FOCUS

BIOPROTECTION

HOW AND WHY?

- **BIOProtection** consists of adding a living organism to occupy an ecological niche and thus limit the predominance of potentially undesirable indigenous microorganisms.
- In practical winemaking terms, it means applying selected microorganisms to the grapes or must to limit the risk of wine spoilage.

PREREQUISITES

- Microorganisms selected from the grape and/or must microflora.
- Microorganisms with low fermentation activity at the inoculated dose able to colonise the medium.
- Selection of high-quality strains among oenological species.

TWO BIOPROTECTION SOLUTIONS FROM LAFFORT®

Characteristics of the two BIOProtection solutions from LAFFORT® :

ZYMAFLORE® ÉGIDE™	ZYMAFLORE® KHIO™
Mixture of 2 strains of the species *Torulaspora delbrueckii* and *Metschnikowia pulcherrima*	Specific strain of the species *Metschnikowia pulcherrima*
Implantation capacity under diverse conditions (musts and grapes)	Suitable for pre-fermentation phases at low temperature (resistance to cold).
Application to harvesting equipment	High capacity to consume dissolved oxygen in musts.
Low fermentation activity	Very low fermentation activity
Robustness to non-rehydration	Robustness to non-rehydration

IMPACT OF SO_2 REDUCTION ON THE MICROBIAL POPULATION

Reducing SO_2 levels in must increases the microbiological pressure, resulting in larger indigenous populations compared to conventional sulphite additions. Depending on the oenological context, the effect can be variable, as shown below.

	SO_2 -	SO_2 +
Saccharomyces cerevisiae	↘	↗
Starmerella bacillaris	→	→
Hanseniaspora uvarum	↗	↘
Torulaspora delbrueckii	↘	↗

PREFERMENT project - Albertin et al., 2014.

Not all yeast species react in the same way to variations in SO_2 levels. *Hanseniaspora uvarum*, a detrimental yeast species known to produce volatile acidity, is particularly favored by lower SO_2 concetrations.

Using BIOProtection allows to reduce SO_2 doses without compromising wine quality

Strong microbiological pressure in the must without added SO_2 can limit the implantation of the inoculated *S. cerevisiae* strain. Consequently, the production of undesirable compounds (ethyl acetate and VA) and SO_2-binding compounds is comparatively higher than in the BIOProtected modality without SO_2.

		No sulphite	No sulphite + ZYMAFLORE® EGIDE™
Analysis during AF	Establishment of the *S. cerevisiae* strain	Negative	**Positive**
Analysis post AF	TL35 (mg/L)	74	**61**
	Ethyl acetate (mg/L)	86	**61**
	VA (g/L H_2SO_4)	0.22	**0.13**

*Impact of using **ZYMAFLORE® EGIDE™** (5 g/hL) during vinification with no sulphite added. Inoculation of a S. cerevisiae strain (20 g/hL) after a 48-hour cold soak at 12°C.*

LAFFORT
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BIOPROTECTION & OXYGEN CONSUMPTION

ZYMAFLORE® KHIO^{MP}

The LAFFORT® solution for the BIOProtection of grapes and musts at low temperatures.

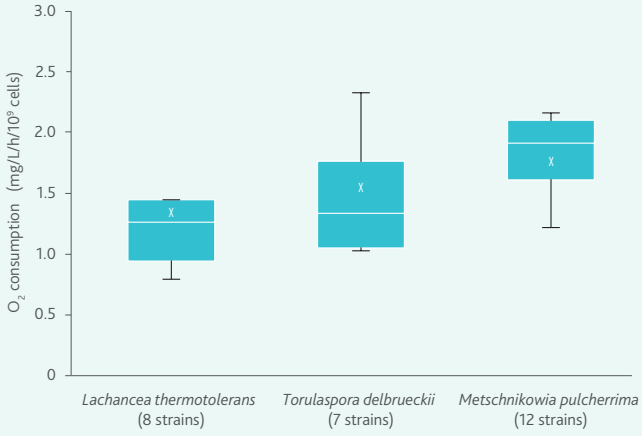
Selected strain of *Metschnikowia pulcherrima* with a high capacity to consume dissolved oxygen in musts while limiting the development of potentially undesirable indigenous flora.

Suitable for particularly long pre-fermentation phases at low temperature:

- On white and rosé musts (stabulation).
- On grapes during cold soak.

The concentration of dissolved oxygen in musts varies with temperature, with lower temperatures resulting in higher O_2 solubility. **ZYMAFLORE® KHIO^{MP}** is capable of proliferating at low temperatures, thus providing adequate antioxidant activity in such scenarios.

Strains of the species *Metschnikowia pulcherrima* consume more dissolved oxygen than other non-*Saccharomyces* yeast.

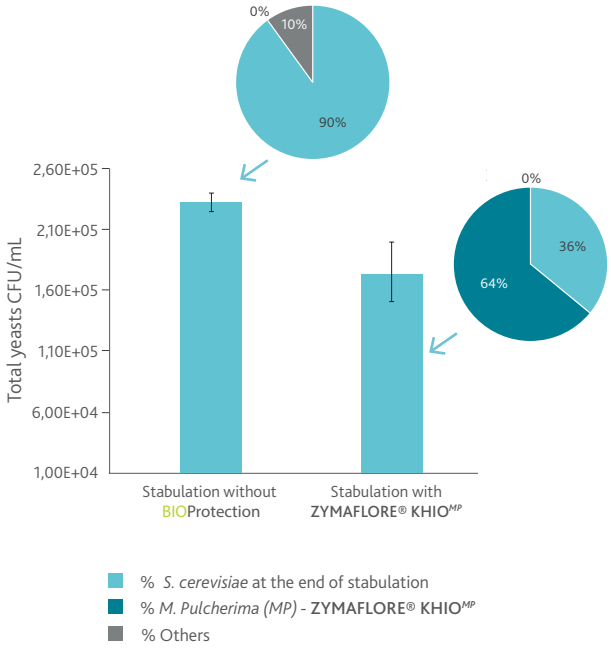


MORE BIOPROTECT project, 2021 - Windholtz, S., Masneuf-Pomarède, I., Nioi, C.

BIOPROTECTION & CONTROL OF THE MICROBIAL POPULATION

The present of nutrient-rich solids during long pre-fermentation phases of musts (i.e., stabulation) can encourage the growth of indigenous microflora and lead to spontaneous alcoholic fermentation. This can compromise the clarification process and the implantation of a selected *S. cerevisiae* strain, thereby negatively affecting wine quality.

ZYMAFLORE® KHIO^{MP} limits the development of indigenous microflora.



Stabulation for 10 days at 4°C.
*At the start of stabulation inoculation with **ZYMAFLORE® KHIO^{MP}** at 5 g/hL.*

Control: Indigenous S. cerevisiae strains represent over 90% of the detected microflora at the end of stabulation

***BIO**Protection: Colonisation of **ZYMAFLORE® KHIO^{MP}** limits the development of indigenous S. cerevisiae yeasts and the risk of spontaneous fermentation during stabulation.*

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