

The Florida citrus perfect storm: Disease, weather and market swings

By Ariel Singerman

Orange yield in Florida has decreased by more than 80% since HLB was first found in the state in 2005. It is hard to find another example in recent history of an industry as iconic as Florida citrus that has declined so significantly as a consequence of a plant disease. As a comparison, at the global level, the impact of plant pathogens and pests on the yield of the top five crops (based on global human

calorie intake) is estimated to be 22% for wheat, 30% for rice, 23% for corn, 17% for potato and 21% for soybean.

Other orchard plant diseases currently pose a severe threat to different crops, and they may, eventually, have the potential to cause significant impact. Panama disease, for example, is threatening the production of Cavendish bananas, which represent over 40% of global production and virtually

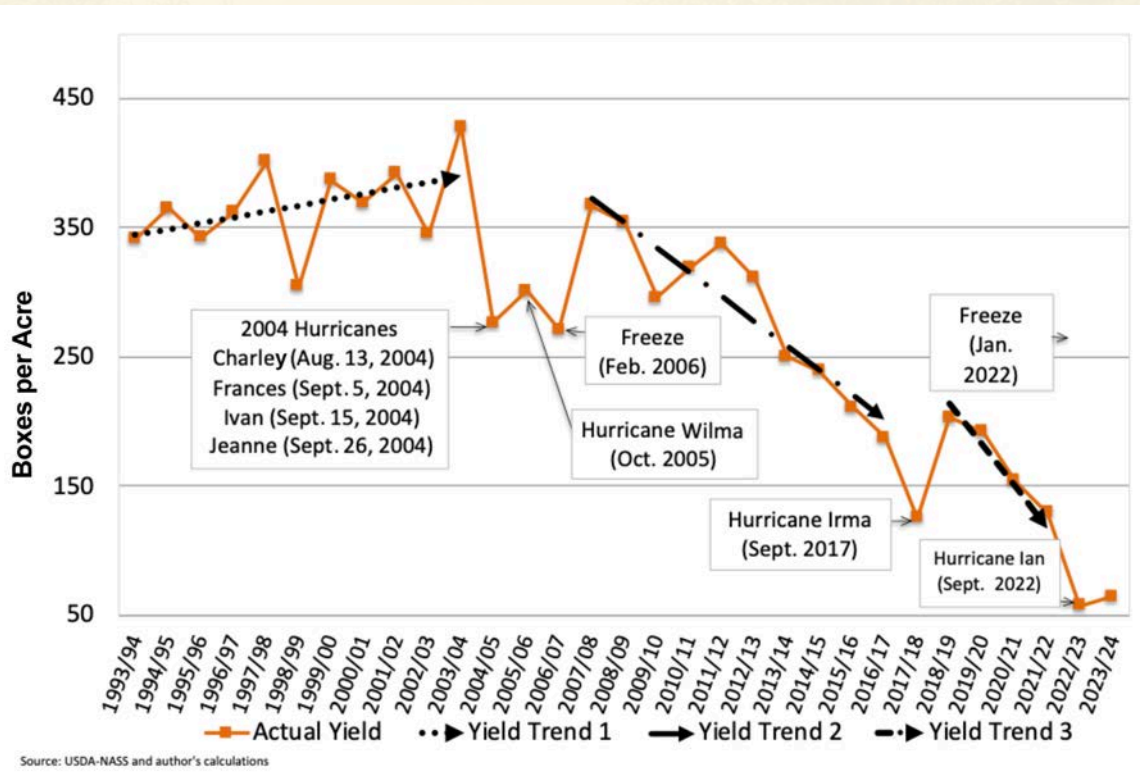


Figure 1. Average and trend orange yield in boxes per acre in Florida

all exports. In the historical Italian olive-producing region of Puglia, olive quick decline syndrome — which similarly to HLB currently has no cure — potentially represents a case where the impact may be as significant as that of HLB in Florida.

