

DIVERSIFICATION OF ORCHARD CROPS OF RIO GRANDE VALLEY

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It was hardly necessary for me to come from California here to suggest that when the new acreage of grapefruit now being planted in this valley comes into bearing, you may have a surplus. In fact, I have been told that there is a surplus now. Evidently greater diversification of orchard crops is needed. I have been asked to present my ideas with respect to what extent the growing of other tree crops is practicable, which crops may be best suited to environmental conditions here, and for which there may be a reasonable market demand. These are rather large questions for a nonresident to answer. A good deal of research and investigation will be necessary before the right answers may finally be arrived at. My remarks, therefore, are to be taken simply as suggestions.

After looking over the list of orchard crops which may hold some promise, and having in mind the limitations imposed here by the Mexican fruit fly regulations, I can think of at least three crops with definite possibilities. These are Mexican type limes, papayas, and avocados. I do not believe that any one, or combination of these, can be developed into an industry comparable in volume with your present grapefruit and orange industry. However, if some lands can be diverted to them, to that extent may the pressure on the present grapefruit market be reduced.

Mexican Type Limes

While the lime is a specialty item, and is handled and marketed quite differently from lemons, there has long been a good demand for fresh lime drinks as a thirst quencher, particularly in summer. Lemons can be substituted for limes for certain uses only; such, for example, as a garnish for sea food dishes and in hot and cold tea. Lemon juice is not satisfactory for use in carbonated mixed drinks, either hard or soft. Here the lime is supreme and finds its place beside the "fizz-bottle" in every bar. The lime must be squeezed fresh for each drink in order to provide that distinctive aroma of lime oil from the rind.

Because of climatic conditions there is great difficulty in getting Mexican type limes up to good size and maturity in either California or Florida in summer when the demand is greatest. Therefore growers in California have turned to the less desirable Bearss and Florida growers are producing the Tahiti lime. But demand of the trade is still strong for Mexican type limes. I will not take time here to go into all the interesting reasons why. Many millions of pounds of Mexican limes are imported each year, chiefly from Mexico. They grow in many parts of that country and are of good size and quality in summer. Dealers in the United States would prefer to buy limes in this country because of the

difficulty in getting Mexican growers to grade and pack them uniformly, and also because of inadequacy of transportation facilities in Mexico. A packing-house is maintained at Laredo for the regrading and packaging in small paper cartons of these limes, many carloads of which arrive days or even weeks behind schedule.

Another and ominous handicap in handling limes from Mexico is the fact that Black Fly (*Aleurocanthus woglumi*), an extremely devastating citrus pest, has become well established in Mexico. It is now found at several places in central Sonora, and has recently been reported at Valles near Tampico. In Cuba and elsewhere this pest has been controlled by biological means, but in Mexico, on account of climatic conditions, introduced parasites have so far failed to give control. We may expect, any day, to have Mexican limes either quarantined out of this country, or we may have to subject them to fumigation or other treatment at the border. This will not only mean more expense and delay, but may seriously injure their marketability.

Mexican type limes thrive in this valley and produce good sized fruit. The main picks come in June to September which is the season of greatest demand. This past July, I took samples back to show to the Manager of Calavo Growers who stated to me that they were quite satisfactory. The chief function of Calavo is to pack, distribute and market California avocados. Limes and some other sidelines, such as Florida avocados, are distributed in summer, when the volume of California avocados is not sufficient to keep the employees and distributing facilities throughout the country fully occupied.

But before you can fully grasp this opportunity to grow and sell 10 to 15 million pounds of limes a year, the subject should receive considerably more study and investigation. I see that you can grow three kinds of limes; thorny, thornless, and a form called "limón" by Mr. Ballard. For the sake of uniformity of product you should find out which is best for all purposes and make that standard. In picking limes here it has been customary to pull them rather than clip them. Is that really best for keeping quality? The market prefers limes to be green in color. How should they be treated here to retard decay and enable the green color to be retained for a longer time? What standards should be adopted with respect to acids and juice content?

It is true that the lime tree is more tender to cold than grapefruit and some sections of the Valley may be found better adapted than others. It is my understanding that the lime is not attacked by the fruit fly and that they may be harvested all summer. Abrasions caused by wind injure the appearance of limes and you may find the thornless variety less affected, or you may find it advisable to provide windbreaks. Soil types best adapted; irrigation, fertilization, root-stocks and cultural methods, all should be investigated. If these problems are vigorously attacked and solved, I see no reason why the production of Mexican type limes may not become a profitable industry here.

Papayas

For many years papayas have been grown here in a small way for home use in yards and gardens. When planted on light soils and given good care, they yield well. I have eaten fresh papaya in many parts of Mexico as well as here, and in my judgment the quality of fruit produced here compares very favorably with that grown in Mexico. Grown from seed, the plants begin maturing fruit in about fifteen months, or in much less time if the seeds are planted in a greenhouse in fall and planted out as good-sized plants in

spring. Seed is cheap and plentiful. Because of the short time needed to mature the crop, a relatively small amount of capital is necessary.

