

# OHIO GRAPE-WINE ELECTRONIC NEWSLETTER

Edited by: Dr. Maria Smith

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Photo: Netted Cabernet Franc, OARDC Wooster, OH. August 2019, photo credit: Maria Smith

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## Dry news is good news

...Maybe not for the corn! But the drier weather across much of the state over the past several weeks has been a welcome reprieve from the high precipitation of the early season. This is especially true for warmer portions of the state where the earliest ripening varieties are currently being harvested.

Although we are still above average accumulated precipitation for the year, the timing of this dry down is much appreciated for giving us a hand up on managing late-season disease pressure while we await our fall bounty.

*-Maria and the V&E Team*



# Pricing your grapes for the 2019 harvest

By: Dr. Maria Smith, HCS-OSU

## Do you sell grapes or are you interested in selling grapes?

One frequent question growers have this time of year is “What price should I sell my grapes?”. And the answer is, “It depends”. There are several factors that can influence grape prices beyond supply and demand, including:

- Variety
- Fruit maturity
- Additional management practices for targeting crop levels
- Pest and disease management and crop quality

We sought to provide guidance towards variety-specific grape production and pricing throughout Ohio by survey feedback from Ohio growers. The following 3 pages summarizes the survey responses from the 2018 season and can be found as a PDF handout on the Buckeye Appellation Website (<https://ohiograpeweb.cfaes.ohio-state.edu/grape-growing/2018-ohio-wine-grape-production-and-pricing-index>).

All responses to the survey are anonymous.

With support from the Ohio Grape Industries Committee (OGIC), we plan to conduct a second year of surveying following the 2019 growing season. We encourage grower participation in the next year’s survey to continue building upon our work in a way that reflects more varieties grown throughout the state, in addition to improving the accuracy of the prices and acreage shown.

**Don’t see your varieties?** Check out other 2018 regional price guides from the Finger Lakes (NY: [https://nygpadmin.cce.cornell.edu/uploads/doc\\_53.pdf](https://nygpadmin.cce.cornell.edu/uploads/doc_53.pdf)) and Virginia (<https://www.virginiawine.org/resources?category=1>)



*Photo: 2018 Cabernet Franc, AARS Kingsville, OH.*

# 2018 Ohio Wine Grape Production and Pricing Index

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*This survey was conducted in accordance with The Ohio State University, Institutional Review Board protocol #2019EO52. Funding for this survey was provided by the Ohio Grape Industries Committee.*

Over the past 10 years, the Ohio wine industry has boomed from 124 to now over 300 licensed wine manufacturers. As the wine industry continues to grow, grape supply must rise in order to meet winery demands. A major challenge towards achieving this goal is ensuring profitability for wine grape production. As a commodity, grapes have high start-up costs, several years from planting until productive bearing, annual vineyard labor and supply costs, and high risks of crop loss that limit profitability. Therefore, grape prices should reflect not only the available supply and demand but also production costs.

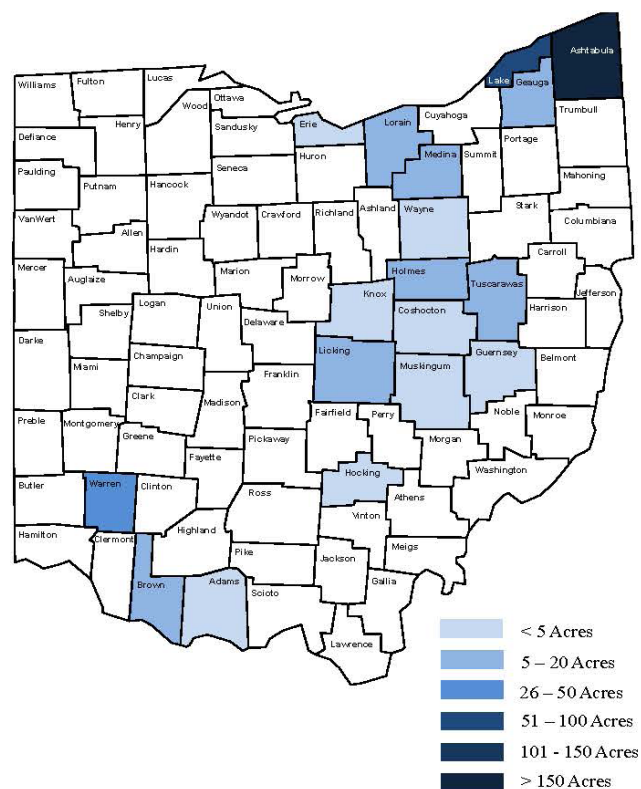
In spring 2019, an online Qualtrics survey was distributed to grape producers across Ohio between 22 Apr 2019 and 31 May 2019. In this survey, growers were asked about their 2018 planted and bearing wine grape acreage, yield (tons), cost (\$ per ton) if wine grapes were sold, and plans for increasing acreage in 2019. The survey results below aim to provide an overview of grape production and pricing for the 2018 season and act as a base for multi-year grape production and pricing trends in Ohio.