Since 2017, citrus production in Florida has faced additional challenges on top of those posed by HLB. These challenges include hurricanes, a freeze, rock-bottom fruit prices and skyrocketing input prices, which all combined with HLB to create a perfect storm.

YIELD TRENDS

Figure 1 (page 10) shows the average and trend orange yield per acre in Florida during the last 30 years. The yield trend refers to how the average crop yield evolves over time. The orange yield trend during the last 30 years can be divided into three time periods:

During the period before HLB was found, the yield trend was increasing.

- Before HLB (1993–94 to 2003–04), denoted as yield trend 1
- During HLB spread and progression (2007–08 to 2016–17), denoted as yield trend 2
- During the combination of endemic HLB with other economic and weather factors (2018–19 to 2021–22), denoted as yield trend 3

During the period before HLB was found, the yield trend was increasing. But in the mid-2000s, there were major weather events that included four back-to-back hurricanes in 2004, Hurricane Wilma in 2005 and a freeze in 2006, which caused yield to decrease significantly, albeit temporarily. Thus, to avoid having the yield trend be affected by those weather events, they were excluded from the trend computation. But, as depicted in Figure 1, the



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yield trend started to be negative in 2007–08. Given that there were no significant weather events from 2007–08 to 2016–17, it can be sensibly argued that the 55% decrease in yield per acre during such a period was due to the spread and progression of HLB.

Beginning in 2017–18, multiple factors combined to impact yield and its further downward trend. As shown in Figure 1, in September of 2017, Hurricane Irma hit Florida. The storm's strong winds not only impacted yield in the short term by blowing fruit off the trees, but it also affected yield in the medium term due to the damage caused to the trees' root systems from uprooting in some groves and flooding in others. In 2017–18, the average orange yield declined by 33% relative to 2016–17.

Orange yield recovered in 2018–19, but processors, who had been concerned about the potential speed of recovery from the hurricane, had signed multi-year contracts for importing juice from Brazil and Mexico. The impact of those commitments caused prices to decrease significantly in 2019–20, when spot prices were as low as \$1 per pound solids for early and mid-season oranges and \$1.25 per pound solids for Valencia oranges. Those prices were not high enough for growers to break even. Prices increased

during that season. With yield declining and prices increasing, growers faced additional cost constraints that further impacted yield.

In late January of 2022, there was a freeze that affected Valencia oranges in some parts of Florida. In addition, the significant decrease in quality started to make it challenging to meet the U.S. Department of Agriculture standard of 10.5 Brix for not-from-concentrate orange juice. Consequently, Florida Citrus Mutual asked for the standard to be lowered to 10 Brix. The Food and Drug Administration replied that it would consider allowing the lower Brix but would require labeling it as lower quality juice.

During the 2022–23 season, Hurricane Ian hit Florida and impacted many citrus groves across the state. As shown in Figure 1, orange yield decreased by more than 50% that season relative to 2021–22. But even without taking that hurricane into account, Figure 1 illustrates that the slope of the yield trend from 2018–19 to 2021–22 became more negative (that is, steeper) relative to the period from 2007–08 to 2016–17. The steeper slope of the yield trend denotes that the combination of HLB and other factors in recent years have compounded the impact on orange trees' productivity statewide.

In 2021–22, the lack of profitability was worsened by the skyrocketing of input prices.

in 2020–21, driven by the surge in demand due to the COVID pandemic. Growers responded to the swing in fruit prices by reducing costs in almost all grove caretaking programs (which inevitably affected yield).

In 2021–22, the lack of profitability was worsened by the skyrocketing of input prices, which was triggered by the outbreak of the war in Ukraine. The price of fertilizer roughly doubled

SUMMARY FINDINGS

Analysis of the average orange yield per acre in Florida during the last 30 years shows that there have been two very apparent changes in its trend. The first occurred during the period from 2007–08 to 2016–17, when the average orange yield per acre decreased by approximately 55% due to the spread and progression of HLB throughout the state. The second change in orange yield trend started in 2018–19, when the endemic state of the disease combined with multiple factors to push it further down by an estimated 30%. 🍊

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