

## Invasive insect threatens iconic Florida citrus

August 24 2014, by Tamara Lush

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In this Wednesday, July 30, 2014 photo, Ellis Hunt Jr., 61, walks past an orange tree, left, which is affected by a disease called "greening", in Lake Wales, Fla. The Hunt family owns 5,000-plus acres of groves and is part of the co-op that contributes to Florida's Natural, the third largest juice brand in the country. Florida's \$9 billion citrus industry is facing its biggest threat yet by a tiny invasive bug called the Asian Citrus Psyllid, which carries bacteria that are left behind when the psyllid feeds on a citrus tree's leaves. (AP Photo/Lynne Sladky)

The tourists stream to Florida in their cars, intent on a week at Disney or a sugar-sand seashore or a nonstop party on South Beach. Road weary

and thirsty, they pull over at one of the state's five official welcome centers. They walk inside, and then they look up.

"The best start under the sun," reads a big sign. "FLORIDA ORANGE JUICE."

Behind a counter, a woman sits with a stack of paper cups. "Welcome to Florida," she says with a big smile. "Orange or grapefruit?"

The juice is cold and sweet. It tastes like the Sunshine State.

Once, emerald green trees bursting with citrus carpeted more than half of the state, from the northern reaches of Jacksonville and the parks of Orlando to the Miami coastline. Oranges, especially, have long been synonymous with the magic of Florida.

Think back to those old advertisements touting OJ as a vitamin-filled glass of goodness. The dream of Florida as a tropical vacation paradise was cemented in Americans' minds through such promotions. Today, the orange adorns the state license plate. There is even a county called Citrus.

The people behind the groves have been among Florida's most influential. The University of Florida's famed football stadium was named after an orange magnate, and at least three of the state's governors were citrus growers.

Throughout the decades, citrus has stood strong—through freezes, hurricanes and rampant development.

But now the \$9 billion industry is facing its biggest threat yet, putting at risk the state's economy and very identity. Blame a mottled brown bug no bigger than a pencil eraser and a disease called "the yellow dragon."

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Have you seen those commercials that begin with a farmer's leather-gloved hands opening to reveal a blossom that ripens into an orange? The ads are for Florida's Natural juice, and Ellis Hunt Jr. is the man behind the brand.



In this Friday, July 25, 2014 photo, a sign in the Florida Citrus Tower points west to Florida's citrus growing region, in Clermont, Fla. The observation tower was built in 1956 as a tourist attraction to view miles of citrus groves. Today Florida's \$9 billion citrus industry is facing its biggest threat yet by a tiny invasive bug called the Asian Citrus Psyllid, which carries bacteria that are left behind when the psyllid feeds on a citrus tree's leaves. Eventually disease clogs the tree's vascular system and the tree slowly dies. (AP Photo/Lynne Sladky

Tall and thin, wearing jeans and a plain white button-down with a

Florida-honed tan on his 61-year-old face, Hunt could star in one of those spots. His family owns 5,000-plus acres of groves and is part of the co-op that contributes to Florida's Natural—the third-largest juice brand in the country, behind Pepsi's Tropicana and Coca-Cola's Minute Maid.

Hunt's grandfather started the company in 1922, and ever since Hunt could walk, his life was surrounded by oranges. He followed his father into the business, and now serves on the state's powerful citrus commission. He jokes that the backbreaking task of picking fruit was what inspired him to attend college, so he could take a rest from hard work.

This summer, Hunt's has been driving his truck through his groves in Polk County, the state's top citrus-producing region, and what he sees is uncertainty. Many of his trees look beautiful, acres upon acres of vibrant green. But trouble can be spotted if you look closely.

Hunt stops his truck, climbs out and points to a tree's limb. Some leaves have turned yellow, and the hue is spreading in waves. He guesses that 75 percent of his groves are infected.

In China, where it was first found, the disease is called huanglongbing. Translation: "the yellow dragon." In Florida, it's known simply as "greening."

It arrived here via a tiny invasive bug called the Asian Citrus Psyllid, which carries bacteria that are left behind when the psyllid feeds on a citrus tree's leaves. The tree continues to produce useable fruit, but eventually disease clogs the vascular system. Fruit falls, and the tree slowly dies.

The psyllid isn't native to Florida but is believed to have arrived from someone who perhaps unknowingly brought a slip of a tree from Asia.

The bug was first spotted in the state in 1998, and some think it then spread on the winds of hurricanes. Greening showed up in 2005. There is no cure, and no country has ever successfully eradicated it.

All of that has Florida's growers in a frenzy to find a way to stop the disease.

"It feels like you're in a war," Hunt said.



