Cornell University
Cooperative Extension
Finger Lakes Grape Program

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Vineyard Notes

Pest Management from Veraison to Harvest

By: Hans Walter-Peterson, FLGP Team Leader, Viticulture Extension Specialist

Much of the focus of growers' pest management plans falls in the period from before bloom to a few weeks after berry set. This is when the young clusters, flowers and berries are most vulnerable to infection, and keeping pest and disease problems to a minimum earlier in the season helps to keep them from exploding later in the year, if the conditions are right. However, anybody who has grown hybrid or *vinifera* grapes in the East for any period of time knows that pest problems don't always stop at veraison. Varieties that have a short period of time between veraison and harvest (e.g., Aurore and Elvira) are at a lower risk of developing problems due to the limited time they have to hang, and others like Concord and Catawba (and Niagara to some extent) are better adapted genetically to resist pests in general, including at this time of the year. But many cultivars that are more susceptible to pest pressures won't be picked until later in September or October, leaving pests plenty of time to have an impact on crop quality.

So here are some brief reminders about management of the major pest issues that can affect crop quality and/or vine health between now and the end of harvest. I have included several sources of further information at the end of the article.

Grape Berry Moth (GBM)

Our focus on GBM control during much of the year focuses on the use of the GBM model, which can be found on the NEWA Network website. The model has performed well when it comes to predicting GBM egg-laying and larvae hatches in order to give growers a better sense of the proper timing for applying insecticides. After the 3rd generation of GBM larvae emerge and bore into the grapes (around 1700 GDDs after wild grape bloom), further egg-laying become less synchronous and therefore not as easy to predict with a model. Therefore, growers with higher risk vineyards should consider continuing to apply insecticides every 7-10 days through mid-September, but only in *warm years.* In most years, once we reach 1700 GDDs on the GBM model, most of the third generation larvae will not continue their development to adults, and will instead enter their overwintering mode.

Given that our heat accumulation this year is tracking with our long-term average, it is likely that there will be very little activity by a fourth generation of GBM this season, so further insecticides at this point probably serve little purpose in most cases.

Powdery Mildew

As we've often said here in the East, most of the growing season is one giant powdery mildew (PM) infection period, so controlling it can be a season-long effort. How much effort any particular grower puts into it is at this point in the year, though, is influenced by several factors, including the variety, the severity of infections coming into veraison, the crop load, the growing season, etc. For growers of native varieties, PM sprays (or any sprays at all) are pretty rare after veraison, but for more sensitive hybrid and *vinifera* varieties, they continue to be part of the tank mix during ripening.

There are a whole slew of materials that can still be used to control PM at this point in the year, but one that gets used a lot is sulfur. Winemakers, however, have been concerned for a long time about the potential for high levels of hydrogen sulfide developing in fermenting wines due to sulfur residues present on the fruit at harvest. Fortunately, Misha Kwasniewski, Gavin Sacks and Wayne Wilcox were able to do some trials several years ago that looked into this problem, and came up with some fact-based guidance for growers and winemakers:

- *White varieties:* Misha found that when the pressed juice was allowed to settle for 24 hours before fermentation, virtually all of the sulfur residues settled out, even when sulfur was applied less than 2 weeks before harvest (see Figure 1).
- *Red varieties:* In cases where the skins will be in contact with the juice during fermentation (as in red wine production, or skin-fermented white wines), it was found that stopping sulfur applications 5 weeks before harvest allowed enough time for residues to be below the threshold of 10 ppm of S on the fruit.

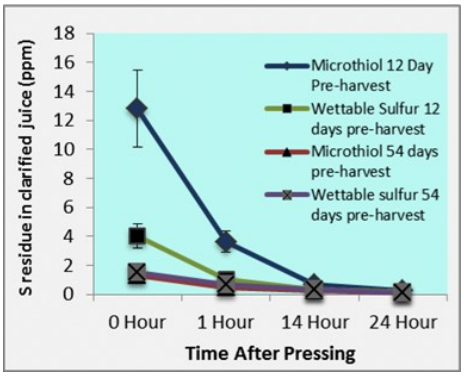

Figure 1. Clarifying juice before fermentation reduced S residues to almost nothing, regardless of S form or timing. Figure taken from "Grape Disease Control 2017" by Wayne Wilcox.

