Understanding Aggregation Behavior of the Leaffooted Bug, *Leptoglossus zonatus*

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PROJECT SUMMARY

Objectives:

A long-term goal for leaffooted bug management is to develop an early detection or monitoring system. Steps to do this include:

- Determine which factors influence formation of aggregations or attraction of *Leptoglossus. zonatus* under lab conditions
- Determine which factors/cues result in formation of aggregations or attraction of *L. zonatus* in the field
- Determine factors related to dispersal of *L. zonatus* from aggregations under lab and field conditions

Background and Discussion:

Leaffooted plant bugs (LFPBs) feed on developing almonds, which results in nut drop and damage to developing kernels. These bugs are difficult to detect in the field prior to observing the damage they inflict on almonds. Pest control advisors and managers currently use the gummosis (sap) response or the level of almond drop observed after bugs feed to make control decisions. Currently, there is no trap or lure for monitoring LFPBs. A long-term goal for leaffooted bug management is to develop an early detection or monitoring system, which may include traps that exploit attraction to pheromones or host plant volatiles. Another behavior which may be manipulated to improve trapping or monitoring of this pest is the aggregation behavior exhibited by *L. zonatus*.

There are approximately 60 species of leaffooted bugs in the Western Hemisphere; two species are found on almonds in the central valley of California. The two species which occur on almonds are *L. clypealis* and *L. zonatus*. Both are occasional pests from the Manteca-Ripon area in the mid-central valley into the Bakersfield area. Notable is that one of the species, *L. zonatus* is approximately twice as large as *L. clypealis*.

Field studies of feeding damage by *L. zonatus* and *L. clypealis* have found that more damage to almonds occurs from *L. zonatus* feeding, in terms of early season almond drop from trees and late season damage observed on almond kernels at harvest. Thus, *L. zonatus* is the target of this project. Aggregations of *L. zonatus* adults have been observed overwintering in California. These aggregations have also been observed to breakup and disperse in the spring typically in March, as temperatures warm up and days become longer. Many factors may be involved in the aggregation behavior observed for *L. zonatus*, such as external environmental changes in light and temperature, along with attraction or influences to other physical and chemical cues.

The objectives of this study include investigating factors which influence formation of aggregations in the lab and in the field, as well as how these factors influence the dispersal of *L. zonatus* from aggregations. Both lab work and field work are critical to understanding the natural behavior of the insect. Ultimately, these factors need to be understood in order to manipulate the insect behavior in the field so that trapping or monitoring by using behavioral attractants is effective.

Field collections have been made of *L. zonatus* from different regions of the central valley. Colonies of *L. zonatus* are maintained year round so that insects are available for experiments. Lab experiments are underway to observe which factors attract adult *L. zonatus*. These experiments are being conducted in a wind tunnel using both insects and plants to attempt to mimic a natural environment. We are in the early stages of the project. Further information will be available on the poster at the Almond Conference.

Project Cooperators and Personnel: David Doll, UCCE-Merced; Brad Higbee, Wonderful Orchards; Roger Duncan, UCCE-Stanislaus County; and Kris Tollerup, IPM Advisor UC KAC, Parlier

For More Details, Visit

- Poster location 99, Exhibit Hall A + B during the Almond Conference; or on the web (after January 2017) at Almonds.com/ResearchDatabase
- 2015 - 2016 Annual Reports CD (15-ENTO8-Joyce); or on the web (after January 2017) at Almonds.com/ResearchDatabase
- Related projects: 16-ENTO14-Tollerup; 16-ENTO18-Millar/Daane