



NORTH DAKOTA GRAPE & WINE ASSOCIATION

WINTER 2022/2023

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ND

NDGWA Mission

"To carry out education, promotion, and extension of the art and science of viticulture and enology in North Dakota and surrounding areas including any and all agricultural, horticultural, and related purposes connected therewith."



NDGWA

**CHECK US OUT AT
WWW.NDGWA.ORG**

Greetings from our President...

Winter came a little early this year compared to last year, and I think it's going to stay. The first week of November we rushed around the vineyard trying to finish some of the projects that we put off this summer, and what we didn't get done will have to wait till spring. The Grape harvest went well and the production was down, because of a June hail storm that created about a 35% loss.

The NDGWA Summer Tour was a great success, beginning at the NDSU test plot on campus. We then traveled by bus to Bergeson's Nursery and Jerome Larson's Vineyard in Fertile MN. We then traveled to the Grape Mill Vineyard & Winery in East Grand forks for wine tasting and tour.. We ended the day at the home of Steve & Pat Sagaser's for brisket, BBQ chicken, potato salad, beans and slaw, and a little wine tasting. The Board is planning for the 2023 summer tour in the Carrington area. If you missed this year I hope you can join us next, it's always a great time.

The NDGWA Board is in the process of planning the 2023 Annual Meeting that will be held in Dickinson on Feb. 3 and 4th. More details will be on the NDGWA Website.

Tourism in North Dakota is the 3rd largest industry and the many wineries around the state certainly are a big attraction to many tourists. Sales Tax collection in the state is now well over \$80,000.00 per year, just from the wineries. I remember the days at the Capitol in front of committee's, when some implied that we were hobbyists, and maybe that is how it started, but our industry continues to grow each year with new vineyards and wineries starting across the state. As we look forward, I think this industry will continue to grow with the new grape varieties from NDSU Plant Science Dept. along with the partnership with the Northern Crops Institute.

Enjoy your winter !

*Rodney Hogen
President , NDGWA*

MEMBERSHIP

Anyone interested in supporting the grape and wine industry in North Dakota is encouraged to join the NDGWA. Our members span the range from hobby growers and winemakers to commercial farmers and wineries. Even if you are not in the business but love wine and fruit and want to be a part of growing the industry in North Dakota, consider membership in the NDGWA. Use PayPal to join or renew your membership on-line:

MEMBERSHIP OPTIONS

Student membership –

\$15 annually

- Includes one voting membership and one member discount at each NDGWA event.

Individual membership –

\$30 annually

- Includes one voting membership and one member discount at each NDGWA event.

Couple's membership –

\$45 annually

- Includes two voting memberships and two member discounts at each NDGWA event.

Commercial membership –

\$75 annually

- Includes two voting memberships and two member discounts at each NDGWA event.

- Includes a LOGO listing on the NDGWA website with contact information and active links to your websites/social media. (Vineyards and Wineries with a non-commercial membership will receive a member affiliated listing with business name and address.)

- Will be featured in NDGWA sponsored marketing material.

GO to the NDGWA.org website to find our PAYPAL link

Alternatively, you may download the Membership Application form and mail the completed form along with your payment to:

NDGWA

c/o Harlene Hatterman-Valenti,

Treasurer

Department of Plant Sciences,

NDSU Dept. 7670

PO Box 6050

Fargo, ND 58108-6050

MARQUETTE TRW PROTOCOLS

Testing Enology Techniques for Results

By Bob Thaden, Tongue River Winery

Many of us have read articles about techniques for improving tannins, body, color and other chemical properties of our wines, but we don't really know what works for us unless we use OUR grapes/fruit with our own equipment and techniques.



This year, Tongue River Winery set out to test several protocols about ways to improve hybrid wines. One of the ideas we simply adopted was to cold macerate the crushed fruit for at least three days. We went 6. This is done because there is evidence that some compounds are more readily released into the juice in the absence of alcohol, so soak before fermenting. Then these are the four techniques we set out to test.

1. Press the cold soaked fruit before fermentation. I know, this sounds illogical if you're trying to get the most flavor, tannins and body. But some studies suggest that the skins left while fermenting can "adsorb" some of the desired

chemicals that provide flavor, color and tannins.

2. ACE: Accentuated cut edges. Several studies have been done. The trick is to chop up the skins to increase the surface area of skin to juice. Others used expensive submersible blenders. We used our Mulimax apple shredder right after crush. Very good shred, very little seed scarification.

3. Add stems to increase tannins. We did one batch with 10% added stems.

4. Concentrate the skin to juice ratio. We took 50 lbs of skins from our "post press fermentation" (batch 1) and added it to 50 pounds of must, thus more than doubling the skin to juice ratio.

5. Control. Of course you need a control! In this batch the ferment was at the end of the six day cold maceration on a 30 ppm SO₂ 18 hour soak.

The wines were all otherwise treated identically, with D254 yeast and VP41 malolactic bacteria. The pictured samples were sent off to MSU (MT) Western Ag Research Center where Zach Miller and Andrej Svyantek and his wife Joy will analyze the samples for tannins, TA, hue, hue intensity, and other variables.

Bob Thaden will present these results at the NDGWA Annual Meeting along with samples of the 5 different wines to taste.



