

# *Ohio Grape-Wine Electronic Newsletter*

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## **Content:**

- 2009 OGWC
  - Determining Time of Harvest
  - Pre-Harvest Reminders
  - Regional Updates
  - Grapevine Leafroll Virus
  - Ohio MarketMaker
  - SARE Grants
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## 2009 Ohio Grape & Wine Conference - Mark your Calendar!

The Ohio Grape & Wine Conference will be held on 16-17 February at the Shisler Conference Center at OARDC in Wooster, OH. Marketing will focus on customer service with nationally renowned speakers. Rick Sigel, a Certified Speaking Professional, and seasoned retailer of 25 years, will discuss customer service from a global perspective. Veronica Barclay, is VP and General Manager of Barclay & Browning Wines, will discuss customer service from a tasting room/winery perspective. Marketing will also feature an industry panel to discuss how to be properly prepared for a festival/special event. Due to multiple requests by attendees in the previous conference on basic and advanced grape growing, these topics will be the focus of viticulture sessions. Featured speakers include Dr. Tony Wolf, Professor of Viticulture at Virginia Tech University, and Mark Chien, winegrape Extension Educator from Penn State University. Featured speakers in enology will include Dr. Christian Butzke, Professor of Enology at Purdue University and Ellie Butz, Enologist, Vintage Winery Consultants. More information will be forthcoming. Please mark your calendar!

## Determining Time of Harvest: The Constant Dilemma

*By Imed Dami, HCS-OARDC*

It is that time of the year when every grape grower and vintner asks the never-ending question: to pick or not to pick. Time of harvest is probably the most important and challenging viticultural decision for grape producers due to the difficulty of assessing grape maturity in the vineyard and predicting wine quality. The yearly dilemma is whether to delay harvest until desired quality parameters are reached since, once picked, grapes do not improve in flavor, color, or sugar content. On the other hand, if the grapes are left hanging too long on the vine, the berries may shatter, get damaged by wildlife, insects, or break down due to rot; and yields and quality are negatively affected. During the past 10-15 years, we have come a long way from the days of determining time of harvest by simply going out to the vineyard with a refractometer. Today, overall ripeness evaluation involves much more than an analysis of °Brix, titratable acidity and pH; and some winemakers use flavor/aroma assessment in addition to the routine standards.

In this article, I have highlighted considerations to take into account when deciding on time of harvest and described objective and subjective methods to determine optimum fruit maturity, which is a balance between the two methods. Sampling methods are also described. The information is especially useful for new growers/vintners and is a refresher for seasoned producers.

### Factors affecting time of harvest

Under our unpredictable environmental conditions, time of harvest is a complex compromise since it is affected by several factors including:

- Season
- Weather (daily and diurnal temperature, rainfall)
- Likelihood of pest, disease, and wildlife damage
- Vintner preference
- Communication and mutual agreement between grower and vintner
- Labor availability

- Grape composition
- Viticultural characteristics: variety (early vs. mid- vs. late season ripening), crop load (heavy vs. light load), sun exposure (exposed vs. shaded fruit), vine health, and vine vigor.

### **Objective criteria for estimating grape maturity**

At maturity, grape juice is generally composed of the following: water (74%), sugars (25%, primarily fructose and glucose), organic acids (0.8%, primarily tartaric and malic acids), minerals (0.5%, mainly potassium), and phenolic, aromatic and nitrogenous compounds (0.2%). Due to their abundance, and ease of measurement, it is no wonder that the primary fruit maturity indicators and “industry standards” are sugar and acid contents, and pH. Flavor and aroma compounds are laborious and expensive to quantify and thus are not commonly measured and winemakers assess them subjectively instead.

Sugar Content: A large portion of the soluble solids in the grape juice is sugars. Glucose and fructose are the main sugars in the juice. At ripening, glucose and fructose are usually present in equal amounts. Both fructose and glucose are fermentable sugars and during fermentation, yeast converts these sugars to alcohol and carbon dioxide. Generally, sugar levels are expressed in degree Brix (a scale to measure total soluble solids) which represents grams of sugars per 100 grams of juice. Levels between 18 and 24 °Brix are desirable, depending on variety and wine style. Sugar level is measured with a refractometer. Juice is placed on a refractometer glass and light travels through the juice to register on a degree scale. The thicker the juice, the sweeter it is, the more it bends the light, and the higher the °Brix that registers on the scale.

