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# COMMERCIAL KAKI PERSIMMON PRODUCTION IN FLORIDA

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*Abstract.* **The Kaki Persimmon (*Diospyros kaki*) is becoming a new commercial orchard crop in Florida. In the last 10 years, over 500 acres have been planted. The non-astringent varieties Fuyu, Izu and Matsumoto are the best cultivars for orchard production, and can bear up to 10,000 lbs/acre by 7-8th leaf. There is a large demand from Asian markets in large metropolitan areas throughout the east and local grocery chains, that is much greater than current available supply. Growers that use proper care and produce quality fruit can receive $1.00-$2.00/lb wholesale, providing a profitable return. A cooperative has been formed to help growers market the fruit.**

The Oriental or Kaki Persimmon (*Diospyros kaki*) has been grown in Florida since the early 1900s, but only recently has become a commercial orchard crop in Florida. Early introductions were tested by Dr. Harold Hume (Hume and Reimer, 1904), and in the mid 1960s a number of varieties were introduced from the Okitsu Research Station in Japan by Dr. A. T. Wallace (Sharpe, 1966). The University of Florida has conducted evaluations at Gainesville, Live Oak and Monticello Research Stations (Miller and Crocker, 1991), but these plantings have been discontinued because of inadequate funding.

Over the last 10 years, over 500 acres of persimmon orchards have been established in the state from Naples to Pensacola, with most of the acreage planted in north and central Florida between Live Oak and Apopka. Early commercial growers such as Mr. Jim Mercer of Chiefland discovered a large, untapped market for the non-astringent fruit in the Asian communities around the state that have expanded greatly since the Vietnam War. Growers began planting orchards and have had virtually no problems selling their crops. Most orchards are small, averaging 1-5 acres in size. A Florida Persimmon Growers Association was formed in 1992, primarily of backyard growers and amateur enthusiasts, and at one time, had over 100 members, though recent membership has dwindled. A small group of larger growers, representing 50+ acres of production, formed the Florida Persimmon Growers Cooperative in 1995, with the express purpose of pooling resources and production to market their crops.

Kaki Persimmons bear in 2nd-3rd leaf, and can produce as much as 50 lbs of fruit per tree by 7-8th leaf. Wholesale prices range from $0.80-1.00/lb for bulk packed fruit picked up at the farm, to $1.00-2.00/lb depending on fruit size, packaging, and shipping costs.

## Varieties

The best commercial cultivars are the non-astringent varieties Fuyu (same as Fuyu-gaki), Matsumoto Wase-Fuyu, and Izu. Observations of these cultivars in commercial plantings have shown that they produce superior results with best fruit quality, more consistent crops (with less bi-annual bearing), and good disease resistance. All are similar for marketing purposes, with the main difference being harvest dates. Izu is a dwarf, compact tree with large, good quality fruit that ripens in mid-September. Matsumoto is an early sport of Fuyu, has the largest fruit of the 3 varieties, ripens in late September to mid October, and has the best disease resistance of all. Fuyu is the standard around the world of non-astringent persimmons. It has good quality, medium size fruit, and ripens late October-mid November. A planting of all 3 varieties helps spread harvest time and marketing.

Other varieties have not shown good results in commercial plantings. Jiro, very popular in California (and is marketed as Fuyu in the east) is a much smaller fruit and the blossom end cracks in Florida's wet summers. Suruga has poor leafspot resistance and defoliates causing fruit to sun-scald. Hana Fuyu, in demand because of its large size fruit, has problems with cracking and should not be planted commercially. Unfortunately, persimmons have a bad history of being misnamed, and unethical nurseries have caused many problems by selling "Japanese surprise" trees as known varieties. Hana Fuyu is an unfortunate example, which is often sold as Fuyu, and many varieties are sold as Hana Fuyu though they are Fuyu or even astringent varieties. Growers should always plant nursery stock from reputable nurseries that maintain fruiting orchards for budwood collection.

## Planting

Persimmon trees have been planted on a wide variety of soil types, from deep sand to flatwoods soils with varying results. They have preformed best in the upland sandy loams of north-central Florida. Some growers have experienced severe problems from planting in frost pocket locations with poor air drainage, in which late spring freezes have severely damaged growth and production. In most locations, however, persimmons are more consistent bearers than stone fruit crops because they flower after leaf emergence. Persimmon trees are small trees and spaced 15' × 15' (192 trees/acre). Drip or microjet irrigation is mandatory for commercial production. Growers have learned that planting container-grown trees produces much better results than planting traditional bareroot trees. *D. virginiana* rootstock is deeply tap-rooted and produces few lateral branches in field nursery production, thus survival is often poor, especially if plants are not planted immediately after digging. Container-grown stock, by comparison, eliminates transplant shock and can be planted year-round. Growers report much better survival and rapid growth of the stock from planting container-grown trees. Orchard stock should be pushed with strong fertilizer and watering regimes in the first two years, and the third year growth should be slowed down and the trees allowed to fruit. Plants growing too vigorously will drop fruit in the early summer with the onset of summer rains, so watering and fertilizer should be decreased at this point. Trees are pruned to a modified central leader, and tops removed above 8-10' each winter for easier harvest and to promote leaf area to maximize fruit ripening and cropload.

