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VITICULTURE NOTES Vol. 26 No. 1, January - February, 2011

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<http://www.arec.vaes.vt.edu/alsen-h-smith/grapes/viticulture/index.html>

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I. Winter progress

The hot, dry summer has faded from consciousness somewhat given the colder than average December and dormant condition of the vineyard, but another season is just around the corner. The winter weather thus far has been very good for cold acclimation of grapevines. Low, but non-damaging temperatures occurred during the fall and the temperatures since November have remained cold enough to maintain a stable level of tissue cold hardiness – good for vine cold hardiness, not so good if you're paying heating bills. A comment on precipitation: parts of Virginia (southwest, southern piedmont and eastern Virginia) have experienced moderate snowfall over the past 2 months. The pattern of reduced precipitation in the northern Shenandoah Valley that began in April 2010 has, however, been persistent. The Winchester (Frederick County) area has recorded about 5.50 inches of rainfall (or rainfall equivalent) since 1 October 2010. The average historical figure for that same period is 10.03 inches. A look at farm ponds and streams in this area confirms the paucity of precipitation. It's too early to say how this will impact the 2011 growing season but it would be nice to see some groundwater recharge before the onset of another hot, dry summer.

As with last winter, we are conducting cold hardiness assessments from our principal viticulture research project being conducted at Winchester. This entails monitoring bud cold hardiness from Cabernet Sauvignon vines in our vine growth management project. An overview of the project can be found at my website: <http://www.arec.vaes.vt.edu/alsen-h-smith/grapes/viticulture/research/ground-cover.html> Research technician Kay Miller has been looking at cold hardiness of buds collected bi-weekly from 8 of the specific treatments involved in this research. Treatments include under-trellis cover crops (vs. herbicide strips), 3 different rootstocks, and root restriction (vs. no root manipulation) as a means of restricting the volume of soil that vines can forage for nutrients and moisture. The first several years' results from this project will be reviewed at the upcoming Virginia Vineyards Association's annual technical meeting in Charlottesville in February (see details in this newsletter).

As explained in last January's Viticulture Notes, our interest in potential effects of treatments on cold hardiness is based on the fact that Cabernet Sauvignon is not a particularly cold-hardy variety in Virginia. Stresses imposed on the vine during the growing season *may* have an undesirable impact on the vine's ability to avoid winter cold injury. The data plotted below in **Figure 1** are mean Low Temperature Exotherm (LTE) temperatures of Cabernet Sauvignon buds collected from vines used in the field study. The buds are frozen under controlled conditions in the lab. The dormant bud mean LTE temperature is a close approximation of the temperature at which approximately 50% of the buds would be expected to freeze (and die) under field conditions at the time of the test. The treatments being evaluated this winter include vines grafted either to 101-14 or riparia Gloire rootstock and grown either in root-restriction bags (Rbg) or planted normally (non-root-restricted, NRM). The vines were planted in 2006, so the 2010-2011 winter is their 5th. The data trend in Figure 1 is typical of what we'd expect to see. Vines were "hardy" to single digit figures in late-October, but became much more acclimated – more cold hardy -- with the onset of very cold weather in late-November. By the first of the year, it would have taken field temperatures of -8 to -10°F to kill 50% of the buds. This is about as cold-hardy as we can expect Cabernet Sauvignon buds to get in our winters in northern Virginia. The two dotted line curves in Figure 1 are for buds sampled from treatment vines grafted to riparia rootstock. Buds of vines grafted to riparia and grown in root-restriction bags appeared to acclimate more rapidly through November and December, compared to the other treatments examined – by up to several degrees. Interestingly, those are the same vines that were under the greatest water stress during the 2010 growing season.