Acid Content: Next to sugars, organic acids are the most abundant solids present in grape juice. They are responsible for the tart taste of juice and wine and have marked influence on wine stability, color, and pH. The predominant acids found in grapes are tartaric, malic, and citric acids. Malic and tartaric acids account for more than 90% of the total acids present. During the early period of berry growth, concentration of both acids increases in the fruit. During ripening and initiation of veraison, the sugar accumulates in the fruit and the acid concentration decreases. Total acidity (TA, also referred to as titratable acidity) is the actual amount of acid reserve in the wine. Acid levels generally should fall between 0.6 – 0.8 grams tartaric acid/100 ml (%TA) at harvest. TA is measured by titrating sodium hydroxide into a sample of grape juice to neutralize the acid in the juice. This amount of sodium hydroxide is then used in a formula to determine how much total acid in the juice.

Level of pH: Acids upon dissociation in a juice solution liberate H<sup>+</sup> ions, which are measured and expressed in terms of pH. The pH is a measure of active acidity in the juice and wine, and thus acidity and pH are related. The pH level influences a wide range of factors in the wine including microbial stability (spoilage), physical stability (protein, tartrate), oxidation level, SO<sub>2</sub> activity, color and flavor. Generally, white grapes harvested at a pH of 3.1 to 3.3 and red grapes at a pH of 3.3 to 3.5. A pH meter is used to measure pH and assesses the strength of H<sup>+</sup> ions in solution and registers the number on a scale of 1 (acid H<sup>+</sup>) to 7 (neutral) to 14 (basic OH<sup>-</sup>).

### **Subjective criteria for estimating grape maturity**

It is a good practice for growers and vintners to periodically check berry skins and seeds and taste the juice collected to measure °Brix, pH, and TA. It is a subjective way to monitor the development of color, flavor and aromas of a given variety. Research and experience have shown that optimum °Brix don't always match optimum flavors and aromas in white or red varieties. For example,

grapes may measure 18 °Brix and flavor and aroma are fully developed in one year. In another season, °Brix may be at 22 and the grapes have not fully developed the typical varietal character. The same is true for acid and pH levels. Since this is subjective, it is difficult to have “hard numbers” to make proper decisions. A scorecard was developed to aid with this process using a check list for subjective criteria for assessing grape maturity as follows:

<b>Attribute</b>	<b>Level of attribute</b>	<b>Points Awarded</b>
Color	Green (lack of color)	0
	Color change; translucent	1
	Fully-matured color	2
	Over-mature color	1
Ease of removal of berries from pedicels	High resistance	0
	Moderate resistance	1
	Little/no resistance	2
Texture upon touch	Firm	0
	Soft/elastic	1
	Shriveled; loss of shape	0
Texture – initial bite <i>Ease of skin collapse</i>	High resistance	0
	Moderate resistance	1
	Low resistance	2
<i>Mechanical features of the pulp</i>	Thin; watery	0
	Viscous	2
	Jelly-like	1
Aroma	None	0
	Recognizable varietal aroma	2
Flavor upon chewing <i>Initial character (upon chewing)</i>	Unripe; green; bland	0
	Some varietal character	1
	High varietal character	2
<i>Release from skin</i>	None	0
	Typical varietal character	1
<i>After taste</i>	None	0
	Bitter; astringent	0
	Typical varietal character	1
Maximum total		15

## Considerations for fruit sampling

In order to determine harvest date, grapes are sampled periodically before harvest to see how the levels of sugar, pH acids and flavor compounds are progressing through the season. The determination to pick grapes is based on a small sample. Therefore, it is important that a sample is collected properly so that will reflect the level of maturity of the entire crop. It is also important that sample preparation and juice extraction mimic the juice obtained from an actual winery crush. The goal is to have vineyard samples accurately reflect must composition at the winery. There are two types of grape sampling: cluster sampling or berry sampling. With either method, it is critical to collect a “representative” sample with a minimum number of berries or clusters from a large number of vines.