2023 NDGWA Annual Meeting & Conference

Fluffy Fields Vineyard and Winery

**February 3-4, 2023
Dickinson, ND**

2023 NDGWA Annual Meeting and Conference

February 3-4, 2023

Fluffy Fields Vineyard and Winery

2708 21st St E

Dickinson, ND 58601

A block of rooms has been set aside for the NDGWA at the [**TownePlace Suites by Marriott**](#) in Dickinson, ND.

Book your room by January 13, 2023, for the \$88 rate.

Breakfast is provided at the hotel. All other meals will be at Fluffy Fields.

Go to NDGWA.org under events to find the Eventbrite link to register:

www.eventbrite.com/e/2023-ndgwa-annual-meeting-and-confernece-registration-489260590597

PRESENTATIONS AND AGENDA

**Updates from NDSU, Marquette Fermentation and Tastings, Marketing Grant, Hard Cider
ND Wine App, Vitinord, Wine Competition And More!
Annual meeting and Election of Board Members**

Complete AGENDA, TOPICS AND INFORMATION coming soon – go to NDGWA.org



Fluffy Fields Vineyard and Winery, located in SW ND - North Dakota's only year round full service winery, is owned and operated by Kevin and Deb Kinzel.

What started as a hobby somehow turned into so much more. First came the vineyard, in 2008 Kevin planted his first grape vines (purchased I believe from Gurneys). In 2009 Deb pulled these vines, assuming they were dead. Later that night "Dan the tree man", let us know to be patient, grapes were budding late. Really who knew? Not me.

In hopes of figuring out what grape vines to plant, to make wine, we joined the Grape Growers Association.

We needed to learn so much, building a vineyard, where to get vines, what vines to plant, how to plant vines etc. Best of all we made friends who understood the passion and really liked to drink wine.

2010 two new vineyards, 800 grape vines, a whole lot of work and what in the world have we gotten ourselves into.

Fast forward, 2020/2021 Continued years of major die back, no moisture, and crazy fluctuation of temperatures. It's hard to say, but we lost at least 75% of our vines. Bring on 2022, what looked to be a promising spring, great moisture, warm temps,

and no frost after bud break, vines that died back (Brianna) were coming back. GREAT!! Well no Mother Nature hits again, a 5 minute pea size hail storm with high winds can wipe it clean. On a good note Frontenac Gris came back strong with 243 pounds. Just a note in year 2015 we picked 2100 pounds. After years of watching one by one grape varieties dye back.

So as I sit and write this article, I look out the window it is November 15, and we have Christmas, 15 inches of snow, it has been below zero a few times already. What will spring of 2023 bring? Was it too cold to early? Will we have above normal temps in February?

We are excited to see what the future brings, we have a few years of rebuilding to do at Fluffy Fields, but with NDSU and NCI working so hard to get new varieties out, we will work with what we can grow now. It is a blessing to be able to purchase cold climate grapes from out of state, however it would be wonderful to purchase grapes in state and closer to home.

What we have learned: What grows in the East may not grow in the west.

Our blessings: All of our customers new and old. All the tourists we have met and keep coming back, our family and friends who continue to support us.

As for the Winery, well that is a whole other article.



Deb and Kevin Kinzel



*Happy Holidays
and a safe and
Happy New Year.
Stop in and
say Hi.*

Follow us at
fluffyfields.com,
Facebook and
Instagram.

ND Wine App Needs Your Input!

By Roberta Forward

The Wine App for online public access to ND wineries, cideries and vineyards was initiated from a grant from ND Department of Ag in 2020. Bob Grosz and Greg Cook undertook the guidance of this process and began working with North Wave Studios. Current board members of the NDGWA are now working with this. We look forward to making this operational by Spring of 2023.

The App is primarily a consolidated view of the winery/cidery/vineyard venues in our state for persons interested and patrons. This is an opportunity for NDGWA and WAND to work cooperatively to promote the winery/cidery/vineyard industry in our state. The participation of anyone wanting to help this industry is needed to make this App useful and successful.

By establishing an account and a password, an individual can view a listing and map that identifies wineries, cideries and, potentially, vineyards. There is no cost to the individual. When an owner posts his or her web link, or posts an event, this can be seen and chosen by the viewer to get more information. Those with overnight accommodations for guests could include that information. Group events could also be added to the Trails section where various upcoming events could be shown; ie "3 Day ND tour", "Central ND Winery Tour", "Fall Stomps and Festivals" etc. Other needs or suggestions for content can be discussed as the venues and administrator collaborate to make this work best for those involved.

The initial costs of developing this App have been paid. To move ahead, the maintenance, administration and management needs to be decided and at what level (see below). The project has languished and there has been no change from 6/17/21 to now. At this time, the main objective is to set a host or hosts as indicated by Nick from North Wave:

We are very close to launch.

There are a few bugs, and 1 bug that has to do with hosting which we have to talk about. Basically without setting up the right plan the Google Maps won't work. Then we are ready for a launch.

Hosting is the next item to be decided. I am also working out a new pricing structure / am flexible and can make

something that works for you. This is my base set rates below.

Hosting:

There are many options we can do for hosting. List the tiers and options below.

1. Would be for you to take over all hosting. I would gather all of the information/accounts and give you the keys. This would include paying for everything on your own as well. I can be a part of working on the apps as much or as limited as you need. We can do an estimate/invoice plan moving forward if I am needed.

2. Each plan below you receives all of the other features from the below tier. For example, if you pick tier 2 you will receive everything that was in tier 1.

