



A new "high density" planting of Hass on Dusa rootstock. The spacing is 7-meters x 7-meters (23-feet x 23-feet). Note the "shelterbelt" (windbreak) in the background.

A Glimpse into Avocado Production In New Zealand

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The 10th World Avocado Congress was held in New Zealand April 2-5, 2023, with 1,160 attendees from 33 different countries. Prior to the Congress, there were two days of optional field tours available for attendees. On Saturday, April 1, I attended an orchard tour in Katikati in the Bay of Plenty region, and on Sunday, April 2, I visited an orchard in Glenbrook across the bay directly south of Auckland.

New Zealand's primary growing region is the Bay of Plenty, which has a relatively warm climate and fertile soils. Whanga-

rei and the Far North are secondary growing regions. All these growing regions are on the country's North Island.

In Katikati we visited the grove of Maria and Andrew Watchorn. Maria and Andrew both come from the financial world and have been "orcharding" since 2005. They currently own about 20 hectares (50 acres) of groves, all situated approximately 65 feet above sea level and 300 feet from the coast on sandy loam soils. Tree spacings vary by grove (they have purchased neighboring properties over the years), ranging from 50 x 60 feet to their closest spacing of 23 x 23 feet,



A demonstration of the Hydralada lift platform used for pruning. The Hydraladas used by Maria and Andrew have a maximum height of 8 meters (26 feet).

which is a new planting on clonal Dusa rootstock.

November through March (summer) is irrigation season and all water is drawn from a pond on the property that is spring fed. All water use is strictly controlled and they are only permitted to draw a certain volume of water from the pond annually. All the pumps on the pond are fitted with telemetry and are monitored by the local council to ensure they stay within their permitted allotment. Maria and Andrew are okay with this as they view their primary job as being guardians of the land (a common theme we heard a lot in New Zealand). To this end, they have spent a lot of time and money over the past few years restoring the area around their pond by planting 2,000 native plants to ensure the health of the ecosystem with plans to plant an additional 2,000 plants.

Because their grove spacings are wide, the trees are large. They maintain their widest spacing trees at about 30 feet tall because they harvest and prune using 8-meter (26 feet) Hydraladas (“cherry pickers”). Pruning is done twice per year, including flower pruning. When they prune, they remove all vertical wa-

ter shoots first. While removing the water shoots, they are looking at the canopy to determine what wood to leave for fruiting in the next season and what wood to remove. A key goal is sunlight penetration to the orchard floor to help warm the soil. Any limbs with fruit that need to be pruned will be flagged, then strip picked and removed after harvest. Pruning costs for the widely spaced trees is NZ\$2,500 per hectare, whereas for the “high density” Dusa trees it is NZ\$5,300. They said according to their experience the yield is the same so the “high density” planting is not as profitable due to the pruning cost.

New Zealand avocado production is primarily for export and harvesting is done based on export orders, with the primary markets being southeast Asia (China and Thailand). However, they carefully monitor their spray

program and their orchards are fully export compliant for all markets that New Zealand currently has access to. Flowering and fruit set occurs in October-November and harvest takes place from October through March/April. Their average yields are 24 metric tons per hectare (approximately 24,000



Maria Watchorn shows off a silver fern, the national symbol of New Zealand.



A particularly large Hass tree held together with threaded rods.

pounds per acre). An old orchard they sold in order to purchase an adjacent orchard produced 50 metric tons per hectare on a 3-year average with the highest production being 59 metric tons per hectare.

Maria and Andrew inject phosphorous acid once per year as a maintenance program for phytophthora control. They will do two injections per year on particularly weak trees or to rejuvenate old, debilitated trees as they have been doing on a recently purchased orchard.

All fertilization is done with dry granular fertilizer applied by hand and dosed specifically for each tree's needs. Because they do not irrigate year-round, dry granular fertilizer is their best option to ensure the trees receive the fertilizer they need when they need it.

Although yields are high, Maria and Andrew do face challenges. Like California, land cost is very high and it was evident from what we saw from the bus windows that urban sprawl is encroaching on New Zealand's agricultural land just like in California. Where they are located, cold springs and frosts are common

so they install automated frost protection systems using micro-sprinklers on all newly planted trees. Labor costs are very high, which is one reason they prune like they do since the open trees keep their harvesting costs down (NZ\$1.60 to NZ\$1.75 per 5.5 kg tray). The cool wet climate is also favorable to many fruit rots and fungal pathogens so they apply eight to 10 copper sprays per year. All spraying is done with ground-based sprayers using 325 gallons per acre for pesticides and about 100 gallons per acre for foliar fertilizer applications. In total, production costs average NZ\$15-18,000 per hectare (approximately US\$3,650 to US\$4,450 per acre) not including packing fees.

Lastly, wind is a tremendous challenge throughout New Zealand's growing regions. Growers must plant extensive windbreaks ("shelter belts") around and throughout their groves to reduce fruit drop and wind scarring. Within their windbreaks, wind speeds during February and March still reach 25 miles per hour and average 8 miles per hour.



A trellised Hass avocado tree in the orchard of David French.

The grower we visited on Sunday, April 2, was David French whose grove is in the Glenbrook area south of Auckland. David is primarily a kiwi fruit grower. Kiwi fruit are grown under large net structures in New Zealand and David decided to try these structures for growing avocados in addition to the standard windbreaks. David's grove was developed beginning in 2004 when he planted the windbreak trees. The avocados were planted in 2005. In 2009 most of the fruit and flowers were lost due to frost so overhead sprinklers were added on 2-meter-tall posts for frost protection. In 2011 another frost occurred but the trees had overgrown the 2-meter-tall sprinklers so the sprinklers were raised to 5 meters and no frosts have occurred since then.

David's greatest struggle with growing under the net canopy is pruning. Due to the structure, he must maintain the trees at about 5.5 meters tall. He initially tried pruning the trees to an open vase, but that didn't work out. He then tried removing just the tallest limb per tree each year, but that also didn't work to keep the trees in bounds. Since then, he has simply been topping the trees to keep them at about 5.5 meters tall, but he is starting to lose



The avocado grove of David French showing the “shelterbelt” and protective net canopy.



A Hass avocado tree growing under a protective net structure. Note the overhead sprinklers for frost protection.

the lower leaves on the trees and is losing production. His best yield has been 10 metric tons per hectare (10,000 pounds per acre).

David said his greatest frustration is that avocado growing is not as regimented as kiwi fruit growing. He is now trying to grow avocados on trellises under the protective net structure to try to bring some of the discipline of kiwi fruit growing to avocados.

It was clear from these grove visits that the fertile soil and abundant rainfall of New Zealand allows for very good avocado production. However, like everywhere they have plenty of challenges including high winds, high production costs and changing weather patterns. New Zealand's dependence on the export market can also lead to volatile market conditions from season to season. 🥑