Invasive Pests in California

Ted Batkin
Citrus Research Board

Asian Citrus Psyllid and Huanglongbing: The Glass is Half Full

The plight of the
US Citrus Industry

Liberibacter appears to multiply in the psyllid

Psyllid retains the bacteria FOR LIFE!

CRB Response Plan

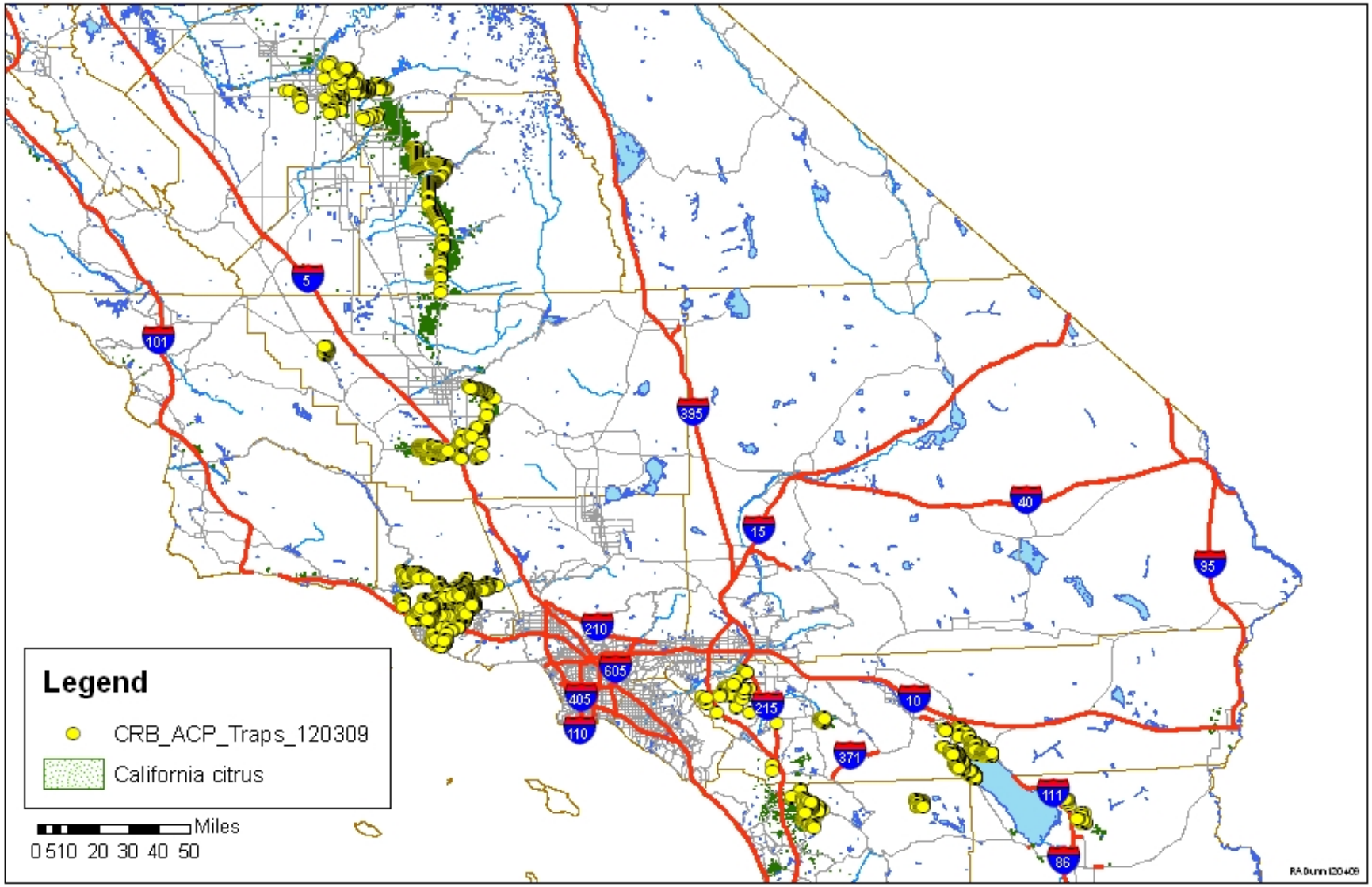
- Early Detection / Rapid Response
- Find the psyllid early
- Test every psyllid found for HLB
- Treat all populations early to prevent or suppress spread
- Remove any host plant material that has eh HLB causing baceria

