Aging your wines

Technical handbook

2022

OENOFRANCE

CONTENTS

AGING ACCORDING TO **OENOFRANCE®**

Wine constantly evolves during its lifetime, through the increasingly significant complexation of its chemical compounds. Once the pre-fermentation and fermentation stages are over, it is sometimes necessary to monitor the wine to ensure it continues to evolve as it should. In order to age a wine, its redox potential and polyphenolic nature must allow this work to take place. Because ageing can go wrong when there is not sufficient structure or when oxidation is not properly managed and controlled.

To **OENOFRANCE®**, the solution to these issue lies in well-planned aging, a 4-dimensional system containing elements that interact to ensure the wine's longevity: polyphenols, yeast lees, wood tannins and oxygen.

A WEALTH OF YEAST PRODUCTS **PUT TO GOOD USE**

Yeast is not just an agent of alcoholic fermentation. Several processes are used in oenology to degrade it to a greater or lesser extent, and optimally tap into the many compounds of interest that it contains.
The composition of the yeast derivatives obtained in this way is varied, and makes it possible to adapt their use to the needs of the wine according to the stages of its production.

The polysaccharides contained in cell walls, for example, eliminate the sensation of astringency and bitterness, and add fat and volume in the mouth. Mannoproteins, a fraction of these polysaccharides, are known to play a protective colloidal role. Yeast derivatives are also rich in reducing elements that amplify the intensity of aromas and protect them against oxidation, thus ensuring their longevity.

Freshness and protection against oxidation	**The advantages of aging on lees**	**Correcting roundness and volume**
AF	**End of AF**	**Before bottling**
Phylia® Cys	Phylia® LF	Phylia® Exel WS
		
An association of **specific inactivated yeast** rich in amino acids and reducing compounds, to protect against oxidation and preserve aromatic freshness.	A preparation of **yeast hulls** rich in mannoproteins and polysaccharides, to control the redox potential and reproduce the properties of natural wine lees.	**Partial autolysate of yeast** rich in mannoproteins, used for the curative treatment of wines and for fast development of volume and fatness in the mouth (less than a week compared to aging on lees, which can take several months).

An answer to oxidation and premature aging issues in wines

Some vintages are particularly sensitive to oxidation and need to be protected. **PHYLIA® CYS** dramatically increases the wine's resistance to oxidation, and much more efficiently than traditional specific inactive yeast rich in glutathione. In effect, for an equal level of redox potential, double the quantity of oxidant would be needed in wine treated with **PHYLIA® CYS**.

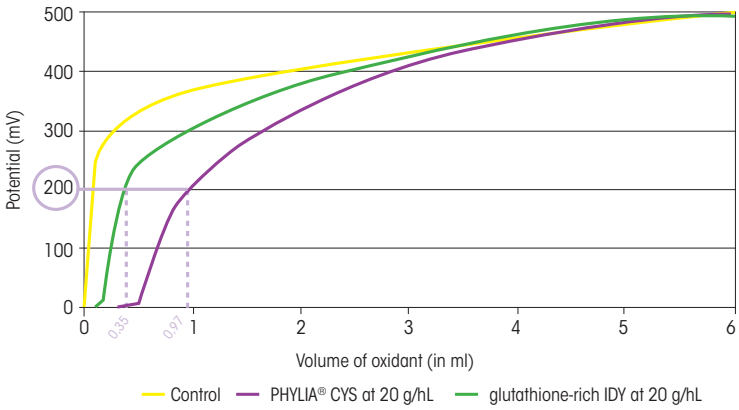


Figure 1: Comparison of the oxidation potential of wine treated/not treated with different fractions of yeast derivatives rich in reducing elements, with a dose of 20 g/hL. Measurement of the redox potential (in mV).

