PROCLAMATION OF AN EMERGENCY PROGRAM REGARDING THE ASIAN CITRUS PSYLLID

On July 18, 2012, the Asian citrus psyllid (ACP), *Diaphorina citri* Kuwayama, was detected in city of Glendale in Los Angeles County. Based on the survey data, pest biology, information from California's Huanglongbing Task Force, recommendations provided to me by the Department's Primary State Entomologist and Primary State Plant Pathologist, and experience gained from the United States Department of Agriculture's (USDA) control efforts in the southeastern United States, I have determined that an infestation of ACP exists in the area.

ACP is an exotic insect that is originally from Asia. It has been introduced into Central and South America, the Caribbean, and Mexico. In the United States, ACP has been found in Alabama, Arizona, Florida, Georgia, Hawaii, Louisiana, Mississippi, South Carolina, Texas, and California (San Diego, Orange, Los Angeles, Imperial, Riverside, San Bernardino, and Ventura 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. The most serious damage caused by ACP is due to its ability to vector the phloem-inhabiting bacterium *Candidatus liberibacter,* the causal agent of huanglongbing (HLB). HLB is considered one of the most devastating diseases of citrus in the world. 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 making it unfit for human consumption. The psyllids 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; which blocks sunlight from reaching the leaves.

Under my statutory authority, as Secretary of the California Department of Food and Agriculture (CDFA), I have decided, based upon the likely environmental and economic damage that would be inflicted by this infestation of ACP, that it is incumbent upon me to address this threat. This pest presents a major threat to citrus grown within the State. California is the top citrus-producing State in the U.S., with total production valued at over $1.8 billion. Additionally, the establishment of ACP in California would increase the need for pesticide use by commercial and residential citrus producers, as well as require enforcement of quarantine restrictions. In a recent study in Florida, the presence of HLB increased citrus production costs by 40 percent (Irey, 2008). Because HLB has been detected in Mexico, the establishment of ACP in California will pave the way for HLB to spread. HLB would have severe consequences to both the citrus industry and to the urban landscape via the decline and the death of citrus trees.

My duty to act, and this decision, is based upon authority set forth in Sections 24.5, 401.5, 403, 407, 408, 5401-5405, and 5761-5764 of the Food and Agricultural Code (FAC) authorizing and mandating the Secretary to: thoroughly investigate the existence of the pest; to determine the probability that the pest will spread; to adopt regulations (Title 3 of the California Code of Regulations, Section 3591.21) as are reasonably necessary to carry out the provisions of this code; to abate the pest from the established eradication area; and, to prevent further economic damage. In order to determine the extent of the infestation, and to define an appropriate response area, an additional survey took place for several days over a nine-square mile area, centered on the detection site. The results of this additional survey indicate that the infestation is sufficiently localized to be amenable for

effective implementation of CDFA's current ACP emergency response strategies, which include treatment. Emergency action is needed to protect California from the negative environmental and economic impact this pest will cause, should it be allowed to remain in this area and spread. The enclosed CDFA project plan describes the actions which are necessary to mitigate the spread of this pest.

This decision, to proceed with a treatment program, is based upon a realistic evaluation that it may be possible to address the threat posed by ACP using currently available technology in a manner that is recommended by California's HLB Task Force. Treatment needs and environmental conditions are outlined in the attached work plan. In making this decision, CDFA has evaluated possible eradication methods. In accordance with integrated pest management principles, the following is a list of the options that I have considered for the eradication of this ACP infestation: 1) mechanical controls; 2) biological controls; 3) mass trapping; 4) cultural controls; and 5) the application of pesticides by ground equipment.

Based upon input from my professional staff, including memorandums from the Primary State Entomologist and Primary State Plant Pathologist, and the input of experts familiar with ACP, I have concluded that there are no mechanical, biological, or cultural controls which can effectively eradicate ACP and allow CDFA to meet its statutory obligations. To eradicate ACP from this area, I am ordering ground applications of pesticides be made to all ACP hosts within a 400-meter radius around the detection sites. If additional ACP or immature life stages are detected in the survey area, the treatment area may expand to an 800-meter radius around the infested properties. A description of the alternative treatment methods considered, and methodologies chosen, is contained in the attached work plan.

