California Avocado Society 1951 Yearbook 36: 35-40

REPORT OF THE COMMITTEE ON FOREIGN EXPLORATION

Root rot or decline is the most serious threat to a permanent avocado industry in California. The only complete solution to the root rot disease of the avocado would be a fungus-immune root stock. All the standard types of avocados are highly susceptible to the root rot fungus, *Phytophthora cinnamomi.* The leading project of the Committee on Foreign Exploration has been to locate and test as root stocks the wild avocado relatives growing in the mountain forests of Mexico and Central America where the avocado is indigenous. From among the many importations now under test the committee has one of great promise, the wild avocado of Aquila (Mexico).

A secondary project of the committee has been the further introduction from Mexico of avocado varieties of possible commercial importance. In general, the domestic field is a more likely area for discovering new varieties, as most local seedlings are from the selected commercial varieties of demonstrated quality, while in Mexico seedlings are generally from other seedlings all of poor quality. However, from the great mass of avocado seedling types there are variations not now present in California. Among these diverse hereditary factors there may be some worth adding to those we now have. Also there is at Atlixco the now famous Rodiles grove of selected seedlings unique in Mexico, where the owner over many years carefully planted the seeds of all superior avocados found in the local area noted in Mexico for its fine avocados.

Previous reports of this committee have described the Rodiles importations. Many of these are blooming this spring in California, and it is hoped to have an evaluation of them soon.

In last year's report, we announced plans to explore northeast Mexico, from Monterrey to Tamazunchale. In this area, including Ciudad Victoria, are growing many West Indian x Mexican crosses that are new to California and may have value as fall fruits. Also there are reported wild avocados in the mountains above Tamazunchale. We had invited the Texas Avocado Society to join forces with us in this exploration. This past winter, Texas and northeast Mexico suffered a disastrous freeze, so plans for this exploration have been cancelled with the thought of again attempting it in the summer of 1952 at which time the committee can judge the tree recovery as well as the fruit quality. 1952 will present a unique opportunity to judge hardiness to cold along with other qualities in this semi-tropical climate— a very important consideration for California varieties.

The committee had never personally investigated the wild avocados of the West Coast of Mexico although numerous reports were received of their existence. Moisture and climate requirements limit wild avocados, as far as known, to the sub-tropical forests of the two coasts of Mexico, the Pacific and Gulf coasts. It is reasonable to suppose that different types would be found on the Pacific slopes than those already found on the

Gulf slopes. A new expedition was undertaken in April 1951, participated in by Elwood Trask. Dr. George Zentmyer, and Harlan Griswold to check this new area. A brief account follows in this report.

AQUILA AVOCADO AS A ROOT STOCK

Among the wild avocado types now under test as future root stocks, the wild avocado of Aquila *(Persea floccosa)* is showing marked immunity to the root rot fungus, *Phytophthora cinnamomi.* This is in contrast with most of the other types, which show great susceptibility to the fungus. In the 1950 report was described a field experiment by this writer which showed definite resistance of the Aquila to soil believed infected with the fungus. We now have additional supporting information from the laboratory.

As yet there are no seeds available in California. The older Aquila trees are in bloom this spring and it is hoped that a few seeds will be available next year for experimentation. In the meantime, Dr. C. A. Schroeder and his assistants at U.C.L.A. have propagated rooted cuttings of this avocado. They report that it roots readily with bottom heat and high humidity, more so than the true avocado. Several of these rooted cuttings have been provided Dr. G. A. Zentmyer, plant pathologist at the Citrus Experiment Station, Riverside.

Dr. Zentmyer has developed a method of inoculation with the fungus of potted avocado plants for a quick laboratory check of susceptibility. Dr. Zentmyer informs the committee that present tests of these potted Aquila cuttings have not taken and that apparent immunity exists. He will repeat the experiment on additional cuttings at once. It is easy to become enthusiastic about these results but there is much work yet to be done.

Nothing is known about the behavior of the Aquila as a root stock. We have discovered that it propagates readily as a scion or tip graft on Mexican root. Tip graftings on Mexican seedlings were very satisfactory, but the first attempt on a small scale to bud the Aquila into Mexican stock was not very successful as only one grew. Both types of propagated trees have made satisfactory growth with normal bud unions and are now growing in the field. As soon as the rooted cuttings are large enough, experiments will be under taken at U.C.L.A. in budding and tip grafting of the Fuerte on the Aquila. When seeds are available extensive experiments will follow.

Aquila Tip Graft on Mexican Root.

ADDENDUM — JANUARY 1952

Since this report was written, new information has been developed on the resistance of the wild avocado of Aquila *(P. Floccosa)* to the root rot fungus. Dr. Zentmyer reports that he has now been successful in inoculating rooted cuttings of this avocado with cinnamon fungus. The rate of resulting decline is, however, slower than with our domestic avocados.

The field plot reported in the 1950 Yearbook (page 29) has passed out of the control of the writer; but the Aquila tree in the plot is still alive at this writing, although not in a thrifty condition. Present conditions of care are unknown.

The Aquila avocado is not yet eliminated from consideration as a root stock, but will be studied intensively. This spring, we are maturing our first crop of Aquila seeds grown in California; these will aid materially in its study.

