CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE

OFFICIAL NOTICE
FOR COMMUNITIES IN SANTA BARBARA COUNTY
PLEASE READ IMMEDIATELY

PROCLAMATION OF EMERGENCY PROGRAM FOR ASIAN CITRUS PSYLLID AND HUANGLONGBING

Between December 2, 2021 and January 11, 2022, the California Department of Food and Agriculture (CDFA) confirmed the presence of the insect, Asian citrus psyllid (ACP), *Diaphorina citri* Kuwayama, which feed on citrus plants and spread the disease huanglongbing (HLB), a devastating disease of citrus. ACP were collected in the city and community of Goleta in Santa Barbara County. ACP present a significant, clear, and imminent threat to California's commercial citrus production, residential citrus plantings, natural resources, and economy. Unless emergency action is taken to disrupt these ACPs life cycles, there is high potential for sudden future detections in and around commercial groves in Santa Barbara County.

In accordance with integrated pest management principles, CDFA evaluated possible treatment methods and determined that there are no cultural, physical, or biological control methods available to adequately control ACP in this area. The Proclamation of Emergency Program is valid until January 11, 2023, which is the amount of time necessary to determine that the treatment was successful.

The detections of ACP described above require immediate action to address the imminent threat to California's commercial citrus production, residential citrus plantings, natural resources, and economy. More specifically, in addition to a variety of commercial citrus crops, ACP threatens loss and damage to native wildlife, private and public property, and food supplies. Due to ACP being a vector for the bacteria that causes HLB and the rapid reproductive rate of ACP, there is a high potential for ACP to establish and spread, resulting in sudden future detections of ACP and HLB in the cities and communities listed above. Therefore, the Secretary of the California Department of Food and Agriculture is invoking Public Resources Code Section 21080(b)(4) to carry out immediate emergency action to prevent the aforementioned loss and damage to California's resources.

The surveillance and treatment plan for the ACP infestation will be implemented within a 250-meter radius of each detection site in all areas (except Imperial County where the area is 800-meter radius due to a sparse distribution of commercial groves and residential properties), as follows:

1. Surveillance

    a. Trapping and visual survey within 250-meters of commercial citrus groves in all areas (except Imperial County where the trapping and visual survey area is 800-meters due to distribution of commercial groves and residential properties).

    b. ACP and HLB Visual Survey. All find sites and adjacent properties are visually surveyed for ACP and HLB.

    c. HLB Disease Testing. All symptomatic host tree tissues, and ACP life stages shall be tested for the presence of *C*Las.

2. Treatment. All properties with hosts within a 250 to 800-meter radius of the detection site are treated according to the following protocol to control ACP:

    a. Tempo® SC Ultra (cyfluthrin), a contact insecticide for controlling the adults and nymphs of ACP, will be applied from the ground using hydraulic spray equipment to the foliage of host plants; and

    b. Merit® 2F or CoreTect™ (imidacloprid), a systemic insecticide for controlling the immature life stages of ACP, will be applied to the soil underneath host plants. Merit® 2F is applied from the ground using hydraulic spray equipment. CoreTect™, which is used in place of Merit® 2F in situations where there are environmental concerns about soil surface runoff of liquid Merit® 2F, is applied by inserting tablets into the ground and watering the soil beneath the host plants.

Public Notification:

Residents of affected properties shall be invited to a public meeting or contacted directly by CDFA staff. Consultation with the California Department of Pesticide Regulation, the Office of Environmental Health Hazard Assessment, and the county agricultural commissioner's office will be provided at the public meeting or upon request to address residents' questions and concerns.

Residents are notified in writing at least 48 hours in advance of any treatment in accordance with the Food and Agricultural Code sections 5771-5779 and 5421-5436.

Following the treatment, completion notices are left with the residents detailing precautions to take and post-harvest intervals applicable to the citrus fruit on the property.

Treatment information is posted at http://cdfa.ca.gov/plant/acp/treatment_maps.html. Press releases, if issued, are prepared by the CDFA information officer and the county agricultural commissioner, in close coordination with the program leader responsible for treatment. Either the county agricultural commissioner or the public information officer serves as the primary contact to the media.

Information concerning the HLB/ACP program shall be conveyed directly to local and State political representatives and authorities via letters, emails, and/or faxes.

For any questions related to this program, please contact the CDFA toll-free telephone number at 800-491-1899 for assistance. This telephone number is also listed on all treatment notices.

