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EXTENSION CENTER FOR COMMUNITY VITALITY

Wineries of the North

2016 STATUS REPORT

Authored by Brigid Tuck, William Gartner, and Gabriel Appiah



IN PARTNERSHIP WITH THE NORTHERN GRAPES PROJECT, AN
USDA, SPECIALTY CROPS RESEARCH INITIATIVE PROGRAM OF
THE NATIONAL INSTITUTE OF FOOD AND AGRICULTURE



Department of
**APPLIED
ECONOMICS**

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December 2016

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Northern Grapes Project, which is funded by USDA's Specialty Crops Research Initiative Program of the National Institute of Food and Agriculture, project number 2011-51181-30850

Special Thanks to:

Jim Luby, Professor, University of Minnesota Extension

Chrislyn Particka, Extension Support Specialist, Cornell University

Participating Industry Associations

Northern Grapes Project Advisory Committee

Photo Credit:

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EXECUTIVE SUMMARY: WINERIES OF THE NORTH, 2015

The Northern Grapes Project assembled researchers from 12 states to assist the cold-hardy grape and wine industry. The project had four main objectives to address cold-hardy grape varietal performance, viticulture practices, winemaking practices, and the economics of vineyards and wineries.

Under the economics-related goal, University of Minnesota conducted two surveys. In 2012, participating grape growers and wineries were surveyed to gather 2011 operations data.

In 2016, the survey was repeated to collect 2015 winery operations data. The survey was sent to grape growers and wineries in January and February of 2016 and yielded 113 useable responses.

Major Findings:

- Growth continues in the winery industry. More than half (57 percent) of responding wineries were established after 2008. This is consistent with published statistics.
- Wineries rely on tasting rooms. Nearly all (95 percent) operated a tasting room in 2015. Seventy-five percent charged a fee for tastings. On average, each tasting room attracted 10,300 customers.
- In 2015, each winery spent an average of \$25,200 to purchase cold-hardy grapes for a total of \$22.7 million. Forty-four percent of grape purchases were from cold-hardy varieties.
- In 2015, sales at wineries in participating states totaled \$449.3 million. Of this amount, \$167.0 million can be attributed to cold-hardy grapes. Wine accounted for 85 percent of all winery sales.
- Wineries employed 8,500 people in 2015. On average, each winery employed nine people, many of which are part-time, year-round positions. Each winery used 209 hours of volunteer labor in 2015, significantly less than in 2011.
- In 2015, wineries spent an estimated \$70.9 million on labor, an average of \$78,500 per winery.
- Wineries view their own branding initiatives, special events, and wine trails as the most important elements of their marketing strategies.
- Wineries collaborated most closely with other wineries, tourism destination organizations, and the lodging industry.
- Wineries are mostly concerned with government policy and sales in terms of the future growth and development of their businesses.

Comparison of 2011 and 2015:

- The two surveys provide a comparison between two points of time within the winery industry, particularly related to the cold-hardy grape industry.

- Along many metrics, the 2015 winery industry was similar in 2015 to 2011. This includes the types of grapes used, the types of labels produced, plans for the future, and the concerns of winery owners.
- The industry showed signs of growth in 2015 compared to 2011. For example, the total number of bottles sold increased between the two surveys.
- Total cold-hardy wine production was slightly lower in 2015 than in 2011. This is a result of lower production per winery, as reported in the 2015 survey. A decrease in production may be attributable to the increased number of new wineries that had limited or no production in 2015. It may also be the result of a poor growing year in 2014, which limited the availability of grapes. Despite the decline, however, sales at wineries using cold-hardy grapes in 2015 were higher than 2011. This may be explained by an increase in the price per bottle sold, an increase in the number of tasting room customers, and an increase in the sale of inventoried wine.
- Wineries reported more tasting room customers in 2015. They also reported becoming more sophisticated in their tasting room operations with more charging for tastings and selling food. Sales through distributors and to liquor stores, however, decreased as a percent of total sales compared to 2011.
- The winery industry showed some early signs of maturity. Vertical integration (wineries owning their own vineyard) increased in 2015 compared to 2011, with only a handful of wineries operating without their own vineyard. Wineries also relied primarily on their own grapes, using informal arrangements with other wineries to fill additional demand. They further reported a decrease in volunteer hours and an increase in the number of paid year-round employees, as compared to 2011.



NORTHERN GRAPES PROJECT

The Northern Grapes Project was a USDA-funded grant project. The project launched in September 2011. Its vision was “to develop grape production, winemaking, and marketing practices suited to the unique characteristics of *V. riparia*-based (Northern Grape) cultivars marketed through retail tasting rooms and their niche in the US wine market” (Martinson 2016)¹.

The history of the Northern Grapes Project is tied to the development of cold-hardy grapes. Traditional grape varieties, often associated with California or New York’s Finger Lake region, are not suited to survive the cold winters of northern climates. In the mid-1990s, University of Minnesota, along with other private and public breeders, began releasing grape varieties designed to flourish in colder climates. The release of these varieties sparked a major change in the grape growing and winery industry across the United States, particularly in the Midwest, New York, and New England. Vineyards and wineries soon began populating the regions. Iowa, for example, went from zero planted grape acres to 1,000 in a nine-year period. Minnesota went from two wineries in the 1970s to 62 by 2016.

The Northern Grapes Project team was assembled to assist the fledgling cold-hardy grape and wine industry. The project had four main objectives to address the vine, the vineyard, the winery, and the tasting room.

- *The vine*: understanding varietal performance and resulting fruit and wine flavor attributes in different climates
- *The vineyard*: applying appropriate viticultural practices to achieve consistent fruit characteristics for ripening
- *The winery*: applying winemaking practices to unique fruit composition to produce distinctive wines that consumers will like and purchase
- *The tasting room*: understanding consumer preferences and individual/regional marketing strategies to increase sales and sustained profitability of wineries and vineyards

In order to measure industry progress, the Northern Grapes Project plan included a survey of the industry, as well as an economic contribution analysis, at the project start (2012) and the project end (2016).

This report summarizes the 2015 survey results. The full report covering the 2011 season can be found at <http://www.extension.umn.edu/community/economic-impact-analysis/reports/>. Reports on the 2015 vineyard status and on the economic contribution of vineyards and wineries are also available on the site.

The Northern Grapes Project is funded by the USDA’s Specialty Crops Research Initiative Program of the National Institute of Food and Agriculture.

¹ Martinson, T. (August 2016). What we have accomplished: Reflections on the Northern Grapes Project. *Northern Grapes News*, 5(3). Retrieved from: <http://northerngrapesproject.org/wp-content/uploads/2016/08/NG-News-Vol5-I3-Aug-2016.pdf>.



WINERIES: END OF PROJECT SURVEY RESULTS

The Northern Grapes Project was a five-year project. One its goals was to establish an industry baseline at the beginning of the project (2012) and then to measure any changes to the baseline at project's end (2016). To achieve this goal, the University of Minnesota conducted a survey of winery owners in early 2012. The survey asked questions about the 2011 wine season. In 2016, the University of Minnesota repeated the survey with questions covering the 2015 wine season.