It is possible to recreate the conditions of aging on lees

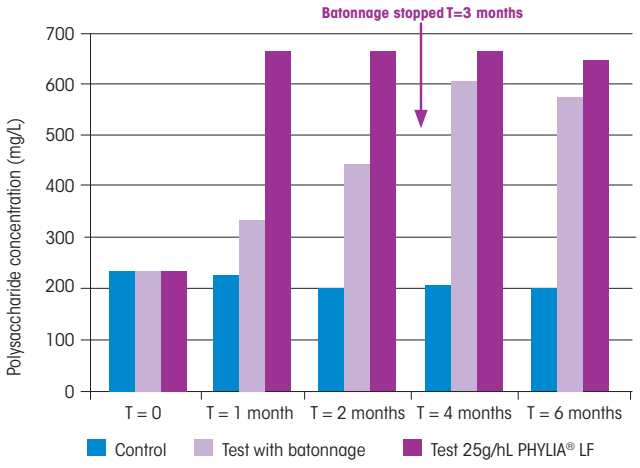


Figure 2: Evolution of the polysaccharide concentration (mg/L) in the medium ove 6 months of aging on natural lees without stirring (control), on natural lees with stirring and with 25 g/hL of PHYLIA® LF (replacing natural lees) with stirring.

Aging can quickly become a problem when lees are not of good quality (the grapes lack maturity, poor sanitary conditions, reducing tendency, etc.). **Without lees, aging is not possible**. With this in mind, **OENOFRANCE®** has developed an alternative to natural wine lees: **PHYLIA® LF**.

Optimizing wood chip integration by combining plant-based polysaccharides and yeast derivatives

In its historic quest to improve the balance and complexity of wines, OENOFRANCE® became interested in the synergy between yeast derivatives and alternative wood products.
Years of research led to the development and refinement of **OENOVEGAN® SBS**, a product that optimizes the integration of wood compounds in wines.

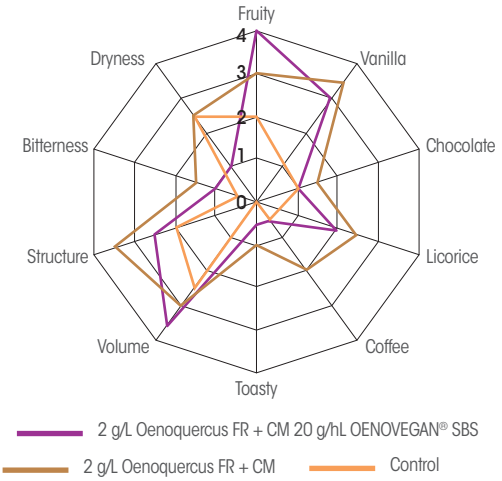


Figure 3: Aromatic profile of a red wine made from Sangiovese grapes (Italy, 2020) and aged with wood chips, with / without the addition of OENOVEGAN® SBS.

OENOVEGAN® Sweet Boosting Structure

OENOVEGAN® SBS is rich in reducing compounds and polysaccharides that enable **fast complexation of wood tannins** and **minimize the risk of oxidation at micro-oxygenation stages** during aging.
This makes it the ideal tool when producing red wines where we need to limit the astringent impact of wood and to protect the color.

OENOVEGAN® SBS, A UNIQUE TOOL FOR TECHNOLOGICAL WINE AGING

OENOVEGAN® SBS is incorporated directly into the volume of wine to be treated, by using the injector of the dynamic infuser.The micro-oxygenation available with this tool enables the optimum use of the product.

Yeast products adapted to each wine

PRODUCT	TYPE OF WINE	DOSE	WHEN TO ADD	TIME IT TAKES TO ACT	COMMENTS
Phylia® Cys	White, rosé	15 to 30 g/hL	AF	A few days	Freshness and protection against oxidation
Phylia® LF	White, rosé	10 to 20 g/hL	After AF or MLF	4 weeks	Aging on lees type
	Red	20 to 30 g/hL			
Phylia® Exel US	White, rosé	10 to 20 g/hL	Before bottling	A few hours	To correct roundness and volume
	Red	20 to 30 g/hL			
Oenovegan® SBS	Red	20 to 40 g/hL	With an injection in the infuser	Depends on the program (3 months maximum)	Special infuser product

OENOQUERCUS®
PRECISION WOOD CHIP ADDITION

The **OENOQUERCUS®** range of wood products offers a wide choice of wood types and toasts to target a **precise wood profile**.

Our experts have also designed predefined blends to meet specific oenological goals.

