PD-AAJ-036

ISN 2220

CONSORTIUM FOR INTERNATIONAL DEVELOPMENT

CID

Colorado State University
Oregon State University
Texas Tech. University
University of California
University of Arizona
Utah State University

007/77

PROGRESS OF THE TEMPERATE FRUIT RESEARCH PROGRAM AT THE SAN BENITO RESEARCH STATION

by

Anthony H. Hatch*

*Associate Professor of Pomology and Superintendent, Colorado State University, Orchard Mesa Research Center, Grand Junction, Colorado 81501; Short-Term Consultant, CID/MACA, Bolivia.

March 1977

PROGRESS OF THE TEMPERATE FRUIT RESEARCH PROGRAM AT THE SAN BENITO RESEARCH STATION

Anthony H. Hatch

At the request of MACA/CID, I returned to the San Benito Research Station, March 2 to March 18, 1977, to review the implementation of the fruit research suggestions submitted the previous May (1). This report contains my findings and suggestions for the next phase of the program.

Six years of temperature data from the San Benito Research Station were analyzed to determine the number of chilling units accumulated each year. The results showed a range of 92 to 387 chilling units. With this information, I called Dr. Wayne Sherman at the University of Florida and asked him to ship to Bolivia peach varieties with chilling unit requirements within this range. He shipped budwood of 11 varieties that were successfully propagated. The buds produced sufficiently long shoots to provide enough buds so that more fall budding can be done to increase the population of each variety.

Budwood from California's Desert Gold peach will be shipped to Bolivia in September for spring budding. It was the only California variety that I found to meet the needed chilling unit requirements. Seeds from the Nemagard peach tree will be sent to be tested as a peach rootstock since it is crown gall and nematode resistant and has a low chilling unit requirement.

The Rey del Monte peach variety was not obtained from Argentina because the nurseries were out of stock last year. Another attempt will be made to obtain this variety this winter.

Testing of local peach seedling varieties is being continued. In reviewing the criteria used to objectively select a particular variety, I found the Station has none. Everything was being done subjectively. Guidelines have now been established to help them objectively evaluate any new varieties.

The low chilling unit accumulations suggest that the popular apple and pear varieties will not develop normally in the San Benito Research Station area. However, apple varieties such as Vinto, Gravenstein, Newton Pippin, and Winter Permain should be tested. Vinto is a local seedling selection while the others do very well in the milder climates of California and Chihuahua, Mexico. Colder climates with greater chilling unit accumulations need to be located before I would recommend placing very much emphasis in apple and pear research. The Swiss program has planted a large number of apple trees at the San Benito Research Station, but I am skeptical the project will succeed.

This Swiss program has also initiated a project to study the proper peach harvesting maturity for maximum cold storage. This work is important and needed to accomodate a large peach industry.

None of the other research projects I recommended were initiated or carried to a successful conclusion because of the lack of equipment or irrigation water. Some of the field equipment I thought were needed for the fruit research program have been purchased by the Swiss program. These include budding and grafting equipment, pruners, and insecticide sprayers. They want to purchase a small fruit grader and have asked me to locate one for them. I still feel that an air blast sprayer is needed. The

laboratory equipment, especially the two refrigerators are urgently needed. They are needed to test the different chilling requirements of the various fruit species and varieties. This information is needed to determine their zones of adaptability.

Evaporimeter data analyses indicate that the peach trees in the thinning experiment should have been irrigated every 15 to 20 days. Irrigations were never applied within 30 days. Further inquiries revealed that the pumps were not run 24 hours a day during the irrigation season. In asking why, I was told that the electric motors needed a rest each day and it was difficult to find someone to irrigate at night that did not need constant vigilance. I find both excuses rather ridiculous. Before more wells are drilled, they should use the existing wells to capacity. I believe there is enough water to meet their needs if used properly, especially with the more efficient irrigation systems. The Swiss program appears ready to initiate a research project comparing trickle and irrigation systems. Ing. Agr. Eliseo Colque, a private contractor, is designing the systems. I loaned him a copy of an article describing a new irrigation system that I feel has real potential for orchard irrigation in Bolivia. The system is described by Dr. Steve Rawlins of the U. S. Salinity Laboratory at Riverside, Calif. Ing. Colque is to return the article to the San Benito Research Station. The primary benefit is that it is a macro trickle irrigation system requiring only 2 feet of head with no filtering or pumps.

I am not optimistic about the areas that have been selected as good fruit growing areas. The Pocona and Valle Grande areas are too far from asphalt roads or railroads which are a must for transporting peaches. The

apple trees still show signs of abnormal growth. While the Capinota area is serviced by railroad, it, like the other areas, is too restricted for developing any sizeable or extensive plantings. Areas with more open ground and higher elevations need to be tested for a better fruit growing climate. Instead of organizing planting trials that take years of study, I recommend that hygrothermographs be purchased to gather temperature data in different areas. The data can then be analyzed to determine what kind of agricultural crops could be grown in a given area. This type of information is sorely lacking in Bolivia. Ing. Agr. Simeon Rodriquez and I have tentatively located six areas we think should be tested for possible orchard sites I would like to analyze the data even if it is not under contract, because I would like to have the experience. Also, I know the areas.

Desperately lacking in the fruit research program are adequately trained personnel. During this visit I have spent three full days teaching statistical design, data analysis, and interpretation of results that are commonly used in fruit research. The average attendance during this period were six people. A slide presentation showing the various fruit cultural practices used in the U. S. were shown to about 20 people. The presentation lasted approximately 2-1/2 hours with the number of questions asked. Three 1-1/2 hour afternoon classes entitled, "The Role of Temperature in Orchard Site Selection," "Training and Pruning Fruit Trees," and "Irrigating and Fertilizing Fruit Orchards" were presented to approximately 16 station personnel and other interested parties. A considerable number of hours were spent talking on a one to one basis with those directly involved in fruit research. If the fruit industry is to be taken seriously, a qualified young man needs to go to graduate school somewhere for an advanced degree as soon as possible.

While Ing. Simeon Rodriguez's age would not allow him to undertake graduate work, I again highly recommend that he travel to the U. S. to visit a research station where he can spend 4 to 6 weeks working with and observing research underway. With his years of experience and a short visit to a U. S. fruit research center, he could start building a research program that would later be strengthtened by the addition of the returning person with an advanced degree. The Swiss technician is doing a fine job but also lacks scientific training.

In conclusion, I feel that there is sufficient evidence to suggest that a strong fruit industry, especially peaches, can be established in Bolivia. Sufficiently strong, perhaps, to develop into an exportable product. The program will require a higher level of technical expertise, and financial backing.

LITERATURE CITED

1. Hatch Anthony H. 1976. An Assessment of the Temperate Fruit Research Program at the San Benito Research Center. CID/MACA Working Paper No. 006/76.