

New planting options for citrus growers

By Fred Gmitter, Ed Stover, Randy Driggers, Greg McCollum and Jude Grosser

The U.S. Department of Agriculture (USDA) Agricultural Research Service citrus breeding program has a long history of releasing successful scion and rootstock cultivars. There had been a 15-year lapse in creating new hybrids, and the recently released cultivars largely reflect breeding efforts that preceded the onslaught of HLB and overwhelming consumer demand

for seedless fresh fruit. The USDA program has released eight citrus scion cultivars in the last six years. More are in the pipeline, including the first scion (Gnarlyglo) for use as a fresh fruit containing *Poncirus* in the pedigree.

The University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) Citrus Research and Education Center (CREC) is the new kid on the block. It has recently

released 18 new scion cultivars, including eight processing sweet oranges and four seedless mandarins.

Both the USDA and UF/IFAS programs have extensive germplasm collections currently undergoing a natural screen for HLB and canker. As the understanding of HLB-tolerance advances, we are making better crosses each year, utilizing high fruit quality and disease-resistant parents. We are excited

Figure 1. Left: Marathon fruit harvested in early November 2015 show seedlessness. Right: Fruiting habit of Marathon mandarin in early November

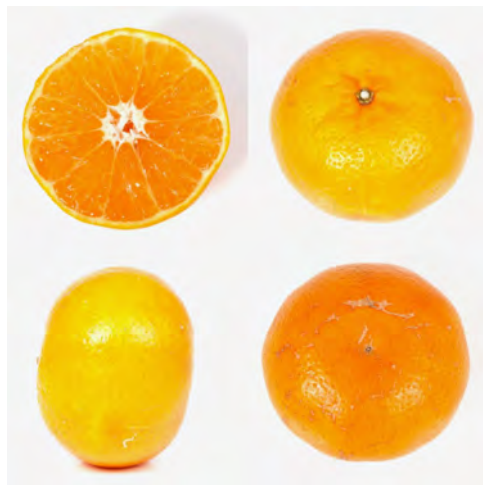


Photo courtesy of Tyler Jones, UF/IFAS Communications



Photo courtesy of FG. Gmitter Jr.



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Figure 2. Left: Fruit of 13-51 at peak maturity, with easily removed peel. Right: This 10-year-old top-worked tree has been affected by HLB for several years. (Photo from late April 2018)

to introduce the following new selections for commercialization.

UF/IFAS SELECTIONS

Marathon mandarin: This variety (formerly known as 1420) is a new seedless, easy-peeler that will be available to Florida's fresh citrus growers next year. Marathon fruit (Figure 1, page 14) are easy to peel and are completely seedless under any pollination conditions. Fruit develop good external orange color as the season progresses, are well-flavored and pleasant, and very convenient to eat because of good segment structure. Fruit are larger and firmer than Bingo, and Marathon can be harvested in most cases without the need for expensive clipping.

Post-harvest tests were conducted by Mark Ritenour and Cuifeng Hu of the Indian River Research and Education Center in Fort Pierce. Marathon responded well to ethylene following early-season harvest. The fruit developed acceptable external coloration, yet retained good quality without decay throughout extended periods of cold storage.

The name Marathon was chosen to highlight the variety's unique attribute: an exceptional ability to hold long in good condition on the tree. In the 2015 season, fruit were mature internally by mid-August, although externally they were still green with just the beginning signs of color break. As the season progressed, the Brix went from 12.5 in mid-August up to 17.4 by mid-December. Very significantly, the acidity declined only slightly, and the fruit retained its firm texture while external color became deeper orange. The ability to store fruit for a longer time on the tree can give growers and packers greater flexibility in harvesting to optimize returns and expand the marketing window.

Marathon has been released under the UF/IFAS FAST TRACK citrus release program. An invitation to negotiate will be launched later this year by Florida Foundation Seed Producers (FFSP). Certified trees will be provided to licensed Florida citrus nurseries in early 2019 for budwood increase, and it is expected that Florida growers will be able to place tree orders in mid-late 2019.

13-51 mandarin: This selection



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Figure 3. Left: Fruit of US HoneyCoat (upper and right) grapefruit vs Ruby (left). Right: Fruit of US Seedless Surprise grapefruit-like hybrid

also is planned for release next year. Although not seedless, 13-51 possesses some other beneficial attributes. It produces very beautiful fruit that develop an attractive, deep-orange color. Fruit are very easy to peel and have been very highly ranked for flavor, aroma and overall eating quality (Figure 2, page 14). Because of its appealing appearance and exceptional flavor profile, 13-51 has very good potential in the gift-fruit market. Additionally, fruit are

at peak maturity from mid-November into early January, the ideal time for holiday gift purchase.

13-51 trees display slight decline when affected by huanglongbing (HLB), but then show a remarkable ability to recover from the disease. They remain productive with good fruit quality and canopy development. Because of this substantial tolerance of HLB, 13-51 should be considered by Florida's dooryard citrus enthusiasts

for planting. With good, basic horticultural care, trees have potential to survive HLB and perform adequately for many years of dooryard production. Furthermore, the fruit can usually be held on the tree in good condition with increasing quality through April, adding to its dooryard appeal. For commercial shipping, however, fruit should be removed no later than early January.

