

Citrus Greening Disease and Asian Citrus Psyllid

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Citrus greening (CG, also called Huanglongbing, HLB) is one of the most destructive diseases on citrus trees. The disease is prevalent in Asia, Africa, and South America. In 2005, Florida Department of Agriculture and Consumer Services and USDA confirmed detection of the Asian form of citrus greening disease first time in the United States from Miami-Dade County, Florida. Now the disease has been detected in 30 counties in Florida. Asian citrus psyllid (ACP), as a pest of citrus, is also a natural vector of CG disease, and it has been found in Alabama, Florida, Georgia, Hawaii, Louisiana, Texas, Puerto Rico, Guam, and portions of California and South Carolina. To prevent the spread of this disease and its vector, USDA-APHIS has ordered a series of Federal Orders to impose restrictions on the interstate movement of CG and/or ACP host plants from quarantined areas.



Why should we monitor CG/ACP? Nevada is not a citrus growing state. However, citrus or citrus relatives from other states are sold in retail nurseries in southern Nevada, and they are planted either in residential areas or landscapes. The chance of bringing this disease and its vector to the state still exists. More importantly, our monitoring is a part of national efforts to prevent the spread of the disease. Federal quarantine can significantly reduce the risk of dissemination of CG and ACP, but a state with CG/ACP hosts still needs to monitor them for potential introduction. If an introduction is not known or undetected, CG or ACP is likely to by-pass federal quarantine to reach citrus growing states.

Symptoms to look for: The typical symptom is leaf yellowing that may appear on a single shoot or branch (Fig.2, left). The yellowing can spread to other branches to give rise to more yellow shoots, and the yellowing leaves are generally smaller than the normal (Fig.2, middle). The Chinese name “Huanglongbing” actually describes this type of symptom, as Huanglongbing literally means yellow (Huang) shoot (Long) disease (Bing). In the early stage of the disease, yellowing leaf may not be typical; instead mottled or blotchy appearance is obvious (Fig.2, right). Severely affected trees may show twig dieback. In nurseries, citrus or relatives with yellow and/or mottle symptoms are worthy to be examined carefully for citrus greening disease.



Fig. 2. Symptoms of citrus greening disease. Left: A yellow shoot on a sweet orange; Middle: yellow shoots and smaller leaves on a grapefruit; Right: Leaf mottle on a pummelo. Red arrows indicate the symptomatic leaves.

Pathogen and Identification: Citrus greening is caused by phloem-limited unculturable bacterium called *Candidatus Liberibacter*. There are three forms of citrus greening disease: African CG caused by *Candidatus Liberibacter africanus*, South American CG caused by *Candidatus Liberibacter americanus*, and Asian CG caused by *Candidatus Liberibacter asiaticus*. The disease found in Florida belongs to Asian form of citrus greening. This pathogen can only be reliably identified or detected through molecular diagnostic procedures.

Hosts: Citrus greening disease affects majority of citrus species, hybrids, cultivars and their relatives. Most susceptible hosts are sweet oranges, mandarins, mandarin hybrids (tangelo). Lemon, grapefruit, pummelo, and sour orange are also very susceptible. Some host plants can be infected without visible symptoms.

Vector: The Asian citrus psyllid (*Diaphorina citri* Kuwayama) transmits Asian form of citrus greening disease. This species is widespread in Asia, the Indian subcontinent, Saudi Arabia, Reunion and Mauritius. It was also found in South and Central America, and now is found in the United States including Florida (well established) and some of southeast states. Recently, it was found in a portion of Imperial and San Diego counties of California. The psyllid feeds and survives on citrus or citrus relatives. Once a psyllid acquires the bacterium from a diseased tree, the bacteria can be transmittable during the entire life of the psyllid. However, the progeny of the infected psyllid is free of the bacterium unless they acquire the bacterium from infected trees by themselves. Pictures on right show the Asian citrus psyllid nymph (left) and adult (right).



Monitoring citrus greening and Asian citrus psyllid in nurseries:

Plants shipped from other states have a risk of carrying citrus greening bacteria and/or Asian citrus psyllid. Inspectors and nursery professionals should examine all imported CG/ACP host plants carefully for CG symptoms and signs of ACP infestation. The first sign of potential citrus greening is the leaf yellowing or mottling (see pictures on right). These symptoms may resemble symptoms caused by zinc or other mineral deficiency. Other suspicious symptoms are twig dieback and stunting. When taking a sample, approximately 15 representative symptomatic leaves including petioles should be collected and submitted to the state plant pathology laboratory for testing. A single yellow shoot can be cut out from a plant as a part of the sample. If any stages of psyllid or the like is found in a shipment or nursery plants, immediately notify Nevada Department of Agriculture for further inspection. Suspicious specimen should be submitted to the state entomology lab for identification. Shipment or nursery plants should be on hold for further notice.



References:

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