

Avocados Around The World

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It is a pleasure and an honor to address this annual meeting of the California Avocado Society on a subject somewhat different than usual for me—avocados around the world—instead of root rot or *Phytophthora* around the world. I don't plan to ignore *Phytophthora cinnamomi* completely, however!

The remarkable, delicious, and nutritious avocado has been known by the natives of this hemisphere for many centuries, but was not revealed to the rest of the world until the early 1500s. When the Spanish invaded the New World, the Conquistadores made the acquaintance of this delectable fruit, recorded its occurrence in many areas in their writings (first published record of the avocado was by Fernandez de Enciso in 1519), and brought seeds and plants back to Europe (primarily to Spain).

At the time of the Spanish conquest, avocados were found (either wild or cultivated) from northern Mexico south through Central America into northwestern South America, south in the Andean region as far as Peru, and into the Andean region of Venezuela.

From these somewhat isolated and largely semi-wild beginnings over 400 years ago, the avocado industry has gradually developed to the present situation that I will be detailing today. There is now production in at least 46 countries. Average annual production is now over 3 billion pounds—a lot of guacamole!

I would like to express thanks to the California Avocado Commission for making available their recently-obtained remarkably detailed figures on avocado production in these 46 countries; thanks, especially, to Avi Crane and Mark Affleck. These are not just one-year production figures, but generally are averages over the past 5 to 7 years.

I will first present these data in the form of bar graphs, listing the countries in the order of production; then we will see a world map of these many locations where avocados are produced.

There are seven countries that have been averaging over 100,000,000 pounds of avocados annually over the five to seven years from 1979 through 1985. These are, in order of production, Mexico, United States, Dominican Republic, Brazil, Peru, Haiti, and Indonesia (Figure 1). Note that six of these are in the Americas.

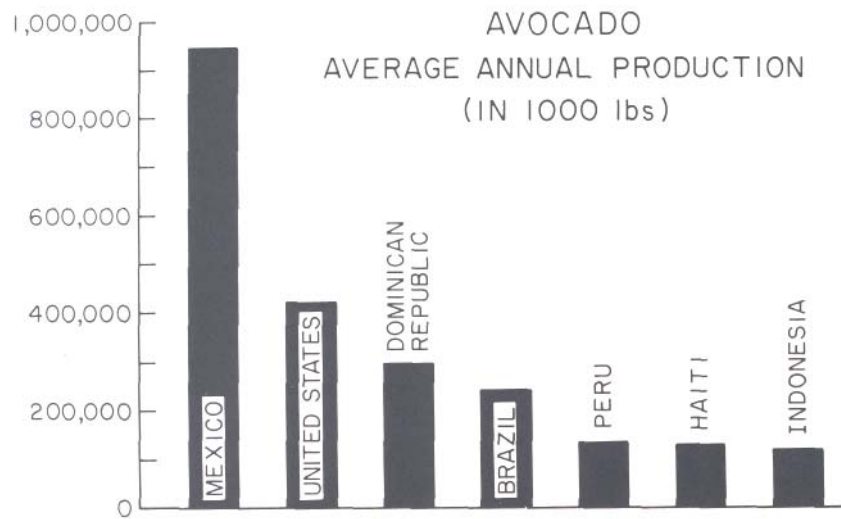


Fig. 1

Eighteen countries produce over 10,000,000 pounds annually. They are, in order of production: Venezuela, Israel, El Salvador, Ecuador, Costa Rica, Cameroon, Chile, Philippines, Zaire, Guatemala, South Africa, Colombia, Congo, Madagascar, Cuba, Australia, Ivory Coast, and Honduras. Production figures for these countries are given in Figures 2 and 3. Nine of these countries are in the Americas, six are in Africa.

