



Vineyards and Grapes of the North

2016 STATUS REPORT

Authored by Brigid Tuck, William Gartner, and Gabriel Appiah



IN PARTNERSHIP WITH NORTHERN GRAPES PROJECT, A
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EXECUTIVE SUMMARY: VINEYARDS AND GRAPES 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 that address cold-hardy grape varietal performance, viticulture practices, winemaking practices, and the economics of vineyards and wineries.

Under the economics-related objective, the project aimed to learn more about the status of the cold-hardy grape industry. The University of Minnesota Extension conducted a study at the beginning of the project to establish an industry baseline. The survey was repeated at the end of the project to measure any changes to the baseline.

In 2012, grape growers and wineries in the participating states were surveyed to collect 2011 operations data. In 2016, the survey was repeated to collect 2015 operations data.

An online survey was sent to grape growers and wineries in January and February of 2016. The 2016 survey of vineyards yielded 349 useable responses. According to the analysis:

- In 2015, there were 55,500 acres of grapes planted in the participating states. Of this, 7,580 acres were cold-hardy varieties. In 2011, there were an estimated 5,900 acres planted in cold-hardy grapes. The percent planted with cold-hardy varieties varies dramatically by state.
- Vineyards produced an estimated 24,240 tons of fruit from cold-hardy varieties in 2015, an average of 3.2 tons per acre. In 2011, vineyards produced an estimated 20,650 tons of fruit, or 3.5 tons per acre.
- Vineyards spent an estimated \$92.2 million in 2015. Of this, \$57.5 million was for operations (including \$30.2 million for labor) and \$34.7 million was for capital expenses. In 2011, total expenditures were \$68.6 million. Expenditures per acre have increased, as well as planted acreage.
- The most common marketing arrangement is for vineyards to sell to their own winery or to another winery without a formal contract. Most vineyards sell their fruit fresh to other wineries rather than as pressed juice.
- Nearly half (48 percent) of vineyards plan to remain the same size over the next two years. Forty-seven percent plan to grow, with most planning on slight growth.
- Disease, pests, and insects are top concerns for growers. The availability of skilled labor also grew as a concern for growers. Between 2011 and 2015, vineyards decreased the use of volunteer and owner labor and increased the use of paid labor. Concern regarding the availability of skilled labor subsequently increased.



- The Marquette and Frontenac grapes are the most commonly planted red cold-hardy grapes. LaCrescent, Edelweiss, and Frontenac Gris are the most commonly planted white cold-hardy grapes.

Comparing 2011 results to 2015 results provides interesting insights into the cold-hardy grape growing industry at two points in time. Overall, the results indicate that the cold-hardy grape growing industry is showing signs of shifting from a young, fast-growing industry to a more mature industry. Major findings to support this include:

- An increase in vertical integration of vineyards and wineries. While many vineyards operate as stand-alone operations, almost all wineries in 2015 reported operating their own vineyard.
- Vineyards increased in size. Overall, the number of planted acres per vineyard increased in 2015 as compared to 2011. In 2015, three-fourths of vineyards reported expanding since their founding. The ability to expand indicates stability. On the other hand, the number of new vineyards being established has shown signs of slowing.
- Vineyard expenditures have shifted. The ratio of expenditures for operations versus capital investment tilted in favor of operations in 2015. In 2011, capital expenditures accounted for 43 percent of expenditures. In 2015, they accounted for 39 percent of expenditures. This shift, although slight, indicates vineyards may be focusing more on operations and less on growth.
- Vineyards are moving toward additional paid labor. In 2011, 40 percent of vineyards reported not using paid labor (often relying on the owner and family members). By 2015, only 30 percent of vineyards reported not using paid labor. In 2011, only 27 percent of labor hours were provided by paid labor. This increased to 58 percent by 2015.
- Labor expenses correspondingly increased. In 2011, vineyards reported an average of \$5,000 in labor costs. In 2015, this figure was \$9,300.



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NORTHERN GRAPES PROJECT

The Northern Grapes Project was a USDA-funded grant project that 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 during 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 addressing 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 viticulture 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 is a summary of the vineyard survey results for the 2015 growing season. Where appropriate, it provides a comparison to the 2011 growing season. The 2011 report can be found at <http://www.extension.umn.edu/community/economic-impact-analysis/reports/>. Reports on the 2015 winery survey results and on the industry’s economic contribution 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.

GRAPE GROWING: END OF PROJECT SURVEY RESULTS

The Northern Grapes Project is a five-year project. One of its goals was to establish an industry baseline at the beginning of the project (2012) and then measure any changes to the baseline at the end of the project (2016). To achieve this goal, the University of Minnesota conducted a survey of

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>.

grape growers in early 2012. The survey asked questions regarding the 2011 growing season. In 2016, the survey was repeated with questions covering the 2015 growing season.

This report presents the results of the 2016 survey related to grape growers and vineyards growing cold-hardy grapes across the 12 participating states. Where appropriate, 2015 season results are compared to 2011 results.