Tier1: Just Hosting: \$50.00 per/month

- This plan I will keep everything up and running and paid for. I will watch and check data once a week.

Tier 2: Hosting and Watching: \$150.00 per/month

- In this plan, I will keep an eye on things daily watching for instabilities in the apps and adjusting accordingly.

Tier 3: Hosting and Bugs: \$250.00 per/month

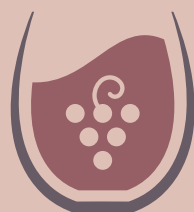
- Fixing bugs as they arise in the apps. These can be reported by you me, or a customer.

Tier 4: Everything: \$500.00 per/month

- Not only will you get everything from all tiers you will get feature work as well. So when you or your team has a new feature idea that isn't in the current apps we will add it.

Note: If "epic" work needs to take place such as a code overhaul, a UI/UX overhaul, a few features in one (normally when it is a month+ of work), other big new sections. This will be estimated and then invoiced out separately from the monthly payment. If a tier planned is picked that isn't 4. You can always request an estimate for feature work. This will be estimated and invoiced out accordingly.

This information is being shared statewide via the NDGWA newsletter for all stakeholders. The hope is to have this fully operational by Spring 2023. Those wishing more information, demonstration or to join this project contact Roberta Forward at 4wrdr@drtel.net with subject line: ND WINE APP



NORTH DAKOTA
GRAPE & WINE
ASSOCIATION

Considerations for Fertilizing ND Vineyards

At What Speed is Your Vineyard's Flywheel Turning?

By Greg Krieger

I picked up a great analogy at the recent VitiNord conference in Vermont. It compared the biological nutrient cycling capabilities of soil to a flywheel. Warm weather, good moisture, tillage, nitrogen applications and high organic matter cause the flywheel to spin faster, resulting in more plant growth. Cool weather, drought, poor fertility and competition from grass and weeds slow down the flywheel, resulting in less growth.

The best time to evaluate (by soil testing) and, if necessary, to modify the nutritional status of a vineyard site is before the grapes are even planted. After grapes are in the ground, fertilizers can no longer be easily mixed into the soil profile but they can still be applied at the soil surface as well as foliarly.

Once they are established and producing fruit, the best way to determine whether grapevines are able to extract sufficient quantities of necessary nutrients from the soil is by utilizing petiole analysis. The burst of nutrients resulting from the deep soil disturbance that occurred during planting has subsided by now. If grass was planted between rows, it has lapped up any available nitrogen in that strip, drastically slowing down the flywheel. If the row middles are cultivated, the flywheel is accelerated. On high organic matter sites that are cultivated between rows, the flywheel is likely spinning too fast, resulting in excessive growth, diminished fruit quality from shading by all those leaves and reduced winter hardiness. As nutrients leave the system in harvested fruit and clippings, and as they are tied up in the grapevine wood and in the grass, the flywheel slows down and there are fewer nutrients available for next year's growth even though growth may have even been excessive in the first year or two.

The NDGWA has been encouraging members to submit petiole samples and has been paying their lab analysis fees for several years, and we now have data from hundreds of site years. The range that is considered "sufficient" as well as the limit that is considered "low" or "high" for nearly every nutrient has varied from one authority to another and some have changed over time as more knowledge is gained. Those target numbers also vary in-season as we go from bloom to veraison. Nevertheless, using the least restrictive definitions of those terms, we have gotten

results that are "low" or "high" for almost every nutrient. On any given set of results, it is very common to be "low" in several nutrients and "high" in several more. So, where to begin?!?!

Nitrogen, phosphorous, potassium and sulfur are referred to as macronutrients and are needed in the greatest quantities by all plants, so we need to be sure to address any deficiencies of those nutrients before turning our attention to the micronutrients.

About half of our samples are low in nitrogen. If your site is well-drained, with lighter soil and low organic matter and its flywheel is barely turning, there is a very good chance it is low in sulfur in addition to nitrogen. Nearly half of our samples are low in sulfur. Annually applying three ounces of ammonium sulfate (AMS) per plant on an 8x10 foot spacing will provide 100 lbs of AMS per acre. That will provide a generous rate of sulfur along with a modest rate of nitrogen. Sulfur is one of two nutrients we have yet to see a "high" result from. Therefore, there is little risk in applying sulfur where it is not needed, but if sulfur is deficient, applying AMS could be a game changer. In addition to adding compost and plant residues on my low vigor site, my strategy is to apply AMS each spring to get the flywheel spinning. By late summer, that nitrogen is depleted, the flywheel slows down and the oldest leaves begin to yellow and drop off, making leaf pulling unnecessary.

If your flywheel is spinning rapidly already, do not apply additional nitrogen, and perhaps consider allowing grass to grow closer to the vines instead.

Phosphorous is low on only about a tenth of samples, and potassium is low on about a sixth. Pomace contains a high level of potassium so it is likely that K levels will decline over time if yields are good and no K is being added to the system. Excessive K can raise the pH of red wines so it should not be added to a vineyard unless there is a demonstrated need for it.

Zinc is the most widely applied micronutrient in North Dakota. It is essential for the production of corn and edible beans. About a third of our petiole samples show low zinc so your odds of being low are good if your site has no history of heavy manure application or zinc fertilization.

The second nutrient that we have yet to see a "high" result for is copper. Cu is low on about a third of samples so there

is little risk in applying it at the recommended product rate even where it is not needed.