In this Wednesday, July 30, 2014 photo, a worker plants new citrus trees on land owned by the Hunt family in Lake Wales, Fla. The Hunt family owns 5,000-plus acres of groves and is part of the co-op that contributes to Florida's Natural, the third largest juice brand in the country. Florida's \$9 billion citrus industry is facing its biggest threat yet by a tiny invasive bug called the Asian Citrus Psyllid, which carries bacteria that are left behind when the psyllid feeds on a citrus tree's leaves. (AP Photo/Lynne Sladky)



Hunt estimates he's spending some \$2,000 an acre on production costs, a 100 percent increase from 10 years ago. Much of that goes toward nutrients and spraying to try to control the psyllids. The trees that don't survive are pulled out of the earth and tossed onto a giant bonfire.

Nearly all of the state's citrus groves are affected in varying degrees by greening, and researchers, growers and experts agree that the crisis has already started to compromise Florida's prominence as a citrus-growing region. Florida is second in the world, behind Brazil, in growing juice oranges, producing about 80 percent of juice in the U.S.

This past growing season, the state produced 104 million boxes of oranges, which comprise the bulk of Florida's overall citrus crop. In 2003, two years before greening was discovered and prior to several devastating hurricanes, 243 million boxes were picked.

"This affects the whole state. The economic impact. The landscape. The iconic image of Florida and how it has drawn people here to smell the orange blossoms in the spring and look forward to that Christmas gift of fresh Florida citrus," said state Agriculture Commissioner Adam Putnam, whose family has grown oranges in Polk County since the early 1900s. "It will have a ripple effect throughout the economy if we can't get our arms around this disease."



In this Friday, July 25, 2014 photo, Nick Howell, 13, a member of the McLean family who owns Uncle Matt's organic orange juice company, places a vial containing the tamarixia wasp to release in their orange groves in hopes of combating the citrus greening disease, in Clermont, Fla. Florida's \$9 billion citrus industry is facing its biggest threat yet by a tiny invasive bug called the Asian Citrus Psyllid, which carries bacteria that are left behind when the psyllid feeds on a citrus tree's leaves. (AP Photo/Lynne Sladky)

Experts say that if a solution isn't found, Florida's entire citrus industry could collapse. Officials worry that some packinghouses and processing plants will have to close because of a lack of fruit. That could send the industry, with its 75,000 jobs, tumbling.

Compounding the problem is the timing of it: The disease coincides with an increase in foreign competition and a decrease in juice consumption as health-conscious consumers count carbs. In July, U.S. orange juice

retail sales fell to the lowest level in 12 years for a second consecutive four-week period.

"We're in the fight of our life," said Michael Sparks, the CEO of Florida Citrus Mutual, the marketing and lobbying arm for the state's citrus growers.

Already, some are losing.



In this Wednesday, July 30, 2014 photo, a mural shows Marie and Hazel Kirch holding oranges in 1914, and the Orange Blossom Special train which brought passengers to Lake Wales in the 1920's, in downtown Lake Wales, Fla. Oranges and grapefruits have been farmed commercially in Florida since the 1800's. Florida's \$9 billion citrus industry is facing its biggest threat yet by a tiny invasive bug called the Asian Citrus Psyllid, which carries bacteria that are left behind when the psyllid feeds on a citrus tree's leaves. (AP Photo/Lynne Sladky)



In the early 1980s, farmer Richard Skinner and his wife took over a small grove near Tampa planted nearly 100 years ago by his wife's grandfather. For years they thrived, selling boxes of oranges to large juice companies to augment their roadside business.

When greening struck his grove in 2011, Skinner realized he couldn't sustain the cost of chemicals and nutrients needed to keep the trees alive. Within two years, 2,600 trees were cut down—and the century-old grove was gone.

"We cried," said Skinner, who is 74 years old and doesn't look like a man who cries easily.

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The war room in the fight against the yellow dragon is found in Lake Alfred, 30 miles southwest of Walt Disney World, in a nondescript cluster of buildings at the University of Florida's Citrus Research and Education Center.

There, some of the world's top citrus researchers—from the U.S., China, Brazil, India—slouch over microscopes and peer into makeshift greenhouses, hoping to unlock the puzzle that is greening. They talk about nucleotides and genomes like regular folks order a sandwich.

They understand clearly that there is no magic bullet—an injection or spray, for example—to cure the disease instantly. So they concentrate on two things: a short-term workaround that will allow existing trees to survive, and a long-term solution—possibly three to five years away—to develop a greening resistant tree.

Experiments study everything from how fast the psyllid flies to how it's attracted to the odor of an infected tree. One French researcher has tied

the bug to a string and a post to measure its flight patterns. Another study, underway at an organic grower's groves, assesses whether tiny wasps can be released en masse to gobble the bad bugs.



