

Section 1. Thresholds and Monitoring

IMPROVEMENTS IN FEEDING ATTRACTANTS FOR NOCTUID MOTH PESTS.

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Many species of moths, including pest moths of tree fruit crops, are attracted to fermented sweet baits. These baits have included various concoctions of brown sugar, fruit mashes, molasses, beer, and yeast. Although attractive, these baits are extremely variable in attractiveness, both in time and from batch to batch. The combination of acetic acid and 3-methyl-1-butanol (isoamyl alcohol), isolated from the odors of fermented molasses and jaggery solutions, was found to be attractive to both sexes of several species of Noctuidae found in Northwest apple orchards. This discovery provides the potential to develop more efficacious and dependable lures for use in monitoring moth activity in orchards and other crops. At this time, these pests include *Lacanobia subjuncta*, *Mamestra configurata*, and *Xestia c-nigrum*. Currently, *L. subjuncta* accounts for most of the "cutworm" or "fruitworm" damage to apple fruit in eastern Washington and is a serious defoliator, while *X. c-nigrum*, the spotted cutworm, can damage leaf and flower buds early in the Spring.

A wet trap had been used for capturing these moths attracted to acetic acid and 3-methyl-1-butanol (AA-IAA lure), with acetic acid formulated in the drowning solution and 3-methyl-1-butanol released from a polyethylene dispenser mounted inside the trap (Landolt 2000). This trapping system is problematic in that trapped moths are difficult to identify, decomposing insects alter the odor chemistry and decrease attractiveness, and the method of dispensing attractants does not permit release rate optimization.

An alternative design has been developed, incorporating a different method of dispensing the attractant from a dry trap (Landolt and Alfaro 2001). A series of experiments were conducted to determine the rate of release of the two co-attractants from a dispenser, to compare the attractiveness of the AA-IAA lure at different release rates and at different ratios, and then to compare the efficacy of different trap designs in capturing attracted moths. In this modified and improved system, acetic acid and 3-methyl-1-butanol are released from separate polypropylene vials, with a 3 mm diameter hole in each vial lid to permit the evaporation of the chemical. These two vials are placed inside the bucket of the Universal moth trap, along with Vaportape to kill attracted moths. The rate of release of both chemicals from this system was found to be nearly constant over a period of 28 days, with no decrease in release rate over time. Because moths are normally dry in the trap and are killed quickly by the Vaportape, identification of specimens is much easier and there is little decomposition.

This trapping system, using the AA-IAA lure dispensed from polypropylene vials in UniTraps, was used in a season-long study in several habitats, both to determine what non-target insects are trapped and to more broadly determine what other pest species the lure and trap might be used against. To date, nearly 100 species of Noctuidae, 3 Thyatiridae, 3 Pyralidae, and 1 Tortricidae have been captured in these traps, including many species of cutworms and armyworms. In an apple orchard, the moths captured were nearly principally *L. subjuncta*, *M. configurata*, and *X. c-nigrum* until mid September, when several species of *Euxoa* were trapped.

References

Landolt, P. 2000. New chemical attractants for trapping *Lacanobia subjuncta*, *Mamestra configurata*, and *Xestia c-nigrum* (Lepidoptera: Noctuidae). J. Econ. Entomol.93: 101-106.

Landolt, P. J. and J. Alfaro. 2001. Trapping *Lacanobia subjuncta*, *Xestia c-nigrum* and *Mamestra configurata* (Lepidoptera: Noctuidae) with acetic acid and 3-methyl-1-butanol. Environ. Entomol. (Submitted).

Landolt, P. J. and P. C. Hammond. 2001. Species composition of moths captured in traps baited with acetic acid and 3-methyl-1-butanol in Yakima County, Washington. J. Lepid. Soc. (Submitted).