Somewhat surprisingly, calcium is low on nearly half our samples. I know of no one who is applying it even though it may play a role in winter hardiness. Part of the reason Ca is low could be due to the high potassium that so many sites have, and those two cations, along with magnesium, all compete with each other for plant uptake. If soil K drops over time due to good yields and nutrient removal on soil that is not acidic, it is possible that tissue Ca concentrations could come up in future years even without adding any Ca to the soil. I would encourage any citizen scientists out there to do a little experimenting with Ca if you have gotten a low Ca test in the past. Drywall is a made of gypsum (calcium sulfate) and can be used as a soil amendment. Spreading chunks of drywall uniformly throughout a vineyard would look a little odd but it would eventually provide both Ca and S as it breaks down. It would be a good alternative to AMS on sites that need S but not N.

Compost, composted manure and mulch can be excellent sources of slow-release nutrients, however there are a couple notes of caution. The first is to be aware that herbicide residues may be present in grass clippings or manure. Growing a sensitive annual crop like beets, tomatoes or green beans for a season in the material you plan to use should give a pretty good idea if there are any harmful residues in it. The second consideration is that the material may be deficient in the same nutrient, say zinc or iron, that the vineyard is needing. Conversely, these materials have properties that speed up the flywheel in ways that simple commercial fertilizers cannot, such as contributing a broad spectrum of nutrients and helping retain moisture.

In conclusion, if you ever get a result that is rated "deficient", do not waste time in addressing it. Fertility management is not a "one and done" project like building a trellis should be. It is better to apply moderate amounts of whatever is needed every year rather than applying massive amounts once every five or ten years. After growth-limiting nutrient needs are corrected, you should expect different results on subsequent petiole tests, even on the nutrients that weren't fertilized.

Hats off to the organizers of VitiNord 2022!

By Greg Kreiger



Allison Krieger sampling wine on VitiNord Technical tour



VitiNord Technical Tour

VitiNord, the tri-annual international cold climate grape and wine conference, was held in early December in Burlington, Vt. This is only second time the event has been held in the US. It was well organized, well attended, and a ton of good information was exchanged.

Even though the temperature in Burlington was 53 degrees warmer than what we flew out of in Fargo, growers there face the same challenge we do in North Dakota - a very young industry in an area with a limited growing season. Our winters here are much more severe and our yield variability is much greater, however. Nearly every grower I spoke with said the winters used to be much colder there than they are now. The vines we saw looked very good going into winter. Many of the wines I tried were among the tartest I've ever tasted but apparently they are okay with that.

We heard from several Canadian wineries who are making a go of it even further north than Vermont. There is a group of wineries in New Brunswick who have come together for marketing their best wines under the Tidal Bay designation. The Bay of Fundy is famous for having the greatest tidal fluctuation of anywhere in the world and was the inspiration for the name. Submitted wines are evaluated in a blind tasting by sommeliers and not all of them make the cut. There are growers in Quebec who are growing vinifera grapes on a very low wire and protecting them through the winter with geotextile. Several wineries make "pet nat" or naturally sparkling wines from grapes that don't achieve full

ripeness. One progressive producer told how he uses "flash detente" to concentrate flavors and sugars in part of his must by warming it to 85 degrees C and then rapidly cooling it by applying vacuum to boil off 5 to 10% of the water. He also takes a portion of his harvest to a commercial dehydration operation that can remove 25 to 50% of the water in 24 hours. These techniques can be very useful in years with cool, rainy falls and the grapes don't ripen.

One of the more notable presentations I attended was given by an engaging Lallemand representative and covered biological alternatives to SO₂. (She said she was encouraged to go into microbiology by her piano teacher. There's gotta be a story there.) Wine aromas can be oxidized; alcohol can be oxidized. SO₂ is both an antimicrobial and an antioxidant. We learned of bioprotectants, bacterial cultures, non-Saccharomyces yeast strains, yeast lees, killer protein yeast byproducts and chitins that do those jobs separately.

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Vineyard Tour, biodynamic methods and reclaiming a neglected vineyard in Vermont

Letter...

Hi All -

This is Avery Shikanai. I'm a PhD student at North Dakota State University and, along with Hava Delavar, Raja Bhoomireddi, Collin Auwarter, and Dr. Hatterman-Valenti, comprise the grape breeding team at North Dakota State University. I still have not met many of you, so I'll let you know a little bit about my background: I got my degree in crop sciences at the University of Illinois. After that, I did a stint working in Napa working as laboratory technician for a medium-sized (by California standards) winery, and then worked as a grower of glasshouse-produced ornamental plants. More recently, I have gotten my MS in Plant Sciences at Southern Illinois University studying hemp.

Plant breeding programs have a heritage. A breeder's work is never done, even if the breeder is. So, continued progress is a baton, passed on from one breeder to the next in the form of selected breeding lines. Earlier grapebreeding at NDSU was conducted by Dr. John Stenger and Dr. Andrej Syvanteck. For years, John, Andrej, Collin, and Dr. Hatterman-Valenti made crosses between promising parents. Progeny from these crosses were each genetically unique potential cultivars. On campus, over 4,000 were tested in a field called the "Life Plot". Most of the Life

Plot transplants died naturally, or were culled for viticultural or enological reasons. Disease susceptibility, unacceptable flavor, or poor winemaking potential are a few of those reasons. Yet, there were a number of standouts which were retained. After years of observation and multi-location testing, two accessions with good winemaking potential and excellent cold-hardiness were selected for release. Information required for patenting has been submitted to North Dakota State University's Research Foundation, and are expected to be available to the general public once the patenting process is completed.

