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Abstract

We surveyed Pennsylvania winemakers and winery owners to determine their skill levels, the varieties and styles of wines they produce, their wine-making production challenges, and best practices for addressing educational needs through Extension programs. Growing and sourcing high-quality fruit were identified as key challenges. Although most participants obtained production information from other industry members and preferred face-to-face workshops to further their education, response to a Penn State Extension Enology blog site, developed to address industry challenges and extend our educational reach, has been extremely positive.

Keywords: wine industry, needs assessment, blog, survey

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Introduction

Pennsylvania's wine industry grew exponentially between 2000 and 2011, resulting in over 160 bonded wineries by 2011 (Pennsylvania Winery Association [PWA], 2013) and over 250 licensed wineries as of 2016. Moreover, Pennsylvania's wine industry contributed $979 million to the state's economy in 2013, a 13% increase from 2007 (PWA, 2013). With such a growing industry, it has become essential to assess challenges Pennsylvania wineries encounter, which may differ from those that are prevalent in western wine-producing regions. For example, many wine-making regions in the western United States do not experience the same level of disease pressure on incoming fruit, which causes large inconsistencies vintage to vintage, that industry members in the eastern United States must manage. Additionally, midwestern, southern, and eastern wineries produce wines from grape varieties not commonly planted or fermented in western states. Eastern winemakers need additional production skills to produce high-quality wine from raw material subject to regular vintage variation or produced from grapes without recognized quality standards, a scenario that can be extremely challenging for inexperienced or undereducated winemakers.

In general, very little research exists on wine-making practices used in wine-producing regions of the eastern United States. Previous studies have indicated that emerging state wine industries share similarities with regard to grape growing or viticulture (Brown, 2008; Centinari, Kelley, Hed, Miller, & Patel-Campillo, 2016; Wolf, 2008), Extension programming (Brown, 2008; Stafne, McGlynn, & Mulder, 2009), and marketing and economic

challenges (Stafne, 2007). Nonetheless, most production research focuses on viticulture, and little insight on eastern wine-making challenges is available.

To address the gap in the research and improve efforts to meet the needs of Pennsylvania wine industry members through Extension education, we administered an industry needs assessment survey in 2014 to licensed Pennsylvania wineries. The primary objectives of our study were (a) to have Pennsylvania winemakers indicate their skill levels, (b) to determine varieties and styles of wines participants produce, (c) to identify key challenges for winemakers surveyed, and (d) to obtain insight into respondents' preferences for accessing educational information that could direct the delivery of Extension programs on enology, or wine making.

Methodology

We collected data through a 15-min Internet survey (February 25 through March 21, 2014) developed by our team and housed on SurveyMonkey.com. A link to the survey was sent to 339 Pennsylvania wine industry members through an electronic mailing list, with a reminder email sent 2 weeks later. We also promoted the survey through an additional electronic newsletter to reach Pennsylvania winemakers who may not have received the initial email. Representatives from 61 of the 200 licensed wineries operating in Pennsylvania in 2014 (Gordon, 2015) clicked the survey link, for a response rate of 30.5%. Of these respondents, 54 answered a majority of the survey questions, as participants were not required to answer every question, providing the data we used in our analysis and generating an 88.5% completion rate. All procedures were approved by the Office of Research Protections at The Pennsylvania State University (University Park, Pennsylvania). Upon completion of the survey, each participant was entered into a raffle to win one of three $25 gift certificates that could be redeemed toward any Penn State Extension Enology event.

Results

State of the Industry

Of the 54 participants whose responses we analyzed, 42.6% identified themselves as winemakers and 31.5% as winery owners; 25.9% did not answer the question, for unknown reasons. It is not uncommon for employees of smaller commercial wineries to hold multiple positions (e.g., winemaker and owner) within one operation. As we did not allow participants to select more than one category, winemakers who also owned the business may have felt that the "owner" category best fit their association with the winery.

All participants selected one of three categories that best described their level of education and experience:

- Hobbyist—had no formal enology education and/or developed a commercial winery after being an amateur winemaker; received wine education primarily from sources such as *Grapevine Magazine* or the American Wine Society.

