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University of Nebraska Viticulture Program

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20th NEBRASKA GRAPE AND WINE CONFERENCE: A SMASHING SUCCESS!

Attendees at the 20th Annual Nebraska Winery and Grape Growers Forum and Trade Show held March 2-4, 2017 found that the program was beyond their expectations, noting that it:

- Was highly educational
- Had great and knowledgeable speakers
- Provided lots of take-home messages
- Was full of valuable information, and
- “Useful to enhancing my enterprise”

The Friday portion of the program led off with Ed Swanson, arguably the real “Pioneer” of the Nebraska grape and wine industry, presenting the first keynote address in which he detailed the challenges that he had to overcome in order to establish Nebraska’s first winery in 1994. He also shared his passion for the industry and his efforts to breed and develop cold-hardy grapes capable of producing high quality wine, listing ‘Temparia’ and several other potential cultivars for Nebraska and the Midwest.

Ed’s stimulating presentation was followed by a second keynote address by Drew Horton, University of Minnesota Enologist, providing advice for winemakers: “Strategies for High Acidity Wine Making in the Midwest.” Drew also had provided a much appreciated hands-on workshop on Thursday in which he demonstrated the measurement of free SO₂ by using the VINMETRICA device. He also

piqued the curiosity and interest of the winemaking professionals in making alternatives to conventional grape wines by describing the production of ciders, meads, and fruit wines. Continuing in the Enology track, Michael Jones of Scott Labs provided insights into the use of fining and traditional and non-traditional substances used for fining.

For the Marketing and Promotion part of the program, the internationally known inspirational speaker, Karen Purves intrigued the audience with her presentations on “Communicate with Strength” (two sessions) and finished with a stimulating presentation that focused on tips and tricks to enhance marketing programs with email.

Other programs and presentations were much appreciated by those in attendance, including Karen Kollars (Nebraska Tourism Commission) discussing marketing efforts, Ben Loseke (University of Nebraska Viticulture Program PhD student) giving an up-date on his research on ground covers, Marty Fisher from the Agrothermal company explaining the impact of Heat Shock and its impact on grapevines and Larry Shafer (AGRO-K Corporation) discussing foliar fertilization as a tool for management of vineyard nutrition. In addition a lively discussion on Herbicide Drift was led by Scott Dvorak (Oak Creek Vineyards) and Josh Rockemann (James Arthur Vineyards), clearly a “hot topic concerning many Nebraska and Midwest growers.”

The formal program concluded with a Round Table and Wrap-Up Discussion that involved the featured speakers, together with comments and questions from many of the attendees. Among issues facing

Nebraska grape growers besides the problems emerging related to herbicide drift, concerns were voiced about grower:winery relations and pricing policies, cost containment for both growers and wineries and the importance of promotion of the industry.

Stan Howell, Professor Emeritus from Michigan State University and viticulture consultant to VESTA, ably filled in for Richard Smart who was a last-minute cancellation because of family health problems. Stan provided advice on trellises and training systems based upon his long experience and research in the Michigan grape and wine industry. (Editor's note: Stan can well be given the title of "Father of Michigan's modern wine industry").

Finally, a Grand Awards Banquet was a fitting conclusion to this conference that represented more than twenty years' commitment to developing this exciting and vibrant industry, one that is both sustainable and a serious contributor to the Nebraska economy. Special awards presented by the Nebraska Winery and Grape Growers Association were the C. J. Schweitzer Award for contributions as a friend of the industry to Karen Kollars, Nebraska Tourism Commission, and the Pioneer Award to Jim Ballard, co-owner and winemaker at James Arthur Vineyards for his many contributions to the development of Nebraska's grape and wine industry. The menu for the banquet featured creative courses presented by the Omaha Marriott Chefs Team, which were matched to specially selected outstanding Nebraska wines. A commemorative wine glass was also given to each banquet attendee. The menu and wines can be found on the University of Nebraska Viticulture Program web site, along with many of the presentations that were featured in the program of the 20th Nebraska Winery and Grape Growers Forum and Trade Show. (<http://viticulture.unl.edu>) To conclude the evening, Stan Howell had us all smiling and laughing in response to his "Thoughts on Humor: What Makes a Story Funny?"

Will The Other Shoe Fall?

With the record or near-record warm temperatures experienced recently throughout the Midwest, in February especially, many growers are wary of "the other shoe falling", i.e., late frost or cold temperature events after bud break and new shoot growth occur. Therefore, I am providing excerpts

from a great article written recently by Dave Scurlock, Ohio State University Extension Fruit Specialist, that should be helpful as we brace for the possible cold temperature damage resulting from the recent weather. As Dave says, it may be appropriate to be "proactive"! Let's hope that Mother Nature doesn't throw us unhittable curveballs and that we escape damage from cold temperature events that may occur.

There are 2 Types of Frosts:

Radiation Frost, occurs on clear nights, the air is stratified with cold air at the ground level and warm air 30-50 feet up. Temperatures usually are above 27°F.

Advection Frost, the 2014 Vortex was an advective frost and can cause the most damage. These are large fast moving cold air masses that render even wind machines ineffective.