In addition to the two varieties identified for release, the Life Plot housed many promising accessions. While not good enough for release per se, these plants all have outstanding features which make them invaluable as parents in our breeding program. So, when we got word that the Life Plot would be bulldozed for a new campus building and parking lot, we got to work preserving and transplanting this treasured collection of breeding lines. With the help of a backhoe and a scrappy crew with everything to prove and nothing to lose, 450 accessions were excavated and transplanted to a new field site. Additionally, we took multiple cuttings of selected accessions for insurance. To slightly misquote Joni Mitchell, "They

paved paradise and put up a parking lot... They took all the grapevines, and put 'em in a grapevine museum. And if you attend our field days, it won't cost you anything to see 'em."

Some of the highlights include: ~100 accessions from the USDA germplasm repository that we are screening for cold tolerance. The breeding team has also successfully transplanted a family of 'Beta' x 'Sommerset Seedless' grapes. With this family, we hope to gain a better understanding of seedlessness, and introduce this trait into an extremely cold-hardy background. We also have a collection of grapevines that we are calling our red mapping population. This is blended family of step-siblings, whose parents include 'King of the North', 'Frontenac', 'Sabrevois', and a red Elmer Swenson accession. By studying this family of cold-hardy reds, our goal is to identify genes that are responsible for superior viticultural traits and use that information to speed up the breeding process.

So, with the departures of Dr. John Stenger and Dr. Andrej Syvanteck, it seems fitting that the baton of grapevine canes has been handed off to the next bunch of grape breeding students. It is our hope to not only preserve their valuable progress in breeding, but also propel their efforts in germplasm improvement and cultivar development.



**Demolition/
Moving Grapes**

Recent TTB Changes and Updates

By Brent Trela

Northern Crops Institute

While the wine and spirits industries faced supply chain and inflation challenges this last year, there were also some liberalizing Alcohol and Tobacco Tax and Trade Bureau (TTB) regulatory developments. Among the modernizing and harmonizing ordinance changes included the most recently published amended TTB authorized list of Wine and Juice Treating Materials and Processes for Domestic Wine Production.¹

Wine Treating Materials

The Code of Federal Regulations Title 27, part 24 regulates winemaking.² The approved materials and processes, within the published limitations in § 24.246, are considered consistent with good commercial practice in the production, cellar treatment, or finishing of wine and, where applicable, in the treatment of juice and distilling material. The recent codification of provisional approvals includes amendments to some fermentation aids, but before getting to the changes, let's review YAN:

Yeast Nutrients / Fermentation Aids

Microbes like yeasts require nitrogen, vitamins, minerals, fatty acids, and sterols to be healthy and support cell metabolism, rate, growth, protein synthesis, and alcohol tolerance. Some fruit may be deficient in microbial nutrition. Fermentation aids support a robust environment for yeast and malolactic bacteria during rehydration and fermentation. Amino acids, ammonia (NH₃), and some peptides contribute to the concentration of yeast assimilable nitrogen (YAN). The amount of YAN in the must varies by fruit variety, climate, cultivation management, harvest maturity, and processing decisions.³ YAN is a measure of ammonia (NH₃) and alpha-amino nitrogen by OPA (NOPA), a technique that measures the free amino acids (FAN) except proline.⁴ Knowledge of available nitrogen is essential for effective fermentation management. Nutrient-deficient must supplementation decreases the incidence of incomplete or stuck fermentation and the prevention of hydrogen sulfide and other sensorily objectionable metabolites.⁵ Nitrogen addition for ammonia is typically Diammonium phosphate (DAP) or products containing DAP. Musts with excessive nutrients may favor an abundance of microbial growth, including spoilage organisms, and excess nitrogen may lead to urea formation. Urea is a precursor to ethyl carbamate formation, known to be carcinogenic.⁶ Measuring nitrogen status as YAN is proactive fermentation management toward desired outcomes.

How much YAN is necessary?

To prevent nutrition-related fermentation problems, measuring the initial concentration of YAN in the juice or must is essential. YAN requirements are related to ripeness- the soluble solids content provides a robust guide for YAN content for optimal fermentation performance and quality, e.g., 21 °Brix musts require an estimated 200 mg/L YAN.⁷ A helpful YAN calculator based on the nitrogen requirements of the selected yeast strain and the initial Brix of the must is available here: <https://fermcalc.com/FermCalcJS.html>⁸

Is YAN all that is necessary?

While YAN is essential to the nutritional nitrogen needs of yeast, it does not address all the micronutrient needs, particularly B vitamins.⁹ The US TTB Wine Treating Materials and Related Regulations updated the following B vitamin yeast nutrient limitation:

- Biotin (B7): 25 µg/L
- Calcium pantothenate (B5) (expanded permission) 0.48 mg/L
- o Previously approved solely as a yeast nutrient in apple wine, now permissible in all juice and wine
- Folic acid (B9): 100 µg/L
- Inositol (myo-inositol) (B8): 2 mg/L
- Niacin (B3): 1 mg/L
- Pyridoxine hydrochloride (B6): 150 µg/L

And the mineral magnesium via

- Magnesium sulfate: 15 mg/L

Before direct B vitamin addition approvals, indirect additions via yeast autolysis products were the only option.