This report presents the 2015 season results for wineries across the 12 participating states. Where appropriate, 2015 results are compared to those of 2011.

Survey Methodology and Response Rates

In December 2015, University of Minnesota Extension updated the 2012 survey instrument. All questions on the survey were reviewed for both necessity and effectiveness. As a result, several questions from the 2012 survey were dropped or modified.

Each participating state provided the Northern Grapes Project with contact information from their membership lists. The survey was deployed following established surveying techniques.²

On January 7, 2016, a pre-notification email was sent to the membership lists of nine states. On January 14, pre-notification emails were distributed to the remaining states.³ The survey officially launched via email on January 19, 2016. Reminders were sent on February 3 and February 18.

The Northern Grapes Project webinar series also promoted the survey. Individual associations, councils, and organizations at the state level encouraged their members to complete the survey. Some organizations also publicized the survey via their webpages and newsletters.

In total, 545 participants responded to the survey (Table 1). The highest number of responses came from Minnesota (110), New York (74), and Wisconsin (66). These are also states with relatively large membership lists. States with the highest response rates include Vermont (67 percent), Nebraska (38 percent), Michigan (32 percent), and New York (32 percent).

It is worth noting the composition of the membership lists, as most membership lists include not only grape growers and winery owners, but also people associated with the industry. This includes researchers, industry specialists, and media contacts. Since the survey was not directly targeted at this audience, they may not have responded, thus lowering response rates.

Table 1: Number of Responses and Response Rates by State

State	Number of Emails Sent	Number of Recorded Responses	Response Rate
Connecticut	65	17	26%
Illinois	231	49	21%
Iowa	169	46	27%
Michigan	176	57	32%
Minnesota	574	110	19%

² Dillman, D.A. and Salant, P. (1994). *How to conduct your own survey*. New York: John Wiley and Sons.

³ The gap was due to delays in receiving membership lists.

Nebraska	50	19	38%
New York	228	74	32%
North Dakota	218	34	16%
South Dakota	109	15	14%
Vermont	36	24	67%
Wisconsin	221	66	30%
Other	None	34	Not Applicable
Total	2,077	545	26%

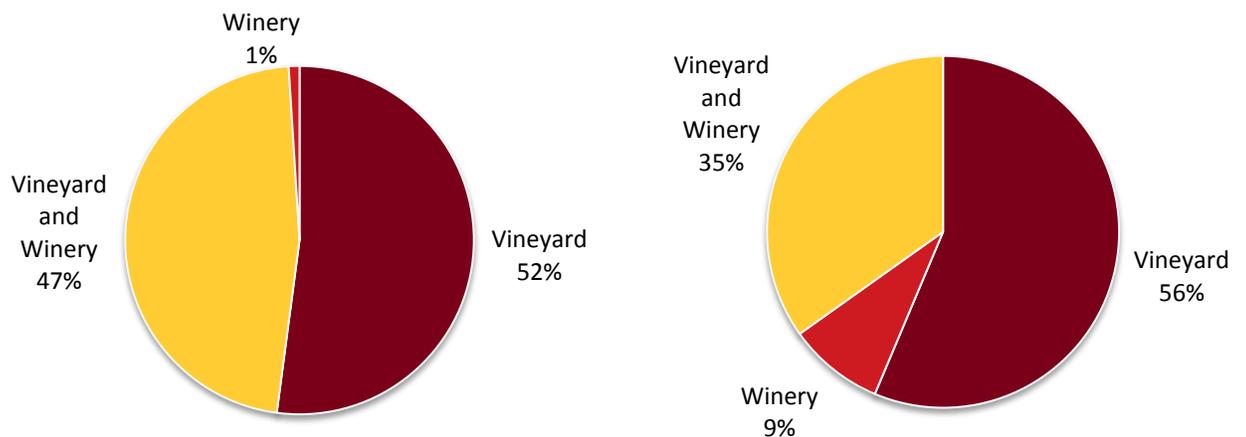
Of the 545 respondents, 37 reported being involved in the industry in another capacity. Respondents indicating they were involved in another capacity were asked to indicate their particular role. These respondents were screened from the survey and answered separate questions.

Survey respondents were nearly evenly divided between owning a stand-alone vineyard or a vineyard-winery combination (Chart 1). Fifty-two percent of respondents owned a vineyard while 47 percent owned a vineyard and winery combination.

Chart 1: Survey Respondent's Role in Grape and Wine Industry

2015 N = 503

2011 N = 442



The 2015 season results indicate a shift from 2011 in the number of respondents owning a stand-alone winery. While the percent of respondents owning a vineyard has remained nearly stable (52 percent to 56 percent), the percent of respondents owning a stand-alone winery has dropped

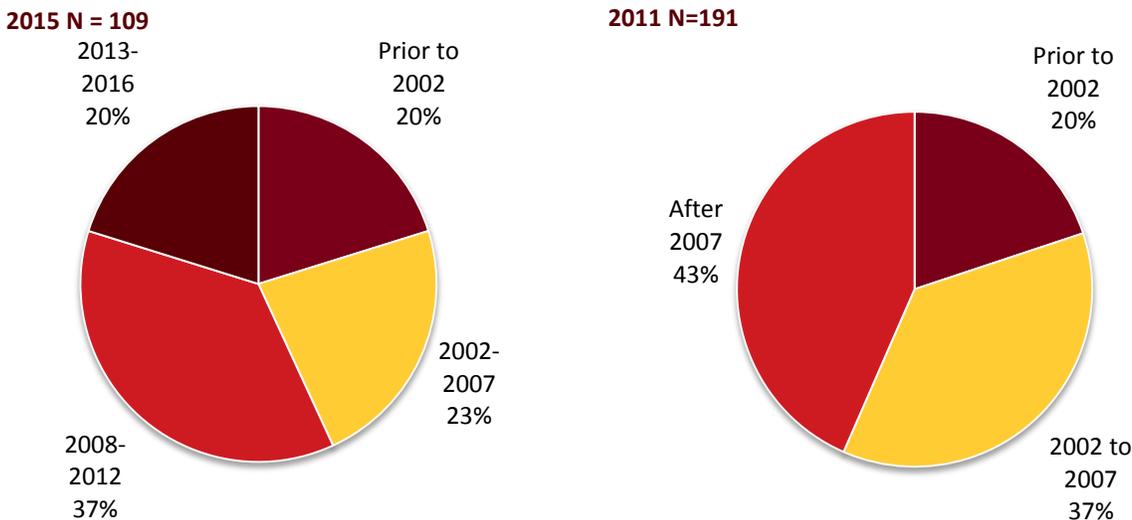
considerably (from 9 percent to 1 percent). The percent of vineyard and winery combination operations, however, has increased from 35 percent to 47 percent.

Winery Characteristics

In total, 241 respondents indicated they owned either a winery or a vineyard/winery operation. Of those, 47 respondents indicated they were not currently licensed to operate a winery. These respondents were directed to the end of the survey and did not complete the full set of questions, as the project’s aim was to measure commercial winery production. Another 79 respondents did not answer the winery questions. The survey closed with 113 usable responses.

