



# Nebraska VineLines

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Lincoln | EXTENSION

University of Nebraska Viticulture Program

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## UP AND DOWN WEATHER RAISES QUESTIONS FOR GRAPE CROPS

A warm late winter/early spring followed by record high temperatures and then low temperatures, not to mention heavy rain and hail, tend to make a grape grower nervous, but unless we get severe cold in the next few days, there is a good chance of a good, possibly great, 2017 vintage. Weather events during flowering can have significant impacts on fruit set and thus potential yield so we're not out of the woods yet. At this time, it is important to pay close attention to the recommendations noted elsewhere in this issue, whether your vineyard has been impacted by hail or cold temperature events or not:

Disease management – the two most important fungicide sprays should take place **just before bloom and about two weeks after.**

If hail or frost has damaged your vines, **it is crucial** that you maintain normal management practices including fungicide sprays and good canopy management practices, even though the damage may have reduced or eliminated this year's crop.

It is tempting to say, "since there's no crop to protect, I can skip sprays and other labor intensive practices", but **this is not the case!**

After fruit set, assess potential crop load.

If crop has been significantly reduced, avoid Nitrogen fertilization, since it may stimulate excessive vegetative growth.

Aggressive canopy management may be necessary to maintain **crop balance.**

Cultivars vary in terms of ability to be fruitful on shoots from secondary buds, so be patient! A partial crop may be feasible in spite of primary bud losses.

I am cautiously optimistic that 2017 will be an outstanding vintage, so good luck with your grape and wine enterprises. I'll look forward to tasting some great Nebraska 2017 wines!

## 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.

**Sage Advice From Dr. Dami (The Ohio State University) for Frosted Grapevines**

*Critical temperature (CT):* is defined as the temperature that causes damage after exposure for 30 minutes. Typically, CT is reported as the temperature that causes 10%, 50%, or 90% damage of buds or young shoots. During deacclimation, grapevines become increasingly sensitive to temperature below freezing (32<sup>o</sup>F) and CT varies with the stage of bud development. That is, buds become more sensitive as they grow in early spring. The following is an example of critical temperatures that cause 50% damage of grape buds and young shoots in

Concord

<u>Stage of development</u>	<u>Critical temperature</u>
Swollen bud stage	26 <sup>o</sup> F
Bud burst (break)	28 <sup>o</sup> F
First unfolded leaf	28 <sup>o</sup> F
Second unfolded leaf	29 <sup>o</sup> F
Fourth unfolded leaf	30 <sup>o</sup> F

CT also varies with weather conditions including air relative humidity and corresponding dew point. Dew point (DP) is the temperature at which water condenses out of the air as dew or the temperature that corresponds to 100% relative humidity. Condensation releases heat and slows the drop of air temperature. Thus, if DP is higher than CT, heat will be released before reaching damaging temperatures and may provide some protection. If the air is dry, DP is low and temperature will drop rapidly and may reach CT and thus cause more damage. Last week's event is a white frost, characterized by a high relative humidity, which means that DP temperature was close to air temperature (see figure below). The wetness of grape shoot tissues may have worsened the extent of damage since wet conditions lead to ice nucleation at warmer than cooler temperature (by preventing supercooling).

*Frost damage symptoms*

If leaves are already apparent and they are damaged they first look water-soaked, oily, and droopy. In a day or two and when it warms up again, the small shoots turn brown and crispy. Swollen buds in a wooly stage are difficult to assess visually. However, by touching the buds you could feel they're crispy, crunchy, and brittle and fall off readily.



### Shoots are frosted, what now?

It is human nature when we face a crisis or an issue like this, we are anxious and can't help it and want to do something, anything to remedy a situation. In this case, what to do with damaged shoots? I've read the very few reports on managing vines after frost damage and the information is mixed and not consistent. In other words, there is a need for more research on this topic (just like what we experienced with the polar vortex in 2014). I will summarize the different situations reported in California, Virginia, Australian, and New Zealand. In any case, growers need to decide on a strategy: 1) focus on getting any yield from frosted vines this year, or 2) sacrifice some/more yield this year for the benefit of next year's crop. Also, growers should weigh in the cost of labor involved to remove damaged shoots against the gain of crop salvaged (i.e. is the extra labor worth it?). Having said that, I know most of our growers do not conduct shoot thinning. This is the year to do it if you have damage so shoot thinning will be done to remove damaged shoots and adjust shoot density at the same time.

1.) Damage at early stage of bud development (e.g. buds well to 1-leaf open): in this case, do nothing and young shoots should be left alone. Rubbing off injured swollen buds would risk damaging the remaining secondary buds. Remember grapevines have compound buds. If the primary shoot is damaged, then the secondary will grow with 30-70% crop potential.

2.) Damage of more developed shoots with no visible clusters (inflorescences): work in CA showed that cutting (pruning) the damaged shoots at the base was better than rubbing off (removing by hand) the shoots or doing nothing. It appears that the benefits of this practice are variety-dependent since Chardonnay benefited more than Cabernet Sauvignon.

