

**Subject:** New England Grape Notes, Sept 7, 2018  
**From:** Sonia Schloemann <umassfruit@umass.edu>  
**Date:** 9/7/18, 4:28 PM  
**To:** UMassFruit <umassfruit@umass.edu>



## *New England Grape Notes - September 7, 2018*

**Crop Conditions:** Growing Degree Days (GDD) base 50°F accumulation are between 2,200 - 2,500 across the state. This means we are reaching the harvest window for grapes. In fact, harvest is underway for many varieties of **table grapes** and growers are reporting

**UMass  
Extension**  
CENTER FOR AGRICULTURE

good quality and yield so far, except where birds have caused damage. Early varieties of hybrid **wine grapes** like 'Marquette' and 'LaCrescent' may also be harvested in some locations. Other wine grape varieties are in the ripening phase. See article from Penn State below for a great summary of how to measure fruit ripeness for timing optimal harvest.

**Disease management:** Recent weather conditions have been very conducive to Downy Mildew development. If you're finding evidence of DM in the vineyard, fungicide applications are recommended. Remember to keep pre-harvest interval restrictions in mind when choosing a spray material. Copper, Phosphorus acid and Captan products are among the materials with short enough phi to be recommended.

### **Insect Management:**

**Fruit flies**, including Spotted Wing Drosophila (**SWD**) can be found in many vineyards at this time. Thin skinned varieties of grapes and those where bird damage has broken the skin are likely to become infested. Fruit flies play a major role in the introduction of Sour Rot into the fruit. Keeping fruit fly populations low is recommended at this point in the season to avoid late season rots or problems with off flavors in the winery.

**Brown Marmorated Stink Bug (BMSB)** have been found at some fruit farms/orchards around Massachusetts in recent weeks. No confirmed reports at vineyard sites to date, but we are also not actively trapping in any vineyards. We recommend some thorough visual evaluations in areas where BMSB is suspected and trapping if you are very concerned. White varieties appear to be more desirable to BMSB than reds, so start checking them first. Be aware that there are other stink bugs (e.g., Brown Stink Bug) that can infest grape clusters and cause damage, too. See this excellent fact sheet at: <http://www.stopbmsb.org/stopBMSB/assets/File/BMSB-in-Grapes-English.pdf> for more information BMSB in grape vineyards. *Please contact me at [umassfruit@umass.edu](mailto:umassfruit@umass.edu) if you find any BMSB in your vineyard.* Take some photos to send along, if at all possible. Also, you can collect some samples and put them in the freezer to preserve them for later identification.

**Spotted Lantern Fly (SLF)** - a new, invasive and damaging planthopper, **has not yet been found in New England** but is established in SE Pennsylvania and was found in two NJ counties earlier this summer. Orchards, vineyards, ornamentals and forest trees are at risk. Adults are large (1"), active now and very distinctive; they may leave sap streaks on tree bark where they feed which can aid in identification. Tree of Heaven (Ailanthus spp) is a common and preferred host and may be the site of first finds of this invasive pest. More information and images at <https://extension.psu.edu/spottedlanternfly>.

~ Sonia Schloemann

---

### **Assessing Grape Maturity for Harvest Planning**

*By Dr. Michela Centinari, Penn State University*

If just one adjective was chosen to describe the 2018 growing season to date, many of us might suggest 'rainy.' In

many Pennsylvania regions, grape growers faced persistent rainfall for the majority of the summer. For example, in central PA, State College has had an accumulation of 29 inches (737 mm) of rainfall for the months of April through August. Growers really had to be on top of their fungicide spray schedule and canopy management plans to minimize the risk of disease so that fruit will be healthy at harvest time. Recently, Bryan Hed and Jody Timer wrote blog posts that provided recommendations for late-season downy mildew control ([late season downy mildew control](#)) and insect problems ([late season insect problems](#)). While the weather forecasted for harvest season is weighing heavily on the minds of many grape growers, a post-veraison task critical for a successful harvest is collecting grape samples to measure the progression of fruit maturity.

This article provides a brief review on *what* fruit ripeness parameters you should measure and *how* to collect berry or cluster samples to best assess fruit maturity. While this information could be particularly useful for new grape growers approaching their first vintage, experienced growers should review the information to ensure that they are using the best techniques for collecting representative fruit samples.

