

Psyllid Control Issues: Pesticides and Biological Control in the United States

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What is Needed – A Coordinated Area-Wide Management Program

- Hard to detect
- Highly mobile
- Found in any habitat or system with rutaceous host plants



Components of an Area-Wide Program

- Detection / monitoring of ACP in all habitats
- Cultural practices that limit amount of usable host materials
- Chemical control
- Biological Control
- Education and outreach of growers and the general public



Insecticide Programs in the US

- Emphasis is placed on preventing psyllid reproduction and protecting flush
- Applications made during the winter when adult densities are low are considered especially strategic
- Both systemic and foliar insecticides are recommended
- Limited use of broad spectrum insecticides is recommended to conserve natural enemies



Chemical Control

■ Advantages

- It works
- Reasonably quick kill for foliar treatments
- Known residual activity

To-date, chemical treatments in CA appear to have been extremely effective in reducing psyllid levels



■ Limitations

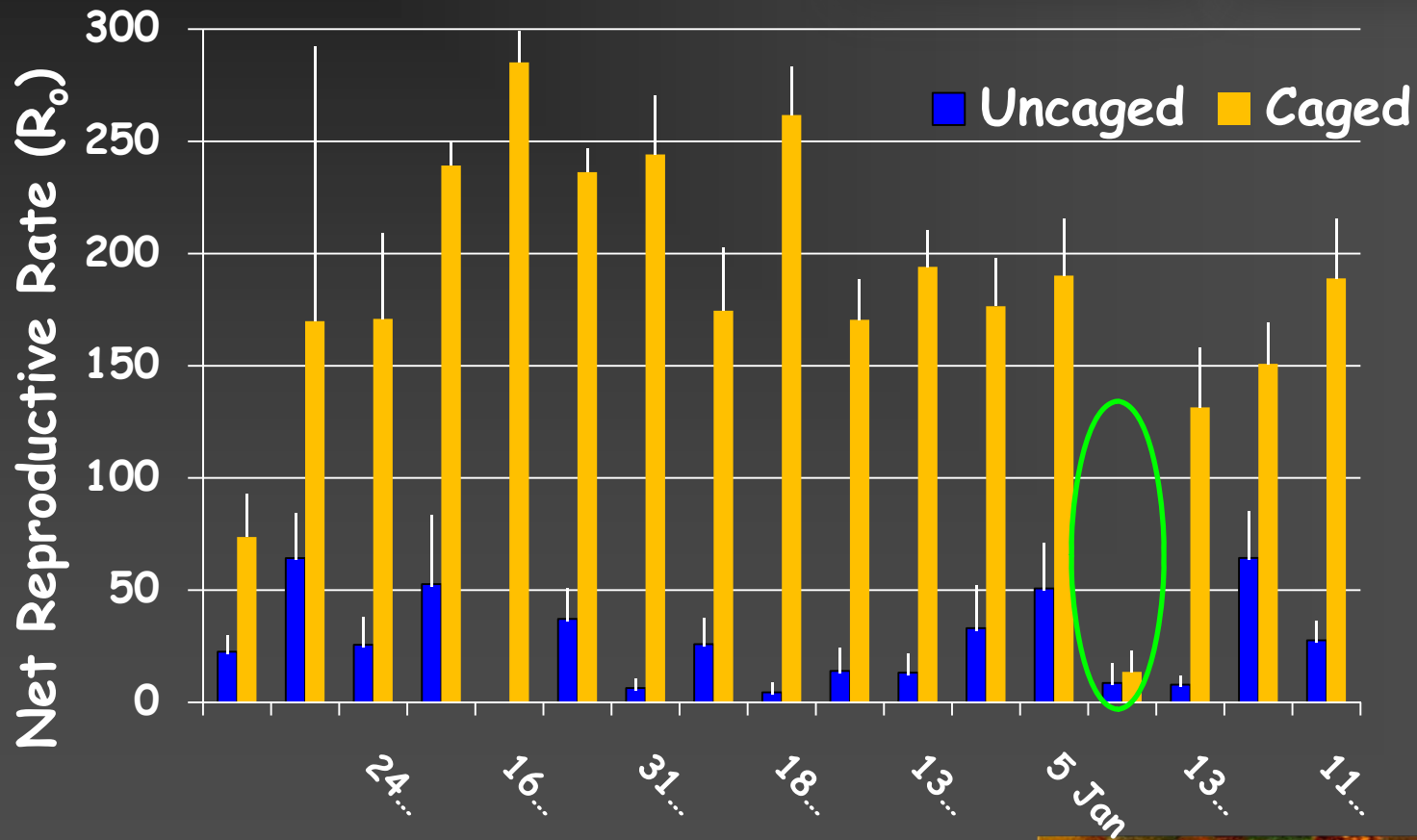
- Development of insecticide resistance
- All treatments in an area must be applied over a 1 week time frame
- Systemic insecticides may take 2-3 weeks or longer to become effective
- Label restrictions
- Environmental and human health risks and consequences
- Public relations issues
- Cost of insecticides
- Secondary pest outbreaks