Establishment of wineries continues to grow in the participating states. One in five respondents reported starting their winery within the past three years (Chart 2). This is consistent with statistics from *Wine Business Monthly* and Wines Vines Analytics. The statistics show that the number of wineries in the participating states increased by 24 percent between 2011 and 2015.⁴ Rapid growth also occurred between 2008 and 2012, with nearly 40 percent of reporting wineries opening during this period.

Chart 2: Year of Winery Establishment

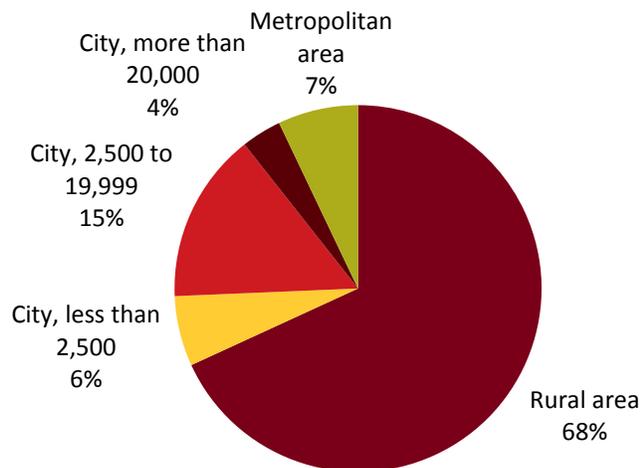


Results from the 2015 season were consistent with findings from 2011. In 2011, 43 percent of wineries indicated they were established between 2007 and 2012.

⁴ Franson, P. (2016). Number of United States wineries reaches 8,702. *Wine Business Monthly*, February, 76-77. <http://www.winebusiness.com/wbm/?go=getDigitalIssue&issueId=8170>.

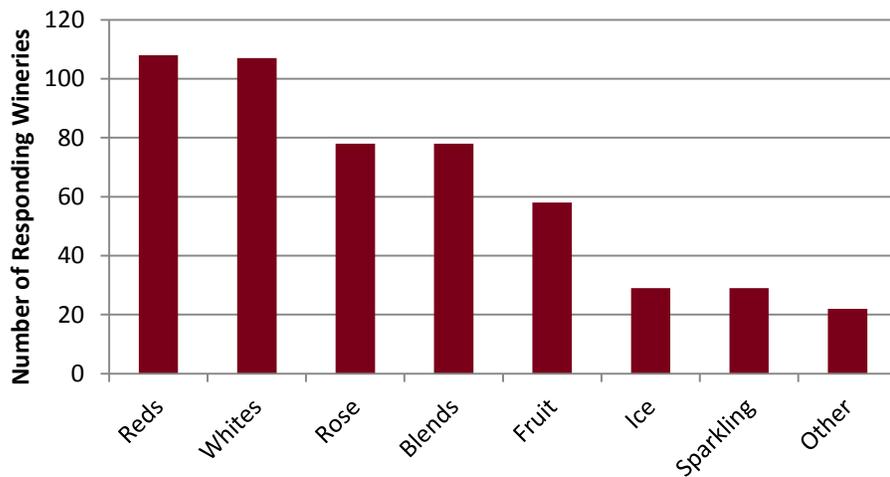
More than two-thirds of wineries (68 percent) are located in rural areas (Chart 3). These results were also consistent with results from 2011.

Chart 3: Winery Location, 2015 N = 113



Most responding wineries reported producing red (108 wineries) and white (107) wines (Chart 4). Rose and blends are also commonly produced. In general, results from the 2015 season are similar to those of 2011.

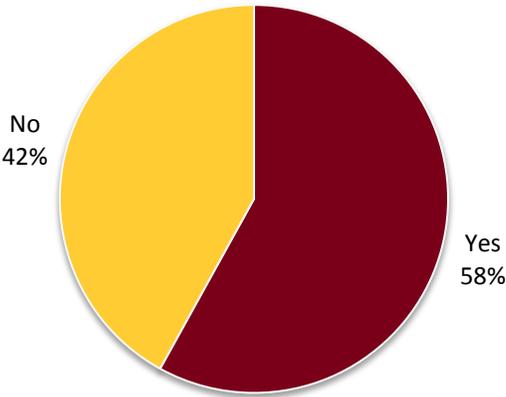
Chart 4: Types of Wine Produced, 2015



On average, each winery produced 3,000 gallons of wine from cold-hardy grapes in 2015. Results indicate wineries in participating states produced a total of 2.7 million gallons of wine from cold-hardy grapes. This is slightly lower than 2011 results (which indicated 2.9 million gallons or 3,600 gallons per winery). Per winery production fell compared to the 2011 season, but this may be due to new wineries in development and with relatively low or no production. It may also be a result of a relatively poor growing season in 2014, which would provide grapes for 2015 wine production. Michigan, one state which publishes annual harvest data, reported production of all grapes was 66 percent lower in 2014 than in 2013.⁵

The majority (58 percent) of responding wineries participated in a wine trail (Chart 5). This statistic is also similar to 2011. There remains room for wineries to further develop in this area.

Chart 5: Wine Trail Participation, 2015 N = 112



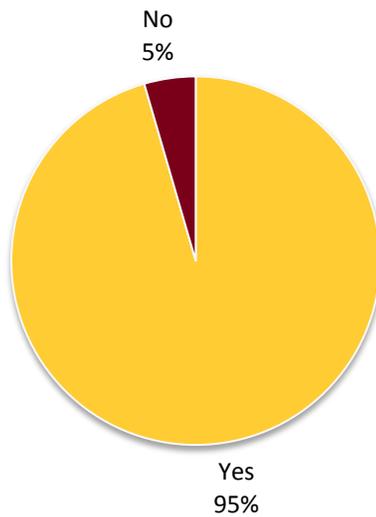
⁵ From Michigan Agricultural Statistics, 2015-2016. Grapes processed for wine in 2013 was 7,600 tons. In 2014, the figure was 2,600.

Tasting Rooms and Events

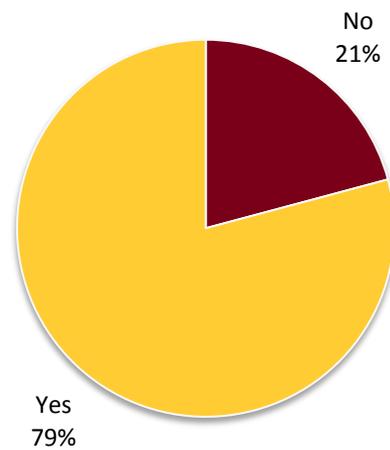
Nearly all of the responding wineries operated a tasting room (Chart 6). Nearly three-quarters of them (75 percent) charged for tastings. Slightly more than half of the tasting rooms offered food with their wine service. **On average, each tasting room reported more than 10,300 customers in 2015.** This represents an increase from 2011 when each tasting room served an average of 8,000 guests.