So if the fruit will be skin fermented, this research suggests to stop applying S about 5 weeks before harvest to avoid residue levels that could cause increased H_2S formation during fermentation. If the juice will not be fermented with the skins, and will be clarified before fermentation, then sulfur applications can continue to be made until much closer to harvest.

Downy Mildew

The wet conditions that we had up until recently have helped downy mildew (DM) establish a foothold in most vineyards this year. While the drier weather lately has helped to slow it down somewhat, it is something that growers will need to be watching the rest of the year in order to maintain healthy, functioning canopies through harvest. This will be especially important where large crops of later-ripening varieties are hanging, and as much healthy leaf area as possible will be needed to adequately ripen the fruit.

Downy mildew spreading throughout a canopy in early August, 2017.

Unlike PM, there aren't any materials that can be sprayed on heavy DM infections and eradicate them. Materials like the phosphorous acid products (Phostrol, ProPhyt and Rampart) are effective at killing new colonies when applied within 5 days or so of the infection, which is about the time that they are just becoming visible to the eye. Applying them to well-established infections that were already producing spores does not kill the infection, but does cut down significantly on the number of spores that infection produced afterwards. As has been preached many times, though, applying these materials under those kinds of conditions means that even more resistant individuals are probably being selected for as well.

Downy mildew materials have a very wide range of PHI values, ranging from 66 days (EBDC materials) down to 0 days. The idea of spraying a fungicide just before harvest might cause some concern on the part of winemakers, which is why Chris Gerling and I conducted a three-year trial to see if late fungicide applications (right at the labeled PHI) had any impact on fermentation or sensory characteristics. In the case of downy mildew materials, we included captan in the study for all three years (0 day PHI, 72 hour REI), and found that it had no effect on fermentation rate, nor could wine consumers detect a difference between wines made from fruit sprayed with captan and from the unsprayed controls.

As always, keep an eye on the resistance codes for each material used in order to manage the development of resistance. And speaking of resistance, don't rely on strobilurins alone to control downy mildew any longer. Most growers are moving away from their use by this time in the season anyway, but another reminder couldn't hurt.

Botrytis

In addition to being a good year for downy mildew, the wet weather we had around bloom has also helped to get some early botrytis infections established in several vineyards we have visited this summer. My experience has been that when we see botrytis infections before veraison (as in the photo here), it means that we'll be fighting it in many places for much of the season. In a couple of past seasons (2013 and 2014), we had wet seasons up through September and then things dried out for several weeks, making management of these late season rots much easier on growers. It would be great if that happened again this year, but I wouldn't be betting too much on that proposition.

As with DM, the two biggest things for growers to be keeping in mind with choosing botrytis materials is to rotate between different materials with different FRAC codes (see last week's Vineyard Update for a table containing FRAC codes for most botrytis materials), and knowing the PHI for each material. Most of the materials that are used for botrytis control are both protectants and have some post-infection and anti-sporulant activity as well, but in order to be effective, they need to make it onto the fruit, so no matter what material is used, it will only be as good as the coverage that the sprayer is able to achieve. And on a related note, a number of studies have confirmed that having good fruit exposure to improve air circulation and promote drying can be just as important in controlling botrytis infection as any fungicide.

As part of our late-season fungicide trial, Chris Gerling and I also tested a few different botrytis materials – Vangard (7 day PHI), Elevate (0 day PHI) and Pristine (14 day PHI)- to see if they would impact fermentation or flavors in the resulting wines. Similar to our results with captan, we did not see any impact of these products on fermentation rates, nor were consumers able to consistently distinguish between wines from sprayed and unsprayed fruit.

