID funds or funds taken from the IBTA/C budget, to promote increased private sector participation in research in the Chapare. It is recommended that a private-sector Chapare Agricultural Development Foundation be established to administer the Fund. The 15 to 20 Assembly of the Foundation should be composed of farmers, agroindustrialists, university staff and other private sector individuals interested in and committed to the agricultural development of the Chapare. A four

or five person Executive Committee should be elected by the Assembly and charged with the responsibility for setting policy for the Foundation and hiring and providing guidance to an Executive Director, initially ad-honorem or part-time, to manage the Fund. The Foundation could also play another important role as an advisory body to IBTA/C on program content and implementation. Short-term technical assistance is suggested for working with private sector organizations such as the Federacion de Empresarios Privados and the Camaras de Agricultura y Industria to set up the Foundation and the Research Grants Trust Fund.

IBTA's Future

On the issue of the medium and long-term future of IBTA/C, the team concluded that it was likely that AID funding for the organization would decline over the next four years and terminate in 1997. In view of this scenario,and for other technical and administrative reasons,the team has recommended that USAID/Bolivia, IBTA/C and IBTA/Nacional enter into discussions leading to the reintegration of IBTA/C into IBTA/Nacional by January 1, 9'95. USAID/Bolivia and IBTA/Nacional could then share funding of the IBTA/C program with declining participation by USAID/B until IBTA/Nacional assumes full funding by January 1, 1998.

Development of Human Resources

In human resources development, the team recommends that four master's level programs be funded (or that individuals with the requisite master's degree by hired), with one each in economics, pest and disease control, soil sciences, and data management/statistics. As commercial crop production expands in the Chapare, there will be an increasing need for local expertise in pest and disease control and soil fertility and plant nutrition which could be provided by these master's level professionals. There will also be a need for improved analysis and presentation of research results which will require the services of a trained professional in data managment/statistics. In addition, the team recommends medium term (four to six months) technical training at external production sites for four IBTA/C extension specialists with one each in banana, pineapple, black pepper and palmito, and short-term (one to two months) training for two extensionists in each of the four main commercial crops. All extensionists should participate in short courses related to extension techniques and the basic food crops.

Administration

On administrative matters, the team recommends a modification of the 10:4 working schedule which would call for the IBTA/C field staff to be divided into three groups arriving in the region on a Monday, Thursday, Monday schedule, leaving 10 days later. This would provide for a continuous presence of IBTA/C in the zone (one of the most frequently heard criticisms of the organization) with 2/3 of the IBTA staff present 72% of the time and all of the staff present 21% of the time.

On measuring the impact of project activities, the team felt that the information being provided by the rural household survey was essential to measuring changes in income in the zone. Periodic repetitions of the recently completed sample survey were also considered essential to measuring area-wide changes in crop area and yields as indicators of progress towards achievement of Project objectives.

I. PURPOSE AND SCOPE OF THE EVALUATION

The Chapare Office of the Bolivian Agricultural Technology Institute (IBTA/Chapare or IBTA/C) has been the recipient of substantial amounts of AID funding for a number of years, beginning with the involvement of the USAID/funded University of Florida technical assistance team in the mid/late 1970's. During that time, IBTA/C has grown from a small, poorly staffed institution with a limited budget to a large, well-staffed organization with over 100 employees and a programmed budget level of US$4.7 million in 1993. Despite this substantial long-term support from USAID/Bolivia, there has been only one comprehensive outside evaluation of IBTA/C by qualified experts in agricultural research, extension and production. Therefore, in July, 1993, the DAI technical assistance group contracted a two-person team to "...assess the appropriateness and effectiveness of all three programs (i.e., research, extension and propagation of planting materials) in meeting the overall objectives of CORDEP in the Chapare, which is to increase farm income by increasing crop and animal (mostly crop) production within the context of sound management of farmers' resources." (Taken from Annex A: Evaluation Scope of Work.)

The two-person team included John O'Donnell, a retired AID agricultural officer with many years of experience in the design, management and evaluation of USAID-funded agricultural research and extension programs in Latin America, and Dr. Lawrence Szott, a CATIE employee and North Carolina State University PhD in soil sciences with in-depth experience in designing and managing agricultural research and extension programs in tropical Latin America.

John O'Donnell arrived in Cochabamba on July 16 and Lawrence Szott arrived on July 20. The initial few days were spent in reviewing project documents and meeting with DAI and USAID/Cochabamba staff as well as individuals from agroindustrial firms and NGO's with current or planned activities in the Chapare.

The team then visited the Chapare from July 22 to July 25. During the course of their stay in the Chapare they visited the La Jota and Chipiriri research stations, the UNABANA packing shed and nursery, the Technoserve-supported pineapple packing shed in Mariposas, community nurseries for bananas and pineapple, the SEASA commercial maracuya and pineapple plantation, the Serviagro production systems work in Entre Rios and a number of IBTA promotors and individual farmers in the area. In Santa Cruz on July 26, the team visited the Industrias LAS bottling and canning factory, their tissue culture lab and their 200 ha. pineapple plantation as well as the Santa Cruz Department Center for Tropical Agriculture Research (CIAT).

Upon their return to Cochabamba on July 27, the team met with officials from IBTA/C, San Simon University, Agrocapital, Technoserve, USAID/Cochabamba, DAI, and SEASA, a local canning firm which is establishing a production and processing capacity in the Chapare. (See Annex C for a complete schedule of meetings and field visits).

The team completed their report and made an oral presentation of their conclusions and recommendations to USAID/Cochabamba and DAI on August 4, 1993.

II. BACKGROUND

Agricultural research and extension activities in the Chapare date back to the founding of the Chipiriri station in 1962. The major emphasis was on the principal agricultural enterprise of that time, livestock, but work was also done on corn, rubber, cacao and cafe. The La Jota research station started as a nursery under the directed colonization program of the National Colonization Institute, was upgraded to a sub-station when the Bolivian Institute for Agricultural Technology (IBTA) was established in 1974, and became a full-fledged research station in 1978. Research and extension activities in the Chapare were cut back in the 1970's due to the decline in coffee and cacao prices and the generally weak national economy.

As coca production increased in the Chapare in the 1970's, USAID/Bolivia financed a University of Florida technical assistance team from 1976 to 1980 to begin work on identifying crops which could do well in the area and might serve as alternatives to coca production. During the period 1980-84, there was a boom in coca production and a period of extreme lawlessness in the area which greatly hindered any research and extension activities.

In 1984, USAID/Bolivia approved a major development project for the Chapare and responsibility for the supervision of IBTA/C was transferred from IBTA/Nacional to the Secretaria del Tropico Boliviano (SDTB) which received funding for the IBTA/C program from AID. IBTA/C was subsequently transferred to the Programa de Desarrollo Alternativo de Cochabamba (PDAC) in 1987 and then to the Programma de Desarrollo Alternativo Regional (PDAR) in 1990, with both organziations under the Sub-Secretaria de Desarrollo Alternativo (SUBDESAL) with full funding for IBTA/C coming from USAID/Bolivia.

In 1985/86, order was restored to the area and serious efforts were made to interdict the movement of coca within and out of the Chapare. The resulting drop in coca prices made alternative crops of more interest to local farmers. Through its efforts in soils studies and land use potential, IBTA/C developed a more realistic picture of the fragile, yet promising nature of the area. Despite a formidable set of adverse socio-economic conditions during the early-mid 1980's, IBTA/C's patient and professional approach to area farmers built trust and facilitated the introduction and expansion of promising crops.

During the mid/late 80's, IBTA/C, with USAID/Bolivia funding and technical assistance from Experience Incorporated, continued and expanded its work in testing new crops such as black pepper, macadamia, maracuya, tumeric, ginger, and achiote. Increased research and extension was also undertaken on some of the traditional crops in the area such as bananas, pineapple and citrus and IBTA/C introduced the Valencia Tardia and Mandarina Ponkin varieties in citrus, the Grand Naine and Williams varieties of banana and the Smooth Cayenne variety of pineapple. While it had become clear by the late 1980's that a number of crops could be produced in the Chapare, a major constraint to development of the area was the lack of knowledge of and access to markets. Thus, the new Cochabamba Regional Development Project (CORDEP) was initiated to address key marketing constraints as well as credit and production problems in the area.

The CORDEP project is a complex undertaking which involves a number of actors including IBTA/C in agricultural research, extension and production, the ONG effort under Planning Assistance, credit under Agrocapital, road construction under PDAR and the marketing effort under the DAI technical assistance team. The Project is trying to carry out a coordinated, integrated effort aimed at identifying and alleviating constraints along the production/marketing chain for commercial agricultural products from the Chapare. This evaluation is mainly concerned with the aspects related to pre-production, production, post-harvest, and preparation of product, i.e., those areas in which IBTA/C is most involved. The evaluation team talked to most of the important actors in the project and also tried to view IBTA/C's role within the larger context of the overall production/marketing system.

In reviewing the organization and program of IBTA/C, the evaluation team tried to consisently apply the test of how well the organization was doing in contributing to the achievement of project objectives. The goal of the CORDEP Project is to "increase investment, productivity, and employment in licit activities as Bolivia's economy transforms its coca-based economy." The objective of the Project is to "develop alternative sources of income and employment for people within the project area." These objectives are to be achieved through an integrated strategy which focuses on marketing, capital resources and sustainable small farm production.

III. ORGANIZATION OF IBTA/CHAPARE

Over the past few years, IBTA/C has undergone several structural and programatic reorganizations and at the time of the evaluation, was in the process of another major restructuring effort. During the period 1990 - 1992, IBTA/C had an administrative/management staff of about 22 persons, including the Director, located in Cochabamba, with a field staff of about 120 located at two research stations in the Chapare. The field staff was divided into an administrative/management staff of seven at La Jota and five at Chipiriri, a general services staff of nine at each station and a technical staff of 78 (including peones) divided between research, extension and plant and animal production as follows:

La Jota		Chipiriri	
Research	7	Research	4
Extension	20	Extension	11
Production	22 (14 peones)	Production	14 (7 peones)
Total	49	Total	29

This past year, IBTA/C decided to restructure itself again, maintaining an administrative/management staff of 27 in Cochabamba and a field staff of 106 in the Chapare. The increase in the Cochabamba staff was due to the addition of three Evaluation Officers (assigned to one or more micro-regions) and transfer of the communications officer from La Jota to Cochabamba. The field staff was divided into an administrative/management/general services staff of 17 at La Jota and 15 at Chipiriri and a technical staff of 50 at La Jota and 24 at Chipiriri. The technical staff was divided as follows:

La Jota		Chipiriri	
Agricultural Programs	26	Livestock Programs	12
Research (7)		Research (4)	
Extension (19)		Extension (8)	
Plant Production Unit	24	Livestock Production	12
Technicians (10)		Technicians (5)	
Peones (14)		Peones (7)	
TOTAL	50	TOTAL	24

This reorganization established eight research programs in fruit crops (including banana, pineapple, citrus, maracuya and papaya); palmaceas (tembe); roots and tubers; stimulants, colorants and spices (including coffee, cacao, achiote and black pepper); cereals and grain legumes; agroforestry; forages and livestock; and multi-disciplinary programs. Under this scheme, the extensionists were assigned responsibilities for programs and geographic coverage in the micro-regions (from west to east) as follows:

Micro-region IV (Pineapple, palmito, small animals)

3 General Extensionists
1 Pineapple Extensionist

Micro-region V (Citrus, macadamia, palmito)

2 General Extensionists

Micro-region I (Banana, black pepper, citrus)

3 General Extensionists
1 Banana Extensionist

Micro-region III (Banana, citrus, pineapple)

2 General Extensionists
2 Banana Extensionists
1/2 Pineapple Extensionist

Micro-region VI (Pineapple, citrus, maracuya)

2 General Extensionists
1/2 Pineapple Extensionist

Micro-region II (Pineapple, citrus, palmito)

2 General Extensionists

Micro-region VII (Livestock, pineapple, banana)

1 General Extensionist
2 Livestock Extensionists
1 Forage and Pasture Extensionist

Micro-region VIII

1 Extensionist - General

We were told by the Director of IBTA/C that the above structure was being changed once again to integrate research, extension and plant and animal production personnel into six crop specific programs in pineapple, banana, black pepper, palmito, agroforestry, and miscellaneous crops (which would apparently cover primarily maracuya and citrus and around 15 other perennial crops and annual crops) and two livestock programs in forages/ruminants and swine/small animals. The detailed assignment of personnel to these programs was not available at the time of the evaluation.