Chart 6: Do You Operate a Tasting Room?

2015 N = 111



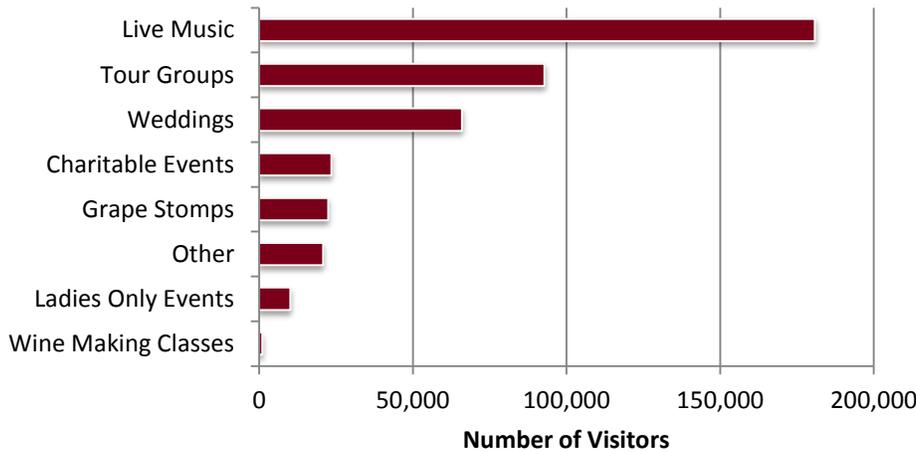
2011 N=192



These results indicate a shift from 2011 when only 79 percent of wineries operated a tasting room. Just under half charged for a tasting, and only 37 percent offered food with their wine service. The change in tasting room use and fees may be an indication wineries are becoming more sophisticated in their marketing.

Responding wineries reported hosting more than 417,000 event attendees in 2015. Live music events attracted the most people to wineries, accounting for approximately 40 percent of all event attendees (Chart 7). Tour groups and weddings were also major attractors. In 2011, live music, tour groups, and weddings were the top three events as well. Live music in 2011, however, only drew only one quarter of event attendees. Thus, the role of live music in attracting people to wineries has grown since the previous survey.

Chart 7: Winery Visitors by Type of Event, 2015

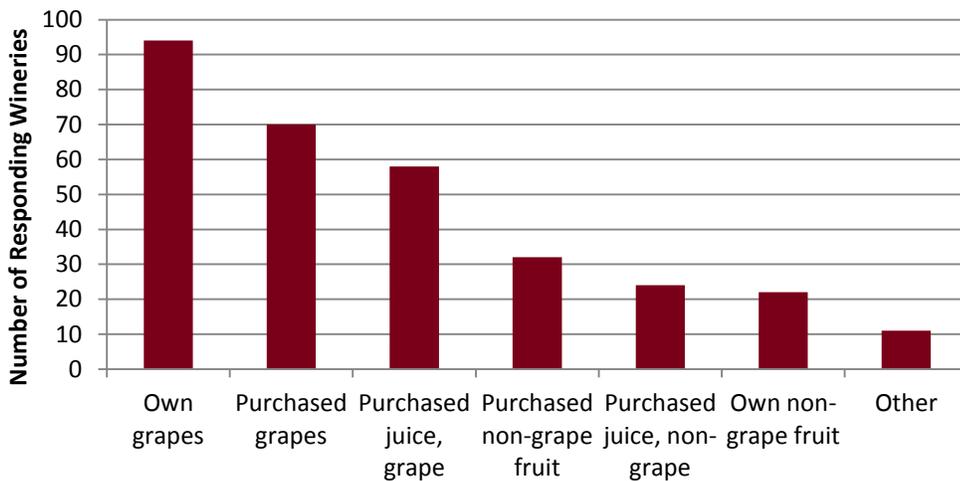


Grape Procurement

Wineries in participating states spent \$22.7 million to purchase cold-hardy grapes in 2015. On average, each individual winery reported spending \$25,200. These results represent an increase from 2011 when wineries purchased \$14.2 million of cold-hardy grapes, or \$17,900 per winery.

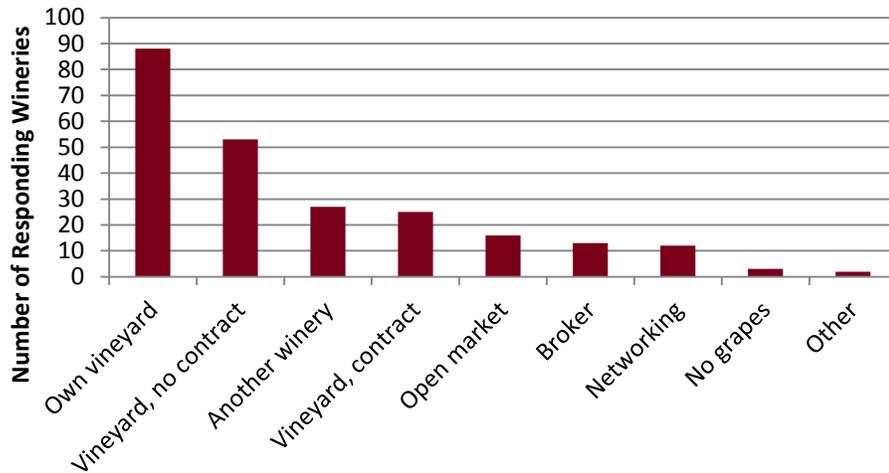
The majority of responding wineries reported using their own grapes in wine production (Chart 8). Other common methods for procuring fruit included purchasing grapes and juice from grapes. The 2015 season grape and fruit use breakdown mirrors the results from 2011.

Chart 8: Grapes and Fruits Used in Wine Production, 2015



Wineries primarily acquired grapes from their own vineyards (Chart 9). A significant number (53 percent) also get grapes from a vineyard without contract. The third most common method is acquiring grapes from another winery.

Chart 9: Grape Acquisition, 2015



Winery Sales

In 2015, winery sales in the participating states totaled \$449.3 million. On average, each winery made \$467,000 in sales in 2015. Of total winery sales, \$167.0 million were related to cold-hardy grapes.

