



Navel oranges: Current status and future in Florida

By Pete Spyke and Bill Castle

Navel oranges are fairly tolerant of HLB, are popular and easy to sell, and offer a stable source of income that is only marginally related to worldwide supply and demand. Nevertheless, the Florida navel orange industry has experienced some tough times recently. Growers are questioning whether it is possible to grow navel oranges profitably in the future. It's definitely worth pursuing, because a high-quality Florida navel orange is among the best citrus grown anywhere in the world.

By high quality, most would agree that the ideal navel orange crop would be medium-sized fruit with Brix levels of around 12 or above, low tendency to granulate prematurely and good production per acre.

So, how do we grow profitable, high-quality navel oranges today? The solutions lie with choices learned from the past and what's to be found in the future.

The Florida navel orange industry is presently characterized by fairly young blocks of nucellar selections on Swingle citrumelo, which are combinations that inherently have medium to low quality. Furthermore, HLB adversely affects fruit quality and cropping.

GOOD VS. GREENING FRUIT

Fruit on HLB-affected trees generally can be divided into two groups: good fruit and greening fruit. On a navel orange tree affected by HLB, some fruit are typical of the variety and rootstock combination (the good fruit). Other fruit exhibit symptoms of HLB (the greening fruit), like premature fruit drop, a soft peel, distinctive color, lower Brix and the absence of the characteristic flavor of the good fruit.

In managing the situation, it is likely that the greening fruit can't be eliminated, only reduced in numbers, but that research will be a long-term effort. Therefore, the main point of this

article is to focus on what we can control right now, which is to improve the quality of the good fruit by applying past experience and research that was conducted prior to HLB.

SITE SELECTION

In the past, navel orange blocks could be found in Florida from Davie in Broward County up to Citra in Marion County. The old-time growers in southern Florida had a rule that navel oranges should be planted on soil that had some organic matter, including the shallower muck soils south of Lake Okeechobee. Navel orange is highly parthenocarpic, which is related to its flowers producing infertile pollen and ovaries. Thus, fruit set is sensitive to stress. The organic soils mitigated irrigation inefficiencies, and the trees had a steady supply of nitrogen.

The soil rule was described in a 1921 Florida State Horticultural Society article in which Frank Stirling reported success with navel oranges in

**Come meet us at
Citrus Expo**

Booth #205

**AGRICULTURAL
WATER SOLUTIONS**

**DRAIN TILE & IRRIGATION
CONTRACTORS**

863-494-5832

FLORIDA'S PREMIER DRAINAGE AND IRRIGATION CONTRACTORS

Founded by farmers for farmers, Agricultural Water Solutions is Florida's most experienced and diverse installation firm.

Addressing drainage, irrigation & farm operational functions holistically gives us a unique perspective on farm design & installation.

This unique perspective coupled with the most experienced staff in the state makes Agricultural Water Solutions a grower's most valuable partner in any farm development project.



Drain Tile/SubSurface Irrigation & Drainage

Advantages Of Tile Drainage Systems

- Reduces or eliminates saturated soils
- Improved crop health
- Increased yields
- Improved access into wet fields
- Low maintenance
- Increased property value

Advantages Of Sub-Surface Irrigation Systems

- Dual functionality providing both irrigation and drainage capability
- Applicable for many different crop types and production models





A good navel (left), true late bloom navel (center) and symptomatic greening navel (right) early in the season.

Davie, an area of shallow muck soil. The navel orange blocks in the Allapattah Flats west of Fort Pierce, which had high organic soils, and the Myacca planting on the muck along Lake Okeechobee were among those known for exceptional fruit quality. The Wild Turkey grove in Vero Beach had a block of navel oranges on Cleopatra rootstock on soils with higher organic matter. The fruit would hold on the tree with good juice Brix and acid and no granulation until March.

Other sites with good soils can be suitable as well. The Crissafulli navel blocks on Merritt Island, on Cleo and planted on high hammock land, were legendary for quality and production.

Navel oranges became popular in the northern citrus counties because the trees are cold hardy, and the fruit could be harvested before freezes. The blocks up there on well-drained hammock soils produced good yields and fruit quality.

ROOTSTOCK SELECTION

Rootstock may be the biggest factor in growing high-quality navel oranges. The very best soil cannot overcome the effects of a rootstock that imparts inherently low quality. Most of the trees in older groves were on sour orange rootstock, which imparts high

quality. Those older trees have largely succumbed to HLB, and most of the remaining blocks are on Swingle citrumelo. Navel oranges on Swingle grow a good-looking tree, but typically, the fruit have lower Brix and acid and tend to granulate prematurely.

