Subject: Re: New England Grape Notes, July 16, 2018
From: Sonia Schloemann <umassfruit@umass.edu>
Date: 8/13/18, 4:33 PM
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New England Grape Notes – August 13, 2018

UMass Extension
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Crop Conditions: Veraison (berry coloring and so much more) is underway. See the article below that unpacks this important phenomenon in grape ripening with more information than you may ever want to know.

Disease management: Conditions have been highly conducive to disease development season long this year. Downy Mildew, in particular, has been quite challenging in many vineyards. More on this below.

Insect Management: Many vineyards experienced high levels of fruit flies (notably Spotted Wing Drosophila) last year. This year table grapes growers especially should pay attention to this insect by monitoring now and making some preventative applications as we near the harvest window. Many grape varieties are considered resistant to SWD due to thick skins, but any damage or splitting can compromise the fruit and allow infestation by SWD and other species of fruit flies. See this table for registered and recommended materials and rates for SWD control in Grapes.

~ Sonia Schloemann

Tips for Late Season Downy Mildew Control

Bryan Hed, Pen State Univ., Lake Erie Regional Grape Program

At this time of year, it's so important to continue scouting leaves for the distinctive white 'downy' sporulation of downy mildew. Growers of susceptible varieties need to keep closely monitoring their vineyards for active sporulation and use that information in combination with the DMCast model on NEWA.

The presence of active white sporulation on the undersides of leaves means the downy mildew pathogen is capable of spreading quickly under wet conditions and can spiral out of control, strip vines of their leaves and effectively end the season (and the ripening of canes for next year's crop).

If you find yourself trying to control this disease well into the ripening period, be aware that your list of chemical control options will start to become shorter as we get within 30 (Ranman, Reason), then 21 (Ziram, Presidio (only older stocks; can't purchase new material anymore)), then 14 (Revus, Revus Top, Zampro) days of harvest, until in the end you'll be left with some formulations of Captan, copper, and phosphorous acid products (0 day pre-harvest interval).

Its also important to remember that materials like Ranman, Reason, Revus/Revus Top, and Zampro contain chemistries that are prone to the development of resistance. These materials should not be used to put down an epidemic, which will speed up the resistance development process. And, although phosphorous acid products are less prone to resistance development, you will enhance the chances of losing this technology to resistance as well, by using these materials on a heavily diseased vineyard.

Also, limit your use of phosphorous acid products to three applications per season. On the other hand, fungicides like Captan or copper formulations would be least risky in terms of the development of resistance and can be an effective means of controlling downy mildew late into the growing season.

Just be mindful of varieties that may be injured by copper applications, and that copper injury will be exacerbated by application under slow drying conditions and application to wet canopies (for example, don't make applications to dew covered canopies in the early morning). If you are protecting a non-bearing, young vineyard from downy mildew (you're not selling/harvesting a crop), you can continue to use mancozeb products past the 66-day pre-harvest interval. (***Source**: Pennsylvania Wine & Grapes U., 8/13/18*).

Veraison Explained

DeAnna D'Attilio, formerly of Cornell Coop. Ext-Suffolk County

I spy with my little eye… something red! The Marquette hit véraison earlier this week so we thought it would be a good time to briefly address the biochemical and physiological shift that transpires at the onset of berry ripening. Berry growth can be defined by three stages that follow a double sigmoid curve. In phase I, berry cells divide and expand following bloom, sugar is low, berries are green due to the presence of chlorophyll and organic acids begin to accumulate. The berry then hits a "lag phase" and growth slows drastically- this is the current state of most grape varieties in Long Island. Depending on the specific variety phase III comes along and marks the commencement of véraison.

During phase III cell enlargement is the sole factor increasing berry size because cell division no longer occurs. This enlargement is enabled by multiple factors which allow for skin stretching. Cell wall components such as cellulose, hemicellulose and pectin are modified by the activity of enzymes which release the hydrogen bonds that connect them. The activity of the protein expansion, which functions to loosen cell wall proteins, also peaks at this time (Keller, 2010). As berry cell walls lose integrity their intracellular and extracellular cell contents mix causing subsequent berry softening and skin stretching (Creasy & Creasy, 2009).

One of the most prominent shifts in berry metabolism at véraison regards water flow. Early in berry development water is supplied via the xylem but after véraison the peripheral vascular tissue of the berry ruptures, causing an alteration in water movement that creates a dependence on the phloem for water movement. This phenomenon partially explains the rapid increase in sugar accumulation which is done via phloem uploading. Sugar is imported to the berries as sucrose and upon arrival is cleaved enzymatically back into fructose and glucose. After véraison the concentrations of these hexose sugars are approximately equal and remain so until harvest.

The increase in sugar concentration alters the water potential gradient so that water movement into the berry is favored and "pull back" into the leaves is decreased. Overall this results in the berries being less susceptible to water stress. Their resistance is also enhanced given the fact that berry stomata become physiologically plugged at véraison (Keller, 2010).

To enable sucrose accumulation malate becomes the substrate for berry respiration post véraison, causing a corresponding decline in acidity. While it is commonly thought that tartaric acid concentration decreases due to precipitation, the decrease is actually attributed to a dilution effect from the increase in berry water. In fact, tartaric acid does not form crystals with potassium or calcium ions within the berry (it will however form crystals after the berries are crushed due to cell
partitions being broken down). The crystals that form within the berry are between oxalate and calcium ions. These crystals later act as a calcium reserve for the berry when import from the xylem halts post véraison. There is also evidence that suggests that the crystals exhibit an anti-feeding role to insects and

mammals (Keller, 2010).

Berry color change is due to the accumulation of anthocyanins that commences with véraison. When anthocyanin accumulation begins skin tannin synthesis stops (seed tannin synthesis stops shortly after). The group of genes responsible for turning anthocyanin production on and tannin synthesis off are activated when Brix reaches 9-10˚ (Keller, 2010).

Post véraison the enzymes responsible for degrading grape carotenoids - a group of compounds found in nearly all plant tissue - into norisoprenoid precursors are most active. "Norisoprenoids" are a group of aroma compounds that are often favorable in wine profiles - β-damascenone which has a floral/rose aroma is an example. A less preferred example includes "TDN," the petrol smelling compound that may taint wines when found in excess, which is common to Riesling wines because the grapes naturally have higher concentrations of the compound. Important to note is that there is a very direct correlation between light exposure and the concentration of norisoprenoid precursors in grape berries (Sacks, 2011). (***Source**: Long Island Vegetable & Fruit Update, No. 19, August 9, 2018*)

Meetings: August 28, 2018. UNH Grape Grower's Meeting, *5:30pm - 7:30pm. Sweet Baby Vineyard, 260 Stage Rd., Hampstead, NH. Free. Pesticide recertification credits pending. For more information, go to: https://extension.unh.edu/events/grape-growers-twilight-meeting*

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