Other recent TTB approvals may be more relevant this season for wines already through primary fermentation. These include several fining agents:

- Potassium Polyaspartate: 100 mg/L
- Pea protein: 0.5 g/L
- Chitosan: 5 g/L
- Copper sulfate: maximum addition of 6.0 mg Cu/L wine with the residual copper limit increase from 0.5 mg/L to 1 mg/L

Potassium polyaspartate

While perhaps not as relevant to many hybrid cultivars high in malic acid relative to tartaric acid concentration, cold stabilization treatment can use Potassium polyaspartate (KPA). KPA improves cold stability by inhibiting the nucleation of tartaric acid with the abundant ions potassium and calcium and the subsequent precipitation of these tartaric acid salt crystals (tartrates).¹⁰ Tartrates include potassium bitartrate (KHT) and calcium tartrate. Historical tartrate stabilization treatments typically decrease solubility through cold temperature treatments to force KHT out of the wine solution. While very effective for KHT, refrigeration has significant energy input requirements, and precipitation of KHT alters the chemistry: TA and potentially pH and color. Tartrate inhibition from additives may avoid these impacts, although they may present further compromises. Other TTB-approved tartrates stabilizing additives include carboxymethyl cellulose (CMC), gum Arabic, metatartaric acid, mannoproteins, and KPA. KPA offers stabilization efficacy similar to metatartaric acid; however, with greater longevity and without the potential color loss, haze, filterability, and sensory issues of the other agents.¹¹ KPA addition in wine can occur immediately before bottling and is effective at 100 mg/L.¹² The prevention of tartrates also reduces or eliminates the cleaning associated with precipitated tartrates adhering in tanks and barrels.

Chitosan

Chitosan was an instrumental discovery for numerous

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Recent TTB Changes and Updates

Cont. from Pg. 9

sectors and industries, including food and pharmaceutical. It has low toxicity, is biodegradable, biocompatible in various uses, and has versatile wine functionality¹³. Despite its low aqueous solubility, its use in winemaking can aid clarification¹⁴, wine proteins heat stabilization¹⁵, metal chelation, remove ochratoxin¹⁶, and control undesirable microorganisms, especially *Brettanomyces*.^{17,18} Chitosan has vast application potential because its chemical structure is adaptable to introduce new functions or properties in different forms, such as beads, films, gels, and nanoparticles.^{19,20}

Chitosan synthesis occurs in the cell walls and exoskeleton of a large number of organisms, but only fungally sourced (*Aspergillus niger*) is approved for use in wine by the OIV (1 g/L)²¹, and TTB (5 g/L) 1. Fungally derived chitosan avoids the potential crustacean allergy and vegan concerns.

Perspicacious pea protein

Many traditional fining treatments read like a seaside haggis recipe or voodoo potion, relying on natural products, including animal proteins extracted from milk (casein), animal hooves (gelatin), ox blood and egg (albumin), and fish entrails (collagen) to clarify wine, 'collage' in French, or fining. Fining wine often involves adding a colloidal substance whose reactive components flocculate on contact with the wine, causing turbidity and eventual precipitation to the bottom of the container, thus helping either in its clarification, coloration, stabilization, or sensory properties.

There is some social movement to reduce or eliminate the use of all animal-derived winemaking materials. Apart from the substantial variation (specificity and efficacy) inherent in animal products, consumer trends like natural wines,

particularly health concerns about allergen status and consideration to vegetarians and vegans, warrant attention to the choice of winemaking ingredients and interest in developing alternatives. Plant proteins and non-proteinaceous fining substances might someday replace fining agents of animal origin. Sources include cereals, pomace, potatoes, and pulses.²²

Due to allergen concerns with milk and egg proteins, EU regulations require their declaration on wine labels if the concentration is more than 0.25 mg/L.²³ The TTB approved pea protein as a fining agent to remove off flavors from wine and juice at 0.5 g/L.¹

Copper sulfate

To remove hydrogen sulfide or mercaptans from wine. The quantity of copper sulfate added (calculated as copper) must not exceed 6.0 mg Cu/L wine. The change allows the residual level of copper to increase from 0.5 mg/L to 1 mg/L.¹

Notices of proposed TTB rulemaking for wine are available at <https://www.ttb.gov/wine/notices-of-proposed-rule-making>. Many proposal notices are open for comment. Industry members wanting to use a treating material or process not explicitly authorized in part 24 may request authorization. TTB may administratively approve the use of treating materials and processes not listed in the regulations, either as an experiment under 27 CFR 24.249 or for continual use (acceptable in good commercial practice) under 27 CFR 24.250. Applicants for such approvals must submit to TTB a request describing the material or process and the purpose, manner, and extent to which the material or process is to be used; certain samples and test results; and any other relevant information, as described in the regulations.

References available upon request:
brent.trela@ndsu.edu

VitiNord 2022

Cont. from Pg. 7

There is a biological product that very effectively outcompetes the organism that causes VA in wines. There is a chitin product approved for Canada that is made from fungal chitin rather than crustacean chitin to make the wine safer for those with seafood allergies. This presentation is definitely one I'd like to watch again when it becomes available online.