Sour Rot

Thanks to research done by Cornell grad student Megan Hall as part of her Ph.D. work with Wayne Wilcox, we now have some information that growers can start to use to try to manage sour rot, a disease that has been very difficult to control in some years and has caused a significant loss of fruit. Wayne and Megan will both say, for good reason, that there is still a lot we don't know about exactly what promotes this disease and some of

of the ways that it works, but some of the information that Megan has developed may be useful in a year like this where there is a good potential of sour rot to show up in some spots. So given that there's still more to uncover about it, here's what we think we know.

1. Conditions: Sour rot generally kicks into gear once fruit hits about 15° Brix and some rainfall occurs. Temperatures in the upper 60s to upper 70s seem to be the sweet spot for disease development. Cooler temperatures will slow its development but not necessarily stop it.
2. Fruit flies appear to play a significant role in the development and spread of the disease. The use of an insecticide along with an anti-microbial material (Oxidate) has provided good control of the disease in Megan's trials. Oxidate is an expensive material though, so one option to save some dollars would be to use just an insecticide, which has shown to provide some control of the disease on its own as well.
3. Trying to "rescue" fruit once the disease is off and running is less effective than addressing it early on (as Wayne would say – "Duh"). Beginning to spray once fruit gets to 15 Brix and following a rain event should help to minimize early infections from establishing and spreading. A more practical (and cost effective) approach might be to watch for signs of infection and jump on them early, before they get out of hand.
4. Anti-microbial materials like Oxidate require contact with the targeted organism in order to kill it. This means that the effectiveness of that material will only be as good as the amount of material that makes it to the cluster.
5. Insecticides in New York that are currently allowed (with 2(ee) approval) to be used for spotted wing drosophila are Mustang Max (1 day PHI), Delegate (7 day PHI), Entrust (7 day PHI), Spintor (7 day PHI), and Triple Crown (30 day PHI).

If you have further questions about any of this, look for more information in the resources listed below, or feel free to give us a call anytime. Good luck to everyone with harvest this year.

Further Resources/References:

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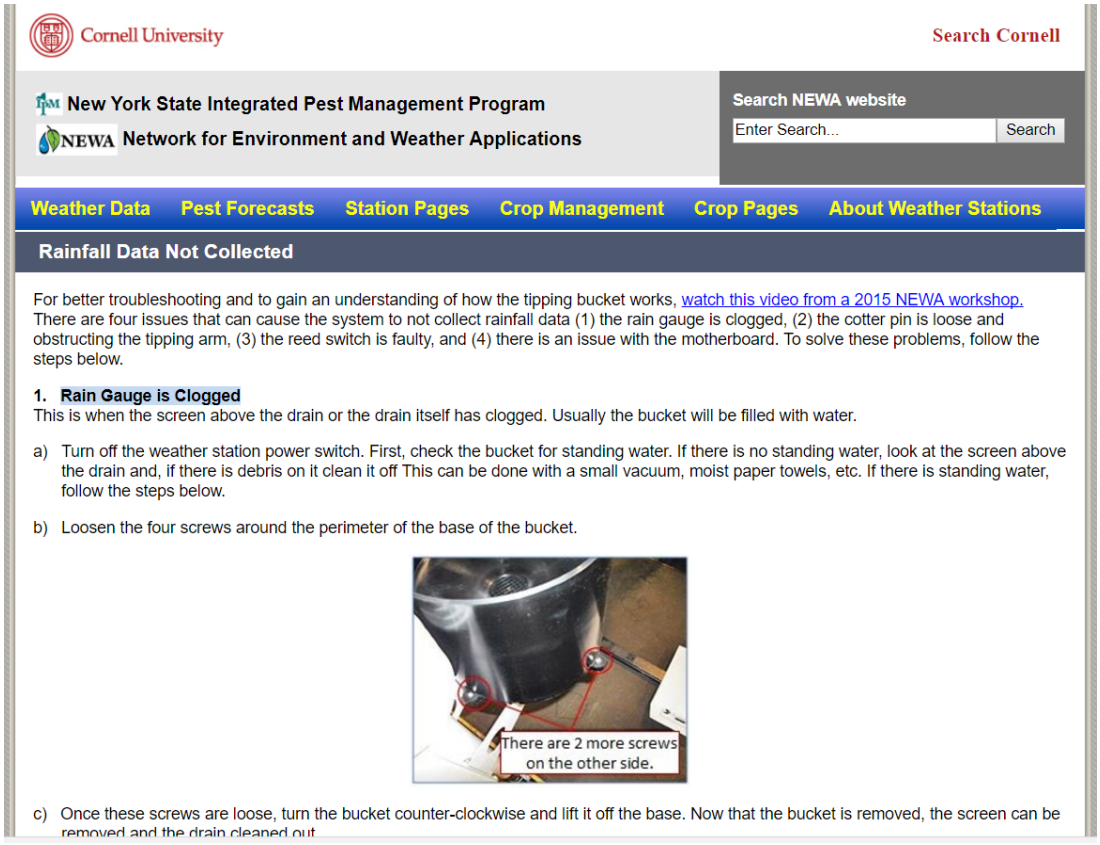
What's in a Weather Station?

