



VITICULTURE NOTES Vol. 29, May 2014

Tony K. Wolf, Viticulture Extension Specialist, AHS Jr. Agricultural Research and Extension Center, Winchester, Virginia

vitis@vt.edu

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

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I. Current situation: Cold injury observations from the 2014 winter.

“Silent Spring”. That seems to be what some growers are currently experiencing at this time when grape buds should be bursting forth with rapid shoot growth. Unfortunately, we’re seeing more widespread evidence of winter cold injury than what our estimates earlier this year would have led us to believe. The injury includes both typical bud injury, but also injury to trunks and cordons, and it spans a surprising range of varieties. The 2013/2014 winter will be remembered as a cold, changeable, and persistent season. But on the whole, the low temperatures experienced throughout Virginia were not *that* low. We had many locations that reported lows in the 0F to -3F range, and many areas remained above 0F, while a few dipped as low as -7F. I started getting some reports of injury following the early January dip in temperature when we recorded about -2F in our vineyard at Winchester. Our vines, including Cabernet Sauvignon, appeared to come through that event unscathed. Reports of damage to cold tender vines, including Tannat and Merlot, arrived soon after. Critical temperatures appeared to be at or below about -4F. There were at least 5 oscillations in air temperature between early January and early March, with the event on 4 March following a three-day stretch of highs close to 60F (Figure 1).

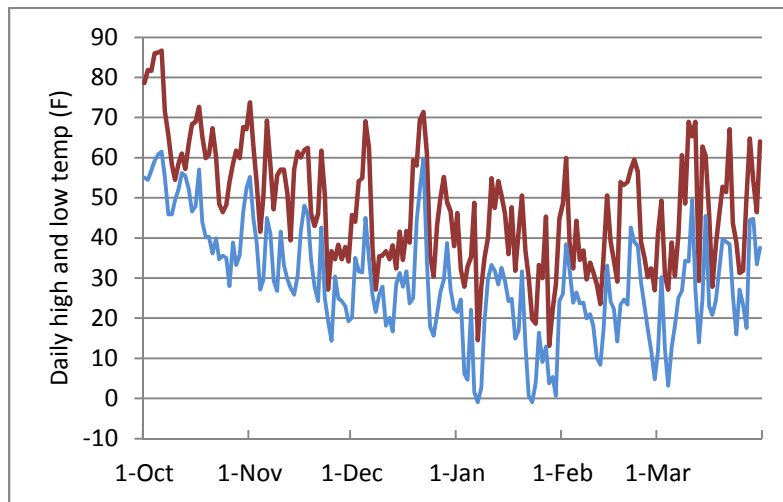


Figure 1. Daily high and low temperatures at Agricultural Research and Extension Center in Winchester, 2013/2014

One grower commented that the injury observed following this most recent winter was reminiscent of what he had observed at his vineyard following the 2003-2004 winter, 10 years earlier. I went back and read what I had observed following the 2003-2004 winter (<http://www.sites.ext.vt.edu/newsletter-archive/viticulture/04marchapril/04marchapril.html>) and was struck by some of the similarities in injury following the 2 winters:

(from May, 2004): I commented in the January – February Viticulture Notes that the 2003-2004 winter was shaping up to be a winter that would cause minimal cold injury to grapevines here in Virginia. Reports and my own observations since February have led me to reassess that statement. In reality, a number of Virginia vineyards are now showing evidence of cold injury. Affected vineyards span a wide geographic area. Those that I'm aware of range from Loudoun County south to Roanoke, and vineyards in Frederick and Shenandoah Counties. The injury includes typical bud and cane injury, as well as injury to older wood – cordons and trunks. In many cases, the latter has included significant cracking or splitting of older cordons and trunks. It was often the trunk splitting that caught grower's attention.

The extent and nature of the observed injury is somewhat puzzling. The low temperatures measured or estimated from nearby min/max thermometers during the 2003-2004 winter were generally at or above 0°F, with the lowest temperatures occurring around 10 January. Given the general pattern of winter temperatures – not a great deal of fluctuation in mid-winter – and our own measures of bud cold hardiness (reported in Jan-Feb Viticulture Notes), I would not have expected much problem with temperatures at or above 0°F in January; at least not with generally well managed vines in normal years. In some of the affected vineyards, varieties that we recognize as relatively cold-tender were the most severely affected. For example, one vineyard that grew a range of varieties only showed significant amounts of injury in older Syrah and Tannat vines, and injury in the latter was only observed in those sections of rows that dipped into a low point of the vineyard topography (cold air ponding). Cabernet Sauvignon and Merlot were also affected in some vineyards, with both cane and trunk injury apparent. Riesling, which we consider to be a relatively cold-hardy vinifera variety, also showed significant trunk injury in one Fauquier County vineyard. In most cases, the injury was not observed until March of this year, even though some rough pruning had been done in January and February.