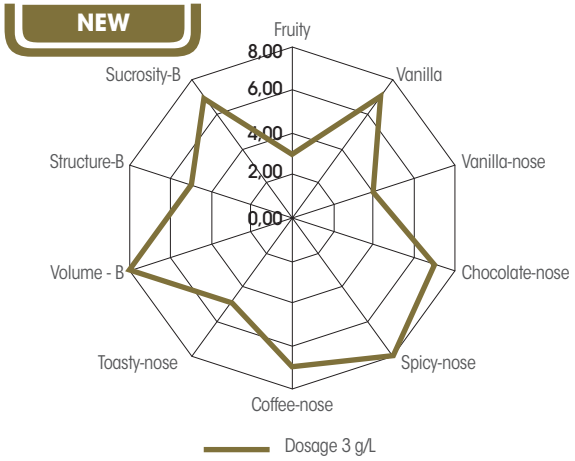
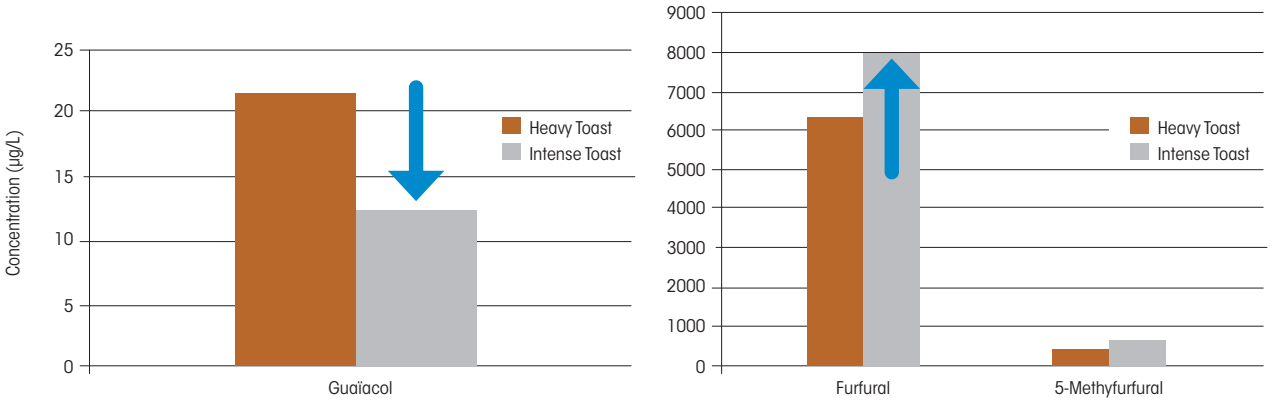


Figure 4: Aromatic profile of the Intense Toast.

***Intense Toast**, the latest innovation and type of toast in the **Oenoquercus®** range, is used during aging to obtain a **highly expressive roasted** wood profile with jammy notes, and to add **volume and sucrosity** in the mouth. Intense toast enables you to use lower doses, and corrects maturity defects in the grapes, as well as microbiological deviations.*



Intense Toast has fewer smoky notes and a more roasted, sweet, caramel character compared to Heavy Toast.

Find all the information about the Oenoquercus® range at www.oenofrance.com/us/

DESIGNING THE DESIRED WOOD PROFILES **WITH THE DYNAMIQUE INFUSER**

Personalized monitoring from A to Z

Step 1

Tasting
To get to know your profiles and your goals

Step 2

Selection of wood chips from the OENOQUERCUS® range
Together with our wood-oxygen expert, we select wood chips from our range to achieve the desired result

Step 3

Customized wood chip service
Using the dynamic infuser to better understand the extraction kinetics of your wines.
Cost per hectoliter calculated according to the volume to be treated

Step 4

Installing the dynamic infuser in your cellar
Our experts will help you size and adapt the infuser to the flow in your production facilities

The dynamic infuser, a unique and powerful tool

Created to improve extraction from wood alternatives for wine aging

- For optimum diffusion of wood compounds
- Automated mixing and pumping over
- Controlled contact times
- Carefully managed oxygenation (micro and macro-oxygenation are possible)
- Obtain the target organoleptic profile
- Software to manage extraction cycles by type of wine, for repeatable, stable extraction over time (remotely)

How does the dynamic infuser work?

As its name suggests, this tool is used for the dynamic extraction of aromatic and polyphenolic compounds from wood products As opposed to static extraction, this achieves higher solubilization speed (minimal wine concentration and accelerated movement of the fluid forced through the wood).This system makes the extraction of wood compounds more efficient, both quantitatively and qualitatively, due to the modulation of the extraction time and temperature, two parameters that influence the extraction of the molecules of interest.

OUR EXPERT SAYS

«The dynamic infuser ensures stability, complex wood chip addition and the reproducibility of the profiles defined.»

