California Avocado Association 1938 Yearbook 23: 107-108

A Promising Method for Distinguishing Between Mexican and Guatemalan Avocado Bark

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There are three broad horticultural groups of avocados grown in the United States, which are conveniently termed the West Indian, Guatemalan and Mexican races. Botanically, the West Indian and Guatemalan races are classed as **Persea americana, Mill.** (**P**. **gratissima Gaertn.**) and the Mexican as **Persea drymifolia, Cham. & Schlecht** (**P. americana var. drymifolia, Mez.**).

In California we are concerned only with varieties belonging to the Mexican and Guatemalan races and varieties intermediate between these two, the so-called hybrids such as Fuerte. A characteristic which serves to distinguish the Mexican from the Guatemalan race is the anise-like odor of crushed leaves in the former which is lacking in the latter. There are exceptions, however; for example, the leaves of the variety Leucadia, which is classed as Mexican, lacks the anise odor. Some varieties of the hybrid class possess it while others do not.

Since leaf character furnishes the main basis for distinguishing between the two species it is obvious that identification of the rootstock or the "sandwich" portion of a top-worked tree is possible only if sprouts are present. In most cases, however, these are lacking, and to force growth requires time and the mutilation of the trunk.

To overcome this difficulty an attempt was made during the past year to find a method of identifying the two species on the basis of bark characters. Several leads were obtained but only one has been tested on a sufficiently large scale to warrant a preliminary report.

PROCEDURE FOR TESTING BARK FOR TYPE

It was found that when water was added to powdered bark, the bark of Mexican formed a coagulated or viscous mass while that of Guatemalan remained more or less granular. The hybrids behaved more like the latter than the former. The procedure which gave these results is as follows: Bark, previously dried at about 75° C., is put in a mortar and ground up sufficiently fine to pass through a 40-mesh sieve; 0.5 grams of the powder is placed in a test tube and 10 cc. of distillsd water added. The difference in behavior between the two species can be seen shortly after the powder has become saturated. The varieties tested are listed below; they are grouped in accordance with the variety check list published in the 1937 yearbook of the California Avocado Association.

Mexican	Guatemalan		Hybrid
Blake	Benik	Mayapan	Fuerte
Duke	Carlsbad	Miller	Leonard
Leucadia	Choice	Nabal	Worsham
Mexicola	Colorado	Nimlioh	
Northrop	Dickinson	Panchoy	
Puebla	Itzamna	Prince	
Snell	Kashlan	Queen	
Topa Topa	Linda	Sharpless	
	Lyon	Sinaloa	
	Matney	Taft	

Bark of 28 of the 31 varieties listed above was obtained from trees on Mexican rootstock growing in the Subtropical Horticulture Laboratory Orchard on the Los Angeles campus of the University of California. Both scion and rootstock of these trees were tested at three different times, namely March 4th, May 4th and July 7th. A fourth test is now under way (October, 1938) and a fifth will be made during the winter when the trees are least active. So far the results have been identical. The hybrids, as stated before, were observed to be closer to Guatemalan than to Mexican. Puebla, which is classed as Mexican, has so far been indistinguishable from Fuerte. The rootstocks, although all are considered typical of the Mexican race, varied somewhat in their reaction, a few showing a very weak coagulating power. In order to obtain more information concerning this variability, bark of 50 two-year-old Mexican seedlings was tested. Forty-two of them formed a coagulated mass which did not separate upon vigorous shaking while in the remaining eight the test was not as pronounced. The root bark gave a weaker reaction than the corresponding stem bark. The leaves of neither species reacted to the test.

In conclusion it should be emphasized that the investigations have been, with one exception, confined to samples from our laboratory orchard. The exception comprised a set of 16 samples, including Mexican and Guatemalan varieties and Fuerte, collected in commercial orchards with the cooperation of Mr. A. Courtney, field representative of Calavo Growers. The successful identification of the Mexican and Guatemalan varieties in this set of samples strengthened the belief that the principle involved in the reaction is not affected by environmental conditions.