FOR CO-INOCULATION
HIGH PH WITHOUT VOLATILE ACIDITY AND BIOGENIC AMINES

Lactic acid bacteria selected from nature

V22™

Lactobacillus plantarum

MBR® process direct inoculation

APPLICATION

During the alcoholic fermentation, a natural selection of different lactic acid bacteria progressively happens. *Oenococcus oeni* is the most resistant specie to extreme low pH wine conditions. Above pH 3.5, species of *Lactobacillus* and *Pediococcus* can thrive.

V22™ *Lactobacillus plantarum* strain was selected by the Sacro Cuore University of Piacenza during a screening among lactic acid bacteria for their capacity to degrade Ochratoxin A in wine. **V22™ *Lactobacillus plantarum* is best suited to grow, to implant well and to ensure Malolactic Fermentation in musts or red wines with pH > 3.5**. In view of climate change and with the trend to harvest higher maturity grapes that result in higher pH and alcohol wines, V22™ Lactobacillus plantarum is able to predominate, secure MLF and microbiological stability under these conditions. As facultative hetero-fermentative lactic acid bacteria, V22™ Lactobacillus plantarum ferments glucose and fructose (main sugars in grapes and musts) to lactic acid only. **The metabolism of V22™ *Lactobacillus plantarum* will not contribute to any increase in volatile acidity deriving from hexose sugars**. This particular property will promote V22™ Lactobacillus plantarum use in co-inoculation or early inoculation while strengthening its ability to dominate the media under high alcohol and pH conditions. V22™ Lactobacillus plantarum is a reliable starter culture for controlled malolactic fermentations with a proven positive impact on the wine aroma profile, since the strain possesses a wide range of enzymes interesting for winemaking.

MBR® process direct inoculation

The MBR® form of lactic acid bacteria represents a Lallemand specific process that subjects the lactic acid bacteria cells to various biophysical stresses, making them better able to withstand the rigors of direct addition to wine. The conditioned MBR® lactic acid bacteria that survive are robust and possess the ability to conduct reliable malolactic fermentation (MLF).

The patent named «**Alcohol-tolerant malolactic strains for the maturation of wines with average or high pH**» is granted in France, Australia, United States and South Africa.