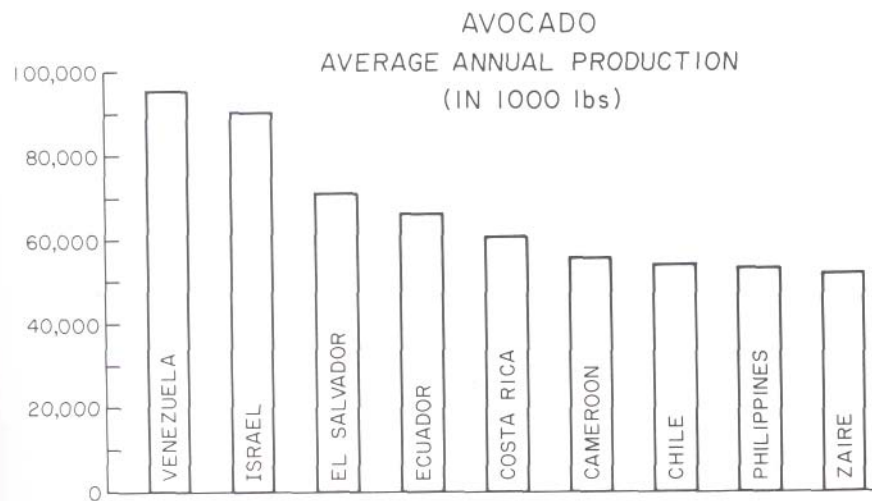
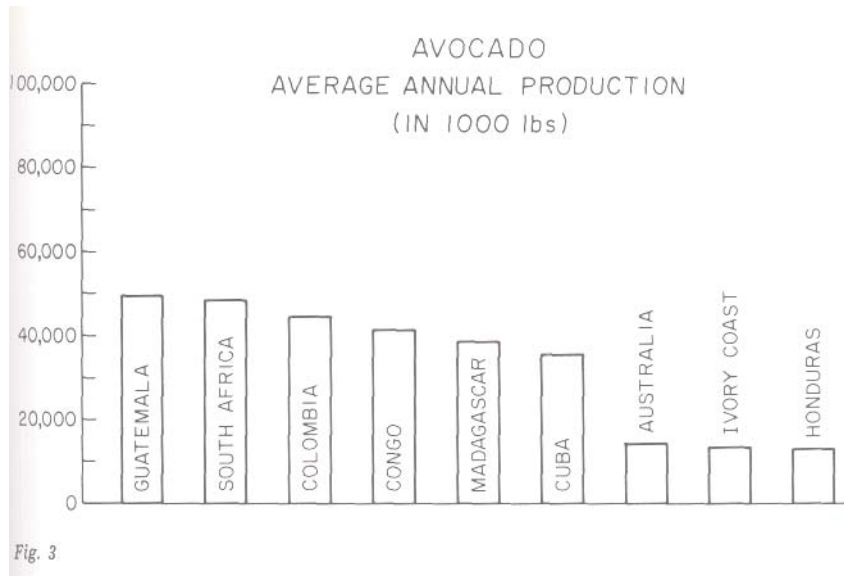
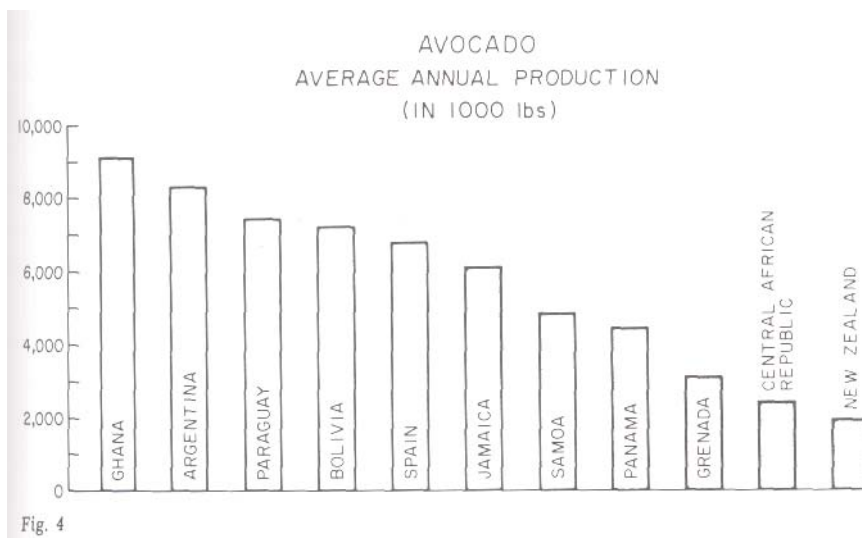


