University of Nebraska Viticulture Program

January/February

Volume IX, Issue 1

Nebraska Vine Lines

Editors: Dr. Paul Read, Professor of Horticulture & Viticulture
Donna Michel, University of Nebraska Viticulture Program

Be Sure To Put The 9th Annual Forum on Your Calendar

March 3 and 4, 2006. Outstanding speakers, growers roundtables, local speakers and an outstanding trade show await you at the 9th Annual Nebraska Winery and Grape Growers Forum and Trade Show to be held at the Kearney Holiday Inn March 3 and 4, 2006. Read more about the 2 key-note speakers in this issue.

For further reading of Anna Katharine's treatment of 'Frontenac', see article on p2.

See page 5 for a note and greetings from Paul Read.

Anna Katharine Mansfield

Senior Research Fellow
Horticultural Science
Department of Horticultural Science
University of Minnesota
Enology Lab

Enologist

A native of North Carolina, Anna Katharine Mansfield became the first Enology Project Leader at the University of Minnesota in 2001. She received a MS in Food Science from Virginia Tech, where she researched wine aroma and flavor precursors. Anna Katharine oversees the enological evaluation and optimization of new cultivars and is responsible for wine aroma/flavor characterization and enology outreach.

Terry Bates

Dr. Terry Bates is working on root biology related projects at the Vineyard Lab. From low-tech root trenches to high-tech minirhizotrons, researchers are exploring the world of root growth, root distribution, and resource storage in Concord grapevines.

Refining the Concord Diet -- Terry Bates is studying the effect of soil pH and nutrient availability on Concord root growth and nutrient uptake.

Viticulture Research Associate
Cornell University
New York State Agricultural
Experiment Station

Making Wine With Frontenac

By: Anna Katharine Mansfield
UM Enology Project Leader

As the Frontenac plantings introduced to northern growing regions in the past 10 years mature, an ever growing group of winemakers are faced with the unusual winemaking parameters of this new cultivar. Traits derived from Frontenac's V. riparia ancestry help it grow and thrive in cold climates, but also make it a very different beast than its V. vinifera cousins. Consequently, putting it through the paces that would make a good Cabernet Sauvignon, Merlot or even Marechal Foch often result in an inky, unbalanced wine.

Handling Frontenac isn't difficult; it's just different. Fortunately, these differences can be manipulated to produce a variety of wine styles, making the grape more flexible than many. This allows the production of several marketable styles from one crop, and gives the winemaker options in years when the growing season has been less than optimal. Modifications in winemaking method are necessary to take advantage of Frontenac's four variations from traditional wine grapes: it is more highly colored than most V. vinifera, it has higher soluble solids and acid content, and it tends to have low tannin.

Like the fruit of its V. riparia ancestors, Frontenac berries are small, have high skin-to-pulp ratios, and tend to have colored pulp. These traits result in intense juice color. For rose production, this means that immediate crushing and pressing, without the few hours of skin time allowed in traditional rose production, results in a rich, bright rose-colored juice. Frontenac rose pigments have proven to be very stable, with little or no color loss during fermentation, and no fading as the wine ages. Tavel enthusiasts may dislike the color intensity, but attempts to lighten it by fining have so far resulted in faded wines with hues of sickly salmon. Until research reveals the exact nature of the grape's pigmentation, it may be best to accept the color as a unique and impressive feature.

Continue on page 3

For red wine production, 2-5 days of ambient skin time, with caps punched thrice daily, generally produce appropriate color. (It's important to note that pre-fermentation pectinase addition is not recommended, as it tends to turn the must into a slimy mess and inhibits good cap formation.)

In experimental and commercial production, skin contact has been extended for as long as 7 days, but the resulting deepening of color and increase of herbaceous aroma and flavor compounds has been deemed unacceptable by some taste panels when evaluation a year or two post bottling. Later tastings suggest that herbaceous characteristics come back into balance by 3 or 4 years, but additional work is needed to determine the validity of this assessment. In informal aging trials, red Frontenac wines aged up to 10 years have shown no discernable decrease in color intensity, suggesting that phenolic polymerization is minimal. Research is currently underway to determine the nature of phenolic compounds in the grape, so further information regarding this phenomenon should be available in the future.

