Biology and management of invasive insect pests in Michigan vineyards

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MICHIGAN Grape & Wine INDUSTRY COUNCIL

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Objectives

- Objective 1. Monitor Michigan vineyards for invasive insect pests.
- Objective 2. Assess Michigan-grown grape cultivars for their susceptibility to SWD.
- Objective 3. Determine the performance of different management approaches to minimize vinegar fly and sour rot infestation.

Monitoring for invasive insects

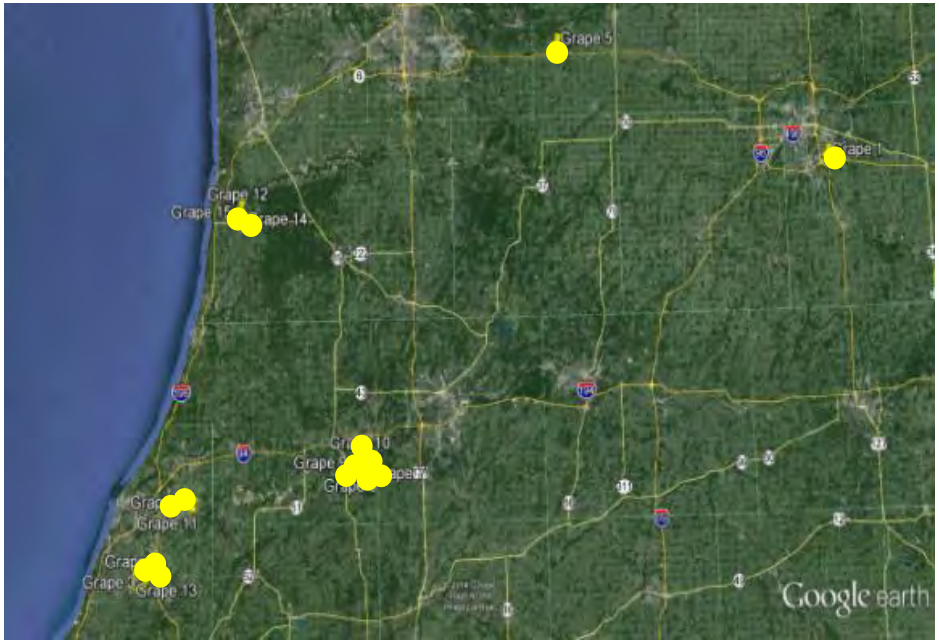
Twenty sites: vineyards and research stations

Traps and visual sampling for multiple pests

May through August 2013-16

Northwest Michigan

Southwest Michigan



Monitoring

Invasive moths

- Species that have invaded other grape growing regions
- Only light brown apple moth and European grape vine moth have been found in US (in California)
- Quarantine and eradication where detected
- **No detections in Michigan!**

Monitoring

Spotted lantern fly

- Plant hopper native to China, India, Vietnam
- Feeds on ~70 species including grapes and tree fruit
- Tree of heaven
- Found in 4 counties in Pennsylvania – eradication program
- **Not detected in Michigan!**

Photos: Pennsylvania Dept. of Agriculture

Monitoring

Brown Marmorated Stink Bug (BMSB)

- Wide host range ~ 300 species
- Major pest in eastern US, slowly moving west
- **Hotspots in Berrien and Van Buren Co.**
- Overwinters in buildings
- Cosmetic damage to fruit and diseases can develop
- They stink! 10 bugs/lug threshold
- Pre-harvest scouting
- Insecticides with good knock down and short PHI

Monitoring

Spotted wing *Drosophila* (SWD)

- Vinegar fly from eastern Asia
- **Now "everywhere"**
- Lays eggs in **intact** ripening fruit
- Major pest in other berry crops
- More risk in thin-skinned and early ripening red wine grape varieties

