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Tropical Fruit Production in Florida—Trials, Tribulations, and Opportunities

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Florida subtropical and tropical fruit horticulture is intimately interwoven into the history and fabric of Florida. Since at least the 16th Century, indigenous peoples from the Caribbean and Latin America have introduced subtropical and tropical fruit crops to Florida and other areas of the U.S. Much more recently are the numerous individuals (e.g., David Fairchild, Wilson Popenoe, Richard Campbell, and Gary Zill), organizations [e.g., USDA–ARS, Fairchild Tropical Botanical Garden–Fairchild Farm, and the University of Florida (UF)], and businesses (e.g., Del Monte) that have introduced and promoted new tropical fruit species and accessions for Florida enthusiasts, entrepreneurs and growers.

In preparing for this presentation, the author distributed a survey to UF Extension faculty, business and private individuals designed to ascertain the current commercial acreage and distribution of subtropical and tropical fruit crops in Florida (Table 1). In addition, the archives of the USDA-National Agricultural Library, USDA-Census of Agriculture, USDA-National Agricultural Statistics Service, USDA-Florida Agricultural Statistics Society, USDA-Agricultural Marketing Service, Florida Lime Administrative Committee Annual Reports, and the Florida Avocado Administrative Committee Annual Reports were consulted (see Litature Cited).

Seventeen Florida counties reported commercial plantings of subtropical and tropical fruit (Table 2). Using government and industry data, Florida has about 14,562 acres and, as expected, most of the commercial acreage is in coastal counties along the lower two-thirds of the Florida peninsula (USDA-Census, 2012). Using survey data, Florida has about 13,859 acres. This discrepancy of 703 acres may be attributed to agency, industry and survey participants uncertainty and unfamiliarity with "minor" tropical fruit acreage throughout Florida. The most northern county was Brevard and Pasco on the east and west

Table 1. Commercial subtropical and tropical fruit acreage and distribution survey respondents.

Name and title	Affiliation
Fitzroy Beckford, Co. Extn. Dir. and Ag & Nat. Res. Agent	UF/IFAS - Lee Co. Cooperative Extension
Stephen Brown, Hort. Agent.	UF/IFAS - Lee Co. Cooperative Extension
Yvette Goodiel, Sustainability & Commercial Hort. Agent	UF/IFAS - Martin Co. Cooperative Extension
Arthur Kirstein IV, Coord. Agric. Econ. Development	UF/IFAS - Palm Bch Co.
Robert Kluson, Ag & Nat. Res. Extn. Agent	UF/IFAS - Sarasota Co. Cooperative Extension
Gene McAvoy, Co. Extn. Dir.	UF/IFAS - Hendry Co. Cooperative Extension
Chris Miller, Commercial Veg. and Tropical Fruit Agent	UF/IFAS - Palm Bch. Co. Cooperative Extension
Ralph Mitchell, Co. Extn. Dir. and Hort. Agent	UF/IFAS - Charlotte Co. Cooperative Extension
Jane Morse, Commercial Hort. Agent	UF/IFAS - Pinellas Co. Cooperative Extension
Chris Oswalt, Citrus Extn. Agent	UF/IFAS - Polk & Hillsborough Co. Cooperative Extension
Jessica Ryals, Sustainable Food Syst. Agent	UF/IFAS - Collier Co. Cooperative Extension
Jeff Wasielewski, Commercial Tropical Fruit Extn. Agent	UF/IFAS - Miami-Dade Co. Cooperative Extension
Mongi Zekri, Multi-County Citrus Agent	UF/IFAS - Hendry Co. Extn. Cooperative Extension
Alan Flinn, Administrator	Avocado Administrative Committee, Miami-Dade County

Table 2. Ranking of Florida counties reporting commercial acreage of subtropical and/or tropical fruits.[z]