Survey Methodology and Response Rates

In December 2015, the University of Minnesota Extension team updated the 2012 survey instrument. Questions were reviewed for both necessity and effectiveness. As a result, several questions were dropped. In addition, the wording of questions pertaining to the number of vines planted was changed. The 2012 instrument asked respondents to report the number of vines planted by variety and age. The 2016 instrument asked for acres instead of number of vines. This change was implemented because acreage is more useful in understanding vineyard characteristics.

Each participating state provided the Northern Grapes Project with contact information from their membership lists. The survey was administered 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. Extension also emailed reminders 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 membership to complete the survey. Some organizations publicized the survey via their webpages and newsletters as well.

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.⁴ 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 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%

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.

⁴ Minnesota tends to have a more comprehensive list with growers from other states.

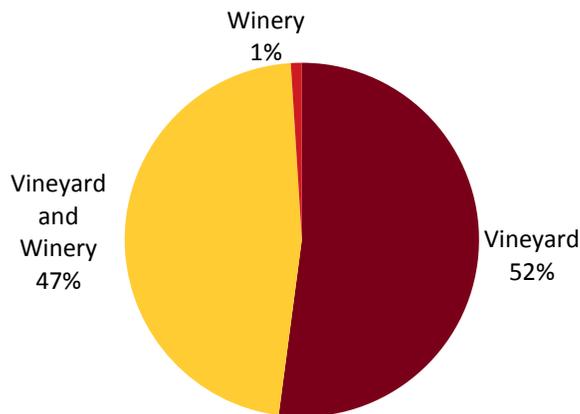
Minnesota	574	110	19%
Nebraska	50	19	38%
New York	228	74	32%
North Dakota	218	34	16%
South Dakota	109	15	14%
Vermont	36	24	67%
Wisconsin	221	66	30%
Other	None	34	Not Applicable
Total	2,077	545	26%

Of the 545 survey 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.

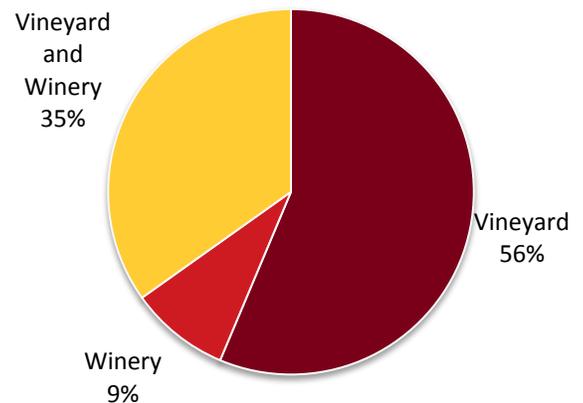
Survey respondents were nearly evenly divided between owning a stand-alone vineyard or a vineyard-winery combination (Chart 1). Fifty-two percent of respondents owned a vineyard while 47 percent owned a vineyard and winery combination.

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

2015, N = 503



2011, N = 442



The 2015 results indicate a shift from 2011. While the percent of respondents owning a vineyard only has remained stable (52 percent in 2011 compared to 56 percent in 2015), 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 has increased from 35 percent to 47 percent.

Vineyard Characteristics

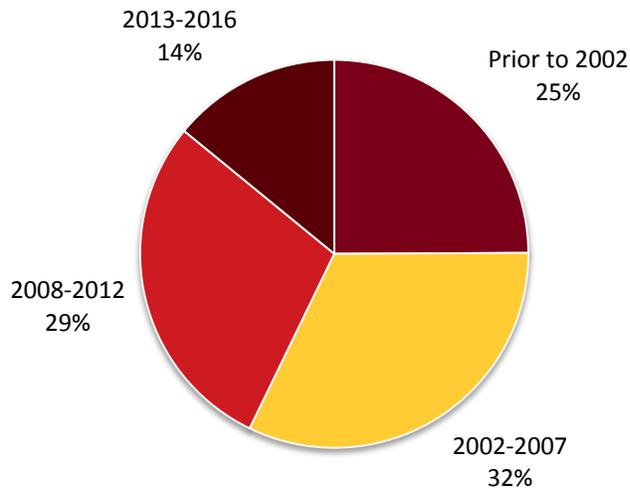
Of the total responses, 497 indicated they operated a vineyard. The vineyard could be a sole operation or operated in conjunction with a winery. The focus of the Northern Grapes Project is on commercial grape and wine production. After removing incomplete responses and non-commercial growers, the total number of responses dropped to 349. Approximately 260 vineyard operations completed the entire survey.

