Jump on the Fast Track
New fresh citrus varieties from the University of Florida

By Fred Gmitter, Jude Grosser and Bill Castle

There was a time not so long ago when the Florida fresh citrus fruit industry was based on a handful of familiar old varieties, and the prices growers received for their fruit usually were such that there was little interest in even thinking about something new and different. Grapefruit was king of the fresh industry, and Florida tangerines, though a smaller segment than grapefruit, represented the greatest production base of this delicious fresh fruit category in the United States.

In Florida during the 1997–98 season, there were about 128,000 acres of grapefruit grown, yielding nearly 50 million boxes, 27,500 acres of tangerines yielding nearly 5.2 million boxes, and more than 12,000 acres of tangelos yielding nearly 2.9 million boxes. By the 2011–12 season, we saw grapefruit acreage drop to about 45,500 and production to under 19 million boxes, tangerine acreage drop to just over 12,000 acres with a little more than 4 million boxes of fruit produced, and there were only 4,000 acres of tangelos yielding just over 1 million boxes of fruit. Recent U.S. Department of Agriculture crop estimates peg the current season’s output even lower.

What happened in these last 15 years? Certainly, some obvious factors fueled the declines we have witnessed — real estate speculation, hurricanes, citrus canker, and most recently HLB. But probably the greatest impact has come from the substantial changes in consumer expectations and demands for fresh citrus products. A tasty, yet not-so-easy-to-peel and full-of-seeds Murcott is no longer what the consumer really wants to buy, especially after they have experienced the seedless, “cute” and easy-to-peel Clementine and the several other new varieties all marketed with the same attributes. And, the typical consumers of grapefruit have aged and been instructed by doctors to lay off the grapefruit because of concerns related to the various medications they consume, because of the so-called grapefruit juice effect.

In the meantime, tangerine acreage and production, first in the Mediterranean region and then in California, have skyrocketed. Former grapefruit fans lament their limitations as they remember fondly their favorite, now-forbidden, fruit. But, citrus breeders in Florida and elsewhere were busy also across those 15 years developing new potential varieties that might address the challenges the Florida fresh citrus industry faces.

FAST-TRACK RELEASE

Now, the time has come for the Florida fresh industry to take a close look at the products produced by the breeding programs, and to that end the University of Florida, the Florida Foundation Seed Producers, and the fresh industry represented by the New Varieties Development and Management Corporation (NVDMC) have devised the Fast-Track release option.
This is a system designed to offer incentive to growers to participate now in the final commercial evaluations of several new UF varieties, and to have firsthand experience growing the trees and producing small crops of fruit, to support decisions about planting these varieties on a commercial scale. Fruit samples have been seen and evaluated by participants at the fruit display days we have held over the past several seasons, and the feedback we have had from industry has helped to guide our release decisions.

What follows is brief descriptive information on the nine selections that are currently available; take a look, consider the possibilities, and make the move to the Fast Track!

Several of the releases available are mandarin hybrids, some with seeds and others nearly or completely seedless. The earliest maturing mandarin available is UF 900. This variety produces fruit that develop orange color in mid-late September and are deeply colored by early November. In comparisons with Fallglo, the current industry standard for early harvest, UF 900 fruit are much easier to peel and more convenient to eat; most notably, the fruit can reach a sugar/acid ratio of 15 by late September or early October, while Fallglo in the same season and time were barely over seven. The flavor of UF 900 fruit is outstanding for such early maturity. The tree is typical in vigor, and notably it bears good crops annually. Tests have shown that the variety is resistant to Alternaria, and no post-harvest problems have been noted across several seasons’ testing. Though not seedless, generally the seed number is lower than the typical Fallglo fruit.

Next in line is N40W-6-3, a mandarin variety that produces small-to-medium, seedless fruit with a unique and robust sweet flavor. These fruit begin to mature in October, but reach their maximum flavor and quality in late November. N40W-6-3 makes a small, compact tree when grown on Swingle rootstock. Although it can be peeled, it should not be considered a zipper-skinned selection. A portion of the first-year crop can exhibit a rougher rind and lower juice content, but this problem seems to diminish with subsequent crops.

Another very promising seedless mandarin selection is C4-15-19, which produces a Clementine-sized, peelable, and well-colored fruit with a very sweet and pleasant flavor, maturing sometime between October and November, depending on the season. Fruit may need to be clipped to avoid plugging, especially with later harvest dates. The rind has conspicuous oil glands that release pleasantly fragrant oil during peeling. The tree has shown potential to yield quite well. This is the first seedless variety we have released that came from a somatic hybrid pollen parent, and the seed parent is our previously released mandarin hybrid, Sugar Belle®.

UF 950 (see page 14) has been called by some the “Florida Clementine” because of its resemblance to that variety. It has better flavor and better internal and external color than the

Can you put a price on a life? Cancer DOES

One of Florida’s very own organic citrus grower and nurseryman for over 30 years needs your help! Charles Farmer, of Farmer’s Citrus Nursery & Budding, was recently diagnosed with stage 4 cancer. Without treatment, this aggressive form of cancer could leave him with only a few months to live. The Burzynski Clinic can offer him a safe and effective treatment that could possibly cure him. We are trying to raise money to afford this costly treatment that isn’t covered by insurance. Please help us save Charles. Every dollar makes a huge difference! For more info, please check out our Facebook Page: facebook.com/farmercfruits or call us at (954) 303-0170. To make a donation through PayPal, visit our website: farmercfruits.wordpress.com

God Bless! — The Farmer Family
Clementine fruit found in the marketplace. It is easily peeled and eaten, with good segment structure and a crisp texture. Generally, the fruit are seedless with no more than two seeds ever found in a single fruit (even with substantial cross-pollination), and can be harvested from early-mid December through mid-January. Like UF 900, it has been shown to be resistant to Alternaria. It flowers annually, but fruit set can be light; however, limb girdling or gibberellic acid spray treatments during bloom have been shown to result in substantial crops of fruit annually.

