



Orange opportunities

New sweet orange cultivars for processing can be harvested throughout the Florida citrus season.

By Jude Grosser, Fred Gmitter and Bill Castle

Florida orange juice has always been the gold standard among the growing portfolio of fruit juices and blends available to consumers. However, the now endemic citrus greening disease or huanglongbing (HLB) threatens this status by causing reduced fruit production, lower juice quality and higher prices.

The University of Florida's Citrus Improvement Team at the Citrus Research and Education Center (CREC) in Lake Alfred has been working for decades to develop new processing sweet orange cultivars. These cultivars have potential to improve the Florida citrus industry's portfolio of oranges used to make the best not from concentrate (NFC) juice possible. This research has resulted in the commercial release of several new promising cultivars, with early-, mid- and late-season maturity dates.

As Florida replants new trees to replace the many trees compromised by HLB, growers are faced with tough choices on which cultivars to

use. There has been some confusion regarding the expected harvest dates of these promising new cultivars. This article briefly describes the new cultivar choices and their projected optimal harvesting windows (Table 1, page 15).

EARLY-SEASON CHOICES

The earliest maturing new selections available are the **EV-1** and **EV-2** early Valencias. Both are somaclones recovered from tissue cultures (in vitro) of standard Valencia, and they produce juice with Valencia-like quality and flavor in November. Juice from these selections generally achieves a color score around 36 in late November, which is required for grade A juice. Hamlin juice rarely exceeds a color score of 34. EV-1 and EV-2 mature ahead of Hamlin, and can be harvested in November, as they usually achieve a ratio of 15 by Thanksgiving. EV-1 and EV-2 should be harvested before the end of December.

A new selection of Hamlin, **N13-32**

(also a somaclone), has been made available. It was selected because if harvested late in the Hamlin season (January), it produces juice with a color score approaching 36.

Thus far, the EV and available Hamlin clones are still experiencing heavy fruit drop due to HLB in some locations. Ongoing research with rootstocks and nutrition is expected to alleviate this problem in the future.

MID-SEASON CHOICES

Vernia and **Valquarius**[®] (SF14W-62) are two relatively new mid-season cultivars widely planted, due to their reasonably good HLB tolerance under enhanced nutrition, and the fact that both produce Valencia-quality juice. Both can usually be harvested from mid-January through February. Vernia arose from a project to evaluate promising sweet oranges collected from around the world by seed.

Valquarius is a somaclone derived directly from Valencia. The first Valquarius trees were thorny, but this problem has been alleviated by the introduction of a later-generation Valquarius LT budline. Both are exceptional juice oranges, but Valquarius has an advantage for the fresh market due to its rounder shape and better external color.

Another newly available mid-season selection is **Midsweet 11-1-24**. This selection was derived from irradiated budwood of standard Midsweet. It was

Table 1. Optimal harvest periods for new processing sweet orange cultivars

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
EV-1									
EV-2									
Hamlin N13-32									
Vernia									
Valquarius									
Midsweet 11-1-24									
Salustiana									
Berna									
OLL-20									
OLL-4									
OLL-8									
Valencia B9-65									

selected for higher yield, higher soluble solids and low seed content. However, its HLB tolerance appears to be similar to that of Hamlin.

Coming soon from the Citrus Improvement Team are three additional mid-season oranges. The first selection is the more robust clone C2-2-1 of

Vernia, another somaclone. The original C2-2-1 tree on Swingle rootstock continues to show excellent health, vigor and productivity despite having HLB for nearly 10 years. Commercial release of this clone is expected in 2020.

Two additional sweet orange selections, **Salustiana** and **Berna**, were

introduced from Spain for evaluation in Florida. **Salustiana** is an old variety tested initially in a 1990s trial with **Orie Lee** in Saint Cloud. In the early 2000s, seed of **Salustiana** was introduced again along with **Berna**. Young seedlings were used as budwood mother plants to propagate nursery trees on

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Figure 1. Note the external peel quality of OLL-4 sweet orange for the fresh market.



Figure 2. Three-year-old tree of OLL-8 on UFR-17 rootstock (photo taken in October 2019)

C-22 or Willits citrange rootstocks for a small trial at the CREC.

From data collected and observations made over the past several years, Salustiana matures in the early mid-season. Trees have yielded moderately and produce seedless fruit with exceptional juice flavor. Berna fruit mature in the mid- to late midseason. The trees have cropped well with low limonin juice. All trial trees have tested positive for *Candidatus Liberibacter asiaticus* but continue to show good HLB tolerance. Commercial release

of these two selections is expected as soon as pathogen-free budwood becomes available in 2020.

LATE-SEASON CHOICES

Our best available Valencia clone, **B9-65**, was commercially released based on its outstanding performance after six years of yield and fruit quality data from a collaborative trial of 30 late-maturing sweet orange clones, including standard Valencia and Rhode Red Valencia clones at Conserv II. B9-65, a somaclone, was the highest yielding

clone in the trial and was among the top five selections for pounds solid all six years that data were collected. Valencia B9-65 also bears precociously and produces good-sized fruit. B9-65 matures in the standard Valencia window and has recently shown excellent performance in several other trials, causing it to gain popularity in the industry.

Another exciting new option for the late season is the newly available OLL (Orie Lee Late) series, a set of somaclones developed from an unstable tree discovered by Orie Lee as a remnant from an old block of experimental trees on his property. OLL somaclones produce very high-quality fruit, with external and internal color usually exceeding that of Rhode Red Valencia (Figure 1). OLL fruit also has exceptional fresh fruit potential, due to its beautiful color and improved peelability compared with Valencia.

OLL-8 and **OLL-4** were the first OLL cultivars released commercially, both selected for high yields and soluble solids. Young trees of OLL-8 are a bit more vigorous and thornier than OLL-4 trees, and thus end up making larger trees (Figure 2). OLL-8 and OLL-4 trees show good HLB tolerance under enhanced nutrition, as 5-year-old trees without psyllid control have produced over two boxes of fruit per tree with more than 7 pounds solid.

OLL-4 and OLL-8 generally mature



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in the standard Valencia window. However, in some years, harvest can begin in early February. Fruit holds well on the tree through May. The robust performance of OLL trees combined with the excellent juice quality are driving the increasing popularity of these clones, as there are now more than 1 million OLL trees planted in Florida.

In October, the University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) Cultivar Release Committee approved the commercial release of OLL-20. This release, driven by industry, is based on the exquisite flavor of OLL-20 juice. Juice of OLL-20 has been favored over that of OLL-4, OLL-8 and Valencia in multiple taste tests, and has potential to contribute to improved flavor in future Florida NFC products. Budwood of OLL-20 is now being increased for an anticipated official release in 2020.

CONCLUDING REMARKS

The Florida citrus industry needs to replant millions of new trees to get back to pre-HLB production levels. However, decreasing orange juice consumption must also be addressed. One of the best ways to increase consumption is to offer a better product.

Planting decisions should be based on scion/rootstock combinations that can guarantee growers profitable and sustainable production, but that also contribute to a competitive juice product. The Citrus Improvement Team has developed several new sweet orange options that should be part of this equation.

When combined with good rootstock choices and emerging nutrition programs, growers now have mid- and late-season scion options that can be planted with reasonably low risk. These options include Valquarius, Vernia, Valencia B9-65, OLL-4 and OLL-8. Ongoing rootstock genetics and nutrition research should also expand this list of options to include early-season cultivars in the not-too-distant future. Time for another glass of delicious Florida orange juice! 🍊

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