

Primitive Avocados of Central America and Mexico

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These observations were made on a trip through Mexico, Guatemala, El Salvador and Honduras in the month of October and early November, 1946.

Primitive forms of the Guatemalan race of avocados are found growing in the wild state on the mountain slopes of Central America. They are found in the subtropical cloud forests at around 6000 feet above sea level. Wilson Popenoe reports them in Guatemala and Honduras and they have been observed as far south as Costa Rica.

Carl Crawford and I were guests of Wilson Popenoe at the Escuela Agricola Panamericana (see foot note) in Honduras. As a special treat he took us on a never to be forgotten climb to the top of Mount Uyuca to see the wild primitive avocados growing in the primeval forest. Our steep climb took us through open meadows with occasional pine trees until at the 6000 ft. elevation we plunged into the dark of the junglelike cloud forest. From there on up to the summit at 6500 ft. we found avocado trees competing for light and sustenance with the dense growth of many other kinds of trees and plants.



Cloud Forest, Mt. Uyuca, Honduras. Where avocado trees grow wild. Left to right, Dr. Popenoe, Mr. Griswold and Dr. Williams.

The forest was damp and dripping with thin clouds drifting through the trees. About us were tall tree ferns and other shade-loving undergrowth. Growing in the six inches of decaying vegetable mulch were maidenhair ferns and occasional brilliant begonialike flowers. All tree trunks were heavily covered with damp moss and many types of orchids

and parasitic plants. The slopes were steep and the climb precarious.

Our soil auger showed the first foot black with organic matter. The next two feet were red clay of very smooth texture. All three feet were uniformly saturated with moisture. Free water could be squeezed from the soil. This condition must exist for at least the duration of the rainy season and undoubtedly it is always very wet as the clouds percolate through the trees throughout the year. The soil tested acid with the top soil having a pH 4.0 value and the subsoil a pH 4.5 value. These conditions should bring on avocado decline, but none was in evidence.

We found many trees scattered through the forest, some as large as four feet in diameter. There were many seeds on the ground some of which were sprouting in the wet mulch. These wild trees produce fruits which are mostly seed and skin, and mature in October. The seeds varied from just under an inch in diameter to one and one-half inches. Around the seed was about one-eighth of an inch of edible pulp of good flavor, and a thick granular skin. No anise was detectable in the leaves and the only sign of insect pest observed was the leaf gall.

Avocado decline has already appeared on four year old trees budded on West Indian root-stock growing on clay soils at the school in the valley below. Wilson Popenoe has gathered seeds from this forest and will test them as possible decline resistant root-stocks. This may be of tremendous importance to our California Avocado Industry and arrangements have been made for trials here.

There may be differences among Guatemalan avocados as regards their resistance to water logged soils. Other primitive types may exist under less severe conditions. These on Mt. Uyuca should be unusually promising specimens.

Wilson Popenoe suggested that we might find primitive Mexican avocados growing on the slopes of Mount Orizaba in Mexico. Carl Crawford and I on our way home investigated and found them growing in the cloud forests at 6000 feet on the mountains surrounding the base of gigantic Orizaba. We doubt very much if they will be found much higher due to low temperatures.

We were looking for one primitive type as in Central America, but we found there were at least two, one bearing in November and December, and the other in April and May. The winter bearing type we found growing in the mountain forests at the summit where the Puebla to Orizaba highway starts its descent into the coastal valley. A local guide is necessary to find them as they are scattered very thinly in the forest.

The environment of these avocados has great similarity to those in Honduras except less humidity and less organic matter. These in Mexico were subject to a wider range of temperature, experiencing some frost and more sunshine. Several inches of mulch littered the ground except where the forest thinned to an occasional open meadow. The soil was of clay with grit and, although wet, contained no free water. The trees were covered with moss and orchids. Of the few trees observed, one was five feet in diameter. Its top, although vigorous, was composed of large suckers growing from the old decayed stump. Leaf gall was the only insect pest noted.

We found both round and pear shaped fruits with thin green skins. They were small with about one-quarter of an inch of flesh. The seeds averaged smaller than those in

Honduras. There was no detectable anise in the leaves.

The other primitive Mexican type bears in the Spring and is sold in the Orizaba city markets at that time. We verified this from many sources in Orizaba. The fruit is prized for its high nutty flavor, which gives it market value in spite of its diminutive size.

These trees grow wild in the forests above Maltrata, a town in the railroad mountain pass above Orizaba. We did not get to see this type although we visited Maltrata, but hope to return in the Spring when they are in fruit and determine whether the usual Mexican anise odor is present in the leaves. Somewhere there must be a primitive Mexican type with this anise in the leaves.

At Atlixco, Mexico, there are two types of cultivated Mexican race avocados, one bearing in the Fall and early Winter and the other in the Spring. These domesticated types correspond to the two primitive types in season and possibly in other characteristics.

I believe the following conclusions can be drawn from our observations: One: The Honduran (Guatemalan race) primitive avocado is accustomed to greater water logging of the soil than the primitive Mexican and consequently it is to be expected that the Guatemalan race of avocados is more resistant to water-induced decline.

Two: Observation of the two environments would lead one to expect the Mexican types to have a wider adaptation to our California conditions, especially our dry heat, and that the Guatemalans would be most at home along our damper south coast line.

Three: All primitive avocados observed are accustomed to mulching, and feed extensively on and near the ground surface; the Mexican types less so than the Guatemalan.

Four: Avocados are forest trees adapted to crowding and competing for sunlight and food. **Excessive** thinning of avocado groves may prove to be undesirable because of the resultant effect on the quantity of mulch and drying out of the soil surface.

Study of these primitive types should give us a better understanding of the behavior of our cultivated types and should suggest possible handling techniques to try in our orchard practice. These primitive types may be valuable root stocks and should be thoroughly tested. Continued explorations should be made to complete the picture and furnish material for trial.

Wilson Popenoe is Director of the Escuela Agricola Panamericana (Panamerican School of Agriculture), Tegucigalpa, Honduras, C. A. It is devoted to the technical training in agriculture of selected Central American youths. The institution was founded and wholly supported by the United Fruit Co. The visit of H. B. Griswold was for the purpose of presenting the Society's emblem of honor to Wilson Popenoe for his work with avocados. For an account of this event see page 99 of this issue.