



Figure 1. Steve Futch (right) and Rhuanito “Johnny” Ferrarezi stand in a 13-year-old Hamlin grove in Brazil expected to yield six boxes per tree.

Inside Brazil’s citrus industry

By Stephen H. Futch and Rhuanito S. Ferrarezi

Many changes have taken place in the Brazilian citrus industry over the past 20 years as growers battle pests, diseases and market challenges. Throughout this process, the industry has encountered difficulties but has continued to maintain production through innovative practices that are founded in science, economics and sustainability.

This article provides an overview of Brazilian citrus production, acreage, varieties, changes, status of HLB and other production issues, and is based on grove visits in central and southern parts of the state of São Paulo in May of 2019 (Figure 1). Most of the information presented in this article is available from Fundecitrus (www.fundecitrus.com.br/English), a private institution maintained with funds from citrus growers and juice processors from São Paulo to foster sustainable development of the citrus industry. Fundecitrus is an outstanding source of information about the Brazilian citrus industry and is currently funded by a box tax being paid by both the growers and processors to support scientific and production research at about 3.25 cents per box.

PRODUCTION, ACREAGE AND VARIETIES

Today, the Brazilian citrus industry consists of approximately 195.27 million trees planted on 1,010,229 acres on nearly 5,885 farms. The current acreage is down 1.33 percent as

compared to the citrus inventory of 2018. The state of São Paulo is the country’s largest citrus producer. The citrus area in São Paulo is divided into five regions: north, northwest, central, south and southwest. Of the total number of trees, 89.1 percent are of bearing

age and 10.9 percent are non-bearing.

Within those areas, 97 percent of the trees are oranges. The major citrus types are early varieties (Hamlin, Westin, Rubi, Valencia Americana, Seleta and Pineapple), mid-season (Pera Rio) and late (Valencia, Valencia Folha Murcha and Natal). The harvest period for early varieties is between May and August. Mid-season varieties are harvested between July and October, and late-season varieties are harvested between October and January. With the Brazilian citrus industry being located south of the equator, the seasons are six months apart from Florida, with winter in July as compared to Florida’s winter being in January.

The 2019–20 citrus crop is expected to be about 388.4 million boxes from the states of São Paulo and southwest Minas Gerais. Of the total estimated yield, 24.9 percent is early-maturing varieties, 29.9 percent is mid-season varieties, and 45.2 percent is late-maturing varieties.

Average production over multiple years is about 321 million boxes. Therefore, this year’s crop is significantly higher than average. Annual yield usually swings up and down due to alternate bearing and is

approximately 425 boxes per acre or 2.24 boxes per tree.

Annually, about a third of total citrus production is consumed internally as fresh fruit, and two-thirds is processed into orange juice mainly for international markets.

INDUSTRY CHANGES

Many small growers are leaving the industry due to low profit margins, lower yields per acre and higher HLB infection rates. As larger companies replant acreage, new groves are being planted at higher densities using enhanced horticultural practices. Thus, total yield and yield per acre are increasing.

In 2000, the average tree number per acre was 148. This figure increased to around 222 in 2010, and today it is at approximately 265. Currently, nearly 30 percent of the acreage is irrigated. Yields per acre continue to increase with the use of irrigation (which has been shown to also increase fruit size) and better nutrition practices.

A recent trend is that some growers are backing away from very high tree density as compared to previous years. High planting density can contribute to production challenges due to a current lack of dwarfing rootstocks to maintain tree size. With higher densities, hedging frequently creates issues for protecting the new flush from psyllid feeding and may result in higher HLB incidences. It was suggested that HLB incidences can increase from 1 to 10 percent in a single year due to failure to protect young new flush from psyllid feeding.

STATUS OF HLB

HLB disease levels can become high if a grower does not properly protect new flush. Since 2015, the incidence of HLB has remained relatively constant due to abandoned grove removal and many smaller farmers leaving the industry. The average HLB incidence (symptomatic trees) in São Paulo is 19.02 percent.