In addition to high color, Frontenac carries the riparia traits of high sugar and high acid. Soluble solids at harvest normally range from 24-28 °Brix, though measurements as high as 30 °Brix have been reported in some Minnesota vineyards. Since this sugar level is often coupled with titratable acidity (TA) ranging from 9-14 g/L (0.9-1.4%), winemakers may choose to ameliorate with water either before or after fermentation. This method can result in a lighter-bodied wine with less pronounced fruit characteristics. To emphasize the black cherry notes typical to Frontenac, some winemakers choose to stop fermentation before dryness, or sweeten the finished wine. The resulting residual sugar adds body and mouthfeel, enhances the perception of fruit in the finished wine, and reduces the perception of acid. Since palate balance is based on the equation

Sweetness ? Acidity + Bitterness
(sugar) (acid) (tannins)

and Frontenac is naturally low in tannins, palate balance in Frontenac wine hinges primarily on the sugar/acid balance. The high acid in this variety allows the winemaker to add enough sugar to boost fruit perception without breaching the threshold of perceptible sweetness. If a sweeter product is desired, however, the high acidity and big fruity notes dominating the palate are capable of balancing a fairly high residual sugar without becoming cloying or over sweet.

To many winemakers, the most frightening aspect of Frontenac is the high TA. At harvest, TA's of 12.0 to 15.0 g/L are typical, though appropriate cluster thinning and canopy management techniques can result in significantly lower numbers. Though these numbers are initially daunting, harvest pH is generally low, ranging from 2.9 to 3.1. For this reason, malolactic fermentation is encouraged, and further deacidification with potassium bicarbonate is occasionally performed.

At the research winery, standard practice to decrease acid includes inducing malolactic fermentation with a strong culture when the primary fermentation is almost, but not quite, finished. Since high acid may stress lactic acid bacteria (LAB) culture, other fermentation parameters are optimized as much as possible-MLF is induced in the primary fermenter without racking, for instance, and yeast lees are stirred thoroughly to resuspend them in the wine at inoculation, providing nutrients for the LAB. The fermenter is kept as close to 70° F as possible, and LAB nutrient (not DAP) is used at a rate of 1.5g/gal if MLF appears sluggish.

REGISTRATION FORM
Ninth Annual Nebraska Winery & GrapeGrowers Forum and Trade Show
March 3 and 4, 2006
Holiday Inn, Kearney, NE

Name_____.

(Price includes Friday and Saturday Sessions; Breaks; Friday afternoon Wine Tasting and Reception; Saturday morning "Early Bird" coffee, Saturday Luncheon)

$110.00 Member **$**_____

$125.00 Non-Member

Name _____ $_____
(Additional attendee)

Company Name_____

Address_____City_____, State_____ Zip_____

E-mail:_____Telephone:_____

I will attend the **Saturday morning** "Early Bird" coffee; (head count is necessary for caterer planning). with the Exhibitors (cost included in registration) _____

Additional attendee (cost included in registration) _____

Friday Night Banquet

Name _____ **$45.00** $_____

Name (Additional Attendee)_____ **$45.00** $_____

Entrée Choice _____ Prime Rib _____Salmon

Additional Attendee _____ Prime Rib _____Salmon

TOTAL $_____

Registration Deadline February 15, 2006
Refunds: $15 handling fee; no refunds after February 15, 2006.