Sampling guidelines: A proper sampling procedure is listed as follows:

- Begin berry sampling at 15 °Brix or weekly after veraison. Sample daily when close to harvest.
- Sample at least 200 berries per block and per variety. At least 10% of the vines should be sampled. You could use a grid sampling approach; for example, berry samples are collected from every 10<sup>th</sup> vine in every 10<sup>th</sup> row.
- If the vineyard has a high degree of variation among the vines, for example, after severe winter injury, disease infestation, or other type of stress, increase the number of berries collected per sample.
- Sample from both sides of the trellis. If the rows run north and south, for example, take half the berries from the east side and half from the west side.
- Pick “random” berries as you walk down the row. There should be an equal chance of a berry being picked anywhere on the bunch or anywhere in the fruiting zone of the vine from both the sun and shade side of clusters. Don’t favor colored berries over green. Collect berries from top, middle, and bottom of selected clusters.
- Avoid row end plants, outside rows and off-type or otherwise unusual plants.
- Early morning sampling is preferred. If you are tracking the sugars, pH and TA through the season, the samples should be collected at the same time of day if possible.
- Store berries in a sealed plastic bag or container in the refrigerator until processing. If you will be out in the field sampling for a while, store samples in a cooler. Try to process berries within the next 24 hours.

Things to remember and consider when sampling:

- With berry sampling, in order to be within 1.0 °Brix of actual sugars at harvest, you need to collect 2 samples of 100 berries. To further increase the accuracy within 0.5 °Brix, you need to collect 5 samples of 100 berries. With cluster sampling, you need to collect 10 clusters to be within 1.0 °Brix.
- Realize that 90% of the variation in berry sampling is believed to come from variation in the position of the cluster on the vine and the degree of sun exposure.
- Juice sample collected in the morning can be 1 °Brix lower than juice sample collected in the afternoon.
- Rate of °Brix increase is usually 1 °Brix per week.

- Sugars of crushed must at harvest are usually lower than those of the sample juice. Therefore, you need to check harvest sample with crushed must to see how far off and take that into account in future sampling.
- Standardize a sampling method and apply it all season and use same sampler(s) if possible.

Have a great harvest!

## Pre-Harvest Reminders:

*By Dave Scurlock and Imed Dami, HCS-OARDC*

### Pre-Harvest Intervals

As we approach harvest, pay special attention to pre-harvest intervals (PHI) on all fungicides and insecticides that you apply in your vineyard. Follow all label restrictions and anticipate an advanced harvest date. Most common fungicides used by grape growers are included in the following table. This information and complete list of pesticides can be found in the Midwest Commercial Small Fruit and Grape Spray Guide 2008 at: [www.hort.purdue.edu/hort/ext/extpubs.shtml](http://www.hort.purdue.edu/hort/ext/extpubs.shtml).

#### Fungicide Harvest Restrictions

Trade Name	PHI (days)
Abound	14
Aliette	15
Phosphorous Acid	0
Pristine	14
Rovral	7
Sovran	14
Sulfur	0
Vanguard	7

### Grow Tube Removal

Tubes must be removed by now and should not be left during the acclimation process and lignification of shoots to canes. Why? Because the environment inside the tubes interfere with the normal hardening off process the vines go through in the fall and worse, may lead to more cold injury if left through winter. You may spray a herbicide (e.g Roundup) one more time if weeds are a problem before grow tube removal. There is more information on grow tubes and pros and cons in the “Midwest Grape Production Guide” at this link: <http://ohioline.osu.edu/b919/0008.html>.

### Wildlife Control

Control is a little misnomer. Wild life management or discouragement is probably more accurate. Pre-harvest considerations include the application of potential exclusion devices such as bird netting, temporary or permanent electric fencing and woven fence. The last two options are not as easy to accomplish with all the other things going on to get ready for harvest so they will probably be done earlier in the growing season when more time to install them permits. Invisible fencing has