Martin Hauser CDFA

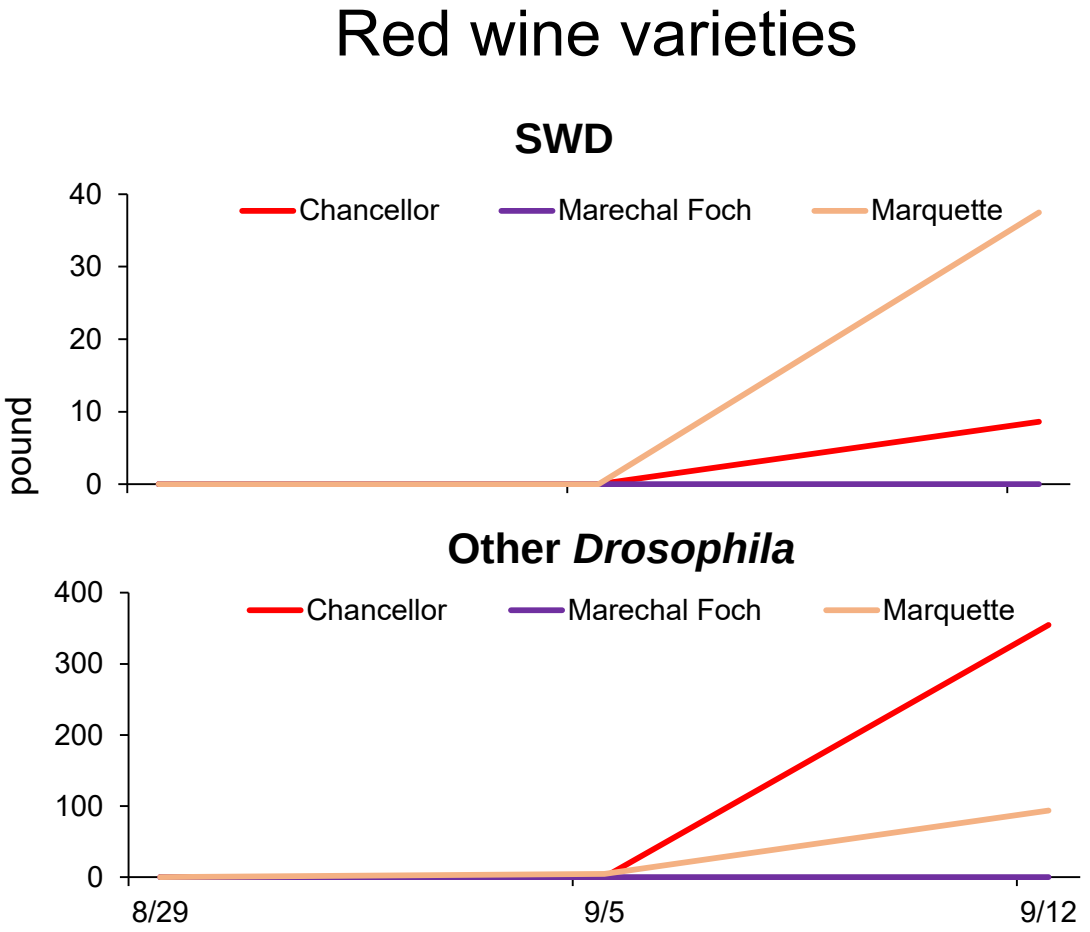
Cultivar susceptibility to SWD

Grapes collected through the harvest season.

Number of insects emerging per pound.

Way more native Drosophila than SWD.

More SWD in Marquette.