Papayas are quite tender to frost and are very likely to be injured or killed by cold occasionally. But this is not too serious because they may be replanted and brought to bearing so quickly. On poorly subdrained heavy soils the plant is subject to root rot, and the fruit is often attacked by the anthracnose fungus which causes spots on the skin. It should be possible to control the latter after experimenting with fungicidal sprays. The market demands a small sized roundish fruit, and the variety question should not be too difficult of solution.

The principal reason why more papayas have not been produced in the Valley is the lack of marketing facilities. In my opinion there already exists a certain amount of demand in the markets throughout this country. Americans are increasing their travel in foreign tropical countries where they get acquainted with, and learn to appreciate the good qualities of the papayas. Thousands of our young men and women saw military service in the tropical lands of the Pacific where many of them learned to like papaya. These ex-service people are now back at their homes scattered all over this country. No doubt they will buy papayas when they are available in their local markets. The selling price of papayas is high enough to warrant shipment by air-freight to all our principal cities.

While byproducts of other fruits are not usually as profitable as fresh fruit, there are, in the case of papaya culls and surplus, interesting possibilities such as liquid juice, evaporated and powdered juice, and certain drugs and chemicals which are derived from the papaya fruit. Quick freezing papaya also offers much promise.

In past years some papayas from Hawaii have reached the Pacific coast cities, but due chiefly to transportation delays, the quality was so poor that this business has not grown. Calavo Growers of California has all the necessary facilities of distribution and the trained personnel to handle this business. They probably would be interested in handling papayas as an additional side-line, especially in summer and fall when avocados are not plentiful. In my opinion papaya culture has considerable promise -in this valley.

Avocados

Over the years a good many avocado trees have been planted in this valley. Most of them have died out, but a few here and there have lived, and some have grown well and borne fruit. No one seemed to know why such a large proportion of the trees failed. In the summer of 1941, Mr. Karl Hoblitzelle asked me to plan and supervise a good sized experiment to find out if avocados can be grown commercially here, and if not, why not.

At first the variety question seemed most important. The only place I knew of where 600 first class budded trees of eleven different varieties could be obtained was Armstrong Nursery in California. All these were on Mexican root-stock as that is used exclusively in California. These trees were carefully selected and shipped to Mercedes in November, 1941. Due to war restrictions on travel, I was not able to visit them again till January, 1947. During this interval I was in frequent correspondence with Mr. Morris Allen under

whose care they were being grown.

Many of these trees died out rather promptly. Some of them grew well and today are large trees for their age. The most successful trees were those planted on well drained sandy soils. The ones which failed were mostly those on heavy, poorly subdrained soils. We now feel that one thing has been sufficiently demonstrated, and that is that it is useless to plant avocados on heavy soils.

In the beginning Mr. Friend of the Experiment Station here told me that, in his opinion West Indian root-stock was best for this valley. But we could get none on that stock for comparison purposes. Observations made last January and again in June by Dr. Cintron and myself, of various bearing trees scattered through the valley, appear to confirm Mr. Friend's opinion. Trees will grow well on Mexican stock as shown by the trees now on the Hoblitzelle ranch. Other trees on West Indian stock grow just as well and apparently are less subject to leaf tip-burn. We are now growing trees here on West Indian and Guatemalan stocks. We plan to mound the soil above the bud-unions for several years in order to protect these more tender stocks from cold.

Since Dr. Cintron has been employed by Mr. Hoblitzelle, he has taken special interest in the avocado experiment and much valuable data has been compiled. He is now top-grafting some trees to many additional varieties from California, Florida and Puerto Rico. He is also experimenting with nursery propagation, irrigation methods, soil management, disease control, etc. He has made extensive observations on avocado flower behavior. Using a refractometer, he has tested the fruit for oil content during its development. He is on this program to report to you some of his observations. I may say here, however, that due to local climatic conditions, several of our California varieties fail to develop normal oil content before maturity. Most varieties, so far tested, bloom heavily and set excessive amounts of fruit, but some of them drop it all before maturity. Anthracnose decay of the fruit is very serious, and with some varieties repeated sprayings with bordeaux have failed to control it.

Of the older bearing trees observed in the valley, the Lula seems to be a healthy grower and bears fair crops of fruit which is little affected with anthracnose. The Lula is grown commercially in Florida, but I know of only one or two trees in California. It is supposed to be a seedling of Taft, which is a pure Guatemalan. I think this must be an error as it has every appearance of being a hybrid between Guatemalan and West Indian. We plan to test the Itzamna, and any other promising similar hybrids which may be brought to our attention.

The Valley growers owe appreciation to Mr. Hoblitzelle for his generosity and altruism in authorizing and financing this comprehensive avocado experiment.

Before the avocado can become a commercial crop here, there are a number of additional problems which will have to be solved by investigation and research. It is not easy and will take time. If we are finally successful and produce an avocado of good marketability, I think the logical thing would be to form a cooperative packing association to handle limes, papayas, and avocados. The distribution and marketing requirements of all three are similar. It would seem to be economically advantageous for these fruits to be marketed through the same facilities.