The team considers this recent move to integrate research, extension and plant and animal production personnel into the eight programs as a very positive development. In fact, the team was going to recommend such a restructuring along priority commodity lines in order to focus all of IBTA/C's resources on expanding production of the priority crops of pineapple, bananas, black pepper and palmito. By integrating research, extension and plant production in these four commodity areas, all personnel can work on a single, coherent, focused program aimed at expanding area of production, emphasizing quality and timely delivery of product and addressing problems as they arise in this process, including problems such as pest and disease control and soil fertility which will require further research. A more detailed discussion of IBTA/C's organizational alternatives is included in Section V,B.

IV. THE IBTA/CHAPARE PROGRAM

Our purpose in this section is to provide a general "snapshot" of the IBTA/C program at the time of our evaluation. We focus not only on the internal structure and program activities of IBTA, but also how those relate to the activities of other institutions working in the area. Given our limited experience with IBTA and the dynamic nature of the institution, it should be recognized that our static description may not be totally complete. A discussion of the implications of these institutional characteristics and the changes needed to make IBTA more effective are included in section V.

A. Research

1. Review of Goals and Structure

The goal of IBTA/C's research program has been to develop the agricultural technology which will permit an increase in the quantity and quality of agricultural production, and hence in farm income, in a socially acceptable manner without destroying the resource base. It should be recognized that this is not an easy task. Agriculture in the Chapare region is based on subsistence and is characterized by shortages of labor and capital and low productivity. Furthermore, the majority of the farmers and researchers there originated in the sierra, a different agroecological zone, and have been present in the Chapare for 10 years or less, a relatively short period of time to learn effective techniques for the management of a new suite of crop species in an alien environment.

In the early years of the project, there was little known about the agroecological characteristics of the Chapare and the types of crops or production systems which would be successful there. The results of IBTA/C's initial research efforts, however, provided a sound basis for present day research. These efforts resulted in: 1) the broad-scale classification of the region into zones (presently eight) based on environmental characteristics (primarily rainfall, soil type, and susceptibility to flooding); 2) the identification of various annual and perennial crops and livestock adapted to conditions in the region; 3) the matching of crops to the zones; 4) the selection and reproduction of improved germplasm; 5) the debunking of myths related to the Chapare's productive capacity and increasing recognition of its fragility; and 6) increased farmer confidence in IBTA as an institution. Although IBTA cast its crop evaluation net widely, by working with more than 40 crop species, this appears to be justified due to the lack of knowledge then available.

As noted in section III, prior to 1992, IBTA's programs were structured on the basis of research, extension, and plant propagation activities, with research sub-divided into the areas of genetic improvement, agronomic management, and special studies. Since 1992, it has been thought that IBTA's overall goal could be best achieved through the development of commercial crops which command good markets and prices. Hence, work on these crops has gradually assumed greater relative importance in the development of IBTA's research program.

In 1992, research activities were restructured along eight lines: 1) fruits; 2) dyes, stimulants, spices, and industrial crops; 3) palms, ornamentals, and miscellaneous crops; 4) agroforestry; 5) annual grains and legumes; 6) roots and tubers; 7) livestock and forages; and

8) support services which included research on soils, pest and disease management, post-harvesting techniques, and nurseries. Continual rethinking of how the research program could best support the development of commercial crops has resulted in a revised structure which is presently under consideration. Under this scheme, research lines would include: pineapple, banana, tembe, black pepper, agroforestry, miscellaneous crops (citruses, maracuya, less important perennials with commercial potential such as annatto, and annual food crops such as rice, beans, corn, cowpea, and yuca), forages and ruminants (chiefly cattle), and monogastric animals (hogs and hair sheep). It is envisioned that the former areas of research, extension, and plant propagation would be horizontally integrated within each of the crop lines.

2. Human Resources and Infrastructure

Research is chiefly carried out on two experiment stations, although some is also performed on local farms. Research related to perennial and annual crops is undertaken at the La Jota experiment station where there are seven active researchers and the forage and livestock programs are based at the Chipiriri station which is staffed by four researchers. At both stations, the majority of the researchers have ingeniero agronomo degrees in general agronomy obtained from San Simon University in Cochabamba. There is also one economist, and 1 veterinarian shared by the stations, but no sociologists or anthropologists. A total of four researchers have MS degress conferred by CATIE or by universities in the US or Puerto Rico.

At both stations, office space, living quarters, and training, storage, and greenhouse facilities appear adequate. Chipiriri is presently undergoing a construction boom which should amplify their ability to hold training sessions and provide housing for visitors. At the stations, livestock and animal-based products can be quantified and plant samples can be dried and weighed. However, other research infrastructure is rudimentary. There are no plant or soil analysis laboratories. Computers, although present, appear to be used mostly by the administration. Moreover, the degree of computer and/or statistical literacy among the researchers is in question.

3. Research Lines

Research within the major lines noted above is primarily adaptive in nature and consists of germplasm evaluation, maintenance, and selection; evaluation of management techniques such as time of planting, planting densities, fertilization, and pest control; studies of pre- and post-harvesting techniques for fruits; soil characterization; and economic analyses. Research planning appears to reflect researchers' preferences, recommendations by extensionists, and input from DAI staff, but there is little attempt to formally include current topics of concern to farmers. A fairly thorough diagnostic survey of on-farm constraints was carried out in 1989, but has not been repeated since. Direct researcher contact with farmers appears to be very limited. Even in the small amount of on-farm research performed, farmer involvement appears to be limited to providing land and hand labor. Such trials are largely extensionist and/or researcher managed, although farmer preferences are taken into account in evaluating the results.

There is a real and pressing need for a much greater emphasis on on-farm research for both the commercial and annual crops. The Chapare region is variable with regard to both rainfall and soil conditions and the only way that the research and extension staff will be able

to make reliable recommendations to farmers is if they are able to tailor their recommendations to the existing conditions. This will be possible only if on-farm research is undertaken at many sites. The results from such a program would enable both a global understanding of how productivity varies with site conditions, what levels of productivity might be expected at a given type of site, and the effect on productivity of locally relevant management techniques. Furthermore, the inclusion of farmers in this process, from problem identification, to experimental evaluation, to the analysis and interpretation of results, would serve as an effective extension and training tool.

According to IBTA's Operational Plan for 1993, there are 85 research activities programmed: 60 activities in perennial crops, seven in annual crops, six in livestock, nine in forages, and ten in special areas such as post-harvest handling of fruits, soil characterization, and economic analyses. The majority of these activities are not related to the main research lines in the structure presently under consideration. Of the 60 activities programmed for perennial crops, eight are devoted to banana, four to pineapple, three to black pepper, and two to palmito, and ten to miscellaneous crops such as maracuya and citrus. Of the remaining activities, seven are devoted to agroforestry systems, and the rest to approximately 15 other crops.

In general, the La Jota station has many more experimental trials than Chipiriri. The ones we viewed were related to the main commercial crops; the majority of them appeared to be well-maintained and the researchers managing them were knowledgeable. Because of constraints on time, we were unable to delve into the adequecy of experimental design, methods, measurements, and analysis of results. Compared to La Jota, the number of active on-station trials at Chipiriri was much reduced and were related to the use of by-products of bananas and yuca as animal feed, the evaluation of legumes and grasses as forages, quantification of mineral deficiencies or toxicities and parasite problems in cattle, and fertilization of grasses for cut-and-carry systems. It would take more time than was available to the team to determine whether these are the most appropriate research thrusts for solving perceived livestock-related problems in the Chapare.

In this context, the rationale behind the amount of resources devoted to the Chipiriri station is not entirely clear given the high rainfall in the region (4500 to 7000 mm annually) and the station's inappropriate (in our opinion) emphasis on livestock. Chipiriri was founded in 1962, before La Jota, and historically stood at the gateway into the Chapare. However, as the Chapare developed, the main cattle producing region shifted to the drier Carrasco province approximately two to three hours drive to the southeast. Results of research on forages at Chipiriri have been validated in trials conducted jointly by CIAT, IBTA, and San Simon University in Carrasco, but there has been little animal improvement work performed at the the latter site. It would appear that the majority of the work related to forages and animal adaptation should be done at the main cattle producing area in Carrasco.

The intra-institutional mechanism for the evaluation of the research performed is largely based on trimesterly (and at times, more frequent) reports. It is telling that the opinion was often voiced by non-IBTA personnel that it is difficult to obtain the results of experiments from IBTA. Our readings of experiment reports and conversations with researchers would tend to support the view that analyses were not up-to-date. These problems in the analysis and disssemination of research results appear to be due to a lack of computational facilities, the absence of

personnel trained in data management and statistical techniques, an over-reliance and over-emphasis on frequent reports which require significant amounts of time in their preparation but which transmit little useful information, and the failure of the communications unit to prepare reports, technical bulletins, and farmer-oriented materials in a timely fashion. Delays in the flow of research funds have also contributed to problems in conducting and evaluating research originally programmed. There is a clear need for a better mechanism for the evaluation of research, especially with regard to quantifying the effect of research on the biological and economic productivity of the priority commercial crops, the incorporation of those results into the programming of subsequent research, and the dissemination of research results to technical audiences and farmers.

B. Extension

The goal of the extension program is to provide training and technical assistance to local farmers in the Chapare and to validate promising production systems under on-farm conditions. Given the project's growing emphasis on the production of commercial crops and the lack of farmer knowledge related to the management of these crops, it could be rightly said that the extension program is the most important component of IBTA's efforts in the Chapare.

1. The Extension Process

The extension program attempts to achieve its objectives through a variety of activities: training, via various methods, of local farmers, promoters, and extension-related personnel from agroindustries and NGOs; provision of technical assistance related to nursery management and plant propogation, crop production, and pre- and post-harvest handling and processing of commercial crops; the organization of regional agricultural fairs and local mini-fairs; the establishment of on-farm demonstration plots; the installation and evaluation of on-farm experiments; control of disease, fertility, and veterinary problems either in community nurseries, modules, or on farms; and the communication and dissemination of information via radio and publications. These activities are carried out directly by 19 extensionists in annual and perennial crops from the La Jota station and 8 extensionists in forages and livestock from the Chipiriri station. Indirectly, this is done by local farmer trainees ("promoters") or extension personnel employed by the NGOs, farmers associations such as UNABANA, or local agroindustries; these groups usually receive at least some training from the IBTA extension personnel.

The extension process starts with group meetings organized by IBTA in order to explain the program and the crops prioritized for the region. Farmers or groups showing interest are then recruited into the program. All interested farmers appear to be accepted, although IBTA prefers to work with farmer groups or associations due to the greater efficiency of resource use obtained by working with groups. The extension program, at least in the case of the commercial crops, delivers the majority of planting material to the groups. Some groups, however, produce their own material. Planting material is either bought at a subsidized price, lent in kind, or given freely. The material may be ready for immediate out-planting or it may require further time in community nurseries which are also organized with IBTA assistance. Outplanting is done under IBTA supervision and IBTA provides crop-related technical assistance and training to the farmers via the extension techniques mentioned above. IBTA also controls fertility and pest and disease

problems, at least initially. Thereafter, the costs of products used in control are paid by the farmers' associations. At each stage in the process, IBTA attempts to train farmers in appropriate management techniques.