A very interesting researcher from Denmark gave a presentation on vineyard economics. Although it is a moot point when our ND vines have a lot of winterkill, he detailed the vast difference in profitability between low and high yielding vineyards and how important it

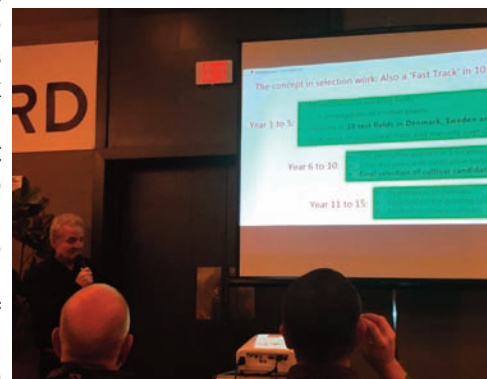
is to have fruiting shoots along every foot of the trellis.

From the California Sustainable Winegrowing Alliance speaker we learned that 80% of California's wine is considered "sustainable". She didn't say if peeling labels and reusing wine bottles are among the 200 practices covered in "The Code", their giant book of sustainable practices.

Apparently, there is a demand out there for "natural wines". A "zero-zero wine" is one with no added yeast and no added sulfur. While I applaud those who attempt to make wine with minimal additions, the results reminded me of my early winemaking days.

Itasca is the latest release from the University of Minnesota breeding program. It had 60% bud survival after -37F weather in 2014, far higher than

any other U of M variety. Young vines frequently have pink clusters, and clusters on older vines frequently have one pink berry. It has good ice wine potential.



Torben Toldam-Andersen, Copenhagen, Demark talking on grape selection and Fast Track

2022 Bylaws update

December 19, 2022

Great news! The bylaws committee has come up with proposed bylaw changes to be voted on at our 2023 Annual Meeting on February 4, 2023. Please take some time to review them. A copy of the old bylaws are available on our website NDGWA.org

BYLAWS OF THE NORTH DAKOTA GRAPE AND WINE ASSOCIATION

ARTICLE I

Purposes

Section 1. The purposes of the North Dakota Grape and Wine Association, hereafter referred to as the NDGWA, shall be to carry out within the State of North Dakota and surrounding areas the education, promotion and extension of the art and science of viticulture and oenology including any and all agricultural, horticultural, and related purposes connected therewith.

This mission shall be accomplished by:

Supporting research that adds to the scientific knowledge about viticulture and oenology and related issues;
Promoting the Grape and Wine industry;

Providing community education and support services for people involved in viticulture and oenology;

Informing the public about viticulture and oenology;
Advocating the interests of, and enlisting support, participation, and involvement of, people involved in viticulture and oenology;

Seeking funds from the public and governments to support programs and services;

Collaborating with other groups or organizations where appropriate to further these purposes;

Undertaking other appropriate action in furtherance of the general purposes of the NDGWA.

The NDGWA shall be operated exclusively for charitable, scientific, and educational purposes as those terms are defined in Section 501 (c) (3) of the Internal Revenue Code of 1986, as amended (the "Code").

ARTICLE II

Offices

Section 1. The registered office of this corporation located in Fargo, North Dakota shall be that set forth in the Articles of Incorporation, or in the most recent amendment of the Articles of Incorporation, or in the most recent statement filed with the Secretary of State of North Dakota changing the registered office.

ARTICLE III

Members

Section 1. Voting members of the NDGWA shall be those individuals desiring to support the purposes of the NDGWA and who have paid annual dues at the rate established by the members. Any member joining the NDGWA for the first time and paying dues after July 1 shall be granted membership through the end of the following membership year.

ARTICLE IV

Annual Meeting of the NDGWA

Section 1. An annual meeting of the NDGWA shall be held each year. The date, time, and place shall be fixed by the Board of Directors and due notice shall be provided to all members.

Section 2. Board members and officers shall be elected at the annual meeting.

Section 3. Notice of the annual meeting shall be posted on the NDGWA website, emailed out on the ND grape list-serve and published in the NDGWA newsletter if applicable.

Section 4. At the annual meeting the treasurer shall give a financial report.

Section 5. The attendance of 10% of the voting members at the annual meeting shall constitute a quorum.

ARTICLE V

The Board of Directors

Section 1. The NDGWA shall be managed by a Board of Directors, hereafter referred to as the Board. The Board shall consist of eight members elected by the

membership at the annual meeting. The elected members of the Board shall serve for terms of two years. Board memberships shall be divided into two groups so that the terms of one-half of the elected members of the Board shall expire each year. In addition, the Board may include one or more ex officio members. Members of the Board must be members of the NDGWA.

Each voting member present at the annual meeting shall be allowed one vote for each directorship.

Section 2. Ex officio board member(s) may be appointed to the Board as needed. Members that serve as ex officio members shall have all the rights and obligations of elected board members. Ex officio board members must be members of the NDGWA.

Section 3. Before the annual meeting of the NDGWA, the President or, in the event of his or her absence or inability or failure to act, the Vice President shall appoint a Nominating Committee. The Nominating Committee shall present to the annual meeting nominations for the members and officers of the Board to be elected. In making such nominations, the Nominating Committee shall attempt to maintain reasonable balance of Board members representing the community the NDGWA serves.

Voting members present at the annual meeting shall have the opportunity to make nominations from the floor for Board members and officers as well.

Section 4. Any member of the Board may at any time resign his or her membership on the Board by giving written notice. Any member of the Board may also at any time be removed from office, with or without cause, by a two-thirds majority vote of the entire Board then in office.

