



# Beverage Supply Group

Quality Winemaking Supplies 2009

800-585-5562

707-252-2550

[www.BSGWine.com](http://www.BSGWine.com)

403 Gateway Rd West  
Napa, CA 94559

Hayward, CA  
Vancouver, WA  
Denver, CO



# **Welcome to the Beverage Supply Group**

The Beverage Supply Group is a division of Brewers Supply Group, a well established company delivering products and technical support services to the brewing industry for over 150 years. Strategically located across the United States, BSG is pleased to offer proven products to the wine industry with the same dedication to service and support that has won the allegiance of our brewing counterparts.

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# Welcome to Beverage Supply Group

## NEW LOCATION - NAPA, CA

### 403 Gateway Road West

#### Directions:

From Napa, take Highway 29 south. After crossing over the Napa River on the George Butler Bridge, turn right at the first traffic light (Soscol Rd). On the left you will see a restaurant (Villa Romano). Turn left onto Devlin Rd. Continue south on Devlin until you come to Gateway Rd. West. Turn right and proceed to # 403 Gateway. We are in the first suite nearest to the road



Look for the green triangle in the window

We stock most of your harvest supplies in the Napa location.

Please call when you are in the area and we will be happy to show you around. Orders are available for pick up when you call in advance.

If traffic is heavy on Hwy 29, take Soscol south past Napa College and turn right on Kaiser Rd, then left onto Corporate Way (past the DMV). Continue south to Soscol Ferry Rd. Turn left and then take the next right onto Devlin Rd.

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## Ordering Information

### Pricing

- Single unit pricing is available on our website, or by calling your sales rep or our 800 customer service line.
- All pricing is F.O.B. originating warehouse.

### Price Quotes & Bids

- For larger consolidated harvest orders please contact your sales representative or call the 800 number for a competitive bid.
- You may also fax the "Request for Quote" form included with the order form.

### Credit

A credit application with a bank authorization must be completed in order for credit to be established. For new customers, please allow 1-3 business days for credit approval upon receipt of the completed credit application. Prepayment may be required. Failure to comply with credit terms may result in revocation of credit privileges. All dealings between parties shall be governed by and interpreted in accordance with the laws of Minnesota.

### Payments

There are several payment options for our prepay customers:

- Credit Card (Visa & Mastercard only)
- Wire Transfer, check or money order
- Fax Check (Our fax number is 952-224-1390; please write "BSG is authorized to cash" in the memo area.)

### Freight

Freight terms are "Prepay and Charge", unless otherwise instructed.

The following items need to be requested at the time of order and may have an extra charge:

- Specific delivery dates and times
- Lift gate service
- Pallet Jack service

**Single unit prices are available online at [www.bsgwine.com](http://www.bsgwine.com). Please contact us for pricing on multiple units for your harvest requirements.**



Napa Valley Vineyard

iStockphoto 1984544

## June 2009 Edition

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# Enzymes

**KERRY**

## Vintagezym Range, Kerry (Ireland)



### Vintagezym P

*Enzyme for improved performance in pressing and juice clarification.*

**Recommended Use Rate: 14-33 g / Ton**

Vintagezym P is a micro-granular powder pectinase enzyme system containing cellulase/hemi-cellulase side activities.

Vintagezym P has been developed for optimized grape maceration and pressing in the vinification process of fine white and rosé wines.

**Very Popular**

Treatment of grapes with Vintagezym P **before pressing** results in:

- reduced maceration time
- optimized aromatic precursor extraction
- low phenolic extraction
- improved must extraction
- increased efficiency of pressing: higher free run juice volume & shortened pressing cycle
- easier juice clarification



### Vintagezym S

*Enzyme for clarification and settling.*

**Recommended Use Rate: 1-2 g / hL (36-76 g/1000G)**

Vintagezym S is a micro-granular powder enzyme system containing pectinase activities derived from a selected strain of *Aspergillus niger*. Vintagezym S has been developed for optimized must clarification in the vinification process of fine white and rosé wines.

Treatment of juices with Vintagezym S during **static settling** results in:

- rapid clarification even in difficult conditions (high pectin content, low pH, low temp.)
- fine and gross lees separation
- compact lees (reduced volume of lees)

Vintagezym S improves clarification using dynamic settling (centrifugation, flotation, filtration, etc)



### Vintagezym R

*Enzyme for increased juice/wine yield and improved phenolic structure*

**Recommended Use Rate: 14-23 g / Ton**

Vintagezym R has been developed for optimized grape maceration in red and rosé winemaking. The combination of pectinase and cellulase/hemicellulase side activities in this product make it an ideal application tool during maceration.

Vintagezym R promotes:

- optimized polyphenol extraction
- increased aromatic expression
- enhanced mouth feel and flavor
- increased yield at pressing
- reduced maceration time
- better clarification & filtration of wines.

Vintagezym R has been developed for optimized grape maceration in fine red and rosé wines.

Kerry has developed a new line of wine specific enzyme products. We are very happy to offer free samples of these enzymes (while supplies last) to commercial winemakers for trial purposes.

**Please call or email to request your FREE 100 gram container.**

Add at  
**CRUSHER**

### Vintagezym P

**Dose: 14-33 g/Ton**

**Pack Size:**

100 gram  
200 gram

CRUSHER or  
Settling Tank

### Vintagezym S

**Dose: 1-2 g/hL  
(36-76 g/1000 G)**

**Pack Size:**

100 gram  
200 gram

Add at  
**CRUSHER**

### Vintagezym R

**Dose: 14-23 g/Ton**

**Pack Size:**

100 gram  
200 gram

**Orders: 800-585-5562** Order online at [www.BSGwine.com](http://www.BSGwine.com)

12 g/hL = 1 lb/1000 G

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Add at  
**CRUSHER**

### Vintagezym V

**Dose:** 23-41 g/Ton

**Pack Size:**

100 gram  
200 gram

Add after  
**Fermentation**

### Vintagezym F

**Dose:** 2-5 g/hL

**Pack Size:**

100 gram  
200 gram

Add after  
**Fermentation**

### Vintagezym Aroma SD

**Dose:** 2-3 g/hL

**Pack Size:**

100 gram  
200 gram



## Vintagezym V

**Enzyme for color extraction and extended maceration in fine red wines.**

**Recommended Use Rate: 23-41 g / Ton**

Vintagezym V has been developed for optimized grape maceration in red winemaking.

The combination of pectinase and cellulase/hemicellulase side activities in this product make it an ideal application tool to break up the complex structures in grape skins and pulp thereby maximizing the extraction of color and flavor compounds.

Vintagezym V:

- promotes advanced polyphenol extraction and color stability
- increases aromatic expression, enhanced flavor and mouth feel
- reduces cold maceration time
- increases free run after maceration and fermentation and promotes better clarification and filtration of wine.

Vintagezym V should be used in the vinification process of fine red wines and especially for those meant to follow extended cellar maturation.



## Vintagezym F

**Enzyme for maturation on lees, filtration and clarification.**

**Recommended Use Rate: 2-5 g/hL (76-190 g/1000G)**

Vintagezym F is a micro-granular powder enzyme system with pectinase and glucanase side activities, derived from selected strains of *Aspergillus niger*.

Vintagezym F has been developed for use between the end of fermentation and bottling of all wines, to enhance liberation of mannoproteins and improve mouth feel and stability.

Use Vintagezym F to optimize maturation while aging on fine lees, promoting shorter aging time and increased yeast polysaccharide release. Vintagezym F improves clarification and filtration in difficult wines.



## Vintagezym Aroma SD

**Enzymes for Aroma enhancement - White wines only**

**Recommended Use Rate: 2-3 g/hL (76-114 g/1000G)**

Vintagezym Aroma is an enzyme system available as both liquid and powder, containing pectinase and glycosidic activities and is derived from a selected strain of *Aspergillus niger* which was not genetically modified. We will stock the microgranular form this year.

Vintagezym Aroma has been developed for aroma enhancement and clarification in white winemaking.

The glycosidic activity of Vintagezym Aroma hydrolyzes the aroma precursors (odorless) into aromatic compounds. Specific pectinase activities improve clarification and wine quality.

**Very Popular**

## **Enzymes - What can they do for me??**

While the use of enzymes in winemaking is far from new, many winemakers do not fully realize the impact that the correct use of specialized enzymes can have on the finished product.

**The correct enzyme.....used at the correct dose rate = "Success"**

<b>Which enzyme? What is the dose rate?</b>	<b>When is it used? What type of grape/wine?</b>	<b>What does it do?</b>
<b>Vintagezym P</b> 14-33 grams/Ton	At the crusher For all white and rosé wines	Improves juice clarification Reduces maceration time Low phenolic extraction Improves must extraction & clarification Higher free run juice volume
<b>Vintagezym R</b> 14-23 grams/Ton	At the crusher Premium red and rosé wines	Improves juice clarification Reduces maceration time Optimized phenolic extraction Increases aromatic expression Increases press yield
<b>Vintagezym S</b> 36-76 grams/1000 G	At the crusher or in settling tank Premium white and rosé wines	Improves juice clarification, even in difficult wines: (high pectin, low pH & low temp.) Compact lees Aids in separation of fine and gross lees
<b>Vintagezym V</b> 23-41 grams/Ton	At the crusher Premium red wines, very good for extended cellar maturation wines	For balanced polyphenol extraction Good color stability Improves mouth feel, flavor, aromas Increases free run Aids clarification and filtration
<b>Vintagezym F</b> 76-190 grams/1000 G	After fermentation All wines to be aged on lees	Releases mannoproteins Improves mouth feel & stability Promotes shorter aging time Increases yeast polysaccharide release Aids clarification and filtration
<b>Vintagezym Aroma SD</b> 76-114 grams/1000 G	After fermentation For all white wines	Aids in clarification Glycosidic activity hydrolyzes aroma precursors into aromatic compounds  Also available in liquid form Ask for Vintagezym Aroma (1-3 ml/hL)





## Lysozyme, Inovapure (Canada)

**Lysozyme is a natural protein extracted from egg whites. It is effective against many gram-positive bacteria, including most lactic acid bacteria in wine. Lysozyme will NOT inhibit yeast or gram-negative bacteria such as Acetobacter.**

Lysozyme is very useful in inhibiting most cases of lactic bacterial spoilage in musts, stuck wines, and bottled wine.

### Sensitive wine bacteria:

- Some strains of *Oenococcus oeni* (formerly *Leuconostoc oenos*)
- *Pediococcus* sp.
- *Lactobacillus* sp., most species/strains

Lysozyme is used against sensitive strains of *Oenococcus* to help prevent MLF where it is undesirable. Lysozyme is very effective against *Pediococcus*, which otherwise must be filtered out before bottling, because these bacteria can often grow in dry wine that is finished MLF.

**The most important use of Lysozyme is to prevent attack by several species of *Lactobacilli* while sugar is present.** These *Lactobacilli* produce acetic acid from sugar, and can also inhibit yeast fermentation. It is a common, devastating type of spoilage in sluggish or stuck wines. Unfortunately, any procedures to encourage yeasts will also encourage *Lactobacillus* spoilage.

**Wineries with a history in certain wines of stuck fermentation, or trouble with *Lactobacillus*, are advised to add a small dose (100 ppm) of lysozyme before yeast fermentation** to restrict growth of 'ferocious' *Lactobacilli*.

### Suggestions for lysozyme use:

Lysozyme dosage is based on bacterial population. The higher the population the higher the dosage required. This is a good reason to add lysozyme prophylactically, before maximum bacterial growth.

We recommend doing lysozyme addition trials, then examining the samples under a phase-contrast microscope. *Lactobacilli* grow poorly in culture, even if they are still viable in the wine, so it is usually impossible to check viability by culturing.

### Before or during fermentation

100-125 ppm (10-12.5 g/hL) to high-risk musts

High-risk musts:

- If *Lactobacilli* have caused trouble in past vintages
- pH > 3.6 after soaking on skins overnight
- No SO<sub>2</sub> before fermentation
- Grapes in poor condition
- No yeast inoculation
- MLF during yeast fermentation

After dryness, inoculate the lysozyme-treated wine for MLF a lysozyme-resistant strain of bacteria.