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fruit UF/IFAS releases, 13-51 is not expected to be licensed exclusively through the FAST TRACK model. FFSP intends to license this variety non-exclusively to Florida citrus nurseries for sale to Florida growers and dooryard enthusiasts.

Trees of US HoneyCoat are vigorous with similar crop load and growth habit as other conventional grapefruit.

USDA SELECTIONS

All of the following varieties are open releases with no patent protection. Clean budwood is available for distribution from the Florida Division of Plant Industry, and in many cases, is available in California for distribution by the Citrus Clonal Protection Program.

US HoneyCoat grapefruit: This variety is a low-seeded, irradiated variant of Foster grapefruit. The rind tends to be thicker than standard grapefruit. Trees of US HoneyCoat are vigorous with similar crop load and growth habit as other conventional grapefruit. US HoneyCoat likely also has similar susceptibility to HLB. The fruit are pink internally, completely or nearly seedless, and are lower in acidity and bitterness than fruit from other grapefruit cultivars, permitting earlier harvest (Figure 3, page 16). During most seasons, the smooth skin has a marked pink blush.

US HoneyCoat has a mild dose of the "tonic" quality appreciated by grapefruit consumers, but is palatable much earlier in the season and seems to hold well on the tree. But as acidity drops in the winter, fruit may become insipid.

At the USDA research farm in Leesburg, US HoneyCoat is commercially mature in mid-October to early-January. This variety should be attractive to specialty fruit growers for niche markets and dooryard producers.

US Seedless Surprise grapefruit-like hybrid: Fruit are very grapefruit-like in appearance and have few seeds.



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US Seedless Surprise has a smooth, yellow peel of medium thickness and firm, cream-yellow flesh. Segment size is more irregular than standard grapefruit (Figure 3, page 16). The flavor is somewhat grapefruit-like, but mild with low acid and no bitterness. The fruit ripens in late September–October in Florida and in October to mid-November in California.

Florida Department of Agriculture and Consumer Services trials in 2003–04 assessed consumer preference between US Seedless Surprise and grapefruit in Florida, Michigan and Virginia. In this study, 76 percent of respondents preferred US Seedless Surprise, and 65 percent indicated that they preferred US Seedless Surprise over their favorite citrus of any type.

Eight- to 10-year-old trees had yields ranging from 116 to 270 kilograms/tree, averaging fewer than five seeds per fruit. Fruit of US Seedless Surprise reach initial market maturity in late September when the rind is still green. This cultivar should be used by specialty fruit growers for niche



Figure 4. Left: Fruit of US Ortanique-LS (low seeded). Right: Fruit of US Furr-ST (scab-tolerant) mandarin

markets and dooryard producers.

US Ortanique-LS mandarin hybrid: This is an irradiated, low-seeded variant of Ortanique. Fruit ripens in January through March in Florida. Fruit are very mandarin-like in appearance, identical to standard Ortanique. Fruit of US Ortanique-LS (Figure 4) have an average of five seeds in mixed plantings, a pebbled orange peel of medium thickness and dark-orange flesh. The flavor is very rich,

but the peel is somewhat adherent with pieces removed in chunks.

There are anecdotal reports that US Ortanique-LS is somewhat tolerant of HLB and responds favorably to enhanced nutritional therapy. At the few locations where it has been grown, trees and fruit are quite similar to standard Ortanique with somewhat smaller fruit and a reduced seed count. US Ortanique-LS is of excellent flavor and is among the latest maturing

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of mandarin types, which make it a potentially desirable addition to the cultivar mix for local markets, gift-fruit shippers, home orchardists and other niche uses.

US Furr-ST mandarin hybrid:

This is an irradiated variant of US Furr (available only in California now), reported to have reduced scab susceptibility. A high-quality, December/January-maturing mandarin, US Furr-ST (Figure 4, page 18) has excellent color, superior flavor and good peelability. Fruit in mixed plantings average 12 to 24 seeds per fruit, with fewer seeds in solid set plantings. Trees are self-compatible. US Furr-ST fruit average 150 to 215 grams per fruit at maturity. Flesh color is orange-red, and fruit are juicy with extremely rich mandarin flavor. Fruit typically reach commercial maturity by mid-December and maintain good quality on the tree through about late-January. Yields appear to be similar to Murcott. This variety should be attractive to specialty fruit growers for niche markets and dooryard producers.

THE FUTURE

Both the USDA and UF/IFAS programs expect to release a number of high-quality seedless or low-seeded mandarins over the next few years. These will be rich in flavor and easy-peeling with little release of juice when segments are separated, and many will be more tolerant of HLB. Improved high-quality seedless or low-seeded oranges and orange-like hybrids, and grapefruit/pummelo types, some with exceptional HLB and canker tolerance, are also coming soon, thereby expanding replant opportunities. Stay tuned! 🍊

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