Nebraska VineLines

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IS IT SUMMER YET? WILL IT EVER COME?

With the crazy spring we have had, it is not surprising that the above questions may be on the tips of every grape grower's tongue. However, if we compare our really late spring this year with last year's record earliness, we are a location of "average" growing seasons, right? To be serious about this, however, please pay particular attention to implementing a diligent spray program, because of the fact that all of this wet weather will exacerbate fungal disease problems. See "Early Summer Vineyard Tasks" and comments from Tony Wolf and Mike Ellis later in this issue.

We are finally at bloom season, a most critical period for disease management. I examined a majority of our cultivars and breeders' selections at our Nemaha research vineyard on June 4th and noted dramatic differences in flowering (per cent "cap-fall"), some Black Rot development and slight herbicide damage as noted in the following table.

Cultivar/breeding selection	% Cap-fall	Black Rot	Herbicide damage
Bianca	0	0	0
Brianna	50	0	0
Catawba	5	0	0
Cayuga White	5	0	0
Grafted Chambourcin	0	0	0
Chambourcin, O.R.	0	0	0
Corot Noir	0	+	0
Delaware	0	0	0
deChaunac	50	0	+
Edelweiss	100	0	+
ES 10-18-30	100	+	0
Esprit	80	0	0
Frontenac	50	0	0
Geneva Red (GR7)	100	0	0
Lacrosse	20	0	0

Cultivar/breeding selection	% Cap-fall	Black Rot	Herbicide damage
La Crescent	100	0	0
Lemberger	0	+	0
Leon Millot	90	0	+
Marquette	50	0	0
Marechal Foch	90	0	+
MN 1197	100	0	0
MN1198	100	+	0
MN 1200	100	0	0
Niagara	70	0	+
Noiret	0	0	0
Norton	0	0	0
Petite Jewell	100	0	0
Prairie Star	50	0	0
Riesling	0	++	0
Sabrevois	100	0	+
Saint Croix	50	0	0
Seyval Blanc	0	0	0
Traminette	0	0	0
Trollhaugen	75	0	0
Valvin Muscat	0	++	0
Ventura	100	0	+
Vidal Blanc	0	0	0
Vignoles	0	+	0

Brainard Field Day Highly Rated

The Ground Cover, Mulch and Community Supported Agriculture Field Day held at Fox Run Farm on May 11, 2013 was very successful, in spite of the wind. Indeed it was a windy, but sunny day (hard to find many of those non-rainy days this spring!). The field day was well- attended and "just what I was looking for" comments were heard from several attendees.

Christina Bavougian, PhD candidate in the University of Nebraska Viticulture Program, discussed her unique experiments employing crushed glass and distillers dried grains as mulches, in addition to her in-row and alleyway cover crop studies. Her presentation led to numerous questions, including what is the economic feasibility of use of such mulches? The potential economic benefits, as always, will be related to the cost of the input materials. However, it was quite clear that the mulches suppressed weeds, conserved moisture and had no negative effects on the harvested fruit. Likewise, she presented preliminary results that suggest that creeping red fescue, and possibly existing vegetation, are successful ground covers.

Lowell Sandell, UNL weed specialist, discussed weed management and conducted a tour of the Fox Run Vineyard. As he and the attendees walked through the vineyard and headlands, Lowell pointed out specific weeds, identifying them and explaining how to distinguish one from another. He also answered questions about weed management, including when and when not to use

specific weed management tools such as specific sprays. He stressed that it is a waste of money to spray herbicides at the wrong time, pointing out that there are optimum times for treating different types of weeds and other times that will be largely ineffective.

Chuck Francis, Professor of Agronomy at UNL discussed sustainability and organic practices. Many aspects of organic approaches to farming in general and for grape growers in particular were evaluated. Professor Francis is widely known for his leadership relating to education about organic approaches, including international collaboration with scientists from other countries, most recently a special cooperative venture with colleagues from Norway.

Yolanda Bailey, co-owner of Fox Run Farms, explained their approach to Community Supported Agriculture (CSA) programs. She illustrated methods for direct seeding of vegetables that they include in their CSA project and explained how they pursue marketing and distribution of their products. Lunch was provided as part of the field day registration fee, culminating in serving of the lunch at Makovicka Winery where participants were also able to sample Makovicka wines. Appreciation is noted for the generosity of the Bailey family in providing the location for Christina's research and hosting the field day, in addition to the Makovicka family's assistance in organizing the lunch and wine tasting.