While there was a good deal of consensus regarding IBTA's role in plant propagation and production, the role of IBTA extensionists in the pre- and post-harvest handling and processing of commercial products was a frequently cited point of contention. Apparently, IBTA extensionists are usually not involved in post-harvest processing, although plans exist, at least in the Mariposa pineapple processing center, for them to be charged with pre- and post-harvest handling, thus involving the extensionist in the whole production process. It was pointed out that this phase in the production process represents a critical point for evaluating the appropriateness and quality of the research and extension program and that the extensionist should necessarily be involved. By doing so, the extenionsists themselves would be able to evaluate the impact of the program. On the other hand, many interviewees thought that pre- and post-harvest handling can be done more efficiently with personnel employed by private agroindustries or by farmers' associations such as UNABANA. In any case, whether extensionists are actively involved or not in product handling, it is clear that they should transfer information on the effects of pre- and post-harvesting handling techniques on fruit quality to farmers.

Each extensionist has an annual quota related to his use of extension techniques and the degree of compliance of these quotas is the chief method for evaluation extension program success. On an annual basis, these quotas include: eight two-day-long on-station training courses for groups of farmers; six group visits of farmers to the experiment station or other farms; the organization of one mini-fair; the organization of one agricultural fair; technical assistance visits to local farms varying in frequency from weekly to sporadic, as noted above; four in-community training sessions for promoters; a variable number of meetings with sindicates and community production organizations (OCPs); the distribution of planting material, when available; and the establishment of on-farm demonstration plots or production modules which include technological packages and training in annual, perennial, and/or livestock management. Of these techniques, it has been suggested that farmers learn the most in short training courses. These activities are supplemented by dissemination of information via radio and publications. Although the latter techniques are potentially powerful, they have been of limited usefulness due to the small range of the local radio station, the limited numbers of publications printed, and the lack of publications in Quechua which many of the farmers, especially the women, speak.

The main pathways for the transfer of information are between extensionists and promoters, extensionists and farmers (groups or individuals), and promoters and farmers. As mentioned previously, researcher contact with farmers is minimal and the researcher-extensionist-farmer relationship is mainly vertical in nature. A similar comment could be made about the extensionist-farmer relationship, at least with regard to the commercial crops, since these crops are new to many of the farmers who consequently must be trained in all aspects of their management.

In general, there is little effort to formally identify farmers' constraints or problems, to elicit their opinions, or otherwise include them in the problem solving process. In the case of the commercial crops, this is partly due to the newness of the crops and the emphasis on

management techniques required for the crops to meet market-determined norms. In addition, neither researchers nor extensionists have had much experience with formal diagnostic techniques or with including farmers as partners in the research-extension process.

2. Extensionists and Promoters

In general, the impression of the IBTA extensionists among their clients is favorable, particularly in the area of bananas. The extensionists are well known to the farmers, make a good effort to maintain frequent and periodic contact with them (this ranges from weekly to sporadic and appears to be due to geographic distance involved and the interest of the extensionist), and are generally viewed as doing a good job, although many clients, as well as extensionists, concur that the latter could be better trained.

In large measure this is due to the continual presence and the policies instituted by the institution during the last eight years. During this time, the number of extensionists has increased greatly and the nature of their responsibilities has also changed. The latter has been a response to the increasing emphasis on commercial crop production and commercialization by the project. Previously, the extensionists were allocated to specific sub-regions and were expected to function as a jacks-of-all-trades, i.e. they were responsible for giving technical assistance related to a variety of annual and perennial crops and livestock. However, as IBTA has become more sensitive to the growing demand for greater amounts of technical information related to the commercial crops, the extension program has put greater emphasis on having extensionists specialized in one of those crops.

This has meant an increased need for extra training for the extensionists since, like the researchers, virtually all (22; in addition, one veterinarian, one economist, and three peritos) have ingeniero agronomo degrees in general agronomy from San Simon University. However, the provision of specialized training does not appear to have kept up with demand. Of the 27 extensionists, only three in banana and two in pineapple have received additional coursework and/or hands-on field experience. This has consisted in training sessions of a few weeks to a few months duration either in or out of country. There is a clear need for further training in the management and production aspects of all of the main commercial crops. Furthermore, few extensionists, regardless of the level of technical training, have received instruction in extension techniques and communication skills and almost all recognize a need for and desire additional training in this area. Finally, both extensionists and promoters alike mentioned shortages in field equipment and agricultural products needed for promotion activities.

The farmer-extensionist relationship is often mediated by the promoters. In fact, the latter have greater contact with the either individual farmers or groups of farmers than the extensionists. The reason for this appears to be due to the great numbers of farmers present and the distances involved. All extensionists cover large geographic areas and serve from approximately 60 to 120 farmers. Furthermore, none are from the Chapare nor reside there permanently.

Promoters receive additional training from IBTA, either in or out of country, in a given commercial crop and are thus able to help organize meetings among groups of farmers in their areas as well as to give technical advice to other farmers. As such, they help extend the range

of the extensionists' influence at little cost to the project. It should be noted, however, that the promoters' ability to supplement the extensionists in technology transfer has been less than originally expected. There are presently 53 promoters; most are usually paid approximately $25 per month, mainly to cover transportation expenses. This causes some jealousy on the part of some farmers, but on balance, the project's experience with promoters has been judged positive.

3. On-Farm Demonstration

Although we concentrated mainly on the extension efforts devoted to the main commerical crops, we feel that certain aspects of on-farm demonstration deserve special mention.

A review of IBTA's Operational Plan for 1993 shows that approximately 50 activities related to the establishment and validation on-farm of mixed associations of annual crops, perennial, and/or animals are programmed. The number of different systems being validated is so large and their functioning so complex that we suspect that the results of these deomstration plots, while locally interesting, are unlikely to contribute much to the understanding or development of improved farming systems. We strongly suggest that work with such systems be based on a prior analysis of limiting factors and constraints in the traditional systems, and the potential role which these improved systems or components will play in alleviating those constraints and improving production. In this regard, we recommend that the rationale behind the validation of many of these crop combinations be made explicit and that **ex-ante** economic analyses be performed in order to narrow the selection of potential systems or components to be validated.

C. Plant and Animal Propagation

IBTA's goal in plant and animal propagation is to provide improved and healthy genetic material to researchers, local farmers, and industries at a reasonable price. Components of this program include: maintaining germplasm banks, providing certified seed, developing appropriate vegetative propagation techniques, acquiring material from outside the region when necessary, and establishing and monitoring community nurseries. Since IBTA's greatest challenge is to provide planting material of the economically important varieties of the main commercial crops, banana, pineapple, black pepper, and tembe, we concentrated most of our efforts on reviewing the status of these activities.

In the case of banana and pineapple, IBTA serves chiefly as a broker and importer of plant material. Once imported, the material is maintained in IBTA nurseries until ready for transportation to community nurseries or for out-planting. Eventually the material is either sold to the local farmers at a subsidized price less than or equal to the cost of production, is lent in kind (for every 5 plants lent, 6 must be returned), or is given freely in exchange for land and labor provided by the farmers.

A number of problems with the system are evident: there appears to be a shortage of plant material; there is no assurance that plant loans will be repaid; and disease problems (e.g. Fusarium in pineapple) have been imported into the Chapare due to a lack of sanitary control.

Of these problems, the shortage of planting materials of banana, pineapple, and black pepper appears to be the principal current bottleneck. This is less of a problem with tembe and annual crops such as rice, since most material is produced locally. However, shortages of certified rice seed have also been experienced. It was noted in IBTA's 1993 Operational Plan that plant production in general only reached 65% and animal production 23% of the goals programmed for 1992. This occured despite the large amount of technical and field staff devoted to plant propagation at both the La Jota (24) and Chipiriri (12) stations.

The reasons for this are manifold: importation of plant material is expensive and the paperwork required slow, propagation in the Chapare itself is limited by the lack of host material (e.g. black pepper) or the slow rate of development of the propagules; appropriate and rapid propagation techniques and facilities i.e. a tissue culture laboratory, are lacking; and there is a lack of coordination with other entities able to assume some of this responsibility (e.g. IVS and rice).

The nursery program includes community nurseries, the central nursery at La Jota, and community clonal orchards ('huertos madres'). In banana, there are five community nurseries, two community clonal orchards, and the central nursery at La Jota. Although we were not able to tour all the banana nurseries, the La Jota and San Luis nurseries were in good condition. There are six community clonal orchards for pineapple. While the ones we viewed were in acceptable condition, the recent presence of Fusarium in the region draws attention to the urgent need for a strategy for dealing with this problem at both the nursery and field levels, since it diminishes the comparative advantage of the Chapare region in pineapple production. Tembe is a rustic plant and its nursery propagation techniques are simple. Of the ten community and one central nurseries, the ones we viewed at La Jota and Entre Rios were adequate. However, more research is needed on reducing costs of production (e.g. bare root planting) and accelerating early plant growth. Black pepper is propagated at the La Jota and Chipiriri nurseries, mainly through cuttings. Current research there is focussing asexual propagation techniques, potting and rooting media, and nursery management. We did not have the opportunity to view any black pepper propagation facilities.

D. Inter-Institutional Relationships and Clients

1. Overview

Apart from individual farmers or groups of farmers, IBTA maintains formal or semi-formal relationships with a number of institutions and clients. These include: NGOs, agroindustries, lending and technical service institutions such as Agrocapital, Bolivian research or teaching institutions such as the Centro de Investigacion de Agricultura Tropical (CIAT) in Santa Cruz and the San Simon University, in Cochabamba, and other international institutions such as universities and international agricultural research centers.

The majority of these relationships center around training and germplasm. On the one hand, IBTA provides training,technical assistance, and germplasm to NGOs, agroindustries, and lending agencies working in the Chapare. On the other hand, IBTA receives germplasm from a variety of CGIAR centers such as IRRI, CIMMYT, CIAT, and CATIE, and a number of their

technicians have been trained in US universities or at CATIE. However, there appear to be few attempts to tap the resources of these institutions to improve the technical quality of IBTA's work. Agreements with US universities, such as North Carolina State University, which provide for the out-posting of US graduate students to IBTA/C, appear to have benefitted the training of both parties; similar results have been obtained with San Simon University. Surprisingly, there appears to be little technical contact with other research stations within the IBTA system.

In cases where IBTA and the other groups are providing technical assistance in the Chapare, it would appear that IBTA's personnel are older and more experienced, more educated, and tend to rely more on group-based methods rather than individual contacts. The extension personnel of IBTA and the other groups are largely non-native, although some groups attempt to employ residents of the Chapare as para-professionals, and all tend to make use of promoters recruited from local farmers. Most groups work on a schedule similar to that of IBTA.

In general, IBTA's relationships with groups and organizations outside the Chapare are good. In contrast, relations with groups working either directly in the Chapare or having interests there are often marked by negative criticism, inter-institutional jealousy, and a break down in cooperation which, in turn, leads to disorganization, confused lines of authority, and an oftentimes confused message and overlap in the services rendered to farmers.

2. Relationships with NGOs

There are presently four NGO's working in the Chapare. The team met with three of them: International Voluneer Assistance (IVS), Technoserve, and Serviagro. IVS works mainly with black pepper, Technoserve with pineapple, and Serviagro with agroforestry systems and rice. All are funded through grants received from Planning Assistance, another NGO funded by AID to help organize NGO activities in the Chapare. All of the NGOs concentrate on providing technical assistence and planting material (either directly or via IBTA) to farmers. Additionally, Technoserve provides assistence, on a contractual basis, in group organization, accounting, and pineapple commercialization. Although Serviagro's project does not prioritize the main commercial crops, they appear to address local market niches which also represent important opportunities for increasing farm income; they are also active in the commercialization of rice. All have been working in the area for less than two years and their technical staffs are small, four in the case of IVS, four for Technoserve, and five in Serviagro. Not all staff have extension responsibilities. Their coverage ranges from 20-60 ha of black pepper (80 to 240 farmers) for IVS, 159 farmers for Technoserve, and 48 farmers in the case of Serviagro. Most of the NGOs train promoters to extend their extension efforts.

