

Soy and Corn Production on Small Farms of Peru

Interim Report on Contract AID/1a-c-1206
November 1, 1977 - June 30, 1978

Submitted to
The U.S. Agency for International Development
Department of State, Washington, D.C.

by

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PDAAV-010

Report of Progress

A. Background

In early 1975 INTSOY was requested by the Agency for International Development to assist the Government of Peru in analyzing the viability of soybean production in Peru and in developing a preliminary plan for such production. Over the next year and a half a number of INTSOY scientists travelled to Peru working with colleagues in the Ministry of Food, with close support of USAID personnel in developing recommendations for an expanded production and utilization program. The conclusion was reached that in social, financial, and economic terms soybeans had greater potential than other crops to produce financial returns to farmers when they were included in rotational systems, that returns to the economy will be substantial as compared to other possible investments, and that soybeans can provide nutritional benefits not now available to the poorest elements of the population.

Concurrent with the evaluation of potential for soybean production, USAID and Ministry of Food personnel were reevaluating a special project for the development of floury corn that had been developed in late 1975. The conclusion of those evaluations was that concentration should be focused on the simple social goal of producing more food for consumption by Sierra populations in a limited number of departments (states) while conducting demonstrations of research and demonstration in other departments depending on the level of seed improvement achieved and the prevailing social and environmental conditions.

While the two projects, integrated soybean development and development of floury corn, had initially been conceived as separate projects, the decision was made to combine the two in a single project, the primary purpose being to achieve self-sustaining growth in the production and consumption of soybeans, improved corn and soybean food products. Technical assistance was heavily

weighted toward soybean production and research reflecting the levels of expertise and experience existing in Peru--high for corn, low for soybeans.

A contract emphasizing soybean production, research and utilization was executed between USAID and the University of Illinois with responsibility for performing the required technical assistance services delegated to the International Soybean Program, INTSOY.

B. Project Objectives as Stated in Contract

The general objective of the contract is to assist the Government of Peru, to expand the cultivation of soybeans in high jungle areas and the use of improved varieties of highland corn in the mountains of Peru, and to achieve increased consumption of improved corn, soybean and soybean projects. Specific objectives include the following:

1. To assist the Peruvian Ministry of Food to develop and adjust comprehensive action plans in corn and soybean research, production, processing and marketing in order to reach targeted production and consumption objectives for the two commodities.
2. To provide technical information and assist the Peruvian Ministry of Food to identify appropriate soybean and corn varieties through research, to develop agronomic practices that are transferrable to small farm conditions, and to identify soybean products and processes appropriate for Peru.
3. To perform or assist in the performance of periodic financial and economic analyses to measure the real or potential impact of project activities in the several project areas.
4. To assist in annual project evaluations in cooperation with the Peruvian Ministry of Food.
5. To perform in-country training as required by the Project and assist in the selection of candidates for academic training abroad.

6. To coordinate academic and short-term training in the United States and other appropriate locations.

Progress was made toward all of the objectives in the first few months of the contract covered by this report. INTSOY recruited a well-qualified team of specialists and began posting them in Peru in early 1978, somewhat in advance of the timetable suggested by the contract. Four staff members were recruited and accepted assignments in Peru to provide technical assistance on the soybean side. They are:

1. Dr. Thomas M. Fullerton, Soybean Extension Agronomist and INTSOY Principal Representative
2. Dr. Luis M. Camacho, Soybean Research Agronomist
3. Dr. Alfred G. Harms, Agricultural Economist
4. Dr. Alvin Siegel, Soybean Food Processing Specialist

INTSOY recruited a highly competent candidate for the fifth position, the Maize Agronomist, but the candidate declined to accept the assignment. Efforts continue to recruit for that position.

All INTSOY staff have been in Peru for a lesser time than is covered in this report. Part of this time was necessarily absorbed by the process of settling in to assignments, becoming acquainted with collaborating scientists, location of operations, and operational procedures, and interacting with USAID mission staff. Nonetheless, the team had an overall beneficial effect on project progress during the report period.

Objective 1. Comprehensive Action Plans

Action plans for 1978 had been prepared by Ministry of Food collaborating scientists for both corn and soy by the time the team was fully assembled in Peru. The extension and research agronomists were the first to meet with counterpart personnel to familiarize themselves with the plans and determine whether inputs

could be targeted to provide the greatest impact in meeting planned targets. The Economist and Food Scientist scheduled similar meetings with their counterpart colleagues shortly after arrival in Peru. This process, which is continuing, involves considerable contact with field research stations and production personnel. The team have noted that high production targets will be extremely hard to meet given the current economic situation in Peru which limits the support available to the collaborating Peruvian scientists. New action plans will be formulated in the next reporting period. Team members will collaborate with Peruvian counterparts in setting attainable targets considering support available through GOP and USAID resources.

