Insect and Mite Research

Project Leader: Frank Zalom
Department of Entomology, University of California, Davis, One Shields Ave., Davis, CA 95616
(530) 752-3687, fgzalom@ucdavis.edu

PROJECT SUMMARY

Objectives:

- Determine treatment timing of bifenthrin, methoxyfenozide, spinetoram, chlornitraniliprone, and flubendiamide for NOW control in spring based on comparison of male trap captures using the Suterra NOW pheromone lure and egg-laying using the traditional black egg traps baited with almond presscake.
- Evaluate residual efficacy of bifenthrin, methoxyfenozide, chlornitraniliprone, and flubendiamide during the spring.
- Determine if low temperatures delay mating or oviposition by NOW females.
- Confirm that mummy nuts that were previously infested in fall are more likely to become reinfested in spring.

Background and Discussion:

This project includes studies conducted in 2015 and 2016 that in one sense or another focused on flight and oviposition of the navel orangeworm (NOW) during spring in the more northernly almond production areas. These studies represent an extension of previous efficacy and spring treatment timing studies for NOW with the intent of comparing use of NOW eggs traps to NOW sex pheromone traps that became commercially available in 2013. As noted in our prior year report, oviposition as recorded in egg traps can begin considerably later than male moth flight as seen in pheromone trap captures in the northern San Joaquin and Sacramento Valleys. We speculate that this could be due to the relatively low numbers recorded in egg traps as opposed to pheromone traps, or to lower temperatures in spring in these areas than in the warmer production areas to the south.

In both 2015 and 2016, males were captured in pheromone traps when the traps were deployed in mid-March and continued at fairly constant levels through early May. New infestation of mummy strands varied considerably on a weekly basis through this period, with lowest infestations occurring during the weeks of April 3-9, 2015 and March 29-April 3, 2016, the coolest week of each spring. This suggests that while lower NOW populations probably play a role in the observed delay in captures relative to male moths in pheromone traps, periods of low temperature are important in successful infestation of nuts during spring even when male moths are present and captured in pheromone traps.

A laboratory study initiated in 2015 with NOW from both a laboratory colony and wild-collected from infested nuts revealed that both the total number of eggs and the number of fertile eggs laid were fewer at the lowest temperatures, but at least some viable eggs were produced at the lowest experimental temperatures (48.2^{o}F constant, and 57.2^{o}F (day) / 37.4^{o}F (night) variable daily temperature) evaluated to date.

Prior laboratory research showed a positive relationship between NOW infestation level and any damage, even mechanical damage, to the surface of the kernel. We exposed previously field-infested almonds with the larvae killed and uninfested almonds collected from the same orchard in another almond orchard after egg traps detected first eggs were laid in spring. Nut infestation was significantly greater in previously infested nuts than in previously uninfested nuts.

Project Cooperators and Personnel: Franz Niederholzer, UCCE - Sutter/Yuba and Colusa Counties; and Nicole Nicola – UC Davis.

For More Details, Visit

- Poster location 94, 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-ENTO7-Zalom); or on the web (after January 2017) at Almonds.com/ResearchDatabase
- Related projects: 16-ENTO6-Haviland; 15-ENTO13-Tollerup (2015-16 Annual Report CD); 14-ENTO11-Siegel/Walse (2014-15 Annual Report CD)