Cooperation between IBTA and these groups has taken the form of provision of plant material, training of NGO extension specialists and promoters, and the preparation of training materials. In the case of pineapple, these relationships have been institutionalized via the formation of a Technical Operations Group (GTO) composed of representatives of IBTA, DAI, Agrocapital, Technoserve, and heads of farmer associations. The purpose of the GTO is to provide coordination in production planning and solutions to technical problems related to production and post-harvest handling of pineapple. A similar group was formed for banana, but is not functioning as well.

Chief complaints related to IBTA appear to be the lack of planting material and the unwillingness of IBTA to cede responsibilities to the NGOs. On the other hand, IBTA has cited the NGOs for lack of program follow-through. It should be noted that much of the latter problem appears to be due to the terms of reference under the grants provided to the NGOs by Planning Assistance which are one year in duration. Planning Assistance and the NGOs should move to a multi-year planning horizon which meshes closely with other CORDEP programs. They should also coordinate closely with IBTA/C in planning the involvement and responsibilities of the NGOs.

3. Farmers' Associations

The principal farmers' associations operating in the Chapare are the Union of Banana Producer Associations (UNABANA) and the Associations of Pineapple Producers. UNABANA is composed of five associations governed by a Board of Directors composed of the presidents of the five associations. Pineapple Producer Associations are located at Mariposas, German Busch and Eteresama.

DAI is working directly with UNABANA, which has constructed two banana packing sheds and has an active association nursery program. Relations with IBTA/C have been a bit shaky as inter-institutional suspicions and relationships have been worked out. UNABANA has two extensionists on its payroll who work directly with association members in pre-harvest pruning, bagging and tagging operations. IBTA/C now accepts this situation although we were told that there was some friction over this matter when it first came up. Relations now seem to be on a relatively good footing.

Technoserve is working with the Pineapple Producer Associations as described in Section IV,D,2 above. IBTA/C provided training to the Technoserve agricultural technician who is extending the IBTA/C recommended management practices for pineapple to Association members.

The team anticipates that the importance of farmers' associations will grow as production of the priority crops expands. IVS, for example, will be working to organize farmers' associations for the production of black pepper. In time, the farmers' associations, working with the NGOs, should take an increasingly active role in transmitting technological information, prepared by IBTA/C, to their members.

4. Agroindustries

The team met with representatives of four agroindustries with activities or interests in the Chapare: Industrias LAS, a Santa Cruz-based bottling and canning firm; Bloch Ltda., a family-operated packaging and marketing firm specializing in spices, jams, and baked goods; SOINAGRO, a small firm with refrigerated trucks which has been transporting bananas from the Chapare to Arica Chile; and SEASA, a juice and canning factory that uses pineapple, maracuya, and citrus from the Chapare and which is in the process of installing a commercial production and processing operation in the zone. Another commercial enterprise working in the region is Agrocapital, which provides credit and limited technical assistance to farmers and agroindustrial firms in Cochabamba department.

Some industries employ their own technical personnel in order to manage their own land holdings, provide technical assistance to cooperating farmers, and produce planting materials. Agrocapital has six credit agents, the majority agronomists, who work with farmers on production planning, and three technical agents who are specialized in the management of banana (one), pineapple (one), and rice (one), as well as other crops; SEASA has an agronomist (an ex-IBTA employee) stationed in the Chapare with responsibility for maracuya, pineapple, and oranges; and Industrias LAS has an agronomist and two tissue culture technicians working on pineapple in Santa Cruz and may assign personnel to work with farmers in the Chapare.

Apparently the tendency of agroindustries to provide services overlapping those of IBTA is based on their analysis of weaknesses in IBTA's ability to provide these services in a timely fashion and their desire to reduce risk, especially in the areas of pre- and post-harvest handling. It was also mentioned that IBTA needs to better disseminate information, especially that related to production planning. On the other hand, it should be noted that IBTA has provided important services to these industries, such as the importation of plant materials and that IBTA and some agroindustries have also cooperated on laboratory analyses and the use of land for large-scale trials.

5. San Simon University

The Faculty of Agriculture at San Simon University has five departments: Fitotecnica, Ingeneria, Zootecnica, Desarollo Rural and Technologia Agro-Industrial. The faculty graduates about 80 students a year, 20 of whom go on to complete their thesis and obtain the title of ingeniero agronomo. 20% of the faculty have master's degrees and 5% have PhD's.

Relations with IBTA/C over the years have not been very collaborative. This situation changed somewhat in February of this year when the Faculty of Agriculture and IBTA/C signed an agreement which provides for joint research and increased cooperation of San Simon egresados and tesistas in IBTA/C activities in the region. Ten tesistas are working with IBTA/C this year, five at La Jota and five at Chipiriri. Six San Simon tesistas worked with IBTA/C last year. The tesista program, which pays each student $100/month and provides room and board, is an excellent and inexpensive way to augment the IBTA/C research staff. It also exposes the tesista to real-world working conditions and prepares them to enter the work-force with IBTA/C or other organizations working in the area. We encountered a number of ex-tesistas who were working with IBTA and other organizations. The team felt that this program deserved additional support under the Project.

The Faculty of Agriculture has a large (5,680 ha) research station in the Sajta valley in the drier, eastern part of the Chapare. It is, in fact, a more logical site for forage, pasture and livestock work than the Chipiriri station. The University would like to upgrade their operation there to make it a first-class commercial/demonstration center. They would also like to train para-technicians from the zone who would have one or two years of general agricultural courses and then work in their communities. Such para-technicians would be a welcome addition to the extension ranks of the NGO's, farmers' associations and even the private agro-industrial firms. USAID/Bolivia should explore the possibility of supporting such a training program as it would make a valuable contribution to the trained work force that lives in the area, as contrasted with the IBTA and other technical personnel who commute weekly or bi-weekly to the Chapare. The

University would also like to provide specialized short courses to colonos that live in the area.

Relations between the Faculty of Agriculture and IBTA/C have been mostly at the inter-personal level. The recent agreement, however, should help inter-institutional cooperation. The Dean of the Faculty felt that the current Director of IBTA/C was more open to collaboration with the University than his predecessors. The team felt that the Project should attempt to encourage increased cooperation between the two institutions. A good start would be through providing funding (at a level of perhaps $100,000 per year) to support an increased number of tesistas and training of "medio tecnico" para-professionals, joint research and plant propagation activities, principally at the Sajta Center, and also for the para-technician training program, including participation by IBTA/C staff in teaching some of the courses.

V. ISSUES AND RECOMMENDATIONS

A. Issue: Are IBTA/Chapare's objectives in research, extension, and plant progagation appropriate?

Discussion: The overall goal of the CORDEP project is to increase the income of farmers in the Chapare by increasing crop and animal (mostly crop) production in a socially acceptable and environmentally sustainable manner. It has been thought that the most effective way to accomplish this goal is to increase the production of commercial crops having good internal or external markets and prices. Based on marketing studies and contacts, these crops include banana, pineapple, black pepper, and palmito. A key element of this strategy is to improve the quality of these products via changes in varieties and improved production and product handling which would permit farmers to demand higher prices.

IBTA/C's primary role in the CORDEP project is to provide planting material to farmers, perform research aimed at solving problems or overcoming constraints related to crop production and quality, and to pass on appropriate management-related knowledge and techniques to farmers. While we regard IBTA's emphasis on the above-mentioned crops as appropriate, we feel that there is a danger in putting too much emphasis on the commercial crops and overlooking the need to continue research and extension on subsistence crops and agroforestry species. The latter are important for a number of reasons.

Although the commercial crops have a high potential for increasing farmer income, agriculture in the Chapare is still based primarily on subsistence systems in which farmers put a high priority on food security and risk avoidance. It can be argued that farmers could easily satisfy their subsistence needs by allocating the majority of their resources to commercial crop production, but given the volatility of prices of major commercial crops such as bananas and coffee, the risk of crop loss due to insects, diseases, or flooding, and the time required to work out the bugs in the production to marketing chain, an overriding emphasis on these crops alone appears to be questionable at this time. Hence commerical crop production should be viewed as a potentially important income-producing component of production systems where other components (annual grain crops, other tree crops, and animals) play important roles in food security, income generation, and long-term sustainability.

Viewed in this context, is the IBTA program appropriate with regard to crop, tree, or livestock species and is it being carried out? The current programmatic reorganization of IBTA, if put into practice, will result in prioritizing the four major commercial crops mentioned above, and is a positive change which we favor. However, we are somewhat concerned about the apparent lack of emphasis placed on rice, corn, beans, and yuca. These crops have traditionally been used for subsistence and, in the case of rice and yuca, appear to possess commercial potential as well. Moreover, the production and resiliency of small farming systems can also be enhanced by taking advantage of and improving the interactions between crop, animal, and tree components, hence we feel that the inclusion of agroforestry as a program line is also appropriate.

At the present time, IBTA's actual programs do not adequately reflect this scheme. In general, IBTA's efforts and resources are dispersed among too many crop and animal species. We suggest that the quality of IBTA's research and extension program can be much improved by trying to do fewer things better.

In practice this would imply investing more resources in adaptive reseach and extension related to the four major commercial crops; secondary emphasis would be placed on the annual crops mentioned above, a small number of perennial crops of secondary importance which would be identified based on their income-producing potential (perhaps maracuya, citruses, and one or two others), and tree, forage, or animal species which can play important role in alleviating constraints perceived by farmers and/or improving the economic productivity and the ecological sustainability of the farming systems. Activities in the latter category would be carried out within the agroforestry program. In agroforestry, we suggest that research and extension concentrate on the development and use of components (eg. improved annual crops, leguminous cover crops, and multi-purpose trees) rather than systems, since the latter strategy is more flexible in adapting technologies to farm conditions. In effect, farmers should be offered a menu from which they could choose the components that they think most useful for their situation. The choice of components to be included in this program should be based on an analysis of limiting factors and constraints present, as well as informed decision regarding probable future problems.

On the reverse side of the coin, we suggest that research and extension on a number of the perennial crops presently included in the program be dropped entirely or limited solely to the maintenance or evaluation of germplasm which require minimum resources. Crops in this category would potentially include: avocado, carambola, mulberry, papaya, coffee, cacao, rubber, macadamia, ramio, and guanabana. These crops could, of course, be included in future programs should conditions change.

Since we spent little time evaluating the livestock and forage prgrams, it is somewhat difficult to assess the quality of programs in these areas and their importance to farmers in the region. In any case, the overall importance of the livestock and forage progams, their research and extension lines, and the geographic location of the headquarters should be subjected to closer scrutiny as IBTA/C budget levels begin to decline.

Recommendations

1. That the IBTA program emphasize the four main commercial crops of banana, pineapple, black pepper, and palmito, subsistence food crops, a limited number of perennial crops of secondary importance, and tree and forage species that can enhance the economic and ecological performance of farming systems present in the region.

2. That IBTA/C eliminate or reduce to a minimum (i.e. germplasm maintenance or evaluation) the number of activities related to the other perennial crops presently included in IBTA's program.

3. That diagnostic surveys and **ex-ante** economic analyses be performed by IBTA/C in order to evaluate the present and potential importance of the livestock program in the region and the suitability of its program lines, its geographic scope, and the location of its headquarters.

B. Issue: Is IBTA/Chapare organized in the most effective manner to achieve project objectives in the short and medium term?