Table 2: Number of Responding Vineyards by Location of Vineyard, N = 349

State	Vineyards
Connecticut	13
Illinois	30
Iowa	30
Michigan	39
Minnesota	66
Nebraska	14
New York	52
North Dakota	17
South Dakota	10
Vermont	12
Wisconsin	49
Other	17
Total	349

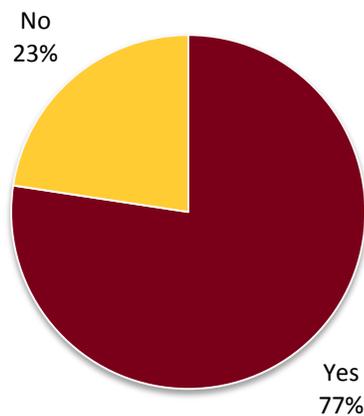
Survey respondents included vineyards from a variety of growth stages and maturity (Chart 2). A quarter of vineyards were founded prior to 2002. Thirty-two percent were founded between 2002 and 2007. These vineyards have likely reached maturity. Vineyards founded between 2008 and 2012 are just approaching maturity, as it takes up to four years for a vine to fully produce fruit. The 14 percent founded since 2013 are young vineyards and likely not producing much fruit yet.

Chart 2: Year of Vineyard Foundation, 2015 N = 341



Of the responding vineyards, more than three-fourths have planted additional acreage since being established (Chart 3).

Chart 3: Have You Added Planted Acreage Since Vineyard Founding? 2015 N = 345



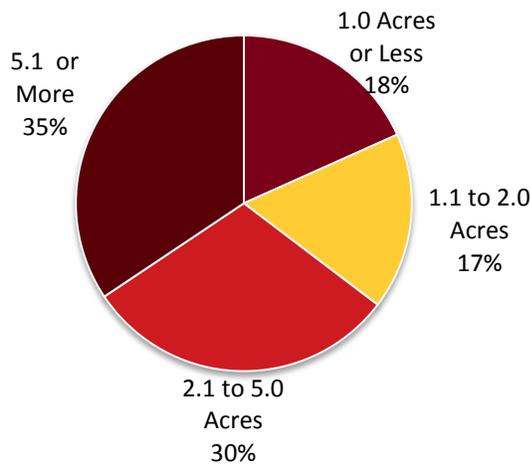
Charts 2 and 3 show continued growth in the grape growing industry among the participating states. The number of vineyards planted in the five-year periods of 2002 to 2007 and 2007 to 2012 was

nearly equal. Continued expansion of existing vineyards also indicates growth. The number of vineyards expanding their acreage increased significantly from 2011. At that time, slightly more than half of the vineyards reported adding acreage.

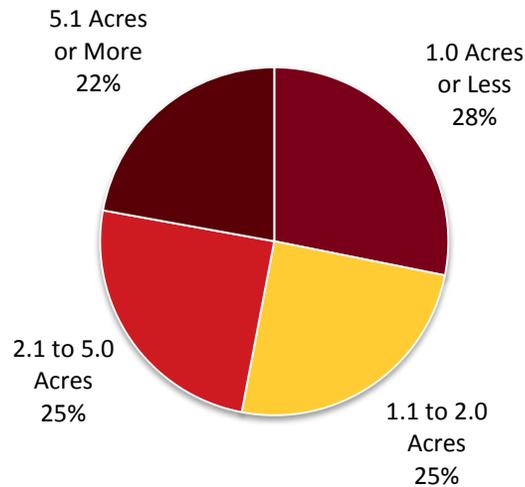
More than one-third of survey respondents operate vineyards with more than 5.1 planted acres (Chart 4). This is equivalent (35 percent) to the number of vineyards with 2.0 acres or less. **The average planted acreage per vineyard is 11.5 acres.** Survey results, extrapolated to the entire population of vineyards, indicated there are 55,500 acres planted within grape vines in the participating states. Survey results also show 14 percent, or 7,580 acres, of the planted vines are cold-hardy varieties. The varieties classified as cold-hardy are listed in Appendix 2.

Chart 4: Vineyard Planted Acreage

2015 N = 317



2011 N = 334

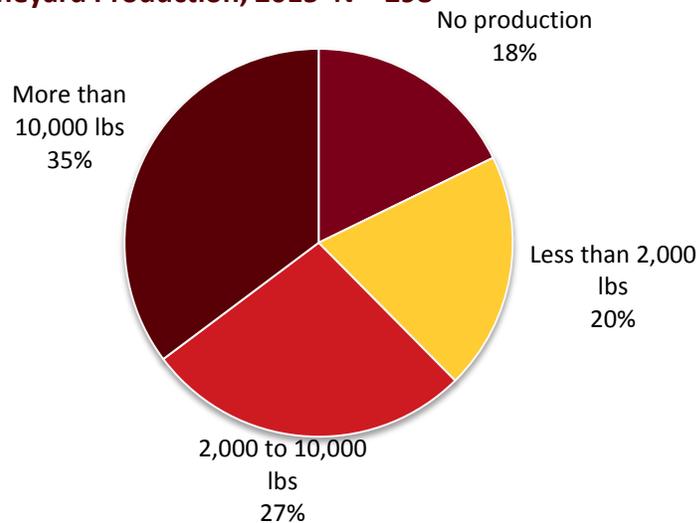


Results from the 2015 season represent a change from 2011. Consistent with three-fourths of vineyards adding acreage, the percentage of larger vineyards (more than 2.1 acres) has grown from 47 percent to 65 percent.