Fig. 2



Twenty-one other countries of the 46 have rather small production, ranging from 9 million pounds in Ghana to 24,000 pounds in the Seychelles (Figs. 4 and 5). Of these 21, 11 are in the Americas. Thus, 26 of the 46 countries producing avocado are in this hemisphere.

Most of the countries, particularly the large producers, use almost 100 percent of their fruit internally. There is some export, as for example, Israel, Spain, and South Africa send fruit to Europe. Mexico has been sending some fruit to Japan. Chile and the Dominican Republic have been exporting some of their fruit to the United States. Mexico and Central America cannot export their avocados to the United States because of a quarantine on the seed weevil that is a serious pest in some parts of those countries.



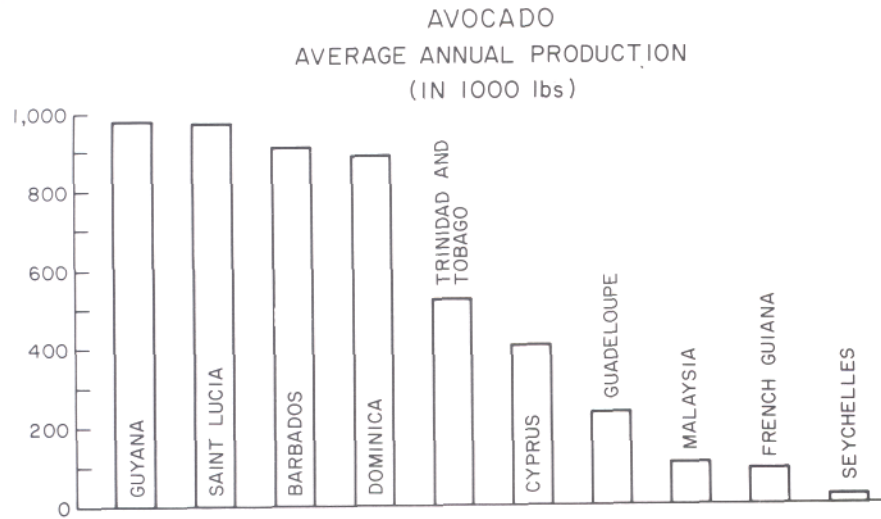


Fig. 5

I have visited 25 of the countries listed in the charts. In my annual meeting talk, slides were shown of some of the avocado production areas and problems in most of these 25 countries. In this report, a few representative pictures are included, with some pertinent comments made on these countries in relation to avocado production.

Figure 6 is a world map of the avocado producing countries.