Discussion: As discussed in Section III, IBTA/C is in the process of restructuring its organization. The structure that they used for a number of years divided the field staff into three elements: research, extension and plant and animal production. Last year's reorganization grouped the research (and some of the extension) program into eight program areas: fruit crops; stimulants, colorants and spices; grains and legumes; roots and tubers; palms; agroforestry; forage and livestock; and multi-disciplinary support The extensionists were divided among the micro-regions with eight specialized extensionists (three in bananas, two in pineapples, two in livestock and one in forage) and 17 generalists.

The Director of IBTA/C told us of yet another planned change which will group research, extension and production personnel into eight commodity programs: pineapple, banana, black pepper, palmito, agroforestry, miscellaneous crops, forage/cattle, and pigs/small animals. There has been some preliminary assignment of research, extension and plant and animal propagation personnel to these programs, but the reorganization is not yet approved.

The evaluation team strongly endorses this move because it provides the structure to bring the three elements (research, extension and production) together in a coordinated, focussed program which can significantly enhance IBTA/C's role in expanding production of the commodities (i.e., pineapple, bananas, black pepper and palmito) with strong market potential and the ability to increase income and employment in the area. Such a change implies, rightfully in our opinion, a substantial reduction of effort in other lower priority crops which will now be grouped under a new, catch-all program labelled miscellaneous. This program area should include a much reduced level of research in crops such as maracuya, citrus, ginger, tumeric, and basic food crops and the maintenance of germplasm collections of such lower priority crops as coffee, cacao, macadamia, and coconut. (See secions V,A and V,C).

In organizing the programs in the four high priority commodities, the strategy should be to emphasize extension and plant production, with research as needed to deal with clearly identified management needs or problems such as variety selection, planting densities, pest control and soil fertility. In addition, while the emphasis within each program should clearly be on the priority crop, it should be recognized that the priority crop is part of a production system which includes food crops and secondary cash crops. Thus, extensionists should be well trained in all aspects of production of the priority crop, but should also be able to advise farmers on a limited number of supporting food and cash crops which constitute the farmer's production system.

The program leaders should bring together the various personnel in the program, including promoters and other farmer leaders, to establish extension, plant production and research priorities, fix responsiblities, and set schedules and dead-lines. There should be a clear understanding by all program participants of where the program is going, who does what, and when.

In this regard, IBTA/C needs a clear methodology for carrying out its priority programs which includes a high level of farmer participation, an understanding of market quality and timing requirements, agreement on a standard technical approach which is transmitted and reinforced by all program participants and a continuous validation of and feed-back on program content. Such a methodology could be introduced through application of the Communications for Technology Transfer in Agriculture (CTTA) model which has been used with considerable success in Honduras, Peru, Indonesia and Jordan. In the words of the evaluators of the CTTA model, it was instrumental "...in developing a systematic process that is highly sensitive to farmer client groups, integrates research and extension, provides for a high degree of farmer participation, utilizes existing personnel and resources in an orderly and cost-efficient mannger, and inspires a surprisingly high level of motivation and enthusiasm among all project participants." IBTA/C needs to internalize and institutionalize such a process to better focus its program resources and energies on the achievement of CORDEP project objectives.

Recommendations

1. That IBTA/C proceed with the planned reorganization that groups research, extension and production personnel into eight priority program areas.

2. That the miscellaneous crops program carry on a reduced level of research and plant production in crops with economic potential but of lower priority, such as maracuya, citrus, achiote, tumeric, and in basic food crops and that it maintain germplasm collections of low priority crops such as coffee, cacao, macadamia, coco and ginger.

3. That USAID/Cochabamba and DAI arrange for a three month consultancy by Milton Munoz, currently with USAID/Guatemala or Marta Cruz, currently with INIA/Peru to work with IBTA/C field staff to outline the elements of an institutional methodolgy for carrying out the research, extension and production programs which makes the best use of existing resources, assures a high level of coordination with farmer clients and market outlets, and focusses the energies of program participants on achievement of project objectives. Design of training programs in extension and communications techniques would be a key part of the technical assistance package.

C. Issue: Are IBTA's research programs relevant and are they effective in carrying out their objectives?

Discussion: There was consensus that IBTA has an important role to play in adaptive research, especially that related to the major commercial crops where much knowledge already exists, and that this research should be targeted at solving problems experienced by farmers that are related to crop adaptation and management. This implies: 1) more direct contact by

researchers with farmers in order to gain a better understanding of their systems and problems and 2) a much greater emphasis on on-farm research in order to test technologies under realistic conditions, develop a broader understanding how such technologies perform under different conditions and what levels of productivity might be expected at given types of sites, better tailor research recommendations to those conditions, and transfer such techniques to farmers.

In order to convert the present research program to one more responsive to farmers' needs, a first step would be to review in detail the present research program and its results in order to decide which research lines to continue or eliminate. Concomitantly, constraints and limitations to production, and potential research lines leading to the alleviation of these constraints, should be identified. Finally, a vigorous program in on-farm research should be instituted.

While we are unable to present an exhaustive list of research needs without a thorough evaluation of the results of diagnostic surveys or the previous research program, various research themes appropriate for all the commercial crops are readily apparent: the screening and evaluation of germplasm; vegetation propagation techniques for on-station (e.g. tissue culture) and community use; the effects of planting densities on crop production; studies of fertilization (both organic and inorganic fertilizers) and plant nutrition; identification and monitoring of pest and disease problems and evaluation of control measures; soil characterization and mapping; and pre-, and in some cases, post-harvest handling techniques. Other research topics limited to fewer crops or relevant to farming systems should include the evaluation and selection of: other potentially valuable perennial crops, live tutors (preferably valuable tree species) for black pepper, living fences, the use of leguminous cover crops/green manures/forages, and multi-purpose economically valuable tree species.

As mentioned above, the present method of research planning should be replaced by one more based on a diagnosis of farmers' problems and constraints in order to better target research. In addition, the present system of research evaluation, based primarily on the presentation of research reports, should be complemented by one where an attempt is made to quantify the biological and economic benefits of the application of such technology on productivity. This, in turn, suggests the need to strengthen the analytical capabilities of the research program in economics, statistics and data management, soil, and pest and idsease control, as well as the installation of more computers and laboratories for plant and soil analysis. The requirements for and quality of periodic reports should also be examined in order to reduce the quantity of researcher time spent on reports which transfer little useful information. Finally, the communications unit of IBTA/C needs to make a greater effort to disseminate information to technical users and farmers.

In light of probable reductions in IBTA/C's budget, it will be necessary to better use the research resources available in the Chapare. We recommend that this be done through the creation of a fund for research grants which would open up the research process and help target research to local needs. These funds would be available to institutions (NGOs, the University of San Simon, private agroindustrial firms, and IBTA) on a competitive, matching basis and would be awarded for proposals deemed appropriate by a grants committee made up of representatives of farmers associations, agroindustries, NGOs, and San Simon University. (See section V, G for an additional discussion of the mechanisms of establishing and administering

a research grants fund).

The formation of GTOs is a positive step and should be taken advantage of in order to improve production planning and evaluation and to forge greater contact and interchange among groups working on technical issues in the Chapare. The formation of similar groups for the other commercial crops on both a sub-regional and region-wide basis should be encouraged.

Recommendations

1. That DAI contract one person month of technical assistance to assist IBTA/C review the results of IBTA's current research program in light of diagnoses of constraints on production and existing market opportunities in order to determine which lines should be continued or eliminated and which concerns are not being currently addressed.

2. That IBTA/C change the direction of its research program so that greater emphasis is placed on identifying and solving farmers' problems via the use of greater researcher-farmer contact, diagnostic surveys, and on-farm trials.

3. That IBTA/C include the diagnosis of farming systems and **ex-ante** economic analyses as formal elements in research programming.

4. That IBTA/C strengthen the evaluation of research impact by including both biological and economic analyses of research benefits. The requirements for and quality of periodic reports should be reviewed in order to decrease the amount of researcher time spent on preparation of reports which transfer little useful information.

5. That USAID/Bolivia provide funding to form a competitive research grants fund to encourage greater participation of institutions in research in the Chapare. (See section VI, G for additional discussion of a research grants fund).

6. That USAID/Cochabamba, DAI, and IBTA/C encourage the formation of GTOs (Technical Operation Groups) in order to provide better production planning and evaluation and greater interaction and exchange of technical information among institutions working in the Chapare.

7. That IBTA/C strengthen its research and analytical capabilities by hiring or training personnel in the areas of economics, statistics/data management, soils, and integrated pest control; equipping laboratories for soil and plant analysis; and installing more computers.

8. That IBTA/C increase the efforts of the communications unit to assure the dissemination of research results at both technical and farmer levels.

9. That IBTA/C, DAI, and USAID review the present and future role of the Chipiriri research station in research, extension, and training.

D. Issue: Is the extension program effective?

Discussion: The effectiveness of an extension program can be evaluated in various ways: number of farmer contacts, the quality of the information transferred, the capture of this information by the farmers, and the increase in productivity as a result of information transfer. As one proceeds along this list, the ease of evaluation decreases, as the appropriateness of the indicator increases. In the Chapare, IBTA's extension program tends to depend on the first two elements of the list, and based on these criteria, the program can be judged to be fairly successful - the IBTA extensionists are known throughout the region, contacts between extensionists and farmers are relatively frequent, and the quality of the information transferred is adequate. However, in order to improve the evaluation of the project's impact, it is clear that greater emphasis will have to be placed on collecting quantitative data related to production and product quality and qualitative data related to farmer attitudes and acceptance of the technology transferred.

With regard to the involvement of extensionists in extension activities related to pre- and post-harvest handling, we agree that extensionists should transfer information related to, as well as be involved in, these processes. Farmers are clearly in need of this type of information. Furthermore, extensionists' involvement in this area will aid in providing feedback to IBTA/C about the effectiveness of its research/extension program.

Although IBTA continues to make a good effort at transferring information to farmers, it is clear that deficiencies exist, especially with respect to the commercial crops, principally due to the large geographic region which must be covered and the extensionists' lack of specialized knowledge of these crops. In the short term, we do not recommend an expansion of IBTA's extension staff, but rather that a hierarchy of additional training be implemented. We suggest that the entire extension staff of IBTA receive further training via short courses in the main subsistence crops and in communication/extension techniques and that select members of this staff (two/crop) having greater contact with farmers working with the main commercial crops receive specialized training (one to three months) in the management of one or two of these crops. These specialists would be complemented by others who would receive longer (six to twelve months) and more intensive training in one of the commercial crops. The intent of the latter would be to form a small cadre of commercial crop specialists who could back up both research and extension activities related to these crops and who could supply specialized training to others.

While IBTA can continue trying to cover the entire Chapare region, this will require a degree of manpower and training that financial resources may not permit, especially in the face of forthcoming budget reductions. Therefore, we suggest that IBTA gradually transfer the responsibility for extension to the private sector. In the medium term, we recommend that IBTA share its responsibilities for extension with the NGO's and agroindustries to a greater extent than at the present. Such an arrangement, however, assumes better inter-institutional organization and sharing of responsibilities than presently exists. We recommend that IBTA assume that responsibility, due to its history and involvement throughout the region.

In the long term, we recommend that IBTA leave the responsibility for direct extension work with farmers entirely to other groups and that it concentrate its efforts solely on pre'extension activities, i.e., the training of extensionists and promoters of the other groups working in the zone. The latter approach has been successfully used by CIAT in Santa Cruz in their technology transfer strategy and would be in accord with IBTA/Nacional's mode of operations should IBTA/C be reincorporated to that group.

If possible, attempts should be made by IBTA, the NGOs, and the agroindustries to recruit extension personnel from the Chapare region itself. They could be trained along the "medio tecnico" lines proposed by San Simon University where residents of the Chapare would take one or two years of coursework in the chief crops and in extension techniques.

