Lowering SO₂ Additions during Winemaking

Mechanical equipment & grape harvest

GRAPE BIO PROTECTION:

√ **ZYMAFLORE**[®] ÉGIDE^{TDMP}: Torulaspora delbrueckii and Metschnikowia pulcherrima - to be used with or without rehydration:

- In the bins of harvesting machines.
- In the transportation bins (add it on the bottom of the bin or in layers, during the addition of grapes to the bin)
- During grape crushing.
- During cold soak: perform a thorough homogenization of the tank when the tank has been filled up.



PRECAUTIONS TO TAKE

- · Harvest fruit in optimal sanitary state.
- Control the temperature (the lowest possible).
- · Avoid berry crushing/bruising.
- Ensure maximum hygiene in the cellar.
- Protect all tanks with inert gas.

ENOLOGICAL GOALS

 $\sqrt{}$ Control of the indigenous microbial flora: **BIO PROTECTION**

- Colonization of the must with microorganisms naturally present in grapes.
- Inhibiting the development of spoilage microorganisms.
- Create a favorable environment for the implantation of Saccharomyces yeast.

During pre-fermentation phase, the dose of ZYMAFLORE® ÉGIDE^{TDMP} should be adjusted regarding the time of contact with the must, the temperature and the microbial pressure:

- ~ The maximum dose is recommended in case of strong microbial pressure and in low temperatures.
- ~ Lighter doses for long pre-fermentation phase and or mild temperatures.

MICROORGANISM RESPONSE TO TREATMENT







WINEMAKING PROTOCOLS

Lowering SO₂ Additions during Winemaking

2 Grape Processing & Fermentation

ENZYME ADDITION:

 $\sqrt{}$ Choose an enzyme according to the desired wine style.

- For fast juice clarification with white & rosé must, use LAFAZYM [®]CL or LAFASE[®] XL EXTRACTION.
- For fast color and tannin extraction in red must and better settling post fermentation, use LAFASE® FRUIT, LAFASE® HE GRAND CRU, or LAFASE® XL EXTRACTION.

TANNIN ADDITION TO GRAPES:

√ Using TANIN GALALCOOL[®] for whites, and TANIN VR SUPRA[®] or VR SUPRA[®] ELEGANCE for reds can replace traditionally used SO₂ for anti-oxidation activity. Tannins are especially important in the case of rot and subsequent laccase activity.

Adjust acidity:

 $\sqrt{\rm Acidulate}$ must or juice to lower pH and limit growth of spoilage microorganisms.

ACTIVE DRY YEAST:

 $\sqrt{}$ Select strains producing low SO₂.

- √ ZYMAFLORE® XPURE.
- For highly aromatic red wines, with black fruit aromas, release of Hsp12 and very low SO₂ production.

Add NOBILE[®] FRESH GRANULAR 24M (2 g/L)

• Enhances complexity and roundness, preserving the fruit – can be used during fermentation phases.

FINING OF WHITE AND ROSÉ MUST DURING FERMENTATION:

- $\sqrt{}$ Remove oxidizable phenolics to prevent browning or pinking of wine during aging and preserve aromatic potential.
- √ **POLYMUST**[®] **PRESS** (300 500 ppm)

PVPP, Vegetal Protein (patatin), & bentonite, non-allergenic, GMO-free.

√ **VEGECOLL**[®] (20 – 100 ppm)

Vegetal Protein (patatin), non - allergenic, GMO-free.

Addition of glutathione:

 $\sqrt{\text{FRESHAROM}^{\circ}}$ provides glutathione, a powerful anti-oxidant for whites and rosé wines (200-300 ppm).



NARNING

- Manage temperature carefully.
- Conduct strict cellar hygiene.
- Protect tanks with inert gas before AF.
- Minimize wine movement.

ENOLOGICAL GOALS

- Protection against oxidation. Use inert gas cover for all juice and wine movements.
- Color extraction and protection with reds.
- White/Rosé juice clarification and fining.
- Excellent oxygen/aeration management.
- Minimize the time gap between AF -MLF to avoid undesirable microbial proliferation.

• Co - INOCULATION OR SEQUENTIAL INOCULATION WITH *ENOCOCCUS GNI*:

- Bacteria highly effective for direct inoculation, active over a wide pH, alcohol, and temperature range.

3 Aging in Cellar

TANNIN ADDITIONS – PROTECT WINES FROM OXYGEN:

- √ **QUERTANIN**[®] Range (additions of 10 to 20 ppm every month, during the entire aging period).
- TANFRESH[®] specifically formulated for white and rosé wines. Dosage: 10 30 ppm.

MICROBIAL CONTROL – PROTECT WINES FROM MICROBIAL SPOILAGE:

Preventive treatments

- √ MICROCONTROL[®] (100 ppm)
- · Chitosan and inactivated yeasts.
- Reduces the overall pressure of spoilage microorganisms (yeasts and bacteria).

Curative or Preventive treatments

- $\sqrt{\text{OENOBRETT}^{\circ}}$ (100 ppm) or OENOBRETT ORG (100ppm)
- **OENOBRETT**[®] is Chitosan and *β-glucosidase* enzyme.
- OENOBRETT ORG[®] is 100% chitosan.
- Both products can decrease spoilage organisms such as *Brettanomyces*.

PRECAUTIONS TO TAKE

- Implement thorough wine chemistry analysis on regular basis with a close watch on VA numbers.
- Taste wines often watching for signs of oxidation.
- Limit wine transfers to the minimum possible.
- Constant wine protection with inert gas.
- Regular topping program for cooperage and tanks.

ENOLOGICAL GOALS

- Excellent oxygen management.
- Microbiological control and management.
- Shape wine to be ready for bottling early.
- Fining treatments, clean racking, mannoprotein additions.
- Consider early bottling and commercial release of the wine.

Prepare wine for early bottling - Build mouthfeel and finesse:

- √ POWERLEES® ROUGE (200 ppm)
- Specific formulation of inactive yeast and β-glucanase used for wine fining and building mid-palate weight and sweetness perception in the wine. Use during fermentation or aging on all wine types.

√ **MANNOFEEL**[®] (30 - 150 mL/hL)

- Mannoprotein in liquid form for smoothing tannins or astringency and building mid-palate weight.
- Can be used during aging or just before bottling on all wine types.

NARNING