3.) Shoot tips are damaged but clusters (inflorescences) on primary shoots are not damaged: clusters from primary shoots may survive and continue to grow. While vines are recovering, clusters may also be produced from laterals and secondary shoots. This creates the situation of two sets of clusters that may be different in development by 2-4 weeks. In Australia, at harvest time, the maturity difference between the two sets of fruit was negligible. However, this may be tricky with late ripening varieties (e.g. Cab franc) in a short season in Ohio.

On the other hand, removing all secondary clusters may promote a more vegetative growth thus undesirable vine balance and fruit quality. This is a situation where growers have to wait and observe fruit development of each variety and the warmth of the growing season and then adjust (or not) the crop accordingly.

### Other tips to consider during the season:

- First, do not panic! Things may look worse now than few months from now. Grapevines have an amazing way of recovering and compensating for yield. Also, the percent of damage does not equate the percent of crop loss.
- The best way to **assess crop potential** in 2017 is **after fruit set** when the clusters are visible. Cluster number per vine should give you an idea about percent cluster number loss. Please check this link to estimate your crop: [ohioline.osu.edu/hyg-fact/1000/pdf/1434.pdf](http://ohioline.osu.edu/hyg-fact/1000/pdf/1434.pdf).
- Whether the damage is severe or not, you **should not discontinue your disease and insect management program**. You need to keep the vine canopy (shoots, leaves, and fruit) healthy.
- Fertilization: if the damage is severe and only fruitless shoots recovered, this situation may lead to excessive shoot growth and vigor. You should **avoid nitrogen fertilization**. If the damage is minimum and a normal crop is expected, continue a normal fertilizer program. If you practice split application of nitrogen (N), skip the first one and then, based on the fruit to shoot growth, decide whether to apply the post-fruit set N application.
- Canopy management: due to excessive foliage and resulting shading you may need to be **more aggressive with your canopy management** practices.
- Disaster Assistance: **Contact your local USDA-FSA (Farm Service Agency)** and report to them your crop loss. It is important that you record the extent of damage you have, in case some assistance program becomes available.

### Food for Thought - Things to keep in mind:

-Generally, varieties bear fruit on shoots originated from primary buds. Some bear fruit from secondary and base buds. Examples include hybrids such as Seyval, Vidal, Dechaunac, Chancellor, Foch, Baco noir, and Marquette.

-Secondary and base buds of Vinifera and juice grapes (e.g. Concord) are not as fruitful and thus

may sustain more crop loss than French Hybrids.  
 -Early frost can be advantageous for secondary clusters to develop larger. Even primary shoots can still develop and produce a crop. In 2016, we had a great summer with plenty of sunlight and heat. Those conditions are ideal for high fruitfulness of buds this year. You may be surprised by a normal crop.

-Some growers reported the use of oil (Stylet or Amigo) with different level of success. Some had bud break delay, others did not observe it. In any case, oils would not be effective in this situation since all varieties already broke buds by the time the frost event occurred on May 8.

-Many also reported using KDL, just before (24-36hrs) the frost event. Unfortunately, all reported no impact of KDL on preventing or reducing frost injury. It is clear that KDL needs further research to investigate its effectiveness.

-Growers used various cultural practices to protect against the frost including high training system, double pruning, mowing the grass, and cultivation of row middles. The success was not as dramatic and obvious as with that observed in good sites or where wind machines were used.

## Preliminary Report of 2016 Grape Prices in Minnesota

Matt Clark, University of Minnesota Viticulture Program Director, has compiled a listing of prices paid to growers in Minnesota in the 2016 season. They appear to be listed from lowest to highest average prices paid. Interesting to compare with what was received by Nebraska growers, isn't it?

	Average 2016 Price/lb	2016 Max. Price/lb
King of the North	\$0.69	\$0.90
St. Croix	\$0.74	\$0.80
Brianna	\$0.75	\$0.90
Petit Ami	\$0.77	\$0.80
LaCrosse	\$0.77	\$0.85
Marechal Foch	\$0.78	\$0.80
St. Pepin	\$0.79	\$0.80
Frontenac	\$0.79	\$1.00
Frontenac gris	\$0.81	\$1.00
Edelweiss	\$0.82	\$0.90
La Crescent	\$0.84	\$1.00
Petite Pearl	\$0.86	\$1.00
Marquette	\$0.89	\$2.00
Frontenac blanc	\$0.92	\$2.00

## Reminder Calendar:

June 7, 2017 Missouri Viticulture Field Day, Crown Valley Winery, Ste. Genevieve, MO. Online registration: <http://www.brownpapertickets.com/event/2926634>

June 24 "Recipe to Reality" seminar which will be offered on June 24, 2017. Pre-registration required, space is limited. Registration deadline June 5, 2017. Contact Jill Gifford at 402-472-2819 or [jgifford1@unl.edu](mailto:jgifford1@unl.edu)

June 26-29 - 68<sup>th</sup> American Society of Enology and Viticulture (ASEV) Annual Conference, Bellevue, WA <http://www.asev.org/2017-national-conference>

July 10-12 42<sup>nd</sup> ASEV-Eastern Section Annual Meeting, Charlottesville, VA <http://www.asev-es.org/>

October 22-24, 2017 "Vindemia", Lied Lodge and Conference Center, Nebraska City, NE – details forthcoming <http://www.nebraskawines.com/>



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