Price after deadline: $125.00 members $140.00 non-members

Walk-ins —- $150.00

Make your check payable to: **University of Nebraska Viticulture Program**

And send to:

University of Nebraska Viticulture Program
377 Plant Science Hall
Lincoln, NE 68583-0724
Attn: Donna Michel

GREETINGS FROM PAUL READ IN TASMANIA

Happy New Year and greetings from "Way Down Under" to all in the Nebraska grape and wine industry. It may seem a bit odd to you that I am sweating in the vineyards here in Tasmania, while you are dealing with sub-zero temperatures and snow and ice. The Australians have a map that shows Australia and Southern Hemisphere geography at the top and the Northern Hemisphere at the bottom, and at times it seems indeed that the world here is sort of "upside down". They, like their British ancestors, even drive on the left side of the road. That takes a bit of getting used to, but we've adapted quite well, since it seems a bit like a mirror image - driver on the right side of the car, so it seems natural to drive on the left side of the road.

However, the grapes grow beautifully here, although a bit more slowly than ours, because the spring is long and cool. It is now summer (think of January down here as being like July would be in the Midwest) and the grape berries range from peppercorn size to pea-size (near the end of December as I write this). The canopies are full and healthy-looking, with little disease in evidence. Most growers have applied several sprays for disease control, with sulfur being the most common early-season spray and a product called "Scala" (generic name: pyrimethanil) being used later in the season.

I have been working on several projects, including a "source-sink" study with Richard Smart and a PhD student (Fiona Chopping). This involves removing the growing tip of the shoot and second clusters ("sinks") and removing fully expanded leaves associated with the developing first cluster ("sources", that is, producing carbohydrate via photosynthesis). To eliminate another contributer of carbohydrate, another treatment involves girdling of the shoots below the cluster to prevent carbohydrates and other metabolites to be translocated via the phloem to the developing cluster. Each of these treatments was applied individually and in all possible combinations, with "control" vines receiving none of the treatments. Although this sounds a bit complicated, the concept is relatively simple: can various pruning treatments applied during the growing season influence flowering and fruit development and thus affect subsequent wine quality?

Another interesting project is an attempt to influence bunch architecture in a fashion similar to the approach used in the table grape industry, that is, application of gibberellic acid (GA3) to the bunches to increase the length of the rachis (bunch-stem) and that of the pedicels (stem that bears the individual berries). The purpose of this for wine grapes is to open up the cluster so that there is better air movement through the cluster and thus reduce potential bunch rot of tight-clustered cultivars ('Vignoles' would be an example of such a tight-clustered grape grown in the Midwest). Another potential benefit is better light penetration into the interior of the bunch, therefore enhancing development of color and other components affecting wine quality. I am working with another PhD student (Mark Robertson) on this project and a couple of others. Because of my background and expertise in working with growth regulating chemicals, I helped design this experiment and another in which we physically remove parts of the cluster. Again, the goal is to determine if the better air movement through the bunch will reduce disease and if the better light penetration will have a positive effect on fruit and wine quality. We are already seeing a response in the GA3 experiment, with at least one treatment causing an elongation of the bunch rachis. These and other projects with which I'm working involve a lot of time-consuming hand operations. This causes me to remind myself (and the students) that research is a lot like Edison's characterization of invention: 5% inspiration and 95% perspiration! I'll comment on these experiments and others when I speak at the 9th Annual Nebraska Winery and Grape Growers Forum and Trade Show in March.

Although Tasmania has only an area a little larger than Iowa, it has very diverse topography, climate and soils. It has high mountains and rugged wilderness, shallow bays and beautiful beaches (it hasn't been warm enough yet to swim in the ocean or bays, however), rolling hills and fertile volcanic-derived soils. Many grape growers like to situate their vineyards on north-facing slopes to take advantage of the sun's angle, much like the German industry, for example, where they select land with a south-facing aspect. Much of the vegetable production is in the northwestern part of the island, where the rich volcanic soils are located. There are also some intersting "alternative" crops being grown, including poppies for the pharmaceutical industry, boronia for the food/flavorings industry, pyrethrum (a daisy-like flower) from which an insecticide is produced, and tulip and lily bulb production. However, as I mentioned in an earlier note, sheep production is one of the most important agricultural enterprises, and along with forestry, constitute a large part of Tasmania's total industrial output. Their other major industry is tourism, and now that their school year is over, I've been told to expect to see a lot more cars with "mainland" licenses. They have also progressed greatly in combining tourism with vineyard and winery enterprises. They aim not just to sell wine, but want to sell the **experience** to give the visitor more than just a look at grapes and wine. I'll look forward to discussing various aspects of marrying the tourism and vineyard/winery experiences, as practiced in Tasmania. There could be some ideas for our industry to consider.