Brian Taylor, Field Director

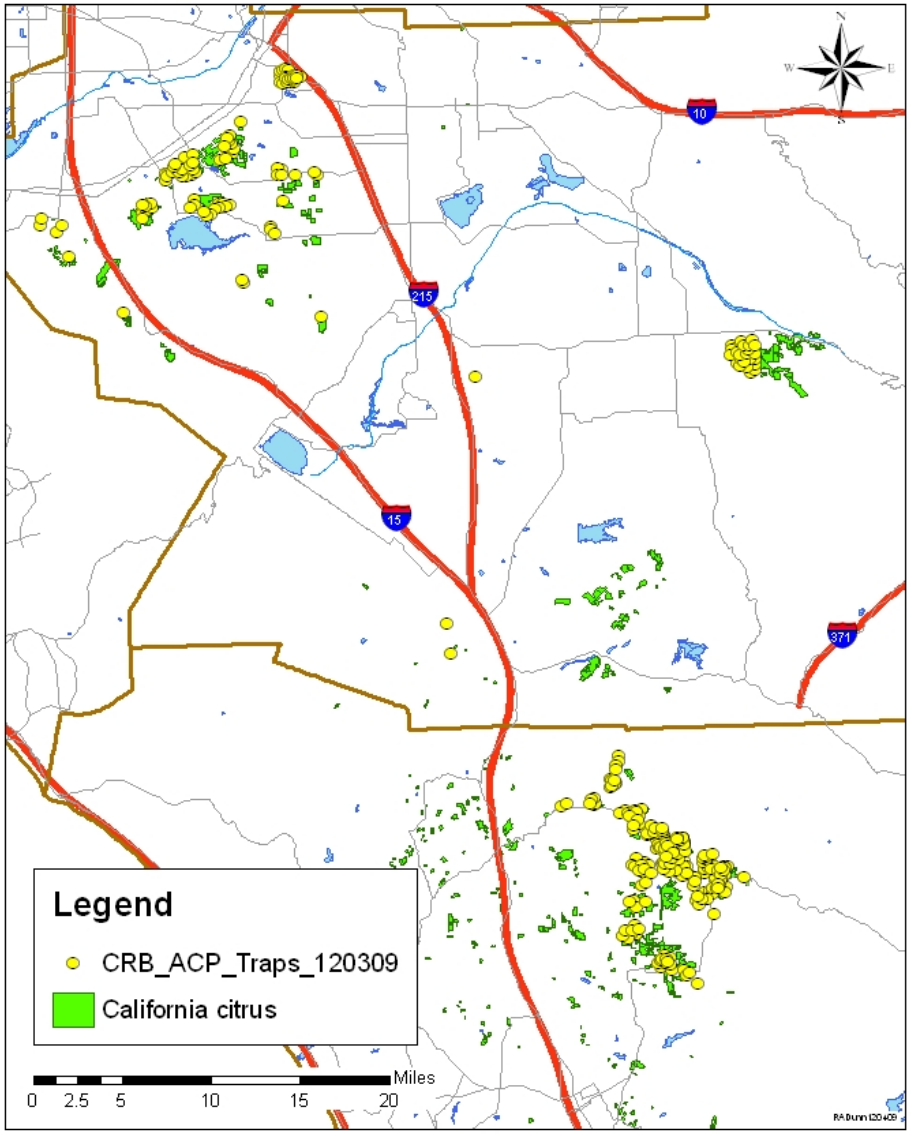
Government Insect Trap
Do Not Disturb

G-Series

CRB ACP Traps as of 12/3/2009



CRB ACP Traps as of 12/3/2009
Western Riverside and northwest San Diego counties



UC RIVERSIDE UNIVERSITY OF CALIFORNIA

Strategies for Reaching the Public in California

HLB Task Force
Communications Subcommittee

Mission Statement

To communicate to the general public the devastating nature of ACP and HLB, to educate the citrus and ornamental industry in the details of identification and management of the pest and disease and to provide communication linkages between Governmental agencies, the University, and the citrus industry

