Proc. Fla. State Hort. Soc. 119:29-31. 2006.

OPTIONS FOR SUBTROPICAL PEACH PRODUCTION IN FLORIDA

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Additional index words. *Prunus persica*, club variety marketing, stone fruit breeding, low-chill

Abstract. **During the past ten years, new patterns for fresh fruit marketing have emerged, with international industry groups, like those of apple growers, shifting emphasis from commodity production to high value, premium fruit marketing. Large supermarket chains have also consolidated purchasing power, especially in perishable produce, and have increased control of fruit quality standards. Although new cultivars have posted profitable returns, oversupply has eventually depressed prices. In response "Club Variety" marketing has sought to control planting and marketing of new patented cultivars to maintain long term premium prices. Following this model, subtropical peach production could rapidly expand in Florida, providing a lucrative specialty crop following the example of low-chill southern highbush blueberries bred for the early spring market window. Fresh packed, tree ripe fruit could be marketed as high value produce rather than as a broad seasonal commodity. Marketing options developed by the Vidalia onion industry and other profitable cooperatives could include exclusive licensing of patented cultivars to grower investors operating within a new generation cooperative model. This grower organization would own exclusive rights to UF patented subtropical peaches, operating as a production and marketing entity to control nursery production and orchard development, provide yield-based royalties to support research and extension programs, and ultimately to manage market supply for profitable grower-investor returns.**

In the 1960s, peach acreage in north Florida totaled 3,958 acres, with Madison (1,860 acres), Jefferson (950 acres), Holmes (450 acres), and Gadsden (245 acres) counties accounting for 89% of the acreage (Young and Bryan, 1966). Production declined to approximately 1,000 acres by 2000 (Williamson and Crocker, 2000) and is now estimated to be less than 500 acres. Late spring freezes, competition from other US production areas, and marketing problems caused the decline of this industry. However, since the 1970s the University of Florida (UF) stone fruit breeding program, frequently in cooperation with the University of Georgia and the USDA, has released over 30 peach, nectarine, and plum cultivars intended primarily for north central and north Florida, with some recently released cultivars adapted for central and south central Florida (Williamson and Crocker, 2000; Williamson et al., 2005) (Table 1). Ironically, some of these low chill peach cultivars are grown more widely in other subtropical and Mediterranean regions of the world, producing profitable crops for early market windows.

Many Florida stone fruit cultivars developed up until the 1990s were not patented but increasing emphasis on intellectual property rights and the need for royalty income to support breeding programs has resulted in patenting of recently released cultivars. However, even cultivar patenting and royalty costs per plant may not alleviate boom and bust cycles for fruit crop cultivars like blueberries and peaches. Building upon recent developments in cultivar patenting and global marketing for fresh apple cultivars, we will discuss the potential for a new, subtropical peach industry in central Florida, with the goal of developing low chill, early ripening cultivars with non-melting flesh for improved on-tree ripening and shelf life.

New Paradigms in Fruit Production

During the past ten years dramatic changes occurred in international apple production and marketing and could serve as a model for Florida subtropical peaches (Tustin, 2003). An international market glut of apples, even of premium value cultivars like Gala and Fuji, reduced the climatic and market window advantages of traditional apple production regions.

These crop surpluses coincided with the merging of supermarket chains into "mega groups", depending on a few commodity or crop category managers who eliminated a whole cadre of wholesale buyers. Large buyers consequently began to set crop quality standards ranging from best management practices to food safety and third party certification by private companies as part of a continuous improvement process.

To avoid oversupply of even popular cultivars and low f.o.b. (a quoted price by the seller that includes the cost of loading goods into transport vessels at a specified place) prices, a new marketing strategy has evolved. When new cultivars are developed as intellectual property and patented, exclusive licensing to a marketing agency as a "brand franchise" or "club variety" can prevent oversupply and low prices. The marketing agency controls nursery production, acreage planted, crop marketed, and could be the exclusive marketer. For example, a new apple cultivar, Jazz, developed by HortResearch, a private New Zealand fruit science company, was licensed to a marketer, who approved acreage planted, production, and marketing of this new cultivar in New Zealand, France, and Washington state (HortResearch, 2005). A number of other brand name cultivars like Cara Cara navel orange, Kandy Primo Melon, Dulcinea SunnyGold Honeydew, and Grapple (a Fiji apple dipped in a Concord-grape-flavored solution) are being marketed as sweeter varieties (McLaughlin, 2006).