Section 5. In the event that a Board vacancy occurs by reason of resignation, death, removal from office or otherwise, the remaining members of the Board then in office, whether more or less than a majority, may by majority vote choose a successor to serve for the remainder of the unexpired term.

Section 6. The Board may hold its meetings in person, via video conferencing and or via conference calls.

The Board shall meet yearly or as called by the President. At each scheduled meeting of the Board, the treasurer shall have a current balance for the most recent accounting period.

Section 7. At each meeting of the Board, members constituting a majority of the Board shall constitute a quorum for the transaction of business at such meeting. In the absence of a quorum, the members present may adjourn or continue the meeting as a committee for planning purposes.

Section 8. Except as otherwise provided in these Bylaws, the vote of a majority of the Board members shall be an act of the Board.

Section 9. The Board shall have full power to manage the affairs of the NDGWA, including the power to make grants and contracts and otherwise to determine the manner and extent of use of the funds of the NDGWA. The Board may delegate such powers as it deems proper to committees, but such delegation shall in no way remove the responsibility of the Board for the financial stability and development of the NDGWA.

ARTICLE VI

Officers

Section 1. The Officers of the NDGWA shall be elected by a majority of the members at the annual meeting following the election of the Board as described in Article V. Officers shall serve for a term of one year. The following Officers of this corporation shall be elected: President, Vice President, Treasurer, and Secretary. Only Board members are eligible to serve as officers.

Section 2. The officers of the NDGWA shall have and exercise the following powers and duties:

The President shall preside at all meetings of the Board and of the NDGWA membership and shall exercise the usual functions pertaining to such office. The President shall call meetings as necessary to complete NDGWA business.

In the absence or disability of the President, or if the office shall at any time become vacant, the Vice President shall have all powers and perform all of the duties of the President during such absence or disability, or until the

vacancy in the office shall be filled.

In the absence or disability of the Vice President, or if the office shall at any time become vacant, the Treasurer shall have all the powers and perform all of the duties of the President and the Vice President during such absence or disability, or until the vacancy in the office shall be filled.

The Treasurer shall supervise the finances of the NDGWA, as directed by the Board, and shall keep regular books. Funds of the NDGWA on deposit with any bank or trust company shall be subject to withdrawal on the signature of such person or persons as may

BYLAWS - CONT. FROM PG. 5

be determined from time to time by resolution of the Board.

The Secretary shall keep the minutes of all meetings of the Board and of the annual meeting. Prior to each meeting, the secretary shall send the minutes of the previous meeting to the Board members for review. The minutes of Board meetings and the annual meeting shall be posted on the website.

ARTICLE VII

Committees of the Board of Directors

Section 1. The NDGWA shall maintain a committee structure. Such committees may be created by affirmative vote of a majority of the directors, and shall have the authority of the Board in the management of the business of the NDGWA to the extent provided in the resolution adopted by the Board. A committee shall consist of one or more persons. The President shall appoint all committee chairs with the concurrence of the Board. The chair of each committee shall be a member of the Board of Directors, but other committee members need not be members of the Board. The members of the committee present at any meeting of the committee shall constitute a quorum for the transaction of the business of the committee.

ARTICLE VIII

Fiscal and Administrative Provisions

Section 1. The fiscal year of the NDGWA shall be the 12-month period ending December 31 of the current year.

Section 2. The NDGWA shall keep at its registered office correct and complete copies of its Articles of Incorporation and Bylaws.

ARTICLE IX

Indemnification

Section 1. The NDGWA shall indemnify persons to the extent required by North Dakota Nonprofit Corporation Act, and shall have the power otherwise to indemnify persons for such expenses and liabilities, in such a manner, under such circumstances, and to such extent as permitted by applicable law.

ARTICLE X

Dissolution

Section 1. In the event of dissolution of this NDGWA, the assets of the NDGWA shall be transferred and distributed as provided in the Article of Incorporation to be used for the purposes of the NDGWA, within the State of North Dakota.

ARTICLE XI

Amendments of Bylaws

Section 1. These Bylaws may be amended by a majority vote of the members at the annual meeting or by the Board of Directors at any meeting where the notice of the meeting contained a statement of the substance of the proposed amendment.

Est. 2006

2012 name change to North Dakota Grape and Wine Association

2014 – September 501c3

Updated 2015 / Updated 2022



NDGWA

ND Grape and Wine Association
North Dakota State University
Department 7670, PO Box 6050
Fargo, ND 58108-6050



NORTH DAKOTA
GRAPE & WINE
ASSOCIATION

NDGWA COMMERCIAL MEMBERSHIPS

**COTTONWOOD
CIDER HOUSE**

1481 25th Street
Ayr, ND 58007

**RED TRAIL
VINEYARD**

3510 142nd Ave SE
Buffalo, ND 58011

**FLUFFY FIELDS
VINEYARD**

2708 21st St E
Dickinson, ND
58601

**KESSELRING
VINEYARDS**

5720 160th Ave SE
Kindred, ND 58051

**THE NORDIC
OAKS**

Barnesville, MN
56514

Join the North Dakota Grape and Wine Association!

Anyone interested in supporting the grape and wine industry in North Dakota is encouraged to join the NDGWA. Our members span the range from hobby growers and winemakers to commercial farmers and wineries. Even if you are not in the business but love wine and fruit and want to be a part of growing the industry in North Dakota, consider membership in the NDGWA. Use PayPal to join or renew your membership on-line.

More information can be found at <http://www.ndgwa.org/membership/>.