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SHORT-TERM WEED SCIENCE CONSULTANTSHIP

by

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REPORT ON
SHORT-TERM WEED SCIENCE CONSULTANTSHIP

Robert Frans

February 25, 1978 to March 13, 1978

The report covers the second period of weed science consultantship with the Consortium for International Development and with IBTA of the Ministry of Agriculture. The purpose of this second trip was to complete work on field tests established during the first period (November 19 to December 5, 1977), and to coordinate final plans for gathering data, analyzing data, and the writing and final publication of results. These activities were carried out in consultation and travel with Ing. Raúl Lara of IBTA, Mr. Larry Janicki of the USAID/University of Florida team, and with Mr. John Tollervey of the British Mission to Santa Cruz.

I acknowledge, with gratitude, the assistance of several other persons who were most cooperative in helping me finish the work during these two weeks. These include Ing. Teodomiro Ordoñez and Ing. Edgar Zapata of the Belén station, Ing. Luis Iñiguez and Ing. Rafael Vera of the Patacamaya station, Brother Niles of the Franciscan school at Carmen Pampa, Ing. Perez (IBTA - Cochabamba) who was most gracious in assisting with arrangements, Ing. Gonzalo Claire of the Toralapa station, Ing. Edmundo Espinoza of the Chipiriri station, and Ing. Enrique Mansilla of La Jota. In addition, the entire CID staff was most gracious in receiving me and providing me with transportation, office space and secretarial help--my thanks to Boyd Wennegren, Allen LeBaron, Dave James, Jim Walker, Bill Brown, Jim Thomas, and to the entire secretarial staff at both La Paz and Cochabamba. Diana Horton and Connie Douthit of the Altheimer

Laboratory, University of Arkansas, have also contributed much with their translation and typing assistance.

This report will not attempt to cover details or final results from the field studies conducted. These will be found in a proposed cooperative publication following the close of the growing season. The results will be published in Bolivia as a cooperative effort between IBTA, CIAT of Santa Cruz, USAID, and CID. Rather, this report will cover certain impressions as to relevance of the research to the area or crop and will attempt to point out program deficiencies or directions for further work in weed science for Bolivia.

Work with potatoes was initiated both at the Belén station and at Toralapa. The test at Belén was designed to compare presently available pre-emergence herbicides and mixtures and their potential both for replacing at least some hand labor as well as improving weed control. Weeds are a problem in potato production in that part of the Altiplano and have been controlled traditionally only with high inputs of hand labor. There appears to be a growing interest in the use of herbicides in the area.

The Belén test represented an expansion of the work begun during the 1976-1977 growing season, primarily in the addition of new materials or mixtures and through discarding noneffective herbicides. The preplant incorporated herbicides trifluralin and EPTC, for example, and one preemergence herbicide dinphenamid, gave poor control and low yields last year, and were not included in this year's test. Cyanazine was added to the list of herbicides tested (the other three being alachlor, metribuzin, and linuron) and all were applied preemergence either singly or in two-way combinations.

Weed pressure was severe in the location selected for the test this year. The test was well-cared for during the season, with attention being paid to hand hoeing the checks where called for. There is an infestation of volunteer oats on one side of the test which may influence yield results.

Two potato tests were planned and initiated at the Toralapa station, one on varietal response of potatoes to postemergence applications of metribuzin, and one on an evaluation of timing and metribuzin combinations for weed control. In the 1976-1977 test at this location, metribuzin was the outstanding herbicide, either applied preemergence or postemergence or combinations. Test work during the 1977-1978 season was planned to better fit the use of this herbicide into current production practices. Unfortunately, excessive rain was received at this location during the early part of the growing season, which delayed some herbicide applications, as well as hand hoeing operations. Then, low temperatures from January 16 to January 18 destroyed nearly all the above-ground foliar growth of the potatoes (weeds were little affected!). When plots were viewed on March 6 some regrowth had occurred, but it was not uniform. Also, because of the extremely muddy conditions of the field, control of weeds was lost where timely herbicide applications could not be made or where hand labor was unduly delayed. It is believed that neither test will yield worthwhile information on herbicide efficacy or yield. Dr. Walker has expressed an interest, however, in following herbicide residues on these plots since nearly all treatments were applied. It is suggested that soil sampling of these plots could well be pursued with time to follow herbicide dissipation--followed by possible effect on subsequent cropping next growing

season. It is also suggested that the two field studies attempted this year be considered for next year's plan of work at this location.

