

Mexico—Is It Really What We Hear?

H. Leonard Francis

Research Coordinator, California Avocado Society

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Are there really over 200,000 acres of avocados in Mexico? If so, is their fruit mainly the big and small, thin-skinned native varieties that we in California have done away with?

With 95% of their production readily consumed by avocado-loving Mexican citizens, do they really want or need to export into United States markets?

I was aware of some of the answers, but not convinced of their accuracy. Besides, there were many other unanswered questions of interest to California growers. So, on May 24, 1993, Taesa Airlines whisked me from Tijuana to Morelia, in the state of Michoacán.

Having earlier investigated the research on avocados being conducted in Israel, South Africa, and Australia, I did not feel that there was a real need to look into *research* activities in Mexico. It is known that there is very little research being conducted there that would relate to California concerns.



Author (left) with agency specialists at the Institut Nacional Investigacion Forestal y Agropecuaria (INIFAO) agency of SARH, Mexico's counterpart of the U.S. Department of Agriculture

There was a different need, a different urgency to make this trip. Mexico produces five

times what we in California do on the average, and it has at least three times our acreage. Tales of Hass acreage producing up to 40,000 pounds per acre needed to be documented and the reasons or the methods for such high production determined. Mexico is the largest avocado producer in the world. Mexican avocado acreage is double the acreage total of the U. S., Israel, South Africa, and Australia combined! Mexico was not visited "just because it is there."

It was 6:15 p.m. when the plane landed in Morelia. Don Luis—an employee of Mission de Mexico, a subsidiary of Mission Produce of Oxnard, California—was calmly waiting for me with a sign on his chest that read "Len Francis." Together, off we went to Uruapan. Steve Barnard and Jim Donovan, of Mission Produce, had arranged most of the itinerary I had requested. Mission was not only my coordinator; they were practically my host. From ground transportation and hotel arrangements to coordination with industry, marketing, and federal officials, Mission paved my way. Ezequiel and Fernando Garcia, respectively the president and manager of field operations of Mission de Mexico, would be at breakfast the next morning in Uruapan, 75 miles southwest of Morelia.

The twelve hours following breakfast made up one of the fullest days of my life. In making a very large circle around Uruapan, 200 miles plus, Fernando Garcia not only educated us, but was also able to provide a view of about 40% of Michoacán's total avocado area—about 90,000 acres. The orchards filled every valley, covered almost every hilltop. Prior to the development of the orchards, the hills were covered with Canary Island pine trees. There is still a tremendous acreage of pines. The owners must receive federal permits before new acreage can be cleared. There were a lot of new acres with avocado trees under four years old. In subsequent meetings, it was revealed that Michoacán has around 90,000 hectares of avocados—approximately 225,000 acres, almost 75,000 acres of which are still non-bearing. At least 90% of the acreage is in Hass. Fuerte and criollos, the native avocados, make up the other 10%. Although Michoacán now has approximately 85% of Mexico's avocado acreage, sixteen other states also produce avocados. The states of México, Jalisco, Nayarit, Puebla, and Sinaloa have the bulk of the other 15%. My best guess is that Mexico has 260,000 acres of avocados in total, of which 80,000 have yet to come into bearing.

The path of our excursion led us around the mountain Tancitaro, which has a peak of 12,500 feet. Avocados are planted in the elevation zone of 6,500-7,800 feet in the foothills of the mountain. In California, avocados usually freeze at elevations over 2,500 feet, yet it is the mountains of central Mexico that give the climate for growing Hass avocados that are harvested virtually the year around. The lower elevations are where the West Indian varieties are grown, such as those grown (pre-Hurricane Andrew) in Florida. You see, due west of Uruapan is the coastal city of Puerto Vallarta, a truly tropical resort. A useful rule I learned from Dr. Storey, of the University of California at Riverside, is that for every 1,000 feet rise in elevation, there is a 3° drop in temperature, all other factors being equal. The higher elevations change the tropics to a subtropics climate. Frost is a very unusual event in Michoacán; 1992 brought the first in at least twelve years and affected maybe 10% of the area's avocado acreage. The minimum temperature recorded was -2°C (28.5°F).



Criollo (native) avocado tree with flowering vine, Mansion del Cupatitzio, Uruapan.

