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Former Ph.D. student Leigh Archer, who did trunk-injection research under the direction of Ute Albrecht (right), uses a portable pressure chamber to measure the stem water potential of trees.

# Repurposing tools to tackle HLB

**T**he hurricane-battered harvest numbers don't show it, but we're in a much better place in developing scientific solutions for managing HLB than we were a year ago.

That's because our scientists have discovered that tools invented to solve other problems can help address your one big problem.

## GIBBERELIC ACID

For example, gibberellic acid (GA) has been around for decades. At first, Tripti Vashisth aimed to use it to synchronize flowering. But then she hit on spray schedules that rejuvenated infected trees. While everyone had access to GA, no one before Vashisth had hit on a pattern of use that did so

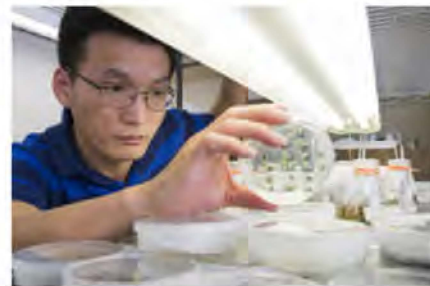
much to increase yield and reduce fruit drop from HLB-infected trees.

Vashisth is working to refine recommendations on applying GA at the right time on the right varieties on the right schedule to get HLB-fighting results. Using an old tool in a new way is moving us toward healthier and higher-producing infected trees.

## TRUNK INJECTION

Similarly, scientists around the world have been investigating trunk injection for hundreds of years (including an innovator, Ute Albrecht informs me, named Leonardo da Vinci, who had an apple tree injected). Albrecht has aimed trunk injection squarely at HLB. Her timing couldn't have been

better given the recent Florida Department of Agriculture and Consumer Services approval of an oxytetracycline hydrochloride-based tree-injection product. Albrecht is refining the method of trunk injection to balance the effective delivery of HLB therapies against injury to the tree.



Nian Wang examines citrus embryos generating shoots in the tissue culture room in his lab.

## CRISPR GENE EDITING

Nian Wang has always been up on genetics, but the CRISPR gene editing technique is still relatively new, and it wasn't invented with citrus in mind. He learned to use it first by aiming it at citrus canker (because it was much more clear which genes control canker susceptibility than which ones control HLB resistance).

He knows how to knock out canker with a non-GMO canker-resistant citrus variety that has received regulatory approval from the U.S. Department of Agriculture Animal and Plant Health Inspection Service. Now he's taking thousands of CRISPR-assisted shots at developing an HLB-resistant or -tolerant citrus variety.

## MAXIMIZING TECHNOLOGIES

That's the way innovation works. Vashisth, Albrecht and Wang didn't invent the technologies they're using. But they're in the vanguard of those using them specifically on HLB.

Look at one of citrus country's most famous snowbirds, Henry Ford. He didn't invent the automobile. He didn't even invent the assembly line. But he had the idea for how moving the product to the workers instead of vice versa could produce a car that everyone could afford.

Vashisth and Albrecht are landing a one-two punch to HLB that shows the greatest promise to restoring



citrus production profitability than anything else I've witnessed since I arrived at the University of Florida (UF) nearly three years ago. Wang is on the longer journey toward creation of a new variety. The strategy here is for GA, trunk injection and other tactics to keep your trees productive during the time it takes to develop a more complete and long-term solution through genetics.



Tripti Vashisth talks to attendees at a gibberellic acid field day.

Part of why I feel so confident about progress on the HLB front is that UF scientists not only know so much about citrus but are also resourceful about using all available tools.

As always, we aim to make the technologies effective, widespread, affordable and focused on the problems you need solved. That's the case whether the technologies and tools are being wielded by a horticulturalist, plant pathologist, entomologist, plant physiologist or some combination thereof.

Ultimately, the measure of success they have with these new or repurposed tools will be the extent to which they end up in your toolkit.

Some of you are already using them, discovering right along with our scientists what works and what doesn't work in your grove. What's exciting is that we have more and more firepower to throw at HLB, and that's going to mean a brighter future for you. 🍊

*J. Scott Angle is the University of Florida's senior vice president for agriculture and natural resources and leader of the University of Florida Institute of Food and Agricultural Sciences.*

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