Examination of split trunks in two separate vineyards revealed brown, desiccated wood. In other cases the injured trunks were hydrated and oozed moisture when shallow cuts were made into the trunk to examine the status of the phloem and cambial (regenerative) tissues immediately beneath the bark. In the former situation, the extent of browning and desiccation suggested that the trunk injury may well have occurred during the previous (2002-2003) winter, but perhaps went unrecognized due to abundant moisture during the 2003 growing season. Canes on some of these vines were observed to be drying out in March of 2004, but the drying (and browning) appeared to radiate out from the cordon. Trunk splitting is thought to occur either from excess water freezing in the trunks causing a physical strain, or from uneven drying of the wood. But more commonly, the drying and cracking of injured wood occurs in the winter following injury, when drier atmospheric conditions prevail.

Some of the other cases of injury observed in Virginia, including splitting trunks, came from vineyards where the injury appeared to be localized in regions of the vineyard that experienced poor soil water drainage. It may be that in these cases the affected vines did not acclimate well to winter temperatures due to saturated soil conditions.

When did the injury or winter kill occur during the 2013/2014 winter? I'm certain that some of the injury occurred as early as the 5-6 January 2014 freeze events, because we were seeing bud kill in tender varieties soon after that event. But some of the injury *may* have occurred as late as 4 March, when temperatures at the Winchester AREC dipped down again to as low as 3°F. We noted some trunk splitting in a near-by vineyard in late-April. Split trunks appeared to be more common on older, larger trunks than on younger, smaller diameter trunks, and multiply-trunked vines often have a mix of live and dead trunks (an argument for multiple trunk training systems). As with my 2003/2004 report, some of this splitting appeared to be due to drying of trunks and canes of vines injured sometime much earlier (summer of 2013?) as the wood was bone dry and completely discolored. We considered that some injury may have occurred as early as 24-25 November 2013, when we had our first real blast of cold air (Figure 1). In this last case, we do note that vines whose health was compromised going into the winter, and those in poorly drained sections of otherwise well-situated vineyards may have had some increased "dieback" of shoots, and potentially greater winter injury incidence. In addition to the more tender varieties mentioned above, we've also seen injury in Cabernet franc and Cabernet Sauvignon as well as more hardy varieties including Riesling, Chardonnay, and Pinot noir. Injury to early budding varieties such as Chardonnay, Pinot noir, and Cabernet franc is perhaps consistent with the notion that these vines might have deacclimated some by early March in time to be damaged by the cold temperatures on 4 March.

What are the options for dealing with injured vines: I anticipate that we're going to continue to observe additional injury/damage from the 2014 winter, including collapse of some vines that break bud and begin to develop a canopy. This occurs when some buds are alive but the regenerative vascular cambium tissue is damaged. The first real hot weather of the season puts a strain on the damaged vascular system and the new shoots collapse when their transpirational loss of water exceeds the ability of their impaired vascular system to transport water. We may also see a resurgence of **crown gall** as a result of the trunk and cordon injury.

In either case, new trunks will need to be developed, and this will require retraining from shoots that originate from uninjured portions of the vine, near the graft union, assuming there are live, latent buds in the graft region of the scion. With no appreciable winter injury over the last 10 or more years, many of us have ceased hilling and de-hilling of vines for cold protection. And, with very tender varieties, there's a chance that severely damaged vines may need to be replanted.

Renewal trunk shoots that do develop from severely injured vines will likely be extremely vigorous because they are supported by a large, intact root system. Permit these vines to develop as many shoots as reasonably possible (5 or 6 if possible), and keep the shoots well exposed and supported upright on the old trunks and trellis system to minimize shading and to permit effective disease management. The observed injury that I observed was not uniform across entire vineyard blocks and you may find that uninjured vines (or uninjured trunks on multiply-trunked vines) have more shoots than can be trellised. So be prepared to do some shoot (and crop) thinning where needed in June and July. Where injury is certain and significant, avoid nitrogen fertilization for this season, and consider sowing a cereal (or allow weed growth) under the trellis to provide some competition to reduce shoot vigor. Retain moderate (1/2-inch to 5/8th -inch diameter) canes next winter to retrain trunks and cordons. You don't need to remove the injured trunks immediately; there will be time for that after you've gained a fuller picture of how much injury your vines might have sustained. Trunk injury (and splitting) may also be observed in the following winter (2014/2015).