Most *Lactobacilli* are sensitive to lysozyme, though a few strains may be resistant. Monitor treated wines microscopically on a regular basis, and test VA frequently, to check that a resistant strain has not grown.

**Mode of action:** Within minutes, the enzyme attacks and degrades bacterial cell membranes. Usually, the cell ruptures and the contents spill out. Some bacteria are not visibly affected although they are dead, some remain recognizable but are debilitated, while others are completely pulverized.

In reds, lysozyme binds to phenolics, which reduces its activity after a few days to weeks. *If the wine is reinfected with spoilage bacteria after the lysozyme is bound up, the bacteria may grow anyway.* Thus, for example, a lysozyme addition during fermentation does not protect the wine from bacterial growth in the bottle.

**Color, flavor, and other changes:** Lysozyme increases protein instability in white wines. Because Lysozyme combines with certain phenolics, in some red wines it can reduce pigmentation. In our experience, color changes are usually minor, though clarity can be much improved. The flavor impact on the wine is similar to an egg white fining. Sometimes winemakers comment that they preferred the treated wine to the untreated samples.

We strongly advise doing a bench trial before adding lysozyme, if time permits. However, *if a wine that is not dry is being attacked by *Lactobacilli*, add lysozyme immediately, without waiting for bench trials!*

### Stuck or sluggish wines

Reds, and whites pH 3.4 or >  
150 ppm (15 g/hL) if no *Lactobacilli* are seen  
300-500 ppm (30-50 g/hL) if *Lactobacilli* are seen (dose depends on bacterial population)

### Bottling:

250-500 ppm before bottling unfiltered  
If wine is not done MLF (Caution! Lysozyme does not kill all lactic bacteria!)  
If *Pediococcus* are present (can grow even if wine is dry and MLF done)

**100 ppm = 10 g/hL = 3.8 g/Gallon**

### Note:

A larger dose of bentonite may be needed to achieve protein stability in whites treated with lysozyme.

*Like other enzymes, Lysozyme is inactivated by even a small amount of bentonite!*

### Lysozyme

Dose: See discussion

### Pack Size:

- 100 gram
- 500 gram
- 5 kg

Also available in liquid as a special order.

### For Bottling:

**IMPORTANT!**

**Add lysozyme 3-4 weeks or more before bottling to allow time for settling of cellular and other debris**

Figure 1

***Lactobacilli* prior to treatment with Lysozyme**



Figure 2

**Post treatment, the cell walls are ruptured**

Photo courtesy Neova Technologies

# Yeast



## Fermol®, Italy



### Fermol® Blanc (*Saccharomyces cerevisiae bayanus*)

*For sparkling wine base, late harvest, ice wine, fruit wine, honey mead, aromatic whites*

#### Characteristics

- Ferments well at lower temperatures
- Does not produce H<sub>2</sub>S except in cases of extreme nutrient deficiency
- Fermol Blanc is recommended for maturation on lees (high alcohol tolerance)
- Wines are full bodied, with complex aromas reminiscent of flowers, citrus or white pulped fruit



### Fermol® Chardonnay (*Saccharomyces cerevisiae cerevisiae*)

*For Chardonnay, Viogner, Gwurtztraminer, Pinot Blanc, Seyval, Chardonel*

#### Characteristics

- Produces wines with characteristics of ripe, exotic fruit
- High production of mannoproteins
- Tolerates low temperatures, thus suitable for cold macerations or barriques.
- Aromatic intensity, high during fermentation, increases substantially during maturation



### Fermol® Sauvignon (*Saccharomyces cerevisiae cerevisiae*)

*For Sauvignon Blanc, Pinot Gris, Riesling, Viogner, Tocai, Friulano, Verdelho*

#### Characteristics

- Produces wines reminiscent of New Zealand style Sauvignon Blanc, with aromas of aromatic herbs, white flowers, green fruit and nettle
- Aromas are rich & intense, lending a complexity to other well ripened grapes that are rich in aromatic precursors
- Low production of volatile acidity
- Tolerant of high alcohol, low temperatures, and low nutrition



### Fermol® Rouge (*Saccharomyces cerevisiae cerevisiae*)

*For Cabernet Sauvignon, Zinfandel, Merlot, Sangiovese, Syrah*

#### Characteristics

- Produces intense red berry aromas such as raspberry, currant and strawberry nuances
- Relative to other yeasts Fermol Rouge produces wines with more intense color, given the limited time to fix coloring substances extracted during maceration
- Short latency time provide rapid start to fermentation, a vigorous and dominant yeast
- High alcohol tolerance



### Premier Cru (*Saccharomyces cerevisiae cerevisiae*)

*For Pinot Noir, Cabernet Sauvignon, Cabernet Franc, Merlot, Petit Verdot, Petit Syrah*

#### Characteristics

- Produces high level of polysaccharides with good extraction of color and tannins - for more structured wines that are meant to be aged.
- Does not mask varietal aromas, allowing the full expression of varietal character
- Requires adequate nutrition and higher temperatures (82°F)
- Low alcohol conversion (5.6%Vol from 100g/L sugar, using 18.1 g/L sugar to produce 1% alcohol by volume)

### Fermol Blanc

Sparkling wine  
Late harvest  
Fruit wine  
Ice wine  
Honey mead  
Aromatic whites

#### Pack sizes:

10 kg, 500 gram

### Fermol Chardonnay

Chardonnay  
Viogner  
Gwurtztraminer  
Pinot blanc  
Seyval  
Chardonel

#### Pack Sizes:

10 kg, 500 gram

### Fermol Sauvignon

Sauvignon blanc  
Pinot gris  
Riesling  
Viogner  
Tocai  
Friulano

#### Pack Sizes:

10 kg, 500 gram

### Fermol Rouge

Cabernet  
Merlot  
Zinfandel  
Sangiovese  
Syrah

#### Pack Sizes:

10 kg, 500 gram

### Premier Cru

Pinot Noir  
Cabernet Sauvignon  
Cabernet Franc  
Merlot  
Petit Verdot  
Petit Syrah

#### Pack Sizes:

10 kg, 500 gram

Orders: 800-585-5562 Order online at [www.BSGwine.com](http://www.BSGwine.com)

12 g/hL = 1 lb/1000 G

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## Fermol®, Italy

### Complete Killer

Restart stuck ferment  
Sparkling wine

Pack sizes:  
10 kg, 500 gram

### Super 16

Zinfandel  
Pinot noir  
Dessert wines  
Ice wine

Pack sizes:  
10 kg, 500 gram

## Maurivin™

### PDM

**Note:** Partly because of its nutrient-grabbing habit and partly because of SO<sub>2</sub> production in some musts, ML bacteria may have trouble competing with this strain (under any of its brand names). If this strain is used, inoculate for MLF at the **start** of yeast fermentation, **or after** the end, not in mid-fermentation.

**Be sure** to use Leucofood to replace nutrients used up by the yeasts!



### Complete Killer (*Saccharomyces cerevisiae bayanus*)

*For restarting stuck fermentations, methode champenoise*

#### Characteristics

- Medium-low nutrient requirement
- Considered a fructophilic yeast (consumes fructose, the sugar usually remaining with a stuck fermentation)
- Resistant to high temperatures (up to 94°F) and high alcohol (up to 17.5%)
- Flocculates well, easy to filter shortly after fermentation

Best choice  
for restarting stuck  
ferments!



### Super 16 (*Saccharomyces cerevisiae cerevisiae*)

*For Zinfandel, Pinot Noir, Dessert wines, Ice wine*

#### Characteristics

- Isolated from Greece, this yeast is adapted to tough osmotic conditions, ferments well with high percentage of raisins and over-ripe grapes
- Performs at high temperatures (up to 94°F) and alcohol (up to 18%)

## Maurivin, Australia



### Maurivin PDM

*Saccharomyces cerevisiae bayanus*  
*All Purpose*

#### Characteristics

- Very vigorous yeast, ferments well at low temperatures
- At higher temperatures rapid nutrient depletion may occur requiring nutrient additions (see note)
- Low foaming
- Alcohol tolerant in 14-17% range



### BP 725

*Saccharomyces cerevisiae cerevisiae*  
*For Aromatic Reds*

#### Characteristics

- Well suited to varietal red wines
- Enhanced color extraction
- Higher alcohol tolerance (15.5%)
- Considered a low to moderate nitrogen consumer

#### Dry Yeast Use Chart

##### 500 grams:

2.5-3 tons white grapes  
500 G white juice  
500 G red must & skins  
2-2.5 tons red grapes

##### 10 kg:

50-60 tons white grapes  
10,000 G white juice  
10,000 G red must & skins  
40-50 tons red grapes



### AWRI 796

*Saccharomyces cerevisiae cerevisiae*  
*Both red & white*

#### Characteristics

- A very neutral yeast, this strain does not impart its own character to varietal character of the grapes
- Moderate to rapid fermenter with short lag time
- Temperature sensitivity in white wines - be sure to acclimatize the yeast to ferments below 15-18°C.
- Alcohol tolerance 13-15%

#### Rehydrating Dry Yeast

Follow the manufacturer's directions exactly. *Many winemakers kill their yeasts, primarily by cold-shock.*

For a strong start, add Startup or Startup-ORG to the warm water used to rehydrate dry yeast. Sugar or juice is not necessary and may actually hurt the yeasts.

Sprinkle (do not stir yet) 500 g dry yeast into 5 L of water (not juice!) at 38-40 C. *This temperature is critical!* Most cells die if the water is even a *little* too cool or too hot. After 5 minutes, stir very gently. Wait 15 min. Yeast *may* or *may not* froth up; this does NOT relate to activity.

Acclimate rehydrated yeast to juice temperature by slowly adding portions of cool juice (max. 10F/ 5C drop in 15 min). Add acclimated yeast to tank but do not circulate right away. If juice is < 60F/15C, let yeast/juice mixture begin fermenting before adding to the rest of the juice. If possible, check yeast viability microscopically with stain before and after inoculating the tank.

Storage: Keep yeast tightly closed in cool, dry place.

## ML Bacteria

### Oeno™, Kerry (USA)

#### General Information

This frozen, highly concentrated culture of *Oenococcus oeni* (ex-*Leuconostoc oenos*) is capable of inducing malolactic fermentation in red, rosé and white wines. Manufacturer's notes list tolerance of 13% alcohol and pH of 3.2, but *user reports indicate higher alcohol tolerance*.

Oeno™ is shipped on dry ice, and must be stored in a non-cycling (NON-frost free) freezer.

- expedited shipping is at **no additional charge for more than 1 case (12 cups)**
- price breaks at 1 case, 3 cases, 12 cases, 36 cases (12 cups/case)
- consolidate your requirements and order in advance for maximum savings
- sold as individual cups or by the case of 12



#### Rate of use

Packaged in 170 gram containers, 12 per case

Red wine - 1 container inoculates 3,000 - 5,000 gallons  
White or rosé white - 1 container inoculates 500 - 1,500 gallons

#### Customer comments:

"Oeno offer a convenient, single stage preparation that is easy to manage during hectic harvest days. Most of our wines complete MLF in a timely manner, with little or no diacetyl production. No flavor impact, cost effective and convenient."

*Sonoma County premium winery*

"Oeno (oeno cups) are easy to use/prepare, and they finish quickly. We find them to be convenient and effective." **Large production facility**

"You get more bang for your buck, and it works well."  
**Well established Mendocino County winery**

## ML Bacteria Nutrients

### Leucofood™ & Leucovit™, VFerm Nutrients

#### Leucofood™

This rich mixture of **primary-grown yeast extract, casein digests, vitamins, and minerals** helps ML bacteria grow and survive. Helpful for ANY bacterial strain in ANY situation, **Leucofood** can be essential when fermenting with yeast strains that hoard nutrients or have high nitrogen requirements, depleting grape nutrients more thoroughly.

Unlike yeasts, ML bacteria cannot store nutrients, and they cannot synthesize all the amino acids they need so they must find them in the wine. Nutrient depletion is frequently the cause when MLF begins but does not finish.