The club varieties are a means to control planting and marketing of new patented cultivars to maintain long term premium prices. Following this mode, subtropical peach production could rapidly expand in Florida, providing a lucrative specialty crop. Fresh packed, tree ripe fruit could be market-

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Table 1. Characteristics of peaches released by the University of Florida breeding program.[z]

Cultivar	Date released	Patented status	Chill units	Fruit development period	Flesh type
UFSun	2004	Patented	100	80	Non-melting
TropicBeauty	1988	Not patented	150	89	Melting
Flordaprince	1982	Not patented	150	78	Melting
Flordaglo	1988	Not patented	150	78	Melting
UFBeauty	2000	Patented	200	82	Non-melting
UFGold	1996	Patented	200	80	Non-melting
UFO	2002	Patented	250	105	Non-melting
UF2000	2000	Patented	300	95	Non-melting
UFBlaze	2000	Patented	300	80	Non-Melting
Flordadawn	1989	Not patented	300	60	Melting
UFSharp	2005	Patent Pending	325	90	Non-melting
Flordacrest	1988	Not patented	350	75	Melting
Gulfking	2004	Patented	350	77	Non-melting
Flordaking	1978	Not patented	400	68	Melting
Gulfprince	1999	Patented	400	110	Non-melting
Gulfcrest	2004	Patent pending	525	70	Non-melting

[z]All melting flesh peach and nectarine cultivars released from the University of Florida breeding program begin with the prefix "Florda" and 'Sun', respectively with all non-melting peach and nectarine cultivars sharing the prefix 'UF'. Joint releases by the University of Florida, the USDA, and the University of Georgia have the prefix 'Gulf'.

ed as high value produce rather than as a broad seasonal commodity. Patented cultivars could be exclusively licensed to grower-investors operating as a business. This business would own exclusive rights to UF patented subtropical peaches, operating as a production and marketing entity to control nursery production and orchard development, providing yield-based royalties to support research and extension programs, and ultimately to manage market supply for profitable grower and investor returns. This club variety concept depends on sizeable initial investment linked with consistent brand and market development. Such new relationships among plant breeders in the public and private sectors, growers, investors, and marketing agents has changed international apple markets and has implications for the development of a subtropical peach industry in Florida

A key feature of this production and marketing system is the selection of qualified growers who can produce consistently high quality, premium fruit rather than "commodity" fruit. In this context "commodity" fruit refers to fruit of uniform quality, grown in large quantities by many different producers. Commodity fruit production has become subject to strong pressures for production efficiency and profitability. Even new, patented fruit cultivars that have strong demand and high prices initially are quickly adopted by growers and are subject to overproduction that eventually depresses prices. The Florida southern highbush blueberry industry, which has grown from 1000 acres in 1994 to almost 3,000 acres in 2005, is a good example of a rapidly developing "alternative" crop industry with average prices over the past seven years ranging from $4.00 to $5.00 / lb. However, growers are already voicing concern about the effect new plantings could have on current high returns.

For nurserymen and growers, these new arrangements will limit what they can grow and will involve costs for tree, acreage, and production royalties but could also bring membership in a carefully managed organization that enable long term profits (Phillips, 2004). The University of Florida stone fruit breeding program, now at a critical point in its course, is developing patented, low chill, non-melting or firm-fleshed cultivars for a slowly growing Florida stone fruit industry.

The club variety model is a viable option for developing a new, subtropical peach industry from the beginning, compared with an already established brand name apple industry apple or a trademark, geographically located Vidalia onion industry. Risks are certainly involved but given the international stature of Florida's peach breeding program, our early market window during April and May, and proximity to large urban markets like Orlando and Tampa, make Florida a strong competitor against other north American production regions like southern California or Mexico.