Sensitive Areas

The treatment area has been reviewed by consulting the Department of Fish and Game's California Natural Diversity Database for threatened or endangered species. Mitigation measures will be implemented as needed. CDFA also consults with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service when rare and endangered species are located within the treatment area. CDFA will not apply pesticides to bodies of water or undeveloped areas of native vegetation. All treatments will be applied to residential properties, common areas within residential developments, and other non-commercial properties.

Treatment Plan

The proposed project area encompasses those portions of Los Angeles County which fall within an approximate nine-square mile area around each property in which ACP has been detected. Emergency action is needed to protect California from the negative environmental and economic impact this pest will cause, should it be allowed to remain in this area and spread. A map of the detection sites with the project boundaries and the proposed treatment work plan is attached. In summary form, the treatment plan consists of the following elements:

1. Delimitation. Yellow panel traps will be placed throughout the project area to delimit the infestation and to monitor post-treatment ACP populations. Yellow panel traps are placed at a density of up to 100 traps in the core square mile and 50 traps per square mile in the surrounding eight square miles. Additional traps may be added to further delimit the infestation and to determine the efficacy of treatments. These traps will be serviced on a regular schedule for a period equal to three ACP generations beyond the date of the last ACP detection.

2. Visual survey. All host plants will be inspected at all locations where traps are placed. Host plants will be surveyed within a 400-meter radius around the detection site(s). Up to 100 properties per square mile may be inspected.

3. Treatment. Properties within the treatment area will be treated according to the following protocol: 1) Tempo® SC Ultra (cyfluthrin), a contact insecticide for controlling the adults and nymphs of ACP, will be applied to the foliage of host plants; 2) Merit® 2F, an imidacloprid insecticide, will be applied to soil beneath the drip line of host plants to eradicate developing nymphs.

   Treatments will be repeated as per label instructions, for up to two life cycles beyond the last ACP detected (as determined by a life cycle model driven by accumulated day degrees). Both insecticides are applied by ground using hydraulic spray equipment.

Public Information

Residents of affected properties are invited to a public meeting where officials from CDFA, the California Department of Pesticide Regulation, the Office of Environmental Health Hazard Assessment, and the County Agricultural Commissioner's Office will be present to address residents' questions and concerns. Residents are notified in writing at least 48 hours in advance of any treatment in accordance with FAC Section 5779. After treatment, completion notices are left with the residents detailing precautions to take and post-harvest intervals applicable to the citrus fruit.

Public information concerning the ACP project will consist of press releases to the public and direct notification of project developments to concerned local and State political representatives and authorities. Press releases are prepared by CDFA's information officer and the county agricultural commissioner, in close coordination with the project leader responsible for treatment. Either the county agricultural commissioner or the public information officer serves as the primary contact to the media.

If you have any questions related to this program, please contact the CDFA Toll-Free Hotline at 1 (800) 491-1899.

INTEGRATED PEST MANAGEMENT ANALYSIS OF ALTERNATIVE TREATMENT METHODS TO ERADICATE THE ASIAN CITRUS PSYLLID
July 2012

The chemical treatment program used by the California Department of Food and Agriculture (CDFA) for control of the Asian citrus psyllid (ACP), *Diaphorina citri* (Hemiptera: Psyllidae), targets multiple life stages. A contact insecticide is used for an immediate control of adults in order to prevent spread, and a systemic insecticide is used to control developing 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. The California Huanglongbing Task Force, a joint government, university, and industry group formed in 2007 to provide guidance to CDFA on matters pertaining to ACP and huanglongbing, has endorsed the use of these chemicals in CDFA's treatment program.

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

A. MECHANICAL 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. CDFA is participating in research to develop a plant volatile attractant to enhance the trap, but the results are preliminary and are currently under review.

Active Psyllid Removal. Adult ACP 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.