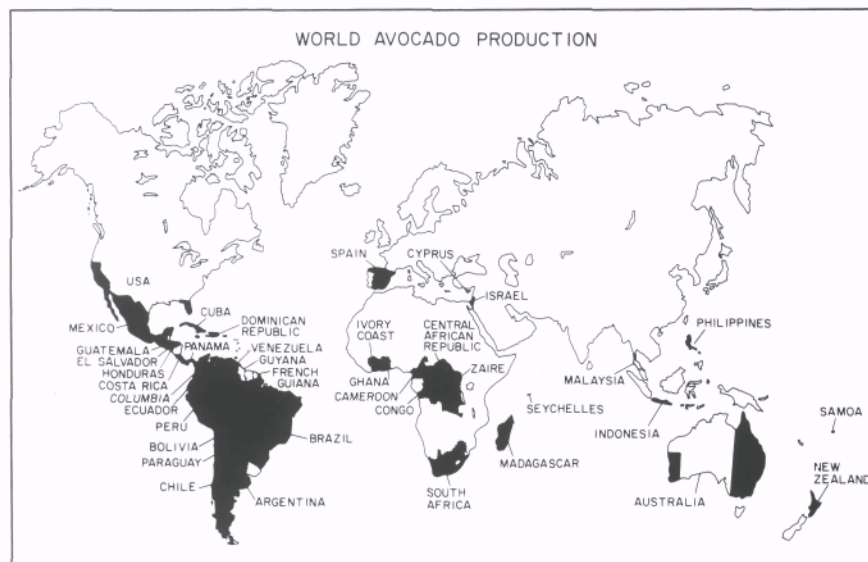


Fig. 6

Mexico— This country is the original source of many of our early avocado California varieties, including our Number One variety for many years, Fuerte. In the Americas, Mexico is the leading producer of avocados as it is worldwide, and of course it is the largest Latin American country in the Northern Hemisphere. Production occurs in a number of different areas, primarily on the east coast, northeast, and central parts of the country, with much of the commercial production now coming from Hass plantings. Fuerte, still an excellent variety in my humble opinion, which had its origin in the town of

Atlixco in the state of Puebla, is still grown more in Mexico than in California. In addition to the commercial groves, there are huge numbers of seedling trees scattered through the countryside in many parts of Mexico. Most of these are variations on the "typical" Mexican fruit—purplish black, small, pear-shaped, with thin skin, and strong anise odor in the leaves (like our Mexicola, Topa-Topa, Ganter, Northrup, etc.). There is tremendous variation, however, in fruit color, size, shape, and in anise odor. This is classified as *Persea americana* var. *drymifolia*, according to Bob Bergh or *P. drymifolia*, according to Wilson Popenoe. In some of the more tropical areas, as Vera Cruz, and Tapachula, larger, thin-skinned, yellowish-green colored West Indian type fruit are found (*Persea americana* var. *americana* according to Bob Bergh). *Phytophthora* root rot unfortunately occurs in many avocado-producing areas. Avocados are produced in 16 states in Mexico, with the principal production in the states of Michoacan, Sinaloa, Puebla, and Mexico.

Guatemala— This beautiful country is the source of what we know as the Guatemalan race—typically thick-skinned, moderately large fruit, with no anise odor, classified as *Persea americana* var. *guatemalensis* according to Bob Bergh. The great plant explorer, Wilson Popenoe, sent many Guatemalan varieties to California from Antigua and other parts of the Guatemalan highlands in the early part of this century—varieties such as Nabal, Benik, and Panchoy; and of course the original germ plasm for what became the Hass variety came largely from Guatemala. This country currently ranks 17th in the world production, with approximately a 49 million pound annual production.

Commercial production of Fuerte and Hass is largely in the highlands, and a huge production of "criollos"—thick-skinned, round native types-occurs all through the highlands, and is sold in local markets throughout the country, with large quantities sold in the Guatemala City markets. Some fruit is shipped also to other Central American countries. To date, there are no reports of *Phytophthora* root rot on avocado in Guatemala, undoubtedly related to the fact that much of the production is on well draining volcanic soils. *Phytophthora cinnamomi* has been found in Guatemala, causing a trunk canker of cinchona (quinine) trees. Typical Mexican type trees are also found scattered through the highlands of Guatemala—these are called by the Mayan name "matul-oj".



Typical small avocado of the Mexican race, in market in Mexico.



Young Fuerte and Hass grove near Atlixco, Mexico, with volcano Popocatepetl in the background.



Market in town of Tecpan, Guatemala.



Guatemalan "criollo" avocados from villages around Like Atitlan, ready for shipment by bus to Guatemala City. (Photo by E. Schieber.)



Market in Cauca Valley, Colombia, with avocados and citrus.



Market in Suva, Fiji, with avocados and other fruit.