For free technical assistance with MLF, contact  
Lisa Van de Water at [vinotecnapa@aol.com](mailto:vinotecnapa@aol.com)

Blended especially for *Oenococcus oeni* (formerly *Leuconostoc oenos*), **Leucofood** is NOT the same as yeast nutrients. **Leucofood** has no DAP because ML bacteria cannot use inorganic nitrogen.

#### Leucovit™

A blend of **pantothenic acid, riboflavin, and biotin**, **Leucovit** replenishes vitamins used by yeasts. It too is formulated specifically for ML bacteria (use Vitamix or Super-vit for yeasts), and is bright orange in color because of its riboflavin content.

We do not recommend adding Leucovit to wines that are already infected with *Brettanomyces*.

Orders: 800-585-5562 Order online at [www.BSGwine.com](http://www.BSGwine.com)

KERRY

Formerly known as  
Oeno Cups, Oeno™

- very reliable
- cost effective
- convenient

The REAL alternative to  
other very costly  
preparations.

Save some  
**SERIOUS \$**

Depending on application  
conditions, the cost  
per gallon of red wine  
can be less than 1  
penny!



VFERM NUTRIENTS

#### Leucofood™

Dose: 4-5 g/hL or  
0.15 - 0.2 g/Gal (wine/must)

Pack Sizes:  
100 g, 1 kg, 5 kg, 25 kg

#### Leucovit™

Dose: 1 g/hL (4 g/1000G)

Pack Sizes:  
10 g, 100 g, 1 kg

12 g/hL = 1 lb/1000 G

# ML Bacteria

## Biolact Acclimatée Line, AEB, Italy

### Biolact Acclimatée®

Dose:  
1 g/hL

Pack sizes:

- Sm (66 gallons)
- Med (660 gallons)
- Large (6600 gallons)

Remove from freezer 30 minutes before use.

Storage & Shelf Life:

Stable for 2 years with minimal loss of activity when stored at -0.4°F or -17°F

### Biolact® Acclimatée 4R

Dose:  
1 g/hL

Pack sizes:

- Sm (66 gallons)
- Med (660 gallons)
- Large (6600 gallons)

Remove from freezer 30 minutes before use.

Storage & Shelf Life:

Stable for 2 years with minimal loss of activity when stored at -0.4°F or -17°F



Photo courtesy of Lisa Van de Water



### Biolact Acclimatée®

**DIRECT ADDITION**

- Freeze dried culture
- Multi strain (3 strains) inoculum of *Oenococcus oeni*

This culture is constituted of three genetically different strains of *Oenococcus oeni*, equally effective in conducting the malolactic fermentation. This union helps improve competition in the event of a high population by indigenous bacteria.

Biolact Acclimatée resolves a problem arising from the presence of bacteria phages, as their action is genetically specific, which means that the phages of a determined genetic group attack only a specific genetic group of bacteria.

Biolact Acclimatée has been selected for its capacity to highlight the typical aromas of the cultivar from which the wine was made, integrating them with pleasant nuances reminiscent, in red wines, of fruits of the forest. Its use also improves the taste profile of wine, enhancing roundness and fullness, prolonged aftertaste sensations, without the appearance of bitter nuances, which often characterize wines at the end of spontaneous malolactic fermentation.



### Biolact Acclimatée® 4R

**DIRECT ADDITION**

- Freeze dried culture
- **HIGHER ALCOHOL TOLERANT**
- Multi strain (4 strains) inoculum of *Oenococcus oeni*

In this product you will find an aggregate of four *Oenococcus oeni* strains especially selected for working in red wines. These strains were selected for resistance not only to ethanol and SO<sub>2</sub>, but also to high levels of polyphenols.

Biolact Acclimatée 4R has been selected under the following conditions:

- pH 3.2
- Temperature 18°C
- Alcohol 14.5% (If wine is at optimal conditions - up to 16%)
- Total SO<sub>2</sub> 60ppm
- Concentration of polyphenols 80 (Total polyphenol index)

**ALL ML BACTERIA ARE STRESSED BY TYPICAL FERMENTATION CONDITIONS**

**ENSURE THAT YOUR ML BACTERIA GETS THE BEST CHANCE**

**USE LEUCOFOOD / LEUCOVIT TO SUPPORT YOUR MALOLACTIC FERMENTATION**

# Yeast Nutrients

## VFerm - The Source for Understanding Nutrients

### Why Add Nutrients

TODAY'S WINEMAKERS SEE NUTRIENT SUPPLEMENTATION AS A NORMAL PART OF FERMENTATION, and are on the lookout for danger signals that indicate high-risk musts likely to have trouble completing fermentation.

The importance of adding nitrogen to N-deficient juices is critical. Insufficient nitrogen has many negative effects on yeast growth and metabolism.

Cell numbers, growth and fermentation rate, protein synthesis (including the glucose transport proteins that bring sugar into the cell), and alcohol resistance all depend on the availability of nitrogen at the right time.

The wine's sensory qualities are most positive with an appropriate mix of nitrogen sources, not just DAP. And H<sub>2</sub>S may form when amino acid synthesis is interrupted because nitrogen has been depleted or vitamins are deficient.

But yeast nutrition involves MORE than just nitrogen! Fermentation researchers around the world have long known that a blend of ingredients is much more effective than just adding inorganic nitrogen (DAP).

It is impossible to overstate the importance of balanced nutrient supplements added at exactly the right stages.

#### What should be in a complex yeast nutrient blend?

- INORGANIC NITROGEN (DAP)
- YEAST PRODUCTS
- MINERALS
- VITAMINS

Our complex nutrients contain effective levels of all four of these "Food Groups".

So many nutrients... many products, often with confusingly close names (not always coincidental), are promoted for yeast nutrition in wine. These products are NOT all the same, and many are not even similar. Some are blends with varying degrees of complexity. Others are more simple, just DAP or inactive yeast with a vitamin added, at a much higher price than the ingredients sold separately. Make sure you know WHAT is in your yeast nutrients!

It is very important for winemakers to know what is in the supplements they use, and to understand the function of each one. In these pages we will discuss what goes into our complex yeast supplements, and why.

#### What Do Complex Nutrient Supplements Do?

- Increase predictability of fermentation
- Balance the overstimulation of yeasts from inorganic nitrogen supplementation
- Improve alcohol tolerance
- Remove byproducts, such as short-chain fatty acids, that are toxic to yeasts
- Reduce yeast stress, which can lead to acetic acid and other unwanted metabolites
- Give better protection against sulfides than just DAP
- Improve aromas and flavors by allowing more balanced amino acid uptake



### COMPLEX YEAST NUTRIENT SUMMARY

**Superferm** • for high-risk fermentations

**Superfood** • for most premium wines

**Vinferm** • for medium to low-risk ferments

**Startup** • add to yeast rehydration water  
• use in must when juice nitrogen is adequate or high

**STUCK FERMENTS ARE VERY EXPENSIVE!**



VFERM NUTRIENTS

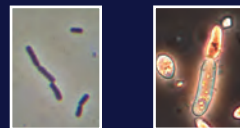
Lisa Van de Water at Vinotec Napa offers FREE technical support for our nutrients.

Cell phone:  
(707) 953-7072  
vinotecnapa@aol.com



#### Stuck ferment?

Alas, fermentations do not always go well despite the best of plans. Wine yeasts struggle with today's high-Brix musts, and spoilage microbes are always ready to interfere. Stuck wines are very susceptible to attack by 'ferocious' Lactobacilli and other nasties.



Photos courtesy of Lisa Van de Water

For expert help in avoiding or treating wine problems:

"The Bad Wine Lady"  
Lisa Van de Water.  
707-953-7072,  
badwinelady@aol.com.



VFERM NUTRIENTS

**NEW!**

**Superferm™**

**Dose:**  
See addition chart page 19  
Supplies 10 ppm YAN at  
1 # per 1000G (12g/hL)

**Pack size:**  
1 kg  
5 kg  
25 kg

**Superfood®**

**Dose:**  
See addition chart page 19  
Supplies 12 ppm YAN at  
1 # per 1000G (12g/hL)

**Pack size:**  
1 kg  
5 kg  
25 kg

**Beware of similar names & claims!**

Watch out for false comparisons... other brands are NOT the same as Superfood or equivalent to it.

**There is nothing like Superfood! (except Superferm)**

**Complex Nutrient Blends, VFerm Nutrients**

**SUPERFERM™**

*The next generation of nutrients for today's Premium wines*

Contains: Yeast Hulls & Yeast Extract, DAP, Complex Minerals, Vitamins.

Superferm has a higher percentage of minerals and vitamins than Superfood, and less DAP. It is designed for fermentations expected to be challenging. Superferm is formulated to help these grapes ferment more completely, and to preserve their intense sensory qualities. Add EXTRA DAP depending on YAN.

Use Superferm especially for:

- HIGH-SUGAR OR LONG HANG-TIME GRAPES
- GRAPES FROM STRESSED VINES

NOTE: No yeast nutrient, not even Superferm, can guarantee that high-sugar grapes will ferment to dryness. Be SURE to reduce Brix of grapes that come in too sweet. See p.18.

Superferm has LESS DAP than Superfood and MUCH LESS DAP than most other nutrient blends, which can be 50-70% DAP or more. With Superferm, BE SURE TO ADD EXTRA DAP TO NITROGEN-DEFICIENT MUST, based on YAN. See charts p.19.



**SUPERFERM™**  
**The NEW Gold Standard of Yeast Nutrition**

**IF ENOUGH EXTRA DAP IS NOT ADDED FERMENTATION MAY STICK**

**SUPERFOOD®**

*SUPERFOOD is the ORIGINAL proprietary complex yeast nutrient, and the most popular.*

(Superfood® is a registered trademark of Lisa Van de Water; it is available after July 25, 2009)

Contains: Yeast Hulls, DAP, Yeast Extract, Minerals, Vitamins

Lab and winery trials consistently show that the MOST EFFECTIVE complex nutrient is SUPERFOOD, providing the most nutritious supplements yeasts need for growth and survival during the anaerobic stress of fermentation.

Many winemakers in several countries rely on Superfood for all their musts. They say that Superfood works better and solves their fermentation problems more readily than other products, because Superfood is different.

Superfood, containing a variety of nitrogen sources, is MUCH better for yeasts than just DAP, and better than other blends. Superfood's unique formula includes 33% DAP; most nutrient blends have much more DAP (45% and up).

*Why is there such a difference?*

When Lisa Van de Water formulated Superfood in 1986, her philosophy was to provide more of the complex ingredients yeasts need to balance inorganic nitrogen additions, and less DAP. She decided that it was much more important to emphasize highly effective doses of complex ingredients, because wineries can add extra DAP as needed.

Superfood's carefully guarded, unique formula contains primary-grown, FULLY autolyzed yeast extract and yeast hulls, not just partly autolyzed yeast as do other blends.

**SUPERFOOD AND SUPERFERM**

- Provide the most powerful defense against stuck or sluggish fermentations
- Help yeast fermentations finish more completely
- Increase alcohol tolerance and health of cell membranes
- Nutrients are immediately accessible when yeasts need them
- Ideal balance of naturally complex ingredients

## Complex Nutrient Blends, VFerm Nutrients

### VINFERM®

*All-round complex yeast supplement that encourages smooth, complete fermentations in juices that are moderately deficient in nitrogen*

Contains: Inorganic nitrogen (DAP), Yeast hulls, Yeast extract, Complex minerals, vitamins

#### What you should know about VINFERM:

- Protection against sluggish and stuck fermentations and sulfides
- Nitrogen is available with **no delays**, giving **perfect control** over nitrogen exactly when your yeasts need it.
- Yeast extract is fully soluble so the nutrients are available immediately.
- Yeast hulls enhance yeast growth and long-term survival, by increasing alcohol tolerance of cell membranes.
- Contains a complex blend of minerals and vitamins balanced for yeasts
- Competitively priced vs. other blends



Balance!

### STARTUP™ and STARTUP-ORG

*Add to yeast rehydration water  
Or add for balance to musts that do not need extra nitrogen*

Startup contains: yeast hulls, yeast extract, complex minerals and vitamins  
Contains no inorganic nitrogen (DAP)

Startup-ORG contains ONLY fully autolyzed yeast

#### STARTUP provides balance when...

- Your must does NOT need extra nitrogen
- You want total control of the amount of inorganic Nitrogen added (Use Startup & DAP)
- Reinoculating sluggish or stuck wines

Startup can be added to the water to rehydrate dry yeast.

