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FACT SHEET

HUANGLONGBING (HLB)

CITRUS GREENING OR HUANGLONGBING (HLB) IS A DEVASTATING DISEASE OF CITRUS WORLDWIDE (Gottwald et al., 2007). HLB is particularly devastating because of its severe yield reduction in citrus trees, followed by tree decline, the absence of resistant citrus varieties, and the limited control measures to prevent disease progression and pathogen spread by the vector, Asian citrus psyllid (ACP, *Diaphorina citri*). At its current rate of spread and impact on the economics of citrus production, HLB could destroy the U.S. citrus industry in our lifetimes. With current management technology, early detection is critical to the rapid response needed to slow the spread of the disease.

The disease was first identified in Florida in 2005 and is now present throughout Florida citrus producing counties. The causal agent is the phloem-limited bacterium, *Candidatus Liberibacter asiaticus* (Las). ACP was first discovered in 1998, but it was too widespread to consider an eradication program (Halbert et al., 2002). HLB was discovered in August 2005, 7 years after the vector, and within a few months the disease was detected in several counties in South Florida. The pathogen spread quickly throughout the Florida citrus-growing regions and, as a result, a mass tree removal to control the bacterium was not considered a viable option. ACP has since been found in six other Southern states, Hawaii, and most recently in California. The psyllid first appeared in Southern California in 2008, and HLB was detected in 2012 in a pumelo tree in a yard in Los Angeles County. ACP was recently reported in citrus groves in California's Central Valley.

The HLB pathogen is a particularly difficult organism to control. The bacterium is essentially inaccessible by chemical treatments because it is protected deep inside the plant's vascular tissue. Las is disseminated through grafting and insect transmission by ACP (Halbert & Manjunath, 2004). Vector control alone is an

imperfect control measure that tends to slow the spread of the disease rather than stop it and only works when practiced in conjunction with scouting to identify and remove infected trees. Unless an effective, comprehensive eradication program is in place to kill the vector, infected psyllids will migrate to infect new plants, especially when there are abandoned groves of infected plants in the area to serve as inoculum reservoirs.

In Florida, reducing disease spread by vector control alone has had limited effectiveness such that the statewide HLB incidence is estimated at over 50 percent and nearing 100 percent in many areas.

The citrus industries in Florida and California contribute more than \$10 billion to their states' economies. Since its introduction, HLB has had a devastating impact on Florida's citrus industry. Commercial citrus acreage has shrunk to 524,640 acres as of the fall of 2013, a 30 percent decline from 748,555 acres before the citrus greening disease was discovered in 2004. That's the lowest citrus acreage figure since the USDA began the survey work back in 1966. From a tree perspective, the number of orange trees in the state has declined from about 80 million down to the current approximately 60 million trees. Grapefruit has experi-



HLB image courtesy of ipmimages.org

enced an even greater drop, going from a peak of about 14 million trees to the current approximately 5 million trees. New tree plantings are at a historically low level and are replacing only about 50 percent of orange trees that are lost to HLB and other decline diseases. Citrus nurseries can supply only about 50 percent of new trees required for replanting. Based on recent observations, protecting replants from psyllid infection with systemic and topical insecticides has been only partially successful. Economically sustainable production after trees show symptoms at age 4 or 5 has not yet been demonstrated. In light of the Florida experience, the citrus industry is gravely concerned that HLB will have a similar impact in California.

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FACT SHEET: HUANGLONGBING (HLB) (CONTINUED)

The National Plant Diagnostic Network (NPDN) is a critical capacity resource for the biosecurity of the United States.

NPDN supplements the resources of plant diagnostic laboratories capable of providing diagnoses and screening for ACP and HLB. In addition, the NPDN coordinates diagnostician training in the most up-to-date methods for HLB diagnostics in cooperation with USDA Animal and Plant Health Inspection Service's Plant Protection and Quarantine. These services enable rapid and accurate diagnoses for dealing with this devastating disease.

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