Most big farms are protecting trees using external actions whereby growers are collectively working with neighboring properties to perform coordinated sprays, remove HLB symptomatic trees up to 3 miles from the grove in all directions, replace trees

A Christmas Wish List

By Rick Dantzler, CRDF chief operating officer



With the holidays upon us, I found myself thinking about a citrus industry Christmas wish list. It takes guts to be in the citrus business in these trying times, so we could all use a little help right now.

For growers, nothing is more important than being able to produce a crop of fruit that is marketable. My first wish is that Mother Nature gives growers a good season, one with adequate and well-distributed rainfall and cool winter conditions to induce uniform flowering next spring.

Of course, what good is growing a crop if you can't sell it? My second wish is that all growers find buyers who will pay a price high enough to sustain themselves, their families and their groves.

It's confounding why consumer demand for a product as wholesome as orange and grapefruit juice has declined so much, although we think we know why. My third wish is for increased consumer demand. The good news is this is fixable.

Those who market juice must have the resources to put it in the consciousness of consumers, so my fourth wish is for adequate marketing resources.

Those who sell juice must have products that taste as good as orange and grapefruit juice can be. We've all had juice that is so good it makes you pause and look at what's left in the glass. My fifth wish is that researchers give growers the tools to grow fruit that has juice which is high in Brix and of great color.

Juice must be affordable or it won't be purchased — regardless of how good it is. My sixth wish is that retailers do their part to keep the price of juice within the reach of all consumers.

This wish list began with the need for growers to produce a marketable crop of fruit that can be sold for a reasonable profit. Everything depends on this, so my seventh wish is for the Citrus Research and Development Foundation to have the funds to support the research that growers need. HLB-tolerant or even resistant cultivars, horticultural practices that yield the most and best fruit possible from HLB-infected trees, smart psyllid control, and methods of attacking *Liberibacter* that make it disappear are high on my list.

I firmly believe there will come a time when HLB is in the rearview mirror, demand for citrus juice will increase, and all segments of the industry will prosper. We survive this rough patch only if my eighth wish comes true, so this is the one I pray for the most: unity among citrus industry constituencies.

Unity is different than agreement. Difficult issues will always have differing opinions, but unity demands all segments of the citrus industry come together to do what is best for the industry as a whole. If we stay focused on this goal, we'll work through our differences and keep Florida citrus the king of all agricultural commodities.



Column sponsored by the Citrus Research and Development Foundation

and release *Tamarixia radiata*. Citrus growers are encouraging homeowners to plant non-citrus type fruit trees, and this action appears to be up to 90 percent efficient. Citrus growers with good external actions can decrease future HLB infection by 30 to 40 percent. The positive results of good external actions in managing HLB are generally seen very quickly.

Within the grove, growers continue to monitor and aggressively control Asian citrus psyllids (ACP) with more frequent border sprays at the edge of the property, which allows less frequent sprays inside the grove. Fundecitrus and others suggest that the border should be considered anything within 325 feet of the edge of the property. In many small farms, the entire acreage could easily be considered a border.

HLB control has increased the average production cost by up to 20 percent. External action increases costs by only 1 to 2 percent of the total production cost and is thus extremely beneficial to conduct since it is cost effective in minimizing future HLB infection rates.

Some regions in São Paulo may have 30 to 60 percent HLB-symptomatic trees. Regions in north and south São Paulo have a lower percentage of HLB-symptomatic trees as compared to the central part of the state. The incidence of HLB



Figure 2. New growth is seen on top of an HLB-infected tree under an experimental management program.

statewide by tree age group is: 0 to 2 years, 2 percent; 3 to 5 years, 7 percent; 6 to 10 years, 19 percent; and more than 10 years, 26 percent. Time from infection to HLB-symptom development is generally less than one year.

Some large growers stop removing HLB-positive trees after the grove reaches about 8 years of age. This may create an issue when planting new citrus acreage due to the higher level of HLB in the area.

