

An Avocado Venture in the Rio Grande Valley of Texas

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Citrus growers and nurserymen in the Rio Grande Valley have been quite generally pessimistic with respect to the growing of avocados in the Valley. They point out that over a period of years, many attempts have been made to grow avocado trees. So far these have met with failure or such discouraging results that avocado culture is not now considered commercially feasible. The reasons for the failures have been variously ascribed to saline irrigation water; too high pH of the soil; lack of sub-drainage; the strong summer Gulf breezes; to the cotton root rot fungus; and to too frequent frosts.

On several visits to the Valley the writer has been interested in examining avocado trees in yards and along roadsides. The majority of these are sickly specimens with bunched growth, badly tip-burned leaves, and progressive die-back. Yet it is very interesting to note that here and there, usually situated in a lawn, are occasional large healthy seedling trees, as vigorous as one could desire, and bearing some fruit. Throughout the citrus area of the Valley these are usually seedlings of the Mexican race, while in the yards and gardens of Brownsville and Matamoros on the Gulf, West Indian seedlings seem to predominate. Environmental conditions are distinctly more tropical at Brownsville than in parts of the Valley further from the Gulf, where the climate is somewhat more arid and citrus is the principal crop.

While on a recent trip through Mexico, the writer had an opportunity to observe a number of large seedling avocado trees of the Mexican race growing along streams between Laredo and Monterrey. Many fine healthy looking trees were observed in the valley of the Rio Sabinas near Hidalgo. Apparently these were all volunteer seedlings, growing in naturally moist places without cultivation or care of any kind. Some of them were 40 to 50 feet high and usually were near enough to the stream bed for some roots to have constant access to the flowing (oxygenated) water. Some trees showed tip-burn while others did not. Some bore fruit which was harvested, the seeds removed, and the halves held together with rubber bands were observed on sale in the markets of Laredo. (A requirement of United States plant quarantine officials on account of the danger of introducing the avocado seed weevil.) These trees are at a latitude somewhat north of Mercedes, which is at about the middle of the citrus area on the American side. They grow on an almost level arid plain, with no mountains to the north to protect from cold north winds, and at a distance of about 200 miles from the Gulf. The question naturally arises as to why cultured avocado trees fail in the Rio Grande citrus area when they grow well spontaneously near Hidalgo, where the environmental conditions are even less favorable?

THE HAZARDS INVOLVED

There seem to be four chief hazards to avocado culture in the Rio Grande citrus area:

1. Heavy soil, lacking sub-soil drainage in many parts of the area. Where avocado trees have been planted on such soils they could hardly have been expected to survive.
2. Salinity of irrigating water, particularly at such times as the river is low and a larger proportion of the water consists of contributions from tributaries arising in the more arid country of Mexico.
3. Winds from the Gulf in summer and occasional cold northers in winter.
4. Occasional freezes. Atmospheric humidity is high and vegetative growth is lush and not very resistant to cold. Normal growing conditions are so favorable, however, that recovery from ordinary and moderate frost damage is surprisingly rapid. The writer is of the opinion that the cotton root rot fungus, which is so damaging to some shade trees, has not been demonstrated to be more than a very minor hazard to avocado culture.



Jalna avocado tree near Mercedes, Texas. Planted Dec. 1, 1941; photo. Sept. 1, 1942.
Summer cover-crop of Sesbania.

THE VENTURE

A small orchard planting of 15 to 20 Mexican avocado seedlings of nondescript parentage, and about six years old, have made a very satisfactory development alongside of a grapefruit orchard on the place of Mr. Karl Hoblitzelle. The location is about four miles north of Mercedes, which is about the center of the citrus area of the Valley. Observing the growth of these seedlings, Mr. Hoblitzelle became intrigued with the idea of making a really thoroughgoing test of avocado culture. He decided to do this on a large enough scale to fully warrant the attention it deserved. He determined to grow a successful commercial orchard or find out exactly why it could not be done. He enjoyed two important advantages. Included in his large citrus holdings were two low sandy hills where soil drainage was good and elevation above the valley floor gave

some protection from frost. His superintendent, Mr. Morris C. Allen, a son of the late R. M. Allen of Bonita, California, was raised in San Diego County and had had experience with avocados in his father's grove at Bonita. Mr. W. H. Friend of the Experiment Station at Weslaco and Professor Guy W. Adriance of the State College of Agriculture both offered advice and assistance to make the venture a success.

PREPARATION OF LAND AND PLANTING

The sandy hills were cleared of brush and terraced on contours for furrow irrigation. A pump was installed to lift water from the valley level and deliver it through a system of pipe-lines reaching all terraces. Windbreaks of athel were planted at suitable intervals to furnish protection from winds. Tests of the soil showed an average pH of 7.4.

Some 558 trees were selected by the writer in California, including 11 varieties: Fuerte, Leucadia, Duke, Jalna, Ryan, Nabal, Edranol, Zutano, Helen, Middleton, and Benedict. This selection included pure Mexicans Guatemalans, and hybrids. These trees were balled with great care, cut back rather severely, cured in the lath-house, loaded into a ventilated refrigerator car, and shipped November 22, 1941. The trees arrived at Mercedes in excellent condition and planting was completed the first week in December. In Rio Grande Valley, fall planting of balled citrus trees is preferred to spring planting. Inasmuch as all the California trees were on Mexican root-stock, 26 boxed trees on West Indian root-stock were shipped from Florida and planted later in December.

After being well irrigated, the tops of the trees were provided with a protective covering of palm leaves and the trunks were painted with copper Bordeaux whitewash. Later in the winter the trees were mounded with soil, as is customary in that country for young citrus, and good lath shelters were erected before the strong Gulf breezes started in spring. During winter a fairly good cover-crop of weeds developed, and the following summer a very heavy crop of sesbania was grown as a summer cover-crop and also as a protection from wind. This may be seen in the illustration.

RESULTS TO DATE

When inspected by the writer in January, 1942, in company with Dr. W. H. Chandler of the University of California, the trees appeared to be in good condition. In spite of cold north winds, they came through the winter safely and made a good growth in spring. The summer weather conditions were to a great extent unfavorable, with very little rain to leach down saline matter brought in by the irrigating water. Also prolonged periods of unusually high temperatures seemed to retard growth and cause tip-burn of the leaves. It may be that the heavy growth of sesbania close to the trees robbed them of soil moisture faster than was realized at the time.

By September 1st the total average growth was less than had been expected and hoped for, yet the total losses of the 558 California trees was 26, and out of 26 trees from Florida 12 had died.

An attempt to overcome high pH of the soil and water was made by applications of

aluminum sulphate and soil sulphur to certain trees. So far no effects from these treatments can be seen. A moderate amount of sulphate of ammonia has been applied, but judging from the rank growth of cover-crop, the soil should not be seriously lacking in nitrates.

In the writers opinion the problem of getting a larger and more satisfactory vegetative growth next summer should be approached chiefly through a study of soil moisture relations. By varying the amounts of water given, considering water appropriation by competitive summer cover-crops, and particularly by shortening the interval between irrigations, better growth is hoped for. Attention is now centered on growing healthy, vigorous trees up to four years of age. After that, observations on bloom, fruit setting, relative yield of different varieties, fertilization, control of pests and disease, etc., will follow and be reported on later.