Frost Events -Temperature drops below 32 degrees F, **amount of damage is dependent on how long temperatures are below that point**. Damage starts when temperatures are at 31°F for more than half an hour. 28°F is my personal number that I know we are in trouble. Spring frost will cause a loss of crop on some varieties and others may come back and produce about a 50% crop.

There are several options and of course not all of them are viable for everyone or "One shoe does not fit all." The one truly Best Option against Spring Frost is **Site Location**. I had to put this in first or get criticism for not mentioning it. The truth of the matter is most of us already have land and within those confines try to decide which site is the best. In a perfect world and you have the time and money we would all seek out the Best Site Location so we would not have to worry about such things as spring frost. Now that's off the table, what are our Best Options?

The first 4 options below are the best options available to those who do not already have stationary or portable wind machines.

Option 1- Pruning. Prune as late as you can. If you have large acreages rough prune, pruning canes or spurs twice as long, planning to come back through and cutting them in half. Grapes are apical dominant, which means they will break bud from the tip to the base. These tip buds are expendable and

delay the breaking of the basal buds. This process can gain up to 1 week of frost protection

Option 2-The application of Soybean Oil + Latron B. Soybean Oil can be purchased at Sam's Club under the name of Bakers Chef in a 5 gallon plastic container and mixed in water as an 8% solution plus the addition of Latron B as a 1% solutions. Example: 8 gallons of Soybean Oil + 1 gallon of Latron B surfactant + 91 gallons of water. You can break this down to any amount that suits your needs. This needs to be applied now and maybe a couple more times every couple of weeks to delay bud break for a total of at least 3 applications. This will delay bud break for at least 10 to 14 days. Latron B can be ordered from Simplot.com or call Johnny at 559-897-5151. This is a California supplier so be aware of the 2 hour time difference when calling and it will probably take a little time to deliver so act quickly if you decide to use this.

Option 3- Amigo Oil use 10% v/v. Example: 4.5 gallons of Amigo oil + 45 gallons of water. Apply in February and continue to apply every 2 weeks until bud swell. Depending on cultivar studies have shown bud break delay from 5 days to 3 weeks. This is another chemical that may not have any local sources, so if you want to use this, start searching.
Note: Too high a concentration can kill buds. We used 10% Soybean Oil in an experiment to try to thin peaches and we did but not very uniformly. We still had to hand thin.

Option 4-The application of KDL. Potassium Dextro-Lac or simply KDL, can be applied a couple of days to as little as 12 hours ahead of a frost event. Agro-K recommends using one gallon/acre about 24 hours before the expected frost event. This acts like an anti-freeze and can lower the freezing point a few more degrees to around 25-260F. There is another recommendation from AGRO-K that says They recommend 1 gallon of KDL and 1 qt. of System Cal per acre in combination. KDL costs approximately \$21/gal. in 2.5 gal. containers and System-Cal costs approximately \$35/gal in 2.5 gal. containers. Agro-K suggest that this treatment can give another 2-5°F degrees of frost protection. Results may vary, but some grower reports suggest this method can be helpful.

Option 5-Wind machines, both stationary and portable three point hitch machines and Helicopters. If you have wind machines then you know of their

effectiveness for use in the winter sometimes and spring frost control. There are times like the Vortex of 2014 though where the strong winds that accompanied the severe drop in cold rendered the wind machines useless.

Option 6-Irrigation. Sometimes used. It is for strawberry growers and some orchards. It is very effective in that as long as the water is being applied and ice crystals are being formed heat is released and the encased buds do not get below 32oF. Water has to be continually applied until the sun comes up and the irrigation water melts the ice. Short of this, you may do more damage to the buds.

Option 7-Copper Sprays to kill ice nucleating bacteria. Cupric hydroxide: 2.1 kg/ha @ Spray volume: 300 l/ ha this is approximately 1.9lbs/A in 73 gallons of water. Super cooling is limited by the presence of certain bacteria. To date, two have been identified as having active ice nucleation capacity. These include the stone fruit bacterial canker organism *Pseudomonas syringae* and the relative of fireblight, *Erwinia herbicola*. Activity occurs when populations of the organism exceed 10,000 bacteria per cm² of tissue surface. If one has a location where the bacteria do not achieve this population during the spring phenological stages that are susceptible, or do not achieve such populations until the last frost hazard has passed, then they are of minimal concern. Where populations are high, copper sprays, to kill the bacteria may provide some protection. The important question is whether such knowledge is available in the specific viticultural region.