In addition to the work with the Aquila avocado, many other related species are continuing to be collected for test as resistant root stocks.

EXPEDITION TO MEXICO, APRIL 1951

Motivated by a desire to test concurrently as many wild type avocados as possible, a new expedition was undertaken in April 1951 to further explore Mexico. We were particularly interested in the Pacific Coast of Mexico, a new territory for committee explorations. Our party consisted of Elwood Trask, Society president; Dr. George Zentmyer, pathologist from the Citrus Experiment Station who went along to check root rot in Mexico; and Harlan Griswold, committee chairman.

We flew from Tijuana to Topic. Tepic is the capitol of the Mexican state of Nayarit and is located in the mountains on the Pacific slope of central Mexico. Here we made contacts that enabled us to explore the forests in the local area. In the mountains near Tepic at

about 4,000 feet, a few wild Mexican type avocados with the characteristic anise odor in the leaves were found. The trees appeared to be of conventional type but had every appearance of being native at this location. No fruit was present at this season but budwood was obtained for study in California.

The forests of this locality have been repeatedly burned over and what remains was suffering from drouth. It is unlikely that many native avocados are left in this area.

We transferred our headquarters to Compostela, twenty miles south of Tepic, and extended our attention to the moist, hot coast line which we reached by local bus. Here we found extensive natural forests of large avocado trees representing both thin skinned West Indian types and thicker skinned Guatemalan types. These coastal forests were near the Indian village of El Capomo, a primitive people living in thatched huts but very friendly to our party. A friend from Compostela acted as interpreter. We braved the fleas and dirt to accept the hospitality of one of these humble homes for a short rest out of the sun.

These coastal avocados were growing wild among the jungle growth of a humid tropical forest. We had as guides several of our new village friends. The forest was infested with a species of small tick locally called "guina" which required hours to painstakingly remove from our bodies after we returned to Compostela.

Mature fruit at El Capomo would not be available until late summer. The natives stated that they harvested the fruit and that they were of good size with the thin skinned ones purple and the thicker skinned ones green.

We discovered nothing in this Pacific area other than known types so we headed across Mexico visiting Guadalajara and Mexico City on the way. Our new headquarters were at Jalapa in the state of Vera Cruz on the Gulf coast.

From Jalapa *we* visited the Indian villages of Huatusco and Coscometepec, an area this writer had previously partly explored. Here we saw many small black Mexican type off-bloom fruits being sold in the local street markets. These fruits are round and about an inch in diameter with large seed. They contain a taste of delicious avocado pulp and it is customary to eat them skin and all. We were able to see some of the trees from which these fruits came, large specimens producing usually two distinct crops a year. These are undoubtedly a wild type as the trees are found growing native in the forests as well as everywhere around cultivated areas. They grow from the seed surprisingly true to type.

Wilson Popenoe has reported that Dr. C. A. Purpos, a botanist formally living in Huatusco, described these small black Mexican type fruits as growing wild everywhere in this area. These trees were heavily infected with leaf gall and seed weevil.

This area is the most interesting yet found in Mexico as it is heavily forested and contains many types of wild avocados as well as cultivated types. All kinds now known in Mexico are represented here. These include *Persea Americana, P. drymifolia, P. schiedeana, P. longipes,* and *P. floccosa.*

This area, which consists of the south and east slopes of Mt. Orizaba, has the rainfall and climate ideally suited for avocados at 6,000 to 7,000 feet above sea level. It is from this area that the wild avocado of Aquila was found in May 1947, located near an Indian

village of that name.

Although no new wild avocado type was discovered on this trip, most helpful information was gathered which, added to previous knowledge from other explorations, should be of value to our project. The village of Huatusco has been recently opened up with a paved road and extensive detailed exploration of this area would be easy and probably profitable. There are good accommodations at nearby Orizaba, Cordoba, and Fortin within easy automobile distance.

On the way home we made a visit to the city of Atlixco and the shrine of the parent Fuerte tree. We also looked over the cultivated avocados numerous in this area. Dr. Zentmyer made many checks for root rot among these and other trees. In all he checked over thirty for root rot fungus. He found only one infected tree in the lot, and that at Huatusco on a wild Mexican type.

We made two side trips, one to Teziutlan near Jalapa and the other to Cuernavaca near Mexico City. At both places, we examined many plantings of Mexican type avocados grown for the local avocado markets. These are small back yard type plantings. At Teziutlan we were unable to find any word of wild avocados which had been reported in the area. We did see much evidence of last winter's freeze which damaged the trees this far south.

The leaf gall is everywhere in Mexico, but other pests such as the twig borer and the seed weevil are only at localized spots. This year a mite similar to our avocado brown mite has caused heavy damage at Atlixco.

We spent an enjoyable weekend with Henri Gilly at his hacienda "Xahuentla" near Atlixco. Here Sr. Gilly is developing with the assistance of Carl Crawford of Santa Ana a modern California type avocado orchard. His varieties are principally Fuerte and Hass—about sixty acres in all. He has a fine market in Mexico City at good prices and expects to develop a profitable enterprise along California lines. We left Xahuentla with reluctance, and returned to Mexico City and our plane for home.

*Avocado Explorers Near El Capomo. (*Photo by Griswold)

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