

Another Look at Pheromonal or Related Attractants for Leaffooted Bugs Infesting California Nut Crops

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PROJECT SUMMARY

Objectives for current year:

- Field test attraction of adults (*L. clypealis* and *L. zonatus*) of both sexes to caged males and caged females, under both summer and fall conditions.
- Identify/verify the metathoracic gland contents of both sexes (the likely alarm and defense compounds), and the contents of the male-specific ventral abdominal glands, some of which might be involved in attraction.
- Analyze volatiles emitted by sexually immature adults, and sexually mature adults, both virgin and mated, under long-day summer conditions when adults would typically be feeding and mating, and under short-day fall conditions, when adults would typically be forming overwintering aggregations.
- Analyze the cuticular lipids of adults of both sexes, which may help to keep overwintering aggregations together.

Background and Discussion:

Leaffooted bugs are becoming an increasing problem in California nut crops, and there are currently no cost-effective methods of monitoring these species, especially early in the season. The problem is exacerbated by the tendency for large numbers of bugs to move into a crop rapidly, so that infestations can go from negligible to large within a few days. Previous research has shown that these bugs use pheromones in a number of contexts, from alarm to aggregation and mating. We propose to have another detailed look at two species, *Leptoglossus*

zonatus and *L. clypealis*, under both summer and fall conditions, to see whether we can sort out the chemical or other signals that they might be using to create the rapid crop infestations in season, and the overwintering aggregations in the fall. It is likely that the chemical signals used in these two different contexts will be different. Overall, if we can gain a better understanding of their behaviors during these different periods of the year, and the signals controlling those behaviors, we may be able to exploit those signals to develop pheromone-based methods of monitoring these species.

Discussion:

Leptoglossus zonatus were collected by both Daane and Millar's labs, off nut crops, pomegranates, and citrus, and lab colonies were started at both Berkeley and Riverside. However, at Riverside, where all chemical analyses will be done, difficulties with rearing bugs to adulthood have hindered progress. We are currently starting a fresh colony with field-collected material from Daane, and will be changing the diet to try and improve rearing success. At the time of writing, we have finished only one round of analyses of volatiles from summer adults. In addition, it has not been possible to start a colony of *L. clypealis* because of the scarcity of this species in the field this year. Because of the slow start, we plan to roll over this year's funding to next year, and will not be requesting additional funding.

Project Cooperators and Personnel: Dr. Sean Halloran, Dr. Steve McElfresh, and Tessa Shates, PhD student, UCR; Robert Straser, UC Berkeley

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- Poster location 110, Exhibit Hall A + B during the Almond Conference; or on the web (after January 2017) at Almonds.com/ResearchDatabase
- Related projects: 16-ENTO8-Joyce; 16-ENTO14-Tollerup