

# CITRUS ADVANCED TECHNOLOGY PROGRAM

**QUARTERLY & FINAL REPORTS:** Control of Citrus Greening, Canker & Emerging Diseases of Citrus

## ▶ INSTRUCTIONS

Quarterly Report  Annual Report  Final

Required: What is the "headline" for this report (e.g. a one-sentence "newspaper headline" describing what you accomplished)

## Identification of lures and repellents for ACP in progress

Proposal Title

Identification of Odor-Based Lures and Repellents for the Asian Citrus Psyllid

Today's Date

Sponsoring Organization (drop-down)

Category (drop down)

2/10/2011

California Citrus Research Board

Unclassified

### REPORT UPDATE (500 words; summarize your accomplishments)

Like many other insects, the Asian Citrus Psyllid (ACP) relies on the sense of smell to find its citrus hosts. The olfactory system of ACP therefore provides an ideal target to design methods to interfere with the ability to find Citrus plants. . In the first part of our project we are interested in finding a highly effective odor lure that can be used to attract ACP to traps for surveillance or to larger traps for population control. In the second part of the project we are interested in finding odors that ACP avoid strongly and can therefore be effective in repelling ACP from citrus plants and groves.

In order to identify potential attractants we have started recording the responses from single sensory cells on the psyllid antenna to odors that are emitted by citrus fruits and citrus flush. Since very little is known about the different types of sensory cells on the ACP antenna, we first asked which of these cells are involved in detection of odors and act as sensors for the insect. We were able to identify several cells on the antenna that specifically respond to odors. These odor-detecting cells are usually found inside the pit-like structures, and only a few hair-like structures detect odors. Based on this initial work we are now able to target our efforts to the odor-detecting pits and hairs. We find that a small number of the odorants from citrus are able to activate specific sensory cells on the psyllid antenna suggesting that they may therefore be important for the attraction to the citrus plants. The other interesting finding is that some sensory cell types appear to detect mostly citrus related odors, suggesting that activation of these cells lead to attraction behavior in the psyllid. Knowing the identity of such citrus-specific detector sensory cells allow us to now identify other odors (natural and artificial) that can activate these sensors even better and therefore be useful as strong lures.

In the second part of the project we are planning to identify potential repellent odors from guava. We are systematically measuring the activity of the different sensory cells on the ACP antenna to odors that are found in guava. Using this approach we have been able to identify sensory cells that respond to an odor present in guava. We are in the process of testing a large number of guava odors to find ones that are detected strongly by the ACP antenna and are therefore ideal candidates for being tested as repellents.

The use of odors to control behavior is very attractive for ACP since they can be useful in very small quantities, be affordable, environmentally friendly and compatible in combination with a variety of other types of control programs. We expect to identify both optimal lures and repellents to help with the control of ACP in the future.

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*Contract Number* 5500-186

*Project Duration (years)* 3 *Year of Project* 1

*Total Funds (current year)* 174,294

**SUBMIT REPORT**