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. One species of entomopathogenic fungus, *Isaria fumosorosea* (*Paecilomyces*

fumosoroseus) (Hypocreales: Cordycipitaceae), recently has been shown to be effective at suppressing ACP populations, but it is not yet registered for use on food crops, including citrus, in California. CDFA is cooperating with the University of California at Davis in pursuing authorization to conduct research in California on this fungus for use against 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). On December 7, 2011, a researcher at the University of California, Riverside (UCR), was issued a Federal permit for release of this insect into the environment in California. CDFA is now actively working with UCR and the citrus industry to pursue options for incorporating this parasite into treatment programs. In addition, testing has begun by UCR on the second species to examine its suitability for potential future releases into California.

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 not 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. The following ones have been considered for use by CDFA, based on a combination of effectiveness against ACP, worker and environmental safety, and California registration status.

PyGanic®, an organic formulation of a pyrethrin, is registered for use on all host plants. However, PyGanic® alone is not effective in eradicating ACP. Researchers recommend that piperonyl butoxide, a synthetic insecticide synergist be combined with PyGanic® to enhance its effectiveness. Without piperonyl butoxide, environmental conditions may degrade the PyGanic® before an effect on ACP can occur. Piperonyl butoxide is not a certified organic substance; therefore, combining piperonyl butoxide with PyGanic® negates the organic certification. The Environmental Protection Agency classifies piperonyl butoxide as a group C carcinogen, a possible human carcinogen. For these reasons, PyGanic® is not an effective treatment against ACP.

Sevin® SL is a formulation of carbaryl which may be applied to the foliage of all host plants. Sevin® SL is effective against ACP. Sevin® SL is a wide-spectrum carbamate insecticide which controls hundreds of insect species, including beneficial insects. Sevin® SL requires an extended pre-harvest interval, which is not compatible with residential fruit-growing practices. For this reason, Sevin® SL is not the foliar insecticide of first choice for residential treatments. However, it remains a treatment option in particular situations where the preferred insecticide for foliar treatment, namely Tempo® SC Ultra, temporarily cannot be used because of label restrictions on annual usage amounts per property.

Tempo® SC Ultra is a formulation of cyfluthrin which may be applied to the foliage of all host plants. Tempo® SC Ultra is effective against ACP. Tempo® SC Ultra is a wide-spectrum synthetic pyrethroid insecticide which, like Sevin® SL, controls hundreds of insect species, including beneficial insects. Tempo® SC Ultra is preferentially used over Sevin® SL by CDFA

because it has no pre-harvest 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. The following ones have been considered for use by 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 may be applied to the root system of all host plants via a soil drench. Merit® 2F is effective against ACP. Imidacloprid is a synthetic neonicotinoid insecticide which controls a number of other phloem feeding pests such as aphids, mealybugs, etc., but is generally considered safe for beneficial insects.

CoreTect® is a formulation of imidacloprid which may be applied to the root system of all host plants via insertion of a tablet into the soil, followed by watering. CoreTect® is effective against ACP. Imidacloprid is a synthetic neonicotinoid insecticide which controls a number of other phloem feeding pests such as aphids, mealybugs, etc., but is generally considered safe for beneficial insects. 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. HOST REMOVAL

