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VITICULTURE NOTES

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I. Current situation

Vineyards in central Virginia and, presumably, points further south are into harvest with early-maturing varieties including Pinot gris, Pinot noir and Chardonnay for bubbly. This puts us about 10 to as much as 14 days ahead of what might be considered a rolling, 5-year average on harvest date. Recall that a record warm March advanced budbreak (by as much as a month), but that a cool April slowed the pace of growth. The season see-sawed somewhat since, but the heat of June and July has generally advanced the season. While the Mid-west, parts of the West and central Georgia have experienced severe drought, we have not generally fared poorly here in Virginia (parts of the southern piedmont are, admittedly, drier than normal). Current conditions (http://droughtmonitor.unl.edu/DM_southeast.htm) are “abnormally dry” for much of Virginia’s vineyard areas, but mature vineyards are still requiring a lot of late-season shoot hedging, so soil moisture levels look adequate if not better than adequate to sustain vine function for the foreseeable future.

In visiting some Albemarle County and Shenandoah Valley vineyards this past week I was impressed with the quality of fruit. As one grower reminded me though, it looked just like this one year ago, just before Hurricane Irene visited Virginia. Problems that were showing up were, for the most part, unsurprising. Downy mildew was present to some extent in many vineyards, but not at severe levels, and mostly confined to new growth on lateral shoots. Dr. Nita’s Grape Disease Blog (http://grapepathology.blogspot.com/) of August 15th highlighted the potential for downy to be a late-season issue:

> Since last week, we are having several nights where relative humidity is very high (>90%) (e.g., 8/9-10, 8/13-15). This condition favors downy mildew fungus to produce spores. Unlike other pathogens, downy mildew can cause disease after a short rain (90 min at optimum conditions). Thus, some of the short showers we are having here and there this week may be long enough for a downy mildew infection event. For example, yesterday's short shower event was probably long enough for downy mildew to spread. Also, please keep in mind that these showers are often geographically non-uniform and you might have had a longer wetness event.

At this point, a phosphonate (aka phosphorous acid, such as Prophyt) is a good option to control downy mildew. Some people prefer to include captan to add more forward protection. The target of this late season application is to keep foliage healthy in order to help berries to mature, and also to accumulate carbohydrates for winter survival. Your berries are not susceptible to downy mildew at this point.

There was also some evidence of sour rot observed here and there in the week's vineyard visits. Gewurztraminer and Merlot were exhibiting sour rot in two of the vineyards. In the one example, bird damage appeared to be the primary problem, with sour rot subsequently developing. In at least one case, spotted wing drosophila fruit flies were found (as adults in traps) in one vineyard. It was not possible to conclude, however, that the fruit flies were the *primary* factor in the sour rot development. There is some evidence from at least one other vineyard though, that spotted-wing drosophila have been attacking wine grapes. Please see Dr. Doug Pfeiffer's most current article on spotted wing drosophila, including good photos, biology description, as well as management options (http://www.virginiafruit.ento.vt.edu/SWD.html)

Another observation of interest this past week has been what looks like possible Pierce's Disease (PD) symptoms in two vineyards in the Charlottesville area. This is considerably further west and north than our previously observed occurrence of PD. The *possible* symptoms observed were confined to one or several shoots on an otherwise unaffected vine. The affected shoot(s) had leaves that appeared to be drying, with distinct delineations between healthy and dead, discolored tissue on a given leaf. The potential occurrence of PD in central VA is certainly consistent with the very warm winter we "enjoyed" last winter. Readers might recall from Dr. Doug Pfeiffer's comments this past winter that sites that fail to drop to 15°F at least 3 times during a winter are at much greater risk for PD than are those vineyards that do experience those cold temperatures. It would therefore not be surprising to find increased incidence as well as expanded geographical occurrence of PD in Virginia this summer.

Canopy management: Do a final check of the vine canopy. Prematurely senescing, yellowing leaves should be pulled from the fruit zone. They do not contribute carbohydrates to fruit maturity. Dead leaves retard the drying of clusters when they are in contact with clusters, and they can promote botrytis development on fruit in both direct and indirect ways. Keep the leaf layers in the fruit zone of the canopies down to 2 or less on average (a real or imagined probe run through the canopy should contact no more than 2 leaves on average as the probes passes from one side of the canopy to the other). While there is still a chance of causing fruit sunburning by being too aggressive with leaf-pulling, in my experience, the sunburning is more apt to occur closer to the summer solstice. Look for congestion at the tops of hedged VSP-trained canopies. If the hedging was not done in a timely fashion, the shoot tops might be growing horizontally along the top wires, giving rise to leafy laterals. Normal hedging can also produce several laterals where there was originally only one growing point. Collectively, this lateral growth can create very dense regions at the top of the canopy. It is often in these shaded, poorly ventilated regions that downy mildew gains a foothold on young, susceptible leaves.

Grow tubes: As a reminder to anyone using grow tubes, the tubes should be removed from vines by 1 September to allow vines to normally acclimate to fall conditions. DO NOT leave the tubes on over winter. We have seen ample evidence that vines can be severely damaged by winter temperatures if the vines remain in tubes over winter.

II. Introducing Teresa Stoepler

Dr. Teresa Stoepler is a new postdoctoral associate working with Tony Wolf at Virginia Tech's Alson H. Smith Agricultural Research and Extension Center (AREC) in Winchester, VA. Originally from Northern California, Teresa earned her B.S. in Biology and Botany at Humboldt State University in Arcata, CA and her Ph.D. in Biology at George Washington University in Washington, DC. Teresa's research background is in the ecology of plant-insect interactions in a variety of biological systems. She started work at Winchester the first of August.