By: Gillian Trimber, Viticulture Educator for The Finger Lakes Grape Program

Whether you like it or not, we're all obsessed with the weather, especially as farmers, and particularly as we move toward harvest (not to mention the tenuous times of year when a few degrees of cold can mean a significant loss of buds and vines). Most growers I know track the weather in some way—everything from a thermometer on the barn or a rain gauge on an endpost to one of the large Mesonet stations constructed by New York State. Some use tiny dataloggers (iButtons or Hobos) hung directly on the trellis wire to record temperatures in multiple locations on the farm, others have complete stations that provide read-outs which are downloaded locally from the station. At the Teaching and Demonstration Vineyard we've opted for a Rainwise weather station, which ties into the IPM program's Network for Environment and Weather Applications (NEWA), as well as several weather sites. There are twenty-six stations linked to NEWA within our six-county region, fifteen of them owned and maintained by vineyards. Being part of a network has distinct advantages—we're able to tie into NEWA's pest forecast modelling, access historical data for our weather station (we get this both through NEWA and Rainwise—it's nice to have the back-up), receive notifications when the station isn't working correctly, and can see estimations of missing data based on what nearby stations are reading and likely patterns of similarity. Not to mention, it allows us to share information with the larger community, as NEWA data is free and publicly accessible to everyone, not just those with weather stations.

Recently, our weather station stopped putting out data, around the time that we had some of the biggest thunderstorms of the season. The problem turned out to be a faulty battery, but in the process of troubleshooting, we came across some good resources we thought we'd share. The first is the weather station maintenance guidelines, found at http://newa.cornell.edu/index.php?page=maintenance-guidelines. There, you'll find instructions for checking and maintaining sensors relative humidity, precipitation amounts, leaf wetness, wind speed, wind direction, and solar radiation. The weather station troubleshooting guide on the NEWA site is likewise very helpful: http://newa.cornell.edu/index.php?page=weather-station-troubleshooting-guide. They provide photos, screenshots, and even video for certain tasks.