EARLY SUMMER VINEYARD TASKS

As spring moves into summer, it is important to remain vigilant and persevering with vineyard management tasks. Although it might be tempting to sit on the veranda and sip one or more of those great Nebraska summer wines (Edelweiss, one of the many lovely "blushes", Lacrosse, Traminette and Brianna, to name a few) and contemplate the meaning of life (it's a great life here in this paradise we call Nebraska!), it is critical to follow your vines as carefully as at other times of the year. In particular:

1. Walk your vineyard rows and monitor for insect and disease problems. Remember, a hornworm can strip a cane of all green vegetation overnight.

2. If insect or disease problems are apparent, follow recommendations found in the Midwest Commercial Small Fruit and Grape Spray Guide.

3. Provide irrigation as needed, especially in dryer areas of the state. Avoid excessive irrigation.
4. Discontinue fertilization with nitrogen and potassium. Excess vegetative growth is encouraged by excess nitrogen and excess moisture.

5. Evaluate your vines for obvious symptoms of micronutrient deficiencies, especially if your vineyard site is on soils of high pH. Correct by application of appropriate foliar micronutrient sprays.

6. Continue weed control measures. Weeds compete with the vines for water and nutrients.
7. Canopy management. Remember Richard Smart's admonition that our goal is to turn the light energy

of the sun into chemical energy via photosynthesis, that is, turn "Sunlight into Wine". This requires good fruit and leaf exposure. When leaves shade each other, very little light strikes the lower (shaded) leaf, so minimal photosynthesis takes place. Ideally, the flower/fruit clusters have been exposed to light since fruit set, thus avoiding sunscald problems.

8. Consider taking petiole samples at veraison for tissue analysis by an appropriate laboratory. It will still not be too late for correcting micronutrient deficiencies, but major nutrient problems (nitrogen, potassium, phosphorus) will need to be addressed with your next year's fertilizer program.

9. Evaluate potential crop load. Is it predicted to be at or near desired yield levels? Count clusters on several vines for a given cultivar, multiply the average cluster number by the number of vines per acre and then multiply that number by the average weight per cluster for that cultivar based upon records for that vineyard.

10. **Keep good records**. As you approach harvest, be sure that you have all necessary harvest equipment clean and ready, including a scale to determine cluster weights.

TTB Issues Advistory: Use of Social Media in the Advertising of Alcohol Beverages

The following guidance is intended to assist industry members in ensuring that advertisements for alcohol beverages that appear in social media outlets comply with the FAA Act and the TTB advertising regulations. Because of changing technology and the ongoing evolution of social media, this is not intended to be an all-inclusive list of the types of social media. However, the general principles set out in this circular can be applied to other social media outlets that have been or will be developed"

The official detailed announcement is available from the TTB noted as "Industry Circular number 2013-01", dated May 13, 2013

The following items are reprinted from Virginia Cooperative Extension Viticulture Notes, Vol. 25 No. 3, May – June, 2010. By Tony K. Wolf, Viticulture Extension Specialist

Dr. Mizuho Nita, Virginia Tech plant pathologist has this advice:

Please remember that **the critical period for downy mildew, powdery mildew, and black rot to infect berries are from bloom to 4-5 weeks after bloom.** Please be on top of the situation during this critical period. After this critical time, you can relax a bit in terms of the berry protection

Dr. Tony Wolf, Virginia Tech Viticulturist and past speaker at the Nebraska Winery and Grape Growers Forum and Trade Show, responded to a query regarding frost damage in Virginia vineyards. His advice is from a couple of years ago in Virginia, but very applicable to Nebraska vineyards that have experienced frost damage.

Question: The lower portion of my 'Norton' vineyard was frosted twice this spring; once in late April, and again, more severely, on the morning of May 10th.

What can I expect in term of crop yield and crop maturation? Should I have rubbed off the damaged shoots?

Answer: To answer your second question first, No, I don't believe that you should have rubbed off injured shoots, although there could be a justification for this under specific conditions. Vineyardists have dealt with the consequences of frost since weather and vineyards have existed, so it's not surprising that someone took a methodical approach to looking at various vine management strategies following a frost event. Frost is rarely even-handed in the injury it causes, especially when air temperatures are at, or just below, the critical temperature required to initiate freeze events. Some shoots are totally scorched. Others are unscathed. Still other shoots may have their tips or only a portion of leaf area frosted, with the basal portions of the shoot, including inflorescences escaping injury. To simplify the response discussion here, let's just consider these three scenarios: A) totally destroyed shoots; B) healthy shoots, and C) shoots with injury to the tips and/or some degree of leaf area, but with apparently unaffected flower clusters…. a first course of action would be to survey the frosted vineyard and determine the classification of injury and the pattern of injury within the vineyard. As you illustrated in your question, topography would obviously affect the pattern or incidence of injury within the vineyard, but also the severity of injury on a given vine.