We question the usefulness of the majority of the on-farm demonstation plots. Due to their large number, variety, and complexity, we suspect that the results of these demonstration plots, while locally interesting, are unlikely to contribute much to the understanding or development of improved farming systems. We strongly suggest that work with such systems be based on a prior analysis of limiting factors and constraints in the traditional systems, and the potential role which these improved systems or components will play in alleviating those constraints and improving production.

Recommendations

1. That USAID/Bolivia and IBTA/C should support, in the short term, a training program for IBTA extensionists. Under this program all extensionists would be trained in subsistence crops and extension/communication techniques; a subset of extensionists (two/crop) would undergo short-term training in techniques related to the main commercial crops; and a small cadre (one per crop) of extensionists would undergo longer and more intensive training in one commercial crop in order to enable them to provide technical backstopping to research and extension in these areas and to train other extensionists.

2. That, in the medium term, IBTA/C seek greater cooperation and coordination with NGOs and agroindustries working in extension and that it share responsibilities for extension with them. IBTA should be responsible for limited extension activities, organizing an inter-institutional extension network, assigning responsibilities for crops in specific sub-regions, and ensuring that the technical content of the extension messages disseminated by all groups are compatible.

3. That, in the long term, IBTA/C transfer all responsibility for direct extension services to NGOs, farmers associations and agroindustries while assuming responsibility for the training of extensionists and promoters.

4. That IBTA/C assess the possibility of collaborating with the University of San Simon in the training of 'media tecnicos' from the Chapare region in extension techniques. (See section V, F for additional discussion of cooperation between IBTA/C and San Simon University).

5. That IBTA/C, DAI, and USAID ensure that the extensionists participate in pre- and post-harvest handling in order to provide direct feedback to the research/extension process.

6. That IBTA/C examine the usefulness of the crop combinations used in on-farm demonstration/validation and that the rationale behind these systems be made explicit. **Ex-ante** economic analyses and diagnoses of limiting factors and constraints should be performed before installation of such systems in the field in order to narrow the selection of potential systems or components to be validated.

7. That IBTA/C strengthen the formal evaluation of the research/extension programs by attempting to quantify biological and economic increases in productivity and changes in farmers' attitudes and acceptance of new technologies through periodic surveys.

E. Issue: Are current plant propagation activities sufficient in order to meet project needs?

Discussion: IBTA is clearly not meeting its goals in providing plant material, especially of the main commercial crops, and it is uncertain whether they will be able to do so in the future as demand increases. Therefore, the main question is how can IBTA increase production either alone or in cooperation with other institutions.

In the short and medium term, the possibilities for rapidly expanding plant production are limited due to the long time required for producing plant material by either tissue culture or vegetative propagation techniques. Therefore, it appears that IBTA will necessarily depend on the importation of plant material in order to meet demand over the next 2 to 3 years. However, a concerted collaborative effort by IBTA, NGOs, agroindustries, and the University of San Simon to produce material by vegetative propagation would help in decreasing importation needs. In this regard, IBTA could play an important role in synthesizing and disseminating information related to plant production to these institutions and by certifying the sanitary status of the material produced. We also suggest that IBTA not abrogate its responsibility for producing certified seed of the basic grain crops unless a reliable arrangement with other organizations is in place.

In the long term, it should be questioned whether IBTA should make the investment in a tissue culture laboratory or whether this should be the responsibility of the private sector. Again, given the foreseeable decline in funding, it may be advisable to assign this responsibility to the private sector. This could be done by competitively contracting out for production of pre'determined amounts of plant materials which would provide an incentive for a private sector firm or firms to invest in plant propagations infrastructure, including the possibility of one or more low'cost tissue culture labs. In order to 'prime the pump' for private sector investment in the production of planting materials, we suggest that USAID/Bolivia set aside $100,000 to $200,000 from the IBTA/C budget to fund competitively bid contract(s) for production of a pre-determined quantity of pineapple, banana, black pepper, and/or palmito planting material. The availability of funding for planting material production should induce private sector firms to enter into this business, which may be the most advisable course in the long run. Alternatively, it may be possible to form a consortium of private industries that would be responsible for the

operation of such a laboratory. In any case, IBTA's role would be to certify the material produced by the laboratory.

With regard to planting material, it is clear that a decision regarding the management of the current Fusarium infection of pineapple is urgently needed. We suggest that university or agroindustrial experts with experience in diseases of pineapple be consulted and that more than one opinion be sought regarding appropriate courses of action.

Recommendations

1. That, in the short and medium terms, IBTA/C continue with the purchase of planting materials that are unavailable in the region and that they work cooperatively with NGOs, farmer associations, the University of San Simon, and agroindustries on the vegetative propagation of planting materials in community nurseries in order to increase plant production. Special attention should be paid to how nursery cost can be reduced while accelerating early plant growth.

2. That, in the long term, USAID, DAI, and IBTA/C promote increased private sector participation in production of planting materials, including the possibility of establishing one or more tissue culture labs, by providing $100,000 to $200,000 to competitively contract for production of pre-determined amounts of planting materials from the private sector.

3. That IBTA/C assume the responsibility of certifying seed and planting material.

4. That IBTA/C consult with university and agroindustrial experts regarding the appropriate course of action for dealing with the Fusarium infection in pineapple plantings in the Chapare.

F. Issue: How should IBTA/Chapare work with other organizations in the Chapare, such as the NGO's, farmers' associations, San Simon University and private agroindustrial firms?

Discussion: The evaluation team was struck by the large amount of actual and potential resources at play in the Chapare. We presented a portion of these resources in Section III,D, describing some of the work of the farmers' associations, NGO's, private agroindustrial firms and San Simon University. Also evident was the clear need for much greater cooperation and collaboration between these groups. We were impressed with the good start that has been made in this direction by the naming of DAI product managers and field coordinators for each of the priority crops. The efforts in bananas and pineapple seem to be progressing well and this effort should be continued and intensified. One immediate move would be to reduce the responsibilities of the field coordinators so that they each work on only one priority commoditiy. Field coordinators responsible only for black pepper and palmito should also be named. The job of these field coordinators should be to serve as a catalyst to bring the various actors, i.e., farmers' associations, NGO's, Agrocapital, IBTA/C, and private agroindustrial firms together in a coordinated program in order to increase the quality and volume of the priority crops being processed in and exported from the Chapare. This will require continuous monitoring and

interaction with the key players, identifying bottle-necks, arriving at solutions and ensuring the free flow of information.

The establishment of the IBTA/C-led Technical Operation Groups (GTO) in pineapple and bananas has been a step in the right direction. This approach should be expanded to black pepper and palmito as soon as possible. These groups can make an important contribution to identifying and solving technical problems, establishing and maintaining high quality standards in the production and post-harvest phases, and to assuring that careful planting and harvesting schedules are put in place so that farmers are fulfilling delivery schedules for processors and exporters. Since the GTO's concentrate on pre-production, production and post-harvest activities, they are not a substitute for the role that needs to be played by the DAI field coordinators, but they are critical to the overall effective, efficient functioning of the production/marketing system being applied by CORDEP.

IBTA/C should be involved in the training and technical backstopping of extensionists working for the farmers' associations, NGO's and private agroindustrial firms. There should be agreement on the appropriate technologies to be pursued and the uniform diffusion of those technologies. As discussed in Section V,D., increased use should be made of radio and more farmer-friendly written materials need to be produced and disseminated by all of the partcipating organizations. Such an approach would greatly increase IBTA/C's outreach to farmers.

IBTA/C should enter into more collaborative activities with personnel from San Simon University. The sponsorship of San Simon tesistas should be continued and expanded, since the program provides a relatively inexpensive source of additional manpower and prepares additional human resources which can be employed by IBTA/C, farmers' associations, NGO/s and private firms. Both institutions should also enter into joint discussions regarding the training of "medio tecnico" para-professionals (see section V,D). Additionally, IBTA/C and San Simon University should develop joint research activities at the University's Sajta Center, especially on forages, pasture and livestock, since the Center is located in an ecological zone far better suited to such research than the Chipiriri station. Both entities should also collaborate on research in plant propagation.

Recommendations

1. That DAI designate full-time field coordinators (with no other responsibilities) for the four priority crops. They would serve as a catalytic element to bring all of the actors in the crop-specific production/marketing system together in a collaborative effort to significantly increase production, processing and export of each of the priority crops.

2. That GTO's be established for black pepper and palmito as soon as possible.

3. That IBTA/C proceed immediately with the proposed reorganization along priority crop lines and that they receive three months of technical assistance in developing a systematic methodology which integrates research, extension and production, increases farmer participation in problem identification and solution and is sensitive to the quality, volume and timing requirements of a market-oriented production/marking system. (See section V,B).

4. That a specific amount (perhaps US$100,000 to start) be set aside within or outside the IBTA/C budget to fund additional tesistas from San Simon and other Bolivian universities, the training of "medio tecnico" para-professionals in extension, and to start a set of joint research and training activities with San Simon University at the Sajta Valley Center.

G. Issue: Should there be more private sector participation in the planning, prioritization and execution of IBTA/Chapare programs?

Discussion: It appeared to the team that there was very little participation by the private sector, whether farmers, agroindustrial firms, NGO's or University professors, in determining the nature or content of IBTA/C's programs. At the field level, there appeared to be an interest on the part of researchers and extensionists in including farmers' concerns in the planning and prioritization, but there is no systematic process followed to assure that such participation occurs. At the national level, there is a Technical Council which advises the Director on policy and program content, but it is composed exclusively of IBTA/C personnel. Aside from its own internal deliberations, the only other organizations which exerts any meaningful influence over IBTA/C are PDAR, SUBDESAL and USAID/Bolivia which review and provide funding for its budget.

The team believes that IBTA/C's program would be improved and could be made more responsive to the concerns of farmer/clients, agroindustrial consumers and the public in general if provisions were made for more systematic participation by the private sector in defining IBTA's program content, implementation, and evaluation. Such participation should begin at the farmer/client level, involving them in identifying problems, validating technological alternatives and improving technical extension materials. The suggestion has been made in other sections of this report that IBTA/C should develop an institutional methodology which integrates research, extension and production along priority commodity lines, provides for increased farmer participation and places emphasis on responding to quality, volume and timing requirements of the agro-industrial processing and export firms. Such a methodology should build on the participation of farmers, the NGO's, the agroindustrial community and the local university staff in advising IBTA/C on program content and implementation.

It also appeared to the team that there should be increased involvement of the university community and private agroindustrial firms in agricultural research. As the production of priority crops expands, the number of problems which require research will also expand. IBTA/C will conduct much of this research, but private firms and members of the university staff will also have the interest and the capacity to engage in needed research. The team believes that this interest and capacity should be encouraged, particularly as IBTA/C resources will probably be reduced over time, limiting their ability to respond to the increased range of research needs. To facilitate this involvement, the team believes that USAID/Bolivia should provide additional funds or take a portion of the IBTA/C budget over the next four years and establish a trust fund for agricultural research to be administered by a Chapare Agricultural Development Foundation (FUNDEAC), initially housed in either the Federacion de Empresarios Privados or the Camara de Agricultura. The assembly of the Foundation should be composed of fifteen to twenty leading members of the private agricultural/agroindustrial sector having strong interests in and commitment to the agricultural development of the Chapare. The

Assembly members could be selected by a nominating committee appointed by the Federacion de Empresarios Privados and/or the Camara de Agricultura with participation from USAID/Bolivia and DAI. The Assembly could elect an Executive Committee which would in turn appoint an Executive Director, initially **ad honorem** or part-time, to publicize the availability of the research grants, review grants proposals and monitor approved grants. The grants should be matching in nature and should be geared to priority crops in the Chapare and priority research problems associated with them.