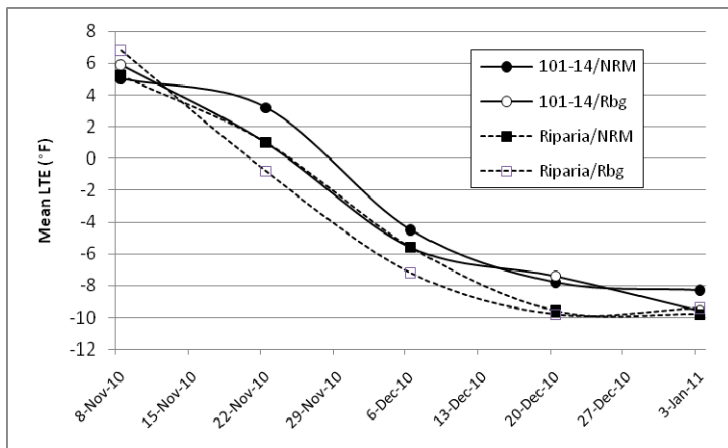


Figure 1. Mean Low Temperature Exotherm temperatures of Cabernet Sauvignon dormant buds (2010 – 2011) collected from vines grown in an on-going growth regulation project at Winchester. Vines were grafted either to 101-14 or riparia rootstock, and were either planted (2006) in root-restrictive bags (Rbg) or planted normally (NRM).

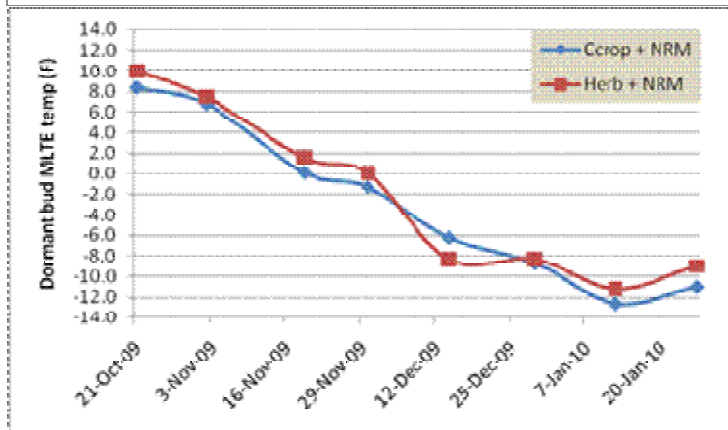


Figure 2. Mean Low Temperature Exotherm temperatures of Cabernet Sauvignon dormant buds collected from vines during the 2009 - 2010 winter. Vines were either grown with a companion cover crop under the trellis (Ccrop) or managed with an herbicide strip (Herb) under the trellis. Both of these treatments involved vines that had no root manipulation (NRM) and these particular vines were grafted to riparia rootstock.

The level of bud cold hardiness achieved this winter is only slightly less than that observed last winter at this point (**Figure 2**). The data of Figure 2 are from the same experiment but the comparison made in Figure 2 is for vines grown either with a companion cover crop under the

trellis (Ccrop) or managed with an herbicide strip under the trellis (Herb). The comparison illustrated in Figure 2 involved vines that had no root manipulation (NRM), and that were grafted to riparia Gloire. These data were shown in last January's Viticulture Notes. The level of bud cold hardiness estimated last winter was slightly greater in early January than that measured this January, which probably reflects differences in air temperatures between the two periods.

Although vines have not achieved quite the level of bud cold hardiness this winter as they did last winter, the current situation is still very positive. Similar freezing tests that we did in the nineties would normally show Cabernet Sauvignon acclimating to an MLTE of only about -5°F at best [take a look back at an old newsletter that included January 1997 and January 1998 data at <http://sites.ext.vt.edu/newsletter-archive/viticulture/98janfeb.html> to see just how different the current winter's data are!]. Our results for the 2010-2011 winter are far superior, with all treatments achieving an MLTE of greater than -8°F after early December. Another point to make with the data is to repeat a comment made last year -- that our use of under-trellis cover crops and even root restriction, which do impose some stress on the vine, have not appeared to adversely affect bud cold hardiness. If anything, the data suggests a slight advance of acclimation in the fall and a slightly greater mid-winter cold hardiness with those growth-suppressing treatments. It would still be wise to do some cane and bud cutting to look for winter cold injury before you complete your winter pruning. Again, I plan to talk more about this at the upcoming VVA technical meeting and I hope you'll be there to ask questions.