Although the time here has just seemed to have flown by, I'm excited about approaching another great year in the Nebraska grape and wine industry. I hope that your new year of 2006 is off to a wonderful start and that you are preparing for the coming growing season. If you haven't already done so, be sure to clean up your equipment, destroy any prunings and debris left in the vineyard, order necessary chemicals, planting stock, tools and equipment and of course register to attend the Forum in March. Let's hope for another great year in 2006!

Cheers,

Paul Read

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Once MLF is complete, the TA of the wine measured again, and wines that are still deemed to be too acidic are treated with a conservative amount of potassium bicarbonate. The wine is then put into cold stabilization, and TA checked in a couple weeks—if it's still high at that point, another small bicarbonate addition is made, with the total amount still kept below the 15g/gal recommended on the label. It's important to note that bicarbonate additions are made incrementally, rather than all at once, to insure that the acid reduction can be fine-tuned to prevent excessive deacidification or production of off-flavors. Final acids higher than those acceptable in traditional wines can work well in Frontenac; because it is naturally low in tannin, the wine can support higher finished TA's and still present a balanced palate structure. Lack of tannins makes acid the primary wine component giving Frontenac aging potential, so a TA of 9g/L or so is appropriate for reds meant for aging. Calcium carbonate additions for deacidification are generally not recommended, primarily because the off-notes produced are usually deemed unpleasant by consumer panels.

Both increased aging potential and improved flavor characteristics can be achieved through barrel aging or contact with oak chips or staves. Oak-derived aroma and flavor compounds can round out and soften the aggressive one-note cherry typical to Frontenac, producing a more complex wine suitable for consumption with heavier dishes. Enological tannins, which can be added before or after fermentation, are now widely available, but determining the correct rate of addition is a matter of trial and error. All tannin additions require extra aging to allow components to integrate; even so, many tannin-enhanced wines exhibit a disharmonious mouthfeel, where the tannins seem divorced from the rest of the palate, and the whole wine a bit clunky As more tannin products are available and more winemakers experiment with them, this option may become more approachable, but the inexperienced should approach it with caution.

The final legacy of Frontenac's riparia genetics is the occurrence in some wines of herbaceous notes, described as 'tarry' or 'resinous.' These are usually prominent when the vines have been overcropped, but in properly ripened fruit they should be faint and just enhance complexity. Yeasts that claim to 'enhance varietal character', however, should be avoided; they tend to enhance vegetative character as well. In fermentation trials performed at the Research Enology Lab, trained tasters preferred Frontenac reds produced with RC212, Pasteur Red, and BM 45, and L2226 yeast strains. Wines produced from Fermirouge and Barolo 97 were deemed to lack fruit and/or body.

As a general rule, aroma and flavor characteristics in Frontenac are dominated by a bold cherry note, with lesser hints of black currant and general red fruit. Trained sensory panels have also identified notes of grass, green bean, evergreen, tar, and in some cases, chocolate.

Synopsis: Wine styles produced from Frontenac

Commercial production efforts hint at Frontenac's flexibility in various styles. As mentioned above, rose'-style whites have been successfully produced from must allowed 0-8 hours skin contact time, and have proven popular in the commercial market. Though darker than traditional rose's, the wine color is jewel toned and strikingly deep, with no hint of tapering to an insipid salmon. Cool (55°F) fermentation with an aromatic yeast, like Cotes de Blancs, is recommended. The nose and palate showcase a bright, Bing cherry note that is enhanced by an off-dry finish and moderate acidity. Depending on the fruit, sugar levels from bone dry to moderately sweet have shown appropriate balance and customer acceptance.