Option 8-Vineyard Floor Management

Vineyard Floor Management	Temperature Change
Bare, Firm, Moist Ground	Warmest
Shredded Cover, Moist	0.5 °F cooler
Low Cover, Moist Ground	1 to 3 °F cooler
Dry, Firm Ground	2 °F cooler
Freshly disked, fluffy	2 to 3 °F cooler
High cover crop	2 to 4 °F cooler
High cover crop, restricted air drainage	6 to 8 °F cooler

Source: Glenn McGourty 2016 OGWC

Soil Water Management To Reduce Frost Risk

- Maximum protection: Bare, packed soil - either cultivated or sprayed with herbicides
- Drawbacks: Erosion risk, loss of soil organic matter, destruction of soil structure, poor footing for early spring spraying

Keep soil water content near field capacity

Wet 2-3 days early

Wet entire surface

Wet the top foot

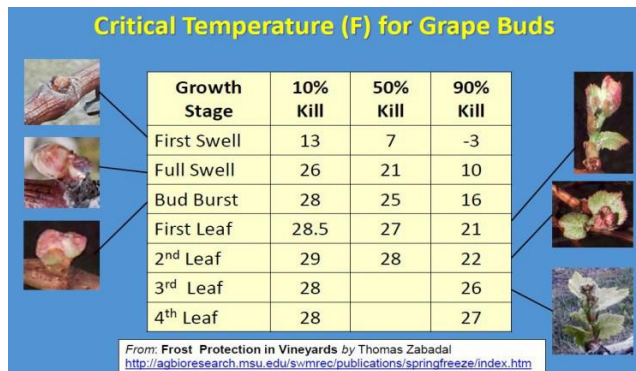
MOIST SOIL

- Water Filled Spaces
- High Heat Capacity
- High Conductivity
- Higher Minimum

DRY SOIL

- Many Air Spaces
- Low Heat Capacity
- Low Conductivity
- Colder Minimum

All of this is FOOD for THOUGHT. We cannot wait until the midnight hour and then try to do something about the weather. This is just another one of those years that we have to be proactive and have a plan of action. Below you will see the chart with the critical temperatures for grape buds at different phenological stages. I wish all of us the BEST this coming season. Just like the Boy Scout Motto says “Be Prepared”.



Option 9-Row Covers or Frost Blanket-

Row cover gently protects young plantings from frost, insects and wind. Row Cover; floating row cover is a fabric that can be used to protect young plants from frost, insects, wind, and harsh rains yet is permeable enough to allow a portion of the water to pass through the fabric. Available in 2 weights for row crops, garden beds, shrubs, individual fruit trees or deck containers.

These are used in strawberry production but maybe they can be used as an option for grapes. I can imagine that the short canes and spurs may poke holes in the row cover and destroy it. Strawberries do not have any sharp edges so this may not be a viable option unless you can hang it on wires just above the sharp canes. It is also going to be more vulnerable to high winds so it must be anchored down. In strawberry protection it is laid down going into winter and weighted down with bags of rocks. I have also seen this in the Rotating Arm Trellis in blackberries, where the trellis is laid down and the blackberry canes are covered with this row cover before winter. The row cover may have to be removed and put back on several times in some years in the spring due to spring frost.

ADDITIONAL NOTE ON FROST DAMAGE POTENTIAL:

Growing degree day (GDD) accumulation in Nebraska from January through March 10, 2017 has been slightly above 2016 (20 GDD in Lincoln, 7 in Brule), but significantly higher than several previous years (“normal” years? – over 100 higher in Lincoln than in 2008, 2010 and 2014). These large differences simply confirm what most of us have suspected or observed: this early part of the year has been considerably warmer than average. This will mean grapevine buds are going to be more de-acclimated (less dormant) and thus more vulnerable to damage from cold temperature events (frosts) as the season progresses. A positive note is that the recent cold temperatures (20s Fahrenheit and lower) are probably delaying the de-acclimation and speed of breaking dormancy. This is one of the times when we hope for extended cold temperatures to occur.

The chart below shows LT50s for a few key cultivars based on canes collected and tested in late January. Data shared by Dr. Imed Dami, Ohio State University Viticulturist corroborates the same trend, i.e., that Frontenac buds are among the cold hardiest and Marquette less cold hardy, with Chambourcin and Traminette (in Ohio) intermediate at this time of the year. LT50 means the temperature below which 50% of the primary buds will be killed.

LT50s for Nebraska Cultivars Collected and Tested January 24, 2017

Cultivar	LT50
Frontenac	-14.4
La Crescent	-13.6
Marquette	-13.3
Saint Croix	-12.9

Reminder Calendar:

March 22-24, Eastern Winery Exposition at The Oncenter – Syracuse, NY:

<http://easternwineryexposition.com/>

April 1, 2017 “Recipe to Reality” seminar, University of Nebraska Food Processing Center, Pre-registration required, space is limited. Registration deadline is **March 15, 2017**. Contact Jill Gifford at 402-472-2819 or jgifford1@unl.edu for an information packet.

April 11, 2017, Northern Grapes Webinar Series, final for this academic year, past webinar recordings available, <http://northerngrapesproject.org/northern-grapes-webinar-series>

June 15-16, 2016, Wine Chemistry Short Course with Clark Smith: <http://www.aep.iastate.edu/wine/>

July 6, 2016, Intensive Tasting Proficiency Training:

<http://www.extension.iastate.edu/wine/sensorytraining>

October 22-24, 2017, Vendemia, the NWGGA celebration of our industry, Lied Lodge Conference Center, Nebraska City. Save the date!



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