

Michigan Grape & Wine Industry Council
2015 Research Report

Michigan Vineyard IPM Extension Program

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ABSTRACT

This work demonstrated how reduced-risk pesticides can provide effective insect and disease management when they are integrated into commercial grape production. Reduced-risk and standard broad-spectrum pesticide programs provided similar pest and disease control, and in some cases the reduced risk program out-performed the standard program. Scouting information was collected each week and summarized in biweekly reports that were published in MSU Extension Grapes News and are now archived at www.grapes.msu.edu. Results from this and related studies were presented at grape workshops in southwest and northwest Michigan during the growing season, and provided information on current insect, disease and horticultural topics.

GOALS & OBJECTIVES

This project demonstrated IPM techniques to the Michigan grape industry using a combination of demonstration vineyards, electronic scouting updates, formal presentations and hands-on workshops. This included using insect and disease scouting to provide timely information for growers to help them make management decisions. This project also provided training on how to use IPM tactics including cultural controls to show how effective vineyard management can be achieved with reduced chemical inputs. A particular focus of this training was placed on management of insect and disease problems in the period around harvest. The specific objectives of this project were to:

- 1. Demonstrate performance of scouting and reduced-risk management in commercial grape vineyards.**
- 2. Deliver information on IPM and cultural controls to the Michigan grape industry.**
- 3. Deliver training programs on harvest-time pest concerns in 2015.**

PROJECT PERIOD

This project was conducted during 2015, with fieldwork occurring from May to October.

WORK ACCOMPLISHED DURING THE PERIOD

Objective 1. Demonstrate performance of scouting and reduced-risk management in commercial grape vineyards. A pair of demonstration vineyards of the same variety were established at each of two Berrien County and two Van Buren County grape farms in May of 2015. The Berrien County farms were Vignoles and Concord and in Van Buren County the vineyards

were Chancellor and Niagara varieties. In each vineyard pair, one received the grower's "standard" program for insect and disease management (Leverage, Sevin, Imidan, Mustang Maxx, Penncozeb, Ridomil, etc.), while the other vineyard received an IPM program that incorporated reduced-risk pesticides for controlling key insect pests and diseases (Intrepid, Altacor, Belt, Phostrol, Sovran, Orius, etc.). To compare the efficacy of the management programs, we scouted each vineyard bi-weekly for insect pests (rose chafer, grape leafhopper, potato leafhopper, grape berry moth and Japanese beetle) and diseases (Phomopsis, black rot, powdery mildew, downy mildew, Botrytis, and sour rot) until harvest.

In most cases reduced-risk products consistently performed as well or better than their conventional counterparts. For example grape berry moth (GBM) control was better in the IPM vineyards where Intrepid and Altacor were used compared to the grower's standard program. The number of infested berries per cluster was lower in vineyards that received the IPM program (Figure 1). We have seen similar results through multiple years of this project, and our cooperating growers have now incorporated Intrepid and other reduced-risk compounds such as Belt and Altacor into their grape berry moth management programs on their farms. Very low abundance of other important grape insect pests such as leafhoppers and Japanese beetles were found in all vineyards, and numbers were similar between IPM and standard programs.

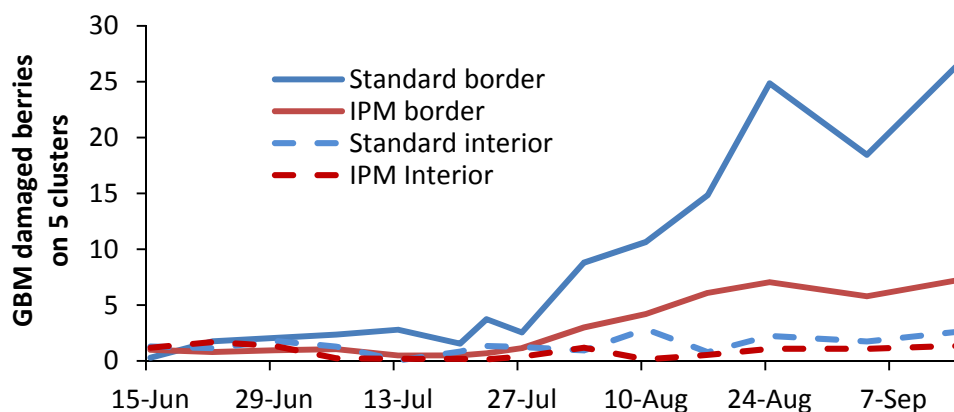


Figure 1. Comparison of grape berry moth control in IPM (reduced-risk) and Standard programs at four farms in southwest Michigan.