Cultivar susceptibility to SWD

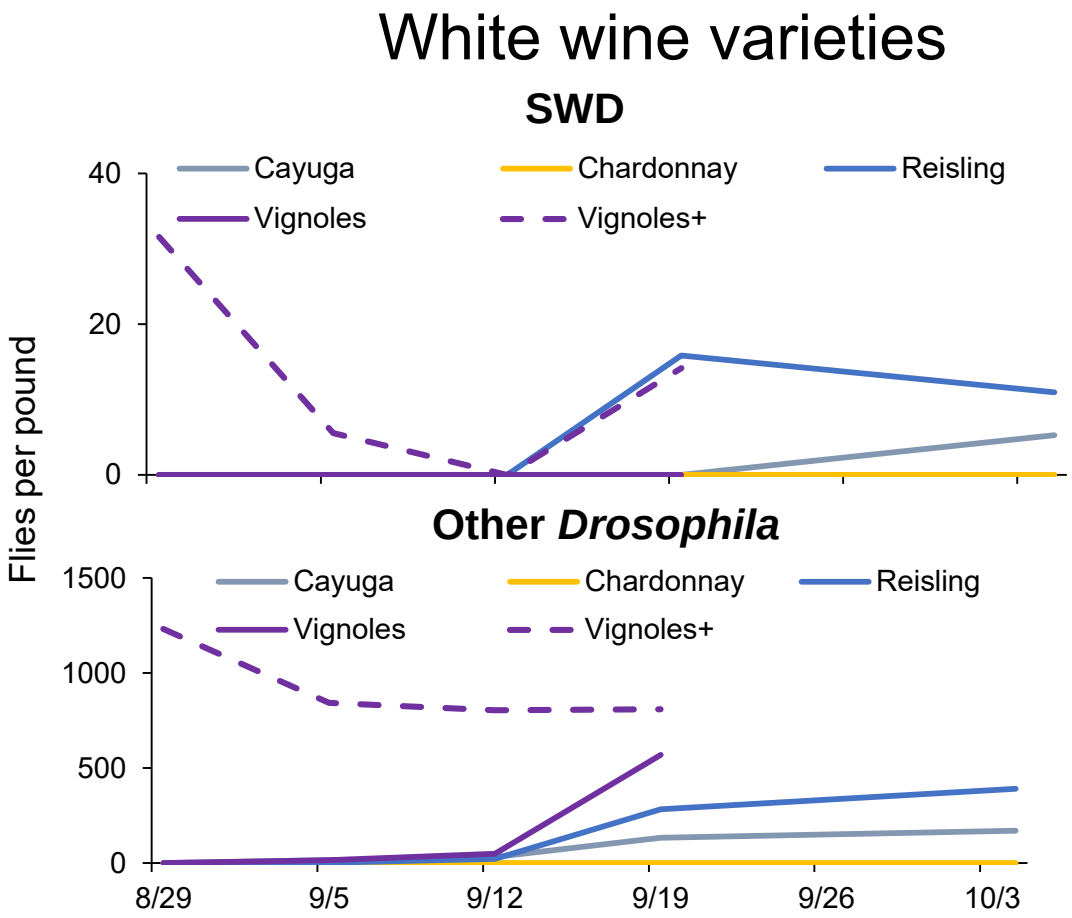
Grapes collected through the harvest season.

Number of insects emerging per pound.

Way more native *Drosophila* than SWD.

More SWD in Reisling.

Vignoles with sour rot have more SWD and other *Drosophila*.