Diseases and Insect Pests

Michoacán has avocado root rot, but not very much nor severe. Infected locations are primarily in the lowest, wettest parts of the few groves with the problem. Aliette®, Ridomil®, and phosphorous acid are used by some, but most growers don't see it as much of a problem. As Mexico's state of Michoacán has very similar weather conditions to those in South Africa and Australia, with a rainfall period of spring through fall, I had expected root rot to be very severe there. According to Dr. José Vidales Fernandez, of S ARH (the equivalent of our USD A), they either have only a mild strain of *Phytophthora cinnamomi* or their seedling rootstocks are very tolerant of the fungus. Their rootstocks are almost entirely of seedlings from criollo (native) avocado trees. It may be that there is an inherent tolerance of root rot, this being the home of the original avocados on this planet. This is probably true to a limited extent; but Dr. George Zentmyer, then Dr. Mike Coffey, and now Dr. John Menge have extensively tested imported selections for decades. The Martin Grande selections from Guatemala are the only quasi-tolerant root-stocks that have been deemed good enough for commercial production. It does appear that there is a lot more going on with *P. cinnamomi* in Mexico than in California. It could be that they do have less virulent strains of *P. c.* in addition to the inherent tolerance of their criollo rootstocks. There is also highly probable a reservoir of beneficial organisms in their soils. Dr. William Casale (UC/Riverside) would probably add four to ten more selections to his present biocontrol research program. I did not probe the soil for a sense of organic matter content; but as the land was naturally forested in the past, it is probably tenfold higher than ours in California. One thinks Mexico has a nice natural bio-complex working against root rot; good for them.

Most of us have heard about the spraying practices of Mexico. They do have several diseases and pests. Most of their sprays have a copper base to control anthracnose, a

leaf and fruit fungus that can both defoliate trees and rot fruit. As in Australia and South Africa, which suffer from anthracnose, the sprays are necessary.

Thrips and mites are the Mexican growers' worst pest problems. I saw heavy populations of red mite. The growers were looking forward to the oncoming rains. Rain not only satisfies their irrigation needs; it also causes major reduction of red mite infestations. Speaking of mites, perseae mite does not appear to be a problem in Michoacán. There were a couple of webbed colonies seen in one orchard, but exact identification could not be determined. According to Dr. José Sanchez Peres, entomologist with the Institut Nacional Investigación Forestal y Agropecuaria (INIFAP), parasitic wasps keep the perseae mite pretty well under control. Ramon Paz Vega, a prominent Mexican avocado consultant, is sure the webbed mites were not perseae, but white mites. Paz Vega said perseae mites are mostly in the states of Jalisco and México. He said Michoacán has had white mites for over ten years. (I did not ascertain which species of thrips is their major concern.)

Seed weevils exist in Mexico, and are common in several states. The SARH people and the growers I talked to all say they have only an occasional seed weevil in Michoacán. As I am not an entomologist, I can only report here what was told to me.

According to a list of "Agroquimicas," there are almost 80 pesticides registered for use on avocados in Mexico. Most of the chemicals are fungicides. Most of the others are various formulations of malathion, parathion, dibrom, and *Bacillus thurengiensis*. There are a few herbicides also, like simazine, paraquat, and Roundup® duplications. Some of the products are merely nutrient formulations.

Some Generalities

Fertilizers. Mexico's avocado growers use mostly commercial formulations of nitrogen, potassium, and phosphorus. Manure accounts for maybe 30%. Most of the micronutrients are included in their sprays.

Irrigation. Rain is their godsend. Probably 80% of their irrigation comes from the sky. All the irrigation systems I saw were solid set sprinklers, though I understand there are some furrowed groves. Most of the water for the sprinklers comes from wells and from pumps located on streams and rivers. Many of the poorer groves survive only on rainfall. Rainfall is between 50 and 70 inches per year in Michoacán; about 80% of this comes in spring, summer, and fall—nice! Several of the less productive groves have criollo seedling trees as their main producers and are usually non-irrigated. We saw several of these small groves on the way back to Morelia. Most of these small groves are ejidos: parcels of land given back to the citizens of Mexico by the government when it split up the haciendas (large land holdings) in the 1930s. Ejidos average 9 hectares (about 23 acres) in size. Until two years ago, owners could not sell their property, nor could the property be taken from them by those lending money to the owners. There have been several disgruntled financiers. The ejidos now can be sold.

Labor. Labor is plentiful. We envision their labor costs as being very minimal. For general cultural work, this is true; but their pickers average \$22 per day as contract labor. General labor is \$8-\$10 per day. California labor is \$50-\$60 per day when all

taxes and insurance are tacked on.