- Experienced—professional career in another field; no formal enology education; learned wine making through Extension/outreach programs or through independent reading; had acquired several years of industry experience.

- Professional—had formal education in enology or related scientific field; had several years of experience at commercial wineries in two or more wine-making regions.

Twenty-eight participants (51.9%) referred to themselves as experienced, 20 (37.0%) as hobbyists, and six (11.1%) as professionals.

Participants were asked to rate the quality of the wine they produced. Of the participants who answered this question, 63% felt some percentage of their wine was of superb commercial quality, 83.5% felt some percentage of their wine was of acceptable commercial quality, and 40.8% felt some percentage of their wine was not of acceptable commercial quality.

Wineries in Pennsylvania are not required to use estate-grown fruit; however, of the 44 participants who responded to a question regarding grapes they use, only three (6.8%) did not grow any of their own fruit. Table 1 shows the percentages of participants growing various wine grape varieties and producing particular wine varietals or styles at their wineries.

Table 1.

Wine Grape Varieties Grown and Wine Varietals or Styles Produced by Survey Participants

Variety name or style	Wineries that grew the grape[a] % (*f*)	Wineries that produced the wine[b] % (*f*)
Native varieties (e.g., Concord, Niagara)	36.6 (15)	76.1 (35)
Vitis vinifera white varieties (e.g., Chardonnay, Pinot Grigio, Riesling)	56.1 (23)	89.1 (41)
White hybrid varieties (e.g., Cayuga, Traminette)	41.5 (17)	76.1 (35)
Vitis vinifera red varieties (e.g., Merlot, Cabernet Sauvignon, Cabernet Franc)	31.7 (13) Merlot 53.7 (22) Cab Sauv/Cab Franc	95.7 (44)
Red hybrid varieties (e.g., Chambourcin, Noiret)	34.1 (14) Chamb 22.0 (9) Noiret/other	73.9 (34)
Fruit other than grapes		65.2 (30)
Formula wines (e.g., chocolate wines)		50.0 (23)

aNo. of respondents = 41. bNo. of respondents = 46.

Wine Producer Challenges

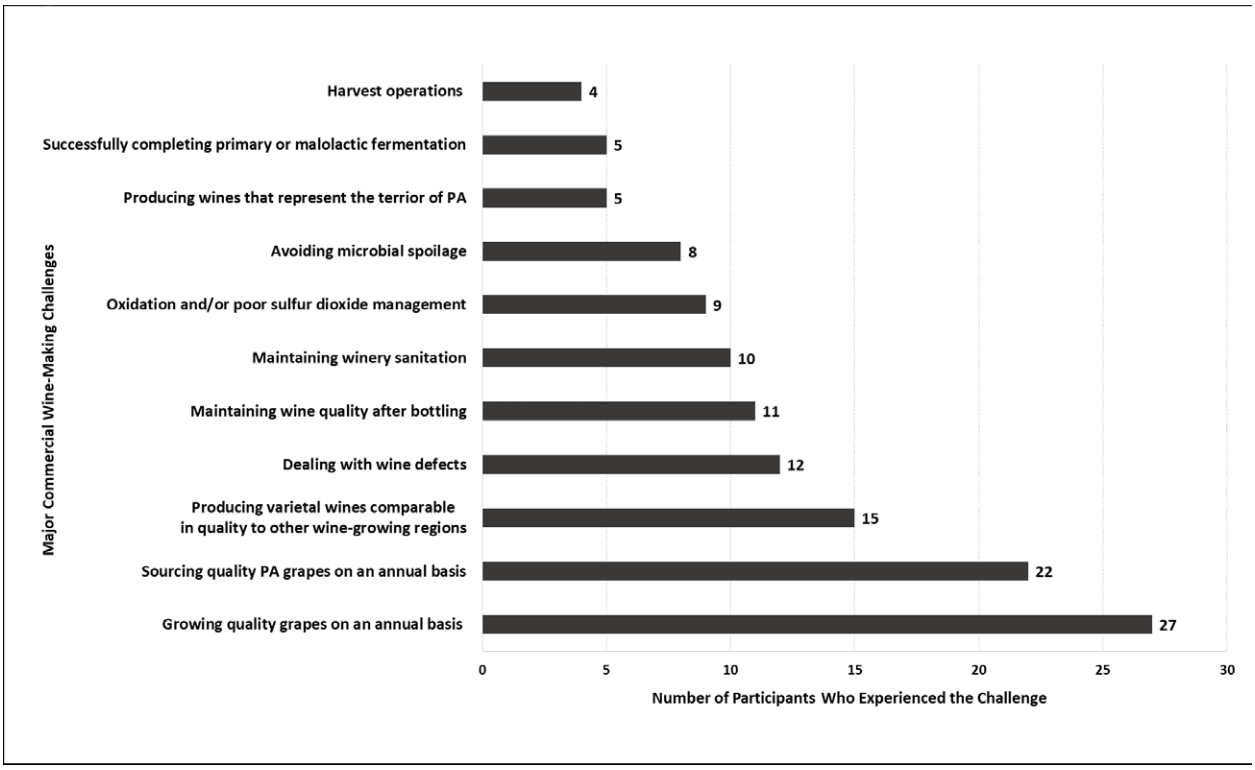
To generate ideas for Extension programming that addresses Pennsylvania wine producer needs, we asked several questions pertaining to problems participants faced at their production facilities. The 38 responses to the applicable open-ended question revealed that the most common challenges participants had experienced in 2013, the production year prior to the survey, were