History of Biological Control in US



- Native arthropod predators found to feed on Asian citrus psyllid (ACP) nymphs
- Predators include coccinellids, syrphids, lacewings, and spiders
- At times, the predators can impart significant mortality to ACP populations and should be conserved as much as possible in a management program.

Suppression of Psyllid Populations by Predaceous Insects





History of Biological Control in US

- Late 1990's, *Tamarixia radiata* imported from Taiwan and South Vietnam into Florida and released; Established throughout most of Florida but found only at low levels
- Additional strains of this parasitoid imported from China, Vietnam, and Pakistan; being evaluated for safety in quarantine
- *Diaphorencyrtus aligarhensis*, another parasitoid of ACP, was imported into Florida from Taiwan in the late 1990's. Did not establish
- *D. aligarhensis* imported from China in 2006 and released. Some recoveries have been made from dooryard plantings of orange jasmine in Apopka, Florida.

Biological Control



■ Advantages

- Probable persistence after releases
- Reduction in insecticide use
- Reduction in economic costs over the long term
- Increase in public goodwill and acceptance of ACP management programs



■ Limitations

- Does not reduce ACP populations to zero
- May require additional input of mass reared natural enemies
- Requires conservation practices because many natural enemies are very susceptible to foliar insecticides
- Requires education of all affected parties

Current Plans



- Use biological control in area-wide management plans in appropriate situations
 - Urban and other unmanaged areas are targeted for biological control because of limitations on insecticide usage. The goal is to keep these areas from serving as refugia for ACP.
 - Commercial citrus growers would like to get more from biological control to decrease the probability of insecticide resistance development, production costs, and other arthropod pest outbreaks.
 - Certified organic growers need biological control for managing ACP.
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Current Plans



- National committee for biological control of ACP has been formed to discuss short-term and long-term needs for biological control and to look for resources to meet these needs.
- Short-term needs include:
 - Surveying natural enemies attacking ACP in newly invaded areas
 - Conducting host testing for strains of *T. radiata* currently in quarantine
 - Developing methods of mass production of *T. radiata*
 - Begin release and evaluation of appropriate strain(s) of *T. radiata* when approved for field release
- Determine the distance that natural enemies will travel or disperse from an area
- Determine the impact of insecticide applications for psyllid control on natural enemies