In areas where a significant portion of the shoots (is) "A" (totally destroyed), most (possibly 75% or more, but varies by variety) of the current season's crop potential of these vines will have been lost. New shoots will emerge in time from base buds on cordons or from secondary buds in the compound bud of cane-pruned vines. Some of these new shoots will bear some crop. The amount of crop will depend on (i) variety, (ii) training system, (iii) exposure of the buds during their development, and (iv) general management of the vines in the previous year. Certain hybrid varieties, for example, can have very fruitful base buds. High training systems (such as GDC) tend to have somewhat more fruitful base buds than do low-trained (such as VSP) vines owing to the greater sunlight exposure of buds on high training systems. Canopies that were relatively thin and well exposed to sunlight in (one year) will likely have more fruitful base buds in (the next year) than would canopies that were heavily shaded in (the first year). Growers understandably feel a compelling need to do something, anything, to help vines that are totally scorched ("A"). Would the stripping of damaged shoots benefit the vine? With vines that have total loss of shoots there would likely be no benefit to this strategy. Work in California (Winkler, 1933; Lider, 1965; Kasimatis and Kissler, 1974) suggests that while a positive response (slight crop increase) to stripping damaged shoots might *occasionally* be observed with *some* varieties (such as 'Tokay' in the Winkler study), the overriding result was no significant increase in yields. Furthermore, if the shoots were partially lignified at their point of attachment to older wood when the stripping was done (18- to 24-inch shoots), the manual breaking out of damaged shoots often damaged the base buds.

What about vines that have long shoots (24 inches or longer) that had their tops/tips frosted, but which appear to

have unaffected flower clusters (what I called scenario "C", above). The consequence of this damage is difficult to accurately predict, but let's try. A damaged shoot will initiate one or more lateral shoots at nodes proximal (below) to the point of frost injury. We've all seen this response with shoots that were decapitated from grape cane girdlers, periodical cicada egg-laying, hedging, wind damage, or from a host of other reasons. The new leaf area of the lateral shoot(s) will compensate in time for the primary shoot leaf area lost to frost. However, the lateral leaf area may not develop rapidly enough to ensure good fruit set on the subtending clusters. We know from leaf pulling research that pulling leaves prior to bloom can cause small reductions in fruit set by depriving the vine of a source of carbohydrates at a critical time (bloom and fruit set). This can be good if we're simply trying to reduce cluster compactness. If the leaf area to flower ratio is greatly depressed, however, the reductions in set may be much greater than desired. There's not a lot you can do here – it simply takes time for the vine to re-foliate after a frost. But don't expect full set on shoots that are damaged in this ("C") fashion.

Vines that bear largely unaffected shoots ("B") will generally set and mature a normal crop. One could do some shoot-thinning (or cluster thinning) of these vines if/as fruitful secondary shoots appear in order to standardize the crop to primary crop only (see following discussion).

The above discussion focuses primarily on the yield response of frosted vines. What can you expect in regards to fruit ripening? It's easier to predict the ripening pattern of vines that have completely destroyed shoots ("A") than it is for vines that have partially destroyed shoots ("C"), or those that have a mix of healthy ("B") and damaged shoots. The clock is reset for vines that have lost all shoots to frost. Base and secondary buds will eventually produce a full canopy of leaf area, assuming the temperatures were not so cold as to cause vascular injury. This "second" flush of canopy will have some crop, depending on variety, etc., and this crop will ripen in a generally predictable fashion. It will, however, reach commercial maturity somewhat later than a normal crop owing to the fact that budbreak of the second canopy was more than a month later than the original budbreak. On the positive side, it will be a lighter than normal crop and this will accelerate ripening to a point.

The picture is muddied for vines that bear a mix of destroyed ("A"), damaged ("C"), and perfectly healthy shoots ("B"). Here we have two or more discrete populations of fruit that differ in the *onset* of ripening, if not the *rate* of ripening. The populations may be mixed on the same vine, and will very likely differ within sections of the vineyard due to topographic impacts of the vineyard on frost incidence. What is the predicted outcome for such vines? Mardi Longbottom described such a situation that occurred in Coonawarra Australia following a frost in 1998. In sum, Mardi found that the two populations of fruit (primary shoots vs. secondary shoots) did indeed have large differences in Brix at veraison. Those differences tended to converge with ripening, however, and the crops were ultimately picked at the same point in time. They had decided not to drop one or the other crop in advance, which was a gamble, but it paid off for them (quantity-wise, anyway) to harvest