### Harvest decisions

Grapes are typically harvested when they reach desired fruit quality parameters (e.g., sugar content, pH, flavor, color) which vary depending on the wine type or style the winemaker aims to produce. Grapes should be sampled periodically until harvest to monitor how parameters associated with fruit maturity (e.g., sugar, pH, organic acids, flavors) evolve through the ripening season. However, there are many other factors involved in selecting a harvest date, which may or may not directly relate to optimal fruit maturity. These factors include:

- Fruit health condition (is the fruit deteriorating due to rot or other disease or insect damage?),
- disease and insect pressure,
- short and long-range weather forecasts,
- available labor,
- space available at the winery to process the grapes, and
- type or style of wine that will be made.

### What fruit ripeness parameters to measure

The evaluation of the overall fruit ripeness involves quantitative parameters (sugar content, pH, titratable acidity) but also measurements that go beyond analytical techniques (berry sensory analysis).

#### Quantitative measurements to determine grape ripeness:

The information reported below is adapted and summarized from the factsheet *Determining grape maturity and fruit sampling* written by Dr. Imed Dami, Ohio State University. To access the entire document click the following link [Determining grape maturity and fruit sampling](#).

Sugars, organic acids, and pH are the primary indicators of *technological* or *commercial* grape maturity, which is different from *physiological* maturity that occurs at or soon after veraison when seeds are ready to germinate.



**Sugars:** Sugars, specifically glucose and fructose, are the main soluble solids in grape juice. Sugar content is typically measured in degree Brix ( $^{\circ}$ Brix); 1 degree Brix corresponds to 1 gram of sugar per 100 grams of grape juice. Desirable levels of sugar content are typically between 18 and 24 $^{\circ}$ Brix, depending on grape variety and wine style.

Sugar level is relatively easy to measure in the vineyard with a handheld refractometer (Figure 1). However, sugar content is not always related to an accumulation of flavor compounds. Even within the same variety, the desired varietal flavor can be reached at different sugar level in different vintages.

Similarly, two varieties might have the same sugar level, but one might have fully developed varietal flavors, while the other may not.

**Figure 1.** Handheld refractometer used to measure soluble solids (sugars) content.

**Organic acids:** Titratable acidity (TA; sometimes referred to as total acidity) indicates the total amount of acids in the grape juice. The two major organic acids in grapes are tartaric and malic acids. TA is determined by titration of the juice sample with a standardized solution of sodium hydroxide (NaOH). The amount of NaOH used to neutralize the acid in the juice is used to calculate juice TA.

$$\text{TA (g/100 ml of sample)} = \frac{\text{mL NaOH} \times \text{Normality of NaOH solution} \times 0.75^*}{\text{ml of grape juice}}$$

\*conversion factor for tartaric acid

Although acid levels at harvest vary across vintages and varieties, they generally fall between 0.6 and 0.8 grams of titratable acids / 100 mL of juice (or 6 – 8 g/L of juice).

**pH:** pH (power of Hydrogen) measures the strength of acidity, which is the reactivity of H<sup>+</sup> ions in the juice solution. pH is generally measured with a pH meter. Typically, the lower the pH the higher the acidity in the juice; however, there is no direct relationship between TA and pH. It is possible to find juice (or wine) with high pH and high TA. Generally, white grapes are harvested at a lower pH than red grapes (white varieties = pH of 3.1 to 3.3; red varieties = 3.3 to 3.5). High pH levels (> 3.70) can negatively influence wine microbial and physical stability.



Berry sensory analysis:

It is a good exercise for growers and winemakers to periodically monitor fruit ripeness (e.g., development of flavor, color) both visually and using sensory evaluation of the berry skin, pulp, and seeds separately. Berry sensory analysis may seem difficult at first, but you can easily master the technique with some practice and good record keeping.

The procedure involves putting berries in your mouth, crushing them gently to press out the juice, and evaluating its sweetness and acidity. The next step is to separate the seeds from the skin and place them in your hand for visual observation (green seed = immature seed; brown seed = mature seed; Figure 2). Lastly, crush the berry skin and put it on your cheeks to assess the degree of astringency. For more detailed information refer to the following article written by Dr. Joe Fiola, University of Maryland: [Evaluating grape samples for ripeness](#).

**Figure 2.** Seed – visual and taste evaluation (Photo credit: Denise Gardner)

You can learn more about berry sensory analysis techniques and protocols available by reading [Berry sensory analysis](#), written by Dr. B. Zoecklein, Virginia Tech University, and [Assessing ripeness through sensory evaluation](#), written by Dr. Mark Greenspan.