II. Dormant Pruning Reminders

Tremain Hatch, Viticulture extension associate, AHS AREC, Winchester

Dormant pruning is the deliberate removal of plant parts during dormancy to redirect or regulate growth or to promote and control fruiting and flowering in the subsequent season. Experienced growers know that dormant pruning is the single most important task annually performed in the vineyard, outside of perhaps harvesting crop. Pruning is the primary but not sole means to manage canopy and crop in the next growing season. The energy (carbohydrate and nitrogen reserves) stored by the vine will be focused towards the buds (nodes) retained at pruning. Prune too severely (retain too few buds) and you can expect excessive vigor of shoots this coming spring. Prune too light (retain too many buds) and you can expect an excessive crop, which may fail to ripen, and excessive canopy density. Finding the appropriate balance takes experience and some learned principles. The principles are discussed in-depth in the [Wine Grape Production Guide for Eastern North America](#). Here are some of the key points to consider:

How many buds to retain: The number of buds retained at pruning will determine the distribution and extent of growth next year. A desirable canopy density is fostered by limiting shoot density to 3 to 5 shoots per linear foot of canopy. The number of nodes retained at pruning will roughly set the number of shoots which grow next season. Shoots and crop can be further thinned after budbreak or after the threat of frost has passed. Buds can be distinguished as "count" buds that are borne at the nodes of a cane that are separated from each other by internodes, or "base" buds that are borne at points other than nodes (usually the base of the cane or spur). The number of buds retained will only roughly predict the number of shoots that will be present next season because some "count" buds may fail to produce a shoot (or may produce more than one shoot) and some shoots may emerge from base buds. Base buds vary in fruitfulness (clusters per shoot). Most vinifera cultivars have limited basal bud fruitfulness, while some hybrid cultivars (such as Seyval) have very fruitful basal buds.

Formulas are available to balance the number of "count" nodes retained to the weight of the canes pruned off the vine during dormant pruning. An experienced pruner will take this into

consideration and by eye, prune larger vines to retain more nodes and smaller vines to retain fewer nodes. Less experienced pruners are encouraged to use a weighing scale to weigh the canes from as many vines as necessary to gain the experience to visually estimate pruning weights or “vine size”. For further details on this “balanced pruning” process, and to see the recommended formulas for balanced pruning, watch the pruning video of Fritz Westover, former viticulture extension associate at the AHS AREC (<http://connect.ag.vt.edu/westover2/>)

Suitable wood: It is key that the wood retained though dormant pruning for canes or spurs has properly matured. Wood that has not suitably matured will be too cold tender to survive the winter or the ability to provide fruitful shoots next growing season. Avoid canes that grew too much or too little in the previous growing season. Suitable canes will have:

- Medium to dark brown color
- Moderate length internodes (4 – 6 inches)
- Internode diameters between 3/8 and 1/2 inch
- Will have limited development of large, persistent lateral shoots

Shoots that were well exposed to the sun during the previous growing season will have better fruitfulness (crop) and cold hardiness than shoots that were very shaded during the previous growing season.

Cold injury: Buds may be damaged during winter dormancy if the temperatures fall below the temperature to which the buds are acclimated. Dr. Tony Wolf’s previous article in this newsletter suggests that winter temperatures thus far have been conducive to the acquisition and maintenance of a good level of cold hardiness, but it would still be wise to sample buds from the field before proceeding with pruning to determine the level, if any, of cold injury. To check for bud mortality, take a large representative sample of buds from the vineyard, and slice through each bud with a razor blade cross-sectionally – shallow at first, cutting deeper if needed to examine the core of the bud. Inspect the fresh cut with a hand lens or microscope and determine whether each of the three buds are green, and viable, or brown (lacking green color) if the buds have not survived. Record the number of dead primary buds you observe as well as the total number of buds you cut to obtain a percentage of dead primary buds. Pruning severity generally does not require adjustment if primary bud mortality is less than 20%. Above 20%, more nodes should be retained, more or less proportionate to the extent of injury. A rule to determine a bud adjustment number is to divide number of buds by the solution of (1 - % dead buds). Fritz Westover’s third video has a description of the bud sampling process (<http://connect.ag.vt.edu/westover3/>)

Bud Necrosis: Bud necrosis is the death of buds during the season of their initiation. Buds developed last growing season that then died during the growing season fall into this category. The important thing to remember is that these buds will not produce a primary shoot next year if retained during dormant pruning. Some varieties that commonly exhibit bud necrosis when grown in the mid-Atlantic are Viognier, Riesling, Syrah, and Temperrillo.