the sum of the two crops. Lider (1965) reported a similar pattern of Cabernet Sauvinon maturation in the Napa Valley, with the crop on primary shoots running about 3.0 Brix greater than that of the secondary crop in the week prior to harvest on differentially frosted vines. Lider's advice to differentially sample affected portions of the vineyard makes as much sense today as it did 45 years ago. Seasoned growers know that vineyard topography, variation in vine capacity, and soil characteristics can affect the rate of crop maturation and will stratify their vineyard sampling (and harvest) accordingly. Variable frost damage adds another layer of complexity to this sampling approach. What are your options? One potentially compelling reason to strip off both uninjured and partially injured shoots on frosted vines is that it resets the vine to a common crop ripening sequence, and avoids the asynchrony described above. The negatives are three-fold: (i) you will further reduce yield potential; (ii) you might push the ripening end-point beyond what your site/variety/season mix can adequately ripen; (iii) and it incurs a labor expense. In the case described with the leading question, you are starting with a very late-ripening variety (Norton) in a site that has shown its potential fro frost damage. If, on the other hand, you had a variety such as Seyval, that has very fruitful base buds, and which ripens early, completely shoot-thinning a partially frosted vine would make more sense (if done immediately after the frost, not a month later!)

Some other general considerations of frosted vines: First, never give up. Even heavily frosted vines may bear a nominal – even "adequate" crop. Secondly, fungal pest management and canopy management should be prudently applied to avoid defoliating disease or shaded canopy interiors, respectively. Remember, we are, in part, farming *this* season to provide optimal vine conditions for *next* year's crop. Light crops on otherwise high-capacity vines can lead to overly vigorous growth, necessitating perhaps some added labor in shoot hedging. Go easy on the fertilizer if the crop is dramatically reduced.

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Plant Nutrition Reminders (adapted from an article by Fritz Westover, Texas A&M viticulturist).

Plant nutrition reminders:

Proper vine nutrition is often neglected until an obvious problem appears. Following a flurry of diagnoses and corrective measures, the symptoms go away and balanced nutrition is often forgotten about again until another deficiency appears. There are the occasional odd nutritional anomalies that

defy explanation and may be hard to correct, but fortunately these situations are rare. Most nutritional imbalances are relatively easy to correct within a 12 to 24 month period, if correctly diagnosed. Correct diagnosis of an existing or an impending nutrient imbalance can be achieved by using one or more of three principal approaches: soil analysis, plant analysis, and visual observation of symptoms or general vine performance. Knowledge of past problems and past corrective measures helps inform decisions about potential corrective approaches.

Soil Analysis: Detailed soil analyses are recommended before vineyard establishment, mostly to determine the pH, soil organic matter (SOM), cation exchange capacity (CEC) and absolute quantities of mineral nutrients available for plant uptake. Routine or "maintenance" soil analyses are recommended every 2 or 3 years to monitor nutrient reserves and soil chemistry changes due to leaching of nutrients, additions of fertilizers, and removal of nutrients by annual cropping. Soil tests provide a quantitative measure of the quantity of plant nutrients available in the tested soil. Soil samples typically include pH, phosphorus, potassium, calcium, magnesium, zinc, manganese, copper, iron and boron; however, the addition of CEC and SOM to soil reports will improve nutrient management decisions. For example, changes in pH may occur over time with the addition of some nitrogen-containing fertilizers (i.e., sulfate or ammonia, ammonium nitrate and urea). Subsequently, lime application rates to correct acidity are based on both soil pH and CEC. Soil colloids with a high CEC and SOM may contain larger quantities of exchangeable hydrogen and aluminum ions, inducing a lower soil pH. Soil tillage may decrease SOM by increasing erosion and by oxygen enrichment of the soil and increased microbial activity. Soil microbial activity has been correlated with SOM content and thus, periodical testing of SOM may also indicate the impact of farm practices on microbial communities involved in nutrient cycling.

Plant tissue analysis: Soil analyses inform us about the relative availability of nutrients to the plant. Plant tissue analysis tells us how much of each essential nutrient is contained in the plant sample (in ppm or percent of dry weight). Sufficiency levels of what is available in the soil and what is absorbed by the plant are occasionally different for a given nutrient, although the two tests are more often positively correlated. Plant tissue analyses reveal the actual nutrients that the vines were able to remove from the soil and utilize and thus, indicate the effects of soil amendments and cultural practices on vine health. The time of season to collect plant tissue samples depends upon the standards adopted in that area. Samples collected at or shortly after full-bloom offer a good snapshot of the vine's overall nutrient status. Where bloom-time analyses indicate borderline nutrient levels, particularly for nitrogen or potassium, a second sampling my be warranted in late-summer (70-100 days post-bloom). The tissue collected and analyzed is the leaf petiole. Samples of about 75 petioles collected from leaves located opposite the flower/fruit cluster around bloom-time are the appropriate tissue. The target values for nutrients (Table 1) have been standardized for petioles collected at full bloom or late-summer in the Mid-Atlantic region. Target values for vineyard soils in the Mid-