## Survey response summary

Forty participants (n = 40) responded to the survey. The participants represented vineyards (46.2%) and A2 permitted estate wineries (53.8%). Respondents reported individual vineyard sizes between 1 to 5 and > 50 planted acres. Vineyard acreage was recorded for 18 Ohio counties (**Fig. 1**).

## Production, yield, and pricing

**Production (acreage):** Planted vineyard acreage ranged between 357 to 505 acres, with an average vineyard size of 10.8 acres. Production acreage accounted for 97.1% of the total planted acreage. In total, 49 different cultivars were reported among planted vineyard acreage (**Fig. 2, Table 1**). The cultivars represented native (*V. labrusca*), interspecific hybrid ('hybrid') and *V. vinifera* ('vinifera') species. Native grapes comprised the majority of reported acreage (60.9%), followed by vinifera (27.8%), and hybrids (11.4%; **Fig. 2**).



**Fig. 1** Distribution of reported grape acreage among Ohio counties. Acreage was summed across the number of survey participants that reported for each county.

**Yield (tons):** Participants reported yield for 39 cultivars (**Fig. 2, Table 1**). Total yield for 2018 was 507.1 tons, of which 207.4 tons (40.8%) were sold. It was assumed that the remaining yield (299.7 tons) was used for estate winemaking purposes. In contrast to planted acres, the highest percentage of yield bearing cultivars were vinifera (48.5%), followed by natives (37.2%), and hybrids (14.3%).

**Pricing (\$ per ton):** Price data was reported for 23 cultivars. The average price per ton was generally lowest for native cultivars and highest for vinifera cultivars (**Table 1**).



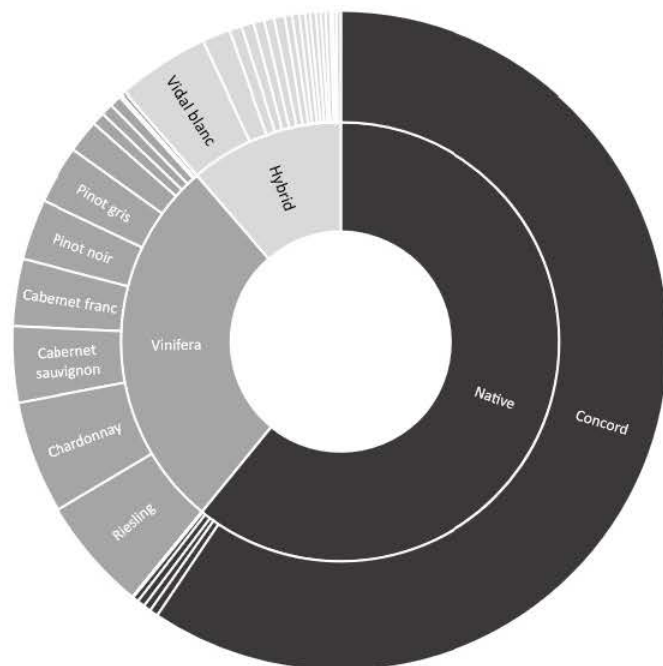
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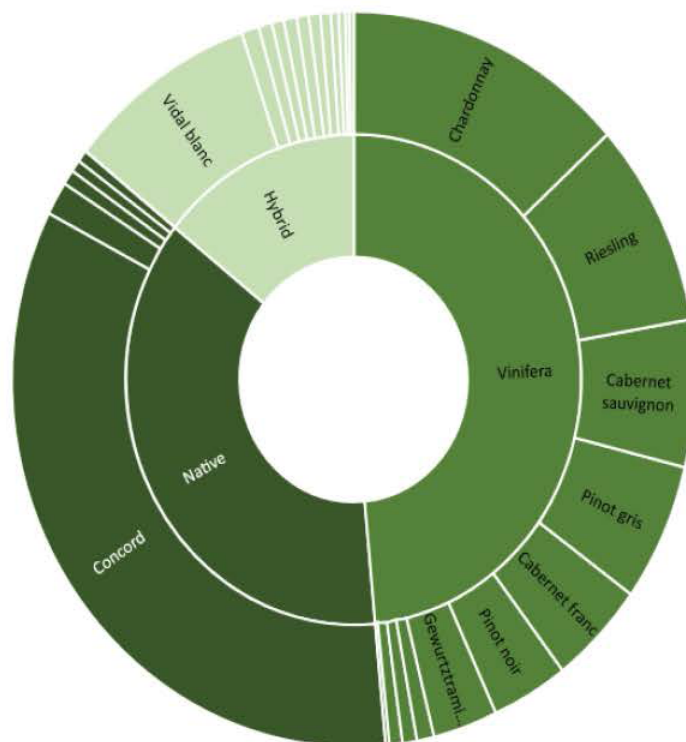
**Pricing (\$ per ton):** The price per ton ranged between \$250 (Concord) and \$3000 per ton (Cabernet franc, Cabernet sauvignon, Chardonnay, Merlot, Pinot gris, Pinot noir; **Table 1**). The average price per ton was \$773, \$1165, and \$2235 for native, hybrid, and vinifera grapes, respectively.