Larger growers are spraying at least one time per month or more to manage ACP to reduce future HLB infection.

When you compare Brazil's and Florida's citrus industries, one could speculate some of the reasons Brazil has been able to keep the level of HLB lower than what Florida has are as follows:

- 1) The number of psyllids is lower in Brazil. It has been suggested that the lower level of ACP may in part be due to better chemical and/or biological control of ACP with *Tamarixia radiata* or other insects which may have naturally developed to suppress ACP since it has been present in Brazil since about 1949. This is much longer than Florida has had ACP.
- 2) Brazil produces citrus in more fertile soils due to natural physical and chemical properties, which provide better nutrition and water availability and minimize plant stresses during the growing season.
- 3) Many groves in Brazil are much larger than in Florida, which makes ACP management more efficient over a wider area.
- 4) The major production areas are geographically separated and sometimes isolated in Brazil, which has minimized the spread of HLB over time.
- 5) Climatic conditions are different between the two countries.
- 6) The adoption of working beyond the grove boundaries in ACP and HLB management has allowed

FROSTPROOF
growers supply

A WORLD OF GROWING IDEAS

Tree Wraps • Deer Nets • Budding Tape • Hand Tools
Picking Bags • pH Testers • Bug Lenses • Shade Cloth
Ground Cover & Staples • Mesh Bags • Tensiometers
Bamboo • Safety Supplies • Testing Equipment
Harvesting Supplies • Flagging Tape • Nursery Supplies

Family Owned & Operated
Toll Free 1-800-635-3621

Local Service & Delivery
Full Catalog @ **FROSTPROOF.COM**

Brazilian growers to have lower HLB infection compared to groves without external actions.

Due to high prices, lime and lemon production are increasing with small farmers. Therefore, it is expected that incidences of HLB in orange production areas may increase as small farmers do less psyllid and HLB management.

There is no indication that nutrition helps with HLB management in Brazil, despite random positive results in some regions. We did visit some groves where growers are making treatments based on soil health improvement and an enhanced nutritional program. This appears to allow trees to continue growing vigorous branches on top of sick tissue after sprays are applied, even with HLB symptoms present (Figure 2, page 16).

OTHER PRODUCTION ISSUES

High temperatures (above 95) in the north and postbloom fruit drop in the south are major production problems. Both conditions can limit fruit set and ultimately reduce yield. Major fruit drop prior to harvest is estimated to average 16.7 percent in 2019. Of that total, physiological and mechanical factors are responsible for 5.16 percent of the drop, HLB for 2.7 percent, fruit borer and fruit fly both for 5.7 percent, black spot for 2.02 percent, leprosis for 0.82 percent and citrus canker for only 0.3 percent.

CONCLUSION

In conclusion, the lesson learned in Brazil is that growers have developed effective practices to manage HLB and remain productive and profitable. By adopting innovative production practices from grower trials and research findings from Florida and elsewhere that optimize HLB management, the Florida industry will remain viable into the future. 🍊

Stephen H. Futch is an emeritus Extension agent at the University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) Citrus Research and Education Center in Lake Alfred. Rhuanito S. Ferrarezi is an assistant professor at the UF/IFAS Indian River Research and Education Center in Fort Pierce.

PROTECTS AGAINST:



Psyllids and
Most other insects



Birds



Frost and Hail



Deer and
Small animals

"MAKE CITRUS GREAT AGAIN"™

Drastic Reduction of Neonicotinoid Pesticide use

Has Shown Increased Growth Rates with Larger Leaves and Fuller Canopy

Proven by University Field trials to grow 100% greening free trees

Our product was created by growers for growers

Great for both residential and commercial use

Tree Defender provides a long term return on investment

PATENT PENDING



863-439-2877
5600 Lake Trask Road
PO BOX 970
Dundee, FL 33838
www.thetreedefender.com

Chandler Pull-type Compost Spreaders

Available at

 and Associates Inc.



Contact us today: (863) 402-1072 | cdftanks@gmail.com