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Special Feature

The Regulatory Corner: Citrus not so green with citrus greening

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Citrus is a major food crop for the United States and more specifically in the southeastern U.S. The total citrus crop in the 2007/08 year is valued at $3.22 billion according to the National Agricultural Statistical Service. Among the top citrus producing states, Florida is number one, with a crop valued at $1.76 billion, followed by California at $1.37 billion and Texas with $30.1 million. In the midsouth, Louisiana also has a significant amount of commercial citrus acreage. According to the August 2007 *World Markets & Trade: Citrus* report, published by the USDA Foreign Agricultural Service–Office of Global Analysis, the United States is ranked 3rd among citrus-producing countries, behind Brazil and China who are 1st and 2nd, respectively.

No doubt the citrus industry is in great jeopardy from the introduction of exotic pests, especially since the top-producing states are near major seaports and international airports and are also exposed to millions of foreign travelers each year.

One major problem recently imported into Florida is citrus greening (CG), also known as huanglongbing disease, a bacterial disease that can be caused by any one of three *Liberibactor* species. *Liberibactor asiaticus* is the pathogen currently found in the U.S. Of entomological concern is the fact in the United States CG is vectored by the Asian citrus psyllid (ACP), *Diaphorina citri* (Duwayama), one of two psyllids known to transmit the disease. The CG disease has been found in over 30 counties in Florida, initially in 2005, and two Louisiana parishes more recently. The insect vector has been found in Florida, Louisiana, Texas, Mississippi, Alabama, Georgia and South Carolina.

Figure 1. Asian citrus psyllid adult. Photo courtesy USDA-APHIS.

Potential Damage

CG is one of the most serious diseases of citrus. According to the Florida Department of Agriculture and Consumer Protection, citrus canker eradication efforts by the state (costing $500 million so far) have already killed over 4,000,000 trees, and citrus greening is said be capable of far worse damage. Infected

trees decline within 5 to 8 years after planting and rarely bear usable fruit. The disease organism inhabits the phloem (nutrient-carrying tissues) of the plant. It is significant that it can not be cultured in the laboratory; therefore, research efforts are greatly hindered in finding control mechanisms. No pesticides are known to be effective against the disease organism. The only viable means of suppressing the disease is through cultural practices of removing diseased trees. CG can be transmitted by grafting diseased bud wood. Unfortunately, disease symptoms may not be manifested for several years after the tree is exposed. The name "Greening" comes from the fact that CG causes trees to produce predominantly greened (worthless) and deformed fruit, which fails to ripen, and induces a bitter-salty flavor when processed.

Biology and Symptomology of Citrus Greening

Foliar symptoms of CG include blotchy mottling of leaves and yellowing of leaf veins and shoots. Newer leaves may display symptoms than can be mistaken as signs of zinc deficiency and older leaves show the mottling effects. Other associated symptoms are poor flowering, stunted growth and twig dieback.

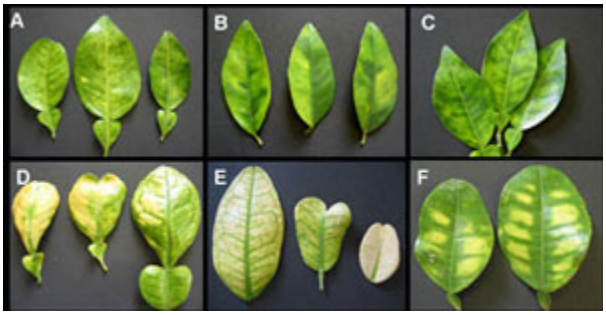

Figure 1. Leaf symptoms of CG. Photo courtesy of USDA-APHIS.

Affected fruit are often small and misshapen with some green areas often remaining on the ripe fruit. The fruit will taste bitter, medicinal and sour. Seed and fruit set are also very poor. Symptoms will vary according to host, time of infection, stage of disease and host maturity.

Figure 2. Citrus fruit infected with CG. Photo courtesy of USDA-APHIS.

Hosts

The insect psyllid vector is believed to have been introduced into Florida on nursery specimens of orange jasmine, *Murraya* spp., as an ornamental landscape plant that is also a preferred host of *D. citri.* The host list consists of approximately 40 species and genera combined, including all citrus species and many ornamental plants.

Regulatory Activities

Because of the parasite/host relationship, federal and state regulatory requirements are aimed at eradication, suppression and “control the spread” of both the CG pathogen and the insect vector. A federal quarantine is in effect for all of Florida and Georgia, eight Louisiana parishes, three counties in South Carolina, in Hancock County, Mississippi, 32 counties in Texas, in Baldwin County, Alabama, a portion of San Diego County, California as well as in Hawaii, Guam and Puerto Rico. Under federal order,

host plants can not legally be shipped from *any of these states* to another citrus-producing state except to another quarantined county or parish and after treatment for ACP, inspection and certification is achieved. USDA/APHIS/PPQ officials have determined that host plants and other regulated items can not even be moved from infected/infested counties or parishes within states to other non-infested areas of the state. Nurseries in quarantined areas must sign compliance agreements in order to be allowed to ship host plants.

For more details and a list of host plants for CG and ACP readers may go to the APHIS website for citrus greening.[1] Persons who find *D. citri* or observe symptoms of CG on host plants should report the situation to their respective state's regulatory agency.

[1] http://www.aphis.usda.gov/plant_health/plant_pest_info/citrus_greening/index.shtml