California Department of Food and Agriculture
University of California
Citrus Research Board
USDA

University of California ANR Publications: 2006-07

Select & Zoom

PUBLICATION 8205

Asian Citrus Psyllid

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Division of Agriculture and Natural Resources
http://anrcatalog.ucdavis.edu

UC IPM

UC Exotic/Invasive Pest and Disease Program

UC PEER REVIEWED

The Asian citrus psyllid, *Diaphorina citri* Kuwayama (Homoptera: Psyllidae) (fig. 1) is a pest of citrus and close relatives of citrus. Asian citrus psyllid damages plants directly through its feeding activities. New shoot growth that is heavily infested by psyllids does not expand and develop normally and is more susceptible to breaking off. While direct damage is serious, there is even greater concern that the psyllid is an efficient vector of the bacterium that causes the economically devastating disease citrus greening, or Huanglongbing.

Asian citrus psyllid is found in tropical and subtropical Asia, Afghanistan, Saudi Arabia, Reunion, Mauritius, parts of South and Central America, Mexico, and the Caribbean (fig. 2). In the United States, Asian citrus psyllid was first found in Palm Beach County, Florida, in June 1998 in backyard plantings of *Murraya paniculata* (orange jasmine) (fig. 3). By 2001, it had spread to 31 counties in Florida, with much of the spread due to movement of infested nursery plants (Halbert et al. 2002). In the spring of 2001, Asian citrus psyllid was accidentally introduced into the Rio Grande Valley of Texas on potted nursery stock (orange jasmine) from Florida (French et al. 2001). The Asian citrus psyllid could invade California at any time, with most likely sources of infestation being Florida, Mexico, or Asia. There were 170 interceptions of Asian citrus psyllid at U.S. ports on plant material (primarily *Murraya* and citrus) from Asia from 1985 to 2003.

Figure 1. Asian citrus psyllid adult and nymphs. Photo by M. E. Rogers.

Figure 2. Worldwide distribution of Asian citrus psyllid alone (orange) and the psyllid in combination with the Asian form of greening disease (green). Illustration by G. H. Montiz.

Figure 3. *Murraya paniculata*, orange jasmine. Photo by E. E. Grafton-Cardwell.

PUBLICATION 8218

Citrus Bacterial Canker Disease and Huanglongbing (Citrus Greening)

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INTRODUCTION

Compared with the rest of the world, the California citrus industry is relatively free of diseases that can impact growers' profits. Unfortunately, exotic plant pathogens may become well established before they are recognized as such. This is primarily because some of the initial symptoms mimic other diseases, mineral deficiencies, or toxicities. In addition, development of disease symptoms caused by some plant pathogenic organisms occurs a long time after initial infection. This long latent period results in significantly delayed disease diagnosis and pathogen detection. Citrus canker (CC) and huanglongbing (HLB, or citrus greening) are two very serious diseases of citrus that occur in many other areas of the world but are not known to occur in California. However, if the pathogens causing these diseases are introduced into California, they will create serious problems for the state's citrus production and nursery industries.

CITRUS BACTERIAL CANKER DISEASE

Citrus bacterial canker disease (CC) is caused by pathotypes or variants of the bacterium *Xanthomonas axonopodis* (formerly *campestris*) pv. *citri* (*Xac*). This bacterium is a quarantine pest for many citrus-growing countries and is strictly regulated by international phytosanitary programs. Distinct pathotypes are associated with different forms of the disease (Gottwald et al. 2002a). All disease forms are subject to the same international phytosanitary regulations.

Figure 1. Areas shaded in red indicate the presence of citrus canker. The cross-hatched area in Australia shows where citrus canker occasionally occurs and infected trees are removed. *Source:* G. H. Montez, UC Kearney Agriculture Center.

Xac probably originated in Southeast Asia or India and presently occurs in over 30 countries including the United States (Florida) and Australia (northern region). *Xac* is present in Asia, Pacific and Indian Ocean islands, and South America. It is also found in dryer, more temperate areas in Southwest Asia and the Middle East, occurring in countries such as Iran, Iraq, Oman, Saudi Arabia, United Arab Emirates, and Yemen. (Whiteside et al. 1988; Gottwald et al. 2002a) (fig. 1).