Current Plans

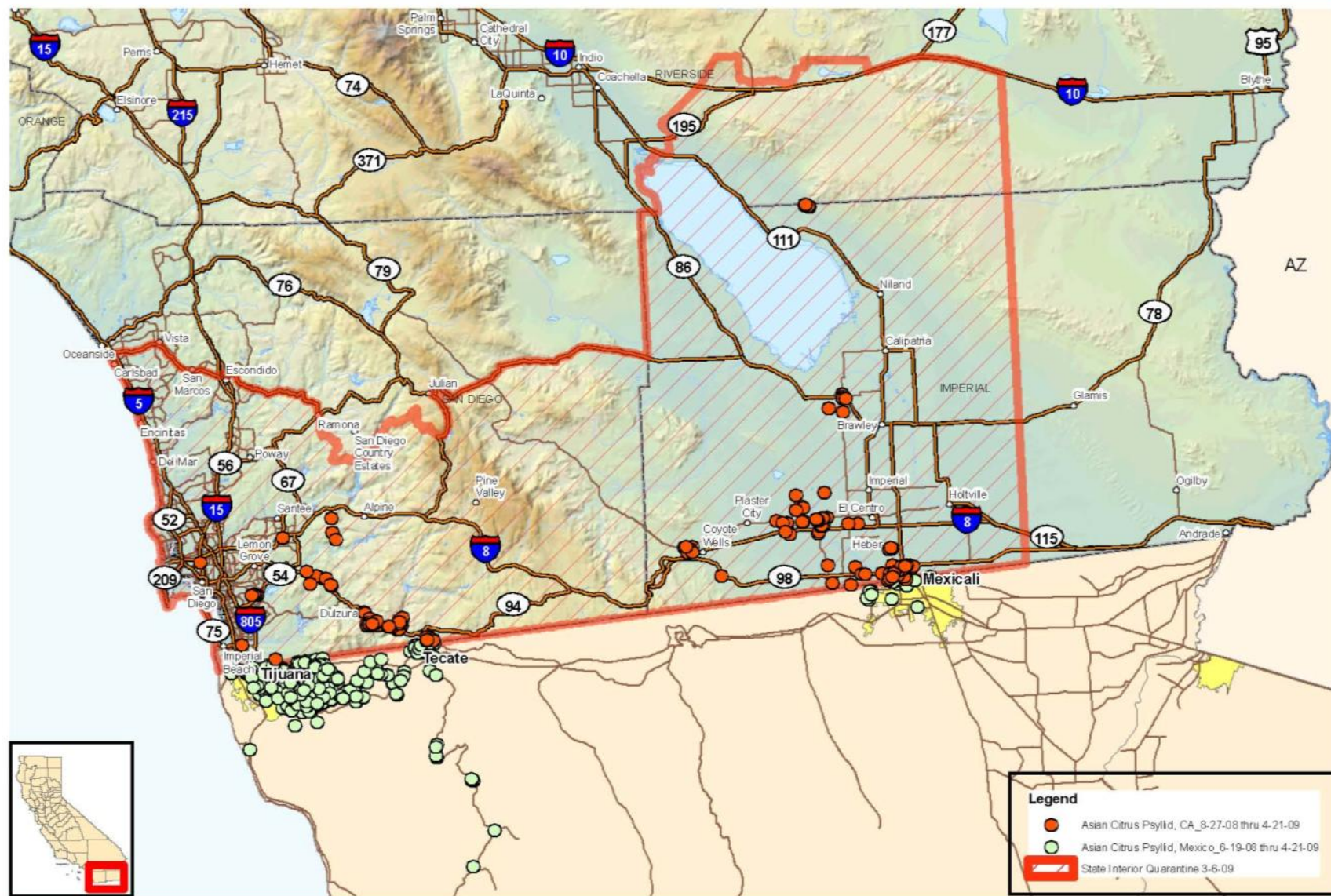


- Long term needs include:
 - Surveys of natural enemies attacking ACP in other parts of the world to determine if better strains or species of natural enemies exist
 - Studies of the optimal time and number of parasitoids to release in a given habitat
 - Studies on release methods for optimal effect from the natural enemies
 - Studies on methods to conserve natural enemies
 - Optimal incorporation of biological control in area-wide management programs
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Potential Collaborations

- Coordination of all management efforts, including biological control, especially along the urban areas at our border.
- Sharing of information that will help to develop coordinated area-wide management programs.
- Cooperate in educating growers, urban dwellers, and others about the use of various tactics in area-wide management of ACP





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