The final mandarin selection is UF 411, a variety that produces large and attractive fruit that, although quite firm, are easy to peel cleanly. The fruit are not seedless, but because of their exceptional eating quality, we have decided to release the variety nonetheless. Fruit are very aromatic and flavorful, and produce high soluble solids balanced with substantial acidity for a robust eating experience. Their consistently large size and visual appeal, along with their flavor, suggest a potentially important place in the gift fruit market. UF 411 was selected as the most desirable mandarin of more than seven tested in consumer taste tests several years ago, including several seedless commercial varieties. The fruit mature in most seasons during January, and are of excellent quality when harvested at maturity. The tree is vigorous and dense, which protects most of the crop from sunburn. And like UF 900 and UF 950, this selection is resistant to Alternaria.

**FOR THE PUMMELo NICHE MARKET**

For growers interested in exploiting the pummelo niche market, there are three exciting new selections that have substantial visual appeal, as well as very good flavor. The 5-1-99-5 produces a medium-large sized and

UF 950 variety has been called the “Florida Clementine.”

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The 5-1-99-5 produces a medium-large sized and juicy fruit. The flesh color is very attractive dark-red, and the segments are more uniform in size and shape than other pummelo varieties. The flavor is very good, with just a hint of grapefruit-like bitterness. External appearance is likewise attractive, with pink blushes appearing sometimes when fruit are clustered together.

A very similar appearing selection is C2-5-12, a red-fleshed selection with a pleasant, non-bitter and sweet flavor, maturing in time for Thanksgiving in most seasons. Its furanocoumarin content (the chemicals associated with the grapefruit juice effect) is slightly lower than red grapefruit, and much lower than the 5-1-99-5 described above. The fruit and segment sizes of C2-5-12 are more variable than the 5-1-99-5. Finally, there is 5-1-99-2, which produces a fruit with unique, non-bitter and sweet flavor due to high Brix and ratio (13, and 16–19 in late December). They have lower seed content than most pummelos, sometimes exhibiting seedlessness when cross-pollination has been prevented. Fruit are also smaller than most pummelos, and as such, may be amenable to existing packinghouse equipment that handles grapefruit. Field performance and some lab tests have indicated lesser sensitivity to canker in this selection, as well.

Finally, we are releasing a pummelo-grapefruit hybrid called UF 914.
This variety produces nearly uniform, red-blushed and red-fleshed, seedless fruit that resemble a large red grapefruit in shape, color and overall appearance. The similarity follows in aroma and flavor, although they are somewhat sweeter and less acidic than ordinary grapefruit, with a ratio exceeding 10 while grapefruit harvested at the same time and location were around 7.5. The tree yields well annually and has produced good yields even when covered in bee-proof mesh at bloom time.

However, the most significant attribute is that UF 914 fruit have extremely low levels of furanocoumarins. Tests of juice from this variety have shown that it does not inhibit human liver enzyme activity in vitro, while grapefruit juice does so, thus leading to the grapefruit juice effect. This variety potentially could meet the demands for grapefruit and juice coming from those former fans who no longer can have their old-time favorite! Focus group studies have demonstrated that consumers who do not like grapefruit found this fruit to be very good, and those who already like grapefruit considered it to be a very good grapefruit.

UNANSWERED QUESTIONS

There are some unanswered questions relating to these new varieties, such as the need for, or the need to be isolated from, cross pollination, their compatibility and performance on various rootstocks, and field tolerance to diseases. In general, most have had at least some preliminary post-harvest assessments and have been found acceptable compared to standard varieties. We, the researchers, could take another five to 10 years to investigate the unknowns, but in the end the most important evaluations ultimately will come from the industry partners who step forward now. So we are ready to move ahead quickly, and with the best information we can have, on to the Fast Track!

Footnote: The authors gratefully acknowledge support from the NVDMC, Florida Citrus Production Research Advisory Council, Florida Department of Citrus and the Citrus Research and Development Foundation for various aspects of the research leading to this point, and the collaborations with Mark Ritenour (UF-IRREC) for post-harvest assessments, Megan Dewdney and James Graham (UF-CREC) for disease testing; and Anne Plotto and Liz Baldwin (USDA-ARS), Filomena Valim (FDOC), and Lisa House and Zhifeng Gao (UF-FRED) for consumer testing and
University of Florida-IFAS Citrus Mechanical Harvesting and Abscission faculty member Michelle Danyluk received the 2013 Excellence Award for Assistant Professors from the University of Florida in recognition of her outstanding research. Danyluk, food science and human nutrition faculty member at the Citrus Research and Education Center in Lake Alfred, was awarded for her work this past year on Salmonella and E. coli detection and dispersal.

Danyluk’s research interests include microbial food safety and quality, as well as developing standards for maintaining them in different storage and processing conditions. One of her research focuses is on citrus, and how and why foodborne pathogens survive in production environments and the role environments play in food contamination.

See http://citrusmh.ifas.ufl.edu for more on Danyluk’s work with citrus mechanical harvesting.