

NEW AVOCADO RESEARCH MATERIALS FROM MEXICO —1954

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The pressing need for concerted research on the various problems which confront the California avocado industry becomes apparent when effects of the onslaught of avocado root rot, to mention but one, are viewed in the field in the many areas where this destructive condition has developed. Extensive and intensive examination of materials presently at hand which might be utilized as rootstocks has offered but little encouragement that resistance to the soil-borne organism, *Phytophthora cinnamomi*, may be found among these materials. One of the natural alternatives, therefore, is to seek new, untried materials from the natural habitat of the avocado in Mexico and Central America, in hope that these may exhibit the desirable inherent characteristics of disease resistance and compatibility with present commercial clones. Such material also can be utilized in the breeding program and in other investigations and problems.

Previous personal explorations to the native habitat of the avocado by the author and others have resulted in the introduction of many forms, species and botanical relatives which are under continued observation and experimentation by several departments in the experiment station. As a continuation of this program an extensive exploration was conducted in May-June, 1954, through the Mexican states of Sinaloa, Nayarit, Tamaulipas, Veracruz, Oaxaca, and Chiapas. Accompanied by Ing. C. M. Faura of the Ministry of Agriculture of Peru, the author spent one month searching for so-called wild avocados in the mountains and coastal canyons of southern and central Mexico. At the outset we want to acknowledge the generous cooperation of the many governmental officials in the various states and of the kind assistance of many individuals, several of whom we had never met previously. This extensive assistance together with much kind hospitality made the trip both pleasurable and highly rewarding as measured in kinds and numbers of materials received and sent back to California.

Previous visits and personal contacts were responsible for conservation of time and energy so that only a minimum of delay was experienced. Regardless of carefully developed plans, however, certain areas of interest were not approached because of exceptionally heavy rains which made trips in to them inadvisable. By jeep, plane, truck, taxi, bus and afoot we traced down all possible leads and reached into the more remote villages, generally off the route of the casual tourist.

Among the more interesting specimens encountered in many areas were the so-called "aguacatillos" or little avocados. These are undoubtedly close botanical relatives of the ordinary avocado and possibly are of the genera *Ocoteo* or *Nectandra*. Their exact identification can be made only when the flowers become available in our trees which we brought back. Trees of this type are of various sizes and forms. Some are rather

bushy in nature, 8 to 10 feet tall, others extending up to 70 or 80 feet with a trunk diameter of over two feet. The small black or green fruits range in size from 1/2 inch to two inches long and resemble small olives or large grapes.

The "aguacate blanco" of Oaxaca, which is one of the dominant species providing shade for coffee bushes in the southern coffee producing area of that state, is a handsome tall tree with relatively smooth, whitish bark, and reaches a height of 40 to 50 feet with a trunk diameter of two feet. This species, probably of the genus *Ocotea*, bears small, olive-size fruits in great profusion. This fruit is generally not eaten. It consists of an ovoid seed with a flesh thickness of 1/16 inch. The fact that many of the specimens thrive in a very high clay content soil which apparently has a very high water-holding capacity makes them of potential value for our work on adaptation of rootstocks to poorly drained, high moisture holding soils.

Another unusual avocado type encountered was the "aguacate de piedra" or stone avocado. This is probably a Guatemalan type of avocado which is found in an apparent wild condition throughout Oaxaca and Chiapas. The tree resembles a typical avocado. The fruit, however, is almost spherical in form, 2 to 3 inches in diameter, with a very large, round seed and an edible portion perhaps 1/4 to 3/8 inch in thickness. The rind, black or green in color, is exceptionally thick, up to 3/16 inch, and can be cut only with a strong knife. Here again this unusual species is growing in soils ordinarily considered unfavorable for avocados.

The "aguacate de tejón", the badger or possum Avocado, again is another of the dominant larger shade trees in the coffee fincas of Oaxaca. This tall tree is characterized by very large, highly pubescent, gray-green leaves and small oval, black fruits about one inch long.

The southernmost state of Chiapas, Mexico, has received very little attention by horticulturists. Several botanical explorations have indicated a wealth of materials still remain in that area. Our visit to the more readily accessible areas verified these facts. Within ten miles of Tuxtla Gutierrez, the capital, we encountered an "aguacatillo" tree 75 feet high with typical avocado leaves but with long ovoid fruits 3/4" in diameter and over 2 inches long with flesh 1/10" thick, a thin black skin and yellow seeds. As we continued southward toward the Guatemalan border the soils were noted as very high in clay content and red in color. Regardless of apparently unfavorable soil moisture conditions, several types of Guatemalan avocados were growing in village dooryards, although many definite symptoms of root-rot were observed in isolated specimens. Collections of scion wood were made from the more healthy trees among those surviving in dooryards.

A brief visit was made with Wilson Popenoe in Honduras. We went into the field and climbed to the experimental plot on Mt. Uyuca near Tegucigalpa to obtain seed specimens of *Persea gigantea*, which grows in the cloud forest nearby. This species had been introduced previously and has given some indication of promise as a possible rootstock, but of limited use because of extreme susceptibility to leaf burn. It is hoped that some of the new seedling materials will show less leaf burn in California soils.

Following a very pleasant three day visit with Dr. Popenoe at the Escuela Agrícola Panamericana, Honduras, a flight was made over the Caribbean Sea to British

Honduras with its beautiful mahogany forest and great stands of chicle trees. Here in the dense jungle forests is found the avocado relative, the timbersweet, probably another *Ocoteo*, with small avocado-like fruits which are not edible. This species now has been introduced into California as seed and is under experimentation.

As the result of the exploration a total of thirty-eight collections were made, of which perhaps twelve or thirteen were entirely new forms or species not previously known to have been introduced into California. Reports on the observations, concerning the experimental behavior of these materials will be presented in the near future.