**ALSO ADD THE USUAL SUPPLEMENTS TO THE MUST** (see charts p.19)

Startup is also used to supplement musts.  
Add DAP separately if juice nitrogen is low.

Note: Nitrogen MUST be measured and deficiency corrected during fermentation if ANY nutrient is added to the yeast rehydration water, or the fermentation can stick later on, when the stimulated yeasts get "hungry."

The ONLY nutrient allowed to add to Organic ferments is Autolyzed Yeast.  
That's it. NOTHING else.

Startup-ORG provides alpha-amino nitrogen, but not enough to significantly raise YAN. No inorganic nitrogen is allowed, thus there is no LEGAL way to adjust YAN to the correct levels in nitrogen-deficient must for organic wine.

To adjust YAN significantly you would have to add so much autolyzed yeast that your wine would taste like 'yeast soup.' Our fully autolyzed yeast can provide the most accessible nutrients possible, as opposed to partly autolyzed yeast products.

### VITAMIX® and SUPERVIT®

**To promote yeast health & avoid sulfides: ADD WITH COMPLEX BLENDS, NOT ALONE!**

Vitamins make yeasts healthier, promote survival, help avoid stuck ferments, and are useful in preventing sulfides. Nitrogen-deficient musts produce H<sub>2</sub>S because of interruption in amino acid synthesis, but research now shows that if there is enough nitrogen but a deficiency of pantothenate, MORE and WORSE-SMELLING sulfides form. Testing vitamins in juice is quite expensive and takes weeks, so adding a vitamin blend can be good "insurance."

• Thiamine • Pantothenate • Pyridoxine • Inositol • Biotin

Vitmix: PURE YEAST VITAMINS

Dose: 0.1 - 0.2 g/hL (1-2 ppm)  
(4-8 g/1000 G; legal limit 4 g/1000G)

Supervit: VITAMINS AND MINERALS

together in a nutritive base  
Dose: 2.5 g/hL (25 ppm)  
(100 g/1000 G)

Extra vitamins are not needed when using Superferm at higher doses

### VINFERM®

#### Dose:

See addition chart page 19  
Supplies 14 ppm YAN at  
1 # per 1000G (12g/hL)

#### Pack size:

1 kg  
5 kg  
25 kg

### STARTUP™

### STARTUP-ORG

#### Dose:

In yeast rehydration water: 50 g/liter of water

In must: 25 g/hL  
2 #/1000 G

Supplies 7 ppm YAN at  
1 # per 1000G (12 g/hL)

#### Pack size:

1 kg  
5 kg  
25 kg

What's the difference between Vitamix and Supervit?



Vitamix is pure vitamins for yeast.

Supervit has the same vitamins as Vitamix, but also has minerals in a nutritive base.

Which should you add?

Supervit is best for higher-risk or difficult musts because of its extra mineral content.

Vitamix is the choice if you want vitamins only.



Yeast Hulls (Nutrex 370)

### Yeast Extract (T154)

Included in Superferm, Superfood, Vinferm and Startup

Dose if added separately:  
6-12 g/hL  
1/2 to 1 lb/1000G

Supplies 11 ppm YAN at  
1# per 1000G

Pack Size:  
1 kg  
5 kg  
25 kg

### Yeast Hulls (Nutrex 370)

Included in Superfood, Superferm, Vinferm and Startup

Dose if added separately:  
12-30 g/hL  
1-2.5 lb/1000G

Supplies 1 ppm YAN at  
1# per 1000G

Pack Size:  
1 kg  
5 kg  
22.7 kg

## Nutrient Ingredients

“Primary grown” yeast products are made from fresh, aerobically grown yeast cells that have not fermented, so they retain a full complement of nutrients, providing several times as much nutrition as spent “brewers’ yeasts” left over from brewing. Primary grown products also have less sour off-odors and bitter flavors than other yeast products.

### Autolyzed Yeast: Full vs. Partial autolysates

“Autolyzed yeast” is a catchall term, covering many yeast products, not all suitable for wine. Gently heating yeasts initiates autolysis, a natural degradation process, and the cell contents start leaking out.

ALL such products are legally termed “AUTOLYZED YEAST” (“inactivated” or “killed” yeasts can mean partly autolyzed, or can just mean dead yeast), but there are vast differences, depending on the exact procedure.

The process is scientifically engineered to control the degree of autolysis and even the flavor. By adjusting pH, temperature, and time, products with different flavors, composition, and nutrient availability are made.

Nearly all yeast products are PARTIAL AUTOLYSATES. The yeasts are heated for a few hours before they are killed and dried. Autolysis begins but does not proceed far.

### Yeast Extract (T154)

Yeast extract is used in many microbiological media recipes because of its rich nutrition, and is also perfect for yeast and ML fermentation in wine. Preparation of this very special extract requires an elaborate, full autolysis regime.

T154 is a full autolysate high in amino acids in proportions used by yeasts. It also supplies natural vitamins, micronutrients, and other yeast components in an easily soluble form, so nutrients are available instantly to yeasts. **Yeast Extract is a key to Superfood’s great success.**

**NOTE:**  
*Yeast products are naturally tan-colored.*  
If a nutrient is white or cream-colored, either it does NOT contain yeast products, or it contains products that have been over-purified and do not retain the full complement of natural nutrients. *Add Yeast Extract and Yeast Hulls separately if using such products.*

### Yeast Hulls (Nutrex 370)

Yeast Hulls (also called cell membranes, yeast cell walls, yeast ghosts, enveloppes cellulaires) are the insoluble cell membranes left over after separating out yeast extract.

They are very beneficial to fermentations, adsorbing pesticide residues, toxic short-chain fatty acids (C8-10) and other inhibitory byproducts. Yeast hulls also provide sterols and long-chain fatty acids to build healthy cell membranes that help delay alcohol toxicity.

### DO YEAST HULLS PROVIDE NITROGEN? NO, NOT MUCH.

Yeast hulls have little YAN, despite being high in total nitrogen. Most of the amino acids are tied up in mannoproteins and other proteins, which are not digested by yeasts. Soluble material (including free amino acids) is removed during production, to make yeast extract. Yeast hulls are a wonderful product, but not a major source of nitrogen for yeasts. Unlike nitrogenous nutrients, they can be added directly to stuck and sluggish ferments.

Much of the nutrients then stay sequestered in clumps of whole cells, leaking out gradually over weeks, often not in time to be useful for yeast fermentation.

Unfortunately, most autolyzed yeast and other yeast products are only PARTIAL AUTOLYSATES.

The products we use are all FULL AUTOLYSATES. In this procedure, temperature is increased in steps over 24 to 36 hours, to completely disrupt the cells and release the rich extract as a fully soluble product. *Not surprisingly, full autolysis is much more costly than partial autolysis.*

Analytical data does not reveal this difference, because the cells are always completely digested for the tests. The tests do not show how much of the nutrients are trapped within partly autolyzed cells, nor how long the cells will take to release their nutrients into the must.

### Why don’t other yeast nutrients contain yeast extract?

Most yeast extracts are designed to enhance meaty-toasty flavors of hearty soups and stews, so they taste too strong to add to wine. Extracts made from brewers’ yeast can be bitter or rancid-tasting. But T154 is produced to minimize sensory qualities, so it does not give off-flavors to the wine.

European yeast nutrients can contain partly autolyzed yeast and yeast hulls but cannot contain yeast extract. *Why not?* EU authorities are worried that winemakers might use it to enhance the flavors of an inferior wine, so they cannot have any yeast extract. This restriction does not apply to winemakers in other countries who are following their own laws.

T154 is agglomerated to reduce its very hydroscopic nature, but if exposed to air it will become sticky and then harden. If hard lumps form it will not dissolve readily and cannot be used.

Yeast hulls are a key element in many nutrient blends, and are also added separately late in fermentation to stimulate stuck or sluggish ferments. Famed French oenologist Pascal Ribereau-Gayon considered yeast hulls to be the most helpful product for preventing or treating stuck ferments. Nutrex 370 comes from the same procedure as T154, so it has VERY neutral sensory qualities, without cheesy odors or aggressive flavors that mar some other brands.

Yeast hulls have little YAN, despite being high in total nitrogen. Most of the amino acids are tied up in mannoproteins and other proteins, which are not digested by yeasts. Soluble material (including free amino acids) is removed during production, to make yeast extract. Yeast hulls are a wonderful product, but not a major source of nitrogen for yeasts. Unlike nitrogenous nutrients, they can be added directly to stuck and sluggish ferments.

## Nutrient Ingredients

### YAN? AMINO ACIDS? TOTAL NITROGEN? WHAT IS IMPORTANT?

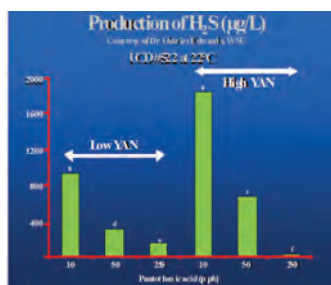
All products made from yeasts are high in nitrogen. But the form of the nitrogen is very important. The nitrogen in amino acids contained in proteins (including mannoproteins) is mostly unavailable to yeasts. Analysis of total nitrogen, or even total amino nitrogen, in nutrients is not relevant to winemakers because the proteins are all digested during these tests. Testing YAN itself gives an accurate picture.

### YAN CONTENT

Even the richest of yeast products, while providing many benefits to yeasts, do not contain as much YAN as DAP. So **if one complex blend is much higher YAN than another, it probably contains more DAP.** For example, Vinferm provides over 50% more YAN than Superferm, because Vinferm has more DAP.

## Vitamins

Vitamins are essential to yeasts for cell division, metabolism and survival, and can help prevent sulfide formation. Vitamins are essential for yeast cell division, metabolism and survival, and they can help prevent sulfides. Until recently, it was assumed that all grapes contained sufficient vitamins, despite winemakers' long-standing observations that vitamin supplements improved fermentation health.



Wang, Bolscheid, and Edwards  
J. Appl. Microbiol. 94:1-11 (2003)

**Thiamine** is routinely added to grape must, especially in Europe. But thiamine is not the only necessary vitamin!

Fermentation specialists have known for many years that a deficiency of both **pantothenate** AND nitrogen produces H<sub>2</sub>S. But research in Dr Charles Edwards' lab at WSU shows that if there is a **deficiency of pantothenate while there is ENOUGH nitrogen, even MORE sulfides are produced**, and WORSE-smelling ones, at that!

This explains the puzzling observation that when DAP alone is added to some musts, H<sub>2</sub>S may be stimulated. *The DAP did not cause the H<sub>2</sub>S* (as was once believed), but it did not correct the pantothenate deficiency in the juice.

Other useful vitamins include biotin, inositol, and pyridoxine. Nicotinamide is sometimes added, but an Australian study saw stimulation of acetic acid production by certain yeasts, so nicotinamide is not included in our vitamin blends.

## DAP

**DAP (Diammonium phosphate) is the main source of added nitrogen in wine fermentations in the USA.** Ammonium sulfate is allowed in other countries but not USA (however, some supplements sold in USA contain it anyway, usually called "ammonium salts"; *check ingredients*).

**DAP is 21.2% ammonia nitrogen**  
**100 ppm (10 g/hL) DAP = 21 ppm nitrogen**  
1 lb/1000G = 25.4 ppm N

**Test juice nitrogen to calculate the correct dose!**

DAP is best used in conjunction with yeast products in complex blends, but low-nitrogen musts need EXTRA DAP also.

**Add DAP in stages during the first half of fermentation.** DAP stimulates fermentation rate, so if too much is added at once, the yeasts may ferment too fast and too hot.

*Adding it in portions gives you the option to SLOW DOWN additions if the ferment is going too fast, which you cannot do if you have added nutrients all at once.*

## Minerals

Most mineral blends for yeast are based on requirements for growth in culture, not fermentation, but **our mineral blend was developed specially for alcoholic fermentations.** It has a dozen ingredients including potassium, magnesium, zinc, and trace minerals in a nutritive base containing an extra source of amino acids. Minerals are important for yeast growth and survival, and function as enzyme cofactors.

