



Industry members give their feedback on new varieties of fruit during Citrus Variety Display Days at the Citrus Research and Education Center.

# Top picks from Citrus Variety Display Days

By Yu Wang, Fred Gmitter, Jude Grosser, Joon Hyuk Suh and Peter Chaires

**T**he Citrus Variety Display Days at the University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) Citrus Research and Education Center (CREC) have been a unique platform to fulfill one of the core missions of the Florida citrus industry. These events help identify new selections with superior traits to improve Florida citrus growers' competitive position in the marketplace.

New Varieties Development & Management Corporation (NVDMC) and the UF/IFAS CREC plant improvement team have been collaborating to move the most promising material forward for both the processed and fresh fruit markets, as well as to gain feedback for future variety improvement.

*Successful development and marketing of new varieties ... should be driven by industry and consumer interests.*

In the HLB era, production in Florida of large quantities of high-quality citrus is needed to keep pace with projected market growth and for the citrus industry to remain viable. Successful development and marketing of new varieties for both fresh market and processing should be driven by industry and consumer interests. Therefore, in addition to developing disease resistance and high yield

for growers, Citrus Variety Display Days develop sensory quality and consumer preference information to guide which selections move forward toward commercialization.

In recognition of the consumers' role as a key driver for product success, sensory attribute analysis and consumer preference studies have been conducted. Ideally, multiple groups, including segments of the citrus industry, consumers and marketers/buyers, would be surveyed. However, because many potential new varieties have been developed and market/consumer studies are complex, information from the citrus industry is being gathered first to help direct future studies.

At the Citrus Variety Display Days, participants are invited to complete a survey on their perceived impression of fruit sweetness, sourness, bitterness and overall flavor based on an 11-point scale (0 = none, 10 = strong). The final question asks if each selection should be moved for rapid release/commercialization, revisited next year or destroyed.

During the 2019–20 season, five

display days were conducted. This article lists the top varieties from the current season's display days by category, along with their sensory attributes and consumer preferences. According to the Food & Health Survey conducted by the International Food Information Council Foundation, flavor has been the top-ranking driver of food/beverage purchasing decisions, followed by price, which indicates consumers are willing to pay more for better tasting products. Therefore, the top selections are highlighted based on their overall flavor rating, while recognizing that other attributes such as seedlessness, ease of peeling, color, postharvest behavior and other factors are also critical characteristics for success.

### HIGHEST RATED JUICES

Figure 1 (page 24) shows the sensory attributes (e.g., sourness, sweetness and overall flavor) of the top five juice samples. There was no significant difference among these samples, but compared with other juice samples, these were the highest ranked for overall flavor (~8 on a 11-point scale). The intensity of sweetness and sourness were around 7 to 8 and 4 to 5, respectively. Selections 18A-4-35 and 18A-6-14 are orange-like mandarin hybrids. Fifty percent of the responders recommended to release these two immediately, while the other half preferred revisiting them next year.

True sweet orange OLL-20 (Orie Lee Late #20), which was approved for release last year, was recommended for immediate commercialization by approximately 70 percent of responders. When comparing OLL-20 with Valencia, 57 percent of people reported the flavor balance of OLL-20 was just right, but only 22 percent thought the same of Valencia. In the comparison of juice color, 78 percent and 50 percent of responders believed OLL-20 and Valencia were just right, respectively. This limited data set shows the potential for both new sweet oranges and new orange-like hybrids to improve not-from-concentrate products.

### GRAPEFRUIT AND PUMMELO PICKS

The sensory attributes of the top five grapefruit and pummelos are shown in Figure 2 (page 24). Bitterness,



