Michigan Grape and Wine Industry Council
Research Priorities
2009-10

Research Topics:

These are listed in two priority groups with group 1 having high priority and group 2 having moderate priority.

Group 1: High Priority

1) Develop a GIS / GPS map of the important wine grape-producing regions of Michigan Develop a map that identifies the viticultural potential of different sites. Use this information as an educational tool to:
    a. Aid city and county planners in understanding the extent of potential vineyard acreage in their region as they plan for urban development.
    b. Aid potential land purchasers/grape growers in understanding the strengths/limitations of the sites in which they are interested.
    c. Identify varieties and their potential for various sites and land types.
    d. To discuss Michigan's industry and explain it to those outside our wine-producing community.

2) Determine the impact of biotic and abiotic stresses on biomass productivity of vineyards. Determine "acceptability thresholds" for various pests and diseases. Determine the cumulative impact of various stresses at varying levels on cropping potential and how these factors subsequently impact wine quality, long term vine health and vineyard potential. Develop recommendations for bringing vineyard crop level into balance with vineyard cropping potential. This would be part of an ICM program.

Continue overall improvement of Michigan wine grapes and wines. Includes testing vineyard factors such as variety, clone, rootstock, site, training system and yield as well as testing the impact of various cultural practices on wine quality. The winery factors include manipulating fermentation variables to determine their impact on wine quality.

3) Maximizing color development, extraction and stabilization in red wines.
    a. Survey of commercial varieties in state for pigments and co-factors.
    b. Study impact of viticultural practices, including crop level and canopy management on pigments and pigment co-factors.
    c. Study impact of enological practices on color extraction from fruit, intensity and stability of color.

4) Harvest Maturity of Fruit: Develop a better understanding of the factors in fruit that translate into wine quality. Give growers and winemakers better tools for determining optimal harvest maturity.

5) Cold Hardiness of Grafted, Resistant-Hybrid Grapevines: Develop a better understanding of graft-union cold hardiness of resistant hybrid grapevines during vineyard development. Determine the number of years various scion / rootstock combinations must be covered to insure maximum vine survival.

6) Insects: Maintain active research into reducing the impact of commercially damaging grape insect pests (e.g. grape berry moth, Japanese beetle, grape leaf hopper, potato leafhopper, etc.).

7) Diseases: Maintain active research into reducing the impact of commercially damaging grapevine diseases (e.g. phomopsis, black rot, botrytis, eutypa, powdery mildew, downy mildew, crown gall, viruses).

8) Integrated / Ecological Viticulture: Determine the potential for integrated viticultural management programs that help Michigan grape growers reduce or soften inputs (e.g. pesticides, fertilizers, etc.). Better understand how these systems impact fruit and wine quality, vine health, long term vineyard productivity and survival, soil health, environmental impact, management costs, etc.

9) Variety and Clone testing: Evaluate varieties and clones of varieties new to Michigan for their potential as wine-producing varieties here.

10) Rootstocks: Evaluate performance and interaction of various, rootstocks and scions on varying sites in Michigan. Develop recommendations for scion / rootstock / trellis for various soil types and growing regions of the state.

11) Atypical Ageing of White Wines: Develop a deeper understanding of the chemistry underlying atypical ageing of white wines. Determine the impact of viticultural factors on the occurrence and intensity of atypical ageing.

12) Winter injury: Find ways to reduce impact of winter injury to vines and, reduce costs of managing vineyards planted with cold-tender varieties.

13) Maximizing development of aromatic compounds in white grape varieties: Determine influence of viticultural practices on development of terpenes and other aromatic compounds in Riesling and Pinot gris.

Group 2: Moderate Priority

1) Determine optimal leaf to fruit ratios for important wine grape varieties in Michigan to produce the best wines. Better understand how vineyard management strategies and vine stresses interact to impact this relationship.

2) Remote sensing of vineyard health and performance: Develop methodologies to determine a vineyard's physical condition quickly and easily with accuracy and precision (e.g. water stress, nutrient stress, biotic stress). Relate remote sensing data to impact on vineyard cropping potential. Develop corrective viticultural practices which bring crop into balance with vineyard cropping potential.

Extension Ideas: The Extension Ideas are grouped into two priority classes with group 1 having highest priority:

Group 1: High Priority

1) Demonstrate vineyard management for commodity, premium, or super premium grape production. This could be on-farm or located at an MSU experiment station. Regional workshops that incorporated farm visits might also address this need.

2) Help growers and winemakers better understand the complex relationships between yield, crop level, canopy management, vine vigor management, vine nutrition, and other vineyard management practices, flavor development in the vineyard and how those factors translates to wine quality.

3) Show growers how to obtain a representative sample from their vineyard (i.e. show them the basics of population sampling). Demonstrate crop estimation techniques. Demonstrate techniques to estimate vineyard crop potential. Show how to bring crop level into balance with vineyard potential

4) Compile data from past research on varieties and clones. Develop table rating each variety and clone for viticultural and enological attributes (suggest using 5 point or similar scale).

5) Assist in organizing winemaking workshops that help winemakers review (both fundamental and advanced) topics in enology (these could feature roundtable discussions and/or guest winemakers (presenters) to discuss strategies, techniques. A range of topics is possible, including harvest maturity of fruit and harvest timing; flavor development in the vineyard; crush and fermentation; fining options; wine stabilization and filtration; barrel aging and barrel management; routine wine monitoring; recognizing and handling wine problems (faults).

Group 2: Moderate Priority:

6) Educate growers on theory behind vine vigor management and how it relates to ones choice of trellis and ultimately impacts wine quality. Demonstrate how to obtain a record of vineyard information(e.g. vine size, cluster number, yield, berry weight) and use this information in a vineyard management program.

7) Develop spray recommendations to control common diseases in *all* varieties (e.g. powdery mildew in *V.vinifera* cultivars). Develop and update IPM recommendations for all varieties.

8) Help growers better understand the relationship between vineyard stress, yield, quality, vine health and long term vineyard productivity. Stresses include insect, disease, heat, water, nutritional, crop load, and cold injury.

9) Post vineyard management notes on a web-site *weekly.* See Cornell Finger Lakes web site for example . (Note: In current Extension bulletins, little information is given on current pressure and control of Powdery mildew – a problem in vinifera

in SW Michigan. It would also be useful to have reminders for growers that it is time to count clusters, estimate crop, adjust crop, move catch wires for VSP or Scott-Henry trellis systems, tip shoots, thin shoots, pull leaves etc.)