Teresa will be studying North American Grapevine Yellows (NAGY), a lethal, insect-transmitted disease of grapes caused by bacteria-like pathogens (phytoplasmas). The incidence of GY has been increasing in the mid-Atlantic region in recent years and has caused some wine growers in high-risk sites to question the long-term sustainability of highly susceptible varieties such as Chardonnay and Malbec. Teresa's work will be focused on the ecological aspects of the disease, including identifying the primary insect vectors, understanding the importance of alternative host plants that may act as disease reservoirs near vineyards, and determining the role of other ecological factors related to GY incidence. In the short-term, we're interested in determining the prevalence of one or two of the potential insect vectors of NAGY, and determining whether, in fact, these leafhoppers are effective vectors of the NAGY phytoplasmas in Virginia.

As part of this study, Teresa and Tony would like to visit vineyards from southern Pennsylvania, through Virginia and into the Yadkin Valley of North Carolina before the end of September 2012. These initial visits this summer/fall are focused on insect surveys, and laying some groundwork for future conversations about spray programs in the affected vineyards. If you are interested in having Teresa and Tony visit your vineyard, please contact either **Tony Wolf** (Phone: (540) 869-2560 ex. 18; E-mail: vitis@vt.edu) or **Teresa Stoepler** (Phone: (540) 869-2560 ex. 27; E-mail: stoepler@vt.edu).

III. Vineyard posts: steel vs. wood?

Tremain Hatch, Viticulture research/extension associate, Virginia Tech

A hallmark of Virginia weather is the variability that we often associate with it: large temperature swings, extremes of precipitation and droughts, and occasionally violent thunderstorms that feature strong winds and hail. While more regional in scope, high winds associated with hurricanes and tropical depressions, or the more unusual derecho winds, such as that on 29 June, are additional extreme weather events. In the latter case, we measured a top wind speed at the AREC here in Winchester of 58 mph. We've observed a number of vineyards that have been designed and installed with all-steel posts over the past 5 to 10 years and, in some cases, we've seen some dramatic failures of trellises that are based on all-steel line posts. Some of the photos in this article illustrate this

Figure 1. Trellis failure in vineyard with wooden line posts, 2009.

failure. To be certain, even wooden post trellises can be blown over by strong winds, or if the posts are not well set at vineyard establishment (Figure 1); however, the failure rate with all steel post trellises has been, in our experience, much greater than with wood post trellises (figures 2, 3, and 4).

Figure 2. Trellis failure in vineyard with steel posts, June 2012

Wind load on a trellis can be very high when the wind direction is perpendicular to the vine row and the vines have a full canopy, and this strain can be serious enough to result in trellis failure. Grapevine canopies catch wind similar to a sail. Trellis strength with respect to wind load comes from the lateral strength of the line posts, and the spacing of the line posts. The lateral strength of a line post is the amount of force that must be applied perpendicularly to the post to cause it to break or permanently bend (see Table 1).

Figure 4. This vineyard had seen post failure before and reinforced with a second steel post, both posts failed in the derecho event, June 2012

Figure 3 Many rows were blown over in this all-steel trellis post vineyard in northern VA, June 2012

Table 1. Comparative lateral strength of steel and several diameters of treated wood posts, measured in pounds of tension (applied 4 feet above ground).

Lateral Strength (pounds)*			
Steel posts	**Treated wood post 2.5”**	**Treated wood posts 4”**	**Treated wood post 6”**
175 – 325	238	970	3,268

*From the *Wine Grape Production Guide from Eastern North America*

Table 1 shows that steel posts have less lateral strength than larger diameter wooden posts (of course there will be variability depending on the manufacturer of the steel post or the quality of the wood post).

Trellis line post spacing should not exceed 21 feet to avoid sagging of wires and vines between posts (Zabadal). With respect to wind load, the closer the line posts are to each other, the more strength will be added to the trellis. Spacing line posts every foot would transfer greater lateral strength to the trellis; however, this would not be financially feasible. The spacing of line posts directly influences the number of posts needed per acre and therefore the installation cost of a vineyard.

Some vineyardists choose steel posts for new vineyards due to steel post's properties with respect to ease of installation, canopy management and decay resistance. Due to the low lateral strength of steel posts, however, a hybrid approach is favored where the vineyardist will alternately install 2 to 4 steel posts for every wooden line post. Similar to post spacing, the closer together the wooden posts are, the more lateral strength will be transferred to the trellis.

Wood and steel posts differ in convenience, installation cost, product cost and years of service. Vineyard trellis materials are an important consideration with respect to vineyard productivity and profitability over time. When considering vineyard posts, remember to shop around and consider the annual cost of the trellis:

$$Annual\ Cost\ = (Cost\ of\ Materials\ \times Installation\ Cost) \div Years\ of\ Service$$

What the weather will do is unknown; therefore it is a reasonable strategy to plan for the worst with trellis and vineyard design. This strategy will result in a reliable trellis which will last for years. Selection of trellis hardware with the lowest material and installation cost may prove to be a very expensive gamble. So, if you choose to use steel posts in a new vineyard, we recommend that you at least alternate one wooden post in for every three heavy-gauge steel posts.

For more information:
Chapter 4, Wine Grape Production Guide for Eastern North America. Dr. Tony Wolf, 2008
Engineering a Modern Vineyard Trellis, Dr. Thomas Zabadal,
http://www.grapes.msu.edu/pdf/cultural/engineerTrellis.pdf