Survey results, extrapolated to represent all vineyards in the states, reveal grape growers produced 24,240 tons of cold-hardy fruit in 2015. **Average yield was 3.2 tons per acre.** Production increased from 2011 when total production was 20,650 tons of cold-hardy fruit and average yield was 3.5 tons per acre. The increase in total production may result from an increase in the number of vineyards and expanded acreage.

Vineyard production mirrors vineyard size (Chart 5). Thirty-five percent of vineyards have more than five acres and 35 percent produced more than 10,000 pounds of fruit in 2015. Eighteen percent of vineyards produced no fruit in 2015. Of these, two-thirds were vineyards founded between 2013 and 2016. These vineyards are still in the establishment phase.

Chart 5: Vineyard Production, 2015 N = 298

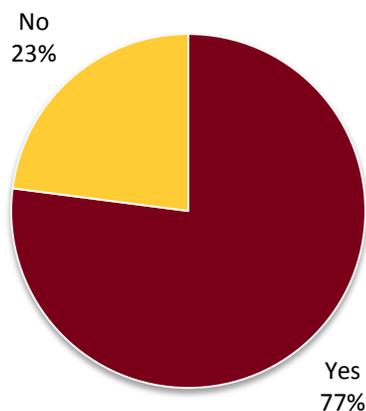


Vineyard Operations

For the majority of vineyard operators (77 percent), the vineyard is their primary agricultural operation (Chart 6). Almost one-quarter of respondents indicated they have another operation that supersedes the vineyard. If not grapes, fruits and vegetables or row cropping (corn and soybeans) were the primary operation for the majority of respondents.

Only five respondents indicated they operated a commercial nursery in conjunction with their vineyard.

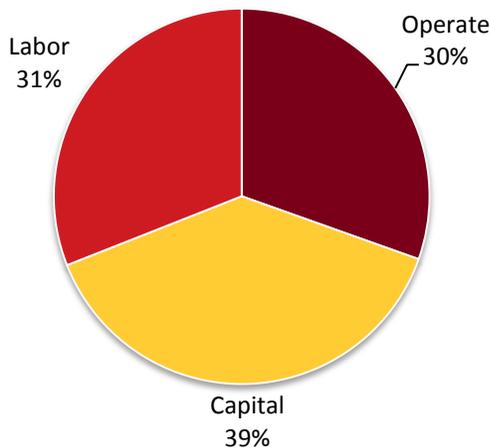
**Chart 6: Is the Vineyard Your Primary Operation?
2015 N = 318**



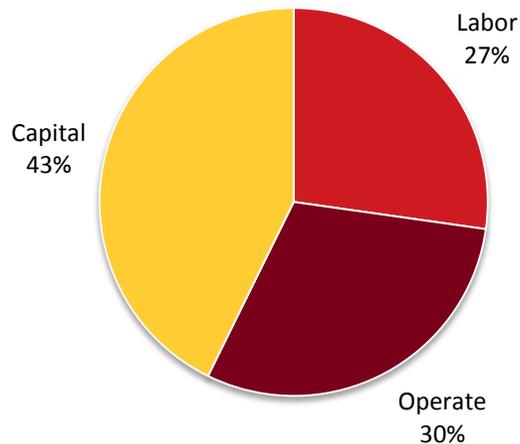
In 2015, vineyards reported spending an average of \$27,800. Of that, nearly one-third was for operational expenses (Chart 7). (Operational expenses include fertilizers, fungicides, water, fuel, overhead costs, marketing, and taxes.) Slightly more than 30 percent went for labor. The remaining 39 percent was spent on capital improvements, such as trellises, tractors, crushers, ATVs, and other equipment.

Chart 7: Expenditures per Category

2015



2011



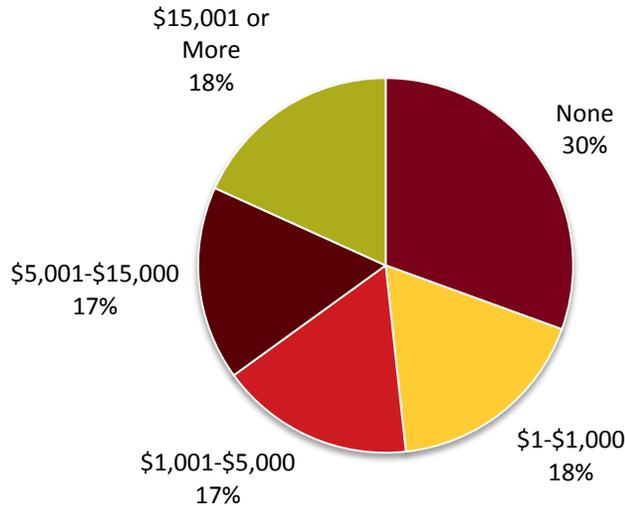
On average, each vineyard spent \$5,700 on operations (not including labor), \$7,400 on capital improvements, and \$9,300 on labor. In total, vineyards in the participating states spent \$27.3 million on operating expenses (including labor) and \$34.7 on capital expenditures. Vineyards spent \$30.2 million on labor. In 2015, total expenditures were \$92.2 million.