El Salvador— This country ranks 10th in the world in our production figures, with an annual production of approximately 71 million pounds. Production is scattered through this small, largely coffee-growing country, with some commercial production and many local trees of largely West Indian type in areas of low to moderate elevation.

Honduras— This Central American country has a small production of avocados, averaging approximately 13 million pounds annually. Research on avocados is being conducted at the Escuela Agricola Panamericana, the agricultural school begun by Wilson Popenoe in the late 1940s, and in the Ministry of Agriculture. Several species of *Persea* related to the avocado are native to Honduras, primarily small-fruited "aguacatillos".

Costa Rica— This jewel of a country ranks 12th in world production, with approximately 62 million pounds annually produced. There are some new commercial groves of Fuerte and Hass, and old plantings and scattered trees of largely West Indian type at lower and moderate elevations. A wild primitive West Indian type grows in rain forests along the Gulf of Dulce on the west coast; this was described by botanist Paul Allen in the 1950s, and I collected this in that area in the late 1950s. Root rot is a serious problem in several of the avocado areas.

Dominican Republic and Haiti— These two Caribbean countries are among the top six producers in the world; the Dominican Republic ranks third with nearly 300 million pounds annual production, while Haiti ranks sixth with 130,000 million pounds. Much of the fruit is consumed locally, though the Dominican Republic has shipped some fruit to the United States. These are mostly West Indian types produced at low elevations. Root rot is a problem especially in the Dominican Republic.

Cuba— This Caribbean country has a modest production, ranking 22nd in the world in our production figures, with approximately 35 million pounds per year. These are mostly West Indian types, of local or Florida selection, some with very large fruit.

Brazil— This country ranks fourth in the world in avocado production, with most recent figures of approximately 244 million pounds annually. Most of the avocado production is in the states of Sao Paulo (40%), Minas Gerais, Parana, and Rio Grande de Sul. The industry relies on varieties introduced long ago, including West Indians Pollock and Simmonds; Guatemalans Prince, Linda, and Wagner; and several local selections (Geada, Fortuna, Quintal, and Oro Verde). Root rot is the major problem affecting production.

Peru— Peru ranks fifth in the world in avocado production; this averages 132 million pounds per year. Some production is in the coastal strip, with also some fairly large groves in the Chanchamayo Valley east of the Andes. Varieties are mostly West Indian. An interesting small-fruited wild relative, *Persea haenkeana*, grows in the spectacular area around the Inca ruin of Macchu Picchu.



Ancient Inca ruin of Macchu Picchu, Peru, with tree related to avocado in foreground. This is Persea haenkeana.



Typical Guatemalan "criollo" avocados from highlands of Guatemala.



Commemorative plaque placed by California Avocado Society in central plaza in Antigua, Guatemala, in 1946. Dr. Eugenio Schieber is beside the plaque.



*A different root rot disease caused by fungus *Dematophora* that is an occasional problem in Israel. Pathologist Yaacov Pinkas at left.*

Other South American Countries— There is substantial avocado production in three other countries in South America—Venezuela (8th in world production, with 96 million pounds), Ecuador (11th, with 66 million pounds), Chile (14th, with 54 million pounds),

and Colombia (19th, with 45 million pounds). Also, Argentina (8 million pounds mostly in the western part of the country and in Misiones north of Buenos Aires), Paraguay, and Bolivia (7 million pounds each) have small industries. I have not visited Paraguay or Bolivia.

Venezuela, Ecuador, and Colombia have considerable production from local West Indian varieties, for example in the Cauca Valley of Colombia, with some California varieties especially in the higher plantings in Ecuador. Chile and Argentina grow considerable Hass and Fuerte, and some Mexican types introduced by the Spanish many years ago, especially in Chile. Root rot is a major problem in all of these countries.

Philippines— There is a moderate production here, with the 54 million pounds making the Philippines 15th in the world. Most of the production is of West Indian types— probably brought here originally from the Americas by Spanish explorers and traders.

