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## Iowa Wine Industry and Its Educational Needs

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### Cover Page Footnote

The members of the Midwest Grape and Wine Industry Institute provided help in the elaboration of this survey. Thank you to all the grape growers, winemakers and wine industry members of Iowa for their participation in the survey. Thank you to Jennie Savits, enology field specialist with the Midwest Grape and Wine Industry Institute and to Ellen Johnsen, Education Extension Specialist for their contribution in reviewing this article.

## Iowa Wine Industry and Its Educational Needs

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**Abstract.** The grape and wine industry in Iowa is based on non-*Vitis vinifera* grapes, which are not well known and come with their own set of challenges. An industry survey revealed that wine business and marketing are the main concerns for the Iowa grape and wine industry members. The educational resources already provided by Extension personnel were highly appreciated and events should be offered in several locations around Iowa. The main topics of roundtables and discussions should be about vineyard management and winemaking practices, specifically practices to avoid microbial spoilage, to reduce wine acidity and to select appropriate yeasts for fermentation.

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### INTRODUCTION

In 1999, only 12 wineries were producing wine in Iowa, but by 2012 the economic impact of the Iowa wine industry totaled \$420 million. Based on reports and wine statistics, the production of native wine in Iowa increased further from 243,571 gallons produced by 99 wineries in 2012 to 329,283 gallons of wine produced by 109 wineries in 2019 (A. Frank Rimerman & Co., 2014; Alcohol and Tobacco Tax and Trade Bureau, 2019; Farm Food and Enterprise Development, 2019). Even though wine production in the Midwest generally and in Iowa specifically is constantly growing, many challenges related to the climate and the use of cold-hardy grape varieties are present in this grape and wine industry.

As previously reported (Gardner et al., 2018), interspecific hybrid grapes are used for making wine in the Midwest region, but those grapes have specific characteristics that are not found in *Vitis vinifera* grapes commonly grown in the Western United States and other countries. Hybrid grapes are regularly released by the University of Minnesota and Cornell University, but little is known about the most appropriate grape-growing and winemaking conditions to produce high quality wines with these hybrids (Brown, 2008; Centinari et al., 2016). Therefore, winemakers produce wines from the interspecific hybrid grapes according to the winemaking guidelines for *Vitis vinifera* grapes, but it is difficult to evaluate the pros and cons of those viticultural and winemaking practices in the Midwest grape and wine industry (Brown, 2008), especially in Iowa.

My research-in-brief shows the results of a survey completed by the grape and wine industry members of Iowa

focusing on their background, the production of grapes and wines, their common practices in vineyards and wineries, as well as their current educational resources and needs. The goal of the survey was to develop an Extension program related to the educational needs of the Iowa wine industry for increasing their wine quality. Even though the survey was focused on Iowa's wine industry, the results could be applied in other states such as Minnesota, Illinois, Ohio, and Wisconsin, where winemakers face similar challenges. The use of online Extension programs including roundtables, webinars, and YouTube videos could therefore be used to spur collaborations between winemakers from various states, to create better teaching environments for local consumers, and to improve wine quality overall.

### SURVEY METHODOLOGY

Using Qualtrics XM, I developed an online survey of 44 questions estimated to take ten minutes to answer. I did not collect any personal data, and I split the questions into different categories: a) information about participants and their Iowa wine and grape industry background, including skills, common production techniques, and common practices; b) main challenges, including marketing, viticultural, and wine-making issues; and c) educational resources and needs. Prior to sending out the survey to producers in the Iowa grape and wine industry, this project was reviewed and exempted by the Institutional Review Board (IRB ID: 19-483). Between January 9 and February 9, 2020, I sent three emails about the survey to 226 email addresses: an initial email with a link to the

survey, a reminder email 20 days later, and a final reminder two days before the due date. I also distributed a paper version of the survey during the 2020 Iowa Specialty Producers Conference. I did not offer any incentive for the completion of the survey.