Atlantic are also provided in Table 1 for reference. Detailed instructions for collection petiole samples may be reviewed at Tony Wolf's website: http://www.arec.vaes.vt.edu/alson-h-smith/grapes/viticulture/extension/growers/documents/grape-petiole-sampling.pdf

Visual Observation: Frequent scouting trips in the vineyard throughout the season are an absolute necessity for identifying early stages of nutritional disorders in grapevines. Visual observation of vine nutrient status is free of charge and may be combined with disease scouting and other routine activities in the vineyard. Many viticulturists look at visual observation as a means of discovering nutrient deficiencies in vines or sections in a vineyard based on symptoms expressed on foliage. Observations of excessive vigor or nutrient toxicities, however, are also key indicators of how a nutrient management program is affecting vine growth. It is also important to realize that not all foliar disorders are nutritional in origin. Herbicide toxicity, for example, may appear similar to certain nutrient deficiencies. Leafroll virus disease may be mistaken for phosphorus deficiency on red-fruited grapevines. Additionally, vines located on hilltops may be subject to shallower or rapidly drained soil conditions compared to lower areas, and may more readily show deficiencies of water-mobile nutrients such as nitrogen, potassium, magnesium and boron, especially during periods of drought. If uncertain about the nature of a disorder, a grower may wish to collect petioles from vines showing questionable growth patterns and submit them to a lab for a "diagnostic" nutrient analysis. Diagnostic petiole samples may be collected at any time of year and should always be submitted with a separate sample of petioles for comparison (collected from the same shoot position on healthy vines). Foliar disorders may be observed on the scale of an entire vineyard, section of vineyard, individual vine or individual leaf. Disorders that are observed over a large portion of a vineyard are potentially the result of a nutrient deficiency. Biological disease agents are suspect when an individual vine or patches of vines are affected. Successful diagnosis of foliar disorders depends upon grower experience. Combining the visual clues with the soil and plant diagnostic information provides a powerful means of correctly identifying actual or impending nutritional problems.

One can formulate a fertilization strategy by following the guidelines in the nutrition chapter of the Wine Grape Production Guide for Eastern North America. A comment on foliar fertilization: this might be desirable if vines are very low in particular nutrients such as nitrogen or boron, but the general response is ephemeral; a more persistent response can be obtained by using soil application of what are normally chaper fertilizers. If you choose to use foliar fertilizers, be wary of mixing with pesticides and/or spray adjuvants, especially during hot, humid weather. We have seen some dramatic injury occur to developing berries and leaves when certain foliar fertilizers are combined with pesticides.

In-depth discussion of grapevine nutrient requirements, deficiency symptoms and corrective measures is provided in the Wine Grape Production Guide for Eastern North America (2008), which is now available at:

http://palspublishing.cals.cornell.edu/nr a_winegrapecontent.html

Table 1: Target values for soil, bloom petiole, and late-summer petiole samplings.

Nutrient	Soil		Bloom petiole		Late-summer petiole	
Nitrogen	--[z]	--	1.2 – 2.2	%	0.8 – 1.2	%
Phosphorus	20 – 50	ppm	0.17 – 0.30	%	0.14 – 0.30	%
Potassium	75 – 100	ppm	1.5 – 2.5	%	1.2 – 20	%
Calcium	[*]500 - 2000	ppm	1.0 – 3.0	%	1.0 – 2.0	%
Magnesium	100 - 250	ppm	0.3 – 0.5	%	0.35 – 0.75	%
Boron	0.3 – 2.0	ppm	25 – 50	ppm	25 – 50	ppm
Iron	20	ppm	30 – 100	ppm	30 – 100	ppm
Manganese	20	ppm	25 – 1000	ppm	100 – 1500	ppm
Copper	0.5	ppm	5 – 15	ppm	5 – 15	ppm
Zinc	2	ppm	30 - 60	ppm	30 - 60	ppm
Organic matter	2 – 5	%				
pH	5.5	*V. labrusca*				
	6.0	hybrids				
	6.5	*V. vinifera*				

[z] Soil nitrogen is not normally evaluated for vineyards.

[*] Calcium level is normally adequate when pH is in the proper range for the grape variety.

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