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The Avocado

By David Robinson

The avocado is a member of the Laurel family, Lauraceae. Other members of this family include sweet bay, cinnamon, camphor and sassafras. In Central America several wild species of Persea grow. It has been concluded that cultivated forms must have been developed in Mexico and Guatemala at a very early stage of mans history.

Two native names for the avocado are still used in America. The nahuatel term was "ahua-cacua-huitle" from which other Central American names like ahuacatl (which is the common Aztec idiom) alcuahte and aquacate have been either derived or shortened. Corruptions of the original name include "abacata" (Portugese) and "alligator" (English) pear. In South America the fruit is called "Palta" derived from the Indian tribe of Ecuador inhabiting the province Palta.

Archeological diggings prove it to have been introduced into the Tehuacan area of S. Central Mexico before 7000 possibly as long as 10,000 BC; from a more humid habitat. Remains of avocados came from almost all levels of the Coxatlan cave, beginning with the phase labeled Ajverado (before ?000 BC). The influence of selection on fruit size is not evident until the Santa Maria phase, represented by artifacts from between 900-200 BC. There was evidence that the tree was not only in cultivation, but that it had been actively selected for increase in the fruits size sufficiently long to prevent the large fruited forms from being completely swamped by the wild, small fruited forms since a System of open pollination must have prevailed at the time. Since it takes about seven years for a seedling avocado to bear fruit and the trees continue to bear for about 70 years or longer, the period of selection prior to the demonstration of larger cotyledons must have been extensive. Particularly since all the fruit available would be harvested for use regardless of size. The much longer time between generations of fruit trees makes the developmental picture demonstrated by other earlier domesticates look rapid by comparison.

Other significant archeological specimens of avocado occur in Peru during the period 750-100 BC. The avocado may have spread from Mexico southward, but its also possible that it was redomesticated in S. America near Peru. Early Spanish recorded its cultivation from Mexico to Peru but it wasn't in the Indies at that time. It was introduced to Jamaica about 1650 and spread throughout the region. It was taken to S. Spain in 1601. It was in Burbon and Mauritius in 1780. Most of its spread in Asia was in the mid 19th

century. It was reported in Zanzibar in 1892.

Avocados are now grown in most tropical and subtropical countries, including S. Africa and Australia. It was first recorded in Florida in 1833 and California in 1856 but commercial production in these states didn't begin until 1900's. Production in the U.S. in 1924 was 130 tons, increased to 21,000 tons in 1948 and 40,000 tons in 1958. By 1985 the US was producing 1 million tons/year, which represents greater than 90% of the world production at that time. Yields today in S. America are low and it has been noted that great parts of South American crops are lost before reaching a consumer or they may not even be harvested.

Only one species is now usually recognized and there are 3 ecological races. The Mexican - native to the highlands of Mexico where wild progenitors have been found. They have small fruits of less than 1/2 pound. They have the highest oil content of all the races at 30%. They have a comparatively large seeds and are the heartiest of the races, often with hybrids surviving temperatures to 5 degrees C. The Guatemalan race - native to the highlands of Central America; the wild prototype has been found in Guatemala. They have large fruits 1-2 pounds with smaller seeds. They have an oil content of 8-15% and are less resistant to cold than the Mexican race. The West Indian race - native to lowlands of Central America but it did not spread to the West Indies until after the discovery of the new world. The fruits are large, seeds are large, pulp-has the lowest oil content of 3-10%. It is best suited to the hot low tropics.

The avocado tree varies in size and shape quite a bit now since we have so many different cultivars, but the average tree will generally reach a maximum height of 60 feet. They are usually a low spreading tree.

The trees produce many perfect f lowers and the f lower biology of this tree is complicated. For a long time the problem existed of how it is possible to have such enormous quantities of flowers and have fruit production be extremely low (perhaps 5%). Finally, it was discovered that there exist distinct times for pollination and female reception. They function with a synchronous dichogamy which favors cross pollination. Biotypes exist with floral rhythms which oppose the floral rhythms of other biotypes. The practical solution is to plant biotypes of differing floral rhythms.

Over 700 cultivars have been tried in the U.S. during this Century, of which few have shown real success and promise. Some of the more important cultivars are:

Fuerte - A Mexican/Guatemalan hybrid which has commanded great success in California and seems to have selected some of the best qualities from each of its parental strains. It is resistant to cold, ranges in size 1/2 - 1 pound and has 18-26% oil. Most of these plantations in California fruit in the winter.

Lula - A seedling from a Guatemalan race and the male parent is unknown, but thought to be a West Indian. It is suited to the tropics, has 12-15% oil and ranges in size from 1 - 1. 5 pound, and is a rapid grower. This is the leading cultivar in Florida and one of the two most common in Trinidad where it fruits in September. This is an effective pollinator for a cultivar with an opposite floral rhythm named

Polluck. Extensively grown in Florida.

Polluck - A West Indian race which has large fruits from 3-5 pound with only 3-5% oil. It is well suited for the tropical lowlands. It is also the 2nd of 2 cultivars from Trinidad, but it fruits early in June. The cultivar Collinson produces no viable pollen and must have pollen from another cultivar.

Avocados can be easily grown from seed but the cultivars are very heterozygous and therefore are more efficiently propagated vegetatively. Grafts are made with different races and Mexican rootstocks are considered to be very valuable because of their resistance to cold, but aren't compatible with W. Indian scions. Guatemalan and hybrid scions are successful on stocks of all races. Seedling plants generally begin to bear in 6-7 years but a vegetatively propagated plant usually can bear in 3-4 years. There are genetic factors that control biennial bearing.

Avocados are very nutritious with large amounts of protein, vitamins and oils. The oil is similar to olive oil and is highly digestible. The oil commands a high price and has the highest energy value of any fruit. They are usually served as 1/2 fruits with lemon Juice, salt and pepper or in salads. The industrial importance of the fruit is derived from its oil, which is used widely in the preparation of cosmetics.

Pests are known to cause problems, but generally Just in the native ranges. Very little pest control is necessary in areas where it has been introduced.

The plant is very susceptible to problems with wind because it is so brittle and it8-fruits are so heavy. They require good drainage and are susceptible to a root rot disease which destroys small roots and can kill a plant. Avocados have had an important role to play in the history of man since men started leaving some sort of foraging trail. In the last 100 years the evolution of the tree as a crop plant has proven to reward us with a diverse selection of potential traits which will be exploited to their fullest potential, if we are all lucky.

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