In general, both fungicide programs kept diseases at low levels in all vineyards in spite of the very wet and cool growing season in 2015. Overall very little disease pressure was observed in the juice grape vineyards. Through most of the season only 1 to 6% of observed clusters had black rot symptoms and incidence was very similar in IPM and Standard vineyards. An increase in black rot infection was observed before harvest in the Niagara vineyard and suggests that early season fungicide applications in these vineyards were negatively affected by the wet conditions that occurred during the period that clusters were susceptible to black rot. Phomopsis was the most common disease affecting leaves early in the year, and as the season progressed, downy mildew lesions were the most common symptoms observed in juice grape vineyards (Figure 2). Despite the appearance of leaf lesions, these diseases were considered to be well managed as the infections did not move onto the clusters.

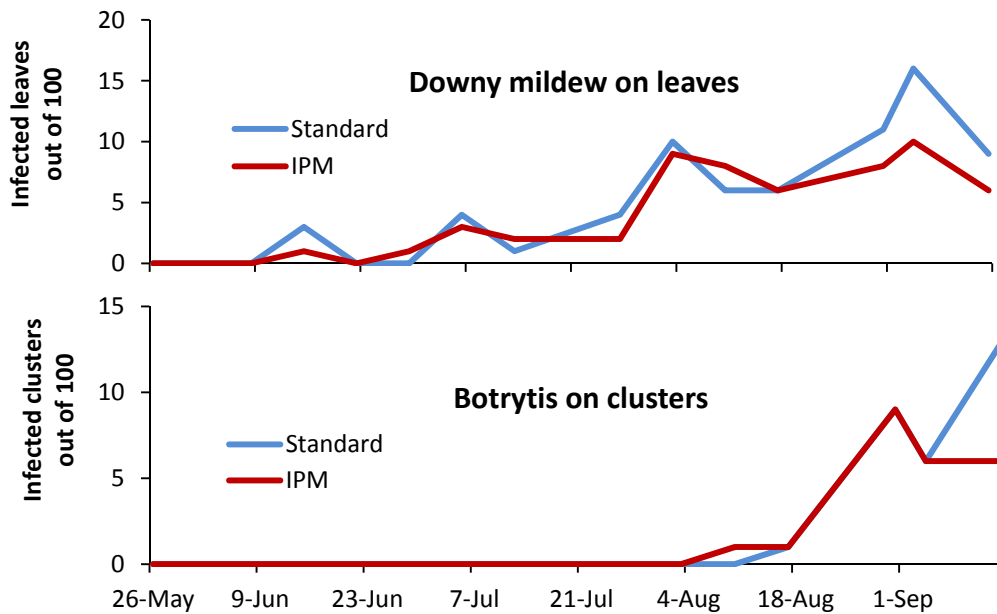


Figure 2. Disease incidence in vineyards receiving either an IPM or Standard program. (Top) Downy mildew symptoms in two juice grape farms in southwest Michigan in 2015. (Bottom) Botrytis infections on clusters in vineyards that received either an IPM or Standard program at two wine grape farms in southwest Michigan in 2015. Incidence of this disease was much higher in Vignoles than in Chancellor.

The key disease issues on clusters in the wine grape vineyards that we scouted were Botrytis (Figure 2) and sour rot, and the IPM and Standard programs both provided similar and adequate control of these pathogens. Although the data are not shown by variety the incidence of these two cluster diseases was much higher in the Vignoles vineyards than in the Chancellor vineyards. This result was not unusual given the compactness of clusters in Vignoles. Phomopsis and black rot lesions were visible on leaves in both of these varieties, but there was little evidence that these diseases colonized clusters, again showing that the IPM and Standard programs both provided equivalent control in these vineyards. Powdery mildew was not a problem in any of the vineyards we scouted in 2015, and this was a marked improvement from 2014 when powdery mildew was prevalent in the Chancellor vineyard that received the IPM program. The improved control in 2015 is likely due to using Revus Top and Vivando for some of the applications targeting this disease. Overall, these results show that reduced-risk pesticides can be substituted for conventional compounds in pest management programs, but in some situations where varieties are highly susceptible to certain insects or diseases, a conventional pesticide may be needed for adequate control.

Objective 2. Deliver information on IPM and cultural controls to the Michigan grape industry.

The data from weekly scouting in the demonstration vineyards used in Objective 1 were compiled into Vineyard IPM Scouting Updates that were distributed through MSU Extension Grape News. These bi-weekly updates provided growers with detailed information on current insect and disease

pressure in vineyards in southwest Michigan, and a similar report was written by Dr. Duke Elsner to cover vineyards in the northwest. Growers were able to use this information to determine when and which pesticides to apply. In addition to current scouting information, the reports contained timely feature articles on a wide range of topics including disease and insect control and various aspects of viticulture. A total of 10 issues of the Vineyard IPM Scouting Update were produced in 2015 from May to September, and these are now archived on grapes.msu.edu. The Vineyard IPM Scouting Update along with events and articles with recommendations was sent out to the Grape & Wine Industry Constant Contact list. This list was initiated in May 2014 with 220 contacts and as of December 2015 has 1,133 contacts. Out of the approximately 70 Constant Contact email lists maintained by MSU Extension, the Grape & Wine Industry list has the highest email open rate at 33-45 percent, and the average open rate for “Educational” organizations is 25 percent. Three significant information sections were added to www.grapes.msu.edu this year:

- The grape pest and beneficial search tool
http://grapes.msu.edu/integrated_pest_management/grape_pest_and_beneficial_search
- Wineries and wine tourism with research from McCole and Holecek
http://grapes.msu.edu/wine_tourism
- Grape rootstocks for Michigan (also in print) from Sabbatini and Perry
http://grapes.msu.edu/viticulture/grape_rootstocks_for_michigan

The www.grapes.msu.edu website continues to see significant increase in traffic, which demonstrates this website is a powerful tool for transferring information to the grape and wine industry. From January-December 2015, it has attracted over 22,500 users making 27,600 sessions (visits) with 46,700 page views. In 2015, articles containing the word “grapes” at the MSU Extension website received 26,300 page views of which 22,800 were unique page views. Average time spent was 3.5 minutes per page.

3. Deliver training programs on harvest-time pest concerns in 2015.

Meetings in northwest Michigan in 2015 included a spring “Kick-Off” at the Northwest Michigan Horticulture Research Center on April 10 and two “First Friday” field meetings on June 5 and July 10. The Kick-Off featured a comparative tasting of commercial wines made from numerous super-cold hardy varieties, led by Dr. Ron Perry. The July 10 meeting featured Dr. George Bird discussing soil health indicators, and was well attended (about 25 people). No harvest-time meetings were held in 2015 because of a series of devastating weather events that occurred in the Grand Traverse region, resulting in the reduction of harvestable crop to under 20% of a typical yield in most varieties. Fruit quality was also severely impacted by the last event, a violent storm with large hail on August 2nd, and many vineyards were not harvested.

In southwest Michigan three grower meetings were held including a Season Kick-off meeting on March 24th that included presentations on early-season insect and disease control and winter injury (40 attendees). A special meeting was held on June 3rd to talk about horticultural responses to winter injury, and post-bloom insect and disease control strategies were also discussed (20 attendees). A pre-harvest meeting was held on August 18th, with the main focus of late season chemical and cultural control of grape berry moth and harvest time diseases. This meeting included a demonstration of a precision sprayer system that can be added to a high pressure sprayer, to allow selective application of pesticides to areas of high insect or disease pressure (15 attendees).



Figure 4. Mark Ledebuhr of Application Insight speaks with growers about precision sprayer technology that can be retro-fitted to an existing sprayer to enable location specific pesticide application.

COMMUNICATIONS ACTIVITIES, ACCOMPLISHMENTS, AND IMPACTS

Results from this project have been shared during summer and winter grower meetings, including the SWMREC Viticulture Days, Great Lakes Expo, Southwest Hort Days, and the Northwest Orchard and Vineyard Show. The information from this project's vineyard scouting was also presented in the Grape eNews newsletters that were distributed via email through the growing season.

RESULTS & CONCLUSIONS

This project has supported the delivery of relevant and timely information to the grape industry regarding vineyard management. It has also supported the gathering of weekly scouting information used to present timely updates and recommendations in the Grape eNews distributed through MSU Extension. The scouting information has also been taken at vineyards where reduced-risk insect and disease management programs have been used, and this has allowed demonstration of their efficacy under commercial conditions, resulting in improved pest control and reduced dependence on broad-spectrum pesticides. Through the support of this project, we were also able to inform the industry about the increasing incidence of grapevine mealybug and the spread of grapevine leaf roll virus. During 2015 we also organized and delivered multiple workshops covering insect and disease control and horticultural techniques for renovating vineyards.

Growers have been able to see the performance of new pest management programs at the whole vineyard scale and these commercial sites have provided venues through the growing season for discussion of relevant issues in the plant pathology, entomology, and horticulture. Our ongoing extension program has helped improve vineyard management in Michigan and we have had highly positive feedback from growers on the information being provided. Feedback from growers at post-harvest meetings indicate the following outcomes: increasing adoption of certain reduced-risk products such as Intrepid, Altacor, Vivando and Prophyt; incorporating tactics like dormant season fungicides into spray programs; increased use of scouting to determine if sprays are necessary and use of the grape berry moth degree model to time sprays.

BUDGET NARRATIVE

This project was conducted in accordance with the approved budget, as outlined in the original grant agreement and funds were used to accomplish the objectives of the proposal. Our grower cooperators made in-kind contributions of labor, materials and equipment costs to manage their vineyards to the specifications of the IPM and Standard programs. This is estimated to be between \$1,500 and \$2,500 per acre, and we used approximately 30 acres for this project. Some pesticides were provided to the Isaacs lab by agrichemical companies for use in this research/demonstration project. We estimate this to be an additional \$6,500 of in-kind contribution.

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