

Asian Citrus Psyllid (Hemiptera: Psyllidae) and Citrus Greening Disease in Louisiana

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Abstract. The Asian citrus psyllid, *Diaphorina citri* Kuwayama, was detected in Orleans Parish, LA, in May 2008. Soon after detection, the tree upon which the Asian citrus psyllid had been found tested positive for citrus greening (or huanglongbing). In response to these detections, personnel from the Louisiana State University AgCenter worked with representatives of the Louisiana Department of Agriculture and Forestry and USDA-APHIS-PPQ to respond to the situation. Pest control recommendations were developed for nursery, commercial, and backyard citrus production. This information was distributed to stakeholders via traditional extension channels (publications, media, Internet sites, and in-person presentations). County field faculty worked with inspectors to identify locations to survey. The efforts culminated in the implementation of an area-wide management approach in Plaquemines Parish, the largest citrus-producing region of Louisiana. To date, huanglongbing has not been detected in Plaquemines Parish and Asian citrus psyllid has been suppressed by carefully timed applications of insecticide. We continue to work with USDA-APHIS-PPQ and the Louisiana Department of Agriculture and Forestry to monitor the situation.

Resumen. El psílido asiático de los cítricos, *Diaphorina citri* Kuwayama, se detectó en el municipio de Orleans, LA, en Mayo 2008. Poco después de esta detección, el árbol sobre el que se había recolectado ACP fue positivo para el enverdecimiento de los cítricos (huanglongbing). En respuesta a estas detecciones, el personal del centro de agricultura de la Universidad Estatal de Louisiana trabajó con representantes del Departamento de Louisiana de Agricultura y Silvicultura y el USDA-APHIS PPQ para desarrollar una respuesta a la situación. Recomendaciones para el control de plagas se han desarrollado para viveros, comerciales y de producción doméstica, de árboles cítricos. Esta información fue distribuida a las partes interesadas a través de canales tradicionales de extensión (publicaciones, medios de comunicación, páginas web y seminarios). El personal de campo del condado trabajó con los inspectores para identificar las áreas a evaluar. Los esfuerzos culminaron en la aplicación de un enfoque para una amplia zona en el municipio de Plaquemines, la región productora mas grande de cítricos de Louisiana. Hasta la fecha, huanglongbing no ha sido detectado en el municipio de Plaquemines y la población ACP ha sido suprimida por las aplicaciones cuidadosamente programadas de insecticidas. Seguimos trabajando con el USDA-

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Introduction

One of the most potentially devastating pest/disease complexes recently detected in Louisiana is the Asian citrus psyllid, *Diaphorina citri* Kuwayama, and huanglongbing. Asian citrus psyllid is an extremely destructive citrus pest because it is the vector of a disease, huanglongbing (also known as citrus greening), for which there is no control. This insect/disease complex has resulted in the loss of hundreds of thousands of acres of citrus production in Florida. The presence of the Asian citrus psyllid was originally reported by a homeowner in Algiers, LA (Orleans Parish) in late May 2008. The homeowner observed an insect on her citrus tree that she did not recognize and found a picture of Asian citrus psyllid on a Louisiana State University AgCenter web page (www.lsuagcenter.com). This identification was confirmed by USDA-APHIS-PPQ in early June, and shortly thereafter the Persian lime tree, *Citrus latifolia* Tan, from which the the psyllid was first collected was confirmed to be infected with the bacterium that causes huanglongbing.

Situation and Extension Response

Huanglongbing is a serious threat to the Louisiana citrus industry and to home orchards. All species of citrus are susceptible to the disease and other members of the Rutaceae (citrus family) may also serve as hosts, particularly orange Jessamine, *Murraya paniculata* (L.). Once a tree is infected, there is no cure. Infected trees rapidly decline in vigor and eventually die. The disease is caused by the bacterium *Candidatus Liberibacter asiaticus* that inhabits the phloem of citrus trees, ultimately causing the phloem to degenerate. Detection of the disease in the early (pre-symptomatic) stages is difficult at best, if not impossible. Currently, polymerase chain reaction (PCR) is the only rapid way to detect the pathogen, which cannot be grown in culture. Initially, symptoms may be expressed in only one sector (or branch) of the tree, but the disease will eventually spread throughout the tree.

Citrus affected by huanglongbing may not show symptoms for 2-3 years after infection. Symptoms vary according to time of infection, stage of the disease, tree species, and tree maturity. As the pathogen moves within the phloem of the tree, individual branches and eventually the entire tree may turn yellow. The most characteristic foliar symptoms of huanglongbing are a blotchy yellow mottling of the leaves and a yellowing of leaf veins and shoots. Newly infected trees show blotchy mottling; chronically infected trees show symptoms similar to zinc deficiency. Other symptoms include premature leaf and fruit drop, poor flowering, twig dieback, and stunted growth. Fruit from diseased trees are usually small and misshapen, and typically, some green color remains on ripe fruit. Huanglongbing-affected fruit have a sour or bitter taste and seeds are usually aborted (Gottwald et al. 2007).

The detection of Asian citrus psyllid/huanglongbing prompted an immediate response by USDA-APHIS-PPQ and Louisiana Department of Agriculture and Forestry to survey all citrus-producing regions of the state. Simultaneously, it prompted a response by members of the Louisiana State University AgCenter to inform and educate AgCenter personnel (county agents) and the public regarding this new threat to Louisiana citrus production. As a team, we published extension

educational materials, conducted meetings with producers and homeowners, distributed information to the media, produced a video on how to scout for Asian citrus psyllid and huanglongbing/greening (Hummel and Ferrin 2008a,b,c,d), and also developed recommendations for control of Asian citrus psyllid in commercial citrus production (organic and conventional), nurseries, and backyards. We also worked with the Plaquemines Parish government to implement an area-wide management plan we believe has prevented an outbreak of huanglongbing in Plaquemines Parish.

Conclusion

Detections of Asian citrus psyllid and huanglongbing in Louisiana have altered citrus pest management strategies by increasing the number of pesticide applications and restrictions on the movement of nursery plants throughout the state and into neighboring citrus-producing states. This pest was originally detected by an alert and watchful homeowner, whose actions likely saved the Louisiana citrus industry from extensive infestation and irreparable harm. The response to detections of Asian citrus psyllid and huanglongbing in Louisiana was a coordinated effort between the Louisiana State University AgCenter, state and federal regulatory agencies, and parish governments. This cooperative effort has resulted in an extremely slow rate of disease spread across citrus-producing areas of Louisiana. We continue to foster a cooperative working group in response to this, and other, invasive species infesting citrus in Louisiana.

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