

Progress Report – Submitted Feb 10, 2013

Second Quarterly Report

A. Title: New Project: Use of pheromones in management of grape berry moth and grape root borer

B. Investigators:

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C. Type of Project: Research

D. Objectives:

This proposed project addresses risk assessment and management of grape berry moth (GBM), a key pest of grape throughout Virginia, and pheromone-based mating disruption for the management of grape root borer (GRB), a pest that has been sporadic in occurrence but locally severe and of increasing severity. The objectives attempt to deal both with short-term control options, comparing non-disruptive approaches as well as enabling more specifically timed application of conventional tools. The specific objectives are:

Grape berry moth:

1. Evaluate role of vineyard surroundings on phenology and incidence of GBM,
2. Evaluate content of pheromone blends present in commercially available GBM lures.

Grape root borer:

3. Evaluate a more economic application rate for mating disruption for control of GRB,

E. Progress on objectives

1. Phenology of grape berry moth: We have continued to collect analyze data of GBM phenology, vineyard surroundings and degree day accumulation. Conclusions to date include:

- Vineyard trap catch may drop significantly following the 1st generation
- Catch in exterior rows may be further reduced near wooded edges
- Generally, from bloom through harvest, Interior traps **attract** and **detect** more GBM than Edge traps
- Compared to NEWA model biofix of wild grape bloom and 810 DD generation intervals
 - This study used a biofix of first spring catch:
 - Forecast ~900 DD from biofix to predict peak flight of 1st generation
 - Forecast ~1900 DD from biofix to predict peak flight of 2nd generation
 - Caution needed when forecasting peak to peak

- 1st generation peaks <700 DD from spring generation
- 2nd generation peaks >1100 DD from 1st generation
- No difference in model predictions between weather station types (i.e. AIR, CWS, VAES)
- No clear model for 3rd generation
- Always start monitoring in March to detect earliest emergence of spring generation (biofix)
- Use model forecasts to determine when to focus monitoring around a given flight
- Use pheromone traps to validate model predictions and target control at peak catch

2. GBM blends: Our evaluation of GBM pheromone lure load and quality are show in the following figures. There was variation in the blend components present as percent representation (Fig. 1.), and in loading rate (Fig. 2). Suterra lures caught the most GBM, but this lure has been discontinued. Figs. 3-4 show captures of GBM and sumac moth (also attracted to GBM traps).

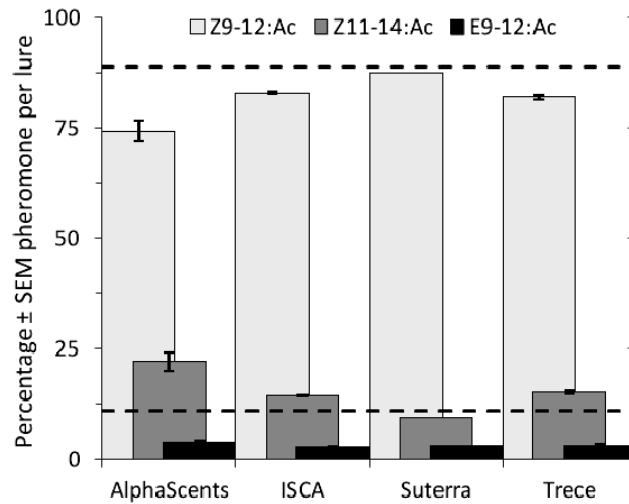


Fig. 1. Pheromone blends in commercial grape berry moth lures, as % of total blend present.

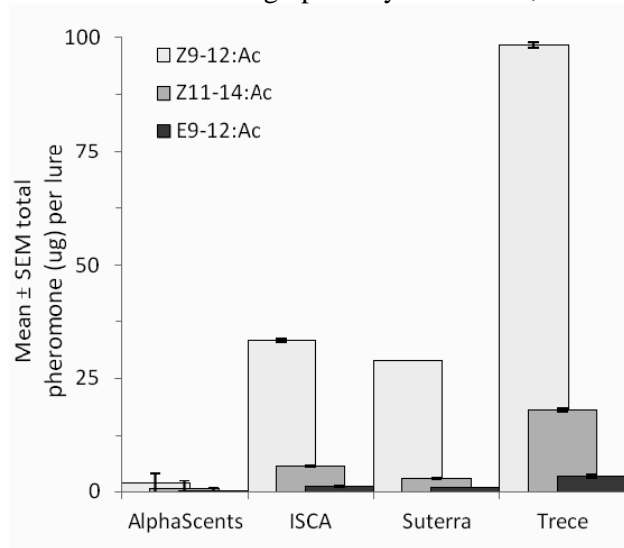


Fig. 2. Loading rate of grape berry moth pheromone components.