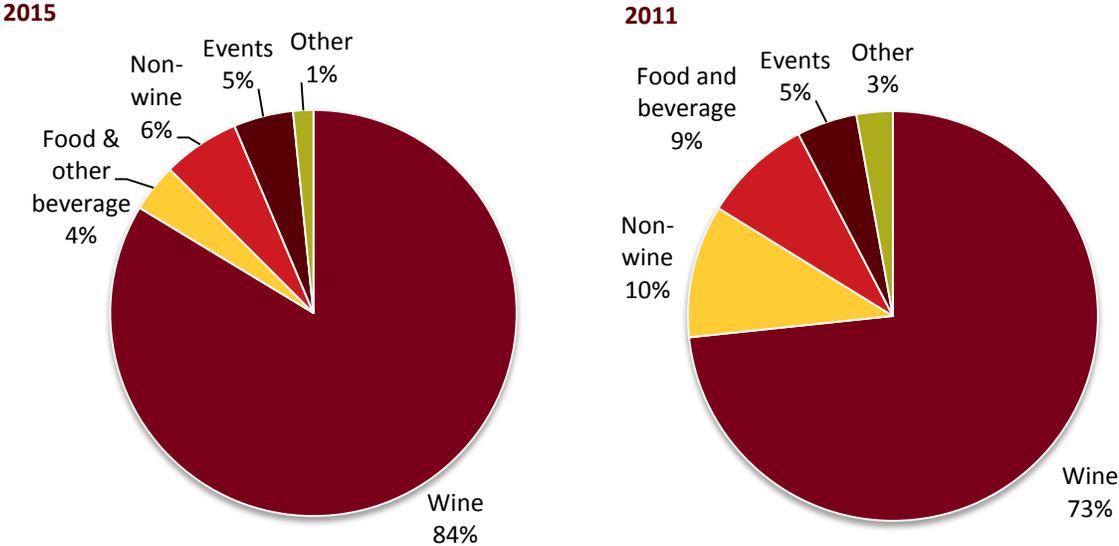
Overall, winery sales decreased slightly from a total of \$492.9 million in 2011. Part of this may be attributable to the weather and grape availability. Michigan’s 2015 production of all grape varieties was almost half of its 2011 grape production.⁶ Of the states included in this analysis, Michigan is one of the two largest traditional wine grape growing states. It is also one of the only states with annual statistics published on grape growing.

Meanwhile, 2015 sales of wines derived from cold-hardy grapes increased since 2011. In 2011, wineries producing cold-hardy grapes generated \$149.9 million in sales. The increase in wine sales, even with a decline in total production per winery, may be attributable to several factors discussed in this report, including an increase in the price per bottle, the increased use of tasting fees, and the increased number of people visiting tasting rooms and buying other items. Wineries also reported decreasing their inventory by selling wines produced in previous years.

⁶ From Michigan Agricultural Statistics, 2015-2016. Grapes processed for wine in 2011 was 6,800 tons. In 2015, the figure was 3,300.

Wine comprises the majority (84 percent) of total winery sales (Chart 10). As mentioned previously, wineries produced an average of, 3,000 gallons of wine in 2015. Non-wine, non-food sales comprised 6 percent of sales and event-related sales comprised 5 percent.

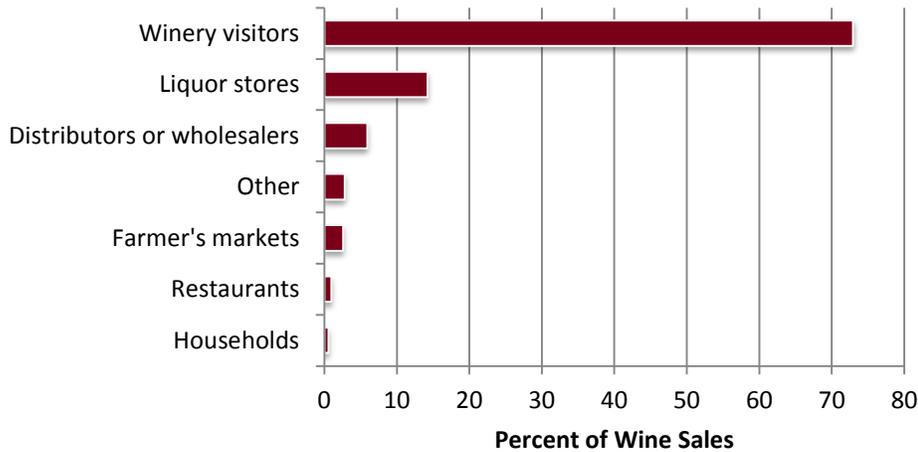
Chart 10: Winery Sales by Category



Since 2011, the percent of winery sales from wine itself increased from 73 percent to 84 percent. This may indicate wineries have not been successful in diversifying their sales base, or it may indicate that consumers are visiting wineries to enjoy and purchase wine.

Wineries in the participating states sold an estimated 13.6 million bottles of wine derived from cold-hardy grapes in 2015. On average, each winery reported selling 15,000 bottles of wine. Nearly three-quarters of all winery sales were from the tasting room or winery visitors (Chart 11). Direct sales to liquor stores accounted for 14 percent of winery sales, and sales through distributors or wholesalers accounted for 6 percent of sales. The number of bottles sold, primarily from cold-hardy grapes, also decreased slightly from 2011 (14.3 million bottles).

Chart 11: Percent of Wine Sales by Distribution Channel

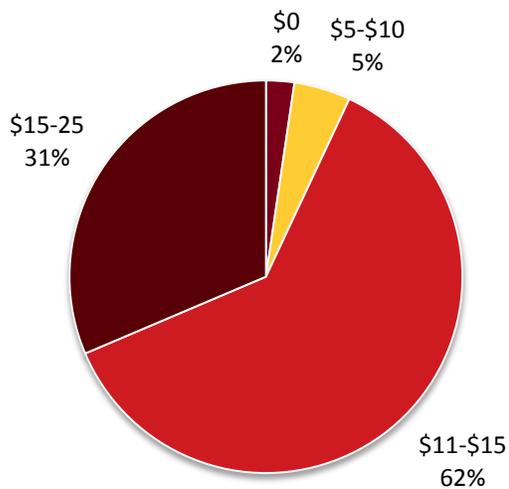


The percent of winery sales through the tasting room or winery sales room increased compared to 2011. In 2015, the figure was 72 percent compared to 52 percent in 2011. The percent of sales through liquor stores and distributors fell, however, from 32 percent in 2011 to 20 percent in 2015.

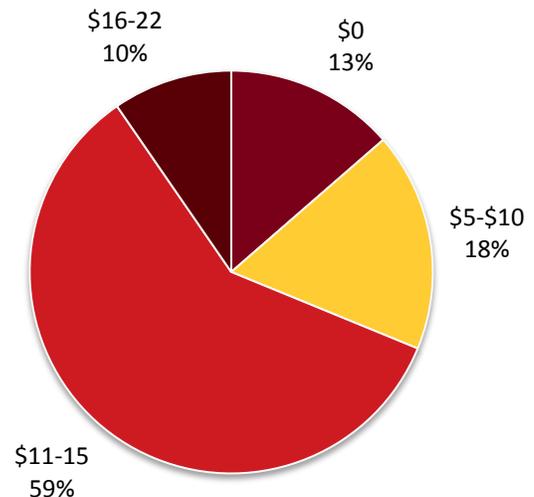
On average, wineries reported earning \$14 per bottle of wine sold. Sixty-two percent of wineries sold bottles between \$11 and \$15.

