



**Figure 1.** Typical 6-year-old commercial tree of OLL-8 sweet orange on US-802 rootstock near Arcadia, Florida.

# OLL sweet oranges: Alternatives to Valencia

By Jude Grosser

**V**alencia sweet orange has always been the gold standard of processing oranges for the best orange juice in the world. However, there is a new kid on the block that is challenging this.

University of Florida (UF) citrus breeders have been working with the late, great Citrus Hall of Fame grower/researcher Orié Lee and his family for nearly 20 years to develop the OLL (Orié Lee Late) series of sweet oranges that mature during the Valencia harvest period. The first two OLL sweet oranges released for commercial production were OLL-8 and OLL-4. Both are somaclones regenerated from embryogenic callus produced from the original unstable OLL tree discovered by Orié Lee.

## OLL CHARACTERISTICS

Both of these selections were producing five to six boxes of fruit per tree on Swingle rootstock in St. Cloud, Florida, before HLB arrived. In addition to the high yields, these clones also produce juice with high soluble solids and exceptional juice color similar to or better than Rhode Red Valencia. OLL-8 has produced juice with 1.0 pound solids per box higher than standard Valencia on rough lemon rootstock for four consecutive seasons. A comparison of OLL-8 and Valencia juice on rough lemon and Carrizo rootstocks is provided in Table 1 (page 12).

A grove of OLL-8 producing 400 boxes per acre with juice prices at \$2.50 per pound solids would make \$1,000 more per acre than Valencia with the

same production. OLL-8 is more vigorous than OLL-4, and both are more vigorous than Valencia.

OLL-8 can also have more thorns on primary scaffold branches, making it more susceptible to citrus canker. There is accumulating anecdotal evidence that both OLL-8 and OLL-4 might be slightly more tolerant of HLB, especially when grown under a good nutrition program (Figure 1).

During the past three seasons, both OLL-4 and OLL-8 have produced between 1.5 and 2.5 boxes per tree on rootstocks UFR-1, UFR-2, UFR-4 and UFR-5 in a trial block planted in the summer of 2013 and grown with no psyllid control. Yields per tree were less on smaller UFR-6 trees, but pound solids per box were excellent,



**Table 1.** Pilot plant juice data from mid-February 2021 showing the higher soluble solids and juice color of OLL-8 juice on rough lemon (RL) and Carrizo (CZO) rootstocks, as compared to standard Valencia (VAL). Fruit was harvested from Orié Lee Family Groves in St. Cloud, Florida.

| Sample ID | Sample Weight | Juice Weight | Pounds Juice Per Box | Percent Acid | Total Brix | Ratio | Pound Solids Per Box | Juice Color |
|-----------|---------------|--------------|----------------------|--------------|------------|-------|----------------------|-------------|
| OLL-8/RL  | 20.88         | 12.54        | 54.052               | 1.03         | 12.99      | 12.61 | 7.02                 | 38.4        |
| VAL / RL  | 22.06         | 12.99        | 52.996               | 0.82         | 11.41      | 13.91 | 6.05                 | 36.9        |
| OLL-8/CZO | 18.27         | 10.77        | 53.054               | 1.09         | 14.18      | 13.01 | 7.52                 | 36.9        |
| VAL/CZO   | 16.79         | 10.14        | 54.354               | 0.95         | 11.41      | 12.01 | 6.20                 | 35.9        |

ranging from 6.8 to 7.7.

OLL-8 can hold fruit late into the season. Last year, quality fruit was harvested from a tree of OLL-8 on UFR-2 rootstock in June that had 14+ Brix with no to minimal granulation. OLL fruit are attractive inside and out and have excellent crossover potential for the fresh market.

UF breeders are discovering new OLL clones that are maturing earlier and could be considered mid-season clones. With this development, the meaning of OLL is changing from “Orié Lee Late” to “Orié & Louise Lee” oranges. Orié’s widow, Louise, has been an important partner all along and made sure the Lee family still supports the OLL research effort full steam ahead. Unfortunately, Louise passed away just a few months ago. The University of Florida is happy to honor this incredible couple for their continuing contributions to the Florida citrus industry.

## NEW RELEASE

OLL-20 (Figure 2) is the third OLL sweet orange clone to be released for commercial production, largely because of its exceptional juice flavor. OLL-20 juice has been the favorite when included in Citrus Research and Education Center fruit/juice display days and has shown superior flavor in proprietary juice evaluations by a major processor.

Sensory (taste panel) analyses have repeatedly indicated that OLL-20 juice from HLB-positive trees has an exceptional flavor profile that exceeds standard Valencia, OLL-4 and OLL-8. Juice from OLL-20 has been described as having a unique floral bouquet.

OLL-20 has excellent potential to improve the not-from-concentrate (NFC) portfolios of citrus juice processors. Improved NFC orange juice flavor/quality is a way to help increase



**Figure 2.** OLL-20 sweet orange has been released for commercial production.

orange juice consumption/sales.

Although not every season, OLL-20 has often matured earlier than OLL-4 and OLL-8 and can be considered a late/mid-season orange. For the past two seasons, OLL-20 fruit matured three to four weeks earlier than OLL-4 and OLL-8 fruit.

In the current season, OLL-20 juice had a mean Brix/acid ratio (from the fruit of 18 rootstocks) of 16.2 in mid-February. The mean ratios for OLL-4 and OLL-8 were 14.0 and 13.6, respectively.

As with OLL-4 and OLL-8, nurseries can obtain a license for propagation and sale of OLL-20 trees from the Florida Foundation Seed Producers (see [ffsp.net/varieties/citrus](http://ffsp.net/varieties/citrus)).

## ONGOING RESEARCH

OLL germplasm is a good source of genetic variation for additional progress with true sweet oranges. More than 300 new OLL clones are currently under evaluation for earlier maturity, higher

soluble solids and better HLB tolerance. Two clones have already been identified that mature in early January. There are a few others that show no HLB symptoms after eight years in the field with no psyllid control.

UF breeders hope to make additional commercial releases of improved OLL clones in the future. The already released and future OLL sweet orange clones will contribute substantially to the sustainable production of higher-quality juice oranges in Florida, helping Florida NFC maintain its status as the best orange juice in the world. 🍊

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