These expenditures also represent a shift from the 2012 survey results. Overall, expenditures increased from \$68.6 million in 2011. One reason for this change is the increased number and size of vineyards. More vineyards and more acreage lead to increased spending. Vineyard spending for labor also increased significantly. First, vineyards reported a shift from free labor (mainly provided by the vineyard owner) to hiring staff. This likely happens as vineyards mature. Second, larger vineyards require additional labor.

The share of total expenditures devoted to operations remained similar, but the share for labor increased from 27 percent to 31 percent. The share for capital investments fell from 43 percent to 39 percent.

On average, vineyards reported spending \$9,300 for labor. Of the responding vineyards, 30 percent reported no expenditures for labor (Chart 8). Many of these respondents indicated all labor was provided by the vineyard owner or family members.

Chart 8: Vineyard Labor Expenditures, 2015 N = 203



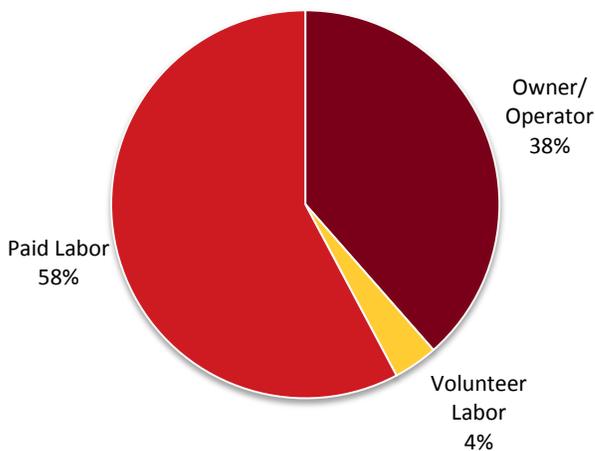
Labor expenditures also indicate a shift from the 2012 survey. First, the share of vineyards with no labor expenditures has decreased from 39 percent to 30 percent. Second, the average amount spent on labor has increased from \$5,000 to \$9,300.

Survey results related to expenditures also indicate increasing maturity of the vineyards. They appear to be shifting away from high growth (as evidenced by capital improvements) to investing more in production (as evidenced by paying more for labor).

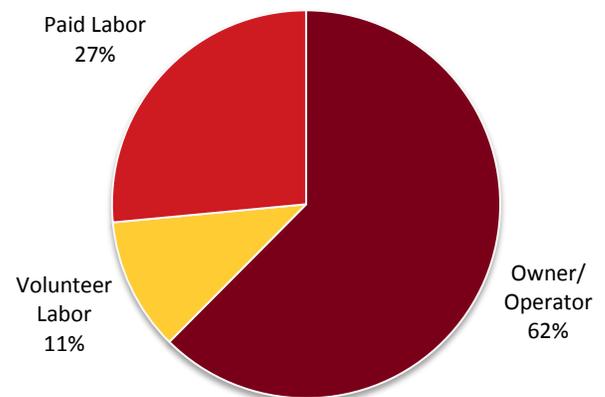
In 2015, operators reported spending more than 402,000 hours in the vineyard. **On average, each vineyard required 2,000 hours of labor.** More than half of labor (58 percent) was paid labor (Chart 9). Owner/operators provided 38 percent of labor in 2015.

Chart 9: Hours of Labor by Category

2015



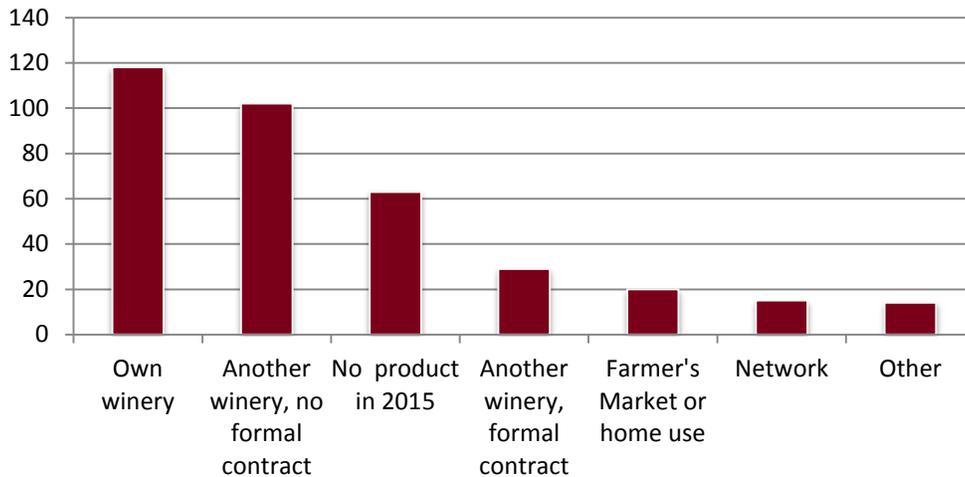
2011



Marketing and Grape Utilization

The survey asked vineyards to select the types of marketing arrangements they used in 2015. The most commonly used marketing channel was selling grapes to their own winery (Chart 10). Selling to another winery without a formal contract and not marketing a product in 2015 are the second and third most common arrangements, respectively. No vineyards indicated the use of a broker.