Cost of Production / Returns. The consensus on the average cost to produce one kilogram of Hass in Mexico is 600-700 pesos, equivalent to 10-12¢ per pound. The average return is 30¢ per pound.

Production. This is highly variable. Production is as low as 3,000 pounds per acre for non-irrigated criollo groves, up to 20,000 pounds for well managed Hass groves. There are no records of total production such as are maintained by the California Avocado Commission. Sr. Carlos Illsley provided a conservative production average of about 5,300 pounds per acre; almost everyone else thinks it is 10,000 pounds. My guess is 9,000 pounds per acre. Weather; soil; and plentiful high quality, inexpensive water make a productive complement.



Delivery of avocados from field to one-line, two-to three-employee packing house, Uruapan.

Consumption. Here is the good news. Mexican citizens consume 15 pounds each, annually. And this is without any consumer promotion or advertising. The U. S. annual per capita consumption, by contrast, is 1 1/2 to 2 pounds. Mexican per capita domestic consumption in 1976 was only six pounds. It must help a lot when your customers already know and desire the product. As avocados became more available, the appetite was there to eat them. But yes, Mexican growers would love to move 10-15% of their crop, about 250 million pounds, across their northern border.



Delivery of packed avocados at rear of market stall, wholesale produce market, Mexico City.

The Produce Market

Mexico City is either the largest or the second largest city in the world. Lack of a quality census prevents the declaration between Beijing and Mexico's capital. The population of the latter is between 25 and 30 million. In one place. That is a lot of people, and I was in the middle of them all. I had not given much thought to population until the ride from the airport to the Hotel Aristos: traffic was slo-o-o-w, with no freeways anywhere close to Mexico City, and certainly none through it. But I did not mind the traffic. It was quite orderly; it worked.

The major reason to go to Mexico City was to observe avocado sales at the wholesale produce market. Viewing the retail market was very important, too. It is my understanding that as much as 80% of the avocados grown in the state of Michoacán are sold in Mexico City—almost all through the wholesale market. We later saw that some packing houses in Uruapan also sell directly to some of the major supermarkets in Mexico City.

The wholesale market is more than impressive. It is new; it is huge; it is well run; it is a resource Mexico can be proud of, and is. The market is built on 225 acres, all well used. John Schmidt, of Harvest Time Produce (California), estimated the market to be eight to ten times larger than all of the Los Angeles wholesale produce markets combined. Señor Mario Vargas, a broker in Mexico City and Tijuana, was our host. Señor Vargas brokers the sale of produce of at least one major California grower in Mexico. He also arranged the sale of avocados directly to "Superama" markets. The avocados are packed by Mission de Mexico, the Mexico branch of Mission Produce Company in Oxnard, California. Mission's program is to pack an especially high quality carton. "Superama" was selling Mission's avocados for about 50% more than we saw at other major markets selling similar avocados.

The design of the market has the auction of bulk produce taking place on the outer circle of the market. From here, the buyers can take 10,000 pound truck loads directly out to retail markets; but most take the produce into the center of the wholesale market, where they rent one or more market stalls of approximately 5,000 square feet. These

stalls are easily accessible by interior truck lanes. The produce is unloaded at the rear of the stalls and sold at their fronts to the buyers from all sizes of markets and restaurants. At the rear of many of the stalls, the produce is packed, or repacked, to make attractive cartons for display. It was a warm experience later to see brands of individual market stalls being sold on corners all over Mexico City and in the retail markets. Except for brand names on boxes, most avocados and other produce is not being promoted; the quality of the produce is the selling factor to the ultimate buyer—the consumer.

Visiting Michoacán state and the capital of Mexico was an educational, enjoyable, and productive experience. I learned that Mexico is indeed the number one avocado producer in the world. The Creator of the world did make several areas of Mexico ideal for avocados. With some major help from Mexican citizens, the avocados went forth and multiplied. How many times during the centuries had the criollos served as a major food source for our southern neighbors? They love the aguacate, consuming 95% of production that varies from four to tenfold that of the United States. With all this inherent appetite for the avocado, what would be the demand for avocados if they were promoted and distributed to all areas of Mexico? My single piece of advice to my associates in Mexico was that they should promote, advertise, and develop markets within Mexico. Because, unlike the situation in the United States, almost every one of their fellow citizens is already familiar with the avocado and probably already desires it. Maximum production, maximum consumption—a very good combination.

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