The team estimates that research projects funded by the Foundation would be two to four years in length and would cost about $30,000 each, with an average grant of $15,000 to $20,000 from the Fund, after taking into account matching cash and in-kind inputs from the prospective grantees. The Fund could finance six to ten projects a year at a total cost of $100,000 to $150,000. To build a trust fund which would sustain this level of activity, would require an annual funding level of about $400,000 per year over the next four years: $100,000 to fund the approved grants, and $300,000 per year to be added to the trust fund, building it to a level of $1.2 million by the end of the Project. Such funds could be provided separately or taken from the IBTA/C budget. IBTA/C would also be eligible to present research proposals to the Foundation. The establishment of the Foundation would provide increased private sector participation and involvement in the agricultural development of the Chapare and would also provide a vehicle for a wider range of private sector activities in the Chapare as and if conditions warrant. As a start, USAID/Bolivia might suggest that the Foundation participate in an annual review of the IBTA program and budget and provide comments and guidance as appropriate.

Recommendations

1. That increased private sector participation in determining the nature and content of the IBTA/C be promoted by providing short-term technical assistance to assist IBTA/C in development of an institutional methodology which integrates research, extension and production along priority commodity lines, provides for increased participation by farmer/clients and agroindustiral processors and exporters, and emphasizes quality, volume and timing considerations in meeting market requirements.

2. That USAID/Bolivia provide funding (from what would otherwise have gone to the IBTA/C budget) to establish an agricultural research grants Fund to be administered by a private-sector Chapare Agricultural Development Foundation.

3. That DAI contract short-term technical assistance to work with the private sector to establish the Chapare Agricultural Development Foundation and the Research Grants Fund, including recommendations on organization, funding levels and institutional mandate and by-laws.

H. Issue: What are the medium and long-term prospects for IBTA/Chapare? Should it reintegrate with IBTA/Nacional? What are the prospects for increased private sector participation in research, extension and plant production in the Chapare?

Discussion: For the purpose of addressing the issues of the medium and long-term prospects for IBTA/C, the team assumed that USAID/Bolivia budget levels to support the Chapare development effort would decrease over the next few years. Under such a scenario, we assumed that IBTA/C's budget would decline at a level of about 15% per year over the next three years and then decline by 50% in the final year of Project funding. Such a reduction might look as follows:

1993 -- $4.7 million
1994 -- $4.0 million
1995 -- $3.4 million
1996 -- $2.9 million
1997 -- $1.5 million

We also feel that part of the budgetary savings could be channeled over the next four years to support joint activities with San Simon University ($100,000), for contracting for private sector plant production ($100,000 to $200,000) and to establish the Agricultural Research Grants Fund ($400,000).

It appears from our analysis of IBTA/C's program that they could absorb such budget reductions over the next three years by cutting out low-priority activities. As the farmers' associations, NGO's and private firms become more active in the area, IBTA's funding of extension and plant production could be reduced. Also, some of the research on priority commodities could be switched to the private sector through the Agricultural Research Grants Fund. Cost reductions could also be accomodated by increasing revenues generated from service activities such as the sale of planting materials and soils analyses.

The team believes that USAID/Bolivia, IBTA/C and IBTA/Nacional should enter into discussions leading to the reintegration of IBTA/C into IBTA/Nacional no later than January 1, 1995. A gradual reduction of USAID/Bolivia funding and increased IBTA/Nacional funding should be negotiated in such a way that IBTA/Nacional assumes complete funding for IBTA/C on January 1, 1998.

The team considered the possibility of assisting IBTA/C to become an autonomous regional institution funded by some combination of an endowment/trust fund and its own income generating activities but rejected this alternative for two reasons: 1) much of IBTA/C's activities, now and in the future, fall in the realm of a public good and should be funded from public sources; and 2) forcing IBTA/C to rely on their own income-generating activities would cause them to emphasize such pursuits to the detriment of needed research and extension activities.

Recommendations

1. That USAID/Bolivia enter into discussions with IBTA/C on reducing their budget beginning this year in accordance with some systematic formula (i.e., 15% per year) and that part of the budgetary savings be channeled to joint research and training activities with San Simon University ($100,000), contracts for private sector planting materials production ($100,000 to $200,000) and to establish the Agricultural Research Grants Fund ($100,000).

2. That USAID/Bolivia, IBTA/C and IBTA/Nacional enter into discussions leading the to the reintegration of IBTA/C into IBTA/Nacional no later than January 1, 1995. Funding of IBTA/C would be split between IBTA/Nacional and USAID/Bolivia (on a declining basis) from January 1, 1995 until January 1, 1998, when IBTA/Nacional would assume responsibility for funding all of IBTA/C operations.

I. Issue: What are the priorities in human resource development for IBTA/Chapare?

Discussion: As noted in sections V, C and V, D above, IBTA/C's main human resource needs in research lie in the areas of economics, data management/statistics, pest and disease control, and soil fertility and plant nutrition. In the latter two areas, we highly recommend that such training be directly related to the main commercial crops. In extension, there is a need for greater training of personnel: all extensionists should participate in short courses focussing on subsistence crops and extension/communication techniques; a subset of extensionists (two/crop) should undergo short-term (one to three months) training in techniques related to the main commercial crops; and a small cadre (one per crop) of extensionists would undergo longer (six to 12 months) and more intensive training in one commercial crop in order to enable them to provide technical backstopping to research and extension in these areas and to train other extensionists.

Recommendations

1. That IBTA/C should hire MS degree-level specialists or offer MS degree-level training in agricultural economics, data management/statistics, pest and disease control, and soil fertility and plant nutrition and that this training or expertise be directly relevant to the main commercial crops.

2. That IBTA/C provide the following training to extensionists: all extensionists should participate in short courses focussing on subsistence crops and extension/communication techniques; a subset of extensionists should undergo short-term (one to two months) training in techniques related to the main commercial crops; and a small cadre (one per crop) of extensionists would undergo longer (six to 12 months) and more intensive training in one commercial crop in order to enable them to provide technical backstopping to research and extension in these areas and to train other extensionists.

J. Issue: Are there any administrative problems which require the attention of IBTA/Chapare and USAID management?

Discussion: While the team did not have sufficient time to get into administrative matters in any great detail, there were a couple of problems which were brought up in various meetings. The most frequently heard complaint was about the IBTA/C 10:4 schedule which has the field staff spending 10 days in the Chapare and four days in Cochabamba, leaving a skeleton group of two technicians at each research station while the rest of the IBTA/C staff is gone. The complaints centered on the fact that there are four days, and often the better part of two additional days when the staff is travelling to and from Cochabamba, when there is almost a complete absence of IBTA personnel in the zone. Farmers' needs and problems over those six days must be handled by the two technicians at each station, or not at all. There is no IBTA/C presence during the critical period of delivery of product to packing centers and during the packing process which falls, as it regularly does, during their lengthy absences.

It would be preferable for IBTA/C staff to live in the zone, but the technicians were vocal in their opposition to such an arrangement because of the lack of adequate schools and other amenities in the zone. Over time, IBTA may be able to recruit more personnel from the Chapare or may be able to persuade more technicians to live in the zone, although both courses seem problematic. The next best solution would be to have a continuous IBTA presence in the area. This could be accomplished by breaking the field staff into two or three groups and working on a 10:4, 15:6, or 20:8 schedule which would assure a continuous presence and preclude the necessity for have a grupo de turno during staff absences. Given the desire of staff to see their families on a more frequent basis, the 10:4 schedule would seem to be the most workable. A practical approach would be to divide the field staff into three groups, going to the Chapare on a Monday, Thursday, Monday schedule and leaving ten days later. This would maintain a continuous presence of IBTA staff in the area with 2/3 of the staff in the region 72% of the time, all of the staff there 21% of the time and 1/3 of the staff there 7% of the time on every other Sunday. The entire staff would be there Monday, Tuesday and Wednesday of every other week. A system could be developed for individuals in each of the groups to backstop individuals in the other groups and appears to be a workable and desirable alternative to having all of the field staff absent from the zone for 4 to six days every two weeks. An alternative would be the 5:2 system whereby all personnel, with the exception of a skeleton crew, would work a weekly schedule, leaving the Chapare on Saturday morning and returning on Monday morning.

Another problem that the team encountered was how to measure the impact of IBTA/C programs in the region. The most suitable means would be to periodically gather household income data, such as that collected by the rural household survey, and data on crop area and yield changes, such as that collected by periodic sample surveys. The team believes that both such survey techniques are valid and valuable and should be continued. The extensive data collection effort at the central level seems, at least on the surface, to be a bit unwieldy, quite expensive and less useful in assessing region-wide trends.

Recommendations

1. That IBTA/C revise its 10:4 work schedule to allow for a continuous presence in the region. Division of the field staff into three groups working a 10:4 schedule, on a Monday, Thursday, Monday entry routine, would seem to both workable and desirable to assure that the bulk of IBTA staff are in the region on a continuous basis and avoiding a four to six day absence every two weeks. An alternative would be the 5:2 schedule.

2. That USAID/Bolivia provide continued support to the rural household survey and the agricultural sample survey in the region to maintain a reasonable process for measuring impact of IBTA/C and other Project activities through periodic information on changes in incomes, crop area and yields.

ANNEX A

ANNEX A

SCOPE OF WORK
EVALUATION OF IBTA RESEARCH AND EXTENSION PROGRAMS

The goal of the Cochabamba Regional Development Project (CORDEP), which is an integral part of the GOB's Alternative Development Program, is to stimulate balanced economic development and an improved standard of living in the rural areas within the Department of cochabamba, and to convert the economy of the Chapare Region in particular to one based on the production of priority alternative crops for which proven or potential export and domestic markets have been identified.

Since the beginning of the Alternative Development Program, La Jota and Chipiriri Experiment Stations have been continually expanded to carry out a programs of research, extension and production of planting materials in the Chapare with USAID funding. IBTA/Chapare was created to implement this program, which is presently funded by CORDEP. In other words, during the past eight years, La Jota and Chipiriri Stations have grown from small physical plants with limited budgets and research staffs to large, well staffed stations with sufficient funds to carry out these programs. Chipiriri, which was established in 1962 by the Servicio Agrícola interamericano (SAI) program, has major responsibility for livestock development. La Jota, which was established about the same time as a colonization station, has major responsibility for crops.

Initially, technical assistance was provided through an AID funded contract with EXPERIENCE INCORPORATED (a U.S. firm), which expired in June 1992. Since then, no direct, resident long-term T.A. has been provided. However, Development Alternatives, Inc. (DAI) has a full-time tropical agronomist on-board, who coordinates with IBTA/Chapare on numerous activities including the provision of short-term specialists to assist and/or train IBTA/C technicians and to carry out specific activities and/or studies in order to improve, expand and accelerate these programs.

The objectives of the research program are to investigate new production systems, alternative crops and alternative technologies and to produce high quality genetic material. In the Chapare, this is done by conducting experiments with perennial crops, annual crops, agroforestry systems, animal husbandry and tropical flowers.

The objectives of the extension component are to transfer new technologies, promote sustainable production systems, motivate change of attitude and to distribute improved genetic material to farmers. Specific functions of the extension program are:

(1) Carry out training programs at both the community level and on the stations

(2) Assist in the establishment of demonstration/production plots

(3) Establishing private nurseries

(4) Provide technical assistance to Chapare farmers

(5) Other agricultural extension activities as may be noted.

The objectives of the plant production program are to create and expand off-station nurseries to produce selected priority stock for distribution to the farmers in the selected areas.

IBTA/Chapare is totally dependent of CORDEP for funding, which is channeled through PDAR. However, in reality it functions semi-autonomously in order to support and coordinate with NGO's and other CORDEP-affiliated institutions. IBTA/Chapare has a budget of $4,700,000 per year and has over 100 employees including staff in Cochabamba and at the two stations. The extension programs were expanded in 1992 from 19 to 28 extension agents in response to the need to expand and strengthen the off-station private nursery program.

