WINE GRAPE INFORMATION FOR PENNSYLVANIA AND THE REGION
From Penn State Cooperative Extension

Do not forget to register and attend the 2007 American Society for Enology and Viticulture Eastern Section Annual Conference and Symposium at the Lehigh Valley Holiday Inn Conference Center near Allentown, July 15-17. The symposium topic is "Vine Vigor and Soil Moisture". What could be a more appropriate topic? The conference will present recent viticulture and enology research. We will feature Pennsylvania and wines from all across the Eastern Section region at all meal events. Please register early and book your room now at a discounted rate until June 15th. You can find all the information you need at http://www.nysaes.cornell.edu/fst/asev/

2007 Winter Injury - I had a conversation with Dr. Sara Spayd at NC State last week and she highlighted the damage to grapevines due to the Easter freeze in the wine areas west of Raleigh where 80F days were followed by cold nights into the teens in some areas. Many primary and secondary buds were killed and there is concern about permanent injury to vascular tissues. She sees a clear relationship between the ability to irrigate and the general health of a vine at this pre-bloom stage of growth. I only say this as a cautionary note to growers in Pennsylvania, that you should be aware of possible damage to phloem and xylem and its effect on shoot growth. Remember that up until bloom shoot growth is powered by stored reserved in the vines woody tissues like roots, trunk and cordons. If those become exhausted or impeded the collapse of shoots can be very dramatic and disturbing. I have seen this happen in the spring of 1987 in Oregon when we got hit by a big arctic blast. Crown gall often follows. Last year we noted some pretty grotesque crown gall + aerial root "growths" on canes and trunks in a vineyard so be aware of those as the season progresses. It is hard to say how extensive the damage is to our vineyards. I have seen what I believe is mild winter injury in every vineyard I have been in since bud break. Let's hope the damage is limited to this year only. You can read more of Sara's observations at http://www.ces.ncsu.edu/disaster/freeze/

Observations from the Field - Jim Travis, John Halbrendt, Stephen Menke and I visited vineyards and held a twilight meeting at Blair Vineyards in Berks County yesterday. Thanks to Rich and his family for hosting us after a very BIG thunderstorm. The vineyards we saw were all in good shape and mostly into or just getting out of bloom. All looked very clean at this point and the only issues were crop and canopy management. But looking clean and being clear are far from equivalent as Jim had cautionary words about the recent warm, humid, thunderstormy weather we are having - perfect for downy, great for botrytis, wonderful for powdery. Get the picture? Disease management 101. Also, too many growers are spraying insecticide prophylactically. Insecticides are not like fungicides. Please read Dr. Greg English-Loeb's treatise on insect control. Scout then spray if necessary. For GBM, time the sprays according to the climate in your region. I was impressed by the ground we have made up in growing degree days since bud break and most growers think we are about average for bloom

date. That's encouraging as we move into mid season. Now is the time that you can make really good wine by doing the job in the vineyard (see Tony Wolf comments below). Later, Mother Nature will call the shots. Maybe what impressed me most were the wines that Rich poured for us out in the vineyard. Rich is trying to make great Pinot Noir and Chardonnay in Pennsylvania. Well, I'm not much of a Chardonnay fan but after spending 16 years biting my nails over PN I was very, very impressed by both his 04 and 05 renditions crafted from various Dijon clones of PN, growing on a very, very rocky site at 1000+ feet at 850 vines per acre. The 04 was reminiscent of a Volnay with a lighter style but delicious pure fruit with beautiful balance and texture. The 05 from a warmer vintage had great depth and concentration with more oak, structure and complexity. The wines were very indicative of their terroir and vintage and so different but both were super classy. In my humble estimation PN is the true test for any region or grower and I would be the last to say that PN should be widely planted in Pennsylvania but if in particular places we can grow excellent PN then Pennsylvania certainly has its place on the world wine map. I have also tried outstanding 2005 PN from Chaddsford and Pinnacle Ridge. These are not endorsement, just facts. My hat is off to these growers. They are doing something very right and we can all learn valuable lessons from them. By the way, Rich has gone to Burgundy and Oregon to learn how to make great PN. Cause:Effect???

Current Observations from Dr. Tony Wolf, Virginia Tech - Tony has summarized the current situation in vineyard very concisely and precisely, better than I could ever do so here are his observations and recommendations....