been incorporated into some orchard systems with the use of dogs to discourage wild life from calling your farm home. I have not seen this used in a vineyard situation in Ohio but, it is still the same concept regardless of crop. The use of live traps to capture and physically relocate the violators is another method. The primary targets here include raccoon and possum. An occasional skunk may wander into your trap much to your dismay. Our farm manager has calmly opened the trap and re released the skunk to go on its way unharmed and him too. If you use these traps they must be checked daily or even twice a day so that the guilty party may be removed. Building high perches to attract birds of prey that in turn discourage other birds that actually do the damage to the grapes is a practice used by one vineyard in southern Ohio. There are several commercially available chemicals such as *Plantskydd* and *Rejects It* that help to repel deer and birds respectively. Other methods include the use of sound devices that have recordings to upset the usual feeding habits and propane cannons that just scare the unwelcome intruders into the vineyard. Mylar tape, scare eye balloons, owl decoys as well as home made scare crows have been used to disrupt eating habits. Actually you do not want to let it get as far as to be called a habit. Once the unwelcomed guest establish a feeding habit or taste for your product they are virtually impossible to change their ways.

Here are some advices to avoid major crop loss to birds or raccoons:

- Early, red and small-berry varieties are extremely susceptible.
- Use wildlife protection before the feeding pattern is established. Usually this corresponds to the ripening stage following veraison and about 2-4 weeks before harvest.
- Use a combination of protection methods not just one method. For example, distress calls (e.g. BirdGard), combined with visual deterrents (e.g. scary eyes, fake owls).
- Move the deterrents frequently in vineyard blocks so that birds do not get used to them.
- None of these methods are 100% effective. Nevertheless, several growers reported adequate protection of their grapes. There are situation where these methods do not work crop losses are substantial. Netting is one of the most effective methods for bird control. If your crop has a high market value and losses occur on a yearly basis, then you should consider netting as an option. Nets are worth the high initial cost in the long run.
- For raccoon control: Low electric fencing around the perimeter of the vineyard is effective. The fence should consist of 2 strands of wire, one placed at 4"-6" above ground and the second at 8"-12".

#### **Wildlife Control Suppliers (list not all inclusive):**

Ben Meadows Company, 800-241-6401, [www.benmeadows.com](http://www.benmeadows.com)

Bird-X Inc., 800-662-5021, [www.bird-x.com](http://www.bird-x.com)

Forestry Suppliers, Inc., 800-647-5368, [www.forestry-suppliers.com](http://www.forestry-suppliers.com)

Gemplers's, 800-382-8473, [www.gemplers.com](http://www.gemplers.com)

Hummert International, 800-325-3055, [www.hummert.com](http://www.hummert.com)

Wildlife Control Technology, Inc., 800-235-0262, [www.wildlife-control.com](http://www.wildlife-control.com)

# Grapevine Leafroll – An increasing Problem in the Finger Lakes, the US and the World

By Tim Martinson, Ph.D., NYAgric. Exper. Sta., Geneva, NY

(Editor's note – Tim Martinson, Marc Fuchs, Greg Loeb, have published an extension article about the survey of 95 Finger Lakes vineyards for grapevine leafroll virus and mealybugs in 2006 and 2007. Although the article focuses on the Finger Lakes, the results should be of interest to us here in Ohio. Hopefully, this article will raise awareness about this insidious problem and we hope with the establishment of the National Clean Plant Network, all vines sold by nurseries will be virus-free certified. The article is posted at: <http://blogs.cce.cornell.edu/grapes/files/2008/08/grapevine-leafroll-virus-an-increasing-problem.pdf>)

## REGIONAL UPDATE: OARDC Vineyard Update

By David Scurlock, HCS-OARDC

The bird netting is on and veraison has come and gone. We have not experienced any damage due to birds or other fur bearing friends and disease control looks good in Wooster. Our first berry sampling was done this week. Most varieties included in this article are part of the cold hardy/disease resistant trial. Sugars seem to be accumulating quickly while the titratable acidity slowly decreasing. The pH is unusually high. We will verify in the next sampling whether it is equipment- or vineyard-related problem. We observed hot days and cool nights in the past couple of weeks which is ideal for grape ripening.