The test on renovation of rangeland at Patacamaya was continued on plots initiated during 1976-1977. The original purpose of this test was to measure the effect of weed control on possible reclamation of weeping lovegrass established some 5 years earlier. It has been observed that weeping lovegrass on the Altiplano decreases in productivity with time and that nonproductive invader species begin to infest. A new herbicide was substituted for a spot treatment of dalapon and 2,4-D during the 1977-1978 season. This herbicide, glyphosate, gave good control of all weeds present (it was applied in November, 1978), but was injurious to weeping lovegrass. It was decided also, to attempt to replant the pasture grass on these plots since the stand was extremely sparse and scattered. This was done in early January. By March, however, little germination had occurred even though rainfall at this location was adequate. It is possible that the seed source was poor. It is suggested that these plots be maintained for at least two more years. The station personnel seem interested in the possible outcome of these results and cooperation has been good. Yield results, however, have not been obtained from last year as yet.

The citrus test at Chipiriri has been exceptionally well cared for this year. Indeed, the entire orchard area, in which the test is located, shows signs of improved care. This test, too, is an extension of work initiated last year. Several of the treatments remained the same, although some changes were made. Initial herbicide treatments were made in early December. Again, the new herbicide glyphosate, in combination with 2,4-D, gave outstanding

control. Apparently, a synergistic response occurred, since glyphosate alone gave little control. Plots calling for additional paraquat applications were retreated during the March visit to this location. Additional ratings were also made on all plots. It is hoped that fruit production data can be obtained from this location this year.

The rice test at La Jota also had been well taken care of. Apparently all postemergence treatments were made at the proper time. The test had been established on November 30 on the same location as last year's test. Several new combinations of treatments were added this year, mostly applied post-emergence. Apparently, there has been almost a three-fold increase in weed numbers during this second year of production. Degree of competitiveness will not be known until plots are harvested. Rice was growing well, however and uniformly, with few weeds emerging above the canopy. Nevertheless, the increase in weed numbers on the same area, the second year after clearing, does confirm the usual trend that occurs. It also signifies that increased weed control measures probably will be necessary with time on such areas.

The wheat test was established under the supervision of Inq. Lara in cooperation with personnel at the San Benito station. Wheat was planted in January and the postemergence treatments applied in early February. The first ratings and weed counts on this test were taken on our trip to the station, March 7, 1975. The test appeared to be in excellent shape and well cared for. Several differences among treatments were evident, ranging from good to little weed control, and complete to partial herbicide selectivity to the crop. Again, this work appears to be well-received by the station personnel and has been of high interest to them.

Additional work was planned for peaches at this location, providing there was sufficient interest on the part of station personnel. Apparently, there was not since no work was initiated. Some work on weed control in peaches was already underway at the station--a project being carried out by a student for the Ingeniero degree, presumably. It is probable that station personnel did not feel the need for further work because of the student project.

The cooperative work in coffee with Larry Janicki of the Florida team was continued. Again, changes were made in treatments, particularly at Carmen Pampa, where Mr. Janicki has better control. This is coffee grown in the open. Plots at the Coroico station were under the control of Ing. Luis Zegada, but it was difficult to determine what had been done and at what time. Ing. Zegada has been ill for some time and the technicians on the station were not fully aware of what had been done. This work will not be reported this year.

At Carmen Pampa, glyphosate, applied for the first time this year, was showing excellent control of weeds on March 10. In most cases, it was considerably superior to the diuron-paraquat treatments which were quite good last year. Production data from these plots were obtained from last year's harvest (which takes place over a period of several months) and will be reported in the published results this year.