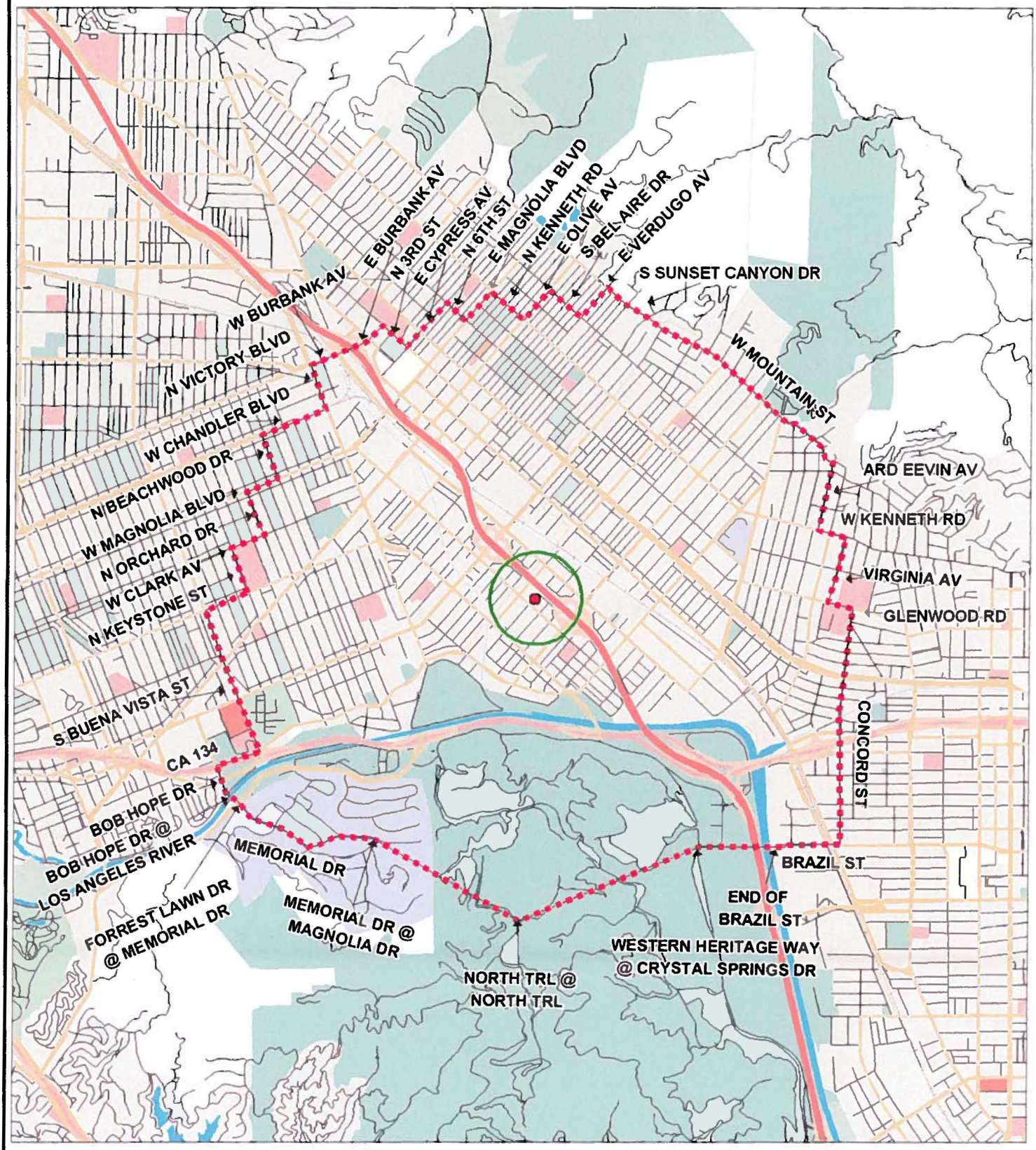
Host Removal. Removal of host plants would involve the large scale destruction of plants and their roots by either physical removal or phytotoxic herbicides. The remaining soil may have to be protected against new plants sprouting up by regular herbicide sprays or by tarping. For these reasons, host removal is considered economically inefficient and too intrusive to use over the entirety of the 400- to 800-meter radius treatment area used for ACP. Additionally, host removal could promote dispersal of female psyllids in search of hosts outside of the treatment area, thus spreading the infestation.

F. RESOURCES

Grafton-Cardwell, Elizabeth E., K. E. Godfrey, M. E. Rogers, C. C. Childers, and P. A. Stansly. 2006. Asian citrus psyllid. University of California, Division of Agriculture and Natural Resources Publication 8205. 8 pp. http://www.anrcatalog.ucdavis.edu/pdf/8205.pdf

Rogers, M. E. and P. A. Stansly. 2009. Biology and Management of the Asian Citrus Psyllid, *Diaphorina citri* Kuwayama, in Florida Citrus. University of Florida Cooperative Extension Service, ENY-739. 7 pp. http://edis.ifas.ufl.edu/pdffiles/IN/IN66800.pdf.

ASIAN CITRUS PSYLLID
GLENDALE, LOS ANGELES COUNTY
2012



cdfa

DETECTION SITE

MAXIMUM PROGRAM BOUNDARY

PROPOSED 400M TREATMENT BOUNDARY