- lack of quality fruit available in Pennsylvania (*f* = 11),
- disease pressure due to wet growing seasons (*f* = 6),
- high pH levels in wines (*f* = 3), and
- development of hydrogen sulfide in wines (*f* = 2).

When participants were asked to make selections from a list of issues that may have affected them, results were relatively consistent with the collective open-ended responses, as indicated in Figure 1. According to participants who responded to the question, the greatest production challenges were growing quality Pennsylvania grapes on an annual basis (75.0%), which is a viticultural issue, and sourcing quality Pennsylvania grapes on an annual basis (61.1%). Producing varietal wines that were comparable in quality to those produced in other, revered wine-growing regions and dealing with wine defects were the next two greatest enological issues, affecting 41.7% and 33.3% of participants, respectively.

Figure 1.

Wine-Making and Production Challenges Associated with the 2013 Pennsylvania Wine Grape Harvest



Note: No. of respondents = 36.

Receiving Educational Information

We also assessed participants' preferences for receiving wine-making information from Extension and other outreach education sources. Options included traditional, online, and social media sources. At the time of the study, Penn State Extension Enology had Facebook and Twitter accounts, with 355 followers on Facebook and 286 followers on Twitter. Additionally, 339 individuals were signed up to receive a weekly email newsletter. Our

survey results indicated that participants preferred the more traditional organized workshops and seminars over web-based sources (Table 2).

Table 2.

Participant Preferences for Accessing Wine-Making Information from Educational Outreach Sources

Educational outreach source	Less preferred *f*	Neutral *f*	More preferred *f*	No response selected *f*
Organized workshops or seminars hosted at Penn State's main campus or at county Extension offices with a wine tasting	1	5	39	1
Regional (e.g., southeastern Pennsylvania, northwestern Pennsylvania) seminars held on a quarterly basis with Extension personnel providing new marketing strategies, production tips, etc.	1	11	33	1
Online webinars	7	12	23	4
Social media and online resources	7	19	17	3
Meetings made available through video teleconferencing or other media means	12	18	13	3
Meeting at the Mid-Atlantic Fruit & Vegetable Convention or other structured event	19	12	12	3

Note. No. of respondents = 46.

We gained additional insight pertaining to preferred Extension delivery mechanisms, with hands-on workshops being the most preferred (85.4%), followed by regional visits to wineries (75.6%), conference presentations (68.3%), and printed materials (68.3%) (Table 3). Delivery mechanisms that less than half of the responding participants selected included webinars (39.0%) and postings of content on social media sites (14.6%) (Table 3).

Table 3.