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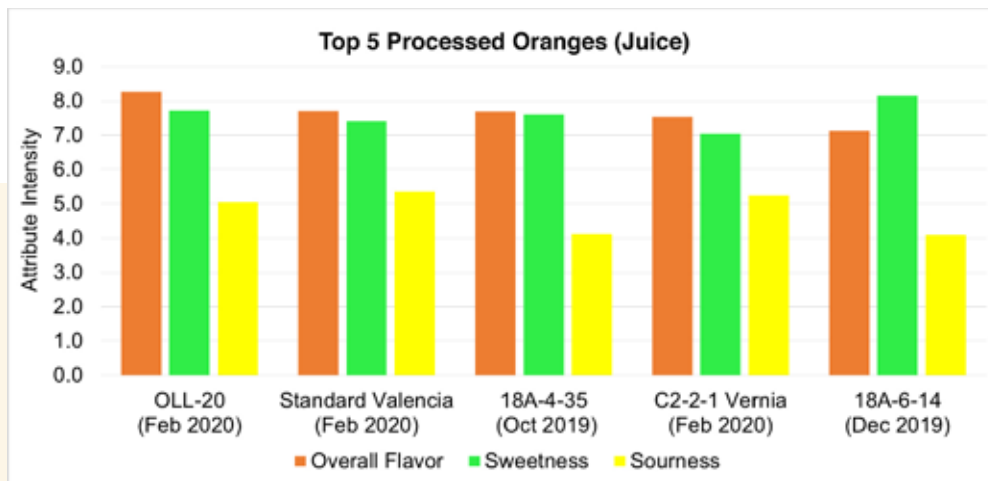
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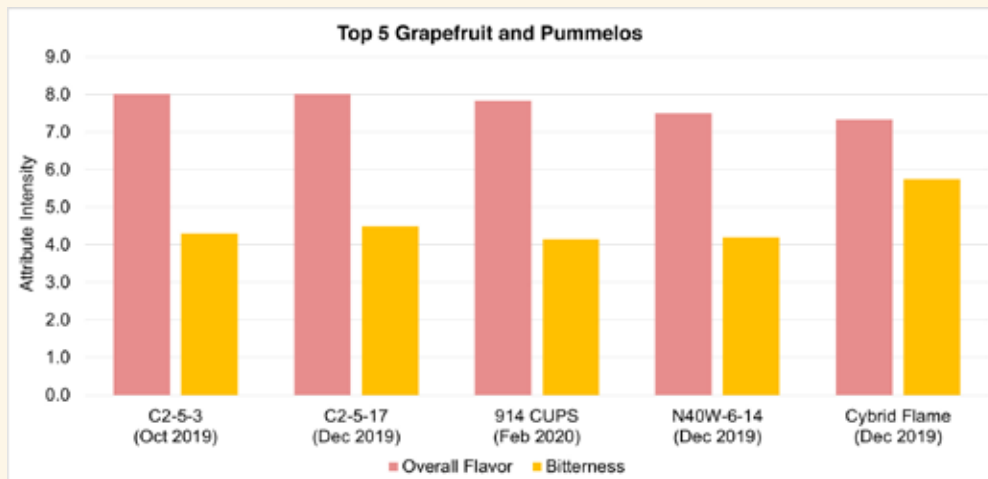
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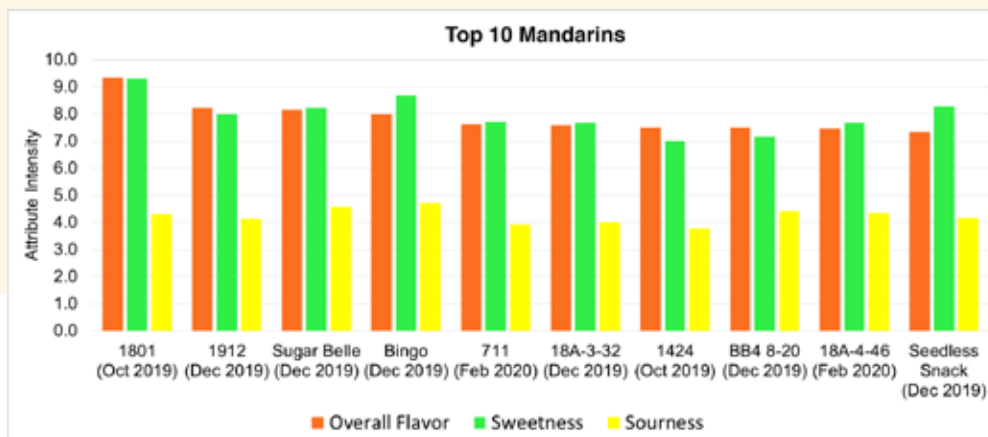
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**Figure 1.** There were no significant differences in sensory attributes for the top five processed orange or orange-like hybrid juice varieties.



**Figure 2.** There were no significant differences in sensory attributes for the top five fresh grapefruit and pummelo varieties.



**Figure 3.** There were no significant differences in sensory attributes for the top 10 fresh mandarin varieties.

a key attribute, could overwhelm other attributes of grapefruit flavor. Therefore, participants were asked to focus more on the bitterness and overall flavor rating. Like the results of orange juice, the overall flavor ratings of these top five varieties were around 8. Except for cybrid Flame, the bitterness ratings

were around 4, which was quite low.

A large majority of responders (90 percent) concluded that 914 should be commercialized immediately due to its exceptional flavor, flavor balance and flesh color, while 50 percent of responders indicated rapid release for the remaining varieties. Triploid hybrid

selections C2-5-3 and C2-5-17 showed similar traits such as seedlessness, large size and pinkish internal flesh color. N40W-6-14 (a cybrid grapefruit) was seedless as well, but with a dark red flesh color. C2-5-3 showed exceptional quality in October, very early in the season for a grapefruit-like hybrid.



## TOP 10 MANDARINS

The top 10 mandarin varieties have been selected based on their overall flavor rating (Figure 3, page 24). Bitterness was not a detectable attribute in all the top orange and mandarin varieties, so only sweetness, sourness and overall flavor were rated. The overall flavor rating of most varieties was in the 7 to 8 range, but selection 1801 showed an exceptional rating of over 9. 1801 is a seedless mandarin variety with a good flavor balance.

For the next step, there were different opinions due to the slightly small size of the fruit. Among these 10 varieties, Sugar Belle showed the highest rating (83 percent) for rapid commercialization, followed by 1424 at 70 percent. BB4 8-20 was the only variety with no support for rapid release.

## MOVING FORWARD

Overall, the UF/IFAS CREC plant improvement team has benefited from information collected during the Citrus Variety Display Days. With some improvements, these events can become even more informative and valuable to the team regarding decisions on rapid commercialization of the most promising selections.

As mentioned above, in addition to flavor as a major fresh market attribute, seedlessness, ease of peeling with minimal peel oil, etc. are also critical for consumer preference. For example, an extremely delicious fruit that has seeds and cannot be easily peeled will be very unlikely to succeed, despite having the highest flavor rankings.

There is a need to refine the process to improve the response rate and to develop a selection index that will most accurately predict success. Studying all attributes together is a great challenge, so researchers are developing approaches and studies to address the challenge. Greater levels of industry involvement will help to ensure the best information for business decisions is generated. Look for an improved format in the 2020–21 season! 🍊

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