Attachments

FINDINGS REGARDING AN EMERGENCY PROGRAM FOR ASIAN CITRUS PSYLLID AND HUANGLONGBING

Santa Barbara County
Program CR-9123

Between December 2, 2021 and January 11, 2022, the California Department of Food and Agriculture (CDFA) confirmed the presence of the insect, Asian citrus psyllid (ACP), *Diaphorina citri* Kuwayama, which feed on citrus plants and spread the disease huanglongbing (HLB), a devastating disease of citrus. ACP were collected in Santa Barbara County. Unless emergency action is taken to disrupt the ACP life cycle, there is high potential for sudden future detections in and around commercial citrus agriculture in Santa Barbara County and other areas.

ACP is an insect pest native to Asia. It has appeared in Central and South America. In the United States, ACP has been detected in Alabama, Arizona, Florida, Georgia, Hawaii, Louisiana, Mississippi, South Carolina, and Texas. In California, ACP has been detected in twenty-nine counties.

ACP feeds on members of the plant family Rutaceae, primarily on *Citrus* and *Murraya* species, but is also known to attack several other genera, including over forty species of plant that act as hosts and possible carriers. The most serious damage to the environment and property caused by ACP – the death and loss in value of host plants – is due to its vectoring HLB. In addition, ACP also cause injury to their host plants via the withdrawal of large amounts of sap as they feed and via the production of large amounts of honeydew, which coats the leaves of the tree and encourages the growth of sooty mold. Sooty mold blocks sunlight from reaching the leaves.

Due to the rapid reproductive rate of ACP, there is a high potential for ACP to establish and spread, resulting in sudden future detections of ACP/HLB in the cities and communities listed above.

If unabated, the establishment of HLB in California would harm the natural environment as commercial and residential citrus growers would be forced to increase pesticide use. It could lead to enforcement of quarantine restrictions by the USDA and California's international trading partners. Such restrictions would jeopardize California's citrus exports, which are valued at over $7 billion in economic revenue.

ACP is the vector for the bacteria that causes HLB and HLB is considered one of the most devastating diseases of citrus in the world. There is no cure for HLB. Symptoms of HLB include yellow shoots with mottling and chlorosis of the leaves, misshapen fruit, fruit that does not fully color, and fruit that has a very bitter taste, which makes it inedible for human consumption. These symptoms often do not appear until two years after infection, making this disease particularly difficult to contain and suppress. These undesirable symptoms of HLB-infected trees result in the trees' loss of commercial and aesthetic value while at the same time such trees are hosts for spreading HLB.

*C*Las was first detected in Los Angeles in 2012. It has subsequently been detected in Orange, Riverside, San Bernardino, and San Diego counties.

Infected trees are destroyed as soon as they are discovered. However, due to the length of time it takes for symptoms to appear on infected trees, new infestations continue to be discovered. If the current infestation is not abated immediately, ACP will likely become established in neighboring counties and could pave the way for a statewide HLB infestation.

CDFA evaluated possible treatment methods in accordance with integrated pest management (IPM) principles. As part of these principles, I have considered the following treatments for control of ACP: 1) physical controls; 2) cultural controls; 3) biological controls; and 4) chemical controls. Upon careful evaluation of each these options, I have determined that it is necessary to address the imminent threat posed by ACP using currently available technology in a manner that is recommended by the HLB Task Force.

Based upon input from the HLB Task Force, the Primary State Entomologist, the Primary State Plant Pathologist, USDA experts on HLB and ACP, and county agricultural commissioner representatives who are knowledgeable on ACP and HLB, I find there are no cultural, physical, or biological control methods that are adequately effective against ACP and allow CDFA to meet its statutory obligations, and therefore it is necessary to conduct chemical treatments to abate this threat. As a result, I am ordering insecticide treatments for ACP using ground-based equipment within a 250 to 800-meter radius around each ACP detection site and any subsequent sites.

Sensitive Areas

CDFA has consulted with the California Department of Fish and Wildlife's California Natural Diversity Database for threatened or endangered species, the United States Fish and Wildlife Service, the National Marine Fisheries Service and the California Department of Fish and Wildlife when rare and endangered species are located within the treatment area. Mitigation measures for rare and endangered species will be implemented. CDFA shall not apply pesticides to bodies of water or undeveloped areas of native vegetation. All treatment shall be applied to residential properties, common areas within residential development, non-agricultural commercial properties, and rights-of-way.