## SURVEY RESULTS

### PARTICIPANTS AND IOWA GRAPE AND WINE INDUSTRY BACKGROUND

From the 226 emails sent and the paper version provided, 35 wine industry members in Iowa participated, providing a low response rate of 15.5%. The participants were grape growers, winemakers, and/or winery owners, with 94% of them being members of the Iowa Wine Grower Association (IWGA). The low response rate may be due to the low association membership with 40 members in 2019. The participants were from Central and East-Central Iowa (50.0%), Southeast (20.6%), Northwest (17.6%), and Northeast (11.7%). There was no participation from industry members in Southwest Iowa, though vineyards and wineries are located all around the state.

Fifteen participants had worked for the grape and wine industry in Iowa for less than five years, while 10 participants had worked in the Iowa grape and wine industry for more than 13 and less than 20 years. Only four participants had a previous background in the wine industry from another state or country. The remaining participants were workers or business owners from another field.

Of the participants surveyed, 76.5% of them indicated that their vineyards were more than six years old but younger than 20 years. Alongside these young vineyards, 50% of participants indicated that their wineries were younger than five years old. Taken together, these responses demonstrate that the wine industry in Iowa is a young, growing industry. More than 57% of grape growers had between one and five

acres of grapes, and about 39% of the participants produced between 1,001 and 5,000 gallons of wine per year. The most popular wines produced were white wines, by more than 74% of participants, followed by red wines, rosés, and fruit wines (Figure 1). Most of the participants (84%) made wines with interspecific hybrid grapes, predominantly Brianna, La Crescent, Frontenac blanc, Edelweiss, and St. Pepin for white wines and Frontenac, Marquette, Maréchal Foch, Geneva Red, and Chambourcin for red wines. Four participants made a small portion (less than 5%) of their wine with *Vitis vinifera* grapes and juice or concentrate. The *Vitis vinifera* varieties, including Cabernet Sauvignon, Muscat, and Chardonnay, were then blended with the hybrid grape varieties mentioned above. Almost 43% of winemakers produced 5 to 15% of fruit wines using raspberries, cherries, and aronia berries as the main fruits.

### MAIN CHALLENGES

To evaluate the educational needs of the wine industry in Iowa, survey questions focused on the main challenges or issues the industry was facing. Out of 35 responses, 14 participants were concerned about the promotion and advertisement of the Iowa wine industry. Ten participants shared concerns about winemaking practices, and eight participants were concerned about vineyard management. In Iowa, the main marketing concerns were related to a lack of consumers and difficulties in selling and advertising wines. With the participation of winemakers, I developed a workshop for consumers (held online and in-person) to lead to more visits of local wineries.

### VITICULTURAL PRACTICES AND ISSUES

As a result of having small vineyards in Iowa, about 66% of participants manually harvested while 44% mechanically harvested. From 29 responses about common practices in

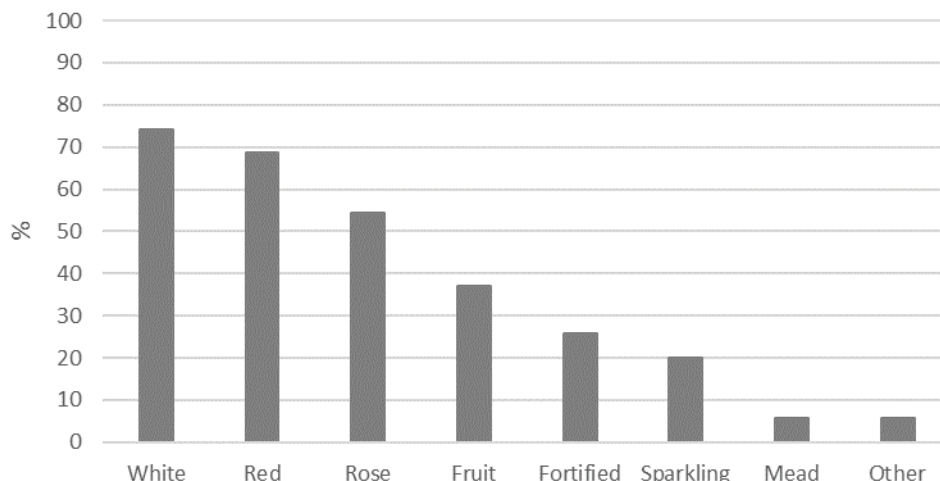


Figure 1. Percentage of wines produced in Iowa ranked by type, based on 35 responses.