## Yeastex W & Yeastex WHP

Yeastex W is a 100% inactivated yeast product, and can be used to help avoid sluggish fermentations. It can also be used when restarting a stuck ferment.

Yeastex WHP is inactivated yeast with 0.15 % w/w addition of thiamine.

## Yeastex 61

Used extensively in the brewing industry, Yeastex 61 is a source of nitrogen and a complex blend of minerals that can increase yeast viability and activity during fermentation.

**Pack size: 35 pound**

Alas, suppliers often confuse the different forms of nitrogen.

No matter how high the product's total nitrogen, yeasts can 'starve' if it is not in a usable form.

## DAP

**Dose:**  
See addition chart pg 19

**Pack Size:**  
1 kg  
5 kg  
22.7 kg

**DAP = 21.2% ammonia N.**  
**A product that is 100% DAP would have 21.2 ppm N in 100 ppm of product.**

**KERRY**

## Yeastex W & WHP

**Dose: 20-40 g/hL**

**Pack Size:**  
1 kg  
10 kg

Orders: 800-585-5562 Order online at [www.BSGwine.com](http://www.BSGwine.com)

12 g/hL = 1 lb/1000 G

15

## Nutrient Supplementation - the "How To"

**STUCK  
FERMENTS  
ARE VERY  
EXPENSIVE!**

### Test YAN

(assimilable nitrogen) and bring to recommended level (250 ppm at 23°Brix, 300-350 at 25°Brix) or stuck ferments may occur even if musts have been supplemented



Syrah grapes starting to dehydrate before their phenolics are ripe. These were 24.8 Brix but 1.0 g/100 ml TA and 3.25 pH, with bitter, green flavors.

Can I raise the amino nitrogen content of my grapes?

Too late this year, but maybe next year. In NZ, mulching studies have had good results.

Contact Dion Mundy:  
Dmundy@hortresearch.co.nz.



### Questions

1. Where do I start?
2. Risk factors: What are they and what do they mean?
3. How do I use the charts on page 19?
4. When do I add this stuff, and why not all at once?
5. Will someone help with my nutrient additions and problem fermentations?

### #1 Where do I start: Initial YAN

The best way to calculate how much nitrogen to add to a juice is to test **alpha-amino nitrogen** (NOPA) by spectrophotometer (enzymatic method or method by Dukes & Butzke, 1996) and **ammonia nitrogen** (enzymatic or specific ion electrode). The sum is called "**Yeast-Available Nitrogen**" (YAN). Subtract juice YAN from the recommended levels on the next pages to obtain the amount of nitrogen to add. **Note:** Nitrogen tests MUST be run before ANY yeast growth at all occurs.

It is very important to measure juice nitrogen, not just guess, because grape nitrogen levels vary so much. Adding the same amount of nutrients to all musts is a recipe for disaster, because - as in "Goldilocks" - some musts will receive the right amount, but some will be underfed while others will have too much.

### #2 Risk Factors

**There is a large range in grape nitrogen levels, and in yeast needs for nitrogen.** This is not surprising, because there is no evolutionary pressure for a vine to grow nutritionally balanced grapes. The purpose of fruit is to attract birds at the right time for seed dispersal. In general, dry soil and/or water stress significantly reduce berry nitrogen (not the same as vine nitrogen). Vine diseases or deficiencies, and low vigor, also reduce berry nitrogen.

In the winery, some factors increase yeasts' nitrogen needs. High Brix and hot fermentations are the two most important. *Some yeast strains use up to twice as much as other strains.* And if molds or non-Saccharomyces yeasts grow, all the natural nitrogen and vitamins may be depleted before Saccharomyces has a chance to dominate the fermentation.

#### Risk factors for low grape nitrogen

- Varietal (Merlot, Riesling, Chardonnay, etc)
- Rootstocks other than AXR-1 or St. George
- Poor or infertile soil
- Water stress, hot, dry summer or drought year (drier vineyards have lower YAN than wetter ones)
- Low-vigor, struggling vines
- Signs of nutrient or mineral deficiency in vine
- Vine diseases (phylloxera, Petri disease, etc)
- Long hang time or grapes starting to dehydrate

#### Reasons for higher nitrogen needs by yeast

- Grape diseases (mold, rot)
- HIGH-SUGAR GRAPES (25+Brix)!
- History of stuck ferments or H2S
- Clarified juice (fined/filtered)
- Sparging with CO<sub>2</sub>, N<sub>2</sub>, or argon
- Yeast strain with high N requirements, or no yeast added
- Hot fermentations!
- ML inoculation before dryness
- ANY OTHER REASON to anticipate a sluggish ferment

**See Brix adjustment procedure on page 18**

### #3 How to use the charts

The charts are intended as **general guidelines ONLY!** Doses depend on MANY factors, some listed above. Grapes > 25 B (even rehydrated to lower Brix) need more nitrogen. *These charts are updated annually in response to research.*

The charts, based on juice YAN, show **AVERAGE** doses for our complex blends.

**Superferm** - for high-risk fermentations  
**Superfood** - for most premium wines  
**Vinferm** - for medium to low-risk ferments

**Startup** is best when juice nitrogen is adequate or high.

**Using the charts:**

1. Find the chart for your juice YAN
2. Select the blend you will use.
3. The total ppm of the complex blend to add, PLUS extra DAP, are listed, along with the YAN provided.
4. Look on the right at the three fermentation stages, to determine how much to add and when.  
**ADJUST ADDITIONS IF FERMENT IS TOO FAST.**

*We can recommend specific nutrient regimens for your wines, on request. For organic wines, see page 13.*

**Lower Brix grapes need less nitrogen,  
high Brix grapes need more.**

## Nutrient Supplementation - the "How To"

### #4 When do I add this stuff and why?

Yeasts need nitrogen during growth phase and throughout fermentation, but *the cells cannot take up nitrogen late in fermentation*, so **timing of supplementation is crucial!**

**Raising juice nitrogen:** In grapes, alpha-amino nitrogen is naturally 2 to 3 times the ammonia nitrogen, but in yeast nutrients ammonia from DAP provides most or all of the usable nitrogen. DAP has been called 'yeast candy' because yeasts use ammonia so easily. They deplete the supply during growth phase and very early fermentation. The more ammonia, the more yeast cells are produced ("biomass"), all of which continue to need nitrogen throughout fermentation.

**Balancing DAP and complex supplements:** Adding complex nitrogen sources derived from yeasts help balance ammonia. Alas, usual amino acid sources – yeast extract and protein digests – have negative flavor impact at high doses, so supplements cannot completely restore the balance of amino acids and ammonia, though they certainly do help.

**Yeasts need amino acids:** Ammonia represses uptake of amino acids. Too much DAP, especially at the beginning, can prevent use of some amino acids, arginine, in particular. Leftover arginine is an ethyl carbamate precursor, and can feed spoilage microbes like *Brettanomyces* and *Lactobacillus*. Amino acids are also aroma and flavor precursors necessary for the wine's sensory profile. Adjust nutrient supplement timing so that the yeasts "eat their amino acids" instead of "spoiling their dinner" by gorging on ammonia first.

#### AT YEAST REHYDRATION

You can add a supplement made from yeast, without DAP (such as Startup or Startup-ORG) to water before rehydrating yeast in it. This gives yeasts a boost for a fast, active start. **BUT YOU MUST TEST JUICE NITROGEN** and adjust the nitrogen to recommended levels (see chart on page 19), or the 'jump-started' yeasts can slow down or stop when they run out of nitrogen later on.

#### AT YEAST INOCULATION

If grape YAN is 150 ppm or below, add some supplements when you add yeast (or when encouraging a spontaneous ferment). At or over 200 ppm, delay the first addition until partway through fermentation.

#### DURING FERMENTATION

Add the rest of the supplements including extra DAP IN PORTIONS during the first half of fermentation. It is **VERY IMPORTANT TO ADD SUPPLEMENTS GRADUALLY INSTEAD OF ALL AT ONCE!** Make the last addition of DAP, or of any supplements containing DAP, at or just after mid-fermentation, to give yeasts extra nitrogen after they have stopped growing, but while they can still take up nitrogen (test with spectrophotometer; ask for procedure).

Despite the inconvenience, we recommend making multiple additions of products in which the nutrients are immediately available and do not have to leak out of partly autolyzed cells or dissolve slowly. Immediate availability gives much better control, allowing the winemaker to respond to fermentation kinetics by adjusting amounts and timing of the additions.

A large influx of nitrogen as DAP throws the cell's metabolism off balance, potentially leading to overgrowth of yeasts, runaway fermentation, flavor problems, nitrogen wasting, and leftover amino acids.

#### What's wrong with adding too much inorganic nitrogen (DAP) all at once?

- Yeasts produce too many cells, which get "hungry" when they have depleted the nitrogen.
- Yeasts may ferment too fast and too hot, and may even kill themselves with the heat.
- Some yeast strains waste nitrogen if they have too much DAP available at the start of fermentation.
- Fast or hot fermentations often have less complexity and less fruity aromas.
- Too much DAP can result in incomplete use of grape amino acids, stimulating spoilage microbes.

Later in fermentation, yeasts lose the ability to intake nitrogen because of inhibitory effects of alcohol. When is that point? It varies... in some musts the yeasts stop taking up nitrogen by 10° B, but in others they can take up nitrogen until 5° Brix.

If H<sub>2</sub>S forms during fermentation, do a simple trial (ask for procedure) to determine if DAP or vitamin addition will help.

Leftover DAP - not used by yeasts because it was added too late - tastes terrible, raises pH and is a nutrient source for spoilage yeasts. **Never add nitrogen-containing nutrients directly to a stuck or sluggish wine** (add to reinoculation starter). Yeast Hulls are good to add to stuck wines, they adsorb toxins and contain very little nitrogen.

### #5 Will someone help?

**Lisa Van de Water**, internationally known fermentation consultant and creator of Superfood in the mid 80's, is available to assist winemakers with the often complicated process of designing a supplementation plan. If you have ANY fermentation problems and have been using VFerm nutrients, Lisa will also assist with diagnosis and treatment of problem ferments. Contact her through BSG, by cell at Vinotec Napa (707) 953-7072, or at [vinotecnapa@aol.com](mailto:vinotecnapa@aol.com).

#### Why not just use "time-release" products?

Yes, it seems like such a good idea. But once you have added them, you can't "take it back" or adjust nutrient additions to respond to fermentation kinetics. If the ferment is too fast or too hot, you can do nothing. Also, in independent trials the nutrients dissolved within hours, not days.

#### ARE YOU FACING COMPLEX HARVEST ISSUES?

- Do you have long hang time or high Brix grapes?
- Did you have H<sub>2</sub>S or stuck ferments last year?
- Can you have better but also more cost-effective fermentations?

**Ask Lisa Van de Water for assistance with YOUR specific situation. She can assist you in designing a supplementation strategy that accommodates your logistics and budget, while providing the best support for a clean and successful fermentation.**

## Planning Nutrient Additions

### Recommended levels for YAN

**YAN (ppm) = Ammonia N + Alpha-amino N**

21 Brix or less:	200- 250 ppm YAN
23 Brix:	250- 300 ppm YAN
25 Brix:	300- 350 ppm YAN

**Add last dose before 10 Brix**  
(or test ability of yeasts to still pick up nitrogen)

**Also add Vitamix (0.1 g/hL; 1 ppm) or  
Supervit (2.5 g/hL; 25 ppm)**

ADD **STARTUP** OR **STARTUP-ORG** TO YEAST  
REHYDRATION WATER FOR A STRONG START

### Fermentation Stages

*For use with Nutrient Addition Charts on next page*

**At yeast rehydration:** Startup or Startup-OR can be added to the water used to rehydrate yeast. See page 13.

**STAGE 1: At yeast inoculation, or when Saccharomyces yeasts start growing in uninoculated musts** (instead of Kloeckera, apiculate vineyard yeasts). Growing yeasts need a wealth of nutrients including nitrogen, mineral, vitamins, and survival factors. If nitrogen is limited during growth, fewer cells will be produced.