Work Plan

The proposed treatment area encompasses those portions of Santa Barbara County which fall within a 250-meter radius area around the property on which the ACP has been detected and any subsequent detection sites within the program boundaries. The Proclamation of Emergency Program is valid until January 11, 2023, which is the amount of time necessary to determine that the treatment was successful. Maps of the treatment boundaries are attached. The work plan consists of the following elements:

The proposed surveillance and treatment area encompasses those portions of Santa Barbara County which fall within a 250-meter radius area around the properties on which ACP were detected in all areas, (except Imperial County where the area is 800-meter radius is due to the sparse distribution of commercial groves and residential properties) and any subsequent detection sites within the proposed surveillance and treatment boundaries. The Proclamation of Emergency Program is valid until January 11, 2023, which is the amount of time necessary to determine that the treatment was successful. Maps of the treatment boundaries are attached. The work plan consists of the following elements:

1. Surveillance

    a. Trapping and visual survey within 250-meters of commercial citrus groves in all areas except Imperial County where the area is 800-meter radius due to distribution of commercial groves and residential properties.

b. ACP and HLB Visual Survey. All find sites and adjacent properties are visually surveyed for ACP and HLB.

c. HLB Disease Testing. All symptomatic host tree tissues, and ACP life stages shall be tested for the presence of *C*Las.

2. Treatment. All properties with hosts within a 250 to 800-meter radius of the detection site are treated according to the following protocol to control ACP:

a. Tempo® SC Ultra, containing the contact pyrethroid insecticide cyfluthrin, shall be applied by ground-based hydraulic spray equipment to the foliage of host plants for controlling the adults and nymphs of ACP. Treatment may be reapplied up to three times annually if additional ACP are detected.

b. Either Merit® 2F or CoreTect™, containing the systemic insecticide imidacloprid, will be applied to the root zone beneath host plants for controlling developing nymphs and providing long term protection against reinfestation. Merit® 2F is applied as a soil drench, while CoreTect™ tablets are inserted two to five inches below the soil surface and watered in to initiate tablet dissolution. CoreTect™ is used in place of Merit® 2F in situations where there are environmental concerns about soil surface runoff of the liquid Merit® 2F formulation, such as host plants growing next to ponds and other environmentally sensitive areas. Treatment may be re-applied once annually if additional ACPs are detected.

Public Information

Residents of affected properties shall be invited to a public meeting or contacted directly by CDFA staff. Consultation with the California Department of Pesticide Regulation, the Office of Environmental Health Hazard Assessment, and the county agricultural commissioner's office will be provided at the public meeting or upon request to address residents' questions and concerns.

Residents shall be notified in writing at least 48 hours in advance of any treatment in accordance with the Food and Agricultural Code (FAC), sections 5771-5779 and 5421-5436.

After treatment, completion notices are left with the residents detailing precautions to take and post-harvest intervals applicable to the citrus fruit. Treatment information is posted at http://cdfa.ca.gov/plant/acp/treatment_maps.html.

For any questions related to this program, please contact the CDFA toll-free telephone number at 800-491-1899 for assistance. This telephone number is also listed on all treatment notices. Treatment information is posted at http://cdfa.ca.gov/plant/acp/treatment_maps.html.

Press releases, if issued, are prepared by the CDFA information officer and the county agricultural commissioner, in close coordination with the program leader responsible for treatment. Either the county agricultural commissioner or the public information officer serves as the primary contact to the media.

Information concerning the HLB/ACP program will be conveyed directly to local and State political representatives and authorities via letters, emails, and/or faxes.

Findings

HLB and ACP pose a significant, clear, and imminent threat to California's natural environment, agriculture, public and private property, and its economy.

Unless emergency action is taken to disrupt the life cycles of recently detected ACP, then there is high potential for sudden future detections in Santa Barbara County.

The work plan involving chemical control of these pests is necessary to prevent loss and damage to California's natural environment, citrus industry, native wildlife, private and public property, and food supplies.

Therefore, I am invoking Public Resources Code Section 21080(b)(4) to carry out immediate emergency action to prevent this loss and damage.

My decision to adopt findings and take action is based on FAC sections 24.5, 401.5, 403, 407, 408, 5401-5405, and 5761-5764.