Australia— This country ranks 23rd in world production, averaging recently 14 million pounds per year. Production is principally in Queensland, New South Wales, and some of South Australia, with a small acreage in Western Australia. Principal commercial varieties are Fuerte, Hass, and Sharwill—apparently a Guatemalan-Mexican hybrid of good quality. Root rot is a problem in most of the producing areas. New Zealand has a very small production of approximately 2 million pounds annually.

Spain— In southern Europe, the only country with significant production is Spain, with approximately 7 million pounds annually, including the production in the Canary Islands. Fuerte and Hass are grown in the Malaga area along the south coast of Spain, and on Tenerife in the Canary Islands there are some excellent Fuerte groves. Also on Tenerife there are some local selections such as a large-fruited Guatemalan variety, the Orotava. Root rot is a problem in both areas.

Israel— This country ranks 9th in world production, with a figure of 90 million pounds annually. Fuerte and Hass are grown considerably, as well as Ettinger, a local selection that is apparently from a Fuerte seedling. Much of the production is shipped to Europe. *Phytophthora* root rot has only been found in the past ten years and apparently has not become a significant problem.

Africa— The largest production in Africa is in four countries that I have not visited, thus have no photos of these. The Cameroon is 13th in world production with 56 million pounds, Zaire is 16th with 52 million pounds, the Congo is 20th with 41 million pounds, and the Ivory Coast is 24th with 13.5 million pounds. All of these are tropical countries, so West Indian varieties are the principal types. Root rot is a major problem in Cameroon. South Africa— There is a moderate production here, with good possibilities for expansion of the industry. South Africa ranks 18th in the world in avocado production, with an annual crop of approximately 48.5 million pounds; much of this is shipped to Europe. Commercial varieties are primarily Fuerte and Hass, with some local selections. *Phytophthora* root rot has been severe, but injection of new fungicides is giving good results in control.

Indonesia— The only one of the top seven avocado producing countries that I have not visited is *Indonesia*, which produces a sizeable 120 million pounds annually. This is

mostly low-elevation tropics, so that undoubtedly various West Indian varieties are involved.



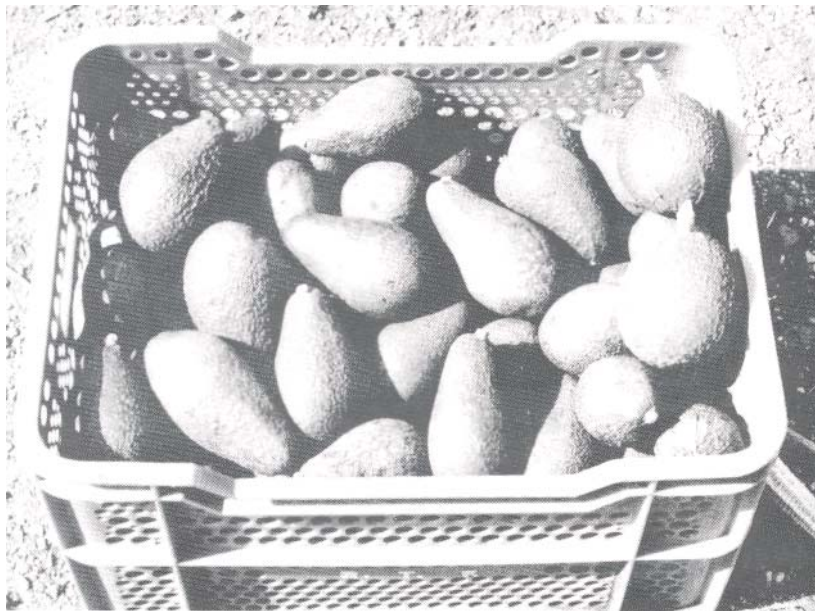
Avocado and citrus groves at Westfalia Estate, Transvaal, South Africa.



Pack of Sharwill variety in Queensland, Australia.



Excellent Fuerte grove at Glasshouse Mountain, Queensland, Australia.



Fuerte fruit from grove on Tenerife, Canary Islands.