Citrus canker occurs primarily in tropical and subtropical climates where considerable rainfall accompanies warm temperatures, but it can also occur in drier climates. CC becomes a serious disease when wet weather conditions occur during the periods of shoot emergence and development of young citrus fruit. Pathotypes of CC may vary in their severity, host range, and location in the world. CC-A (Asiatic canker) is the most severe form of the disease; it affects most citrus varieties and is the most economically

University of California www.ccpp.ucr.edu/
G. Vidalakis (Dept of Plant Pathology)
and E. Grafton-Cardwell (Dept of Entomology)

Spanish
English
Chinese

Citrus Research Board and Nuffer Smith and Tucker flyer

In English, Spanish, Hmong, Vietnamese, Chinese, Punjabi, Khmer

No more California citrus?

That's what is at stake if the disease-carrying Asian citrus psyllid gets a foothold.

It must be stopped – before it's too late.

The Dangerous Pest: Asian Citrus Psyllid

- A small insect, about the size of an aphid.
- Feeds on citrus leaves and stems.
- Is a carrier of the deadly bacterial plant disease, Huanglongbing (HLB) also known as citrus greening disease.
- This insect has already been found at several sites in California.
- It threatens our locally produced citrus and Californians' ability to grow citrus in their backyards.

The Disease: Huanglongbing (HLB)

- Destroys production, appearance and value of citrus trees.
- Causes asymmetrical yellowing and splotching of leaves.
- Produces bitter, inedible, misshapen fruit.
- Is fatal to citrus trees.

The Solution: We All Play a Critical Role

- It can take years for symptoms of the disease to appear, meaning inspection for and elimination of the psyllid is our first line of defense.
- HLB is also spread through grafting with infected budwood. Be sure to plant only certified disease-free citrus trees from a reputable nursery and do not bring any plant material into California from other states or countries.
- Inspect trees monthly and whenever watering, spraying, pruning or tending trees.
- If you find the Asian citrus psyllid, act fast! Call your County Agricultural Commissioner or the CDFA hotline at **800.491.1899**. Time is critical.

To learn about the Asian citrus psyllid and HLB disease, visit

CaliforniaCitrusThreat.org

Printed materials in English, Spanish and Chinese are downloadable from this Web site.

CITRUS RESEARCH BOARD

¿Se quedará California sin cítricos?

Esto podría suceder si el psílido asiático de los cítricos y la enfermedad que transmite se establece en el estado.

Debemos detenerlo – antes de que sea demasiado tarde.

La peligrosa plaga: el psílido asiático de los cítricos

- Un insecto diminuto (3-4 mm), del tamaño de un áfido.
- Se alimenta de las hojas y tallos de los cítricos.
- Es portador de la enfermedad Huanglongbing (HLB) la cual mata las plantas. También se le conoce como el enverdecimiento de los cítricos.
- Este insecto ya se ha encontrado en el Sur de California.
- Representa una seria amenaza para la producción y cultivo de cítricos en California.

La enfermedad: Huanglongbing (HLB)

- Hace que las hojas se tornen de un color amarillento con moteado. (ver foto a la izquierda)
- Produce frutos amargos, incomibles y deformes.
- Daña la apariencia y reduce el valor de los árboles de cítricos.
- Es mortal para los árboles de cítricos.

La solución: todos jugamos un papel importante

- La detección y eliminación del psílido es la primera línea de defensa contra la enfermedad.
- Es ilegal traer árboles de cítricos a California provenientes de otros estados o países, porque podrían estar infectados con HLB. Asegúrese de plantar sólo árboles de cítricos cultivados en California y que hayan sido certificados como libres de enfermedades.
- Inspeccione sus árboles con frecuencia en busca de señales del insecto o de la enfermedad.
- Si sospecha que sus árboles tienen el psílido asiático de los cítricos, actúe de inmediato! Llame a la línea directa de CDFA al **800.491.1899** o comuníquese con el Comisionado de Agricultura de su condado. ¡No pierda un minuto para hacerlo!