**2019 acreage expansion:** 25% of participants indicated that they plan to expand planted acreage in 2019. Several *V. vinifera* cultivars, including Saperavi, Riesling, Auxerrois, Riesling, and Pinot Gris, as well as several hybrid cultivars, including Petite Pearl and Valvin Muscat, were among those listed for new plantings.

**Summary:** The results of this survey represented approximately 20 to 30% of the total grape acreage reported in the 2017 USDA-NASS/OGIC grape production survey. Therefore, this survey reflects only a subset of the Ohio grape industry. Available time to complete the survey, knowledge of the survey distribution, and individual identification likely played roles in the survey response rate. Increasing future survey response rates will be key to improving available data. The longer term goal of this data will be to provide pricing information to the industry to aid in vineyard and winery budgeting and negotiations.



**Fig. 2** Proportion of total planted acreage of production by species (inner circle), and proportion of of total planted acreage by cultivar (outer circle).



**Fig. 3** Proportion of total yield (tons) by species (inner circle), and proportion of of total yield by cultivar (outer circle).

**Table 1** 2018 Grape acreage, yield, and pricing by cultivar. Blank spaces indicate no data provided.

Species group	Cultivar	Planted acres	Yield harvested (tons)	Yield sold (tons)	Low price per ton (USD)	High price per ton (USD)	Average price per ton (USD)
Native	Catawba	1.7	3.4	0.9	1000	1000	1000
	Concord	242.9	172.4	141.2	250	1000	325
	Delaware	1.5	2.5	0			
	Isabella	0.2	0.2	0			
	Niagara	1.2	7.5	2.5	360	360	360
	Norton (Cyanthiana)	1.5	2.9	2.9	750	1750	1250
Hybrid	Arandell	0.1	0.2	0.2	1400	1400	1400
	Aromella	2					
	Brianna	0.1	0.1	0			
	Chambourcin	5.4	4.2	1.9	750	2000	1600
	Corot noir	0.3	2.6	1.1	850	850	850
	DeChaunac	1					
	Edelweiss	0.1	0.3	0			
	Elvira	0.3	2.1	1.8	1000	1000	1000
	Frontenac	1.6	3.0	1.6	800	1000	973
	Frontenac blanc	1					
	Frontenac gris	1.2					
	La Crescent	1.3	2.5	2.1			
	Marechal Foch	1					
	Marquette	2.7	3.0	1.3	1000	1200	1100
	Noiret	2.3	1.5	0			
	Prairie star	0.5					
	Regent	0.1	0.8	0.5	1600	1600	1600
	Seyval blanc	0.5	3.1	0			
	St. Croix	0.1	0.1	0			
	Traminette	2.0	3.2	0			
	Vidal blanc	18.5	45.7	11.4	700	900	800
	Vignoles	2.3	0.5	0			
Vinifera	Albarino	0.1	0.1	0			
	Arneis	0.1	0.1	0			
	Cabernet franc	13.5	23.3	6.5	1000	3000	2675
	Cabernet sauvignon	15.3	32.8	5.8	1000	3000	3000
	Chardonnay	22.7	67.8	5.8	1000	3000	1900
	Chasselas	0.5					
	Dornfelder	2.4	4.2	4.2	1000	1000	1000
	Gamay noir	0.1	0.2	0			
	Gewurtztraminer	6.6	15.7	2.2	1000	2000	1900
	Gruener veltliner	2.3	3.1	0.35	1800	2000	1900
	Merlot	2.6	3.3	0			
	Petit sirah	0.2					
	Pinot gris	11.7	30.8	5.1	1000	3000	2400
	Pinot noir	12.3	18.5	1.7	1000	3000	2675
	Pinotage	0.1	0.1	0			
	Riesling	22.8	46.1	6.4	1000	2000	1900
	Sangiovese	0.1	0.1	0			
	Sauvignon blanc	0.1	0.3	0			
	Terodelgo	0.1	0.1	0			

# Importance of Temperature Control for White and Rose` Winemaking

Patrick Pierquet, Todd Steiner and Dr. Lisa Dunlap. Horticulture & Crop Sciences Department.