**STAGE 2: Fermentation is fully underway** (actively bubbling, cap risen) and Brix has dropped at least 3 to 4 degrees. At this point the yeasts should have taken up most of the nitrogen present in the juice, especially ammonia N.

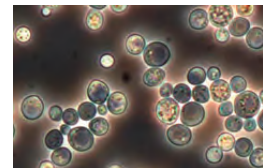
**STAGE 3: Mid-fermentation**, around 10-12 Brix. Yeast growth has stopped, but alcohol is low enough that yeasts can still take up nitrogen. Nitrogen at this point helps replenish the supply in existing cells without producing more cells.

### SUPPLEMENTING UNINOCULATED FERMENTS? ASK FOR DETAILED INFORMATION

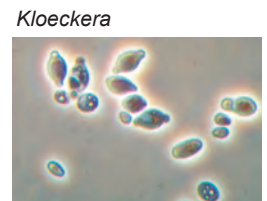
Many fermentations without added yeast (or when added yeasts are killed by mishandling) begin with Kloeckera or other vineyard species. These cold-tolerant yeasts can also grow during or after settling or skin-soaking if above 50F. Some are even resistant to SO<sub>2</sub>.

These yeasts make off-characters including ethyl acetate (nail polish), amyl acetate (banana), acetic acid, and floating clumps or fluffy lees. They deplete vitamins and nitrogen (whether in the grape or added) very quickly, before the desirable yeasts can take over. Later on, ferments may become stuck even though the non-Saccharomyces yeasts are dead by then.

Check under a phase-contrast microscope: If vineyard species such as Kloeckera have grown, add supplements only when round/ovoid Saccharomyces yeasts can be seen, or when the fermentation is clean and healthy-smelling, to avoid feeding the wrong yeasts.



Saccharomyces



Kloeckera

Photos courtesy of Lisa Van de Water

**HANDLING HIGH-SUGAR GRAPES:** Warm-climate, dry-summer grapes often become too sweet before their phenolics have matured. As hang time increases, especially with water stress, dehydration compounds the effect.

“Rehydrate” (add water to) must that is > 25 B before adding yeast, after soaking overnight on skins (legal even in CA now). Bring to 24-25 Brix with water, to avoid making sweet and/or high-alcohol wine. The sugar often rises after rehydration, so **RECHECK BRIX AFTER SOAKING AGAIN** several hours to overnight, rehydrate again if necessary. Use risk assessment for 25+ Brix even after rehydration. *Ask for calculation information.*

High sugars?  
READ THIS!

VERY IMPORTANT:  
GRAPES > 25 BRX



Rotten eggs, onions,  
...asparagus!!!!

What do I do now??



### Sulfide Trial During Fermentation

If sulfides form during active fermentation, do a short, easy bench trial with a nitrogen source and vitamins, to determine whether nutrient additions could cure the problem.

*PROCEDURE ON REQUEST.*

*Stubborn sulfides may need chemical treatment after fermentation. Sulfides very late in fermentation are usually best treated chemically later.*

## Nutrient Addition Charts

**These charts are intended as general guidelines ONLY!**

Adjust according to risk factors on page 18, or ask for specific recommendations for your wines.  
**Lower Brix grapes need less nitrogen, high Brix grapes more.**

CHOOSE SUPERFERM, SUPERFOOD, OR VINFERM (not all 3). Use CHART C if you cannot test YAN.

Also add Vitamix or Supervit at Stage 1

ADD STARTUP/STARTUP-ORG TO YEAST REHYDRATION WATER FOR A STRONG START

**Recommended TOTAL  
YAN levels  
(in grapes plus added)**

23 Brix: 250 ppm  
 25 Brix: 300 ppm  
 > 25 Brix: 350 ppm+

VERY HIGH RISK

HIGH RISK

MODERATE RISK

MILD RISK

LOW RISK

Start Point	Nutrient	Nutrient		DAP		Stages	Amount to Add			
		Dose #/1000G (ppm)	YAN (ppm)	Dose #/1000G (ppm)	YAN (ppm)		Nutrient #/1000G	DAP #/1000G		
Chart A 50 ppm	SUPERFERM	5 # (600 ppm)	50	6 # (725 ppm)	154	1	2 #	2 #		
		(Also use this chart for 100 ppm YAN @ 25+°Brix)					2	2 #	2 #	
							3	1 #	2 #	
	50 ppm	SUPERFOOD	5 # (600 ppm)	60	5.5 # (650 ppm)	138	1	2 #	1.5 #	
								2	2 #	2 #
								3	1 #	2 #
50 ppm	VINFERM	NOT RECOMMENDED								
Chart B 100 ppm	SUPERFERM	4 # (500 ppm)	42	4.5 # (550 ppm)	117	1	2 #	1 #		
		(Also use this chart for 150 ppm YAN @ 25+°Brix)					2	1 #	1.5 #	
							3	1 #	2 #	
	100 ppm	SUPERFOOD	4 # (500 ppm)	50	4 # (500 ppm)	106	1	2 #	0	
								2	1 #	2 #
								3	1 #	2 #
100 ppm	VINFERM	4 # (500 ppm)	58	3.75 # (450ppm)	95	1	2 #	0		
						2	1 #	1.75 #		
						3	1 #	2 #		
Chart C 150 ppm	SUPERFERM	3.25 # (400 ppm)	33	2.75 # (325 ppm)	69	1	1 #	0		
		(Also use this chart for 200 ppm YAN @ 25+°Brix)					2	1 #	1 #	
							3	1.25 #	1.75 #	
	150 ppm	SUPERFOOD	3.25 # (400 ppm)	40	2.5 # (300 ppm)	64	1	1 #	0	
								2	1 #	1 #
								3	1.25 #	1.5 #
150 ppm	VINFERM	3.25 # (400 ppm)	47	2 # (250 ppm)	53	1	1 #	0		
						2	1 #	1 #		
						3	1.25 #	1 #		
Chart D 200 ppm	SUPERFERM	2.5 # (300 ppm)	25	1# (125 ppm)	27	1	0	0		
		(Also use this chart for 250 ppm YAN @ 25+°Brix)					2	1 #	0	
							3	1.5 #	1 #	
	200 ppm	SUPERFOOD	2.5 # (300 ppm)	30	0.8 # (100 ppm)	21	1	0	0	
								2	1 #	0
								3	1.5 #	0.8 #
200 ppm	VINFERM	2.5 # (300 ppm)	35	0.6 # (75 ppm)	16	1	0	0		
						2	1 #	0		
						3	1.5 #	0.6 #		
Chart E 250+ ppm	STARTUP	2 # (250 ppm)	15	0	0*	1	0	0		
		(Also use this chart for 250 ppm YAN @ 25+°Brix)					2	1 #	0	
							3	1 #	0	

**Stage 1** = Yeast inoculation

**Stage 2** = Active Fermentation

**Stage 3** = Near mid-ferment (10-12 Brix)

Addition amounts and YAN are in ppm

(100 ppm = 0.10 g/L or 10 g/HL).

ppm	lb/1000G	g/HL
50	0.4	5
75	0.6	7.5
100	0.8	10
125	1.0	12.5
150	1.25	15
200	1.7	20
250	2.0	25
300	2.5	30
400	3.3	40
500	4.0	50

Add nutrients in portions during the first half of fermentation,

*NOT all at once!*

**PLEASE NOTE:**

By adding nutrients in stages, you can **SLOW DOWN** or **REDUCE** the additions if the fermentation is going too fast. Adding nutrients all at once, or using *sustained-release preparations*, does not allow real-time response to different fermentation kinetics.



**TOASTED OAK  
COMPANY**

**NEW!**

**Liquid Tannin  
Oak Concentrate**

Product is stable if stored in cellar conditions.

Can be used 2 days prior to bottling.

Add to wine post-filtration to preserve fresher aromas.

**Pack Size:**

20-25 Liter bottle  
1000 L

Samples are available - please call to request more information.

**These products have been approved by the TTB. Copy of approval letter available upon request.**



**Tannins**

**Liquid Tannin - Liquid Oak Concentrate**

**Liquid oak concentrate** contains only water and tannins from French oak. We extract unique flavors with different toasting methods in a distillery near Cognac, France.



*Photos courtesy of Toasted Oak Company*



*Distilling process, Cognac, France*

**Fruit Enhancer**

Fruit Enhancer is a concentrate with 80 g of tannin / liter of concentrate. It adds structure as well as a softening, rounding, aging effect on red and white wine, often reducing any vegetative character.

**Usage:** Approximately 1 L / 300G (or 4 L/1000G) of wine; use 50% less in white wines.

**Vanilla**

With 80 g of tannin / liter, Vanilla has a denser concentration of the vanillin present in oak. It gives a slight vanilla accent and provides a very smooth, and almost creamy, addition to wine. Vanilla works well on white wines along with "Fruit Enhancer" to soften the wine and give it a touch of vanilla.

**Usage:** 1 L treats 800 to 2,650 G of wine (or 1.25L/1000G)

**Save some  
"less than perfect"  
grapes.**

**Try Harvest Tannin**

NOTE: Concentrates are not a substitute for traditional oak. They provide structure and mouthfeel with hints oak flavors.

All Oak concentrates have been approved by the TTB

**Mocha**

Mocha has 10 g of tannin / liter of concentrate. It brings out the character of a heavy toast barrel, slightly smokey with chocolate-coffee undertones.

**Usage:** Approximately 1 L / 300G (or 4 L/1000G) of wine; use 50% less in white wines

**Harvest Tannin**

Made from fresh and aged (not used) oak, Harvest Tannin is used the same way as powdered fermentation tannins, yet has a much smoother effect. It is easier to measure and disperse than powder, and is competitively priced. Harvest Tannin adds structure, preserves color and covers most vegetative characters.

**Usage:** Recommend 0.5 L / 1000 G of grapes of must

**Add pre-fermentation**



## Fermentation & Post-Fermentation Tannins, AEB



### Fermotan®

#### Fermentation tannin for red & rosé fermentations

Fermotan® adds body and helps stabilize color. It is a combination of ellagic and proanthocyanin tannin extracted from white grape skins and prized European oak which, when added during fermentation, rapidly stabilizes red wine color and optimizes the level of noble tannins. It increases the

Add DURING fermentation

quality of stable grape tannins/anthocyanins through the formation of small quantities of polymerizing acetaldehyde, preventing loss of color and reducing the astringency and coarseness of wines.

Fermotan limits intense polyphenolic extractions that yield hard and bitter tannins, and restores the correct balance of soft-tasting tannins.



### Protan Raisin®

#### Post-Fermentation Adds velvety smooth structure

Protan Raisin is a proanthocyanin tannin that has been extracted from white grape skins.

The presence of Protan Raisin stimulates polymerization making a wine mellow and harmonious.

Post fermentation



### Ellagitan Barrique Rouge®

#### Post-Fermentation tannin for red wines, oak alternative

Ellagic tannin is extracted from toasted oak wood. Ellagitan Barrique Rouge prolongs aromatic persistence, improves the mellowness of wines and integrates their aromatic complexity, with nuances of chocolate and vanilla.

## Clarifiers and Finings



### Gelsol®

#### 50% liquid gelatin solution

Gelsol® is liquid gelatin produced by a process of irreversible hydro-solubility that maintains a constantly stable liquid product. The clarifying effect achieved through instantaneous flocculation results in the formation of large, heavy macro coagula therefore sediments are compact and easily filtered out. Wines become softer and less susceptible to oxidation because they remove condensed tannins, which give astringency to wines.

Gelsol has little affinity with anthocyanins, therefore it is ideal for red wines because it does not cause any loss of color intensity. In order to avoid possible over fining in white wines with little tannin and a low pH, it is recommended to combine Gelsol with an adequate bentonite treatment.

To facilitate fining, Gelsol can be used in conjunction with Spindasol W at a 2-1 ratio. Approximately one part of Gelsol to two parts Spindasol W.

#### Directions for use:

Gelsol can be used at full strength or diluted 1:1 with water. Apply uniformly to wine while circulating.