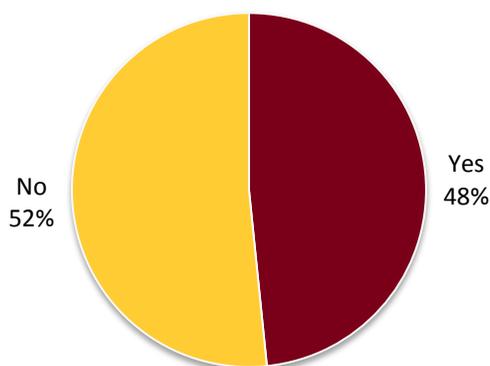
Chart 10: Marketing Arrangements, 2015 N = 285



Consistent with the results reported earlier regarding more winery and vineyard combinations in 2015, the number of vineyards marketing through their own wineries also increased since 2011. The number selling grapes to other wineries with a formal contract, however, decreased.

Growers contracting with wineries indicated about half the wineries were active in vineyard management decisions (Chart 11).

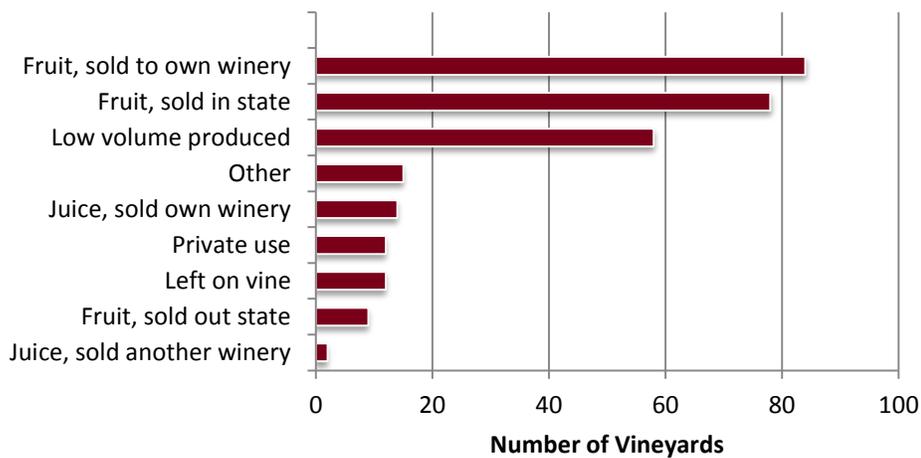
Chart 11: If Sold Via Contract, Was Winery Active in Management Decisions? 2015 N = 124



The majority of grapes are sold as fruit (Chart 12). Thirty percent of vineyards reported their primary use of grapes was fruit sold to their own winery. Twenty-eight percent reported selling their

grape as fruit to an in-state winery. Nearly one-quarter of vineyards (24 percent) had low production in 2015 or grapes that were left on the vine.

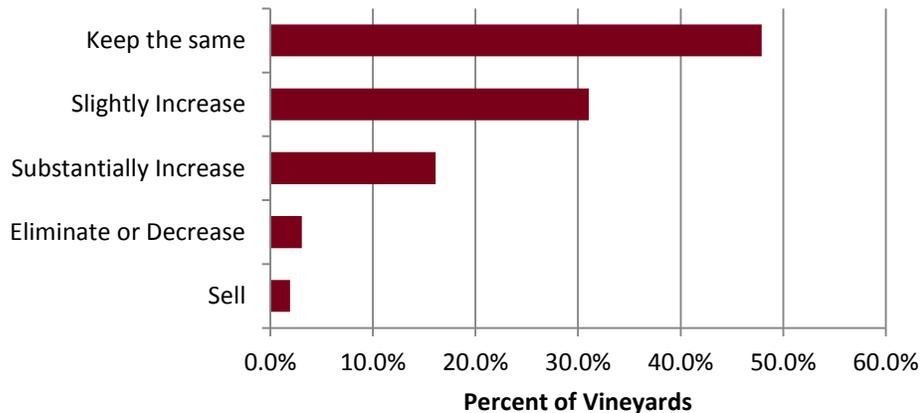
Chart 12: Grape Utilization, 2015 N = 284



Future Plans

Current vineyard operators remained optimistic about the future of their vineyards. Only 3 percent plan to eliminate or decrease their vineyard acreage (Chart 13). The majority (48 percent) plan to keep their vineyard about the same size over the next few years. Forty-seven percent plan to expand, either slightly or substantially. These results are similar to those from 2011.