Rank	County	Estimated acreage
1	Miami-Dade	11,887
2	Palm Beach	947
3	Lee	617
4	Hendry	107
5	Pasco, Polk	50 each
6	Brevard	36
7	Martin	30
8	Broward	25
9	Osceola	21
10	Indian River, Highlands	20 each
11	Charlotte	15
12	Manatee, St. Lucie	10 each
13	Sarasota	~9
14	Collier	5
Total		~13,859 acres

[z]Data from survey participants; lemon acreage not included.

coasts, respectively. Interior counties such as Polk, Osceola, Highlands and Hendry County also reported commercial acreage. Miami-Dade County accounted for about 86% (11,887 acres) of the commercial acreage with Palm Beach (947 acres) and Lee (617 acres) Counties, second and third, respectively (Table 2). Small acreages were reported in all other counties.

In general, the number of subtropical/tropical fruit farms in Florida has increased over the past 25 years (USDA-Census, 1997, 2002, 2007 and 2012) as the proportion of small (<100 acres) farms has increased. Since 1974, the number of full- and part-time farmers has fluctuated with more part-time than full-time growers. Although people of European decent make up the majority of tropical fruit producers in Miami-Dade County, the number of people of Hispanic, African-Caribbean, and Asian decent has increased. In addition, the number of female farm owner/operators has continued to increase since 2002 (when records began). Observation of the current grower demographics suggests about 60% of the producers have a limited horticultural background, there is a wide and diverse educational background (i.e., high school to professional degrees), people on their second or third careers, as well as second and third-generation family farmers and entrepreneurs. In general, the average age of farmers in the U.S. has been increasing for many years, however, universities are experiencing an upward trend in students interested in traditional agricultural majors such as horticulture and ag-operations management but more specifically for agroecology, biology-cell science, plant science technology and genetics (E. Turner and A. Wysocki, personal communication).

In 1960, Florida had an estimated 16,000 acres of subtropical/tropical fruit crops and by 1986; acreage had peaked at 24,220 acres (Avocado, 1987-2006 and 2009 and 2017; Bronson, 2008a and 2008b; Campbell, 1971, 1986 and 1987; Crane, 1989; Crane et al, 2001; FASS, 1993 to 2003; Knight et al., 1984; Lobo, 2013; Murray and Campbell, 1989; Putnam, 2015 and 2016; Steele and Crane, 2006; USDA-AHS, 2018; USDA-Census, 1997, 2002, 2007 and 2012; USDA-AMS 1978/1979; USDA-AMS 1985/1986 to 1992/1993). Today, Florida has about 14,562 acres of subtropical/tropical fruits (Table 3). A number of factors have contributed to the acreage decline including natural disasters such as freezing events, hurricanes and floods. In addition,

Table 3. Tropical fruit crop acres and locations in Florida.

Fruit Crop	Estimated total Florida acres	Estimated acres by county
Avocado	6656	Miami-Dade 6,600; Lee 25; Martin 20; Brevard 10
Longan	1368	Miami-Dade 1,100; Palm Beach 100; Lee 50; St. Lucie 10; Hendry 5; Collier 2.5
Mango	1351	Miami-Dade 800, Palm Beach 300; Lee 200; Osceola 20; Brevard 15; Manatee 10; Broward 5; Sarasota 1
Pitaya (dragon fruit)	721	Miami-Dade 600; Palm Beach 100; Charlotte 15; Brevard 5; Lee 1
Lychee	608.5	Miami-Dade 400; Palm Beach 80; Lee 50; Indian River 20; Broward 20; Martin 10; St. Lucie 10; Highlands 10; Brevard 5; Collier 2.5; Sarasota 1
Guava	714	Miami-Dade 700; Palm Beach 10; Lee 4
Mamey sapote	600	Miami-Dade 600
Banana	610	Miami-Dade 560; Palm Beach 40; Lee 10
Papaya	356	Miami-Dade 300; Lee 50; Hendry 5; Osceola 1
Sapodilla	255	Miami-Dade 200; Lee 50; Palm Beach 5
Carambola	150	Miami-Dade 40; Lee 100; Palm Beach 10
Pumelo	120	Polk 70; Lee 50
Passion fruit	72	Miami-Dade 60; Lee 10; Hendry 2
Kumquat	52	Pasco 50; Lee 2
Sugar apple	31	Miami-Dade, Lee, and Brevard
Miracle fruit	20	Miami-Dade
Jackfruit	16	Miami-Dade, Palm Beach, Lee
Jujube	12	Miami-Dade, Lee
Caimito	11	Miami-Dade, Lee
Guanabana	10	Miami-Dade
Spondias	4	Miami-Dade 4
Canistel	3	Miami-Dade
Wax jambu	2	Miami-Dade