Francesco Cavini
Wood-oxygen expert Sofralab® Group

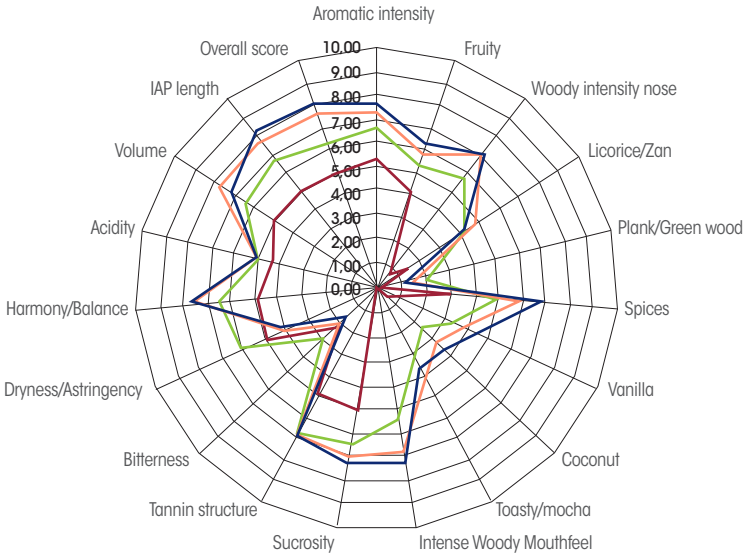


Figure 5: Sensory analysis performed 6 months after the end of the tests.

- Day 1: Vegetal and not expressive
- Day 5: Fruitiness, volume and structure
- Day 7: Complexity, intensity and sucrosity
- Day 11: Balance, jammy notes, structure and elegance

The Dynamic infuser enables you to stop the extraction process when the desired profile is achieved, as well as obtain different wine profiles.

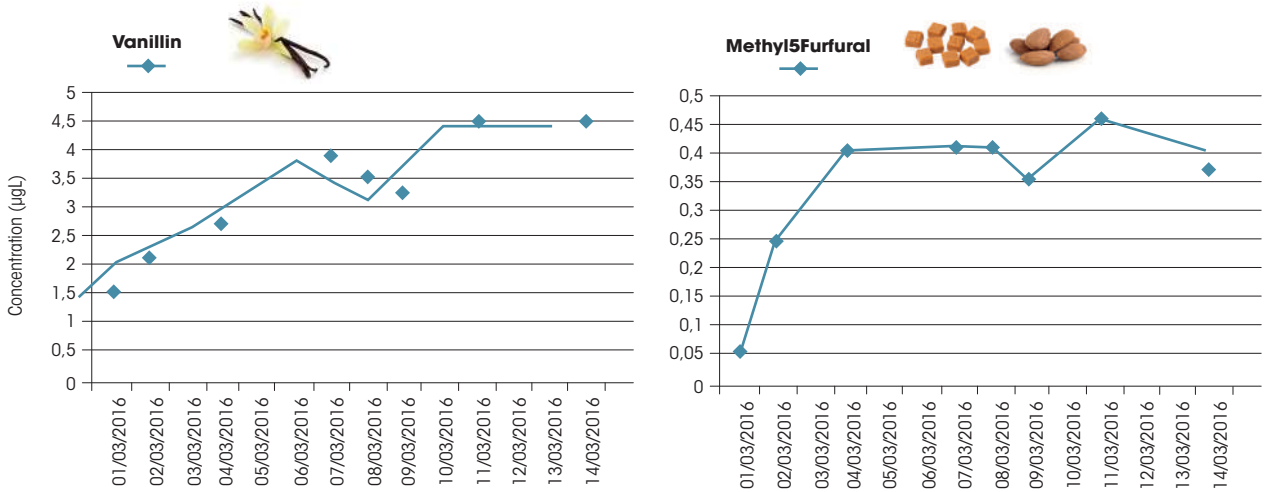


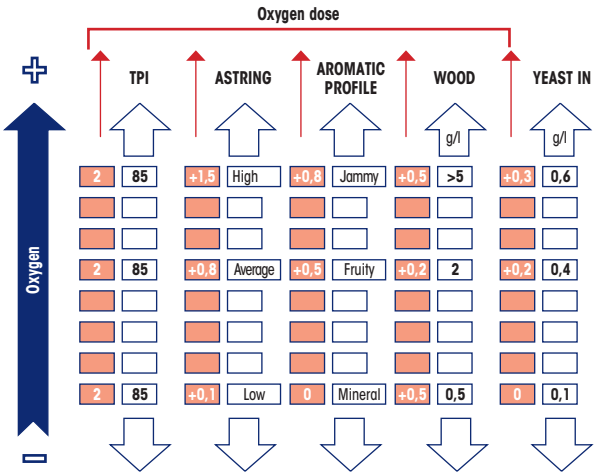
Figure 6: Evolution of vanillin and methyl-5-frufural concentrations over time.