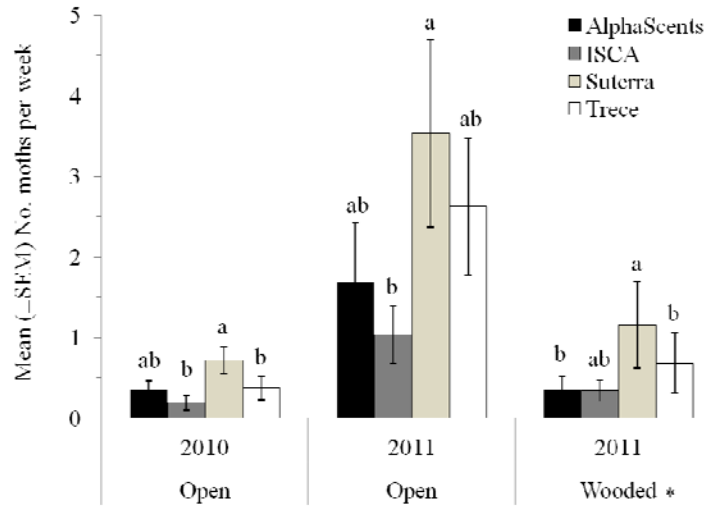


Fig. 3. Grape berry moth captures in traps baited with four commercial pheromone lures.

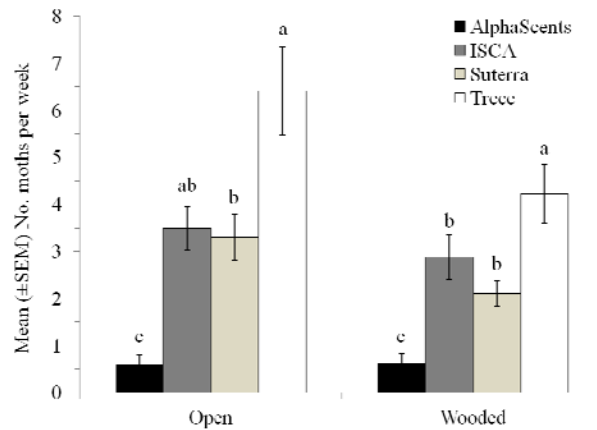


Fig. 4. Sumac moth captures in traps baited with four commercial pheromone lures.

Conclusions from our studies under this objective:

- Pheromone monitoring for grape berry moth less reliable in vineyards near wooded edges
- Sumac moth abundant in both open and wooded vineyard locations
- Trap contamination by sumac moth with the use of some lures (Trece, ISCA & Suterra*)
- Suterra* lures most attractive to grape berry moth, but AlphaScents lures were comparable in open environments with fewer sumac moths

3. Application rates for Isomate GRB: The rationale for this objective was a concern that the labeled application rate for this new product (100 dispensers/acre) would be too expensive for growers to choose. We initiated a trial of 75 dispensers per acre at three sites. However, in 2012 two of these sites placed their entire vineyards into mating disruption at the labeled rate. This

makes further pursuit of this objective unnecessary. To date, results are good; we will collect data one more year (2013 will reflect populations disrupted at 75/acre, before the commercial availability of Isomate GRB).

F. Technology Transfer:

- a. Information has been shared with industry through numbered extension publications, grower conferences, vineyard meetings, and through the Virginia Fruit web set, maintained by the PI. This is a heavily visited site; there were 158,980 visits to pages within this web site in 2010. Progress has also been disseminated through an e-mail list for grape growers and county agents, already in place, part of the Vineyard Scholar project management site established and maintained by the PI.
- b. Information has been shared with the scientific community through reports at the Cumberland-Shenandoah Fruit Workers Conference, presentations at the Entomological Society of America meetings, and refereed journal articles.