

Local Dispersal of Grape Berry Moth

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**Local dispersal of grape berry moth, *Endopiza viteana*,
within and between wild and cultivated grape habitats.**

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Introduction

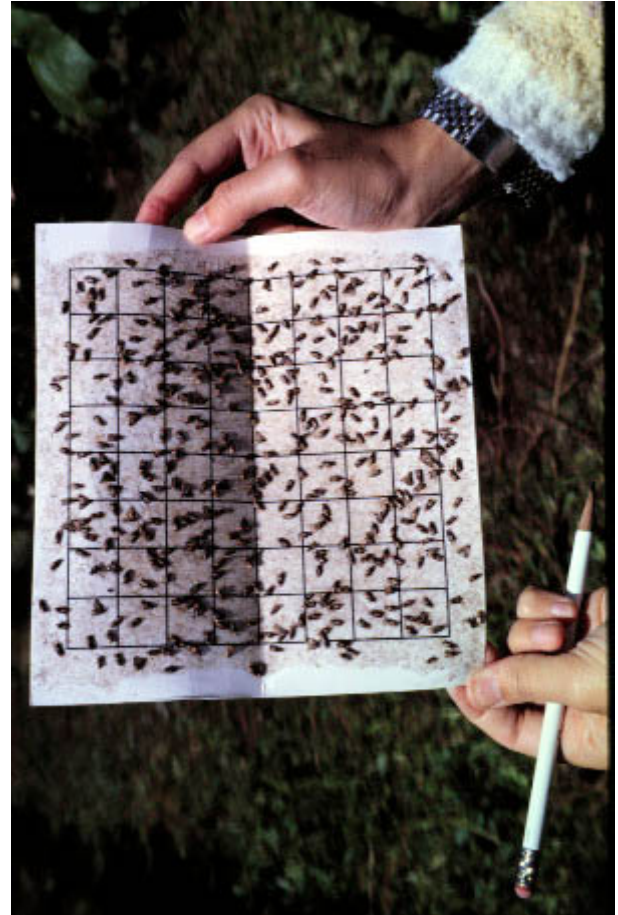
Grape berry moth (GBM) is a key insect pest of grapes in the Northeast US. This species is native to North America and is found east of the Rockies in wild habitats in close association with wild grape, *Vitis riparia*. In grape growing regions of Michigan, Ontario, New York and surrounding states, the proximity of wild habitats to commercial vineyards contributes to the 'risk-factors' for pest pressure. Typically, damage from GBM is highest at vineyard edges, and growers may resort to discarding the first few rows of crop to reduce insect contamination in their product. This project aims to understand the importance of dispersal within and between wild and cultivated grape habitats for GBM population dynamics in grapes. Michigan vineyard agroecosystems contain a high degree of natural habitat with ideal conditions for wild grape. However, crop consultants are often unable to trap significant numbers of pests in woods when traps are placed at the standard 5ft position, even adjacent to highly infested vineyard edges.

Methods

In this project we monitored the degree of male GBM activity in woods around vineyards at four sites, and determined the vertical distribution of GBM at these sites. Pheromone traps were placed on vertical trap-lines (below) on July 6th and monitored weekly until mid-October. Traps were placed at 5, 10, 20 and 30 ft above the ground and suspended from tree branches. Consequently, all traps were at the interface between grape and adjacent woods.



Vertical Pheromone Trap Lines for Sampling Grape Berry Moth Movement placed at the interface of woods and vineyards



Pheromone Trap filled with adult Grape Berry Moths

Results

Weekly total catch ranged from 25 to 578 male GBM, and the phenology of activity varied somewhat between sites. At all sites there was a highly significant increase in the number of moths trapped with height, and this effect was independent of the population size (Figure 1 below).

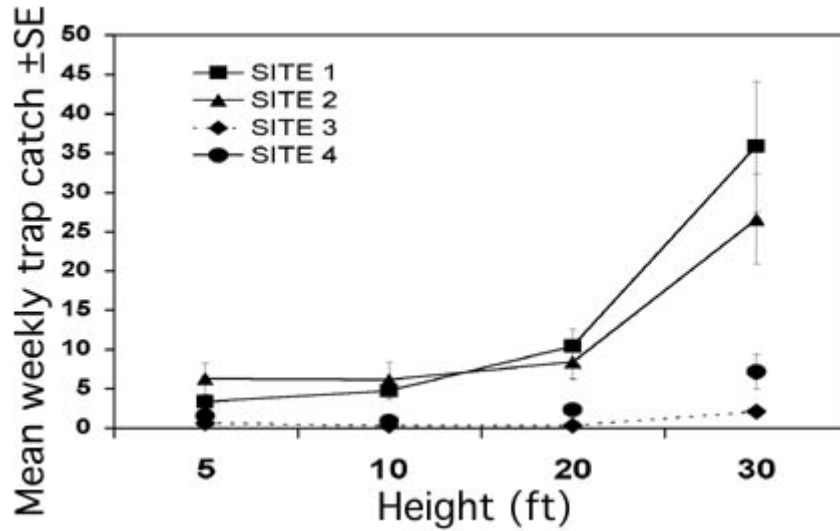


Figure 1. Variation in GBM catch with height at four wood-vineyard interfaces

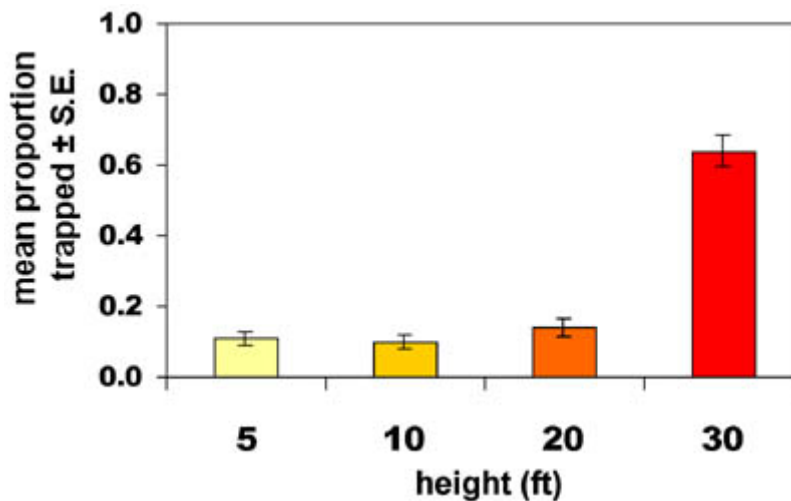


Figure 2. Proportion of total GBM catch trapped at different heights

Calculation of the mean proportion of GBM trapped at each height revealed a strong positive exponential relationship between trap height and proportion. This effect was relatively constant throughout the season, with some evening of distribution as sample size decreased.

Discussion

This initial study to determine the importance of wild habitats for GBM in Michigan has revealed that woods play a potentially critical role in the population dynamics of this pest in vineyards. Our priorities are to determine the degree of exchange of individuals, both male and female, between cultivated and wild habitats. This understanding will have important implications for conventional management, pheromone mating disruption, and resistance management strategies. Future work will also examine the role of natural

enemy dispersal between these two habitats and the importance of wild grapes and associated GBM populations on the stability of biological control in vineyards.

For more information on Small Fruit Entomology research at Michigan State University see:

<http://www.cips.msu.edu/sfe/main.html>

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