

Monitoring the Adult Navel Orangeworm (NOW) Moths with Pheromone and Host-Plant Volatiles

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PROJECT SUMMARY

Objectives:

- Use wind-tunnel bioassays to identify host-plant volatiles (blends or individual compounds that can be used to monitor males and females.
- Determine if these are field active and could serve as a replacement for oviposition traps

Background and Discussion:

Based partly on our work, Suterra has developed a plastic membrane formulation of pheromone that attracts of male NOW for approximately one month. This breakthrough enables pest managers to monitor populations more effectively than by using traps baited with females. Information from temporal and spatial patterns of trap capture will be useful for spray timing, modeling seasonal development and for estimating density and therefore for guiding decisions on control measures.

A second strategy is to use host volatiles as a monitoring lure for females (and possibly males) or in combination with pheromone for males. This would be similar to the pear ester that has proved promising for monitoring codling moth. ARS colleague John Beck has identified many volatiles released by almonds, almond mummies, and almond foliage. We are seeing if any of these alone or in combination are efficacious lures. At present, the only system in use for monitoring females relies on a bait of almond meal to induce egg laying.

Our wind-tunnel tests evaluate the most likely of these to be attractive, based on two criteria: the compounds are major constituents of the blend and they are electroantennogram active. We test volatiles at 3 doses (10, 100 and 1000 micrograms) with and without a pheromone lure for males and 3 doses (without pheromone) for females. Among the compounds tested so far are octanal plus nonanal, sabinene, (*Z*)-3-hexenal, (*Z*)-3-hexenal plus (*Z*)-3-hexenol, 3-octen-2-one, methyl salicylate, sabinene hydrate, linalool, limonene, a pistachio blend and other compounds. Typically tests are run with 20 insects per treatment or a total of 100 male moths per volatile or volatile blend. So far none of these has proved attractive alone or in combination with pheromone. One issue that we are considering is that it may not be a single active compound but rather a blend that evokes attraction. As was demonstrated with the black bean aphid, a blend of host volatiles is required for attraction and surprisingly these compounds presented individually are either inactive or even repellent. So besides testing compounds alone or paired with pheromone, we will prepare blends to see if these are attractive. John Beck will continue to provide guidance as to the best candidate compounds or blends for us to evaluate.

Project Cooperators and Personnel: Jocelyn Millar, UC - Riverside; Brad Higbee, Wonderful Orchards; John Beck, USDA/ARS, Albany, CA

For More Details, Visit

- Poster location 17, Exhibit Hall A + B during the Almond Conference; or on the web (after January 2016) at Almonds.com/ResearchDatabase
- 2014 - 2015 Annual Reports CD (14-ENTO9-Cardé); or on the web (after January 2016) at Almonds.com/ResearchDatabase
- Related project: 15-ENTO4-Beck