When producing white and rose` wines, most winemakers strive for a wine that is fresh, fruity and aromatic. There are several procedures that can help achieve this style of wine, and one of the most important techniques is temperature control in the winemaking process. This fact sheet will discuss the rationale for this and explain several ways to achieve quality white and rose` wine production.

At harvest time, the ambient temperatures can be quite high, so the fruit may arrive at the winery at higher than desired temperature. Also, fruit exposed to direct sunlight can be 10 – 15° F above air temperature. In addition, the process of fermentation itself produces heat as a byproduct:

$\text{Sugar} + \text{Yeast} \implies \text{Ethanol} + \text{CO}_2 + \text{Energy(heat)}$

The delicate fruity and aromatic compounds in wine are composed of volatile compounds such as terpenes, thiols and esters. High juice temperatures and rapid fermentations can cause these compounds to volatilize, and result in a wine that lacks freshness and varietal character. Off flavors can result since high fermentation temperatures encourage the growth of spoilage organisms and the breakdown of fruit solids in the must. This phenomenon has been recognized for many years. In fact, more than 50 years ago enology researchers were stressing the importance of active temperature control in the winery(3). It is generally agreed that fermentation temperatures in the range 55 – 65° F will result in the highest quality white and rose` wines. Too low a temperature may cause the wine to become sluggish or “stick” before fermentation is complete. It is helpful to refer to suppliers’ catalogs, to determine the temperature tolerance and nutrient requirement of the yeast selected to use. Many wineries start the fermentation process at a slightly higher temperature to encourage early yeast growth, then gradually lower the temperature once fermentation is active.

For aromatic varieties, it may be desirable to provide skin contact time, to enhance the uptake of these compounds. Skin contact time can also be used in making rose` wines, to ensure adequate extraction of color. It is important that this technique take place at reduced temperatures (less than 60° F), and with adequate SO<sub>2</sub> levels, to avoid the growth of microbes, and to avoid extraction of higher phenolic levels which cause a harsher character(6). Higher skin contact temperatures also result in higher juice protein levels, which requires more bentonite for protein stabilization, along with increased levels of insoluble solids making it harder for juice clarification. There are a number of procedures that can help with temperature control throughout the winemaking process.

## Harvesting and transporting the fruit

It is recommended to conduct grape harvest during the night or early morning hours, when the vineyard is at its coolest temperature. This will give the winery a head start on temperature control. However, given the shortage and sporadic nature of labor availability, this may not be possible.