### 2008 Fruit Maturity

Location	Collection Date	Variety	100 Berry wt (g)	SS (%)	pH	T.A. (g/L)
Unit2	9/2/2008	MN 1060	121.35	18.4	3.27	15.56
Unit2	9/2/2008	MN 1200	131.65	22.8	3.38	11.27
Unit2	9/2/2008	MN 1211	130.42	22.2	3.38	12.23
Unit2	9/2/2008	La Crescent	135.29	20.6	3.43	12.62
Unit2	9/2/2008	Frontenac	112.75	18.4	3.3	15.53
Unit2	9/2/2008	Frontenac Gris	123.62	19.2	3.33	14.6
Unit2	9/2/2008	Seyval	187.4	17.8	3.3	10.25

## Ohio MarketMaker Building Relationships In the Ohio Grape-Wine Industry

*By Julie Fox, Ph.D., Direct Marketing Specialist and Maurus Brown, Ph.D., Small Fruit Crop Specialist, OSU South Centers*

Ohio MarketMaker, a free Web-based resource launched earlier this year, is making it easier for producers to connect with food retailers, grocery stores, processors, caterers, chefs and other food supply chain contacts. Since its launch, Ohio MarketMaker has received more than 340,000 hits.

One important component of MarketMaker is the section for wineries. More than 40 Ohio wineries and 20 Ohio grape growers have registered for this online service, which can assist them with buying and selling grapes. Ohio wineries can use MarketMaker to find sources of locally grown grapes, and promote name recognition in the industry. This is a great opportunity for Ohio's grape-wine industry to connect and build relationships. At present, Ohio MarketMaker offers the selection of 12 different wine styles, which is being reviewed to help reduce and simplify categories.

Consumers are starting to request local products, and that demand will continue to grow. Buyers for grocery stores and restaurants are turning to MarketMaker to fill those requests. This is another reason why it is important for Ohio wineries and grape growers to register their business so their products can be found.

Registering on MarketMaker is easy. Just visit [www.ohiomarketmaker.com](http://www.ohiomarketmaker.com) and click on Register/Log In. Then click on Register Your Business and complete the appropriate form. Once a business is registered, a username and password can be requested so data can be edited if the business information changes.

Ohio MarketMaker is part of a national network of state Web sites that boasts one of the most extensive collections of searchable food industry-related data in the country -- categorized by buyers, sellers, location and other demographic information. The concept of converging related databases into one Web site, and summarizing information by using clickable maps originated with the University of Illinois Extension in collaboration with state partners. Although MarketMaker originated in Illinois, it has expanded to numerous states including Ohio, Nebraska, Iowa, Michigan, Indiana, New York, Kentucky, Mississippi and Georgia.

Ohio MarketMaker (<http://www.ohiomarketmaker.com>) is supported through the collaboration of Ohio State University Extension, the Ohio Agricultural Research and Development Center, Ohio Department of Agriculture, Ohio Farm Bureau and the Center for Innovative Food Technology. To obtain additional information or for direct assistance with Ohio MarketMaker, please contact Julie Strawser at OSU South Centers at Piketon at (740) 289-2071, ext 223, or e-mail [strawser.35@osu.edu](mailto:strawser.35@osu.edu).

## Farmers Can Now Apply for SARE Grants

*By Alan Sundermeier - SARE coordinator, OSUE Educator*

COLUMBUS, Ohio -- Farmers and ranchers in the North Central Region can now submit proposals for grants to support sustainable agriculture projects.

The 2008 North Central Region Sustainable Agriculture Research and Education Program (NCR-SARE) Farmer Rancher Grant Call for Proposals is now available online at <http://www.sare.org/NCRSARE/prod.htm>.

Grants can range from \$6,000 for individual farmers and up to \$18,000 for groups of three or more farmers. Beginning farmers and youth may also apply. Projects should emphasize research or education/demonstration.

The deadline for proposals is Dec. 1 at 4:30 p.m.

NCR-SARE expects to fund about 50 projects in the 12-state North Central Region. The NCR has funded more than 650 farmer rancher grants worth more than \$4.3 million since the program's inception.

For more information, contact Ohio's SARE coordinators Mike Hogan at (330) 627-4310 or [hogan.1@osu.edu](mailto:hogan.1@osu.edu) or Alan Sundermeier at (419) 354-9050 or [sundermeier.5@osu.edu](mailto:sundermeier.5@osu.edu), or log on to <http://sustainableag.osu.edu> .