Seasonal reminders: We're at that point in the season when it seems that everything happens at once. Let's go down the list of some of the prominent tasks that should be completed now or in the near future, as well as some of the threats that face vines at this important point in their development:

- *Canopy management*: Shoot thinning completed, the aim is 3 to 4 (maybe 5 max) shoots per foot of canopy; somewhat fewer on lower canopy of Smart-Dyson or Scott Henry than on corresponding upper canopies. Frost-injured vines may need to have additional shoots retained from trunk and head region if the vines had been head-trained and cane-pruned (see comments on frost injury, below). Spread the shoots out on available trellis area avoiding shade in head region that could foster powdery mildew development. Shoot hedging of VSP-trained vines (and upper Smart-Dyson canopy) is commencing in southern/central regions of state. Retain 15 or more leaves per shoot in doing any hedging. Tipping of downward-oriented shoots (GDC, Smart-Dyson, or Scott-Henry) can help avoid pinching shoots off the vine by passing vehicle tires. Continue shoot positioning if needed – upright with VSP and initial downward combing with downward-oriented shoots of GDC, Smart-Dyson and Scott-Henry. Repeat the downward shoot combing two weeks later to facilitate the process – vinifera are more stubborn than American-type grapes, and may require further "encouragement."

- *Crop control:* Despite the Easter frost, there are many vines that will require some measure of crop reduction in order to optimize wine potential. My general rule of thumb

is to aim for about 1.5 to 2.0 pounds of crop per foot of canopy – the lower number for reds; the higher for whites. Again, a *general* rule. Hopefully you're on the way to this benchmark via completion of shoot-thinning. With vigorous vines (if you're hedging shoots) wait until July (but prior to or during veraison) to effect further crop reduction, otherwise vines will compensate with larger berries and more compact clusters. With low-vigor and/or young vines, remove additional crop soon after fruit set, once you can see the extent of set. More on crop estimation and crop setting in July-Aug Viticulture Notes.

- *Nutrition*: It's not too late to collect bloom-time petioles for plant tissue analysis (see directions at my website). Small rates (20 to 30 pounds actual N/acre) of nitrogen can be applied shortly after bloom to carry vines through harvest if N was low in previous years. Make sure that applied nutrients are incorporated, as by cultivation or rainfall. It's obviously dry in many parts of Virginia and soil-applied nutrients will be unavailable to the plant unless there's sufficient incorporation and soil moisture to get the nutrient to the roots. Don't apply what's not needed. Use plant tissue analysis, soil testing, and visual observation to determine nutrient needs; not commercial salesmanship.

- *Diseases*: The major players are ALL active at this point, and hungry. We are in the most critical period of vine susceptibility, and will be through 4 to 6 weeks post-bloom. Use the best materials at their full label rate, use materials that you are certain still retain efficacy (no resistance) in your vineyard, use sufficient gallonage per acre to ensure thorough coverage (no less than 50 gallons per acre), use sulfur as a tank mix to add insurance, keep the spray interval down to 10 to 14 days between sprays, depending on materials used (rainfast or not) and weather conditions. Remember that young, developing clusters are particularly susceptible to powdery mildew, and that it is often on shaded clusters that powdery gains a foothold, leading to major epidemics. Maintain a well-ventilated, illuminated fruit zone to improve your powdery mildew control.

- *Insects*: Scout for first or second generation grape berry moth. Insecticide options, if warranted, are in the PMG (http://www.ext.vt.edu/pubs/pmg/hf3.pdf). We sometimes see foliar and other tissue galls at this time of year, for example tomato tumid gall and others that look like small, conical protuberances from the leaf, caused by midges. These are a curiosity and rarely worth worrying about (photos and descriptions of some of these galls are in past Viticulture Notes). Aerial phylloxera becomes apparent at this time of year on some varieties (esp. some hybrids) and may warrant insecticidal control if historically severe.