### Spindasol® W

#### 30% silica solution

Spindasol® W is formulated for the clarification of musts and wines, in conjunction with other clarifiers. It precipitates suspended carbon after de-colorization, leaving the clarification lees well compacted. Spindasol W should be used in conjunction with liquid gelatin Gelsol at an approximate ratio of 2:1. In juices, treatment with a pectic enzyme should precede the clarification process, in order to eliminate the pectin's colloid protector effect, which hinders clarification.

#### Directions for use:

Spindasol W and Gelsol must be added separately to the liquid to be treated.

#### Dosage:

Dosage rates vary with application. Typical ranges are 1 to 10 pounds per one thousand gallons treated.

### Fermotan®

(CLOSEOUT)

#### Dose:

1-4 lbs/1000 G (12-48 g/hL)

#### Pack sizes:

1 liter (liquid)  
25 kg drum (liquid)

### Protan Raisin®

(CLOSEOUT)

#### Dose:

1/4-2 lbs/1000 G  
(3-24 g/hL)

#### Pack sizes:

500 gram (dry)

### Ellagitan Barrique

Rouge® (CLOSEOUT)

#### Dose:

1/2-4 lbs/1000 G (6-48 g/hL)

#### Pack sizes:

500 gram (dry)  
1 kg (liquid)

### Gelsol®

Dose: 1/4 - 4 lbs / 1000 G  
(3 - 48 g/hL)

#### Pack Size:

25 kg



### Spindasol®

Dose: 1 - 10 lbs / 1000 G  
(12-120 g/hL)

#### Pack Size:

1 liter  
25 kg

# Clarifiers and Finings

## Catalasi®

Dose: 1-6 lbs / 1000 G

Pack Size:  
5 kg, 20 kg

## Ovogel®

### Dosage:

Red wines:  
¼ -2½ lbs/1000 G.  
White wines:  
Fermented or kept in barrels  
and for general refining:  
¼ -2 lbs/1000 G

Pack Size:  
500 grams

## Arabinol®

Can be added BEFORE or  
AFTER final filtration.

Dose:  
1-10 lbs/1000 G  
(12-120 g/hL)

Pack sizes:  
25 kg (liquid)

## Batonnage® Plus Elevage

Works faster than other  
preparations composed  
of just dead yeast cells.

Dose:  
1-3 lbs/1000 G  
(12-36 g/hL)

Pack sizes:  
5 kg (dry)



**Catalasi®**  
*Antioxidizing clarifier  
(caseinate compound)*

Eliminates or prevents darkening of white wines and the occurrence of "brick" hues in rose and yellow hues in red wines. Stops the oxidative process and restores wines to their original condition. Catalasi highlights the original aromas and color, reducing the level of polyphenols and polymerized oxidized components.  
**bentonite 49.5%, potassium caseinate 29%, food gelatin 7%, ascorbic acid 3.5%, pot. metabisulfite 11%**



**Ovogel®**  
*Egg albumin-based wine clarifier*

Ovogel is one of the most suitable clarifiers for red wines; it softens wine and maintains their finesse and structure. Ovogel combines with polyphenols and anthocyanins and eliminates, by polymerization, oxidized coloring matter which could precipitate in the bottle. When combined with silica sol, it supports effective brightened clarifications, with fewer lees. Ovogel eliminates the unpleasant bitter-astringent note of wines kept in wooden barrels.



**Arabinol®**  
*Liquid Gum Arabic - does NOT foul filtration media*

It improves the softness and roundness of white, red, and rosé wines and stabilizes the color of red and rosé wines. Being perfectly clear it can immediately be added to finished wine without fouling filter sheets and micro membranes even at high dosage levels. The addition of Arabinol strengthens the ability of wine to resist stability changes. In sparkling wines Arabinol is excellent when added to the "liqueur d'expedition" of Methode Champenoise; it improves, stabilizes and prolongs the effervescence.

Arabinol is a water solution of purified gum Arabic (acacia gum) stabilized with sulfur dioxide. For oenological use, it is in accordance with EEC regulations.

**Directions for use:** Arabinol® is added to finished wines, before or after the final filtration.

**Dosage:** 1-10 lbs/1000 G

**Legal Limit:** 2 lbs/1000 G dry gum arabic = 10 lbs/1000 G of Arabinol

**Pack Size: 25 kg (approximately 5 gallons)**



**Batonnage® Plus Elevage**  
*Manno Protein Product (Yeast cell wall preparations)*

Batonnage Plus Elevage is a post fermentation product that intensifies and brings forward the positive effects of aging on fine lees without the risk involved with the "sur lies" treatment process. Batonnage Plus Elevage eliminates the time, labor and barrels needed in "sur lies" treatment.

**Directions for use:** Mix in 10 parts cold or warm water and add to vessel while circulating. Allow 48 hrs before filtration and 7 days prior to bottling for reaction time to complete.

**Dosage:** 1-3 lbs/1000 G in red wines can be added post fermentation prior to pad filtration.

**Pack Size: 5 kg (dry)**

## Clarifiers and Finings

**KERRY**



### Bio Arabic HS & Bio Arabic HPS *Agglomerated Gum Arabic*

Gum Arabic is a macromolecular colloid consisting of a complex polysaccharide with a high molecular weight (of the order of 200,000 - 1,000,000) made up of beta-D-galactose, L-arabinose, L-rhamnose and D-glucuronic acid associated with a protein fraction.

Gum Arabic application in winemaking promotes the stabilization of wine against hazes and precipitations and/or the mouth feel improvement.

#### Bio Arabic HS

- ▶ is a purified *Acacia seyal* gum Arabic
- ▶ provides a low stabilizing effect
- ▶ improves mouth feel mainly by its softening effect
- ▶ is ideal for highly filtered wine
- ▶ is more suitable for white wine, rosé wine and charmat method sparkling wine

#### Bio Arabic HPS

- ▶ is a purified *Acacia senegal* gum Arabic
- ▶ provides a high stabilization effect
- ▶ provides a broad mouth feel improvement
- ▶ is more suitable for red wine, fortified wine, and bottle fermented sparkling wine

**Directions for use:** A 20% solution of Bio Arabic HS and HPS should always be added to clear wine after final clarification and fining.

**Dosage:** 0.8-2.5 lbs/1000 G (10-30 g/hL)

**Pack Size:** 1 kg, 10 kg, 25 kg



### Biofine W & Biofine W1402 *Purified Isinglass*

Isinglass is a very pure form of a natural complex protein collagen. It is a traditional fining agent considered unique for its gentle and very effective clarifying and fining action for many different types of wine.

The hydrolysis of isinglass produces a high molecular weight protein that has a net positive charge at the acidic pH of wine (isoelectric point at pH 5.5 - 5.9). This positive charge causes flocculation of yeast and other suspended solids.

Isinglass also forms complexes with negatively charged polyphenols that are responsible for astringency and harsh flavors. This means that it is less likely to remove small molecules like flavor compounds or large condensed tannins which improve mouth feel.

Isinglass has several advantages over other proteinaceous agents in fining of wines. Isinglass is active at lower concentrations; its slow rate of flocculation removes fine particles which are in suspension, producing enhanced clarification and a more brilliant wine. It also shows enhanced properties at low temperature, and does not require counterfining.

Biofine W is 100% isinglass product. Biofine W needs the addition of an acid for its preparation before adding to the wine.

Biofine W1402 is an isinglass product containing citric acid (E330) and potassium metabisulphite (E224) for ease of preparation and solution preservation.

**Directions for use:** Preparation instructions are included with product shipped, or upon request.

**Pack Size:** 1 kg, 5 kg

#### Bio Arabic HS & HPS

Add AFTER final filtration

#### Dose Rates:

Bio Arabic HS & HPS are in the range of 10-30 g/hL (0.8 - 2.5 lbs/1000G)  
Lab trials recommended

#### Pack Size:

1 kg, 10 kg, 25 kg (dry)

#### Storage:

Cool, dry, air tight.

#### Shelf Life:

12 months when stored in original intact packaging under ideal conditions.

#### Biofine W & W1402

#### Dose Rates:

Biofine W (0.5-2 g/hL)  
Biofine W1402 (1-3 g/hL)  
Lab trials recommended

#### Pack Size:

1 kg, 5 kg

#### Storage:

Cool, dry, air tight.

#### Shelf Life:

24 months when stored in original intact packaging under ideal conditions.



## Oak Infusion Spirals

### At a glance...

#### Wood sources:

**Northern White Oak** from forests in MN, IA, IL, and WI (*Quercus alba*), and **French Oak** from Allier forest in France (*Quercus sessilis*)

(The Northern forests have the harshest growing conditions, thus tighter grain and less acidity.)

#### Toast Levels:

1. **Heavy** toast brings pronounced caramelized, carbonized and smoky flavors.
2. **Medium Plus** toast offers aromas of honey, roasted nuts and a hint of coffee and spices.
3. **Medium** toast has less tannins and more bouquet. It has a warm, sweet character with strong vanilla overtones.
4. **Light** toast provides fresh oak, coconut and fruit flavors.

- Barrel packs are composed of 6 nine inch spirals, linked in plastic mesh
- Plastic mesh is food grade, metal clips are stainless steel
- Toast levels are even, producing replicable results



### Application Guidelines

- Recommended use is 1 barrel pack for 60 gallons, or 1 tank system per 267 gallons
- 100% extraction will occur within 6 weeks - monitor carefully, remove spirals when desired oak character is achieved

### Why Use Oak Spirals?

1. **Control** - Results are predictable, and the addition of oak character can be halted easily.
2. **Cost** - Spirals cost a fraction of what a new barrel costs, and offer consistent results that do not vary as barrels do with age.
3. **Environmental concerns** - One 100 year old French oak tree produces 4 new 60 gallon barrels, OR it produces 255 barrel packs. Less waste of natural resources.
4. **Wine displacement in containers** - Oak spirals displace at least 50% less wine than stave inserts. This is the result of the greater surface area of a spiral.
5. **Save on floor space** - Use spirals in your stainless steel containers. No need for barrels.



Photos courtesy of The Barrel Mill



**Tank systems provide new oak barrel character in 6 weeks**



Spiral samples are available for trials. Please contact us to discuss your interest.

## Cellar Sanitation Supplies

Sodium Percarbonate	Sodium percarbonate is a water-soluble chemical compound of sodium carbonate and hydrogen peroxide.	25 kg bags
Quaternary Ammonia	Quaternary ammonium salts	1 gallon 55 gallon
Soda Ash	Sodium carbonate (also known as washing soda or soda ash), $\text{Na}_2\text{CO}_3$ , is a sodium salt of carbonic acid.	22.7 kg
TSP Chlorinated TSP Non-chlorinated	Popular agent for cleaning winery surfaces, available in chlorinated AND non-chlorinated form.	22.7 kg 22.7 kg
Peracetic Acid	Liquid oxidizer, blend of acetic acid and hydrogen peroxide. Very commonly used throughout the food and beverage industries. Excellent sanitizer. <b>HAZARDOUS - DROP SHIP ONLY</b>	7 gal pail



### QUESTIONS?

Call Doug Manning  
(707) 256-9891

Having used these products for many years, Doug will provide you with practical advice on cellar sanitation.

## Clean & Sanitary: an Operational Definition

**Cleaning** is the mechanical removal of dirt, debris and gross material that supports microbial growth. It should be performed continually as an integral part of all cellar operations. Consider "cleaning" as you would in a restaurant kitchen.

Material that is not clean cannot be sanitized.

**Sanitizing** is the reduction of microbial growth to an acceptable quality level. The level is established by wine-making and monitored by the microbiology lab through swabbing and culturing and ATP analysis. The only way to accurately determine the success of a sanitizing protocol is through rigorous and exacting microbiological examination.

### Environmental Testing

Environmental monitoring for contaminants is typically performed as aseptic swabbing. Identify the potential spots that could harbor spoilage microorganisms, and try to find them. With aggressive microbiological control measures, it is possible to minimize organisms contaminating wine contact surfaces.



### Monitor Traffic Patterns

Any movement that occurs between the unfinished product and the finished product side of the process is a potential cross-contamination concern. Traffic patterns include pumps, hoses, forklifts, people and anything used to carry items from the grape processing area to the finished bulk wine to the bottling side of the facility. If there is hard-to-clean equipment or inadequate sanitation, there is a potential for bacteria and harborage.