Example of troubleshooting instructions found at newa.cornell.edu

For those of you with Rainwise stations, contacting technical support with that company is also useful, as they'll be able to access records of prior issues with your station, see current read-outs, and walk through solutions with you on the phone. You can also download a .csv file, easily read in Microsoft Excel and many other programs, that shows a complete record of data the station is generating every fifteen minutes on both on external weather conditions and on its own internal conditions, including the temperature inside of the device and the battery voltage.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
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2	9/21/2017 0:00	66.5	66.2	66.9	66.5	66.5	61.2	81.7	71	71	72	56.8	36	72	29.39	29.39	29.39	29.2	29.39	2.3	224	6	337	11	337	0	0	0	0	9729336	0	0	73.9	74	74	69	80	6.5
3	9/21/2017 0:15	66.7	66.7	66.9	66.7	66.7	66.7	66.9	71	71	72	57	71	72	29.39	29.4	29.39	29.39	29.39	29.4	3.7	229	7	225	7	225	0	0	0	0	0	0	0	74	74	74	74	74	6.5
4	9/21/2017 0:30	66.7	66.5	66.9	66.7	66.7	66.5	66.9	71	71	72	57	71	72	29.4	29.4	29.4	29.39	29.4	2.6	223	8	247	8	247	0	0	0	0	0	0	0	0	74	74	74	74	74	6.5
5	9/21/2017 0:45	66.7	66.5	66.9	66.7	66.7	66.5	66.9	71	71	72	57	71	72	29.4	29.4	29.4	29.39	29.4	3.7	224	7	247	8	247	0	0	0	0	0	0	0	0	73.3	73	74	73	74	6.5
6	9/21/2017 1:00	66.5	66.4	66.7	66.5	66.5	66.4	66.9	71	71	72	56.8	71	72	29.4	29.4	29.4	29.39	29.4	3.5	224	7	247	8	247	0	0	0	0	0	0	0	0	73	73	73	73	74	6.5
7	9/21/2017 1:15	66.2	66	66.5	66.2	66.2	66	66.9	70	70	72	56.1	70	72	29.4	29.4	29.39	29.39	29.4	2.9	224	6	247	8	247	0	0	0	0	0	0	0	0	73	73	73	73	74	6.5
8	9/21/2017 1:30	66.1	66	66.4	66.1	66.1	66	66.9	70	70	71	56	70	72	29.4	29.4	29.39	29.39	29.4	2.8	223	6	247	8	247	0	0	0	0	0	0	0	0	73	73	73	73	74	6.5
9	9/21/2017 1:45	66.2	66	66.5	66.2	66.2	66	66.9	69	69	70	55.7	69	72	29.4	29.4	29.39	29.39	29.4	2.6	223	7	247	8	247	0	0	0	0	0	0	0	0	72	72	73	72	74	6.5
10	9/21/2017 2:00	66	65.9	66.2	66	66	65.9	66.9	69	69	70	55.5	69	72	29.4	29.4	29.39	29.39	29.4	1.1	243	4	247	8	247	0	0	0	0	0	0	0	0	72.6	72	73	72	74	6.5
11	9/21/2017 2:15	65.5	64.9	65.9	65.5	65.5	64.9	66.9	69	69	71	55.1	69	72	29.4	29.4	29.4	29.39	29.4	0.9	112	4	247	8	247	0	0	0	0	0	0	0	0	73.7	73	74	72	74	6.5
12	9/21/2017 2:30	64.4	64.2	64.9	64.4	64.4	64.2	66.9	71	70	74	54.8	69	74	29.39	29.4	29.39	29.39	29.4	0.3	142	3	247	8	247	0	0	0	0	0	0	0	0	74.5	74	75	72	75	6.5
13	9/21/2017 2:45	64.3	63.8	64.7	64.3	64.3	63.8	66.9	72	72	74	55.1	69	74	29.39	29.39	29.39	29.39	29.4	0.7	54	4	247	8	247	0	0	0	0	0	0	0	0	74.9	74	75	72	75	6.5
14	9/21/2017 3:00	63.4	62.8	63.8	63.4	63.4	62.8	66.9	71	71	73	53.8	69	74	29.39	29.39	29.39	29.39	29.4	0.2	101	2	247	8	247	0	0	0	0	0	0	0	0	75	75	75	72	75	6.5
15	9/21/2017 3:15	62.9	62.7	63.2	62.9	62.9	62.7	66.9	72	72	74	53.7	69	74	29.39	29.39	29.39	29.39	29.4	1.1	154	3	247	8	247	0	0	0	0	0	0	0	0	75	75	75	72	75	6.5
16	9/21/2017 3:30	62.9	62.7	63.2	62.9	62.9	62.7	66.9	72	72	74	53.7	69	74	29.39	29.4	29.39	29.39	29.4	1.1	183	3	247	8	247	6	6	0	0	0	0	0	0	74.8	74	75	72	75	6.5
17	9/21/2017 3:45	63.2	63.1	63.6	63.2	63.2	62.7	66.9	72	72	75	54	69	75	29.39	29.39	29.39	29.39	29.4	1.4	159	2	247	8	247	0	6	0	0	0	0	0	0	73.9	74	74	72	75	6.5

