Standard and Commercial Formulations for Navel Orangeworm (NOW) Sex Pheromones

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PROJECT SUMMARY

Objectives:

- Develop a highly attractive lure to be used to monitor NOW.
- 2012 specific objectives: 1) Continue to develop formulations in appropriate matrices that are attractive to NOW males for a sufficient time period; and 2) Identify or remove the inhibitory compound(s) in the major pheromone component (ZZ-aldehyde) that is commercially available.

Background and Discussion:

Most known insect pheromones consist of multiple chemical components, often a major component plus minor ones. The major component ((Z11,Z13)-hexadecadienal) of the NOW pheromone was identified in the late 1970's. It is being used in mating disruption as a control for NOW. However, traps baited with this component attract few male moths and lack utility as a monitoring tool. Furthermore, experience shows mating disruption in other species is usually improved with addition of minor pheromone components.

For 3 decades, identification of the critical minor components had been elusive. Recent breakthroughs, in particular by this project, have identified three minor components to yield an active 4-component NOW pheromone mixture. This mixture is as attractive as female NOW moths. However, there was still a challenge: that is developing a trap-bait formulation that would last under field conditions.

Experts in pheromone chemistry experienced in NOW pheromone development and supported by the Almond Board and other groups like pistachios have developed a stable pheromone mixture and formulation which lasts 4-5 weeks in the field. This is being used as a NOW lure for monitoring when deployed in traps.

In 2010 and 2012 we made synthetic, rubber-septa lures containing the 4 purified components that captured as many males as female-baited traps, for 1 week in the field. After that week the number of males captured declined to about 75% of female-baited traps. We simultaneously pursued methods to analyze the release ratios of volatiles emitted from the rubber septa.

We learned at the 2012 Almond Board Conference that Suterra, LLC would likely release a field lure for the 2013 season. An effective lure was released and Suterra has obtained exclusive license for the patented pheromone components.

This project under the leadership of Bas Kuenen and Spencer Walse therefore focused the last of our work on furthering a methodology to analyze NOW pheromone volatiles. The results will likely be useful in the future for lure quality control and to determine if lure longevity can be increased.

Project Cooperators and Personnel: James Bettiga, S&J Ranch; Chris Wiley, AgriWorld.

For More Details, Visit

- 2012.2013 Annual Report CD (11-ENTO12-Kuenen.Walse); or on the web (after January 2014) at www.almondboard.com/researchreports
- Related Project: 13-ENTO9-Cardé