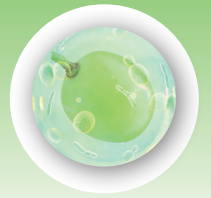


THE TRAIL-BLAZER IN WINE BIOPROTECTION



WHY IS **LALLEMAND OENOLOGY** YOUR TRUSTED PARTNER FOR BIOPROTECTION SOLUTIONS

WHAT IS BIOPROTECTION DURING WINEMAKING?

Bioprotection is the natural alternative to control the development of undesirable microorganisms and/or to avoid oxidations on grapes, must and wines. Bioprotection by using specific selected wine yeast (*Saccharomyces*/ non-*Saccharomyces*), and specific selected wine bacteria (*Oenococcus oeni*/*Lactiplantibacillus plantarum*...), reduces SO₂ or other chemical products use in wine. As some strains can show higher effectiveness than others the strain-effect must be considered between bioprotective species.

Our partnership with leading research institutes and universities has led to the discovery of the diversity of non-*Saccharomyces* yeast and lactic acid bacteria isolated from grapes or musts, for their bioprotection power.

Non-*Saccharomyces* yeast require a special expertise in their production. They are different than *S.cerevisiae*, and as such, they can be fastidious and temperamental to produce and offer in dry-form (ADY). The goal is to retain their specificity as well as a high viability and efficacy in order to be fully functional bioprotection agents.

We have more than 50 years of production expertise for *Saccharomyces* and more than 20 years with non-*Saccharomyces*, with investment in R&D and production. Our production experts grow them with the final objective to adapt the production process both to each strain and to its final application.

Lallemand Oenology is the only company that has the expertise for the development and production of all those bioprotection microorganisms with quality criteria that go above and beyond those of the OIV. From vine to wine, we control **the entire chain of development** of yeast and bacteria. This gives us a unique expertise, and a global vision for bioprotection.

For more than 35 years, we are producing the highest level of quality and activity of *Oenococcus oeni* and *Lactiplantibacillus plantarum* which require special care when they are produced. Each strain and specie has their own production procedure and our production and process teams nurture them to their full potential, efficacy and bioprotection potential.

From selection to our bioprotection solutions, we are the only company that controls the entire chain of development of yeast and bacteria. We share with winemakers our unique expertise, and global vision for bioprotection.

Early and fast

colonization of the must and juice during prefermentation processes, even at low temperature by our non-*Saccharomyces* solutions:

LEVEL2 INITIA™: excellent capacity to grow at low temperature.

LEVEL2 GUARDIA™: out competes contaminant flora by producing pulcherriminic acid, that chelates iron, then not available to spoilage microbes.

GAÏA™: rapid must colonization during cold maceration.



Early colonization and competition against spoilage microflora with our selected wine bacteria

Our MBR™ or 1-STEP™ *Oenococcus oeni* suppress the growth of *Brettanomyces* in must or wines after AF.

ML PRIME™ suppresses molds and spoilage bacteria when applied in grape/musts.

From R&D to innovation

Since our early R&D days, and with our research partners, we understood the positive bioprotection impact of some of our selected microorganisms in wine in research projects such as:

- The work of IFV in Beune that demonstrated, as early as 2004, that inoculation with our freeze-dried MBR™ and 1-STEP™ wine bacteria prevented the development of *Brettanomyces*, and consequently the production of ethylphenols in Pinot Noir.
- Our successful and innovative selection program of different strains of non-*Saccharomyces* yeast led to the hugely popular LEVEL2 INITIA™, GAÏA™ and LEVEL2 GUARDIA™.
- New non-*Saccharomyces* for bioprotection in development with several research institutes.



Bioprotection action against oxidation

Very fast and complete oxygen consumption combined with the ability to decrease copper content.

LEVEL2 INITIA™: scavenges oxygen due to its unique high concentration of unsaturated fatty acids requiring oxygen for their biosynthesis. It also has the ability to decrease copper content in prefermentative stages.



Competition against undesirable microflora

at early stages of winemaking and biosanitation of harvest and winery equipment.

GAÏA™: prevents the proliferation of contaminants on equipment.

LEVEL2 INITIA™: with its capacity to grow at low temperature prevents development of spoilage microorganisms on equipment.

LEVEL2 GUARDIA™: by producing pulcherriminic acid, which chelates irons, spoilage microorganisms can't proliferate on the equipment.



In the Spring of 2024, the OIV published an official document on bioprotection based on a collective of experts. This publication confirms the real impact of bioprotection that we have been communicating on. This aligns with our research and expertise showing the benefits of wine yeast and wine bacteria as agents of control against other microorganisms.



WINE YEASTS



WINE BACTERIA



NUTRIENTS /PROTECTORS



SPECIFIC YEAST DERIVATIVES



ENZYMES



CHITOSAN



VINEYARD SOLUTIONS

LALLEMAND

LALLEMAND OENOLOGY

Original by culture

Visionary biological solutions - Being original is key to your success. At Lallemand Oenology, we apply our passion for innovation, maximize our skill in production and share our expertise, to select and develop natural microbiological solutions. Dedicated to the individuality of your wine, we support your originality, we cultivate our own.

www.lallemandwine.com