Signature on file *January 31, 2022*

Karen Ross, Secretary Date

Asian Citrus Psyllid Program - Treatment Around Commercial Citrus Groves in Southern California
Santa Barbara County
Proclamation of an Emergency Program Map (2022-01)

Treatment Area

Environmentally Sensitive Area: Treatment Mitigation in Place

0 0.5 1 Miles

Map Printed 1/25/2022

CITRUS PEST & DISEASE PREVENTION DIVISION

cdfa CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

Asian Citrus Psyllid/Huanglongbing Work Plan
December 2021

I. Detection and Survey Activities for Asian Citrus Psyllid

A. Urban and Rural Residential Detection Trapping and Visual Survey

Trapping for Asian citrus psyllid (ACP) is a cooperative state/county trapping program to provide early detection of an infestation in a county. Traps are serviced by either state or county agricultural inspectors. The trap used for ACP detection is the yellow panel trap, which is a cardboard panel coated with an adhesive on each side. ACP becomes entangled on the sticky surface and cannot move off the trap. Yellow panel traps have proven successful at detecting infestations of ACP. At all locations where traps are placed, the host plant is visually inspected for ACP. If ACP is detected, the host is visually surveyed for additional ACP and symptoms of huanglongbing (HLB).

- Trap Density: Five to 16 traps/square mile.
- Trap Servicing Interval: Monthly.
- Trap Relocation and Replacement: Traps are relocated and replaced every four to eight weeks to another host with a minimum relocation distance of 500 feet.
- Visual surveys and/or tap sampling are conducted once at each trapping site when the trap is placed.

B. Commercial Grove Trapping

In counties with substantial commercial citrus production, and which are not generally infested with ACP, traps are placed within the groves at the density of one trap per 40 acres. Traps are replaced every two weeks and submitted for screening. In areas that are generally infested with ACP, agricultural inspectors visually survey commercial groves for plant tissue displaying symptoms of HLB and collect ACP which are tested for *Candidatus* Liberibacter asiaticus (*C*Las), the bacteria that causes HLB.

Delimitation Trapping and Visual Survey Outside of the Generally Infested Area

The protocols below are the actions in response to the detection of ACP in counties north of Santa Barbara County and the Tehachapi Mountains.

1. Response to the Detection of One or More ACP

a. Trapping

ACP traps are placed at a density of 50 traps per square mile in a four-square mile delimitation area centered on the detection site. Traps are serviced weekly for one month. If no additional ACP are detected, the traps are serviced monthly for one year past the date the ACP was initially identified. Subsequent detections may increase the size of the delimitation survey area and restarts the one-year duration on the trap servicing requirement.

b. Visual Survey

All find sites and adjacent properties are visually surveyed for ACP and HLB. Additional sites may be surveyed as part of the risk-based survey.

II. Detection and Survey Activities for HLB

HLB Delimitation Survey

Upon confirmation of an HLB infected citrus tree (or host plant), a mandatory delimitation survey is initiated in the 250-meter radius area surrounding the detection. All host plants are visually

surveyed for symptoms of HLB and presence of ACP. Plant and insect samples are collected from every host plant in the 250-meter area and subsequently analyzed for *C*Las.

III. Treatment Activities

Treatment

The Citrus Pest and Disease Prevention Division (CPDPD) treatment activities for ACP vary throughout the state and depend on multiple factors.

Factors CPDPD considers prior to treatment include:

- Determination if suppression of ACP is feasible;
- The proximity of the ACP infestation to commercial citrus;
- Whether growers are conducting coordinated treatment activities;
- The level of HLB risk; and
- Consistency with the overall goal of protecting the state's commercial citrus production.

Scenarios Throughout the State in which Treatment Occurs:

- ACP detections in areas with commercial citrus production near previous HLB detections that are generally infested with ACP, and where all growers are treating on a coordinated schedule, CPDPD may conduct residential buffer treatments to suppress ACP populations around the commercial groves in an effort to prevent establishment of HLB.
- In areas where HLB is detected, CPDPD conducts residential treatments to suppress ACP populations.
- In areas where ACP has not been previously detected, or where ACP has been detected at low densities, CPDPD conducts residential treatments in response to ACP detections to prevent ACP establishment or suppress populations.
- In areas where ACP has been detected along the California-Mexico border, CPDPD conducts residential treatments in response to ACP detections to suppress ACP populations due to proximity of HLB detections in Mexico.

CPDPD's current policy is to not conduct treatments in areas that are generally infested if there is limited or no commercial citrus production in the area.

1. Treatment Protocols

In accordance with the integrated pest management principles, CPCPD has evaluated possible treatment methods and determined that there are no physical, cultural, or biological controls available to eliminate ACP from an area.