As a red wine, Frontenac shows a deep garnet color, sometimes tinted with purple. Cherry notes predominate, but are typical of black or sweet cherry rather than the brighter note of the rose. Earthy and slightly herbaceous notes round the palate, supported by a moderate acid backbone. Two to five days of skin contact produce optimum color, and some producers advocate producing separate lots of wine (a 2 day and a 7 day, for instance) and blending prior to cold stablizaiton to increase complexity. Barrel aging adds welcome structure and a synergistic hint of vanilla. While not as complex as a hearty vinifera, Frontenac packs a solid punch, and stands up well to heavier dishes.

A few creative producers have used Frontenac to produce port-style wines of outstanding quality. In port production, fermentation is stopped through the addition of grape neutral spirits while sugar content is still high, resulting in a product with higher sugar and 15-20% alcohol. The higher acid levels balance the increased sugar beautifully, deepening the typical fruit notes into lush shades of cherry, raspberry, black current, and stewed fruits. Some Frontenac ports exhibit pronounced chocolate notes, which seems dependent on vineyard microclimate. This dessert wine is a showstopper; a Frontenac port won a consensus gold at the 2004 Indy Wine Festival. It wouldn't be surprising to see an increase in commercial production in the coming season.

PROGRAM

DRAFT—Subject to Change

Ninth Annual Nebraska Winery and GrapeGrowers Forum and Trade Show
March 3rd and 4th, 2006
Holiday Inn, Kearney, NE

Friday—March 3, 2006

8:00a	Registration Opens—Commons Registration Area
8:30a-10:00a	NWGGA Annual Meeting
10:00a-6:30pm	Trade Show opens—Silent Auction opens—Loper Room
11:30a-1:00p	Lunch **- On Your Own**
12:00-1:00p	NWGGA Board Meeting
1:00p-1:15p	Welcome—**Dr. Mark Lagrimini**, Head, Dept of Agronomy and Horticulture, University of Nebraska-Lincoln
1:15p-2:15p	**Anna Katharine Mansfield**, Enologist, University of Minnesota; "Stubbornness, Persistence, and Flexibility: Cold-Climate Cultivars and the New Wine Frontier"
2:15p-3:00p	**Terry Bates**, Viticulture Research Associate, Cornell University; Soils
3:00-3:30p	Break—visit Tradeshow—Loper Room
3:30-4:15p	**Paul Read**, Professor, University of Nebraska Viticulture Program—Vineyard experiences in Tasmania
4:15-6:00p	Visit Trade Show—Loper Room
6:00-6:30p	Wine Tasting– Loper Room
7:00p-9:00p	Annual Banquet-Ballroom—Silent Auction Winners