Chart 12: Average Price Per Bottle of Wine

2015 N = 86



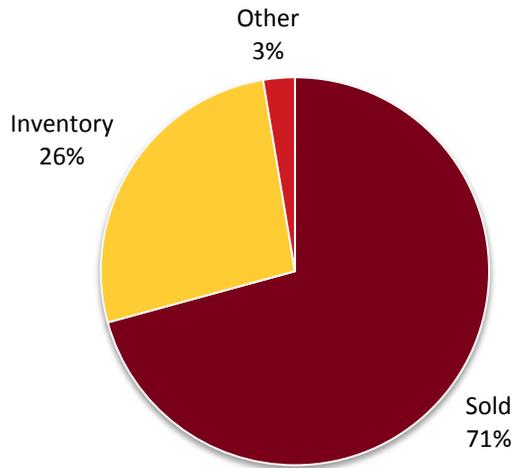
2011 N = 130



The average price per bottle increased from 2011 when wineries reported an average sale price of \$11 per bottle. One cause for this increase may be the decrease in the number of wineries reporting they received \$0 for their bottles of wine (Chart 12).

The majority of wine produced (71 percent) in 2015 was sold (Chart 13). About one-quarter of the wine was moved into inventory. These results were consistent with 2011 findings. Interestingly, multiple wineries reported inventory reductions.

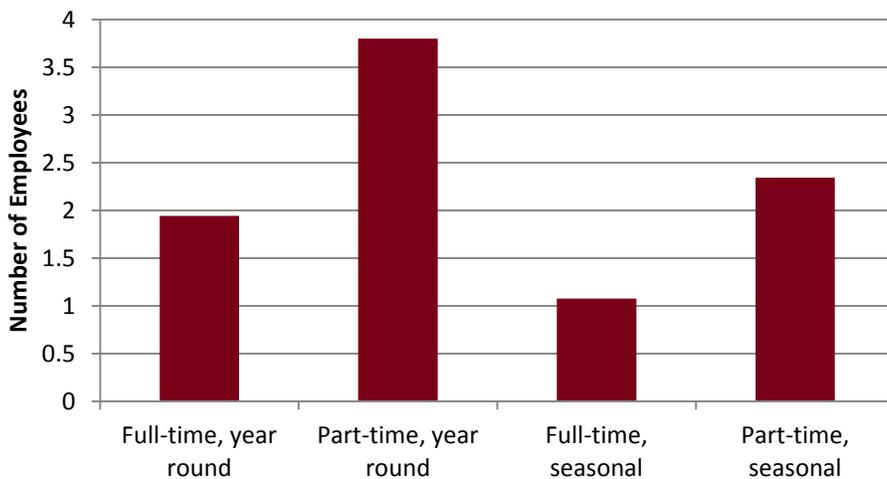
Chart 13: Distribution of Wine Produced, 2015



Winery Employment and Volunteer Labor

Wineries in the participating states employed an estimated 8,500 employees. On average, each winery employs nine people. Of those, four are part-time but work year-round (Chart 14). Two are part-time and work a seasonal schedule. Two are full-time, year round and one is full-time but seasonal.

Chart 14: Average Employment per Winery, 2015



These results mostly reflect those from 2011. There has been a shift from part-time and seasonal work to more part-time but year-round work. The number of employees per winery is down slightly from 13 to 9. This is likely because of the shift from multiple people working seasonal shifts, to fewer people working year round. The total number of winery employees did increase, largely due to the increase in the number of wineries.

In 2015, wineries spent \$70.9 million on labor. On average, each winery spent \$78,500 in 2015 for labor (including benefits) and reported 209 hours of volunteer labor.

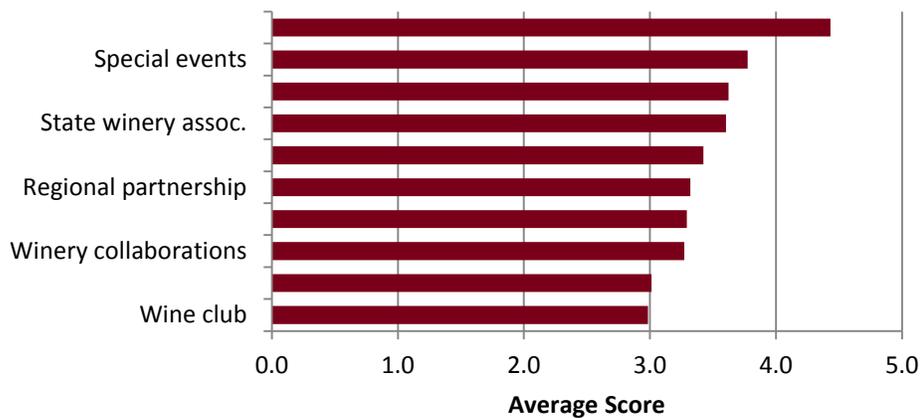
This is similar to 2011 when each winery reported spending \$71,000 on labor. More significant, however, was the major drop in the number of volunteer hours. In 2011, wineries reported using 620 hours of volunteer labor compared to 209 in 2015.

Marketing and Collaboration

Respondents were asked to rate the importance of various factors in their overall marketing strategy. A rating of 1 equaled “unimportant” and a rating of 5 equaled “very important.” Overall, wineries rated their own wine branding as the most important factor in their marketing strategy (Chart 15) with an overall score of 4.4. Also rated as important were special events and wine trails. Vineyard tours and wine clubs were rated lowest in importance.

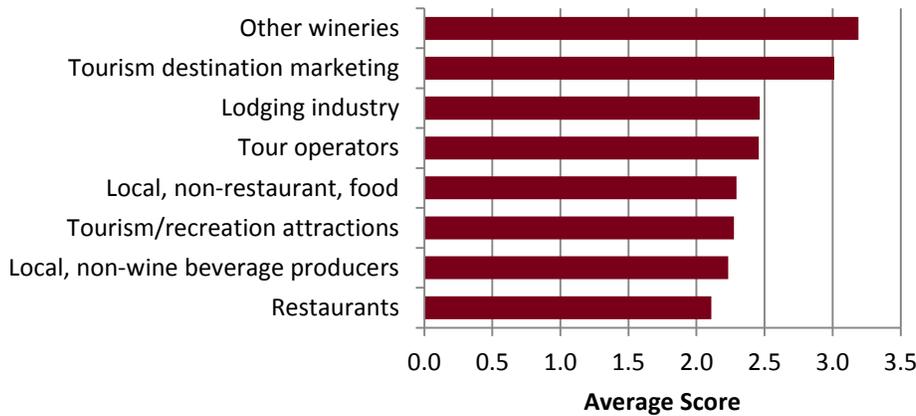
These results largely reflect the responses from 2011, although wine trails have increased in importance.