Participant Preferences for Receiving Enology Information Through Extension

Delivery mechanism	*f*	%
Hands-on activities, including tastings, at workshops	35	85.4%
Regional winery visits and meetings with the Extension enologist	31	75.6%

Conference presentations	28	68.3%
Written information in printed materials, such as handbooks or guides	28	68.3%
Information through Penn State Enology News and/or the Wine Grape Network websites and electronic mailing lists	25	61.0%
Written information on Internet sites	24	58.5%
Videos on Internet sites	21	51.2%
Question/answer through telephone and/or email	20	48.8%
Webinars	16	39.0%
Information posted through social media sites	6	14.6%

Note. No. of respondents = 45.

We also investigated where wine industry members obtained enology information. Results indicated that most participants received production information from other winemakers (89.1%) rather than research-based sources. This finding could indicate a need to provide wine-making resources specific to the local wine region or to improve Extension interaction with state winemakers. Industry trade magazines and Internet websites were both used by 84.8% of participants. The least used resource for production information was the state's winery association (56.5%). No differences were detected as to how participants obtained Extension wine-making information based on their skill level (data not shown).

Table 4.

How Survey Participants Obtain Production Information

Informational source	***f***	**%**
Other winemakers	41	89.1%
Industry magazines	39	84.8%
Internet sites	39	84.8%
Direct contact with equipment and industry suppliers	35	76.1%
Direct contact with Extension personnel	33	71.7%
Manufacturer conferences and meetings (e.g., Eastern Winery Expo, Wineries Unlimited)	32	69.6%
Extension conferences and meetings	28	60.9%
Extension publications	28	60.9%
Pennsylvania Winery Association	26	56.5%

Note. No. of respondents = 46.

Conclusions and Implications

Changes to the Penn State Extension Enology Program Based on the Needs Assessment

Although viticulture education has been a component of Penn State's Extension curriculum for several decades (Centinari et al., 2016), the integration of wine production education is relatively new.

Previous research has indicated that Extension material be written for an inexperienced or low-literacy audience (Miller, 2001). With roughly 88.9% of the Pennsylvania wine industry members considering themselves "experienced" (but not professional) or "hobbyists," we created a blog in an attempt to improve exposure to reputable, science-based information and present important principles in an applied and less technical way. The Wine & Grapes U. blog (https://psuwineandgrapes.wordpress.com/), to which various Extension staff, faculty, and graduate students submit short articles, quickly became a successful medium for Penn State Extension Enology interaction with the Pennsylvania grape and wine industry. At the blog's initiation in 2014, posts were accessed an average of 52.3 times. In 2015, the average number of opened links increased to 253.7 times per blog post, and in 2016, 335.5 times per blog post. Thus, there was a 385% increase in use between 2014 and 2015 and an additional 32% increase in use from 2015 to 2016. These increases in readership suggest the relevance of the information to industry members and the appropriateness of the delivery method.

Blog topics range from vineyard and disease management practices, which relate to the greatest perceived challenges faced by many winemakers across Pennsylvania, as indicated by our findings, to tasting room design. Wine science content is also a primary focus. Like other viticulture blogs (Stafne, 2012), our blog offers a forum for providing industry members within and outside Pennsylvania with engaging content. For example, one Extension program in a southern state used the enology-focused articles to create a customized textbook for local winemakers.

The blog has also become a tool for improving engagement with stakeholders. Although the blog site is a form of social media (Kinsey, 2010), which few survey participants preferred as their method of obtaining Extension enology information, its use increased interactions with other Penn State Extension Enology social media platforms (e.g., Facebook and Twitter). By mid-2016, the number of Facebook page followers was 597 (68% increase since 2014). Additionally, the number of followers on Twitter increased to 427 (49% increase). These results were accomplished with relatively little advertising or promotion. These increases are encouraging as a greater effort was made by Penn State Extension Enology to include social media as an educational platform, using suggestions from Gharis, Bardon, Evans, Hubbard, & Taylor (2014), after the close of our industry assessment survey.

Study Conclusion and Extension Programming Suggestions

We believe that we have conducted and published the results of one of the first assessments of the educational needs of an emerging wine-making industry. From our study, we identified that skill levels varied among Pennsylvania winemakers who participated in the survey. This circumstance presents undeniable challenges in providing appropriate education to a developing industry. However, the fact that many winemakers and winery owners identified themselves as "hobbyists" or "experienced" (but not professional) signifies a large audience for which Extension education could be useful. Platforms such as blogs offer opportunities for Extension to be successful in delivering information.