Objective 2. Provide Technical Information

INTSOY staff are laying the groundwork for progress under this objective through the development of cooperative programs with counterpart personnel. From this effort will flow technical information that will assist in identifying appropriate soybean and corn varieties, to develop agronomic practices that are transferable to small farm conditions and to identify soybean products and processes appropriate for various scales of production in Peru. A brief description of the work underway or in planning by each of the contract team members follows.

a. Soybean research

Dr. Camacho has commenced a program focusing on three objectives:

1. To observe and characterize soybean germplasm to determine its potential use in the Peruvian research program
2. To identify high-yielding varieties with desirable agronomic traits for commercial production in Selva areas
3. To combine, through hybridization, desirable traits for transfer from one variety to another.

Dr. Camacho has obtained and set out 620 breeding lines from Puerto Rico, Florida, and other locations at the El Porvenir Research Station near Tarapoto from which he will select promising lines for making crosses in the breeding program and other yield trials. He is addressing the problem of iron chlorosis which is prevalent in the Huallaga Valley with a view toward developing a resistant or tolerant soybean variety. Forty-five varieties are being studied for their reaction to iron deficiency, planted on a farmer's field near the Research Station.

Also in the Tarapoto area 95 germplasm varieties are being grown from which selections will be made for making crosses in the breeding program.

Near Tingo Maria, Dr. Camacho has planted 100 breeding lines obtained from Colombia. These are different from the breeding lines being planted at Tarapoto and selections of the most promising varieties will be incorporated into the overall breeding program.

Plans are underway to plant soy in the Bagua-Jaen area in July, where soy will rotate with rice under irrigated conditions.

b. Soybean production and extension

Dr. Fullerton is working to disseminate appropriate production technology for soy culture in the High Selva. Working with counterpart staff, he is defining various constraints which prevent the introduction of soy in existing production systems and/or limit the attainment of profitable field levels. In cooperation with the soy project coordinators, he is assisting in designing methods to address problems related to environmental and physical characteristics of production areas, the level of technology available to farmers and a capacity to absorb new technology.

Dr. Fullerton is seeking means to strengthen support of production agents through design and implementation of demonstrations, field days, and farmer short courses. He plans to develop materials for dissemination of agronomic practices for soy production including slide series and printed information. Finally, he is working to involve staff from the production agencies and the research centers in agronomic or applied type research projects conducted in the fields of cooperating farmers.

c. Soybean food utilization

Dr. Siegel is working with staff of Instituto Investigaciones Agro-Industriales (IIA) to develop three soy food products for the Peruvian diet; a soy milk, a soy fortified bread product, and a soy fortified pasta product. Other baked goods and foods derived from a soy beverage base will be investigated for their potential use in soy fortification after preliminary information on the three prototype products has been evaluated. An acceptance-testing program will be established which will include both selected rural and urban areas.

Later, a program for demonstration and training in preparation of soy food products will be instituted in both rural and urban localities with emphasis in the rural areas. Nutrition education programs will be incorporated into the home demonstration program by engaging the support of the Institute of Nutrition and other government ministries. Contacts will be maintained with commercial food companies.

It is yet too early to expect a substantial flow of information from the projects described above to be available to the program. Nonetheless, staff are making preliminary recommendations to their Peruvian counterparts after some initial observations. For example, the soybean research

agronomist has been stressing the importance of Rhizobium japonicum inoculation of soybeans in the Huallaga Valley. Ministry of Agriculture personnel felt that R. japonicum application did not produce appreciably higher yields. In the Selva, however, no fertilizers are being produced and the potential for rapid soil depletion is present. Dr. Camacho has urged that the application of R. japonicum will at least help maintain nitrogen levels in the soil. The same situation would obtain in most of the areas in the Selva, where soybeans are being introduced.

Objective 3. Perform Periodic Financial and Economic Analyses

Dr. Harms is conducting economic analyses of

1. soybean production on small farms
2. machine use in soybean production
3. marketing of soybeans

He is also investigating the credit needs of soybean producers.

Dr. Harms has begun the process of collecting cost-of-production and labor use data from samples of farmers growing soybeans in the Tarapoto, Tingo Maria, Bagua-Jaen, San Ramon and Satipo areas. He is correlating data compiled in previous economic studies by the Dutch technical assistance project, COPERHOLTA, including an economic survey of the Bajo Mayo in Huallaga Central area and data on cost of production on selected model farms. He is preparing an analysis of the competitive position of soybeans versus corn and other crops under government-administered prices.

Dr. Harms has located a fabricator near Tingo Maria who is constructing a pilot soybean thresher. Cost studies will be made of machine threshing versus hand threshing to determine break even points for purchase and use of mechanical threshers.

He is commencing to compile data on soybean marketing, collecting and analyzing transportation costs from production areas to oil mills and areas

of consumption. He will determine the cost of transporting soybeans over the new road to the coast from Tarapoto. He will also update economic data relating to the construction of an expeller oil mill in Tarapoto.

