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. 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*.

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. A number of lab experiments have been completed to determine which factors attract adult *L. zonatus*. These experiments have been conducted in a wind tunnel using both insects and plants to attempt to mimic a natural environment. Large insect colonies are maintained year round in order to have insects for these experiments. First, we determined the age of adults which were sexually mature and attractive. An experiment was run using virgin male and female adults of different ages, from 2-6 weeks old, which were observed to determine mating frequency. We concluded that four week old males and females were more attractive to the opposite sex. We then used four-week old virgin male and female adults for the behavior trials in the wind tunnel. Eight experiments have been conducted to date in the wind tunnel. These include dual choice tests which examine the attraction of males to either females or a control, and whether females were more attracted to either males or a control. Subsequently, we tested whether males were relatively more attracted to males vs. females, or if females were relatively more attracted to males vs. females. The first sets of experiments suggested that odors associated with sexually mature females were most attractive of the above combinations. Another series of experiments was run to examine whether odors associated with mating pairs of *L. zonatus* were more or less relatively attractive than odors associated with sexually mature females. Similar dual choice experiments were run. Finally, these odors were placed into traps and tested in the wind tunnel to determine which combinations would trap (sticky) the most insects.

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

For More Details, Visit

- Poster location 101 Exhibit Hall A + B during the Almond Conference; or on the web (after January 2017) at Almonds.com/Research Database
- 2016 - 2017 Annual Reports (17-ENTO8-Joyce) on the web at Almonds.com/ResearchDatabase
- Related project: 16-ENTO18-Millar/Daane