An example of the data read-out from rainwise.net for the Dresden FLGP/FLCC weather station. It's a lot of data.

For stations that have been in place a while, it's recommended that they sent in for recalibration every couple of years, typically at a time of year when having frequent weather data is less critical, and when the data gathered don't seem to follow typical trends. For most growers, this would likely be in late fall/ early winter, when harvest is done but the extremely cold temperatures we see in January and February are still a ways away. Discussing the data your station is sending with the folks at NEWA and with technical support at Rainwise or your station's manufacturer can help determine if sending the station in for calibration is necessary.

Though weather stations, particularly the more complicated ones that can be linked into NEWA, represent an investment of both money and time, we're hoping to see the network expand in the future. The more data points we have across our region, the better we're able to fill in missing information, predict pest issues, and interpret the climate patterns we see across our area. The best management decisions take into account both the conditions that are unique to a given piece of land and a broader understanding of what's happening regionally; having many local weather stations that can represent the variation around the Finger Lakes helps to do both.

PLEASE PARTICIPATE IN OUR ONLINE NEWA SURVEY – help us build our new website

By: Dan Olmstead, NEWA Coordinator– NYS IPM Program

The Network for Environment and Weather Applications (NEWA) wants you to take our online survey — it'll only take about 10 minutes of your time.

Whether you've used NEWA's online pest forecast models for years or have never used NEWA at all, we will benefit from your responses. Why? Because we are building a new website at newa.cornell.edu, one that'll be as easy to use on your smart phone as on your desktop, and we want to build it *the way you want it to be*.

NEWA is an online agricultural decision support system that uses real time weather data, streamed over the internet from 573 weather stations throughout the Northeast, Midwest and mid-Atlantic. NEWA provides insect and plant disease pest management tools, degree days, and weather information for growers, consultants, Extension educators, faculty, and others.

NEWA models and resources are available free of charge, and are used to make informed localized crop management decisions. The NEWA website will be upgraded soon and we want to know what users', new and old, want and need out of the new website.

All responses are anonymous and confidential and will not be shared with any outside group.

Thank you for participating!

Take the survey now:

https://cornell.qualtrics.com/jfe/form/SV_0GRlhOIDI5HwbR3

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NEWA is a Partnership of the New York State Integrated Pest Management Program and the Northeast Regional Climate Center.

Fruit Maturity Evaluation of Wine Grapes for Harvest Planning

By: Ed Hellman, Texas AgriLife Extension

Harvesting wine grapes at optimal fruit maturity, or ripeness, presents many challenges, not the least of which is accurate assessment of fruit ripening. Much of the difficulty with discussions of grape ripeness is that there is often an implied standard, but in reality, ripeness is subjective. There are two issues to address: 1) how do we define grape maturity, and 2) how is maturity measured.

What is grape maturity?

Numerous winegrape ripeness indices have been investigated (summarized by Bisson, 2001) and a few analytical laboratories are attempting to quantify grape ripeness through complex chemical analyses of flavor and aroma constituents, phenolics, color compounds, sugars, acids, and pH. But there will never be a single set of numbers that defines ripeness for a particular grape variety under all circumstances and for all purposes. Ripeness is defined by the individual and is primarily a function of the intended use for the grapes. Often, an individual's definition of ripeness is also influenced by what is "typical" for that variety in his or her growing region. Some benchmark of ripeness is achieved in one or more seasons and all subsequent crops are compared to that benchmark.