Chart 15: Importance in Overall Marketing Strategy, 2015 (1=Unimportant, 5 = Very Important)



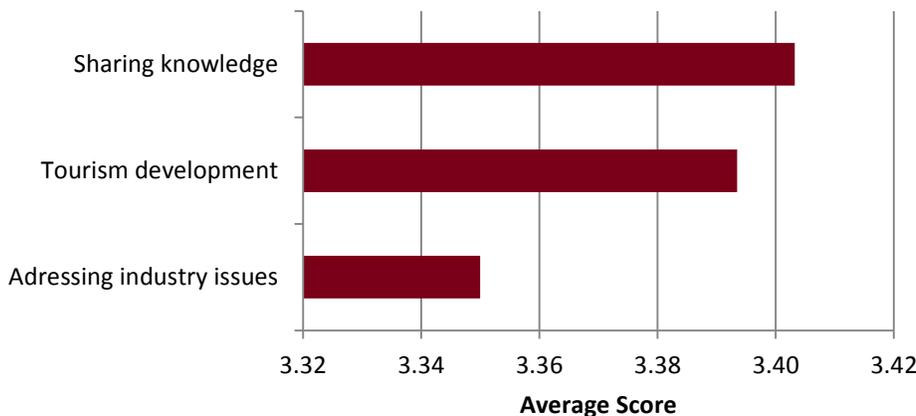
Wineries were also asked to rate their current collaboration efforts. The scale ranged from 1 equaling “no collaboration” to 5 equaling a “great deal of collaboration.” Overall, wineries reported the highest degree of collaboration with other wineries (Chart 16). The average score, however, was only slightly more than 3, which indicates they are collaborating somewhat but not to a very high degree. Given the overall low collaboration scores, it appears there is room to do so. This held true in 2011 as well. Scores have not changed markedly.

Chart 16: Extent of Collaboration, 2015 (1= None, 5 = Great Deal)



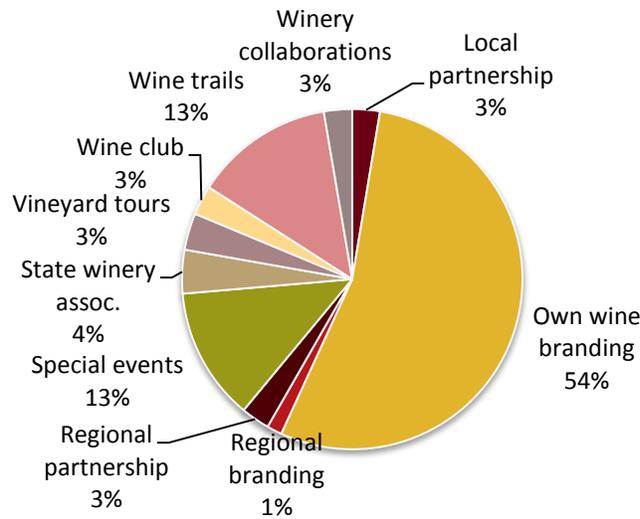
The wineries indicating collaboration with other wineries were asked to rate the types of collaboration. The scale was the same as the previous question with 1 equaling “no collaboration” and 5 equaling a “great deal of collaboration.” Wineries reported the highest degree of collaboration regarding the sharing of knowledge, including viticulture, enology, and business practices (Chart 17). Tourism development, including wine trails and special events, was rated second highest. Wineries reported the lowest level of collaboration around addressing industry issues (such as policy, legislation, research, and marketing).

Chart 17: Extent Collaborating with Other Wineries, 2015 (1= None, 5=Great Deal)



Wineries were also asked to attribute their sales to different types of marketing arrangements. They reported their own wine branding efforts were responsible for more than half of sales (54 percent) in 2015 (Chart 18). Special events and wine trails were each reported to contribute 13 percent of sales. These results also reflected those of 2011.

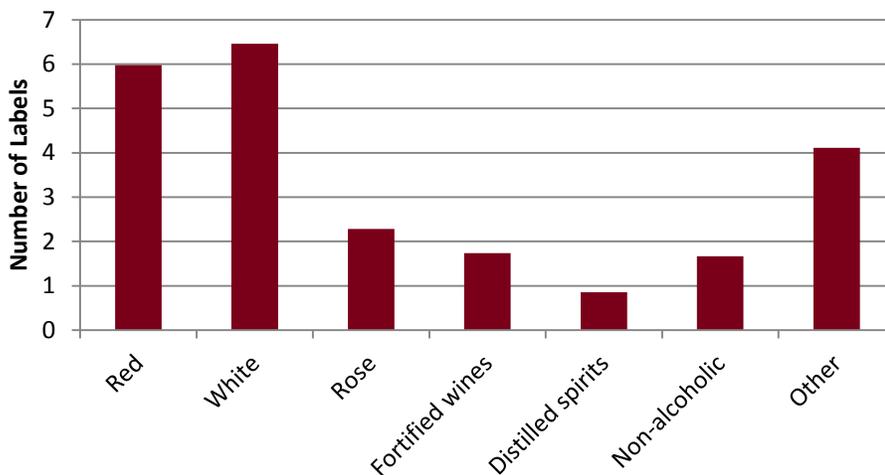
Chart 18: Percent of Sales Attributed to... 2015



Product Development

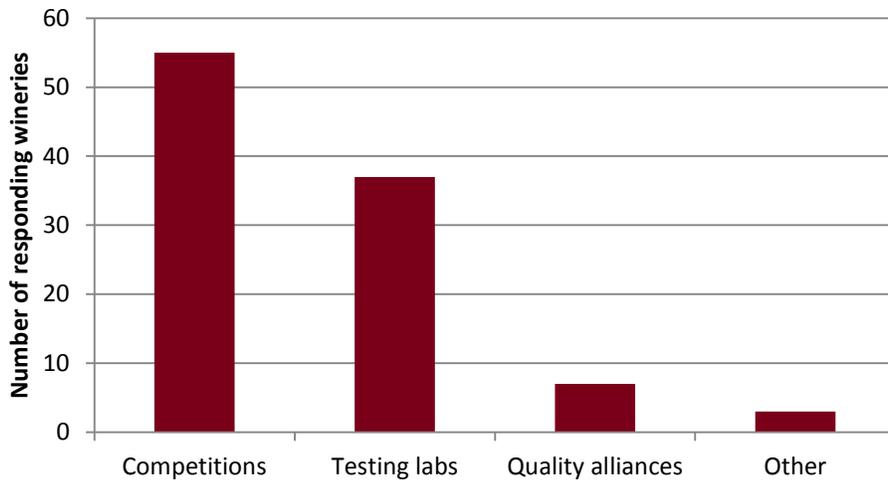
Wineries reported on the number of labels produced for various types of wines and spirits. On average, each winery produced six white wine labels and six red wine labels (Chart 19). Wineries reported four “other labels.” The survey instrument did not ask for clarification regarding “other labels.”

Chart 19: Average Number of Labels Produced, 2015



Competitions were the most commonly used third party evaluation by wineries (Chart 20). They also reported using testing laboratories. Quality alliance use, however, was limited. These results are consistent with 2011 findings.