The cooperation with Larry Janicki and the Florida team on this project has been excellent. It is suggested that, where possible, both CID and IBTA continue to have strong inputs into his work. There have been personnel changes in the Florida team, and for a period of time Mr. Janicki will have responsibilities in the Chapare as well as the Yungas. He has expressed strong interest in my citrus work at Chiniriri and will likely undertake additional

work on commercial plantings in the Yungas. Mr. Janicki traveled with me, both to the Cochabamba area, including the Chapare, and to the Yungas, and Mr. Tollervey traveled with the both of us to the Yungas. This interchange of information was most helpful in discussing weed problems and planning future programs. I would suggest, also, that close contact be maintained with Mr. Tollervey, since he is the only trained weed scientist in Bolivia at the present time. It cannot be emphasized too strongly that planning crop production programs of research today makes little sense without considering pest management. Weed control in Bolivia is an integral part of such management.

During our trip to the Yungas, Mr. Tollervey and I discussed thoroughly his work in Santa Cruz, as well as the work Ing. Lara and I had initiated this year. We also discussed the forthcoming publication and areas of joint responsibility. We agreed that Mr. Tollervey should take the lead for coordinating the results this year, and that I will submit my part of the data and write-up to him once harvests are complete. Presumably he will contact CID concerning publishing details.

The interchange between Mr. Tollervey, Mr. Janicki, Dr. Walker, Ing. Lara, and myself on research responsibilities has been most useful. Because of my contacts in the U. S. and relatively easy access to herbicide industry representatives, I have been able to introduce fairly recent technology into Bolivia. This has benefited Mr. Tollervey's work with soybeans and cotton in Santa Cruz, Mr. Janicki's work with coffee, and Dr. Walker's work with potatoes. I am gratified to see the increasing awareness and appreciation for optimum weed control inputs as I travel around Bolivia. In spite of the

low availability of capital, I am convinced that these new techniques will continue to be gradually adopted over the years as research information continues to be made available. My work (the full year of 1976-1977 and the short-term work of 1977-1978) represents only a beginning, however. It appears to me that renewed dedication and commitment to this area of work must continue to be made both by IBTA and CID if the gains in weed control already made are to be retained.

I am pleased that IBTA was able to commit Ing. Lara to helping carry out the work both with me on my two trips this year, and in my absence. I feel he has done an outstanding job. When I questioned him as to future involvement in weed science research programs, however, he displayed considerable uncertainty. I was not able to determine whether this was because of a lack of interest on his part, or whether he was uncertain as to IBTA's involvement next year. Regardless of this, if a weed science effort in Bolivia, beyond the work of Tollervey and Janicki, is to develop, then people must be trained and brought back to assume project responsibility. I saw no evidence that this was to be so.

From a personal standpoint, I have greatly enjoyed the opportunity of being involved in Bolivian agriculture. I hope this report and the proposed research publication does not end that involvement. Because of family ties, I plan to maintain a strong interest in Bolivian affairs. I hope that I can continue to be of use in a professional way in the future of her agriculture.

(Appended to this report is a brief chronological listing of my activities in Bolivia during this two-week period.)

Day-to-Day Activities

- February 25 - left Fayetteville
25 - arrived La Paz
27 (Monday) - spent day in CID office, La Paz arranging schedule and contacting people.
28 (Tuesday) - went to Patacamaya with Ing. Raúl Lara to take data on pasture renovation test.
- March 1 (Wednesday) - went to Belén to take data on potato test.
2 & 3 - both days in CID office La Paz, analyzing data and constructing tables for final report.
- March 4 & 5 (weekend) - in La Paz
- March 6 - left early for Cochabamba with Ing. Lara and Larry Janicki - traveled same day to Chapare, took data on tests at Chipiriri and La Jota. Stayed overnight at Villa Tunari.
- March 7 - consulted with extension agent on thesis problem in rice - returned to Cochabamba--went to San Benito and took data on wheat test. Overnight in Cochabamba.
- March 8 - went to Foralapa and examined two potato tests (which were destroyed by rain and freezing temperatures). Returned to Cochabamba and in late afternoon to La Paz.
- March 9 - traveled to Yungas (Coroico) with Lara, Janicki, and John Tollervey to take data on coffee tests. Overnight in Carmen Pampa.
- March 10 - returned to La Paz--during trip consulted with Tollervey on his research and completed our plans for writing our combined research report on weed science activities in Bolivia for 1977-78 season.
- March 11 - left La Paz for Lima--met with Tom Fullerton--also met with Ted Olson and Esteban Koosan of the Utah State irrigation project--discussed work and weed problems.
- March 12 - left (late) for U. S.
March 13 - arrived home in Fayetteville.