## Iowa Wine Industry and Its Educational Needs

**Table 1.** Survey Participants' Ranking of Viticultural Issues by Level of Importance

Topic	Ranking										
	1	2	3	4	5	6	7	8	9	10	11
Pest and disease management	13	7	3			3	2	1			
Canopy management	4	8	3	4	3	5	2				
Vine balance	4	1	6	5	6	3	1	3			
Vine nutrition	2	3	6	5	3	2	3	4	1		
Soil nutrition	1	4	1	3	8	4	2	1	2	2	1
Monitoring/scouting		1	4	2		2	8	6		5	1
Labor/mechanization	1	2	2	2		3	2	7	4	2	4
Safety/regulations	1				3	2	3	4	8	2	6
Cultivar performance	2	3	3	1	4	3	1	1	8	3	
Crop estimates			1	4	1	2	2		3	12	4
Maturity analysis	1			3	1		3	2	1	3	15

*Note.* Number of responses: 29. 1 being the most important issue and 11 being the least important issue. Blanks correspond to 0 response for the specific rank and issue.

vineyards, all participants pruned, sprayed, and used insect traps. More than 68% considered pest and disease management the most important issue they had, followed by canopy management and vine balance at 58% (Table 1). The least important issues the grape growers faced included safety/regulations, cultivar performance, crop estimates, and analysis of grape maturity.

### WINEMAKING PRACTICES AND ISSUES

The top issues that winemakers faced were: the management of microbial spoilage, reduction of wine acidity, and determination of the appropriate yeast strain for fermentation. Additionally, determining the appropriate use of sulfur dioxide (Table 2) was a common issue, even though 93% of winemakers added sulfur dioxide during the process. Other

**Table 2.** Survey Participants' Ranking of Winemaking Issues by Level of Importance

Topic	Ranking														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Avoiding microbial spoilage	6	8	6	3	1	1	1	1	1			1		1	
Reducing wine acidity	6	2	5	2	1	4	2	5	2			1			
Selecting appropriate yeast strain for fermentation	5	5	2	3	5	4	1	1	1			2	1		
Determining the appropriate use of sulfur dioxide	1	3	6	4	4	4	2	2	1	2				1	
Managing the production of off-flavors such as hydrogen sulfide (H <sub>2</sub> S), volatile acidity, and oxidation/aldehydes		4	5	9	5	1	1	2	2				1		
Extracting tannins for specific mouthfeel		2		2	6	8	2	4	1		1	3	1		
Managing color stabilization					1	3	9	5	3	3	5			1	
Managing the alcohol content		1			2		2	3	9	7	2		3	1	
Managing the winery operations	3		2	1	1	1	1	7	10	4					
Managing the winery sanitation	3	4	1	3	1		4		2	4	7	1			
Production costs	2			1	2		1	2		1	9	7	2	3	
Managing aging			2	1		3	1			1	1	13	8		
Managing wine sweetness			1	1	1	1	1		3	1	2		2	12	5
Maintaining barrels	1			1			2				1		3	22	

*Note.* Number of responses: 30. 1 being the most important issue or concern and 14 being the least important issue. Blanks correspond to 0 response for the specific rank and issue.

**Table 3.** Education Delivery Preferences for 35 Participants

Preferred education delivery	Number of responses	%
Roundtables hosted at a winery	18	51.4
1-hour online webinar	18	51.4
1-day workshop on ISU campus	17	48.6
1-day workshop hosted at a winery	16	45.7
Half-day workshop on ISU campus	15	42.9
Half-day workshop hosted at a winery	15	42.9
15-minute online webinars	9	25.7
Roundtables on ISU campus	7	20.0
Other (not specified)	4	11.4

winemaking concerns were the finished wine quality and perception, including off-odors such as volatile sulfur compounds, the level of tannins, the stabilization of wine color, and the management of the alcohol content. Wine aging and barrel management were the least important issues that winemakers identified, because most participants did not use barrels for wine maturation.

**EDUCATIONAL RESOURCES AND NEEDS**

For 14 years, the Midwest Grape and Wine Industry Institute (MGWII), located at Iowa State University has organized

roundtables, workshops, and seminars about different wine-making practices and has published newsletters every other month. Seventy-four percent of the participants in this study received the newsletters. Twenty-one percent made the suggestion of adding upcoming events, and 15.6% suggested adding updates about viticulture research and specific topics. Sixty-five percent of the grape growers and winemakers had already participated in those workshops and seminars. The main reasons for not participating were lack of available time and lack of advertising for those events.