Subtropical peaches can be grown in the traditional central and south central Florida citrus belt, with some caveats. For example, compared to citrus with heaviest fruit production in the outer 3 feet of trees grown as a hedgerow, peach fruit is produced on the outer and inner open vase canopy, a tree training system best suited to tree densities of 108 trees per acre (20 × 20) to facilitate winter and possibly summer pruning and spring fruit thinning (Williamson and Crocker, 2000.) Even though high density systems have not been as successful for early maturing peaches as for apples, high densities up to 372 trees per acre trained to a perpendicular-V system in California produced up to 38% more fruit over the first four years of production (DeJong, 1988). Advantages of this perpendicular-V system include easy tree and orchard access, canopy light interception, early, high yields, reduced winter pruning, and focus on the main scaffold branches as the unit of production instead of the multiple branches in the open vase system.

Although rooting depth, fertilization and irrigation practices for peaches and citrus are similar, only one rootstock, Flordaguard, is currently recommended but is in short supply and is not suitable for calcareous soils. Major fruit pests and diseases include plum curculio from Ocala north; occasional stink bugs statewide; Caribbean fruit fly in central and southern Florida; brown rot of fruit and fruit scab. Peach tree borers, white peach scale, San Jose Scale, Botyrosphaeria gumming, Armillaria root rot on land with remnant woody stumps and roots, and leaf rust in central and southern Florida can debilitate trees and reduce yield.

Chill units, accumulated hours during the dormant period below a specified temperature, are necessary for the tree

to blossom and produce leaves in the early spring. Optimum chilling temperatures are approximately 45°F but low chill subtropical peaches can acquire adequate chilling at winter temperatures of 55°F and above. However, some cultivars like UFGold with a chilling unit requirement of 200 h and UFO with a chilling requirement of 250 h has not set fruit well when night time temperatures are above 56°F during bloom (Rouse and Sherman, 2002). Furthermore temperatures greater than 70°F can partially negate previously accumulated chill units. Since chilling does not begin until trees defoliate, zinc sulfate sprays are sometimes used to cause leaf drop. In addition to accumulated chilling hours, average January temperatures for a given area are also required for flowering and leaf development.

Late winter/early spring freezes are an annual threat. Generally, unopened buds can withstand 20°F; open blossoms and young fruit can survive 26 and 28°F, respectively. To counter potential freeze damage to bloom, Florida peach breeders have developed cultivars with an extended bloom period, about 10-14 d, to offset freeze damage to early bloom with later blooms that can still bear fruit. However, freeze damage from bloom to early fruit set will continue to be a major problem, requiring new solutions beyond traditional overhead irrigation and favorable site selection, like modified greenhouse production and in-tree microsprinkler systems.

Substantial private investment with exclusive licensing within a club variety concept may be needed for the rapid development of a subtropical Florida peach industry. Citrus production programs can be adapted for subtropical peach production but early maturing, tree ripe fruit will require careful harvesting practices. Although new to Florida growers, this breeding, production, and marketing strategy, already pursued by other fresh fruit industries, may be the key to maintaining our competitive advantage in both Florida and international markets.

Literature Cited

DeJong, T. M. 1988. Peach planting/training systems in California, pp. 418-421. In N. Childers and W. Sherman, eds. The Peach: World Cultivars to Market. Horticultural Publications, Gainesville, FL.

HortResearch: Fruit Breeding. 2005. http://www.hortresearch.co.nz/index/page/85

McLaughlin, K. 2006. New fruit get a sugar rush. The Wall Street J. June 3-4, 2006, p. 5

Phillips, B. 2004. Innovation, specialization grow with world apple market. Washington State Univ. WSU Today Online. http://www.wsutoday.wsu.edu/completestory.asp?StoryID=1256.

Rouse, R. E. and W. B. Sherman. 2002. High night temperatures during bloom affect fruit set in peach. Proc. Fla. State Hort. Soc. 115:96-97.

Tustin, S. 2003. New paradigms in apple fruit production-core issues affecting the future of fruit growers. The Compact Fruit Tree. 36:19-20.

Young, H. W. and H. H. Bryan. 1966. The peach in Florida. Proc. Fla. State Hort. Soc. 79:4 405-412.

Williamson, J. G., P. C. Andersen, and W. B. Sherman. 2005. Peaches and nectarines for central and north central Florida. Univ. Fla. Coop. Ext. Serv. Cir 1159.

Williamson, J. G. and T. E. Crocker. 2000. Peaches and nectarines for Florida. Univ. Fla. Coop. Ext. Serv. Cir 299D.