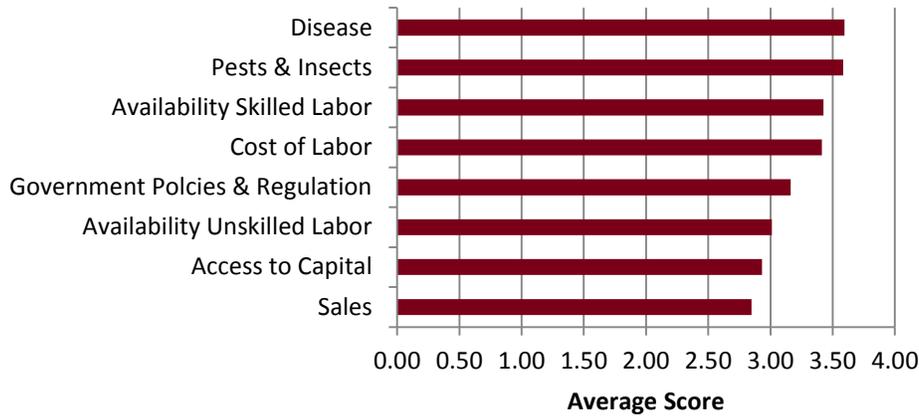
Chart 13: Over the Next Two Years, I am Planning To.... My Vineyard N = 261



Vineyard operators rated challenges to the growth and development of their vineyards. The rating scale ranged from 5 for “strongly agree” to 1 for “strongly disagree”. Vineyards assigned the highest scores to disease, pests and insects, and availability of skilled labor (Chart 14). Sales and access to

capital received the lowest average scores. The low rating assigned to sales indicates vineyards are not concerned with their ability to market their grapes.

Chart 14: The Following is a Challenge to the Growth and Development of my Vineyard, 2015



Skilled labor received a higher average score in 2015 than in 2011. As vineyards increase their use of skilled labor, finding it may be of increasing concern and importance.

Cold-Hardy Grape Varieties

The responding vineyards reported a total of 3,656 planted acres. Of those, 1,100 (30 percent) were planted in cold-hardy varieties. Extrapolating those figures to represent all vineyards, there are an estimated 7,580 acres planted with cold-hardy varieties in the participating states.

Of the cold-hardy acres, 62 percent (686 acres) are planted with red varieties. The remaining 38 percent (415 acres) are planted with white varieties. The ratio of red varieties to white has remained fairly constant from the 2011 to 2015 season. In the 2011 season, the results showed 58 percent red and 42 percent white.

Marquette and Frontenac are the two most commonly planted red grape varieties (Chart 15). Survey respondents indicated about one-quarter of planted acreage in each.

Chart 15: Total Planted Acres, Red Varieties, 2015

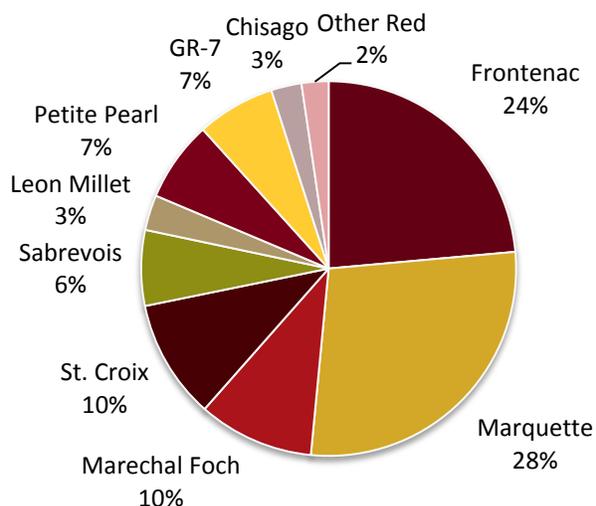


Table 2 shows the reported planted acreage of red varieties by age. Responding vineyards reported a fairly even distribution of red cold-hardy grape acres by age grouping. Thirty-four percent of the grape acres had vines younger than four years of age by the 2015 season. These vines have not yet reached maturity and are not yet fully producing. Thirty-six percent of cold-hardy grape acres had vines between four and 10 years of age. Twenty-nine percent are older than 10 years.

Results show the rapid adoption of the Marquette grape may be slowing. Sixty percent of the Marquette acres were planted between four and 10 years ago. Less than 40 percent have been planted in the last four years. The Frontenac grape, however, continues to grow in terms of number of vines planted. More acres were planted within the last four years than in the period four to 10 years prior.

Table 3: Planted Acres of Red Varieties by <u>Responding</u> Vineyards, by Age, 2015				
Variety	Vines Younger than 4	Vines Between 4 and 10 Years	Vines Older than 10	Total
Baltica	0.0	0.1	0.1	0.2
Beta	0.0	0.0	0.0	0.0
Chisago	0.0	0.0	18.0	18.0
Frontenac	72.0	55.6	34.1	161.7
GR-7	0.8	9.2	36.4	46.4

King of the North	1.0	1.0	0.3	2.3
Leon Millot	6.5	9.6	4.9	21.0
Marechal Foch	4.7	10.2	53.6	68.5
Marquette	72.0	117.2	2.4	191.6
Nokomis	0.0	0.0	2.0	2.0
Petite Pearl	42.3	5.2	0.1	47.6
Sabrevois	17.6	13.9	13.3	44.8
St. Croix	16.5	21.2	32.9	70.6
Valiant	0.4	0.4	1.9	2.7
Other red Swenson	2.3	5.1	1.4	8.8
Total	236.1	248.7	201.4	686.2

Chart 16 illustrates total planted acreage of white varieties. La Crescent (22 percent), Edelweiss (18 percent), and Frontenac Gris (16 percent) are the most commonly planted white varieties.