In general, when treatment has been deemed appropriate, CPDPD applies insecticides to host trees in the residential (urban) areas in a 50 to 800-meter radius around each detection site. Only ACP host plants are treated.

a. International Border Treatments

CPDPD treats citrus host plants in the residential area within two miles of the California-Mexico border. This treatment is conducted within a 400-meter buffer surrounding ACP detections that are within two miles of the California-Mexico border.

- A Proclamation of an Emergency Program (PEP) is issued.
- Prior to undertaking any treatment activity for a property with ACP and/or hosts infected with HLB, CPDPD will contact the affected residents directly or schedule

a public meeting or series of public meetings to inform residents, growers, and other interested parties of CPDPD's intent to take action, and to provide technical information about products used, dates of treatment(s), etc.

b. Within a Generally Infested Area with Commercial Citrus Production

For ACP detections, CPDPD treats citrus host plants within a 250-meter buffer surrounding commercial citrus groves if the growers are conducting coordinated treatments in the designated Psyllid Management Area (PMA) and at least 90 percent of the growers have completed two out of three of the coordinated treatments. The exception is Imperial County, which has fewer residential properties, and therefore ACP detections trigger treatment of residential citrus host plants within 800 meters of commercial citrus.

- A PEP is issued.
- Prior to undertaking any treatment activity for a property with ACP and/or hosts infected with HLB, CPDPD will contact the affected residents directly or schedule a public meeting or series of public meetings to inform residents, growers, and other interested parties of CPDPD's intent to take action, and to provide technical information about products used, dates of treatment(s), etc.

c. Outside of the Generally Infested Area

The actions below are in response to the detection of one or more ACP, whether collected live or in a trap, in counties north of Santa Barbara County and the Tehachapi Mountains.

- Detection of one ACP at one site - All properties with a host within a 50-meter radius of the detection site are treated. A subsequent detection of one or more ACP within 400-meters will result in all properties with hosts within 400-meters of the detection site(s) being treated.
- Detection of two or more ACP at one site - All properties with a host within a 400-meter radius of the detection site are treated.
- A PEP is issued.
- Prior to undertaking any treatment activity for a property with ACP and/or hosts infected with HLB, CPDPD will contact the affected residents directly or schedule a public meeting or series of public meetings to inform residents, growers, and other interested parties of CPDPD's intent to take action, and to provide technical information about products used, dates of treatment(s), etc.

d. In response to an HLB Detection

- All properties with a host within a 250-meter radius of the detection site are treated.
- All host plants found to be infected with HLB are destroyed and removed by mechanical means.
- A PEP is issued.
- Prior to undertaking any treatment activity for a property with ACP and/or hosts infected with HLB, CPDPD will contact the affected residents directly or schedule

a public meeting or series of public meetings to inform residents, growers, and other interested parties of CPDPD's intent to take action, and to provide technical information about products used, dates of treatment(s), etc.

2. Treatment Methodology

The treatment protocol consists of both a foliar and a systemic insecticide. The foliar insecticide is used for immediate reduction of the adult ACP population to prevent the adults from dispersing. The systemic insecticide is a soil treatment used to kill the sedentary nymphs and provide long term protection against reinfestation. Treatment frequency is dependent on the insecticide applied and severity of the infestation.

CPDPD uses registered pesticides and follows the label directions. The treatment protocol may be adjusted to use only the foliar or the systemic insecticide to allow for mitigations in special situations

a. Foliar Treatment

Tempo® SC Ultra (cyfluthrin) is a pyrethroid contact insecticide. Treatment initially occurs once, and subsequent applications may occur for up to three times annually if additional psyllids are detected. This material is applied to the foliage of all host plants using hydraulic spray or hand spray equipment.

b. Soil Treatment

A systemic soil application is made using either Merit® 2F or CoreTect™.

- Merit® 2F (imidacloprid), is a neonicotinoid systemic insecticide. Treatment initially occurs once, and a subsequent application may occur once on an annual basis if additional psyllids are detected. This material is applied to the soil within the root zone of host plants.

- CoreTect™ (imidacloprid) is a neonicotinoid systemic insecticide. It is used in place of Merit® 2F in situations where there are environmental concerns about soil surface runoff of the liquid Merit® 2F formulation, such as host plants growing next to ponds and other environmentally sensitive areas. This material is a pelletized tablet and is inserted into the soil and watered in within the root zone of host plants.