Table 4. Issues and opportunities for selected tropical fruit crops in Florida.

Crop	Issues	Opportunities	Potential
Avocado	Laurel wilt, Phytophthora root rot	New cultivars (e.g., late, red/purple peel), low density plantings, healthy diet fit	Fair to good
Mango	Fungal diseases, low production of some cultivars	New cultivars, demand for specialty mangos, improved production technology	Good to very good
Longan	Need to expand market demand	New cultivars, local high quality, reliable bearing	Good
Lychee	Unreliable bearing, off-shore competition, cold protection	Alternative cultivars, high quality, demand expanding, move production northward for improved flowering	Fair to good
Mamey sapote	Unfamiliar to most Americans, marketing	Use of on-line media to improve demand, food service	Fair to good
Pitaya (dragon fruit)	Fungal and insect pest pressure, red and yellow-types more difficult to produce, limited familiarity	Use of on-line media to improve demand, food service	Fair to good
Guava	Insect and fungal pest pressures, limited familiarity of white-crunchy types	Improved fruit fly control technology, sales of higher quality pink-pulp types	Good
Papaya	Papaya ringspot virus, cool-cold weather	Multiple markets – green and fresh, virus tolerant/resistance cultivars	Good
Banana	Cool-cold weather, Panama disease, Black Sigatoka diseases	Multiple markets – green, fresh, male-bud, leaves, psuedostem; landscape uses and; numerous cultivars	Fair to good
Sapodilla	Moth pest control, unfamiliarity with the fruit	Many good cultivars	Fair to good
Carambola	Cool-cold weather, over production, improved postharvest handling	Potential for protected agriculture production and expanded use in food service	Good
Pummelo	Citrus greening, some quality issues	Demand is good	Fair
Passion fruit	Insect and disease control (especially root/stem diseases)	Demand is good, release of superior material from breeding programs, use of rootstocks	Good
Kumquat	Limited familiarity, better fruit quality	Use of superior sweeter cultivars	Fair
Annona—sugar apple and guanabana	Cool-cold weather, insect and disease pests	Demand is good, production technology improving	Good

competition from offshore, Florida land prices and the cost of production (i.e., materials and labor) have increased. Invasive pests have also caused a reduction in acreage. For example, the detection of citrus canker eliminated the Florida lime industry (~3,500 acres at that time) during 2000-2002. More recently, an estimated 12% (~800 acres) of commercial avocado have been lost to the ambrosia beetle vectored laurel wilt pathogen in Miami-Dade County.

Despite the natural and biological disasters and competition, there is still good potential for maintaining and in many cases expanding Florida's tropical fruit acreage (Table 4). This may be attributed to:

- the increased awareness of the importance of fruits in a healthful diet,
- social trends where consumers want the freshest produce possible,
- introduction and promotion of new fruits and/or varieties of known fruits,
- the "slow food" and "buy local" food movements,
- improvements in growing technologies (e.g., protected culture, environmental sensors, and water and nutrient management),
- reduced timelines for release of new cultivars,
- U.S. population diversification and food pallet sophistication and
- improved marketing technology (i.e., social media, on-line sales – mail order).

The tropical fruit industry of Florida has always been in flux. However, despite the environmental, biological and competition challenges it has continued to re-invent itself and be an exciting part of Florida's agricultural scene.

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