- *Other threats*: Watch the weather. Rainfall has been spotty over the last month and while established vines are still tapping soil moisture reserves, the hot, dry weather will ultimately lead to drought symptoms if rainfall remains meager. Hand-water young (2007 planting) vines if needed. Mild water stress during fruit set and immediately beyond fruit set can be of some benefit in reducing berry size and throttling shoot elongation, but don't let it get to the point that shoot tips are shutting down, or leaves are warm to the touch during the day, or tendrils are aborting. Irrigate to maintain leaf function. I'll talk more about this at the vineyard meeting on 6 June in Lovingston. Other weather-related

events may include lightening strikes on the vineyard, often observed as an entire row that appears to be wilting, while the rows next to it are healthy. Another clue to lightening strikes is the observation that the pith of shoot internodes is segmented rather than continuous. Hail hits at least one VA vineyard per year and I've already received one report from Bedford Co. Injury can range from the occasional torn leaf and bruised berries (almost always on the exposed portion of the cluster) to dings on shoot stems and even defoliated vines. The minor symptoms may be difficult to trace to hail, while there is no mystery about the latter. There's not a lot you can do after a catastrophic hail storm. The vines will usually grow back out. Damage to fruit (bruises, sunken regions on the berry, exposed seeds, etc.) may lead to disease if the weather remains wet, but these injuries usually dry up with pre-veraison berries. A botrytis-specific fungicide might be warranted with botrytis-susceptible varieties that have been hit by hail.

Easter Freeze recap: We have a much better idea of the extent of vineyard frost injury as a consequence of the freezing temperatures on and immediately after Easter weekend at this point. Frost injury was widespread and in some cases extensive within a small area, but it was by no means complete. It's probably safe to say that the yield potential of early varieties like Chardonnay, Viognier and Chambourcin will be substantially reduced statewide, but primarily as a result of the significant damage in central and southern piedmont vineyards. The following are some of my observations and reports from growers on the status of vines following the freeze. Beyond the injury to the early-budding varieties in those two regions, the injury ranged from minimal to moderate. Some observations following the frost event follow.

Many areas in northern Virginia and in the northern Shenandoah Valley were spared significant injury. This related to both temperatures experienced and the degree of vine development. For example, here at Winchester, we experienced a low of about 26F under windy conditions, but Chardonnay was at less than 5% budbreak. We did have some primary shoot freeze injury on exposed shoots, but it was less than 5%. Other varieties here were less advanced and, consequently, had no injury.

The central and southern region of the state sustained the greatest frost injury owing to the advanced vine development. Low temperatures in vineyards that I visited were reported as generally in the low twenties although there were cases where the temperatures bottomed out at 18 or 19F. Chardonnay and other early-budding varieties bore the brunt of injury, as shoots were out anywhere from 1/2 to 2 inches. Typically 90% or more of these shoots were killed. Unfortunately, there was considerable injury to secondary buds as well, which will have some ramifications for cordon development as well as canopy development with cane-pruned vines. That is, growers who had laid out 18- to 24-inch long canes as future cordons, will find that many nodes may not push any buds, and that the process may have to be repeated next season in order to have uniform and consistent spur placement on the young cordons.

On a positive note, I have not seen evidence of vascular injury in any of the vineyards that I visited in April. Later budding varieties fared somewhat better even in vineyards where temperatures reached the teens.

Some general conclusions:
- Unusually warm weather immediately before the Easter weekend freeze advanced vine development 7 to 10 days ahead of average and set the stage for increased frost injury on Easter weekend.
- The peculiars of the freeze made escape of freeze injury difficult to avoid. For example, vineyards that were located at high elevation saw damaging low temperatures early in the weekend when primarily advective freeze conditions existed. Low-lying vineyards, which were often warmer early in the weekend, saw their low temperatures later in the weekend when wind speeds diminished and/or skies cleared, allowing radiational cooling patterns to become established.
- the dry air and low dew point deferred freeze injury to a somewhat lower temperature, but vineyards that had exposed shoots/leaves saw very little shoot survival when temperatures dropped below about 26F. This is typical for what we've seen in previous freezes.
- double-pruning -- leaving long spurs -- with the idea of removing the more advanced, more apical buds after the threat of spring frost -- helped in at least one case.
- Meso-scale differences in low temperatures attained were occasionally on the order of 4 or more degrees F.
- Active frost control measures (heating, wind machines or helicopters, and overhead irrigation) were of limited or no value due to the duration of cold, the wind speed, or the absolute degree of cold attained.
- northern VA (and states further north) escaped significant injury due to delayed vine development.
- central and southern piedmont regions (and states further south) saw more significant injury
- early-budding varieties may be in short supply in Virginia this year
- Some cane-pruned vines (or cane use to further develop cordons) may have problems with shoot development where primaries as well as secondaries were killed.
- I have not seen evidence of vascular injury, yet.
- I saw at least one case where vines on a south-facing slope appeared to sustain greater frost injury than the same variety on a more northerly facing slope, presumably because of the advanced vine development afforded by the warmer, southern slope.

