

Influence of trap design on upwind flight behavior and capture of female grape berry moth with a kairomone lure

Research in Plain English

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Why?

Effective capture of grape berry moths (*Paralobesia viteana*) in flight is the first step for monitoring and control of these East Coast vineyard pests. A seven-component lure based on specific grapevine odor compounds deployed in an oil-coated clear panel trap is currently used by researchers for monitoring in vineyards. However, this type of trap is time-consuming to deploy and difficult to maintain, making it unsuitable for commercial use. Our goal was to evaluate the efficacy of different trap types as well as the effect of adding to the trap visual patterns that mimic the thin stems and small leaves of the grapevine shoot tip.

How?

We initially tested six commercial and modified traps in flight tunnel experiments, in which individual female moths are released downwind of a trap in conditions of controlled wind speed, light intensity, temperature, and relative humidity. Moths were scored for their behavior, including whether they left the cage, flew partially or fully upwind, and landed on the trap. In initial tests the traps were baited with grapevine shoots or the synthetic lure, and the clear delta trap was adorned with a visual pattern made with green paper to imitate grapevine shoot tips, which are essential to getting female grape berry moths to fly upwind in wind tunnel experiments. We followed up with a field trapping experiment in 'Concord' and 'Cayuga white' vineyard blocks to compare the effectiveness of the standard oil-coated trap and the delta traps with and without the grapevine patterning.

What we learned

- In the flight tunnel, although all traps baited with the odorant lure or a grapevine shoot induced more than half of the female moths to complete upwind flights, only the clear delta traps lured females into the trap. Additional visual cues that mimicked grape shoots outside the trap resulted in 66% of females making an upwind flight.
- In the field, the clear delta trap with and without a visual pattern caught a similar number of females, indicating that the visual pattern did not increase the trap's effectiveness in the vineyard.
- However, in the field the clear delta traps with and without a visual pattern captured similar numbers of moths as the more cumbersome oil-coated clear panel traps.

The bottom line

The clear delta trap performed as well as the oil-coated panel trap and is much easier to maintain, so it is a promising alternative for monitoring female grape berry moths. However, overall trap capture rates are still low, so future research will define additional modifications, possibly including visual cues, to improve capture rates.

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