Additionally, many winemakers identified seasonal variability of wine grape quality as one of their greatest

challenges. Climatically, Pennsylvania's growing and harvest seasons vary annually, presenting an obstacle for inexperienced winemakers or winemakers who are only familiar with producing wine from grapes harvested from hotter, drier, or more consistent regions (e.g., California). Educating industry members on how to deal with inconsistent raw materials can be an incredible undertaking, especially when many of those members have limited applicable education, but doing so is critical for ensuring success in areas where wine making is an emerging industry.

Although our survey focused on the Pennsylvania wine industry, the results may have relevance for other state wine industries. In fact, a regional organization, the American Society of Enology and Viticulture—Eastern Section, provides research and education for all state industries and Canadian regions east of the Rocky Mountains. The existence of this organization indicates the depth of shared challenges across wine regions removed from the West Coast. The distribution and use of the Wine & Grapes U. blog site is a good example of how enology content can be disseminated to industry members outside of one state.

Finally, our results indicated that participants preferred face-to-face Extension education over resources delivered electronically. Although content is frequently available online and used to reach a large audience quickly and effectively, as demonstrated by the Wine & Grapes U. blog, traditional classroom-learning techniques are still highly valued.

Author Notes

Author Denise Gardner is now an independent wine-making consultant at Denise Gardner Winemaking in Phoenixville, Pennsylvania. Author Abigail Miller is now marketing director at Chateau Bu-De Winery in Wilmington, Delaware.

References

Brown, M. (2008). Midwest grape production guide. *Journal of Extension*, *46*(6), Article 6TOT7. Available at: https://www.joe.org/joe/2008december/tt7.php

Centinari, M., Kelley, K. M., Hed, B., Miller, A., & Patel-Campillo, A. (2016). Assessing growers' challenges and needs to improve wine grape production in Pennsylvania. *Journal of Extension*, *54*(3), Article 3RIB6. Available at: https://joe.org/joe/2016june/rb6.php

Gharis, L. W., Bardon, R. E., Evans, J. L., Hubbard, W. G., & Taylor, E. (2014). Expanding the reach of Extension through social media. *Journal of Extension*, *52*(3), Article 3FEA3. Available at: https://joe.org/joe/2014june/a3.php

Gordon, J. (2015). Number of North American wineries grows 7%. *Wines and Vines*. Retrieved from http://www.winesandvines.com/template.cfm?section=news&content=145325

Kinsey, J. (2010). Five social media tools for the Extension toolbox. *Journal of Extension*, *48*(5), Article 5TOT7. Available at: https://joe.org/joe/2010october/tt7.php

Miller, J. E. (2001). How to write low literacy material. *Journal of Extension*, *39*(1), Article 1TOT2. Available at: https://joe.org/joe/2001february/tt2.php

Pennsylvania Winery Association. (2013). The economic impact of Pennsylvania wine, wine grapes and juice grapes—2011. Retrieved from

http://pennsylvaniawine.com/sites/default/files/Pennsylvania%202011%20EI%20Report_FINAL.pdf

Stafne, E. T. (2007). Profile and challenges of the emerging Oklahoma grape industry. Oklahoma Cooperative Extension Service Circular E-999. Retrieved from http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-4626/E-999web2015.pdf

Stafne, E. T. (2012). Viticulture education via blogging. *Journal of Extension*, *50*(6), Article 6TOT3. Available at: https://joe.org/joe/2012december/tt3.php

Stafne, E. T., McGlynn, W. G., & Mulder, P.G. Jr. (2009). Post-course evaluation of a grape management short course. *Journal of Extension*, *47*(3), Article 3RIB4. Available at: https://www.joe.org/joe/2009june/pdf/JOE_v47_3rb4.pdf

Wolf, T. K. (2008). *Wine grape production guide for eastern North America*. Ithaca, NY: Natural Resource, Agriculture, and Engineering Service.