Objective 4. Project Evaluation

Shortly after arrival in country, team members were involved in evaluations of 1978 work plans. Initial emphasis was on maize as the team visited Cajamarca, Cuzco, Ayacucho, and Huancaya. In mid-May team members met with mission staff to review the visits to maize producing areas and to make preliminary assessment of the work in soy pending on-site visits to production areas.

The team have offered to review the in-house evaluation of the project conducted by the mission evaluation officer in May so as to establish a base of reference for subsequent evaluations in which they will be more directly involved.

Objective 5. Perform In-Country Training

Contract personnel participated in a six-week course on integrated pest management for maize under the coordination of the University of California group. From UIUC, Professor Richard E. Ford, Professor and Head of Plant Pathology and Michael E. Irwin, Assistant Professor, Agricultural Entomology each contributed a week to the seminar during which they lectured, accompanied participants on field visits and held group and individual discussions with participants. Drs. Fullerton and Camacho met with participants of the pest management course to explain the objectives of the corn/soy project with special emphasis being placed on the application of methods learned during the course to corn and soy production.

During the report period, the team and campus staff assisted in varying degrees with the placement of four counterparts for Master's degree study at

the University of Puerto Rico, Mayaguez Campus. These were: Messrs. Homer Arnulfo Tuesta (plant breeding), Americo Celada Becerra (soybean production), Gonzalo a del Rio Escurra (soybean production), and Ontoniel Mendoza Rouas (soybean production). Each of these men were programmed through USDA's Office of International Training who, in turn, contacted the INTSOY offices at the University of Illinois and the University of Puerto Rico. The programs for each man are planned with sufficient flexibility that, subject to achievement of reasonable competence in English, each student can participate in the INTSOY-sponsored short course Technical and Economic Aspects of Soybean Production as a part of their degree program during the summer of 1979.

A fifth scientist, Mr. Cesar Valles Panduro (soybean pathology) was deputed to the University of Puerto Rico, Mayaguez Campus, for approximately four months of practical training followed by participation in the 1978 summer edition of the INTSOY short course in soybean production on the University of Illinois campus. He was joined there by Angeles Heine Jose Bruno who has been accepted at the University of Arkansas for a Ph.D. program in soybean breeding subject to successfully passing a TOEFL examination.

Objective 6. Coordinate Academic and Short-Term Training in the United States

Activities under this objective were alluded to above. At the University of Puerto Rico INTSOY plant pathologist Dr. Michael Ellis is cooperating with the campus international office and with USDA's Office of International Training in monitoring the progress of the four degree participants. A problem in the timely processing of credentials required for formal admission to UPR resulted in the students being admitted on special status and the process of revising their status to that of regular graduate students is underway.

At the University of Illinois, the INTSOY office, most particularly Dr. John Santas, the INTSOY Training and Communications Specialist and technical leader for the Soybean Production short course, is coordinating the program of Messrs. Valles and Bruno. Mr. Bruno, in particular, is receiving special attention and encouragement to improve his English so that his admission to the University of Arkansas can be completed. Arrangements have been made for Mr. Bruno to have supplementary English instruction through the University's Intensive English Institute during the times he is not required to participate in short course activities.

C. Summary

This is essentially an implementation report reflecting on the first few months of field activity. It is much too early to expect results to be flowing from newly-initiated programs or to forecast the likelihood and degree of success in attaining overall project objectives. The outlook is reasonably bright for good progress to be made on the project overall. An outstanding team of soy scientists has been assembled, given language training where necessary and posted in the field. Qualified candidates for the maize position have not accepted offers of assignment but with the recent clarification of the qualifications a candidate should bring to that position, INTSOY is hopeful that a nomination can be forthcoming soon.

The team have established excellent working relationships with both the corn and soybean research and production coordinators and their staffs in the field. The Peruvian counterpart scientists are interested in soy, committed to the improvement of agriculture, and are dedicated to doing an outstanding job.

The collegial attitude expressed by USAID mission staff to the team is most encouraging. The encouragement of the mission director and his staff to the

INTSOY team to consider themselves an integral part of the overall Mission/country program enhances their credibility with their Peruvian counterparts. The assignment of an energetic project manager with a background in soybeans should assure excellent cross communication between team and mission.

Balanced against this promising beginning is the very serious economic picture facing the Government of Peru. Scarce budgetary and manpower resources on a nationwide scale are reflected in implementation of programs in all ministries, including the Ministry of Food and Agriculture. The level of GOP support, both in currency and manpower, anticipated in the design phase of the project may not be able to be met. This will have an adverse effect on achieving target goals within originally planned periods and may necessitate a restructuring of priorities within the first phase of the project. The goals overall are probably attainable if the target dates can be adjusted outward to more accurately reflect the amount of government support that can be allocated to this activity. Thus, the project which is now thought of as a four-year effort, may have to be extended or the targets may have to be substantially reduced. New directions may be chosen or the program focus may be narrowed. These types of decisions will be discussed in the coming months and the contract team will be prepared to play an active advisory role. The final recommendations on program directions will be made by the Government of Peru.