

THE NEW AVOCADO GERM PLASM BANK IN MEXICO

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*Contribution from the Agricultural Research Organization, The Volcani Center, bet Dagan Israel. No. 1616-E, 1995 Series.*

The importance of the conservation of the germ plasm of many endangered plant species, and the especially serious situation of the avocado and its relatives, have been discussed and emphasized previously<sup>4</sup>. Many of the avocado items that were described by Zentmyer<sup>5</sup> and by other botanists during a period of about half a century could no longer be found among the native vegetation of the forests in tropical America, as the forests themselves disappeared. The diversity of the species *Persea americana* and the availability of related species are diminishing in a rapid extinction process. Thus, plant material for future breeding research will be very limited in its capacity to supply necessary traits of resistance or any other important characteristic. Moreover, the University of California (Riverside) collection at the South Coast Field Station was almost completely destroyed by root rot; and the existence of the U.S.D.A. Station in Miami, including many old avocado accessions, is threatened. Conservation of avocado germ plasm in botanical gardens or in its native habitat is not yet done on any acceptable scale. In this situation, the establishment and development of the new avocado gene pool in CICTAMEX, Mexico, is like a light in the darkness.

**B ackground**

1. A study of avocado germ plasm resources was commenced in 1989, and described in the 2nd World Avocado Congress<sup>2</sup>. Avocado germ plasm accessions were described and collected in Mexico<sup>1,3</sup>, Costa Rica, Guatemala, Honduras, Chile, Ecuador, Peru, and Panama. Material from Israel was introduced.

2. In Mexico, a center for avocado research is directed by Dr. Salvador Sanchez Colin, well known in Mexico and in the California avocado industry, and a former director— at— large of the California Avocado Society. This research center, known as CICTAMEX, recognized the progressive extinction of avocado germ plasm and therefore decided to establish the avocado germ plasm bank in its experimental farms.

3. The GIARA Foundation (German-Israel Agreement for Agricultural Research in 3rd World Countries) has supported the avocado germ plasm study since 1989, in two phases, due to terminate at the beginning of 1996. The support has included the

establishment and maintenance of the gene pool plots.



**Figure 1.** A view of the germ plasm plot at La Curva, Coatepec, Harinas, Mexico, September 1994.

### **Plan and establishment of the germ plasm bank**

The avocado and its relatives in the countries of origin are known to be distributed in a variety of environmental conditions, from sea level up to almost 3,000 m above sea level. In order to enable successful growth of different avocado accessions originating in different environmental conditions, two gene pool plots were established: one in Coatepec Harinas, the high-altitude plot, and one in Ixtapan de la Sal, the low-altitude plot.

At the La Curva ranch, Coatepec Harinas, the soil is relatively heavy but free of salts and lime. This plot is dedicated to Mexican and Guatemalan avocado types, as well as to *Persea nubigena* and *Persea steyermarkii*.

At Tierra Blanca, Ixtapan de la Sal, the soil is calcareous and well aerated, and the irrigation water contains more salts than that at Coatepec Harinas. It is devoted mainly to West Indian avocado types, as well as *Persea schiedeana* and *Beilschmedia* spp.

Accessions collected in the several countries were propagated in the CICTAMEX nursery, as either seedlings or grafted trees, and then were planted in the plots on a continuing basis, according to the supply of the material.

### **The actual situation of the germ plasm plots.**

During the years 1991-1994, many avocado germ plasm accessions were introduced, propagated, and planted in the plots. At the present time, about 150 items are included in the plots, comprising about 450 trees. In the nursery, another 100 items are in the process of propagation. Trees in the two plots have started to bear fruit. A general view of the plots can be seen in **Figure 1**. Besides a great diversity of *Persea americana*

items, the plots include other species of *Persea* and also of other genera. There is still space to extend the bank and make it as complete as possible.

### **The study of the material planted in the plots**

The avocado germ plasm material is to be evaluated as rootstocks, cultivars, and breeding material. In the meantime, evaluation *in situ* is done. This includes continuing observation and recording of characteristics of fruits and of trees that already bear fruit, the reaction of seedling trees to local stress conditions at Ixtapan de la Sal, a study of compatibility between different species, etc. All items have been subjected to DNA study by modern methods in Germany.

### **The future of the avocado germ plasm plots in Mexico**

The avocado germ plasm bank in Mexico was established as an international facility and is intended to serve the avocado industries around the world. Besides its important function of conservation of many endangered types of avocado and related fruits, it is intended to be a source of material for breeding projects in Mexico and elsewhere. For this reason, the avocado industries worldwide should support the above described gene bank and help to secure its future.

### **Bibliography**

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