Winemakers commonly have a target for grape ripeness they would like the fruit to achieve for the wine they plan to produce. That target can vary, even within the same grape variety, depending on the type or style of wine that will be made. For example, one winery may prefer to produce a wine emphasizing red fruit characteristics while another winery would prefer riper black fruit characteristics. Grape ripening is a continuous process and the progression of aroma and flavor characteristics for red grapes is shown in Figure 1. Timing of harvest, therefore, is a matter of determining that point along the ripening continuum that best fits the winemaker's objective for the wine.

Measuring ripeness

The ability to harvest grapes at the desired fruit ripeness is dependent upon one's current knowledge of the progression in fruit maturity occurring in the vineyard. Weather conditions will cause seasonal differences in the rate and characteristics of grape ripening. Varieties and even blocks of the same variety are likely to have different patterns of ripening. The only way to know where the fruit is on the ripening continuum is to collect samples of the fruit periodically and assess ripeness. An excellent discussion of how to monitor fruit ripening can be found in the book chapter 'Monitoring Fruit Maturity' (Watson, 2003). Much of the forthcoming discussion is adapted from this chapter.

Vegetation ➡	Herbaceousness ➡	Unripe Fruit ➡	Red Fruit ➡	Black Fruit ➡	Jam
Plant matter	Straw, herb vegetal, tobacco	Green apple, citrus rind	Cherry, strawberry, raspberry	Plum, blackberry, black cherry	Prune, date, raisin

Figure 1. Evolution of flavorants in Cabernet Sauvignon (from Bisson, 2001).

Fruit maturity of grapes is commonly monitored by periodically measuring soluble solids content of ripening berries with a handheld refractometer. But sugar content is not necessarily related to accumulation of flavor and aroma compounds. Tasting fruit for a subjective assessment of flavor development typically augments the quantitative measure of sugar content. Such simple techniques can be very useful indicators of grape maturity, but only if the sample tested is appropriate. Too often however, conclusions about grape ripening status are drawn from very small, nonrandom and unrepresentative fruit samples. The key to a good estimate of fruit maturity is to collect berry samples that are truly representative of the vineyard block to be harvested.

Fruit samples should be taken weekly beginning about three weeks before harvest is anticipated. More frequent sampling should be done as the anticipated harvest date becomes closer, particularly if there are changes in the weather that could affect ripening or condition of the fruit.

Sample Preparation and Analysis (adapted from Watson, 2003)

Accurate assessment of fruit ripeness also depends on proper sample preparation and analytical procedures. Fruit samples should be processed quickly, preferably within a few hours of collection, and processing procedures should simulate winery conditions as closely as possible. The fruit can be crushed and pressed by hand, taking care to crush each berry thoroughly. Large samples are more easily crushed with a small roller-crusher and pressed with a small bench-top press.

Crushing should be accomplished without breaking the seeds. The crushed fruit can be hand-squeezed tightly through cheesecloth to obtain both the free run and the pressed juice. Fruit constituents are not evenly distributed in the pulp of the berry so a thorough pressing or squeezing is necessary with all of the juice combined. A common mistake is to use only the free run juice for analysis, which tends to have higher sugar and titratable acidity , lower pH, and lower potassium than fully expressed juice. Juice yields from commercial processing can be approximated by pressing hard enough to obtain approximately 300 ml of juice per pound of fruit. This corresponds to about 160 gallons/ton.

Red winegrape samples are best prepared by crushing, de-stemming, and macerating the skins for 1-2 hours at room temperature before pressing. Ripe red grapes rapidly release the anthocyanin pigments from the skin upon crushing and pressing.

