ATTRACTANTS FOR NAVEL ORANGEWORM TO REDUCE INFESTATIONS AND AFLATOXINS

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The Navel Orangeworm (NOW), *Amyelois transitella*, is a persistent pest of almonds, walnuts, pistachios and figs in California, and is found as a scavenger insect in many other crops after the fruits have already been damaged or culled. Infestations by NOW provide an entrance for pathogenic fungi, including *Aspergillus* spp. which produce carcinogenic aflatoxins. Thus elimination or reduction of infestations will affect both direct crop damage and issues of food sanitation. A NOW female-produced sex pheromone has been identified, and an egg trap with female attractants has been in use for more than two decades. Although baits of both types produce trap captures, neither is satisfactory for insect control, and use in monitoring may be problematic as well. Tests this year (2001) with commercially available sex pheromone indicated that traps baited with unmated females captured approx. 25-fold more males than traps baited with the synthetic pheromone. We are currently collaborating with a University of California scientist to test the effects of modified pheromone chemistry on male trap capture compared to unmated females.

Egg trap counts are highly variable regardless of trap baits. As a consequence, decisions for control of NOW are based on less than reliable data. The optimal trap bait, almond press cake plus 10% crude almond oil (CAO), is no longer available. Tests with almond meal (same manufacturer) and red wheat bran, combined with several dosages of CAO, again showed high trap capture variability, but with a consistent trend. Traps baited with almond meal with 0,1 and 3% CAO had the highest egg counts, whereas those baited with 10% CAO and all traps baited with wheat bran trapped fewer eggs. Among the bran-baited traps, those with no CAO trapped the fewest eggs and those with 3% and 10% captured approx. as many eggs as the meal-baited traps with 10% CAO. Low-to-medium doses of CAO plus almond meal elicited approach and egg laying by NOW females whereas higher doses of CAO became less attractive (repellent) to NOW females.

Female NOW are capable of locating individual susceptible nuts in an orchard; our current research focuses on female responses to newly susceptible nuts. Behavioral studies are being conducted in the laboratory and in field trapping assays. In addition, volatiles from susceptible nuts are being collected and analyzed by gas chromatography coupled with mass selective detectors and with NOW electroantennograms (the latter are recordings from the insect antennae that are typically very selective detectors of odors relevant to their life cycle). Our goal is to identify volatiles attractive to NOW females to increase trap efficiency and for insect control to reduce the use of pesticides and fumigants.