The extraction of aromatic compounds (vanilla, caramel profile) is complete after 14-15 days.
The dynamic infuser saves a significant amount of time.

A RESPONSE TO THE OXYGEN **REQUIREMENTS OF EACH WINE**

The relationship between wine and oxygen is probably one of the most hotly debated questions in modern winemaking. During the different phases of winemaking, the wine's oxygen requirements vary. **OENO$_2$** is an onboard oxygenation unit that can be connected to the dynamic infuser. It enables you to adapt with precision to the wine's requirements by diffusing the quantity of oxygen that is needed at each moment of the winemaking process.

OENO$_2$ macro and micro oxygenation promote the organoleptic balance and stability of the wine over time.



Remember that the matrix is rich in oxygen after racking and after the addition of wood chips. So it is necessary to wait 15 to 20 days before starting to treat with O_2.
However, the compounds extracted from the wood, lees or inactivated yeasts need oxygen in order to evolve, as well as to maintain the correct redox potential.
The quantity of oxygen to be supplied is therefore added according to the wine's requirements, as demonstrated in Figure 7 and 8.

Figure 7: Impact of the oxygen intake on several oenological factors.

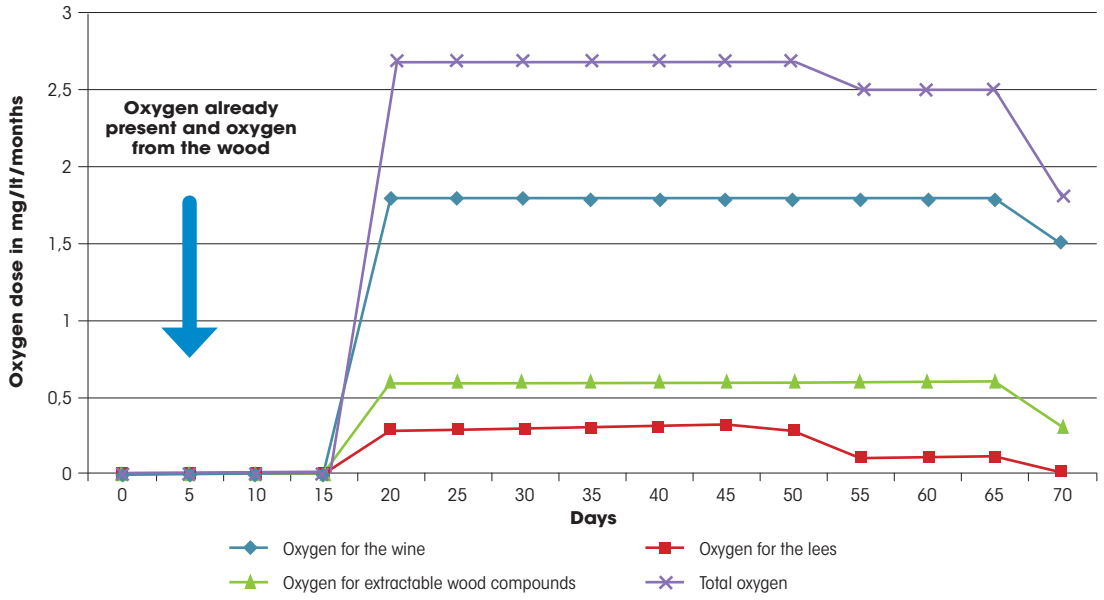


Figure 8: Oxygen needs for the lees, the wines polyphenols and for the extractable wood compounds.

Why add oxygen?

Micro-oxygenation allows white wines to be aged in vats while adding less oxygen than in a barrel or by racking. The aromas remain fresh.
For red wines, it provides the exact amount of oxygen needed for oxidation reactions in polyphenols and aromatic compounds – polymerization of tannins and reduction of astringency, color stabilization, elimination of vegetal notes, etc.