In this Wednesday, July 31, 2014 photo, the Asian Citrus Psyllid is shown on a lemon tree in a greenhouse at the University of Florida Citrus Research and Education Center, in Lake Alfred, Fla. The psyllid is an invasive bug which carries bacteria that are left behind when the psyllid feeds on a citrus tree's leaves. Eventually the disease clogs the plant's vascular system and the tree dies. This disease called "greening" is threatening Florida's \$9 billion citrus industry. (AP Photo/Lynne Sladky)

For three decades, horticulture professors Jude Grosser and Fred Gmitter have worked at the center, mostly studying citrus breeding and genetics. The two men are rock stars in the citrus world because of their

vast knowledge. Now, much of their focus is on greening.

Grosser and Gmitter have discovered that a certain variety of orange trees grafted onto one particular kind of rootstock appears to be more tolerant to greening. Those trees could play a big role in managing the disease down the road.

"A lot of people are looking for miracle cures, but the answer for greening will be a number of different pieces," Grosser said.

The pair want a solution and fast. They've spent their careers developing different fruit varieties, such as easy-to-peel and extra-juicy oranges. Some varieties are nearly ready for release and sales, they said, but most growers don't want to take a chance on anything new until greening is gone.

"We need to give the tree a chance to beat the disease," said Grosser.

"How can we do that?"

Since 2008, \$90 million has been spent in Florida on greening research, much of that money raised by growers from a tax they pay on every box of citrus that's picked. And the 2014 federal farm bill included \$125 million for greening research.

Growers are also taking matters into their own hands. Some have tried putting giant tents over their trees and using the sun's heat in an attempt to kill the greening.

Rick Kress, president of Southern Gardens Citrus, one of the state's largest juice suppliers, has hired a private team of researchers to work on genetically engineering a greening resistant tree with the DNA from spinach.



In this Wednesday, July 31, 2014 photo, scientist Calum Russell loads bacteria from different insects into a vial which will put into an Asian Citrus Psyllid to see if certain strains of bacteria will protect the psyllid, at the University of Florida Citrus Research and Education Center, in Lake Alfred, Fla. Some of the world's top researchers are working at this center to unlock the puzzle of citrus greening caused by the psyllid. The invasive bug carries bacteria that are left behind when the psyllid feeds on a citrus tree's leaves. (AP Photo/Lynne Sladky)

Kress knows that introducing juice from a genetically modified orange would create another hurdle because of the public's perception of such foods. But the alternative—no juice at all—is unthinkable.

"Irrespective of the challenges, Florida orange juice is not going to go away," he said. "Because Florida had the disease first, we're on the forefront of dealing with it and finding a solution that will ultimately

benefit the entire United States citrus industry."



In this Tuesday, June 17, 2014 photo, citrus trees affected by a disease called "greening" are burned in a grove owned by the Hunt Bros. Cooperative in Lake Wales, Fla. The Hunt family owns 5,000-plus acres of groves and is part of the co-op that contributes to Florida's Natural, the third largest juice brand in the country. Florida's \$9 billion citrus industry is facing its biggest threat yet by a tiny invasive bug called the Asian Citrus Psyllid, which carries bacteria that are left behind when the psyllid feeds on a citrus tree's leaves. (AP Photo/Tamara Lush)

California growers, who raise the majority of the U.S.'s fresh [citrus](#) crop, are also petrified of greening. The psyllid has been found in various places around that state, and greening was detected in one residential tree in Los Angeles in 2012. California researchers are doing



their own experiments and piggybacking on the Florida research. In Texas, greening has struck fewer than 200 commercial trees, and the disease has not been spotted in Arizona.

In Polk County, Hunt has been planting new trees to replace the diseased ones. He realizes that this is a gamble; psyllids prefer to munch on young, tender leaves. But if he can keep the bugs away long enough for the new trees to grow and bear fruit, maybe by then researchers will have found a solution to greening.



In this Friday, July 25, 2014 photo, Benny McLean, of Uncle Matt's organic orange juice company, holds up a vial containing the tamarixia wasp which they release in their orange groves in hopes of combating the citrus greening disease, in Clermont, Fla. Florida's \$9 billion citrus industry is facing its biggest threat yet by a tiny invasive bug called the Asian Citrus Psyllid, which carries bacteria that are left behind when the psyllid feeds on a citrus tree's leaves. (AP Photo/Lynne Sladky)

"We can't let this thing go down on our watch," he said.

Hunt had always hoped his family's younger generation would one day take over the business. But now he worries that Florida juice could become a niche product, similar to pomegranate juice. It's something he's reluctant to contemplate.

"You don't want to put your head in the sand and say everything's OK. It's not OK," he said. "But you have to get up in the morning and go to work believing that we will win the battle."

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