INTEGRATED PEST MANAGEMENT ANALYSIS OF ALTERNATIVE TREATMENT METHODS FOR CONTROL OF THE ASIAN CITRUS PSYLLID AND HUANGLONGBING
May 2018

The treatment program used by the California Department of Food and Agriculture (CDFA) for control of the Asian citrus psyllid (ACP), *Diaphorina citri* (Hemiptera: Psyllidae), and the disease it transmits, namely Huanglongbing, *Candidatus* Lilberibacter asiaticus, targets multiple life stages. A contact insecticide is used for an immediate control of ACP adults in order to prevent spread, and a systemic insecticide is used to control developing ACP nymphs and to give the plant long term protection from re-infestation. The contact insecticide preferentially used contains the synthetic pyrethroid cyfluthrin, while the systemic insecticide contains the synthetic neonicotinoid imidacloprid. Both products have been shown to be effective against ACP elsewhere, particularly in Florida. In addition, HLB-infected plants are removed in their entirety and destroyed, in order to remove a reservoir for the disease. The California Huanglongbing Task Force, a joint government, university, and industry group formed in 2007 to provide guidance to the CDFA on matters pertaining to ACP and HLB has endorsed the use of these chemicals in the CDFA's treatment program.

Below is an evaluation of alternative treatment methods to control ACP and HLB which have been considered for treatment programs in California.

A. PHYSICAL CONTROL

Mass Trapping. Mass trapping of adults involves placing a high density of traps in an area in an attempt to physically remove them before they can reproduce. The current available trapping system for ACP relies on short distance visual stimulus, and is not considered effective enough to use in a mass trapping program.

Active Psyllid Removal. Adult ACPs are mobile daytime fliers, and adults could theoretically be netted or collected off of foliage. However, due to their ability to fly when disturbed, and the laborious and time-prohibitive task of collecting minute insects from several properties by hand, it would be highly unlikely that all adults could be captured and removed. Nymphs attach themselves to developing leaves and stems via their proboscis. Therefore, physical removal of the nymphs would entail removal of the growing shoots which will stunt the tree and reduce fruit production. For these reasons, mechanical control is not considered to be an effective alternative.

Host Removal. Removal of host plants for ACP would involve the large-scale destruction of plants and their roots by either physical removal or phytotoxic herbicides. Additionally, host removal could promote dispersal of female psyllids in search of hosts outside of the treatment area, thus spreading the infestation. For these reasons, host removal is considered inefficient and too intrusive to use over the entirety of the treatment areas used for ACP. However, physical host removal of HLB-infected plants in their entirety is used for HLB control, because it is limited in scope to just the infected tree and it is effective at eliminating the disease reservoir, thereby preventing further spread of the disease by ACP.

B. CULTURAL CONTROL

Cultural Control. Cultural controls involve the manipulation of cultivation practices to reduce the prevalence of pest populations. These include crop rotation, using pest-resistant varieties, and intercropping with pest-repellent plants. None of these options are applicable for ACP control in an urban environment, and may only serve to drive the psyllids outside the treatment area, thus spreading the infestation.

C. BIOLOGICAL CONTROL

Microorganisms. No single-celled microorganisms, such as bacteria, are currently available to control ACP.

Nematodes. Entomopathogenic nematodes can be effective for control of some soil-inhabiting insects, but are not effective, nor are they used, against above ground insects such as psyllids.

Parasites and Predators. There have been two parasites released in Florida against ACP, but only one of these are considered somewhat successful there, namely *Tamarixia radiata* (Hymenoptera: Eulophidae). This insect has been released into the environment in southern California. The CDFA is working with the citrus industry to pursue options for incorporating this parasite into treatment programs statewide. In addition, a second wasp has been recently released by the University of California Riverside, *Diaphorencyrtus aligarhensis*.

Sterile Insect Technique (SIT). SIT involves the release of reproductively sterile insects which then mate with the wild population, resulting in the production of infertile eggs. SIT has neither been researched nor developed for ACP, nor has it been developed for any species of psyllids, and is therefore unavailable.

D. CHEMICAL CONTROL

Foliar Treatment. A number of contact insecticides have been researched for use against ACP elsewhere, particularly in Florida. Contact insecticides are more effective against adult ACPs than the sedentary nymphs because adults actively move around on plants, thereby coming into contact with residues, whereas nymphs have to be directly sprayed in order for them to come into contact. The following product has been identified for use by the CDFA, based on a combination of effectiveness against ACP, worker and environmental safety, and California registration status.

Tempo® SC Ultra is a formulation of cyfluthrin which is applied to the foliage of all host plants. Tempo® SC Ultra is a broad-spectrum synthetic pyrethroid insecticide which kills insects on contact. Tempo® SC Ultra has no preharvest interval, which makes it compatible with residential fruit-growing practices.

