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## Commercial Horticulture: What do we know about Mexico's avocado production?

Many people think of avocados as a vegetable, but in reality they are considered a fruit. The avocado, *Persea americana* Miller, is a very popular fruit in the United States and is used in many consumer dishes such as guacamole. Avocados are grown all over the sub-tropical to tropical climate zones around the world such as: Mexico, Brazil, Dominican Republic, Australia, Israel, Chile, tropical Africa, Spain, and Indonesia. The avocado is, therefore, a native to the tropical areas of the Americas where three ecological races are grown. These races are the Mexican, Guatemalan, and West Indies races. California, Texas, Hawaii, Puerto Rico, and Florida are the only U.S. states that grow avocados commercially. In Florida, avocados are grown in the tropical to sub-tropical region of Florida where Miami-Dade and Collier Counties are the main Counties avocados are grown.

In the winter months, we see supermarkets supplying avocados to our southern neighbors Mexico, Costa Rica, and other Central American and South American countries including our immediate neighbor Mexico. Is this good or bad? The United States trade partnership with Mexico along with its strict phytosanitary regulation and restrictions, allows the availability of fresh avocados to be acquired by United States consumers and because of the counter-season production, the result is an extended period of time avocados are available for United States consumers use.

One of Mexico's most productive avocados is the Hass variety. So, let's see what Mexico has to offer for avocados and understand their avocado industry. The

Mexican Hass avocado, a major crop of Mexico, is an oval shaped, small to medium sized seed and a weight range of 5 – 12 ounces. It has a creamy texture and is known for its great taste and unique flavor.<sup>1</sup> Mexico is a large producer and supplier of the world's avocado market. In the Mexican state of Michoacán, there are 100,000 workers who are employed on 8,000 farms. The total acreage of these farms is 220,000 acres with a production of 800,000 tons of avocados per year. Mexico is, therefore, credited with supplying 45 percent of the world's market of avocados.

Because of favorable weather and Phytosanitary programs for pest control, the Mexican Hass avocado production in 2009/2010 had a record breaking year with 1.18 million metric tons (MT). In the export trade, Mexico exported 400,000 MT of Hass avocados and 304,000 MT was exported to the United States. In contrast, the United States did not have the same situation. Because of smaller crops and, therefore, higher prices, the United States' exports of California Hass avocados to Mexico in 2009/2010 decreased.<sup>2</sup>

In 2007, Mexico's fifth ranked fruit crop produced was the avocado. For the United States, the Mexican avocado was the number one import of Mexican fresh fruit whereby holding 26 percent of the total United States imported Mexican fresh fruit market.

In the production of the Mexican Hass avocado for the 2009/2010 growing year, the production was expected to be 5.6 percent higher from the previous year of 2008/2009 with a forecast of 1.18 million metric tons. In Michoacán, the state where 92 percent of the total Mexican avocado production is grown, the increase

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<sup>1</sup> Lamsa Growers. Wholesale Mexican Hass Avocado.

[http://www.mexicanhassavocado.com/Hass\\_Avocado\\_Wholesale\\_and\\_Distribution.html](http://www.mexicanhassavocado.com/Hass_Avocado_Wholesale_and_Distribution.html)

<sup>2</sup> Hernandez, G. et. al. and Ford, M. et. al. and Mustard, A. et. al.

USDA Foreign Agricultural Service. Global Agricultural Information Network. Gain Report Number MX9090. Mexico. Avocado Annual. Mexican Avocado Production to Increase. Report Highlights.

[http://gain.fas.usda.gov/Recent%20GAIN%20Publications/AVOCADO%20ANNUAL\\_Mexico\\_Mexico\\_12-1-2009.pdf](http://gain.fas.usda.gov/Recent%20GAIN%20Publications/AVOCADO%20ANNUAL_Mexico_Mexico_12-1-2009.pdf)

in production for the 2009/2010 season is due to favorable weather conditions throughout the growing year. Because of the international demands for the Mexican Hass avocado, in the 2009/2010 season, there was a four percent increase in production area (i.e. hectares) of the avocado compared from the previous 2008/2009 season. The 2009/2010 season expanded the avocado production to 127,950 hectares.<sup>3</sup>

Another contributing factor to the increase of production is that Michoacán commitment to continue the implementation of Phytosanitary programs to control pest. As a result, in the 2009/2010 season, APHIS will certify 22 Michoacán municipalities. Michoacán Phytosanitary authorities are proactive in requesting that APHIS certifies 59,000 hectares of avocado producing farms. On October 15, 2010 through April 14, 2010, APHIS granted certification of those 59,000 hectares.<sup>4</sup> Other Mexican states such as Jalisco and Mexico are currently underway in establishing an avocado industry by following the lead of Phytosanitary and good agricultural practices in avocado production such as the state of Michoacán. Their intent is to receive certification from APHIS and export to the United States as well.

Food safety is a major concern to where the producers are now implementing appropriated steps towards improved production and packaging procedures. To assure that avocados are free of pest and any chemical or biological residue,

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<sup>3</sup> Hernandez, G. et. al. and Ford, M. et. al. and Mustard, A. et. al.  
USDA Foreign Agricultural Service. Global Agricultural Information Network. Gain Report Number MX9090. Mexico. Avocado Annual. Mexican Avocado Production to Increase. Production.  
[http://gain.fas.usda.gov/Recent%20GAIN%20Publications/AVOCADO%20ANNUAL\\_Mexico\\_Mexico\\_12-1-2009.pdf](http://gain.fas.usda.gov/Recent%20GAIN%20Publications/AVOCADO%20ANNUAL_Mexico_Mexico_12-1-2009.pdf)

<sup>4</sup> Hernandez, G. Ford, M. (12/1/2009). GAIN Report Number MX9090. USDA Foreign Agricultural Service. Global Agricultural Information Network. Gain Report. Mexico. Avocado Annual. Mexican Avocado Production to Increase. Crop Area.  
[http://gain.fas.usda.gov/Recent%20GAIN%20Publications/AVOCADO%20ANNUAL\\_Mexico\\_Mexico\\_12-1-2009.pdf](http://gain.fas.usda.gov/Recent%20GAIN%20Publications/AVOCADO%20ANNUAL_Mexico_Mexico_12-1-2009.pdf)

Michoacán also has invested \$2 million U.S. dollars to continue and to assure they stay on the edge of technology in production.

