

Florida developing automatic chemical delivery system in HLB fight

Researchers at the University of Florida are developing an automated system to deliver chemicals into the vascular parts of trees to reduce their susceptibility to citrus greening disease.

Ozgur Batuman, an assistant professor of plant pathology at the university's Institute of Food and Agricultural Sciences, leads a team of researchers trying to make the automated delivery system a reality to help growers deal with the disease.

Citrus greening, also known as HLB, has led to huge losses for Florida's multibillion dollar-a-year citrus industry.

"The automated delivery system can be installed on any farm equipment and be operated by anyone who is driving – physically or remotely," Batuman said. The person will be trained to use a joystick to control the arm that delivers the chemicals," he said.

To conduct the research, scientists will use a US\$3.4 million grant from the National Institute of Food and Agriculture, an arm of the USDA.

The system would extend from a tractor or ATV to grab the tree trunk. Because the grip has many small needles, it can create numerous tiny openings in the tree, said Batuman. Bactericides can enter the tree through those small openings, he said. These areas on the trunk with openings will be covered with a reservoir, such as a funnel or plastic balloon, that will hold the liquid containing the bactericide, Batuman said. The liquid then slowly enters through the holes of the trunk.

This contrasts with traditional tree trunk injections, in which a grower would use large, single-needle syringes to inject liquid materials in one spot, Batuman said.

Most bactericide treatments are not very effective at staving off citrus greening because they were not directly delivered into the citrus vascular system, where greening — and its associated bacterium, *Candidatus Liberibacter asiaticus* (CLas) – lives, he said. The therapeutic chemicals can kill or suppress the growth of CLas and can be used in HLB-affected plants, Batuman said.

The system can also help newly planted trees fight the disease by controlling the Asian citrus psyllid (ACP), which can transmit greening



into citrus plants, he said. Researchers see the automated delivery system as part of an integrated pest management program to help stem the psyllid ACP.

“We are developing a delivery method that will send chemicals with therapeutic potential into phloem, where bacteria live,” Batuman said.

This four-year project will also study citrus vascular systems with a multidisciplinary research team.

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