Chart 16: Total Planted Acres, White Varieties, 2015

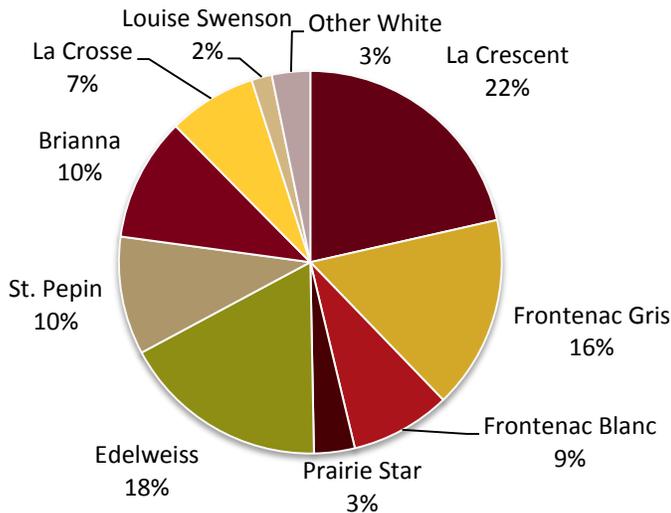


Table 3 shows planted acres of white varieties by age. Forty percent were planted within the past four years. Forty-seven percent were planted between four and 10 years ago. Only 14 percent of acres planted with white varieties were established more than 10 years ago. Brianna and Frontenac blanc (released commercially within the past four years) noticeably increased planted acreage in the past four years. Edelweiss, however, noticeably decreased in terms of new planted acreage.

Table 4: Planted Acres of White Varieties by Responding Vineyards, by Age, 2015

Variety	Vines Younger than 4	Vines Between 4 and 10 Years	Vines Older than 10	Total
Brianna	27.2	14.4	1.7	43.3
Edelweiss	11.7	45.9	14.8	72.4
Esprit	0.0	1.2	0.0	1.2
Frontenac blanc	26.1	9.0	0.1	35.2
Frontenac gris	23.8	38.5	5.5	67.8
Kay Gray	0.0	0.2	0.8	1.0
La Crescent	37.8	42.4	8.8	89.0
La Crosse	10.6	8.3	12.0	30.9
Louise Swenson	4.2	2.8	0.1	7.1
Petite Amie	0.2	0.5	0.0	0.7
Prairie Star	4.5	7.8	2.0	14.3
St. Pepin	17.5	13.3	10.6	41.4
Other white Swenson	0.8	9.5	0.2	10.5
Total	164.4	193.8	56.6	414.8

Other Grape Varieties

Vineyards reported 2,560 acres planted in other grape varieties. Of those acres, 83 percent were older than 10 years. Many of the vineyards with acres planted with other grape varieties were long-established vineyards with significant plantings in those varieties. It appears they are planting small sections of their vineyards with cold-hardy varieties. This may be the result of increases in cold-hardy marketing, which may then increase prices for cold-hardy grapes.

FINDINGS

The Northern Grapes Project assembled researchers from 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.

Under the economics-related goal, the project aimed to learn more about the status of the cold-hardy grape industry. University of Minnesota Extension conducted a study at the beginning of the project to establish a performance baseline of the industry. The survey was repeated at the end of the project to measure any changes to the baseline.

Comparing 2011 results to 2105 results provides interesting insights into the cold-hardy grape growing industry. Overall, the results indicated the cold-hardy grape growing industry shows signs of shifting from a young, fast growing industry to a more mature one. Results that support this finding include the following:

- There appears to be an increasing vertical integration of vineyards and wineries. While many vineyards operate as stand-alone operations, almost all wineries reported operating their own vineyard.
- Vineyards are increasing in size. Overall, the number of planted acres per vineyard increased. Three-fourths of vineyards have expanded since their founding, and the ability to expand indicates stability. Meanwhile, the number of new vineyards being established showed signs of slowing.
- Vineyard expenditures have shifted. The ratio of expenditures for operations versus capital investment has tilted in favor of operations. In 2011, capital expenditures accounted for 43 percent of expenditures. In 2015, however, capital expenditures comprised 39 percent of expenditures. This minor shift may indicate that vineyards are focusing more on operations and less on growth.
- Vineyards are moving towards more paid labor. In 2011, nearly 40 percent of vineyards reported not using paid labor (often relying on the owner and family members). By 2015, only 30 percent reported not using paid labor. In 2011, only 27 percent of total vineyard labor hours were provided by paid labor. This increased to 58 percent in 2015.
- Labor expenses correspondingly increased. In 2011, vineyards reported an average of \$5,000 in labor costs. In 2015, this figure increased to \$9,300.

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 purposes 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