The appearance of cold-injured trunks is a reminder that we are growing cold-tender grapes in a region where winter temperatures can be marginally acceptable. Drought, excess rain, or defoliating diseases (we saw lots of downy mildew problems in 2013) can reduce vine cold acclimation and mid-winter cold hardiness, further increasing the potential for severe injury. Many growers, particularly those who have entered the industry since 2000 or so, have ignored multiple-trunking recommendations and some have planted some very cold-tender varieties. These can be calculated, acceptable risks with small plantings in excellent sites, but the hazards are real and should be carefully considered for future. I've talked to a few seasoned growers who are using the occasion of significant winter injury over the past several months to rethink their variety planting scheme. If, for example, you have considerable injury to a less than optimal clone of Merlot, perhaps it would be a good occasion to replant the block with a superior clone.

II. Early season disease management reminders

Dr. Mizuho Nita, Virginia Tech

Many of us in the northern VA had a very long period of buds in mittens, but we started to see many green tissues this past week. Our 5-yr old Chardonnay is about 50% bud break stage as of May 1st. At this time of the year, the number-one concern is Phomopsis cane and leaf spot. Phomopsis produces spores on old infected cordons and trunks during the spring, and they can infect tissues even if temperature during a rain event is in 40s. Unfortunately, the only option we have against this disease is a protective application of fungicide, such as mancozeb, captan, and Ziram. You can use a QoI fungicide such as Abound and Pristine; however, I would recommend keeping them for the later part of the season. Since they can be active under cold rain event, my recommendation is to protect even when shoots are about 1-3 inches long. The decision to spray for Phomopsis also depends on the history of the vineyard. The vineyard with previous history of Phomopsis tends to carry the same issue year after year.

Let's use our Chardonnay as an example. As with last year, the bud break was followed by warm rain event. At our vineyard, we received a very long (~48 hours) wetness that started in 28 April and ended in 30 April, and the average temperature was 48F. This certainly was a Phomopsis infection risk event. (Note: If you are wondering, it was too cold for black rot.) We did not have a chance to apply fungicide before the rain; however, I am not too concerned about missing the spray for this rain. First, only a few buds were open on the 28th, and second; we have not seen much Phomopsis in the past in this vineyard. Thus, the risk of Phomopsis in this particular vineyard should be very low. We will watch the forecast for next few weeks to determine if we want to protect new shoots or not.

On the other hand, we have 24-year old Cabernet sauvignon vineyard right next to the Chardonnay vineyard. For this one, I would make sure to protect shoots as soon as they come up because these vines tend to get a fair amount of Phomopsis every year. They are still in bud-swell stage as of today.

Recently, several people have asked me about protection of pruning wounds, especially when you make big cuts. We have a special label for VA for the use of Topsin-M, a supplemental label for the use of Rally. Both are effective against Botryosphaeria canker and Eutypa dieback. Botryosphaeria is a very common fungal disease for our region. For the rate and the method of application, please refer to the label (which can be downloaded from my blog, grapepathology.blogspot.com). You are required to have these labels for the application. In addition, there is a new product called B-Lock, which basically is a latex paint with boron. A study in CA has shown a very good efficacy against Esca, which is another trunk disease, and Eutypa. Lastly, please make sure to remove old woody tissues (especially old trunks and cordons) away from your vineyards. A fungal species such as Botryosphaeria can survive and produce

spores on these old tissues, and there is a no-good reason for you to keep them on the vineyard floor.

III. More 2,4-D herbicide could be used in agronomic cropping systems in the coming years

Tremain Hatch, Virginia Tech

A new 2,4-D ready cropping system for corn, soybeans and cotton is to be released by Dow Agrichemical in the next couple years. Because 2,4-D can have a major impact on grapevines, Dow hosted viticulture representatives to their headquarters in Indianapolis for an information exchange meeting.

As review, 2,4-D is a phenoxy herbicide which controls broadleaf weeds. The material is often used for pre-plant burn down in agronomic crops, right of ways and broadleaf control in pastures. Grapevines, like cucurbits and tomatoes are very sensitive to 2,4-D. Application in agronomic fields can be associated with physical drift and volatilization which can cause injury to grapevines and other sensitive plants, sometimes drifting farther than a half mile. See this article from Oregon:

<http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/20353/em8860.pdf> for helpful information about identifying and preventing herbicide drift into vineyards.