When to prune: Some evidence points out that fall-pruned vine are more susceptible to cold injury than are spring-pruned vines. Carrying out pruning close to budbreak allows the grower to alter the number of count nodes retained during pruning to compensate for buds that were damaged by cold temperatures during the winter. That being said, removing wood from the trellis while the buds are swollen is not desirable because the swollen buds are easily damaged at this stage. The other big factor is time. Pruning the vineyard is a slow job; about 40 hours of labor are required to prune one acre of established vines. The best time to prune is in the early spring; but, because of the time required to prune many growers must prune though the entire

winter period in order to finish pruning by bud-swell. A compromise can be made by rough-pruning the vines early in the winter. Rough pruning refers to initially pruning vines early in the winter and retaining 2 or 3 times the number of buds that will ultimately be left on the vine. A second pruning is subsequently done in early spring or even after the final risk of frost has passed to prune vines to the desired number of buds. Pruning by variety is another useful strategy. Prune vines that are most cold hardy first, then continue pruning in order of increasing cold tenderness.

Good luck as you tackle the job of pruning vines this winter.

Resources:

Videos about dormant pruning put together by Fritz Westover

<http://www.arec.vaes.vt.edu/alson-h-smith/grapes/viticulture/extension/index.html>

[scroll down to item #6, Dormant Grapevine Pruning]

Chapter 5, Pruning and Training *Wine Grape Production Guide for Eastern North America*

Available from:

http://www.nraes.org/nra_order.taf?function=detail&pr_id=178&UserReference=0E03AB52E988459F4A0C93D2

Bulletin on checking bud damage from Colorado State [this bulletin has an excellent series of color photographs showing how to section buds to examine for evidence of cold injury]

<http://www.colostate.edu/programs/wcrc/pubs/viticulture/EvaluatingBudDamage.pdf>

Winter Injury to Grapevines and Methods of Protection. 2007. Zabadal, Thomas J., I.E. Dami, M.C. Goffinet, T.E. Martinson, M.L. Chien. Michigan State University Extension.

Available at: <http://www.emdc.msue.msu.edu/viewitem.cfm?INVKEY=E2930>

III. Upcoming meetings (two Virginia meetings are highlighted, followed by a calendar of regional meetings this winter and early spring)

Virginia Vineyards Association's 2011 Technical Meeting & Trade Show

Omni Hotel, Charlottesville, Virginia

17 – 19 February 2011

Registration forms are available at the VVA website :

<http://www.virginiavineyardsassociation.com/events.php#annualmeeting>

Summary : Variety workshop on afternoon of 17 February, followed by two full days of technical sessions including a one-half day program on 'Norton' wine growing. Course has been approved for full recertification of Virginia private pesticide applicators (bring your applicator certificate number)

Program at a glance :

Thursday February 17, 2011

Warm/hot season wine grape varieties: focus on Albariño, Roussanne, Syrah and Mourvedré
Grower/Vintner panel with wine tasting. Scheduled speakers will include:

- Dr. Tony Wolf, Experiences with varieties in the southern piedmont and Winchester
- Alan Kinne, Chrysalis Vineyards
- Dean Triplett, Willowcroft Farm Winery
- Jordan Harris, Tarara Winery
- Dennis & Sharon Horton , Horton Cellars

Technical program (18-19 February)

Program at a glance [also includes trade show, pesticide recertification training and more]

“A step closer to vine balance” Tony Wolf, Virginia Tech

“Planting density: rationale, trends and results”. Dr. Mark Greenspan, Advanced Viticulture
Research project updates:

- Tim Jordan and Dr. Doug Pfeiffer, Vineyard insect ecology and updates on brown marmorated stink bug
- Mizuho Nita, Leafroll virus monitoring and results of 2010 fungicide evaluations
- Peter Sforza, Progress of a new generation GIS for vineyard site evaluation
- Chris Bergh, Grape root borer trap design and GRB survey results
- Lynn Rallos and Anton Baudoin, Sentinel vines for assessing fungicide resistance
- Molly Kelly, Petit Manseng flavor profiling

“Grape IPM Elements” Holly Gatton, Virginia Tech Pesticide Programs

“Quest for crop uniformity” Dr. Mark Greenspan, Advanced Viticulture

“Effects of canopy light environment on powdery mildew” Dr. Craig Austin, Cornell University

“Applied vineyard mechanization: holding the bottom line on costs”

- Fernando Franco, Barboursville Vineyards
- Nick Pehle, Stone Hill Winery (Missouri)

“Community college workforce development programs”

- Greg Rosko, Piedmont Virginia Community College
- John Ayers, Patrick Henry Community College

“Variety focus: Norton” Discussion and Wine Tasting. Panelists include”

- Tony Wolf, experiences with Norton at Blackstone and Winchester
- Mike Weaver “History of Dr. Alwood’s research with Norton”
- Jenni McCloud, Chrysalis Vineyard
- Dennis Horton, Horton Cellars
- Geoff Cooper, Cooper Vineyard
- Shep Rouse, Rockbridge Vineyard

Commercial grape growing workshop

25 March 2011

Virginia Tech’s Middleburg Agricultural Research and Extension Center

5527 Sullivans Mill Road, Middleburg VA 20117

Time: 8:00 am until approximately 5 :00 pm (rain or shine)

Directions : <http://www.arec.vaes.vt.edu/middleburg/>

Cost: \$50 per person (payable Virginia Tech Foundation) Register by 18 March. Includes morning coffee, lunch and notebook.

Registration form and additional information: Please contact Tremain Hatch (540-869-2560 x11 or thatch@vt.edu)

Details: Dr. Tony Wolf (VA Tech), Tim Ohlwiler (Virginia Cooperative Extension), Dr. Mizuho Nita (VA Tech) and Tremain Hatch (VA Tech) will conduct a workshop geared towards beginner and prospective wine grape growers at the MARE Center in Middleburg Virginia. Course offers an overview of commercial wine grape vineyard development including economics, grape marketing, equipment needs, site evaluation and preparation, planting, and young vine care. The information gained from this workshop will provide a foundation upon which you can build your vineyard project. Classroom instruction will be followed by a visit to a commercial vineyard in the Middleburg area. Be prepared to go outside rain or shine.

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The following information was compiled by Mark Chien, Viticulture Extension Educator at Penn State (thus the Penn State logo). We are grateful to Mark for allowing us to reproduce the calendar of events that he generously provided. Thank you, Mark.