Soil Treatment. A number of systemic insecticides have been researched for use against ACP elsewhere, particularly in Florida. Systemic insecticides are particularly effective against psyllid nymphs because nymphs spend much of their time feeding, thereby acquiring a lethal dose. The following products have been identified for use by the CDFA, based on a combination of effectiveness against ACP, worker and environmental safety, and California registration status.

Merit® 2F is a formulation of imidacloprid which is applied to the root system of all host plants via a soil drench. Imidacloprid is a synthetic neonicotinoid insecticide which controls a number of other phloem feeding pests such as psyllids, aphids, mealybugs, etc.

CoreTect™ is a formulation of imidacloprid which is applied to the root system of all host plants via insertion of a tablet into the soil, followed by watering. It is used in place of Merit® 2F in situations where there are environmental concerns about soil surface runoff of the liquid Merit® 2F formulation, such as host plants growing next to ponds and other environmentally sensitive areas.

E. RESOURCES

Grafton-Cardwell, E. E. and M. P. Daugherty. 2013. Asian citrus psyllid and huanglongbing disease. Pest Notes Publication 74155. University of California, Division of Agriculture and Natural Resources Publication 8205. 5 pp. http://www.ipm.ucdavis.edu/PDF/PESTNOTES/pnasiancitruspsyllid.pdf.

Grafton-Cardwell, E. E., J. G. Morse, N. V. O'Connell, P. A. Phillips, C. E. Kallsen, and D. R. Haviland. 2013. UC IPM Management Guidelines: Citrus. Asian Citrus Psyllid. Pest Notes Publication 74155. University of California, Division of Agriculture and Natural Resources. http://www.ipm.ucdavis.edu/PMG/r107304411.html.

PEST PROFILE

Common Name: Asian Citrus Psyllid

Scientific Name: *Diaphorina citri* Kuwayama

Order and Family: Hemiptera, Psyllidae

Description: The Asian citrus psyllid (ACP) is 3 to 4 millimeters long with a brown mottled body. The head is light brown. The wings are broadest in the apical half, mottled, and with a dark brown band extending around the periphery of the outer half of the wing. The insect is covered with a whitish waxy secretion, making it appear dusty. Nymphs are generally yellowish orange in color, with large filaments confined to an apical plate of the abdomen. The eggs are approximately 0.3 millimeters long, elongated, and almond-shaped. Fresh eggs are pale in color, then, turn yellow, and finally orange at the time of hatching. Eggs are placed on plant tissue with the long axis vertical to the surface of the plant.

History: Asian citrus psyllid was first found in the United States in Palm Beach County, Florida, in June 1998 in backyard plantings of orange jasmine. By 2001, it had spread to 31 counties in Florida, with much of the spread due to movement of infested nursery plants. In the spring of 2001, Asian citrus psyllid was accidentally introduced into the Rio Grande Valley, Texas on potted nursery stock from Florida. It was subsequently found in Hawaii in 2006, in Alabama, Georgia, Louisiana, Mississippi, and South Carolina in 2008. ACP was first found in California on August 27, 2008 in San Diego County. Subsequent to this initial detection in San Diego County, the ACP has been detected in Fresno, Imperial, Kern, Los Angeles, Orange, Riverside, San Bernardino, San Luis Obispo, Santa Barbara, Tulare, Ventura, Marin, Monterey, San Francisco, and Santa Clara counties. The ACP has the potential to establish itself throughout California wherever citrus is grown.

Distribution: ACP is found in tropical and subtropical Asia, Afghanistan, Saudi Arabia, Reunion, Mauritius, parts of South and Central America, Mexico, the Caribbean, and in the U.S. (Alabama, Arizona, California, Florida, Georgia, Hawaii, Louisiana, Mississippi, South Carolina, and Texas).

Life Cycle: Eggs are laid on tips of growing shoots; on and between unfurling leaves. Females may lay more than 800 eggs during their lives. Nymphs pass through five instars. The total life cycle requires from 15 to 47 days, depending on environmental factors such as temperature and season. The adults may live for several months. There is no diapause, but populations are low in the winter or during dry periods. There are nine to ten generations a year, with up to 16 noted under observation in field cages.