The new Dow Agrichemical corn, soybean and cotton seed is part of a program called **Enlist** that will feature crops with traits for tolerance to multiple herbicide chemistries and special herbicide formulations to be used with these crops. This is similar in concept to the genetically modified crop lines (soybeans were first in 1996), and proprietary glyphosate product (Round-up) that Monsanto termed "Round-up Ready". The Dow Agrichemical corn product will be tolerant to 2,4-D, glyphosate, and another class of herbicides. The cotton and soybean plant material will contain tolerance to 2,4-D, glufosinate (i.e. active ingredient in Rely), and glyphosate (i.e. active ingredient in Round Up). The stacked traits will allow tolerance to herbicides that will be used to combat the glyphosate resistant weeds that have developed as a result of glyphosate ready corn and soybeans. Here is a short article from Nature that provides some context for roundup-ready crops and the development of glyphosate resistant weeds: <http://www.nature.com/news/war-on-weeds-loses-ground-1.10691>

Dow does realize that their new plant material will result in increased applications of 2,4-D and the potential of increased drift to vineyard sites. They have tackled this in the formulation of this new herbicide to be used with the Enlist system. The herbicide is a new compound with lower potential for volatilization and the formulation makes the droplet size less prone to physical drift.

There will probably be much more 2,4-D sprayed on agronomic land in the coming years. Much of this 2,4-D will be a lower drift formulation and Dow is doing a great deal of work to minimize drift and herbicide resistance with their product suite.

To prepare for these changes, take a moment to consider methods to improve your communication with neighbors (especially those who grow row crops near your vineyard) and your own recordkeeping procedures. Communicating with neighbors is a necessary part of agriculture; there will always be risk of drift from other cropping systems and some right-of-way land management practices. Awareness is a requirement for prevention in these situations. Let this situation highlight the importance of recordkeeping. This is currently important in cases where drift does occur- record what you apply to your vineyards and when you observe issues in the vineyard such as symptoms of herbicide injury. Allow yourself to see this issue from the agronomic crop grower's perspective. They are facing failing materials and the development of resistance in pests and on a scale much larger than that of our own industry. Learn from this situation and remember to rotate modes of actions to discourage development of resistance (herbicides, insecticides and fungicides).

VineSmith's 2013-2014 Vineyard Spray Guides are **now on sale** for the 2014 growing season. This set of unique at-a-glance posters contains all the information you need to quickly and easily select the best fungicide, insecticide or herbicide for the job. They will save you hours of time planning and tracking your spray program. Normally **\$59**, the set of spray guides is **NOW ONLY \$39**. For more information or to purchase, please visit www.vinesmith.com.

2013 commercial grape report: If you haven't seen it, Virginia's 2013 commercial grape crop/acreage report can be found here: <http://tinyurl.com/ly8sv5u>

IV. Upcoming Meetings

Tremain has worked with local VCE agents to schedule a series of spring/early summer vineyard meetings which will involve Virginia Tech specialists, local Cooperative Extension agents, and occasionally other speakers. These meetings follow the IPM meetings and pruning workshops held earlier this year. Included here also is the upcoming Virginia Vineyards Association summer technical meeting scheduled for 5 June at Barboursville Vineyards. Tom Kelly and VVA Board members have organized an interesting program for the summer technical. Stay tuned (<http://www.virginiavineyardsassociation.com/>) for separate registration information for the VVA summer technical.

Please note that the timing of these meetings is variable. For those who have not attended the vineyard meetings in previous years, the format for most includes a discussion about seasonal topics by extension specialists (pest considerations, pertinent viticultural issues), and usually an introduction by the host vineyard owner/operator. Attendees can bring problem samples from their own vineyards for ID or discussion. Depending on numbers and weather, we also try to do a walk-through of the host vineyard.

We hope to see you at some of these meetings.

Date	Meeting	Location	Time	Contact
23-Apr	Vineyard meeting	Cardinal Point Winery, Central VA	11 -3 (bring a bagged lunch)	Michael Lachance, Nelson County http://offices.ext.vt.edu/nelson/staff/michael_lachance.html
5-Jun	VVA Summer Technical	Central VA	all day	VVA http://www.virginiavineyardsassociation.com/
11-Jun	Vineyard Meeting w/LWGA	Boxwood Winery, Northern VA	6 - 8 pm	Beth Sastre, Loudoun County http://offices.ext.vt.edu/loudoun/staff/beth-sastre.html
18-Jun	Vineyard Meeting in Southeastern VA	Suffolk	11 to 3	Marcus Williams, Suffolk http://offices.ext.vt.edu/suffolk/staff/marcus-williams.html
8-Jul	Vineyard Meeting	Barrel Oak Winery	3 - 5 pm	Tim Ohlwiler, Fauquier County http://offices.ext.vt.edu/fauquier/staff/tim_ohlwiler.html

Position Available:

Fruit Hill Orchard (Frederick County, VA) is looking for a field person to scout our approximate 3000 acres of processing apples. Fruit Hill has traditionally been a minimum input operation. This position is responsible for scouting and recommending sprays, fertilizers and other necessary horticultural practices. A transition with retiring field scout is envisioned and therefore the job is available immediately.

Diane Kearns

didi@shentel.net or 540 667 3390

[yes, this is for an apple operation, but our readership includes some fruit operations other than vineyards]