Virginia was on the edge of damage from this frost episode; vineyards in parts of NC, GA, TN, KY and points further west sustained significantly greater damage due to the advanced vine development. Peaches and some apples and other fruits also sustained appreciably injury both in Virginia and in those other states. All in all, it was an unusual winter/spring with December 2006 ranked as 11th warmest on record and February falling in the top third of coldest Februarys on record. The Easter frost followed a week of unusually warm weather.

Again, it's too early to tell the full extent of the Easter weekend freeze, but the preliminary indications are that a significant crop loss occurred throughout the region. In Virginia, mechanisms for dealing with meteorological disasters, including provisions for lessening the stringency of in-state grape purchase by Virginia farm wineries, may be

enabled once the damage is locally assessed and collated by Farm Services Agency (USDA) and local authorities (including Virginia Cooperative Extension). For Virginia producers, I would encourage you to communicate the extent of damage with your local Cooperative Extension office. This will be important as local governments assess the extent of damage to the fruit industry.

II. 2007 Pest Management recommendations

Virginia Cooperative Extension's 2007 Grape Pest Management Guide (PMG) can be downloaded at: http://www.ext.vt.edu/pubs/pmg/hf3.pdf. The pesticide recommendations are annually prepared by pest management specialists with grape expertise at Virginia Tech and form the basis of our grape pest management program. Pesticide recommendations augment cultural control practices, including integrated pest management of arthropod pests and good canopy management techniques to set the stage for effective disease control. Detailed disease management recommendations can be found in past issues of Viticulture Notes, available through my website (http://faculty.vaes.vt.edu/vitis), in the Compendium of Grape Diseases (http://www.shopapspress.org/40888.html) and by attending regional vineyard meetings, a number of which are listed in this newsletter. Readers may also wish to view the pdf versions of several pest management talks that were presented at the 2007 Virginia Vineyards Association's winter meeting in Charlottesville. The Powerpoint presentations can be downloaded from the VVA website at: http://www.virginiavineyardsassociation.com/ (look under "presentations").

Another document that focuses on mid-Atlantic grape disease control is also attached. "*Guidelines for developing an effective fungicide spray program for wine grapes in Maryland, 2007*" was prepared by Dr. Anne DeMarsay, Specialist in Fruit Pathology at the University of Maryland. Anne's model spray program is very similar to what we use at our research vineyard in Winchester, illustrated by our spray record of the 2006 season (http://www.ext.vt.edu/news/periodicals/viticulture/06septemberoctober/06septemberoctober.html)

Oregon - I had a chance to visit with Al MacDonald, the viticulture instructor at the Northwest Viticulture Center in Salem, OR. He made an excellent comment that he strives to teach his students to think critically, not just to look at a problem and call their extension agent or neighbor, although these are both important parts of any solution to a problem. This is truly at the core of farming and, in particular, growing fine wine grapes - anticipating and diagnosis of problems. Grape growers in Oregon have recently been afflicted by what is not being called Short Shoot Syndrome and the causal agent is likely a rust mite. There are many causes of short shoots in the early season from varieties that are genetically predisposed to stunted shoots (Pinot Noir, Cabernet Sauvignon), cold injury, nutrient deficiency, etc. but the secret is to figure out what is happening and why. Think critically.

The Oregon wine industry is pretty amazing. When I left in 1999 there were 90 wineries. Now there are over 350. It is partly the Sideways effect but mostly just a great passion to make great wine in a community of new and veteran wine growers. They have found the best sites, figured out the viticulture and have the capital to drive an industry based on a 2 t/a variety, Pinot Noir. They also have great support and partnerships with state government, the governor, community colleges and the land grant. I think Oregon is a good example of where we want to go as an industry. It's also a very nice place to visit.

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