



After Hurricane Irma, few ripening grapefruit remained on the trees in this Southwest Florida research grove.

# Storm setbacks: Irma's effects on UF/IFAS citrus research

By Tom Nordlie

**F**lorida citrus growers won't forget Hurricane Irma anytime soon. Neither will citrus researchers with the University of Florida Institute of Food and Agricultural Sciences (UF/IFAS).

The storm impacted work at three UF/IFAS facilities — Indian River Research and Education Center (REC) in Fort Pierce, Citrus REC in Lake Alfred and Southwest Florida REC in Immokalee.

No academic buildings were seriously damaged, but research groves were hard-hit. Some researchers faced the possibility that data would have to be discarded or experiments halted prematurely.

Administrators and faculty from the three centers were asked about damages Irma caused, steps taken to address problems and consequences that UF/IFAS researchers have seen or anticipated. The following update is meant to be representative, not comprehensive.

## INDIAN RIVER REC

Irma dumped more rain on Fort Pierce than on any other Florida city, almost 16 inches. Fortunately, she did not bring winds of similar magnitude to Indian River REC.

Nonetheless, winds lashed the center's 17 acres of groves, ripping grapefruit off trees by the thousands, said Ron Cave, center director. The

losses will skew 2017 harvest data for a three-part study investigating how grapefruit yield varies with tree planting density and different irrigation and fertilization methods, he said.

"The yield experiments were scheduled to end in December, so we'll let them run their course," Cave explained. "We know our 2017 data will have limited value."

Wind also impacted a citrus under protective screen (CUPS) project. This system involves large, screened enclosures used to cultivate citrus trees and protect them from huanglongbing (HLB) infections by excluding the Asian citrus psyllid, vector of the HLB disease pathogen.

Two of four CUPS screenhouses at Indian River REC were severely damaged when wooden support poles were ejected from waterlogged soil and Irma's winds broke cables and tore screening, said project leader Rhuanito "Johnny" Ferrarezi, a horticultural sciences assistant professor at the center. Although the screenhouses were compromised, Asian citrus psyllids were not detected inside the structures, and the study was unaffected, Ferrarezi said.

"We were trying to prove that it's possible to grow high-quality fresh grapefruit in Florida using CUPS," he said. "Our data from previous years already confirmed our hypothesis."

Repairs to screenhouses should conclude in January 2018, Ferrarezi said. He was surprised by the extent of the damage, and concluded that screenhouses need a sturdier, more stable frame to make the system viable for commercial plantings.

## CITRUS REC

Polk County saw wind gusts topping 80 miles per hour and almost a foot of rain in many areas. Citrus REC Director Michael Rogers said the center's on-site groves in Lake Alfred had relatively minor damage. He added that fruit loss compared with other research groves around the state.

"I'm thankful things weren't worse, but I have to remind myself that it will be months before we know the full scope of the damage," Rogers said. "We have studies on more than 500 acres across 10 sites. The important thing now is to provide the proper care for these stressed trees to help them recover as quickly as possible."

There's a 1.3 acre CUPS screenhouse at Citrus REC, devoted primarily to fresh oranges. Like the screenhouses

at Indian River REC, this one has a pole-and-cable framework surrounded by sheets of plastic mesh that Asian citrus psyllids can't squeeze through. Irma's extreme winds exerted upward forces on the screenhouse roof, pulling large wooden poles out of place and leaving many of them off-kilter when the wind subsided. The screens fared much better, with only small tears appearing. Repairs are proceeding.

CUPS project leader Arnold Schumann had a realization similar to Ferrarezi's. As Schumann put it, "The experience has raised serious concerns about how screenhouses are built for Florida's tropical weather."

Schumann and Ferrarezi both voiced a desire to collaborate with engineers who have experience designing wind-resistant structures, and develop a practical, economical screenhouse design that can withstand severe weather.

Citrus breeder Jude Grosser wants to know whether a simple barrier of insect-proof screen could stop Asian



**A valued parent orange tree at the Citrus Research and Education Center split in two under the force of Hurricane Irma's winds combined with the weight of developing fruit.**

citrus psyllids, so he surrounded a block of trees with it, leaving the top open. Irma flattened one side of the makeshift structure, but it was subsequently repaired and reinforced, said Grosser, a horticultural sciences professor at the center.

"One of the worst losses at Citrus REC was some important trees that we used for breeding — good parent trees. They were knocked over or they split in half under the weight of the fruit and the force of the wind," Grosser said. "That's something we can't just replace."

Damage also befell young trees in off-site groves used by Fred Gmitter, a citrus breeder and horticultural sciences professor. The trees included new varieties under evaluation; they were subjected to waterlogged conditions for several days. Though Gmitter may replant, he'll delay the task so that he can observe damaged trees and gather data on their long-term recovery or decline.

## **SOUTHWEST FLORIDA REC**

Southwest Florida REC is about 50 miles northeast of Marco Island, where Irma made landfall on peninsular

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Florida as a Category 3 hurricane.

Unsurprisingly, the center's 70 acres of research groves suffered extensive damage, said center Director Calvin Arnold. He estimates that 10 percent of on-site trees are dying or dead from prolonged waterlogging. Additionally, about one-third of all trees were partially or completely blown over.

As of early November, work crews had been resetting trees at Southwest REC for two months, Arnold said.



**As evidenced by this damaged greenhouse, the Southwest Florida Research and Education Center was the hardest-hit of the UF/IFAS citrus research facilities impacted by Hurricane Irma.**

Young trees were given priority, and most have been reset. Crews will soon begin resetting large, mature Sugar Belle® trees. This mandarin hybrid, developed by UF/IFAS breeders, offers greater HLB tolerance than other commercial citrus varieties.

Soil and water sciences researcher Kelly Morgan had to call an early halt to studies on nutrient management, but has now reinitiated them. Among other goals, he hopes to learn why HLB-infected trees usually lack calcium and magnesium. The change in plans will delay Morgan in completing the third edition of the well-known production handbook he authored with Thomas Obreza, "Nutrition of Florida Citrus Trees."

Plant physiologist Ute Albrecht, an assistant professor at the center, is one of four recently arrived Southwest REC faculty members who were assigned space in four new greenhouses, built in summer 2017. Just days after Albrecht moved equipment and supplies into the space and began experimentation,

Irma tore the roof off Albrecht's greenhouse and two others, leaving just one unscathed. Four older greenhouses at the center also need repair, and a fifth was declared a total loss.

In the research groves, Albrecht is debating how to reschedule a study that involves foliar applications of materials to mitigate HLB infections. The materials must be applied to new growth, but the storm has impacted flushing patterns. Consequently, Albrecht is uncertain how the trees will respond to the treatment. Other studies that require root sampling may be halted as well, because waterlogging has likely damaged tree roots, and physiological effects of the damage could mask treatment effects.

"I hope we are not losing too many trees because of this damage," Albrecht said. "They've been through a lot." 🍊

*Tom Nordlie is a public relations specialist with the University of Florida Institute of Food and Agricultural Sciences Communications in Gainesville.*



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