Juice samples should be temporarily stored in sealed, full containers and allowed to settle to remove suspended solids. Refrigeration aids settling and delays enzymatic browning. Browning can be reduced by the addition of 25 mg/liter each of sulfur dioxide and ascorbic acid (vitamin C), which also helps maintain sample freshness for sensory evaluation. Pectolytic enzymes can be added to enhance juice clarity, if necessary. A sensory evaluation of aromas and flavors should also be conducted. Samples can be held refrigerated in full containers for up to 1-2 weeks for comparison with later samples.

Soluble solids are measured as degrees Brix using either a refractometer or a hydrometer. Refractometers should be calibrated following the manufacturer's instructions. Accurate hydrometers are calibrated to narrow ranges of 5 to 10 degrees and are subdivided to 0.1 degree units. Inexpensive hydrometers typically have a large range such as 0-30 degrees and have other scales such as 'potential alcohol'. These hydrometers are not very accurate. Both hydrometer and refractometer readings are usually calibrated at 20ºC (68ºF) so if the juice sample is at a different temperature, a correction must be made.

Digital refractometer (L), and a pH meter (R) with calibration solutions.

Photos by Lane Greer, Oklahoma State University, and Ed Hellman, Texas AgriLife Extension, respectively.

Laboratory procedures for determining soluble solids, titratable acidity, and juice pH are found in several books (Iland et al., 2000; Ough and Amerine, 1988; Watson, 2003; Zoecklein et al., 1995). The accuracy of a chemical analysis is highly dependent upon following appropriate procedures and maintaining properly calibrated equipment. Common errors with refractometer measurements include failing to calibrate with distilled water and not making the necessary temperature corrections. Titratable acidity measurements can be inaccurate because of careless pipetting of the sample, failure to neutralize the acidity in the water before adding the juice sample, over-titration, and failure to calibrate the pH meter properly. Common errors in pH measurement include failure to standardize the pH meter, disregarding temperature correction, and the use of worn or insensitive electrodes. An article by Weeks (2002) provides excellent advice on pH analysis and troubleshooting.

Sensory evaluation should be conducted on the juice sample collected using the processing procedures described above. Crushing and pressing extracts aroma, flavor, and color from the grape skins. The juice sample should be evaluated for both intensity and quality of aroma and flavor, acidity and taste balance, and color.

References and Resources

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Note: This article was originally published on October 20, 2015 on the eXtension.org website at http://articles.extension.org/pages/33152/fruit-maturity-evaluation-of-wine-grapes-for-harvest-planning.

Upcoming Events

SAVE THE DATE!!

2018 B.E.V. NY Conference and Trade Show

Wednesday, February 28 – Friday, March 2, 2018
RIT Inn & Conference Center
Henrietta, NY

Program and trade show information will become available over the next several weeks. Make your plans now to attend this important event!

OSHA Forklift Course

September 28, 2017 9:00 AM
Treleaven Wines
658 Lake Road
King Ferry, NY 13081

OSHA Outreach Authorized Trainer Jeff Hauser of Liftech Equipment Companies (Syracuse, NY) will be conducting a Forklift Certification Class at Treleaven Wines. The class will take approximately 4 hours to complete and will be conducted using a sit-down forklift truck. After completing the class, operators will receive OSHA forklift certification.

Why might you want to get staff certified? OSHA certification is required every three years even for folks who are trained. There are big fines. It makes folks safer because it requires contemplation on those maneuvers which are likely to make the fork lift tip or roll over. Here are more details from Liftech: http://www.liftech.com/5-reasons-why-you-should-become-forklift-certified/

Cost is $85 per person, and class size is limited. Contact Lindsay Stevens at lindsayannstevens@gmail.com or 315-364-5100, to reserve a spot and arrange payment.

Unified Wine & Grape Symposium

January 23-25, 2018
Sacramento Convention Center
Sacramento, CA

Information is available at https://www.unifiedsymposium.org/.

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