February

- 2 Wine Grape Section at the Mid-Atlantic Fruit and Vegetable Convention.** Hershey Lodge and Convention Center, Hershey, PA. 9 a.m.- 4 p.m. Sara Spayd, viticulturist from North Carolina State University is the key guest and will address the impact of temperature and light on fruit color and impact of vineyard fertility on wine grape quality. Other topics include brown marmorated stink bug, weed control, winter injury in vines, bunch rot control and vineyard floor management. PA and NJ pesticide credits are available. Large equipment and supplies trade show accompanies the program. Register at the door. Full details at <http://www.mafvc.org/html/>
- 4-6 North Carolina Winegrowers Association Annual Meeting: From Vine to Wine.** Marriott Hotel Airport, Greensboro, NC. A wide range of viticulture and enology topics. Featured speakers are Ed Boyce, Sara Spayd and Mark Chien. Full program and registration at <http://www.ncwinegrowers.com/>
- 4-7 2011 Midwest Grape and Wine Conference.** St. Charles Convention Center, St. Charles MO. More information at: <http://www.midwestgrapeandwineconference.com/>
- 17-19 Virginia Vineyard Association's Annual Winter Technical Meeting.** Omni Hotel, Charlottesville, VA. Two days of practical information for growers and wine makers and research information from VA Tech. Mark Greenspan, viticulture consultant and writer for Wine Business Monthly is a featured speaker. **More detailed program details included in this Viticulture Notes.** Topics to include research updates, legislative updates, trade show and annual VVA business meeting. For more information, please visit <http://www.virginiavineyardsassociation.com/index.php>
- 21-22 Ohio Grape and Wine Conference.** Nationwide and Ohio Farm Bureau 4-H Center, Columbus, OH. New grape grower session, marketing, viticulture and enology sessions and trade show. For full program and registration go to: <http://www.oardc.ohio-state.edu/grapeweb/pageview.asp?id=783> > December 29, 2010.
- 26 Maryland Wine and Grape Industry Annual Meeting.** Clarion Hotel. Oxon Hill (Prince George's County). Tony Wolf and Wayne Wilcox highlight the program. Registration and program can be found at <http://www.marylandgrapes.org/events/annualmeeting.shtml>

March

- 4-5 Finger Lakes Grape Growers Conference.** Holiday Inn. Waterloo, NY. Find information and registration at <http://flg.cce.cornell.edu/>

- 12 Grape Expectations.** Forsgate Country Club. Jamesburg, NJ. This is the annual viticulture and enology meeting for the NJ wine industry. Jim Bernau, founder of Willamette Valley Vineyards in Oregon and Sigrid Gertsen-Briand from Lallemand are the featured speakers. For info and registration contact Dr. Gary Pavlis at Rutgers Cooperative Extension.
- 17 Lake Erie Grape Growers Convention.** SUNY. Fredonia, NY. A grower oriented meeting that covers juice and wine grapes. For information and registration go to <http://lergp.cce.cornell.edu/>
- 23 Wine Grape IPM Workshop.** Farm and Home Center. Lancaster, PA. 9 a.m. to 4 p.m. Invited speakers include Dr. Mizuho Nita from Virginia Tech, Dr. Noemi Halbrendt and Bryan Hed from Penn State. Topics will include a review of the 2010 season and management strategies from 2011. A spray program review will be offered and PA pesticide credits. Video teleconference to other counties.
- 25 Commercial wine grape production shortcourse.** Virginia Tech Agricultural Research and Extension Center, Middleburg, VA. Team-taught shortcourse. See further details in this Viticulture Notes newsletter.
- 29-4/1 Wineries Unlimited.** Richmond, VA. This is the biggest winery conference and trade show in the East. You can find a full program and registration information at <http://www.wineriesunlimited.com/>.

April

- 13-15 New York Wine Industry Workshop.** Ramada Geneva Lakefront Hotel, Geneva, NY. This is Cornell Enology Program's annual technical meeting focusing on concepts and challenges specific to eastern, cool climate wine production. More details can be found at: <http://grapesandwine.cals.cornell.edu/cals/grapesandwine/outreach/enology/workshops.cfm>
- 15 New Grape Grower Workshop.** Farm and Home Center. Lancaster, PA 8 a.m. to 5 p.m. This is an intensive and comprehensive overview of what is needed to start a commercial wine vineyard in the Mid-Atlantic region. Instructors are Mark Chien and Joe Fiola (Univ of Md) with grape growers to offer practical instruction. \$125 per person.
- 19 Pennsylvania Wine Association Annual Meeting.** 8 a.m. to 5 p.m. with awards banquet. Penn Stater Conference Center. State College, PA. Viticulture, enology and wine marketing sessions. Awards banquet and annual PWA business meeting. Pesticide credits will be available. For information, please call at 717-234-1844 or visit www.pennsylvaniawine.com.

May

- 18 A Closer Look at Hybrid Wine Production: Vine to Bottle.** Farm and Home Center. Lancaster, PA. 9 am to 4 pm This meeting will focus on innovative production of hybrid vines from vineyard to cellar. Speakers will be from industry and extension. The contents will be very practical. More detail will be available.