Saturday—March 4, 2006

7:00a-8:30a	Early Bird Trade Show—Coffee and Rolls for attendees
Session I	**Advanced Viticulture**
8:30a-9:15a	**Terry Bates**—Soils and Fertilizers
9:15a-9:45a	Growers Panel—Moderated by **Terry Bates**
9:45a-10:30a	Break—Visit Trade Show—Loper Room
10:30a-11:00a	**Mark Steele,** UNL CALMIT- "Geospatial Technologies for Nebraska Vineyards." Conservation Survey Division
11:00a-11:30a	**Chelsey Wasem,** "Are Insects a Problem in your Vineyard? " Dept of Entomology, University of Nebraska Lincoln
11:30a-1:00p	Grazing Lunch in Trade Show Area
1:30p	Trade Show Closes
1:30p-2:30p	**Tim Creger**—"Pesticide Regulatory Issues for the Nebraska Grape Industry", Department of Agriculture
2:30p-5:00	Tourism Partners Panel Part I and II
Session II	**Enology and the Commercial Winery**
8:30a-9:05a	**Anna Katharine Mansfield, "**Making Wine from New Cold Hardy University of Minnesota Grapes."
9:05a-9:45a	Wine Varietal Panel—Moderated by **Anna Katharine Mansfield**
9:45a-10:30a	Break—Visit Trade Show—Loper Room
10:30a-11:00a	**Anna Katharine Mansfield** — "Sensory evaluation in the commercial winery—How to establish a tasting panel for small or mid-sized operations."
11:00a-11:30a	**TTB**—What to expect in an on-site audit..
11:30a-1:00p	Grazing Lunch in Trade Show Area
1:30p	Trade Show Closes
1:30p-2:30p	Quality Assurance (Winery Council)
2:30p-5:00p	Growers Chemical Application Certification—(Tentative)
Session III	**Fundamentals of Viticulture**
8:30a-9:15a	**Steve Gamet**—"Vineyard Environments Across Nebraska", University of Nebraska Lincoln Viticulture Program
9:15a-9:45a	Growers Panel—Beginning Concerns
9:45a-10:30a	Break—Visit Trade Show—Loper Room
10:30a-11:00a	**Terry Bates**—"Soils and Site Selection"
11:00a-11:30a	State Level Marketing
11:30a-1:00p	Grazing Lunch in Trade Show Area
1:30p	Trade Show Closes
1:30p-2:30p	**Kris Sperry,** "Basic Winery Design"
2:30p-5:00p	Beginning Vineyard Concepts. Growers Panel & Growers Panel on Successful Varieties/Contracts

5:00p Adjourn—Have a safe trip home! See you next year!

VITICULTURE PROGRAM

377 Plant Science Hall
Department of Agronomy
& Horticulture

Lincoln, NE 68583-0724

REMEMBER—Future Forums

2006—March 3 and 4—Holiday Inn, Kearney, NE
2007—March 2 and 3—Holiday Inn, Kearney, NE
2008—February 29 and March 1—Holiday Inn, Kearney, NE

FOR YOUR CALENDAR

January 27-28, 2006 (Friday and Saturday) = Iowa Wine Growers Conference, Hotel Ft. Des Moines, Des Moines, IA. Contact Paul Domoto, 515-294-0035 or email: domoto@iastate.edu: **Friday Session (Member Prices: $75, Wine Tasting $35; Saturday Sessions—$95—Evening Banquet—$50;** Contact 515/262-8323 or 800-383-1682

February 4-6, 2006—Mid-America Wine and Grape Conference; TanTara, MO; **Conference Fees—$125.00—Pre-conference viticulture and enology $25—MEALS—Sunday Super Bowl Dinner—$45. Monday Breakfast—$12; Monday Luncheon—$14.00; Monday Grand Banquet—$70. (Prices are with conference fees)** Higher pricing without conference fees. Information 573-437-2416.

February 3-4, 2006—Minnesota Grape Growers Cold Climate Grape & WineConference, Kahler Grand Hotel, Rochester, MN; **Friday Afternoon Sessions $50; Saturday Sessions—$125; Saturday Banquet—$45.**

March 24, 2006—Pruning and Advanced Viticulture Workshop/Field Day — Kimmel Education and Research Center, Nebraska City, NE

April 20, 2006 —Western Nebraska Pruning and Advanced Viticulture Workshop/Field Day—Scottsbluff, NE

June 24, 2006 —Trellis Systems Field Day—Heritage Vines Vineyard and Czechland Vineyards, Crete and Wilber, NE

July 15, 2006—Multi-State Field Day hosted by the South Dakota vineyard group, probable location—Devils Nest, NE and Yankton, SD area

November 11, 2006—Fall UNL Viticulture Program Workshop, Lincoln, NE, University of Nebraska-Lincoln East Campus Union

Further details of these programs will be announced in the Nebraska VineLines and on the University of Nebraska Viticulture Program website. http://agronomy.unl.edu/viticulture

9th ANNUAL NEBRASKA WINERY AND GRAPE GROWERS FORUM AND TRADE SHOW REGISTRATION MATERIALS ENCLOSED