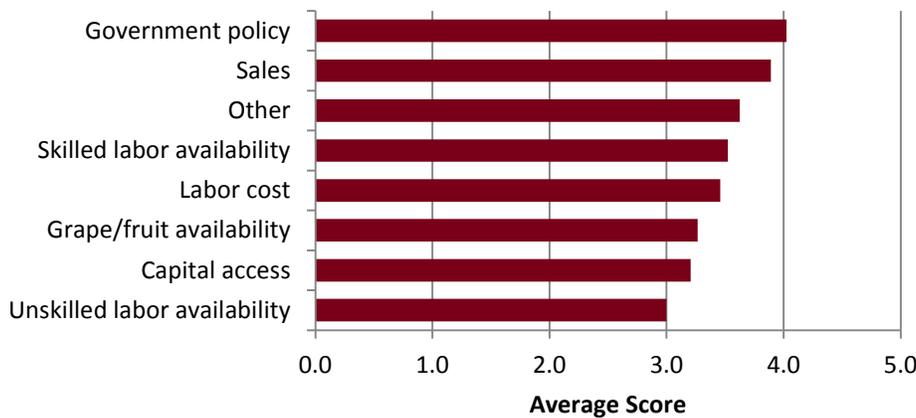
Chart 20: Third Party Evaluations, 2015



Future Plans

Wineries were asked to rate a series of factors in terms of being a challenge to the growth and development of the winery (Chart 21). The scale ranged from 1 as “strongly disagree” to 5 as “strongly agree.” Participating wineries assigned an average score of 4 or “slightly agree” to government policy being a challenge to growth and development. Sales received an average score of 3.9. These results are similar to 2011.

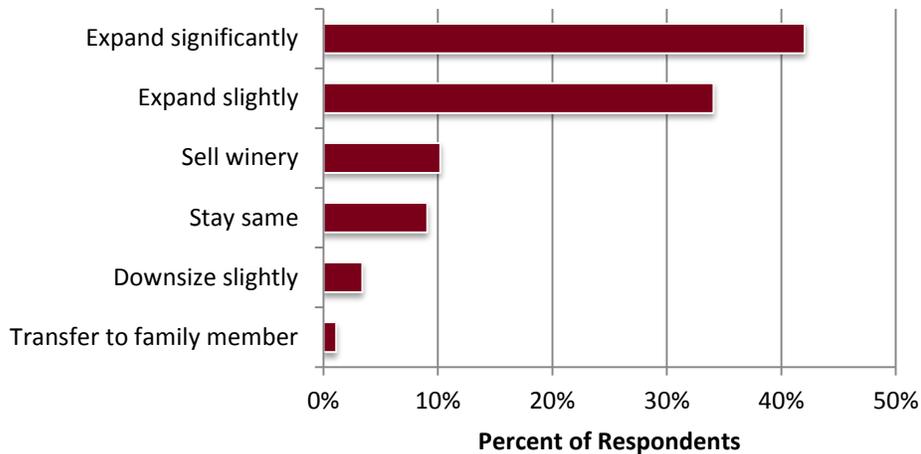
Chart 21: Challenges to the Growth and Development of Winery, 2015 (1=Strongly disagree, 5=Strongly agree)



Wineries remained optimistic about the future (Chart 22) with 58 percent planning to expand in the next five years. Forty-two percent plan to expand significantly. Interestingly, 11 percent of winery owners are looking to transition in the next five years, either by selling or transferring to a family

member. As the industry looks forward, helping wineries with succession planning may become increasingly important.

Chart 22: In the Next Five Years, the Winery Will....N = 88



The results of the 2015 season are similar to 2011. Compared to 2011, there was a slight decrease in the number of wineries planning to expand (from 82 percent to 76 percent). Slight upticks were reported in the number of wineries planning to sell and downsize slightly.

FINDINGS

The Northern Grapes Project assembled researchers from across 12 states to assist the cold-hardy grape and wine industry. The project had four main objectives that address cold-hardy grape varietal performance, viticulture practices, winemaking practices, and the economics of vineyards and wineries.

The University of Minnesota conducted two surveys. In 2012, grape growers and wineries in the 12 participating states were surveyed. The questions collected data on the 2011 winery season. In 2016, the survey was repeated to collect data on the 2015 winery season. The goal was to create an industry baseline in 2011 and then measure any changes to the baseline in 2015. The surveys provide two points in time in which to measure the industry.

Along many metrics, the winery industry in 2015 looked similar to that in 2011, especially the cold-hardy industry. This includes the types of grapes used, the types of labels produced, plans for the future, and the concerns of winery owners.

Along other metrics, the winery industry reported increases in 2015 over 2011. The number of wineries increased, as evidenced by the growth of new wineries in recent years.

Total cold-hardy related wine production was lower in 2015 than in 2011. This is the result of lower production per winery, as reported in the 2015 survey. And lower production, in turn, may have resulted from the increased number of new wineries that had limited or no production in 2015. The

2014 growing season, which produces grapes for wine production in 2015, was a poor growing year in many of the participating states. Grape availability may have also been a factor. Despite this decline, sales at wineries using cold-hardy grapes were higher in 2015 versus 2011. This may be caused by an increase in price per bottle and the number of tasting room customers. Wineries also reported the sale of inventoried wine in 2015.

Wineries reported more tasting room visitors in 2015 than in 2011. They also indicated becoming more sophisticated in their tasting room operations, with more wineries in 2015 charging for tastings and selling food. Sales through distributors and to liquor stores, however, fell as a percent of total sales in 2015. This may be of concern for the industry's future.

The winery industry shows some early signs of moving toward maturity. Vertical integration (wineries owning their own vineyard) increased in 2015 with only a handful of wineries operating without their own vineyard. Wineries are also relying primarily on their own grapes, using informal arrangements with other wineries to fill additional demand. Additionally, wineries decreased the use of volunteer hours and increased the number of paid employees in 2015, as compared to 2011.

APPENDIX ONE: PARTICIPATING INDUSTRY ASSOCIATIONS

The following industry associations/councils provided membership lists for the 2016 survey:

Connecticut Vineyard and Winery Association
Illinois Grape Growers and Vintners Association
Iowa Wine Growers Association
Lake Champlain Wines
Michigan Grape and Wine Industry Council
Minnesota Grape Growers Association
Nebraska Winery and Grape Growers Association
New Hampshire Winery Association
New York Wine and Grape Foundation
Northern Illinois Wine Growers
Scenic Rivers Grape and Wine Association
South Dakota Specialty Producers Association
South Dakota Winegrowers Association
Upper Hudson Valley Wine and Grape Association
Vermont Grape and Wine Council
Western Iowa Grape Growers Association
Wisconsin Grape Growers Association

APPENDIX TWO: DEFINITION OF COLD-HARDY GRAPES

For the purpose of this study, researchers classified the following cultivars as cold-hardy. This was done in consultation with the Northern Grapes project advisory team, which is comprised of growers in each of the states.

Table A-1: Cold-Hardy Red Varieties

Baltica
Beta
Chisago
Frontenac
GR-7
King of the North
Leon Millot
Marechal Foch
Marquette
Nokomis
Petite Pearl
Sabrevois
St. Croix

Valiant
Other red Swenson

Table A-2: Cold-Hardy White Varieties

Brianna
Edelweiss
Esprit
Frontenac blanc
Frontenac gris
Kay Gray
La Crescent
La Crosse
Louise Swenson
Petite Amie
Prairie Star
St. Pepin
Other white Swenson