Fruit harvested at warmer times of the day, and especially machine-harvested fruit, can be cooled by mixing in dry ice snow or pellets. During transportation to the winery, it would be advisable to ship the fruit in a refrigerated truck if transporting greater distances. If crushing and pressing cannot immediately take place at the winery, the harvested fruit should be stored in a refrigerated cooler, or a cool cellar, until processed. At the OSU/OARDC wine lab, we store all our harvested fruit overnight in a large walk-in cooler. This initial cooling helps to minimize the microbial activity on the fruit during processing and results in a cleaner fermentation.

## Temperature control in the winery

Once the fruit is crushed and pressed, there are several ways to control temperature during fermentation. Using a slow-fermenting, low foaming yeast such as EC-1118 can help minimize the loss of volatile aroma compounds, by reducing the amount of heat generated during fermentation.





In addition, CO<sub>2</sub> production is slower when using such a yeast strain, and can minimize the loss of aroma compounds being entrained in the gas bubbles.

Dry ice pellets can be placed in the fermenting must, or cold water can be trickled over the sides of the fermentation tank. Supplying cold water on the outside of the tank to control fermentation temperature is recommended only for smaller tanks. There may be some concerns with this approach, since it can consume large quantities of water.

The methods discussed so far are rather low-tech and inexpensive, and temperature control will be imprecise. More effective and accurate temperature control can be achieved by using mechanical refrigeration systems to cool the fermentation. For smaller winery operations less than 5000 gallons, the entire cellar can be cooled with a suitable commercial air conditioning system. This can be effective if the fermentation tanks are made of stainless steel for good heat transfer (tanks made of wood or plastic will radiate heat much slower than stainless steel) and are small in size. (Smaller tanks have a greater surface-area-to-volume ratio, and will radiate heat more effectively than large tanks.) In the evening when temperatures drop, wineries can also take advantage of cooling by opening cellar doors or mechanically ventilating the winery with cool outdoor air. A separate red wine fermentation room is highly recommended for this type of operation, in addition to a separate room to conduct malolactic fermentations with temperatures at 70° F being optimal.

A number of manufacturers offer portable chilling units, which can be moved around the winery where needed. These units use a glycol-based refrigerant, and the cooling is achieved by circulating the refrigerant through a cooling “plate” or “snake”, immersed in the fermenting juice. Units like this may make the most sense for small wineries that cannot afford permanent, plumbed-in systems of refrigeration for the whole winery(4,5).

Jacketed, glycol-cooled stainless tanks are probably the most effective means of temperature control during fermentation, regulated with an appropriately sized commercial glycol chilling system. These systems employ a large, central cooling unit, and permanent feed lines to each tank, under electronic control via computer and cell phone technology. Temperature controllers can be incorporated into each tank, to customize the cooling of each lot(7). These controllers can further enhance the economics of refrigeration by taking advantage of lower-priced, “off – peak” electricity rates. (using maximum cooling during the night, and minimal cooling during the day.) The efficiency of these systems can be enhanced by insulating

the feed lines and the outside of the tanks. Any enhancement to the system’s efficiency is important, since temperature control can comprise up to 70 percent of the energy consumption in a winery(2). The sizing of the chiller unit is very important, based on expected cooling loads. Wineries should consult with a refrigeration specialist to determine the appropriate size of chiller.

## **An Example – Traminette Wine Quality versus Fermentation Temperature**

In 2014 at the Ohio State University, OSU/OARDC wine lab, we performed an experiment by fermenting Traminette juice at three different temperatures: 63° F, 75° F and 85° F. The fermentation rate was much faster at 85° F(14 days to dryness) and 75° F(18 days) compared to the 63° F treatment(37 days). Finished wine chemistry(T.A., pH, V.A., %ABV) was nearly identical for all three fermentation temperatures.

However, differences were observed upon sensory evaluation of the treatments in this study. Wines were presented at our annual Ohio Grape & Wine Conference, with 120 attendees providing sensory descriptors and results. The treatment clearly rated the highest overall quality was the 63° F fermentation temperature. Attendees also noted this treatment resulted in higher concentrations of floral, citrus and pineapple attributes. The lowest quality was indicated to be the Traminette fermented at 85° F expressing a significant loss in varietal aromatics being subdued and neutral in both aromatics and expression on the palate. Traminette is a variety that is greatly prized for its notable aromatics, and this was a good demonstration of the effectiveness of controlling fermentation temperatures.

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