

Seasonal Abundance of Leaffooted Plant Bugs and Stink Bugs in Almond Orchards

Project Leader: Andrea Joyce

Sierra Nevada Research Institute; University of California, Merced; 5200 N Lake Rd., SE Building, Merced, CA 95343
(209) 777-5837; ajoyce2@ucmerced.edu

PROJECT SUMMARY

Objectives:

- Determine which species of leaffooted plant bugs and stink bugs are present in almonds and on alternate host plants throughout the year.
- Establish a colony of leaffooted plant bugs for ongoing field and lab work.
- Conduct a field cage study to compare bug feeding damage, mechanical damage and natural nut drop on different almond varieties, and to explore the relationship between almond age, nut drop, and the gummosis (sap) response.

Background and Discussion:

Leaffooted plant bugs (LFPBs) and stink bugs 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. Since leaffooted bugs are larger than most stinkbugs, they can feed on and damage developing nuts later in the growing season. A long-term goal for leaffooted bug management is to develop an early detection or monitoring system. Our findings will determine which species or host plant strains of LFPBs are present. In addition, the field-cage study will help determine the level of kernel damage inflicted by two species of leaffooted bugs, *Leptoglossus clypealis* and *L. zonatus*. This information will be important if pheromone traps or lures are to be developed. After LFPBs feed on almonds, sap exudes and this condition is known as gummosis. Pest control advisors and managers currently use the gummosis response to make control decisions. However, the almond age and variety may affect when gummosis appears and may be too late for effective control.

During the last year, leaffooted plant bugs and stinkbugs have been collected from almonds, pistachios and pomegranates throughout the central valley. Molecular markers (DNA) have been used to determine the number of species or plant strains of LFPBs collected. For leaffooted bugs, *Leptoglossus clypealis* is the dominant species on almonds and pistachios and more abundant early in the growing season, while another leaffooted bug species *Leptoglossus zonatus* is more numerous on pomegranate and moved into almonds at the end of the growing season this year (2014).

L. clypealis adults, nymphs and eggs collected from almonds were used to start a laboratory colony, as were *L. zonatus* collected from pomegranate. These colonies were used for the field cage damage study on almonds this year, and are also being used for behavior bioassays to investigate the use of pheromones.

The field cage study to compare feeding damage by *L. clypealis* and *L. zonatus* with mechanical damage was conducted over the course of the growing season from March until August. The study was setup on five almond varieties, including Nonpareil, Fritz, Monterey, Carmel and Sonora. The time elapsed from feeding or mechanical damage until the gummosis response occurred was measured, as was the level of nut drop for different aged almonds and varieties. In addition, a final assessment was made of nut damage to the kernel from both bug feeding and mechanical damage. The data help to determine the level of damage that could be attributed to each of these two leaffooted bug species. Our data contribute to designing a monitoring system and an IPM program for these insects.

Project Cooperators and Personnel: David Doll, UCCE-Merced County; Kent Daane, UC Berkeley & Parlier; Brad Higbee, Paramount Farming Co.; David Haviland, UCCE-Kern County; Roger Duncan, UCCE-Stanislaus County; and Kris Tollerup, IPM Advisor Kearney Ag Station, Parlier

For More Details, Visit

- Poster location 11, Exhibit Hall A + B during the Almond Conference; or on the web (after January 2015) at Almonds.com/ResearchDatabase
- 2013-2014 Annual Reports CD (13-ENTO8-Joyce); or on the web (after January 2015) at Almonds.com/ResearchDatabase
- Related project: 14-ENTO13-Tollerup