Develop an Early Season Monitoring System for Leaffooted Bug on Almond

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PROJECT SUMMARY

Objectives:

- Determine indicators such as low temperatures that provide an early-season mechanism for estimating leaffooted bug (LFB) population density.
- Develop an efficient and effective sampling method for LFB on almond.
- Evaluate host-plant volatiles as possible lures.

Background and Discussion:

The use of weather data may provide a tool for predicting the severity of leaffooted bug (LFB) population densities. Daane et al. (unpublished data) analyzed average weekly minimum temperatures. In years where minimum temperatures dropped below ~ 27°F, LFB pressure was low during the following growing season. Results of cold cabinet experiments conducted on field-collected LFB showed that adult survival fell to approximately 27 and 20% when exposed to 26.6 or 21.2°F respectively for six hours. Survival was about 50% when LFB were exposed to 21.2°F for two hours. Our results suggest that cold winter temperatures could provide a tool for predicting LFB pressure for the subsequent season.

In the San Joaquin Valley, leaffooted bug has three complete and a partial fourth generation per year. In Sept. to Oct., adults begin moving out of almond and pistachio orchards to sheltered sites to form aggregations of just a few to several hundred individuals. The existence of a male pheromone associated with mating and aggregation has been supported, however we have a limited understanding of the behavioral chemical or visual cues involved. Moreover, host-plant volatiles may also play a role in mating and aggregation cues.

As early as March adults can begin moving into almond just as nuts reach the “pea-sized” stage. The UC Statewide IPM Pest Management Guidelines recommend monitoring for LFB by visually inspecting for gummosis on nuts during March and April. Early in the season, during March, the most efficient sampling method is the presence of gummosis on nuts in the tree and dropped nuts. The drawback to this method is that damage can occur quickly and a considerable amount can occur before LFB is detected.

No effective method exists for early-season monitoring of LFB as they leave aggregations in the spring and move into almond. As a possible tool, we evaluated modified navel orangeworm traps (MNT) baited with host-plant material (whole-ground almond, whole-ground pistachio, or peanuts). MNTs were placed in almond, pistachio, and pomegranate orchards. Beginning in April, LFB started aggregating on MNTs; however only at the pomegranate orchard site known to have an infestation of LFB. Significantly more LFB aggregated on the MNTs baited with whole-ground almond then the other plant materials evaluated.

In laboratory bioassay experiments, almond, corn, olive, peanut, or walnut oil did not attract nymphs or adults. One reason for the oils not being attractive may be that the processing alters or eliminates attractive volatiles. In future studies, we plan to modify bioassay experiments and evaluate additional compounds.

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Project Cooperators and Personnel: Samantha Rodriguez and Dolph Beasley, UCCE Kearney

For More Details, Visit

- Poster location 100, 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-ENTO14-Tollerup); or on the web (after January 2017) at Almonds.com/ResearchDatabase
- Related project: 16-ENTO8-Joyce; 16-ENTO18-Millar/Daane