Some technical assistance (mostly soils and extension) has been provided to IBTA/La Jota from 1984 to 1992 and limited, indirect support continues under CORDEP through Development Alternatives, Inc. However, no outside evaluating of the IBTA/Chapare program has ever been done by qualified experts in agricultural research and extension. Moreover, IBTA/Chapare has had very limited contact with international centers in order to compare the results of its efforts with those of other countries.

Therefore, a qualified agricultural research/extension team is being contracted to carefully evaluate the IBTA/Chapare programs. Both stations will be included in the evaluation, but the major emphasis will be on La Jota crop programs.

The evaluation should assess the appropriateness and effectiveness of all three programs (i.e. research, extension and production of planting materials) in meeting the overall objectives of CORDEP in the Chapare, which is to increase farm income by increasing crop and animal production (mostly crop) within the context of sound management of farmers' resources and sustainability.

The specific tasks will include, but will not be limited to the following:

1. Evaluate the effectiveness of the on going research and extension activities with a focus on farmer<-->extension agent<-->researcher linkages, and on the effectiveness of the communication methods being used. If deficient, provide recommendations for improvement.

2. Evaluate the appropriateness of the research and extension plans of CORDEP objectives, client needs, agroecological conditions, and market realities, while at

the same time, taking into consideration the element of long-term sustainability.

3. Determine how effective IBTA/Chapare is in carrying out its research and extension plans based on effective adoption of technologies and net increases in output.

4. Consider and recommend changes in the present operations to better achieve the CORDEP objectives in the Chapare including alternative administrative and organizational arrangements.

5. Provide comments on the appropriateness of extension and technical assistance planning and execution in the Chapare by the NGO's particularly TechnoServe and IVS.

6. Consider the appropriateness of shifting more emphasis toward commodity line extension and the possibility of assigning crop specific extension agents to producers associations.

7. Consider the appropriateness of shifting more emphasis toward farming systems approaches to increase production of priority crops while minimizing inputs.

8. Assess other aspects of the IBTA program which, if restructured or reorganized, would result in more effective assistance to producers.

9. Evaluate training and technical assistance needs,and recommend ways of strengthening collaboration with international centers, with suggestions as to which ones.

10. Inspect the off-station pineapple, tembe and banana nurseries, created in 1992. Suggest ways, if any, to improve this program, and assess the feasibility of increasing and expanding the nursery program, i.e. the production and distribution of planting materials.

A team of two experts will carry out the evaluation during a three-week period. Although the experts will address the specific tasks together, one expert will have the requisite qualifications needed to focus on institutional and administrative issues. The other expert will have the expertise needed to address issues related to tropical agriculture, research planning and methods, and production systems. A draft outline of the evaluation report will be approved by the COP, and draft reports will be reviewed by the CORDEP-DAI and USAID/CBBA agronomists and any substantive comments incorporated into the final report. Also, presentations to USAID/CBB will be arranged prior to departure.

ANNEX B

ANNEX B

LIST OF PERSONS CONTACTED

IBTA/Chapare

Franklin Lastra, Director

La Jota Research Station

Angel Cartagena, Acting Station Director
Yuri Maldonado, Fruit Crops Program Leader
Roberto Delgadillo, Agro-Forestry Program Leader
Eduardo Ayala, Annual Crops Program Leader
Raul Mejia, Researcher in Soils
Cesar Diaz, Researcher in Black Pepper and Macadamia
David Choque, Promotor

Chipiriri Research Station

Cleto Prado, Acting Station Director
Dante Guevara, Researcher in Cattle
Juan Zurita, Technician in Pig Production
Sergio Torrico, Extensionist
José Campero, Technician in Hair Sheep Production
Jaime Claure, Extensionist
Serafin Ramos, Promotor

UNABANA

Primitivo Mariaca, President
Fernando Aranibar, San Luis Packing Shed Manager
Pedro Arandia, Promotor

Association of Pineapple Producers (Mariposas)

Nicandro Lopez, Member

Tecnoserve

Hamilton Erazo, Director

San Simon University

Julio Villaroel, Dean, Faculty of Agriculture
Jaime La Torre, Director of Research, Faculty of Agriculture

USAID/Cochabamba

Marion Ford, Regional Coordinator
Harry Peacock, Deputy Regional Coordinator
Jorge Aldunate, Agricultural Coordinator

DAI

Jack Rosholt, Chief of Party
Chuck Foster, Marketing Coordinator
Peter Alfonso, Banana Program Coordinator
Gerardo Rodriguez, Agricultural Officer
Gregory Minnick, ?
Nelson Bowles, Marketing Field Coordinator

IVS

Ramon de Mora, Director

Serviagro

Johnny Zapata, Agricultural Technician
Patrocino Garbisu, Agricultural Technician
Antonio Gonzalez, Social Promotor

AgroCapital

Arvin Bunker, General Manager
Juan Carlos Claure, Agricultural Technician
Victor Rivero, Agricultural Technician

Industrias LAS

Adan Seminario, Managing Director
Manuel Trelles, Regional Manager, Cochabamba
Cecilia Garcia, Tissue Culture Lab Technician, Santa Cruz
Monica Cerdan, Tissue Culture Lab Technician, Santa Cruz
Renzo Maya, Agricultural Technician, Santa Cruz

SEASA (Fruitall)

Eddy Aliendre, Regional Manager, Cochabamba
Victor Olivera, Agricultural Technician, Frutos del Chapare

SOIN-AGRO

Remy Arandia, Manager

Bloch Ltda.

Mario Bloch, Owner

Centro de Investigacion en Agricultural Tropical (CIAT), Santa Cruz

Cesar Samur, Director

ANNEX C

ANNEX C: SCHEDULE OF MEETINGS AND FIELD VISITS

Friday, July 16

Meetings for John O'Donnell with Jack Rosholt, DAI Chief of Party, Harry Peacock, Acting Regional Coordinator for USAID/Cochabamba, Jorge Aldunate, Agricultural Coordinator for USAID/Cochabamba, and Peter Alfonso, DAI Banana Program Coordinator.

Saturday, July 17

Meeting for John O'Donnell with Girardo Rodriguez, DAI Agricultural Officer and Jack Rosholt, DAI Chief of Party. Review project documents.

Monday, July 19

Meetings for John O'Donnell with Chuck Foster, DAI Marketing Coordinator and Peter Alfonso, DAI Banana Program Coordinator. Review project documents.

Tuesday, July 20

Larry Szott arrives. Meetings with Jack Rosholt, DAI Chief of Party and Harry Peacock, Acting USAID Regional Coordinator. Meeting for John O'Donnell with Adan Seminario and Manuel Trelles, Managing Director and Regional Manager for Industrias LAS, a large bottling and canning firm located in Santa Cruz. Review project documents.

Wednesday, July 21

Meetings with Mario Bloch, owner of Bloch Ltda, a small, family-operated firm specializing in the marketing of spices, nuts, jams and baked goods; Ramon de Mora, Director of International Voluntary Services (IVS), an NGO working on expansion of black pepper production in the Chapare; and Remy Arandia, Manager of SOINAGRO, a small firm involved in the transport and marketing of bananas from the Chapare in Arica, Chile.

Thursday, July 22

Travel to the Chapare, arriving at 10:30 a.m. for a visit to the IBTA/Chapare La Jota Research Station. Met with:

Angel Cartagena, Acting Station Director
Raul Mejia, Researcher in Soils
Yuri Maldonado, Leader of the Fruit Program
Roberto Delgadillo, Leader of the Agro-Forestry Program

Eduardo Ayala, Leader of the Annual Crops Program
Cesar Diaz, researcher in black pepper and macadamia

Visited research experiments in corn, beans, tembe, macadamia, black pepper, pineapple and banana.

Friday, July 23

Visited IBTA/Chapare Chipiriri Research Station. Met with:

Cleto Prado, Acting Station Director
Dante Guevara, Researcher in cattle
Juan Zurita, Technician in pig production
Sergio Torrico, Extensionist
José Campero, Technician in hair sheep production

Visited Chipiriri Station research activities in cuyes, hair sheep, pigs, cattle, grasses and legumes.

Went to visit community pineapple plantation/nursery and swine production module in Eteresama with Jaime Claure, extensionist for micro-region IV. Visited new pineapple plantation/nursery of IBTA/Chapare promotor Seraphim Ramos.

Saturday, July 24

Accompanied by IBTA/Chapare Soils Technician, Raul Mejia, visited UNABANA facilities in San Luis, including new packing shed and excellent banana nursery. Accompanied by Primitivo Mariaca, President of UNABANA, visited new Grand Naine and Williams banana plantings on farm of IBTA/Chapare promotor, Pedro Arandia. Visited UN funded tea processing plant at Senda B. Visited new Grand Naine banana plantings on farm of IBTA/Chapare promotor, David Choque. Visited pineapple processing plant at Mariposas. Talked with Nicandro Lopez, member of the Association of Pineapple Producers. Visited farm of Frutos del Valle, S.A., a subsidiary of SEASA, which just completed clearing land and planting ten ha. of maracuya and three ha. of Smooth Cayenne pineapple. Discussed plans for expansion of plantings of citrus, pineapple and maracuya in the Chapare with Victor Olivera, Frutos del Valle agricultural technician.

Sunday, July 25

Travelled to Santa Cruz by road. Stopped to visit demonstration plots of SERVIAGRO, a local NGO working in Entre Rios which is promoting a system which includes rice, plantain, caupi, coffee, cacao, tembe and quick-growing tree species. Were shown plots by Johnny

Zapata and Patrocino Garbísu, agricultural technicians and Antonio Gonzalez, social promoter.

Monday, July 26

Visited bottling and canning plant of Industrias LAS in Santa Cruz, including new tissue culture lab run by two Peruvian lab technicians, Cecilia Garcia and Monica Cerdan. Also visited Industria LAS 200 ha. pineapple (Smooth Cayenne) plantation about an hour's drive from Santa Cruz where we shown around by Renzo Maya, the Peruvian field manager. In the afternoon, met with Ing. Cesar Samur, Director of the Center for Tropical Agriculture Research (CIAT) in Santa Cruz.

Tuesday, July 27

Meetings with Hamilton Erazo, director of Tecnoserve, an international ONG working to promote expanded pineapple production in the Chapare; Arvin Bunker, General Manager of Agro Capital, an AID/ACDI supported institution providing credit and technical assistance to farmers and agro-industries in the Department of Cochabamba; Juan Carlos Claure and Victor Rivero, Agro Capital agricultural technicians working on bánanas and rice/yuca; Chuck Foster, DAI Marketing Coordinator; Peter Alfonso, DAI Banana Program Coordinator; Nelson Bowles, Field Coordinator for Pineapple Program; and Eddy Aliendre, Regional Manager of SEASA, a local firm which produces fruit juices in tetra-pack and buys citrus, maracuya and pineapple for juice from the Chapare.

Wednesday, July 28

Meetings with Julio Villaroel and Jaime La Torre, Dean and Director of Research of the Faculty of Agriculture at San Simon University; Jorge Aldunate, Agricultural Coordinator for USAID/Cochabamba; and Franklin Lastra, Director of IBTA/Chapare.

Thursday, July 29

Report preparation.

Friday, July 30

Report preparation.

Saturday, July 31

Report preparation

Monday, August 2

Report preparation

Tuesday, August 3

Review draft report with Girardo Rodriguez, DAI Agricultural Coordinator and Jorge Aldunate, USAID/Cochabamba Agricultural Coordinator.

Wednesday, August 4

Oral presentation of evaluation conclusions and recommendations to Marion Ford, USAID/Cochabamba Regional Coordinator; Harry Peacock, Deputy Regional Coordinator; Jorge Aldunate, Agricultural Coordinator; Jack Rosholt, DAI Chief of Party; Girardo Rodriguez, DAI Agricultural Coordinator, and Franklin Lastra, Director of IBTA/Chapare.