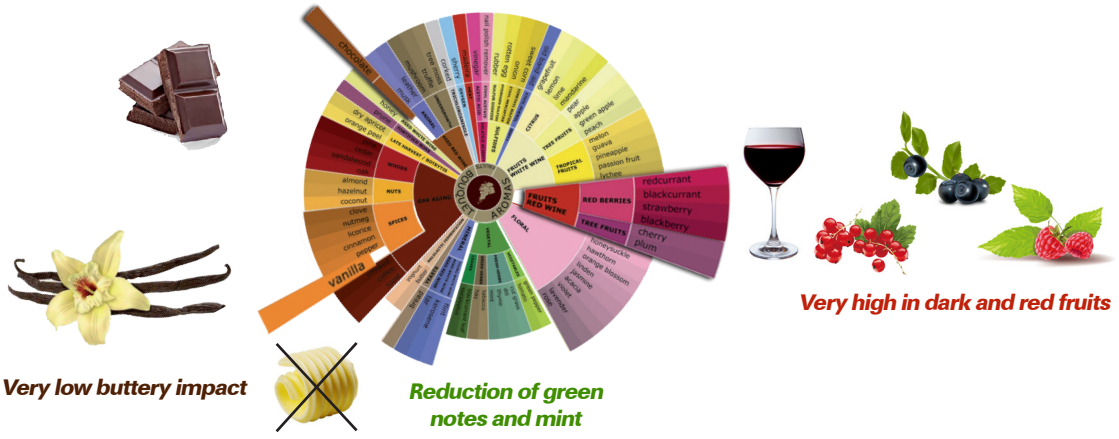
INTERVITIS INTERFRUCTA
AUSGEZEICHNETE INNOVATION
INNOVATIONSPREIS 2010

OENOLOGICAL AND MICROBIOLOGICAL PROPERTIES

- **pH tolerance > 3.5 (sensitive to low pH)**
- **Alcohol tolerance : up to 15,5 % vol.**
- **SO_2 tolerance : up to 50 mg/L total SO_2**
- **T° tolerance : > 17°C (64°F)**
- **High nutrition demand : The addition of nutrient is highly recommended to assure a successful fermentation (could be sensitive to high polyphenol concentration)**
- **MLF Kinetic : Slow**
- **Low volatile acidity production**
- **No production of biogenic amines**
- **Co-inoculation highly recommended**
- **Facultative hetero-fermentative (does not pro duce acetic acid out of glucose and fructose)**
- **Potential to degrade Ochratoxin post MLF**

ORGANOLEPTICAL PROPERTIES

Beyond bio-deacidification, V22® *Lactobacillus plantarum* is a true winemaking agent, which contributes to the sensory complexity and the quality of wine as follows :



Very low buttery impact

Reduction of green notes and mint

Very high in dark and red fruits

This sensory contribution can be further supported by the combination with an appropriate selected yeast strain and timing of ML bacteria inoculation.

LALLEMAND

INSTRUCTION FOR USE

Direct inoculation is possible. For best distribution, we recommend the following :

• CO-INOCULATION (SIMULTANEOUS ALCOHOLIC FERMENTATION)

1/ Yeast addition
Rehydrate the selected dry yeast according to the instructions. Preferably in presence of a rehydration nutrient and inoculate the must.
2/ Bacteria addition
Depending on the SO_2 addition at crush :
• Sulfitage < 5 g/hL : wait for 24 hours
• Sulfitage 5-8 g/hL : wait for 48 hours
• Rehydrate the packet of freeze-dried lactic acid bacteria in 20 times its weight of clean chlorine free water at 20°C for a maximum of 15 minutes.
• Add the suspension to the must/wine to be fermented.
• Assure a good distribution.
• Carefully monitor must temperature, which must be below 30 °C at lactic acid bacteria inoculation (alcohol < 5%vol) and below 27 °C when the level of 10 % of alcohol is reached.
• Complex nutrients addition at 1/3rd of alcoholic fermentation is recommended.
• Monitor malic acid and volatile acidity.
• If MLF takes place during AF and an unusual increase in volatile acidity is observed add Lysozyme (150-200 mg/L).
• Top the wine after alcoholic fermentation (AF)
• Otherwise rack and stabilize after MLF.

• SEQUENTIAL INOCULATION (POST-ALCOHOLIC FERMENTATION)

• Rehydrate the packet of freeze-dried lactic acid bacteria in 20 times its weight of clean chlorine free water at 20°C for a maximum of 15 minutes.
• Add the suspension directly to the wine towards the end of the alcoholic fermentation, then stir gently to evenly distribute the lactic acid bacteria and minimize the oxygen pickup.
• Monitor malic acid.
• Stabilize wine once malolactic fermentation (MLF) is finished.

Recommended temperature range :
• White wine / rosé wine : from 16 to 20°C.
• Red wine : from 17 to 25° C.
If limiting conditions (high alcohol > 14.5 vol, or low pH < 3.1, or high SO_2 > 45 ppm) : from 18 to 22° C.
Check malolactic fermentation activity (malic acid degradation) every 2 to 4 days.

PACKAGING AND STORAGE

• Available in 25 g for 25 hL (660 US gal.)
• Once opened, lactic acid bacteria sachet must be used immediately.
• This product can be stored for 18 months at 4°C and 30 months at -18/-20°C in original sealed packaging.
• Sealed packets can be delivered and stored for a few weeks at ambient temperature (<25°C/77°F) without significant loss of viability.

The information herein is true and accurate to the best of our knowledge however this data sheet is not to be considered as a guarantee expressed or implied or as a condition of sale of this product.

Distributor