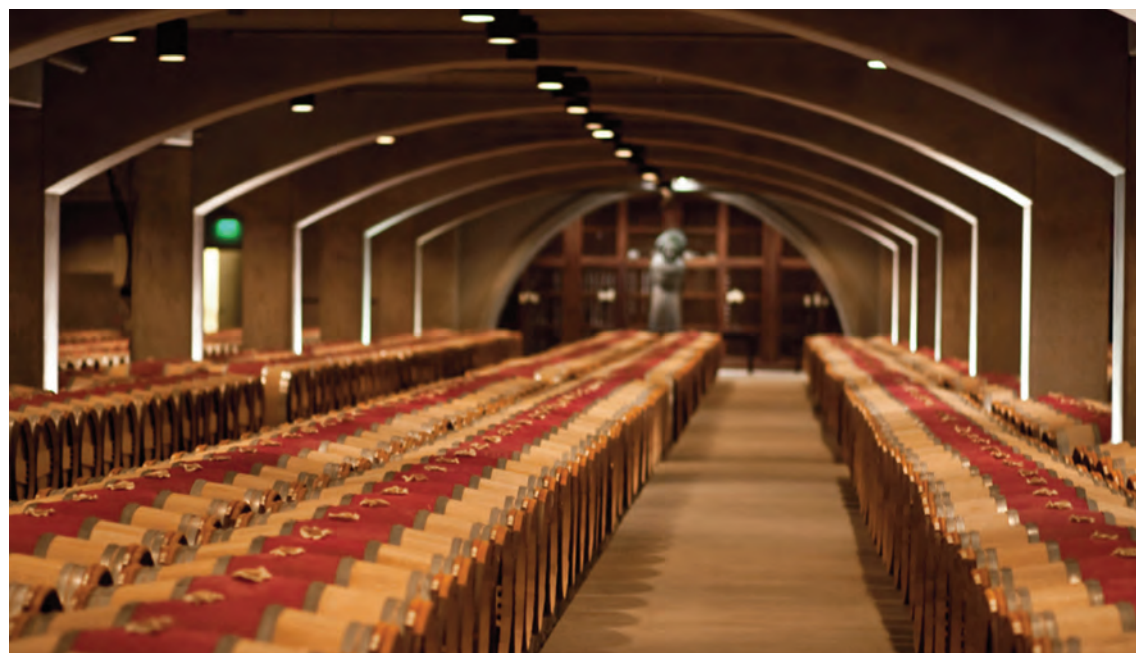
### Sanitation HACCP Plan

A sanitation program must be a well-oiled and efficient machine. Invariably, the safety/sanitation crew is in a real crunch to get its work accomplished so production can start. There have been instances when the production crew is coming in to start work while the sanitation crew is still in the process of cleaning. This is due to poor scheduling of the crew, and is where a HACCP-based approach to determining and monitoring sanitation critical control points can be valuable in planning the work for the sanitation crew.



## Cellar Chemicals

Product	1 lb	1 kg	5 kg	22.7 kg	25 kg	30 kg
Ascorbic acid (used to shift disulfide odors to mercaptans, which can then be removed by copper)		✓	✓		✓	
Bentonite (Vitiben) (cold water - fast prep)				✓		
Citric acid (commonly used acidifying agent)			✓	✓		
DAP (common nitrogen source -See Nutrient page 15)		✓	✓	✓		
Divergan F (PVPP) (while supplies last)		✓	✓			✓
Potassium bitartrate (Cream of tartar)			✓		✓	
Potassium carbonate (for deacidification)			✓	✓		
Potassium metabisulfite (for SO <sub>2</sub> additions)	✓				✓	
Potassium sorbate (retards yeast refermentation)	✓	✓	✓			
Soda ash (classic barrel cleaner & tartrate dissolver)				✓		
Tartaric acid (for acid additions)			✓		✓	
TSP, chlorinated & Non-chlorinated					✓	



SO<sub>2</sub> additions with old potassium metabisulfite can lead to disaster!

Always keep a supply of these 1 kg, sealed bags of well granulated Kmeta on hand. Unopened they will retain their strength for years.

### Tartaric Acid

*New wrinkle this year.*

Due to the global economic slowdown, some industrial grade tartaric acid has found its way into the food market, at much lower cost. The downside is that it contains high levels of sulfates, ILLIEGAL, and can lead to H<sub>2</sub>S production). Regardless of where you purchase your tartaric demand to see CoA for EACH pallet. Our tartaric is certified to be well below the 150 ppm limit.

Interested? Ask for our detailed letter explaining the current situation.

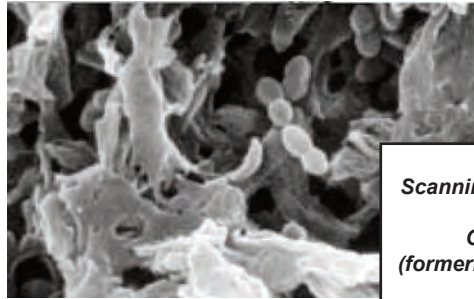
# Filtration

## Sterile Filtration , CUNO (final filtration)

### Cartridge Filters for Beverage Stability

## BevASSURE® II

- 40% more surface area
- higher flow with lower pressure drop
- advanced cartridge construction
- designed for more sanitation & chemical cleaning cycles

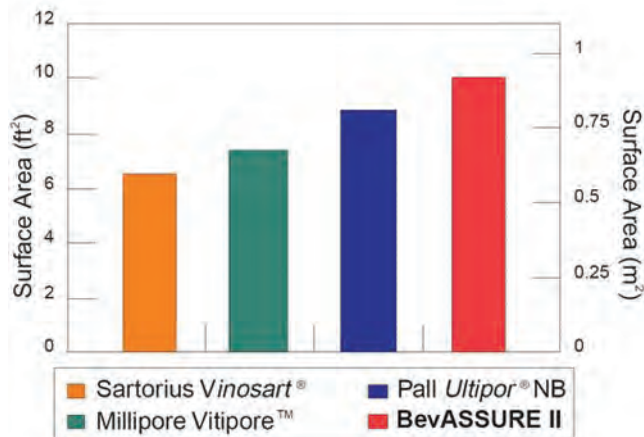


Scanning electron micrograph of *Oenococcus oeni* (formerly *Leuconostoc oenos*), trapped on BeVASSURE II 0.45µ membrane

### Longer Life from greater Surface Area

The BeVASSURE II filter has 20-50% more surface area than competitive filters. Cartridge filter life is directly proportional to filter area and inversely proportional to face velocity (flow rate per filter area). For most beverages, when the filter area is doubled at the same flow rate, the throughput is increased by 2½. The BeVASSURE II filter area is 20-50% higher than competitive filters, so the face velocity can be lower and throughput higher.

*BeVASSURE II filters provide the maximum surface area to reduce initial differential pressure, provide longer filter life, and minimize overall filtration cost.*



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### Longer Life from Repeated Alkaline Regeneration

BeVASSURE II cartridges and LifeASSURE® prefilter cartridges are both manufactured to withstand a mild alkaline flush after each day's run (typically 30 minutes of forward recirculation of 2-5% NaOH at 140°F or 60°C). Throughputs are improved from 3 to 10 times for most beverages depending on when the cleaning cycles are started.

### Longer Life from Enhanced Hot Water Stability

Hot water sanitation and warm water flushing to dissolve accumulated contaminants are common practices in wineries. Longer hot water stability means longer filter life. The BeVASSURE II filter cartridge is constructed with patented nylon membrane optimized to withstand multiple hot water sanitation cycles without compromising filter integrity.

Stocked in NAPA



### QUESTIONS?

Call Doug Manning  
(707)256-9891

Doug is a well regarded expert in the area of sterile filtration and bottling. He has used CUNO Filters for many years. Doug provides wine-specific support for your filtration projects.

Stocked in Napa:

BA045A03BA  
(0.45 µm)



BeVASSURE II

Orders: 800-585-5562 Order online at [www.BSGwine.com](http://www.BSGwine.com)

Stocked  
in NAPA

Stocked in Napa:

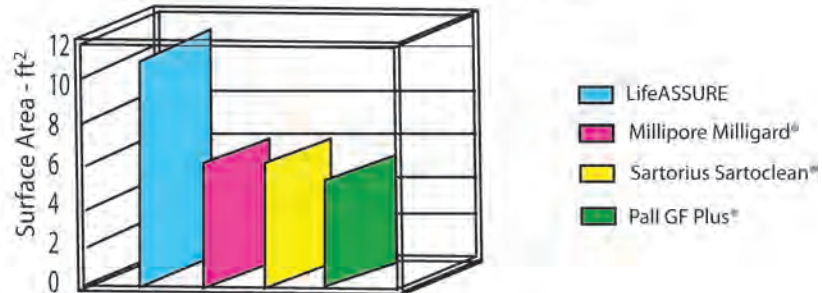
BLA065B03BA  
(0.65 µm)

## Sterile Filtration , CUNO (prefilter)

# LifeASSURE®

**LifeASSURE** cartridge filters feature CUNO's innovative Advanced Pleat Technology (APT) construction for extended service life. This design technology maximizes the useful surface area of the filter while maintaining proper flow paths between media pleats. By employing as much as 50% more effective surface area\* than competitive filters, the LifeASSURE filter provides lower pressure drops, longer service life, and lower overall filtration costs.

### Comparative Surface Area



\* Competitive filter surface area data are from the manufacturer's published literature

### Log Reduction Value

LRV = log<sub>10</sub> number of organisms in, divided by number of organisms out

	LRV
LifeASSURE BLA020	7.3
Millipore Milligard CWSS	4.5
LifeASSURE BLA045	3.5
Millipore Milligard CWSC	2.6

Comparative Log Reduction Values

### Significant Microorganism Reduction

CUNO LifeASSURE filters consistently exhibit a greater reduction of microorganisms than competitive filters that are either constructed of glass or polypropylene fibers, or filters that constructed with non-integral membranes. For effective prefiltration and clarification of beverages, microorganism reduction is a critical parameter resulting in economical, reliable filter systems.

In tests with *Brevundimonas diminuta*, (considered one of the smallest bacteria) LifeASSURE BLA020 grade filters exhibited an average log reduction value (LRV) of 7.3 and the LifeASSURE BLA045 grade filters exhibited an average LRV of 3.5.

### Also available

#### PolyNET™

1 µm - NT30T010S2BA

5 µm - NT30T050S2BA

#### MicroWynds (water treatment)

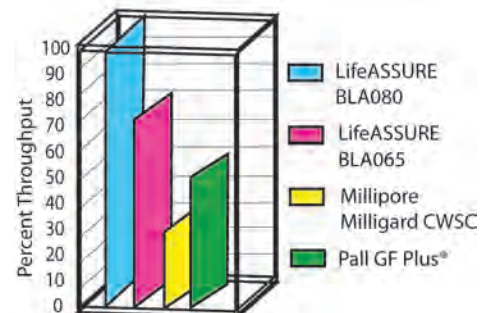
1 µm - 10 inch  
30 inch Code 7  
30 inch Code 8

### Optimize for Service Life and Output Quality

LifeASSURE cartridges are designed to provide both enhanced service life and performance. When compared to competitive products, the available grades of LifeASSURE filters allows the user to select equivalent output quality with vastly superior life, or improve the output quality with reduced, yet competitively superior service life.

Either way, the result is the same, LifeASSURE filters allow significantly more throughput than the competitive filters and provide up to double the service life.

### Throughput Comparison



Throughput comparison of LifeASSURE filters, a 0.5µm nominal filter, and a 1µm absolute filter.

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# What's Inside?



**SUPERFERM™**

LONGER HANG TIME

HIGHER BRIX GRAPES

TRY THE NEXT GENERATION  
OF NUTRIENT BLENDS

**SUPERFERM™**

**CUNO FILTERS**



**DIRECT ADDITION ML BACTERIA**

**LIQUID OAK CONCENTRATE**



**OAK INFUSION  
SPIRALS**

...and of course

**SUPERFOOD®**