Wine industry members highly appreciated roundtables hosted at a winery (Table 3). Roundtables have been a real opportunity for wine industry members to discuss multiple topics with other grape growers and winemakers as well as to hear practical explanations and advice from the MGWII. Some wine industry members suggested that a one-hour webinar would be beneficial for learning more about specific topics. In collaboration with the University of Minnesota, I developed the online “ISU/UMN Research and Winemaking Webinar Series,” which is 90 minutes long and offered once a month to grape and wine industry professionals in the United States and other countries. Each session focuses on a specific topic and includes discussions with both wine industry professionals and academics.

Eighty-eight percent of participants preferred to participate in workshops and roundtables during the winter because it is the least busy season, and 35% of participants preferred to participate in those events twice a year. After asking the participants about the other ways of learning they tended to use, internet websites ranked first at 68.7%, while

**Table 4.** Survey Participants’ Ranking of Ways of Learning by Level of Importance

Topic	Ranking											
	1	2	3	4	5	6	7	8	9	10	11	12
Internet websites	22	2	7				1					
Online newsletters		7	8	6	4	2		1	1	1	2	
Online courses	1	2	3	4	7	4	3	2	3	2	1	
Social networks		3		5	2	8	3	1	2	4	4	
Specialized magazines	1	2	3	3	3	4	6	5		4		1
Scientific articles in open-access			1	2	2	3	4	8	7	3	2	
Extension publications	2	1	1	1	3	1	4	8	6	4	1	
Manufacturer conferences and meetings		1	1	4	3	3	4	2	8	4	2	
YouTube videos		4	4	4	2	3	1	1	3	4	5	1
Phone calls	1	5		2	3	4	1	2	1	5	7	1
Face-to-face consultations	4	3	3	1	3		5	2	1	1	6	3
Other	1	2	1								2	26

Note. Number of responses: 32. 1 being the most important and 12 the least important way of learning. Blanks correspond to 0 response for the specific rank and issue.

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phone calls and face-to-face consultations were ranked as the least used ways of learning (Table 4). The participants ranked YouTube videos both in the most and the least important ways of learning, perhaps because some people prefer reading to learn rather than watching. The program I developed is recorded and then published on YouTube to make the information accessible at a later time to both industry members who participated in the webinars and those who did not.

## CONCLUSIONS AND SUGGESTIONS

Iowa wines are produced primarily from interspecific hybrid grapes rather than *Vitis vinifera* grapes. Because California winemakers produce 85% of all US wines (The National Association of American Wineries) from *Vitis vinifera* grapes, it is challenging for the Midwest grape and wine industry to use existing educational resources to develop their industry based on non-*Vitis vinifera* grapes with different environmental conditions. In 2008, Brown developed a guide for the production of grapes in the Midwest (Brown, 2008). Other states, such as Pennsylvania, have evaluated similar concerns for their grape and wine industries (Centinari et al., 2016; Gardner et al., 2018).

The Iowa grape and wine industry is relatively young. Considering that many producers do not have a viticulture and enology background, grape growers and winemakers face challenges to meet their educational needs. The MGWII and the Iowa Grape Growers Association (IWGA) already support the wine industry through educational resources, roundtables, and workshops. These are highly appreciated, but due to lack of time and the distance between wineries, some people do not participate. I have developed Extension and research programs for grape and wine industry members in Iowa, the Midwest United States, and other countries. These programs include a field day offered in Iowa every year to discuss pests, diseases, canopy management, and research projects on the effect of viticultural and winemaking practices on wine quality; a program for winemakers that involves webinars, roundtables, and newsletter articles and addresses specific hot topics in the field; and as a program that helps promote local growers and wineries to wine consumers in Iowa. As explained in this essay, Iowa's concerns are similar to those of several other states, and it would be helpful to work together (Stafne et al., 2016) on the development of a best practices guide or webinar. Discussions and research projects between Iowa's grape and wine industry and Extension personnel of different Midwest states would be beneficial.

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