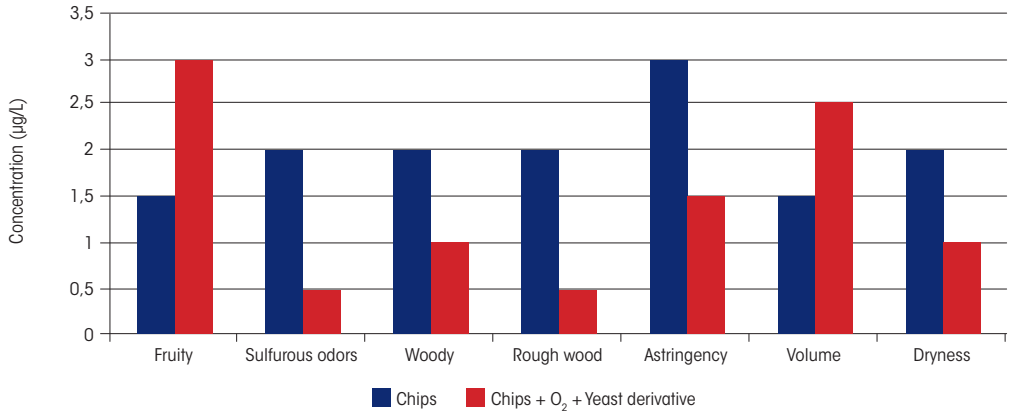
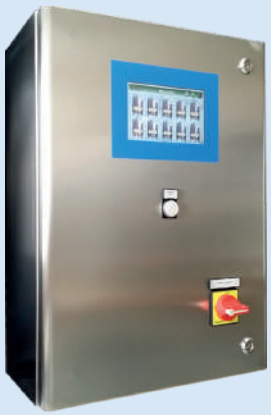


Figure 9: Impact of the oxygen intake on the aromatic properties of wine.

Two models available

1 OR 2 OUTPUTS



TOUCH SCREEN WITH 5, 10, 20 OR 30 OUTPUTS

... can be equipped with additional measuring elements

PRESSURE REGULATORS

INJECTION UNIT

Length 110-130-150 cm

DIFFUSERS

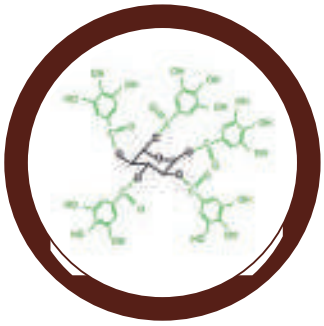
Macro Diffuser Fermentation

Standard Diffuser

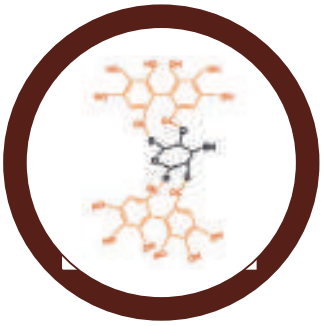
Barrel diffuser

REASONED ADDITION OF TANNINS WITH **OENOTANNIN**

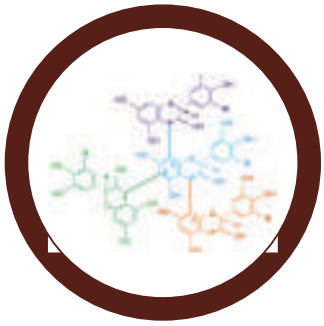
During aging, tannins are most often added to **maintain the optimum redox potential**, as well as to **protect the color and aromatics of the wines**, especially when they are produced by thermovinification. The oenological properties of tannins depend on their structure, which varies according to their botanical origin. They can be classified in 3 groups: gallotannins (oak apple and tara), ellagitannins (oak and chestnut wood) and proanthocyanidic or condensed tannins (grape skins and seeds, quebracho, mimosa, tea) **OENOFRANCE®** has developed a complete range of pure tannins from a single botanical origin so that each tannin can respond optimally, thanks to its chemical properties, to the different issues encountered by winemakers.