In Bill Castle's Indiantown Valencia rootstock trial back in the 1970s and 1980s, Carrizo citrange produced Valencia oranges that had similar Brix and acid as sour orange. Pete Spyke planted blocks of navel oranges on Carrizo in the mid-80s and early 90s on soils with high organic matter, and the fruit quality was excellent. One block, now 35 years old, has tolerated HLB while continuing to produce good fruit quality.

There is little pre-HLB data on effects on navel fruit quality of older commercial rootstocks or now the newer US and UFR selections. Today, rootstocks for navel orange are being investigated in a comprehensive trial planted in 2019 in the Millennium Block at the Indian River Research and Education Center. In the trial, navel oranges are being grown on about 30 rootstocks. This trial is of critical importance because it is essentially a stand-alone effort. When yield is measured, crops will be separated into good and greening fruit,

thus, generating data on their respective quality attributes.

PRODUCTION PRACTICES

Experienced growers warn against fertilizing navel orange trees after June because of the possibility that photosynthetic carbohydrates are diverted from building sugar in the fruit rather than growing new shoots. Currently, frequent fertigation and controlled-release dry fertilizers are used throughout the year to improve HLB-infected trees, which may be detrimental to internal quality fruit.

VARIETY CHOICE

The many selections of navel orange originated from the parent imported from Brazil to the U.S. Department of Agriculture facilities outside of Washington, D.C. in 1870. Mutations are common among navel orange trees, which has led to many clones that differ primarily in their period of fruit maturity.

Most navel orange trees currently planted in Florida are the nucellar clones 56-11 or 56-12. They are seedling selections of Glen navel and are popular because they outperformed the old-line clones such as Dream and Summerfield in rootstock trials. Others such as Thompson, Fisher, Lane Late

and others may be useful for marketing. However, we have seen no indication that the selection itself is the answer to navel orange fruit-quality issues.

TREE AGE

Young-tree navel fruit may not be marketable, regardless of rootstock or circumstances. Because of the parthenocarp, navel orange is particularly sensitive to such things as granulation. As the trees age, vigor decreases, which results in a shift of demand for carbohydrates from vegetative to reproductive growth, and fruit quality improves. Size-controlling rootstocks may mitigate age-related quality, but time is simply necessary to achieve the highest quality good fruit.

GROWER ADVICE

So what can growers do now to improve the quality of the good fruit? Here are a few suggestions:

Avoid propagating navel orange selections, including Cara Cara, on Swingle citrumelo or rootstocks that are characterized by high tree vigor and low fruit quality.

Choose rootstocks that impart higher internal quality, with Carrizo being one for which there is favorable documented experience.

Plant navel orange trees on soils that have higher organic matter in the Flatwoods or finer soil texture in well-drained soils. Avoid very sandy sites or areas with chronic drainage problems.

For any navel orange block, schedule irrigation and production practices to help the trees during the critical fruit-set period in the spring. Then ease off, if possible, to help the trees direct carbohydrates toward fruit quality in late summer and fall.

We encourage the continuation of research in commercial plantings. As efforts are made to re-establish the navel orange segment of the industry, a practical foundation lies in different choices to achieve the highest amount of good fruit. 🍊

Bill Castle is a University of Florida Institute of Food and Agricultural Sciences professor emeritus at the Citrus Research and Education Center in Lake Alfred. Pete Spyke is co-owner of The Orange Shop in Citra and Arapaho Citrus in Ft. Pierce.



Why settle for almost when you can get the real Haifa?



Haifa

Almost

Best Quality only

For us, perfection is the only way to grow. We feel blessed that for over five decades leading farmers worldwide choose Haifa's Multi-K™, the pioneering potassium nitrate, as their only way to grow and get the perfect results.



Scan to learn more

FOR SALE

Shell Creek Grove,
Charlotte County



Turnkey grove with current income and an opportunity for long-term appreciation.

Located in an Opportunity Zone, the Shell Creek Grove is 637.33 +/- gross acres with 419.34 +/- net tree acres. The remaining 218 acres is a combination of staging areas, fallow land, ditches, roads and wetlands. Shell Creek was originally planted in 1997 and 2002 with Valencia, Hamlin, and Midsweet oranges irrigated by low-volume micro sprinkler from four 12" wells and onsite reservoirs.

PREMIERE PLUS CRE
Commercial Real Estate

Rodney Harvey, CCIM
(239) 289-2009, rdharvey@ccim.net