Para conocer más acerca del psílido asiático de los cítricos y el HLB, visite el sitio

PeligranCitricosEnCalifornia.org

En este sitio se pueden descargar materiales impresos en inglés, español, chino y otros idiomas.

CITRUS RESEARCH BOARD

www.saygoodbyetocaliforniacitrus.com

Citrus Research Board www.CaliforniaCitrusThreat.org

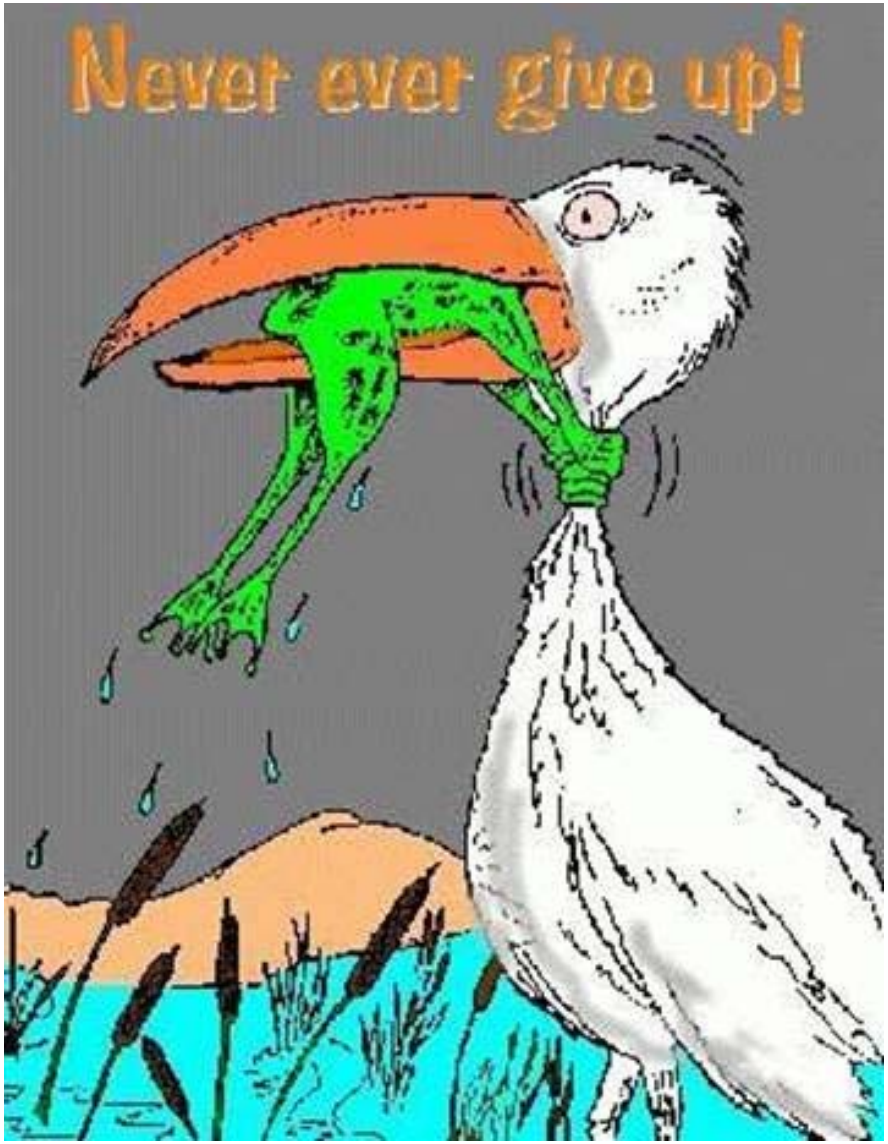
Citrus Research Board www.PeligranCitricosEnCalifornia.org

Banners on cotton trailers

Citrus Research Board

Communications Opportunities and Challenges

- Fresh news to retain the interest of the general public
- Addressing the cultural aspects of plant movement
- Social media: using it for education and countering anti-pesticide efforts
- Size of the audience, severity of the problem and the rapidity with which the situation changes



Thank you !!!