One way to quantify and record subjective fruit ripeness criteria is to use a scorecard, one of which has been developed by The Ohio State University. You can find the scorecard on page 2 in the article: [Determining grape maturity and fruit sampling](#).

**When to start sampling grapes and how often**

You should begin sampling grapes after veraison, and increase how often you sample as harvest approaches (i.e., from every other week to weekly to every couple of days).

### How to collect a representative sample

Before you start walking down your vineyard rows, it is important to *understand your vineyard's variability* in order to collect samples that are representative of the entire vineyard, which can effectively assist with your harvest scheduling-decisions.

Variation within a vineyard can be due to soil characteristics, topography, vine age, etc., which creates differences in vine growth and subsequent ripening. Make sure to collect a separate sample from each area of your vineyard that produces vines with different growth. The number of samples to collect depends on the vineyard size, but also on the level of variation in growth, disease, and other stress amongst vines. A higher level of variation amongst vines will require a greater number of samples.



### Sampling technique

Every vineyard manager or winemaker has a preferred method for collecting grape samples. While some might prefer to collect *whole clusters*, others prefer to collect *individual berries* from multiple clusters and combined them into one sample for each block (Figure 3).

**Figure 3.** Berry samples collected around veraison (Photo credit Don Smith).

Each sampling method has its own pros and cons; however, regardless of the technique you decide to adopt it is critical to:

- Avoid sampling from edge rows, vines at the beginning or end of the row, or 'unusual' vines.
- Collect 'random' samples and avoid looking at the cluster when sampling. Although subconsciously, we tend to preferentially collect good looking, large, and sun-exposed clusters, as well as the ripest berries. This can lead to an overestimation of the actual sugar content of the whole fruit biomass used for winemaking.
- Collect berries or clusters from both sides of the vine and from shoots at all positions on the vines (near the trunk, middle of the cordon/cane, end of the cordon/cane) and across the entire fruiting zone of the vine. Select clusters from basal and distal nodes, but not from clusters that you will not harvest, such as those from lateral shoots.
- Collect the sample from a large number of vines. For example, if you collect 100 berries per vineyard block, they should be from at least 20 clusters from 20 different vines.
- Be consistent. Use the same standardized protocol throughout the season and across seasons. If possible, the same person should do the sampling each time.
- With berry sampling, it is also important to collect berries from all parts of the cluster: top, center, bottom, front, and back. Sampler bias can favor berries collected from the top and bottom of the cluster, missing, or underrepresenting the central region of the cluster.

It is also important to remember that:

- The larger the sample the more accurate the measurement will be. For example, if you collect individual berries you need 2 samples of 100 berries to be within +/- 1.0 °Brix accuracy level at harvest. To improve accuracy and be within +/- 0.5 °Brix of actual sugar at harvest you need to collect 5 samples of 100 berries. If you are sampling clusters, 10 clusters are required to be within +/- 1.0 °Brix. The number of samples also depends on vineyard variability.
- Weather condition might affect the values of fruit ripeness parameters. Try to collect your samples at the same time of the day each time you collect the berries.

### **Process the sample**

Samples should be processed within 24 hours of collecting them. Until you are able to process them, store berries in sealed plastic bags and clusters in a container/bucket, and keep the fruit in a refrigerator.

You can crush the berries in a clear plastic bag and visually check to see that all of them have been crushed, or you can use a food mill or another piece of kitchenware. After crushing the fruit, filter the juice using a cheesecloth, coffee filter, or paper towel.

We encourage PA wine grape growers to share their experience with grape sampling; what works for them and what doesn't.

### **Useful References**

[Evaluating grape samples for ripeness](#)

[Determining grape maturity and fruit sampling](#)

<https://psuwineandgrapes.wordpress.com/tag/berry-sensory-analysis/>

(Source: Penn State Wine Grape U Blog, Sept. 7, 2018)

---

**Meetings:** September 26, 2018. *'Under the Vines' UNH Field Day*, 5:00pm – 7:00pm. UNH Woodman Farm, 70 Spinney Lane, Durham, NH. This meeting will cover Commercial Table Grape, Hardy Kiwi and Day Neutral Strawberry Production. Free. For more information, go to: <https://extension.unh.edu/events/under-vines-field-day>.

---

---

Sonia Schloemann  
UMass Extension Fruit Program  
[umassfruit@umass.edu](mailto:umassfruit@umass.edu)