## Diseases and Pests

Growers have had most problems from *Cercospora* leaf spot. A severe leaf spot infection can cause defoliation and

poor fruit ripening. Unfortunately, few fungicides except Copper are labeled for use on this minor crop. Some growers have had success with Nutriphyte nutrient spray, which has similar active ingredients as Alliete fungicide. Clean leaves produce a much more consistent and heavier crop. Other severe problems include *Cephalosporium* wilt that kills entire trees and can spread through an orchard by transmission from twig girdlers, and death from latent freeze damage to cambial tissues. Some growers have had problems with deer eating new growth in spring, and with wildlife such as raccoons eating fruit on the trees. Replanting when tree vigor slows down, after 10 years, may present a viable method to keep orchard yields high, just as with peaches.

### Harvest and Post-harvest Storage

Persimmons must be harvested by hand-clipping, like tangerines, to keep from breaking limbs. Fruit are then washed, dried and sorted by size. Fruit is packed in 16, 18, or 20 'Panta-pack' trays and shipped in single layer breathable boxes. Fruit can be stored for 30-60 days at 55 degrees F, but storage at colder temperatures can cause premature ripening. Average size of fruit is 6-8 oz. A swelling of 20-30% in fruit size occurs in the last 3 weeks before harvest once the fruit colors up. Fruit can be harvested once the fruit has turned from green to yellow-orange. Time of picking depends upon the market.

### Marketing

A large market exists for high quality, non-astringent fruit. Asian food markets in large metropolitan areas of the eastern US such as Orlando, Miami, Atlanta, Washington DC, New York, Chicago, etc. are virtually untapped targets. Many Asian markets prefer fruit that is barely ripe, just turning from green to yellow, so it is important to know the customer and their demands clearly before harvesting and shipment. Supermarkets, such as Publix in Florida, can be price-conscious markets, especially when the California persimmon crop hits the market in early November. California typically produces small (24 pack) Jiro fruit that can be overripe or bruised upon arrival in Florida, but available at a low price per unit. Sharonfruit, the astringent persimmon variety Triumph grown in Israel and gassed to remove astringency, is of even poorer quality. Florida-grown persimmons are much larger and of much better quality, especially if allowed to swell during ripening on the tree before shipment. However, growers must again know their market, and locate outlets that are willing to pay a higher price for premium quality fruit. The Growers Cooperative is an important step in the establishment of quality standards for communication between growers and buyers, and in advertising and locating markets to bring the highest return for Florida growers. There is far more demand that there is available supply.

### Conclusions

Kaki persimmons can be a profitable orchard crop for Florida growers. As with all commercial orchard crops, growers must plant the best varieties, give proper care, and above all, work to market their crop to outlets that will provide good prices and move sufficient quantities. They are not difficult to grow, and the demand is strong for good quality products and will continue for the foreseeable future.

### Literature Cited

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# CONSUMER PERCEPTION AND WILLINGNESS TO PURCHASE MUSCADINE GRAPES AS FRESH FRUIT: TALLAHASSEE STUDY

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*Abstract.* **A survey of 1,480 consumers in 1995 and 1996 in Tallahassee showed that half of the respondents had never purchased muscadine grapes. Among those who had purchased muscadine grapes before, 61% of respondents were African American and 30% were Caucasians. The largest group of respondents who had purchased muscadine grapes at least once was female African American (65%) and the smallest group was male Caucasian (22%). In general, those who had purchased muscadine grapes before are more likely to have a favorable perception and willing to purchase the grapes compared to those who tried it the first time. Between racial groups, more African Americans have favorable perceptions about muscadine grapes and are also more willing to purchase the grapes than Caucasians. The proportion of males and females with favorable perceptions ranged from 66%-79% and appeared to increase with age. Price has a negative impact on potential demand. The proportion of respondents who were willing to purchase muscadine grapes declined significantly from 78% to 60% as the price increased from $0.79 to $1.39 per pound. Similarly, the average quantity they were willing to purchase also declined from 2.22 to 1.39 pounds, respectively. Similar relationships were observed by race, sex, age group, and household size. The results of this study show that muscadine grape as fresh fruit has good market potential, particu-**