Hosts and Economic Importance: ACP feeds mainly on *Citrus* spp., at least two species of *Murraya*, and at least three other genera, all in the family Rutaceae. Damage from the psyllids occurs in two ways: the first by drawing out of large amounts of sap from the plant as they feed and, secondly, the psyllids produce copious amounts of honeydew. The honeydew then coats the leaves of the tree, encouraging sooty mold to grow which blocks sunlight to the leaves. However, the most serious damage caused by ACP is due to its ability to effectively vector three phloem-inhabiting bacteria in the genus *Candidatus* Liberibacter, the most widespread being *Candidatus* Liberibacter asiaticus. These bacteria cause a disease known as huanglongbing, or citrus greening. In the past, these bacteria have been extremely difficult to detect and

characterize. In recent years, however, DNA probes, electron microscopy, and enzyme-linked immunosorbent assay tests (ELISA) have been developed that have improved detection. Symptoms of huanglongbing include yellow shoots, with mottling and chlorosis of the leaves. The juice of the infected fruit has a bitter taste. Fruit does not color properly, hence the term "greening" is sometimes used in reference to the disease. Huanglongbing is one of the most devastating diseases of citrus in the world. Once infected, there is no cure for disease and infected trees will die within ten years. The once flourishing citrus industry in India is slowly being wiped out by dieback. This dieback has multiple causes, but the major reason is due to HLB.

Host List

SCIENTIFIC NAME	**COMMON NAMES**
Aegle marmelos	bael, Bengal quince, golden apple, bela, milva
Aeglopsis chevalieri	Chevalier's aeglopsis
Afraegle gabonensis	Gabon powder-flask
Afraegle paniculata	Nigerian powder-flask
Amyris madrensis	mountain torchwood
Atalantia monophylla	Indian atalantia
Atalantia spp.	
Balsamocitrus dawei	Uganda powder-flask
Bergia (=*Murraya*) *koenigii*	curry leaf
Calodendrum capense	Cape chestnut
X Citroncirus webberi	
Choisya arizonica	Arizonia orange
Choisya ternate	Mexican or mock orange
Citropsis articulata	Katimboro, Muboro, West African cherry orange
Citropsis gilletiana	cherry-orange
Citropsis schweinfurthii	African cherry-orange
Citrus aurantiifolia	lime, Key lime, Persian lime, lima, limón agrio, limón ceutí, lima mejicana, limero
Citrus aurantium	sour orange, Seville orange, bigarde, marmalade orange, naranja agria, naranja amarga
Citrus hystrix	Mauritius papeda, Kaffir lime
Citrus jambhiri	rough lemon, jambhiri-orange, limón rugoso, rugoso
Citrus limon	lemon, limón, limonero
Citrus madurensis (=X *Citrofortunella microcarpa*)	calamondin
Citrus maxima	pummelo, pomelo, shaddock, pompelmous, toronja
Citrus medica	citron, cidra, cidro, toronja
Citrus meyeri	Meyer lemon, dwarf lemon
Citrus × *nobilis*	king mandarin, tangor, Florida orange, King-of-Siam
Citrus × *paradisi*	grapefruit, pomelo, toronja
Citrus reticulata	mandarin, tangerine, mandarina
Citrus sinensis	sweet orange, orange, naranja, naranja dulce
Citrus spp.	
Clausena anisum-olens	anis
Clausena excavata	clausena
Clausena indica	clausena
Clausena lansium	wampi, wampee

Clymenia polyandra	a-mulis
Eremocitrus glauca	Australian desert lime
Eremocitrus hybrid	
Esenbeckia berlandieri	Berlandier's jopoy
Fortunella crassifolia	Meiwa kumquat
Fortunella margarita	Nagami kumquat, oval kumquat
Fortunella polyandra	Malayan kumquat
Fortunella spp.	
Limonia acidissima	Indian wood apple
Merrillia caloxylon	flowering merrillia
Microcitrus australasica	finger-lime
Microcitrus australis	Australian round-lime
Microcitrus papuana	desert-lime
X *Microcitronella* spp.	
Murraya spp.	curry leaf, orange-jasmine, Chinese-box, naranjo jazmín
Naringi crenulata	naringi
Pamburus missionis	
Poncirus trifoliata	trifoliate orange, naranjo trébol
Severinia buxifolia	Chinese box-orange
Swinglea glutinosa	tabog
Tetradium ruticarpum	evodia, wu zhu yu
Toddalia asiatica	orange climber
Triphasia trifolia	trifoliate limeberry, triphasia
Vepris (=*Toddalia*) *lanceolata*	white ironwood
Zanthoxylum fagara	wild lime, lime prickly-ash