Gallotannin



Ellagitannin



Proanthocyanidi c tannin Condensed tannin

VINIFICATION & AGING	**OENOTANNIN INITIAL**	Provides structure, softens and eliminates grassy notes	Preserves the natural polyphenols in wine Balances the natural phenolic potential of the wine Structure and relax	Grape seeds	5 to 40 g/hL	Red
	OENOTANNIN PERFECT	Stabilizes color	Balances the wine's natural phenolic potential Provides structure and suppleness Combats oxidation Makes up for tannin deficiency	Grape seeds	5 to 20 g/hL	Rosé and red
AGING	**OENOTANNIN VB105**	Preserve the natural polyphenols in wine	Enhances tannic potential Fast consumption of oxygen Precipitates proteins, protects from oxidation	Oak	1 to 30 g/hL	Red
	OENOTANNIN VB TOUCH	Adds volume and strengthens the aromatic potential	Harmony between structure and volume	Oak	2 to 20 g/hL	White, rosé and red
	OENOTANNIN VELVET	Provides structure and volume	Balances the wine's natural phenolic potential Stabilizes color Provides structure and suppleness	Grape seeds	5 to 20 g/hL	Red
	OENOTANNIN FRAÎCHEUR	Maintains and revives aromatic freshness over time	Provides structure and suppleness Combats oxidation Revives the freshness of prematurely evolved wines	Exotic wood	1 to 5 g/hL	White, rosé and red
	OENOTANNIN CELESTE	Adds structure and balance to wines	Does not add bitterness	Exotic wood	1 to 20 g/hL	White and rosé
	OENOTANNIN EMOTION	Adds volume and enhances the perception of freshness and fruitiness	Enhances the expression of red fruit aromas (cherry, strawberry). Adds aromatic persistence and promotes color stabilization over time	Ellagic tannins and plant polysaccharides	1 to 15 g/hL	White, rosé and red

COMPLEMENTARY TOOLS **FOR AGING**

Microbiological control, a key factor for smooth-running aging.

It is important to know the microbiological phenomena that impact a wine's quality in order to devise an effective strategy for the prevention of this kind of instability.

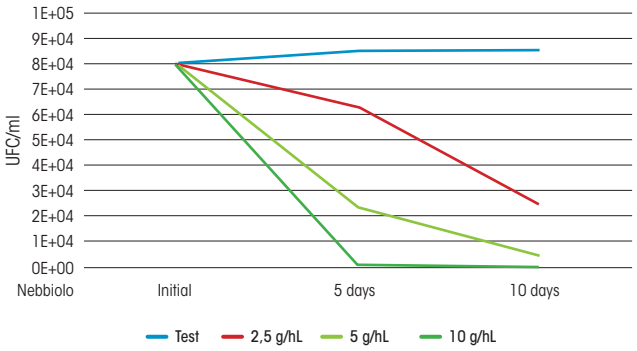


Figure 10: Evolution of a *Brettanomyces* population and the effects of **OENOVEGAN® MICRO** on wine.

OENOVEGAN® MICRO

OENOVEGAN® MICRO is formulated from specific chitosan. It enables wines to be microbiologically stabilized via the fast elimination of *Brettanomyces* responsible for volatile phenols, as well as other harmful bacteria.

DIWINE® Affinage

Formulated from PVP/PVI, **DIWINE® AFFINAGE** adsorbs phenolic acids, precursors of ethyl and vinyl phenols produced by *Brettanomyces* and responsible for organoleptic deviations like horse sweat or leather taint. **DIWINE® AFFINAGE** traps excess heavy metals that cause premature evolution in wine (color and aromas that go from fresh to jammy). In addition, the presence of SIY gives the wine more volume and structure when the SIY undergoes autolysis. Used just after alcoholic fermentation and before malolactic fermentation, **DIWINE® AFFINAGE** helps to obtain fruity, supple red wines.

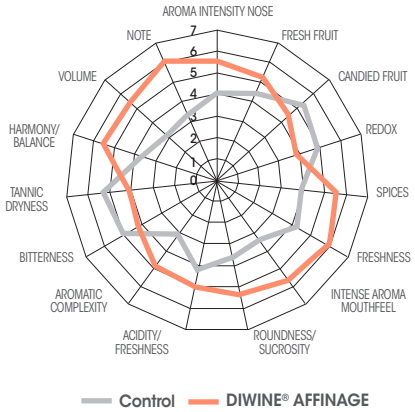


Figure 11: Wine aromatic profile after treatment with **DIWINE® AFFINAGE**.

1180 Holm Rd, Suite D Petaluma, CA 94954, USA
Tél. : + 1 707-971-8270
www.oenofrance.com