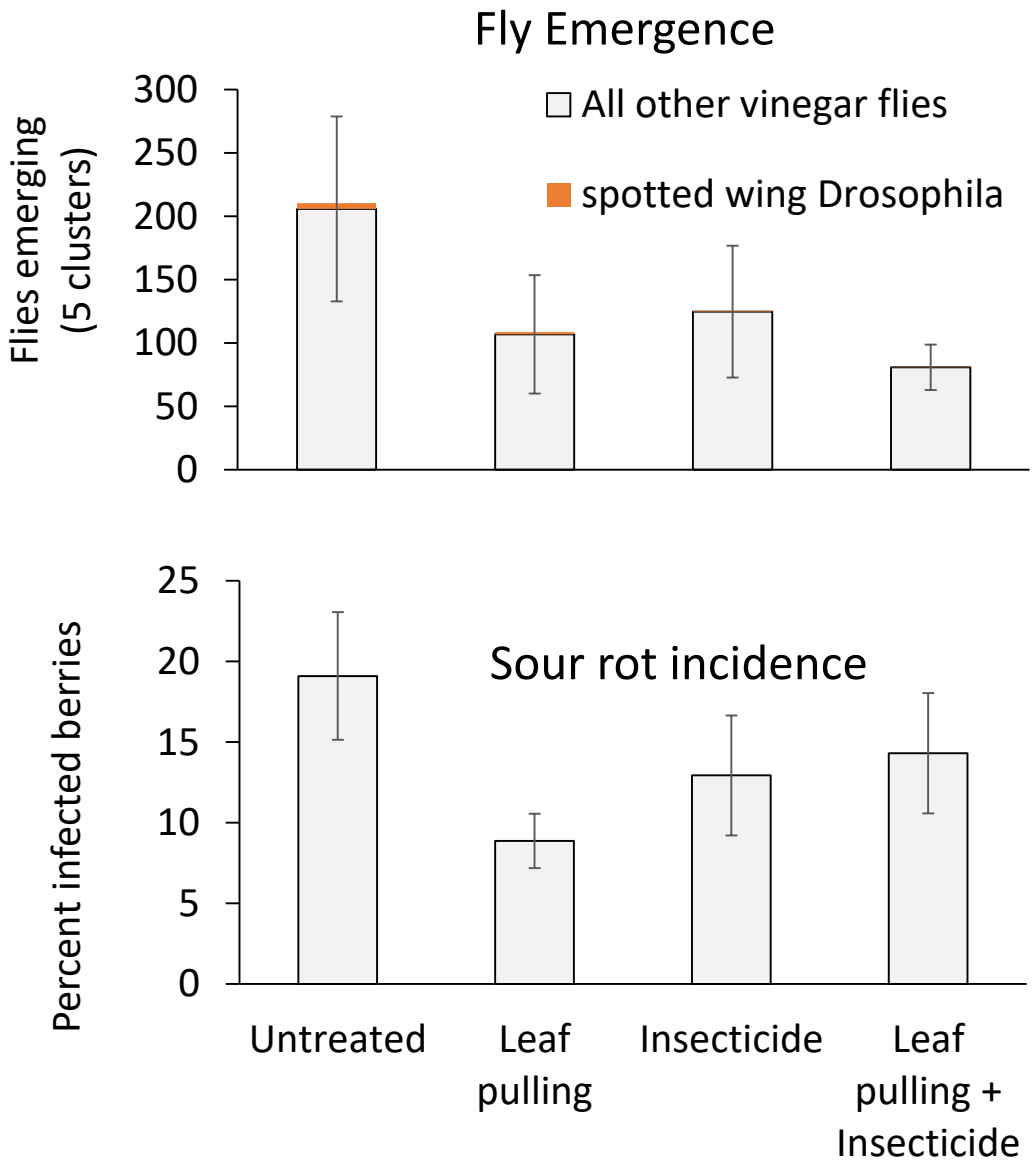
Interaction between vinegar flies and sour rot

Small plot trial in Vignoles.

Leaf pulling in early July.

Insecticide applications every two weeks from veraison to harvest.

Combination treatment had lowest fly infestation.



Summary

- Invasive moths and spotted lantern fly not detected in Michigan.
- SWD and BMSB present in Michigan vineyards, and their impact is increasing.
- Most fruit flies reared from grapes are not SWD, but SWD may be contributing to split berries and infestation by other fruit flies.
- Some cultivars more susceptible to SWD. Others seem resistant.
- Leaf pulling can reduce sour rot incidence, and leaf pulling plus insecticide applications reduce fruit flies.
- Scout your vineyards after veraison to know if border sprays are needed for SWD and BMSB management.

Thanks!

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Questions? Comments?
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