For the cultural production techniques for the avocado, it is first propagated by means of grafting techniques. Although all avocados can be propagated by seed, the quality of the fruit and yield will not be comparable to the grafted means. So therefore, the avocados that are typically used for trade are from grafting of desired cultivars to seedlings or other grafted rootstock. Special precautions are taken to prevent *Phytophthora* root rot contamination of scions. Some precautions such as 1) using only fruit picked off the tree and not take from fallen fruit, 2) production of the scions stock is grown in sterile media, and 3) prevention of nursery container grafted stock from touching the ground are all important to obtain a disease free scion. Once the scions are grafted onto the rootstock and they will remain in the nursery until they are healed and ready to be planted. Ocean locations are not favorable due to high winds and salt. The avocado trees limbs are brittle and could break and the tree is sensitive to salt. The Mexican hybrid avocado is capable of growing in elevations of 2,000 – 2,500 feet as well.

Once the nursery stock is ready for planting, the trees are spaced at 25 – 35 ft., depending on the cultivar and organic mulches and herbicides are used for weed control. It's important to know that avocados, in general, are adapted to a wide range of soil types. However, the avocado does not tolerate waterlogged soils. A successful production operation will need 50 inches of annual rainfall. One of the most important soil characteristics is that the optimum soil pH range is 6.2 – 6.5. Soil test should be done to determine the fertility of the soil prior to planting. Once the fertilizer recommendation is received, the fertilizer has to be mixed in the root zone prior to planting.<sup>5</sup>

In the harvesting of the Mexican Hass avocados, harvesting of the fruit to be at the optimal point is very important. The harvesting techniques that are used are with hand-held poles and baskets. The fruit is picked when it's matured, but still hard.

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<sup>5</sup> Chia, C, L. et. al. and Yokoyama, K. M., et. al. Crop Knowledge Master. Avocado. General Crop Information. [http://www.extento.hawaii.edu/kbase/Crop/crops/i\\_avocad.htm](http://www.extento.hawaii.edu/kbase/Crop/crops/i_avocad.htm)

Experience along with other testing methods determines the harvesting time. Some indicators of ripe avocados are skin color change, loss of glossy appearance and a brown seed coat. Another method is determined by percent dry matter of the fruit. The method is by placing 10g of sliced avocado in an uncovered Petri dish and cooks it in a microwave at high setting for 5-15 minutes. If the dry weight of the avocado is at 22.8 percent for the Hass avocado, the fruit is ready for harvest.<sup>6</sup>

In the post-harvest operations, when the fruit is received, it is first weighed and then unloaded. Colored boxes are used to distinguish the destination of the fruit. Certain colors represent certain markets such as export, domestic markets and even organic markets. The represented colored boxes are then taken to a special machine that sizes the fruit. Next, the fruit goes through a cleaning machine that brushes any debris off. The fruit is again sorted by and packaged for specific markets by either manual or mechanical means. Some of the criteria of sorting are: size, weight, shape uniformity, insect, rodent and mechanical injury. The fruit is then stored in refrigerated storage where temperature control will slow or hasten the soften process.<sup>7</sup>

Finally, in terms of crop value, the wholesale prices of avocados have been consistently stable and unchanged from the 2008/2009 to the 2009/2010 seasons. In the United States, the domestic wholesale prices range during mid-2009 for the United States was \$32.43 - \$37.29 per 12 kg (26.46 lbs.) box. This price was mainly due to sustained exports to the United States and a decreased supply in the domestic market.<sup>8</sup>

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<sup>6</sup> Dorantes, L. PhD. et. al., and Parada, L. MSc. et. al. and Ortiz, A. PhD. Et. al. Food and Agriculture Organization of the United Nations. Harvesting.  
[http://www.fao.org/inpho/content/compand/text/ch30/ch30\\_02.htm](http://www.fao.org/inpho/content/compand/text/ch30/ch30_02.htm)

<sup>7</sup> Dorantes, L. PhD. Et. al., and Parada, L. MSc. et. al. and Ortiz, A. PhD. Et. al. Food and Agriculture Organization of the United Nations. Storage of Avocado.  
[http://www.fao.org/inpho/content/compand/text/ch30/ch30\\_02.htm](http://www.fao.org/inpho/content/compand/text/ch30/ch30_02.htm)

<sup>8</sup> Hernandez, G. Ford, M. (12/1/2009). GAIN Report Number MX9090. USDA Foreign Agricultural Service. Global Agricultural Information Network. Gain Report. Mexico. Avocado Annual. Mexican Avocado Production to Increase. Crop Area. [http://gain.fas.usda.gov/Recent%20GAIN%20Publications/AVOCADO%20ANNUAL\\_Mexico\\_Mexico\\_12-1-2009.pdf](http://gain.fas.usda.gov/Recent%20GAIN%20Publications/AVOCADO%20ANNUAL_Mexico_Mexico_12-1-2009.pdf)

In conclusion, the Mexican production of avocados is very strong and plays an important role in extending the availability of fresh avocados to the United States consumer and processing markets in winter months.

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