

Huanglongbing Citrus Greening



Fresh
Florida.

Division of
PLANT INDUSTRY

Protection through Detection

Florida Department of Agriculture & Consumer Services

Charles H. Bronson, Commissioner

Huanglongbing in Florida

Huanglongbing (HLB), also known as citrus greening, is one of the most serious citrus diseases.

There are three known forms of HLB: Asian, African and Brazilian. It is widespread in Asia, Africa, and the Saudi Arabian Peninsula. In 2004 it was reported in Brazil, and in 2005, the Asian form of HLB was identified for the first time in the US in South Florida.



Lemon tree with mottled-leaf symptoms of HLB

HLB is a bacterial disease that attacks the vascular system of plants. Once infected, there is no cure for the disease, and in areas where the disease is endemic, citrus trees produce bitter inedible fruit and die.



Asian citrus psyllid - approximate size 3mm

HLB bacteria are transmitted by two species of psyllids, small insects with hind legs adapted for jumping. Most psyllids native to the United States are relatively uncommon and rarely become pests. Most pest psyllids are exotic species inadvertently introduced from other countries. Psyllids also cause direct plant damage including leaf distortion such as curling and notching.

The Asian form of HLB is transmitted by *Diaphorina citri*, or the Asian citrus psyllid. HLB can also be spread through plant grafting and movement of infected plant material. The disease cannot be spread by humans, animals, equipment, wind or rain.

Though citrus is the primary plant host for HLB, other citrus relatives can also get the disease. Common HLB host plants include the Chinese box orange (*Severinia buxifolia*), orange jasmine (*Murraya paniculata*) and the curry leaf (*Murraya koenigii*). While HLB disease and psyllids share many of the same host plants, some host plants are specific to the disease and others to the psyllid. For a list of host plants for both the disease and the psyllid, visit www.doacs.state.fl.us/pi.

How did HLB get to Florida?

In 1998, the Asian citrus psyllid was found for the first time in the US in Delray Beach, Florida, but no associated HLB infection was found.

Quarantines and other actions were implemented to control psyllid spread in Florida. However, with the abundance of citrus and other hosts in the state, psyllid populations grew and became established.

Because of the extreme threat the disease poses to Florida citrus, the Department had been conducting HLB surveys for many years. Once the Asian citrus psyllid was discovered, survey efforts were intensified.

As part of a cooperative effort between the state and the USDA, targeted surveys were initiated in communities with concentrations of people from countries where HLB is endemic, because these areas may be at higher risk of receiving infected plant material. In 2005, during one of the targeted HLB surveys, two citrus trees showing symptoms of HLB were identified in South Florida. Laboratory tests confirmed the Asian form of HLB.

HLB Control Challenges

- Limited knowledge of host range
- Difficult to detect disease before symptoms are displayed - can take years
- Illegal importation of infected plant material
- Disease can be graft transmitted from apparently healthy budwood sources, because symptoms may take time to develop
- Pesticides will kill psyllids, but numbers of applications and quantities necessary to control populations are logistically, economically and environmentally challenging



DPI entomologist surveying for HLB

What's being done to control HLB?

All HLB host plants in regulated areas are under quarantine and cannot be moved. Movement of psyllid host material in regulated areas is allowed from nurseries that have signed compliance agreements with the state and who adhere to specific treatment regimens.

Comprehensive surveying continues. Educating growers on management of the disease and protecting Florida's propagative source trees and citrus nursery stock are priorities.

Citrus disease management . . . The big picture

With the establishment of HLB, canker and other citrus diseases, agriculture officials are working to protect citrus production and mitigate the impact of unwanted pests and diseases. An overarching Citrus Health Response Program has been implemented and involves standards for citrus inspection, regulatory oversight, disease management and education. Efforts include training growers how to identify citrus diseases and how to manage psyllids. To ensure their source trees are clean when new resets are planted, all citrus nursery stock now has to be produced in insect-proof structures and in accordance with strict production facility specifications.



Grower self-survey program



T. radiata

Biological control: Reducing psyllid populations with natural enemies can limit losses due to HLB. The Department in conjunction with the University of Florida has imported a parasitic wasp, *Tamarixia radiata*, from Asia and released it into Florida where it has become established. This wasp along with other native natural enemies has reduced the population of Asian citrus psyllids. This biological control mechanism will not eliminate the psyllid, but will help control the spread of HLB.

The Department, with agreement from the USDA, is relying on the best science available to determine disease control actions. As data is gathered, control activities may be adjusted.

Citrus Health Response Program

- Program designed to provide protection at every level of citrus production
- Registration required for producers, production units, nurseries, budwood facilities, harvesters, packing houses and processors
- Surveys conducted to verify compliance requirements for fruit harvest and disease freedom in nurseries and budwood facilities
- Fresh fruit certification—maintain fruit identity and proper phytosanitary documentation, packing house post-harvest inspection and treatment monitoring
- Disease management strategies implemented for fruit production systems and dooryard citrus

Working together to grow healthy citrus

Looking forward . . . What can the public do?

The public plays an important role in protecting Florida's natural environment and plant life. There are many resources available to assist and educate home gardeners about plant pests and diseases. If you suspect your trees may be infected with HLB, please call the Department's toll-free helpline or your local county extension office, or visit the Web sites listed below for more information.

If it is determined that your tree is infected with HLB, it is recommended that you destroy the tree before it infects other citrus in the area. Though there is no cure for HLB, spread of the disease can be slowed by the voluntary removal of infected trees.

Some important actions that individuals can take to protect Florida agriculture and our natural environment include:

Purchase only certified plants from registered nurseries

Be vigilant - if you see signs of disease or an unusual pest, contact your county extension office or the FDACS/DPI helpline.

Don't pack a pest - when returning home to Florida from a trip, don't bring plants, fruits, vegetable or illegal animals.

Ask for advice - contact your county extension office or visit www.doacs.state.fl.us/pi for tips on caring for your citrus trees or managing citrus diseases.

Consider planting alternative fruit trees - for a list of those that will grow well in your area, contact your county extension office or visit www.doacs.state.fl.us/pi



(800) 282-5153

www.doacs.state.fl.us/pi
www.aphis.usda.gov



- HLB SYMPTOMS**
- **Yellow shoots**
Amarillamiento de brotes terminales
 - **Twig die-back**
Muerte regresiva
 - **Reduced fruit size & quality**
Reducción de la calidad y tamaño del fruto
 - **Lopsided fruit**
Deformación del fruto
 - **Bitter, inedible fruit**
Agridamiento del fruto
 - **Leaf mottling or discoloration**
Moteado de la hoja
Deformación de la hoja

