

Avocado in Kona

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The avocado is a productive, well-adapted fruit tree with a long history (200 years) in Hawaii. However, there has been very little agronomic research conducted on this crop in the state. Most recommendations are general and based on research from other avocado growing regions of the world. Consequently, local growers often rely on their personal observations in making agronomic decisions.

The Kona district on the Big Island has traditionally been the principal avocado growing area in the state. Many of today's common cultivars originated from seedlings grown on farms in the infamous Kona coffee belt during the last century. Fittingly, most of these local varieties bear the names of these hard working farmers.

The purpose of this article is to outline a few of the key agronomic variables for growing avocado and to provide a brief history of cultivar selection for the commercial avocado industry in Kona for the past 30 years.



Poster by Ken Love, Hawaii Fruit Net.

Location & Soil Type

Although avocado grows well on many types of soil it is very susceptible to *Phytophthora* root rot disease when grown in poorly drained soils subject to high rainfall. Most Kona soils, though shallow and rocky, are very suitable for avocado due to their excellent drainage. Since all areas of Hawaii are prone to heavy, seasonal rainfall, the a'a land is actually a blessing in disguise for avocado, as well as other tree crops susceptible to root rot diseases.

Another benefit of Kona's location is the protection from tradewinds provided by two large volcanoes, Hualalai and Mauna Loa. Avocado wood is very brittle and branches are easily broken in high wind. Flowers and fruits are also easily damaged therefore, a good windbreak system must be in place when avocado is grown in areas subject to high wind conditions.

Avocado is very well-adapted to the growing conditions found in Kona - to the extent they have naturalized along the mauka roadways and continually volunteer on rural and semi-rural properties. These ambitious, self-propagated seedlings often grow to gargantuan specimens, producing hundreds of pounds of fruit, ranging in quality from poor ("pus bombs") to quite good ("butter pears"). Avocado trees grow so vigorously here they are actually hard to kill if you want to eliminate one. The "one-third" rule and "no topping" tenet of pruning do not apply with avocado in Kona. In fact, the best way to tame and manage a behemoth volunteer tree that

produces junk fruit is to “stumpify” it, graft a resultant sucker to a desirable variety and then maintain the new canopy at a workable height.

The point is that agronomically all avocados (seedlings and cultivars) grow and thrive so well here that the decision of which cultivars to utilize in commercial operations is entirely based on fruit characteristics (quality, season and marketability). There are, however, some cultivar differences in tree growth habits (spreading versus upright; compact vs. aggressive) that can influence plant spacing (20-30 ft between trees) in the orchard. It should be noted that rainfall is another factor determining the optimal space between trees.

Cultivar Selection

One hundred years ago, Hawaii farmers supplied most, if not all, of the avocado fruits consumed in the state, growing varieties either introduced from elsewhere or seedling varieties originating from the introductions (e.g. McDonald, Beardslee, Fuerte, Linda). By thirty years ago Hawaii supplied only 75% of its avocados with 25% imported from outside the state. Many good varieties were grown at that time, including those developed in Kona (e.g. Fujikawa, Kahaluu, Murashige), as well as Sharwil, a recent introduction from Australia.



Photo by Ken Love

(a) **Quality** – Fruits of avocado cultivars vary widely in flavor, moisture and oil content, from less than 5% oil (watery in texture, mild in flavor) to greater than 30% oil (buttery in texture, rich in flavor). It is also important to understand that oil content increases during the fruiting season. Early in the season many fruits may appear mature but actually have unacceptably low oil content compared to fruits harvested in mid-season or later. If harvested too soon, at worst shriveling and rotting of the fruit occurs before ripening is completed; at best, the fruit ripens but with significantly less taste and quality than is indicative for that variety.

(b) **Season** - Avocado trees vary in length of time from flowering to fruit maturity and, therefore, in season of maturity. Elevation also influences the season of maturity: fruit growing at or near sea level will mature a month or two earlier than fruit grown in the typical “coffee belt” elevation range (900 – 1600 ft), which in turn matures earlier than fruit at the limited number of farms near and above 2,000 ft elevation.

The majority of good avocado varieties in Hawaii bear fruit in winter, some bear in the spring and very few during summer and fall. Some varieties, such as Kahaluu, must be harvested within a couple of months or the fruit drops to the ground. Other cultivars have the ability to hold their fruit at the mature green stage for a long time. An example is Sharwil, which is generally fully mature in January when grown at moderate elevations, yet it is quite common to harvest some fruits that are acceptable eating quality as early as November and as late as May.

The ability to store mature fruits on the tree, effectively extending the season of fruiting for a particular cultivar, is a distinct advantage to both the farmer (managing labor) and the commercial avocado industry (marketing/competing with imports).

(c) **Marketability** - Around thirty years ago, leaders in the Kona-based avocado industry developed a two-pronged marketing plan focused on the use of only three of the many local varieties. It was determined that such a plan would hopefully not only stem the tide of increasing imports of avocado into the state (through nearly year-round production of local “branded” cultivars), but also develop the Sharwil avocado into an export crop.

In addition to Sharwil (winter) the three cultivars included Yamagata and Ota. Although little known outside the Big Island and not as exceptional as the best “winter pears,” Yamagata and Ota are among the best spring and summer avocados, respectively. Promotion of Ota eventually was discontinued because it failed to produce flowers in many areas of Kona. For better or worse the industry put itself behind the Sharwil, arguably the best avocado in the world, as the premier cultivar, not only for the future export trade but as the leader in the tri-cultivar strategy to reclaim the local market.

David vs. Goliath

Sharwil, originally from Australia and highly regarded there, compares favorably with the Hass variety (the main cultivar worldwide) in the following industry-accepted parameters that constitute a good commercial avocado fruit:

1. Excellent flavor – Sharwil and Hass both are described as rich and nutty.
2. High oil content – Sharwil and Hass both >25% oil.
3. Medium thickness of skin – Sharwil and Hass - handles shipping better than thin-skinned varieties (Kahaluu); easier for consumer to determine ripeness than thick-skinned varieties (Murashige, Yamagata).
4. Small seed – Sharwil seeds, possibly the smallest of all commercial avocados, are significantly smaller than Hass seeds, yielding a higher edible flesh-to-seed ratio.

The Hawaii Avocado Association conducted Promotional and Marketing programs during the 1980's in Honolulu and out-of-state, successfully increasing awareness and demand for the Hawaii Sharwil avocado. By 1991, Sharwil was finally cleared for export and shipments were made to the U.S. Mainland and beyond, with the eventual eye toward gaining approval to ship to the lucrative Japanese market. Sharwil was able to compete, toe-to-toe, with Hass in mainland and international markets not only because it is of equal (or better) quality but because the early- to mid season Hawaii Sharwils are available two to three months before the start of the Hass season.

Unfortunately, the ability to export to the mainland was rescinded in 1992 due to problems with fruit fly regulations. This restriction pulled the rug out from under the Hawaii avocado industry, resulting in stagnation, disorganization and continued loss of market share to imported Hass avocados from California and South America in the ensuing years.

Apparently, there is a glimmer of hope that the unreasonable restrictions placed on shipping Sharwil avocados to certain northern tier U.S. states may be lifted sometime in the relatively near future. In the meantime, the avocado industry should re-institute the promotion and marketing programs that it employed 20-25 years ago, in Honolulu, to increase consumer awareness and demand for the Sharwil, in an effort to combat the imported fruit and increase Hawaii's food security.

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