Solutions for winemaking
LAMOTHE-ABIET

BOOST AROMATIC EXPRESSION OF WINES DURING AGEING

Global warming continues to have a significant impact on wines' balance. Ripening characteristics and wine profiles are changing; we are observing increases in alcoholic degree and pH with riper aromas in wines. It is becoming more challenging for winemakers to preserve freshness and make balanced wines, yet these are the wine profiles that consumers are looking for today. Consumption tendencies tend towards lower alcohol, higher acidity, and high aromatic wines.

The primary aromas of wine, also called varietal aromas, come from the grape and are a characteristic of grape variety. Some of these aromas are present as soon as the berries are formed. Other aromas exist at this stage in the form of precursors that will only be revealed during the winemaking process with the action of yeasts during alcoholic fermentation and with post-fermentation enzymes. This is the case with thiols, terpenes, and nor-isoprenoids which give white, rosé, and red wines an aromatic freshness often sought after by consumers.

Based on its expertise in the aromatic expression of grape varieties, Lamothe-Abiet has developed **Oenozym FW** and **Oenozym® Thiols.** Highly purified and very specific enzymes, used to increase the expression of varietal aromas such as thiols, norisoprenoids, and terpenes in wines.

A bit more about terpenes and nor-isoprenoids aromas.

Terpenes and C13-norisoprenoids are compounds that are naturally present in grapes and contribute to the varietal aroma of wines. They are largely found in wines in their odorless form, as glycosylated precursors, rendering them aromatically inactive. During fermentation and as wine ages, these aromatic precursors are released via enzymatic reaction and hydrolysis to become full part of the wine aromas.

- Terpenes are a large class of organic compounds produced by plants, and they are the main components of essential oils. Over 50 terpenic compounds have been identified in grapes and wine. The most found terpenes in wines include linalool, geraniol, and nerol, associated with floral, rose, citrus, coriander, and spicy aromas in wines.
- Norisoprenoids are a diverse class of aromatic compounds that contribute to the varietal character of many wines. Among the most important norisoprenoids for wine character:

ß-Damascenone 	Contributes to pleasant, fresh, and fruity aromas in wine. It is also acting as an "aroma enhancer", boosting the intensity of other fruity-smelling compounds.
1,1,6-trimethyl-1,2-dihydronapthalene (TDN) 	TDN is responsible for the "petrol" or "kerosene" aroma typically found in aged Rieslings, and likely contributes to the complexity of other wines as well.
Vitispirane 	Vitispirane has an aroma that has been described as floral, fruity, woody, or reminiscent of eucalyptus.

To optimize the release of these aromatic precursors and increase wine's freshness and intensity, Lamothe-Abiet developed **Oenozym FW**, a preparation of pectolytic enzymes rich in glycosidase activity which can cut the glycosyl group from the precursors, thus expressing varietal aromatic molecules. This enzyme boosts the aromatic potential of wines by liberation of varietal aromas while helping clarification during ageing. We recommend using **Oenozym FW** post fermentation and stop its activity with 5-10 g/hL of Bentosol Poudre once the aromatic profile desired is reached.
Application: End of fermentation, Maturation. White, Rosé, Cider. | *Dosage:* 4-6 g/hL. 6 g/hL for sweet wines.

Grape varieties rich in terpenes and nor-isoprenoids: Muscat, Viognier, Riesling, Pinot Gris, Gewurztraminer, Müller Thürgau, Albariño, Muscadelle, Chardonnay, Chasselas, Chenin Blanc, Pinot Noir, Syrah, Merlot, ...

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A bit more about thiols

Volatile thiols are organosulfur based compounds, responsible for grassy, boxwood, grapefruit, passion fruit, citrus, white peaches, tropical, guava, blackcurrant, and red berries aromas in wines.
Thiolic compounds are present as non-aromatic precursors in the grape skin. These precursors are cleaved under the enzymatic action of yeasts, however, yeasts can only reveal up to 15% of the volatile thiols during alcoholic fermentation. Thus, a very high proportion of precursors remains unrevealed in the wine. Their production and expression in wines can be enhanced through viticultural practices and optimized via the winemaking process.
Thiolic compounds are well known in white and roses wines. Recent studies highlight the role of volatile thiols in the fruity perception of red wines. It has been shown that wines with higher thiolic compounds concentration are perceived as fresher and more aromatic profile with blackcurrant and redcurrant aromas.

Many thiols exist, but three of them play a major role and positively impact the aromatic profile of wines:

3 - mercaptohexan-1-ol (**3MH**) 	Grapefruit, citrus and exotic fruits aromas. It also contributes to blackcurrant notes in red wines
3-mercaptohexan- 1 -ol acetate (**A-3MH**) 	Derived from the 3MH compound by esterification and reminiscent of tropical fruits and with floral notes
4 - mercapto-4-methylpentan-2-one (**4MMP**) 	Boxwood and blackcurrant aromas.

To take advantage of this aroma potential, Lamothe-Abiet has developed **Oenozym® Thiols**, a purified cinnamoyl esterase activity solution of specific pectolytic enzymes. This solution reproduces the natural yeast enzymatic activity, and thus reveals more volatile thiols in both white and red wines. Added during ageing or shortly before bottling, **Oenozym® Thiols** increases the thiols expression, releasing the odorless aromatic precursors. **Oenozym® Thiols** is a relevant oenological solution to boost and maintain the aromatic freshness of wines in the long run.

Application: End of fermentation, Ageing, Pre-bottling. Red, White, Rosé, Cider. | *Dosage:* 4-6 mL/hL.

Grape varieties rich in thiols: Sauvignon Blanc, Chenin Blanc, Chardonnay, Colombard, Grenache Blanc, Pinot Gris, Pinot Blanc, Riesling, Semillon, Cabernet Sauvignon, Grenache Noir, Pinot Noir, Merlot, Gamay, Malbec, Tempranillo, Syrah, Mourvèdre, Cabernet Franc, …

Impact of the addition of Oenozym Thiols (5 ml/hL) on wines during ageing. Contact time: 3 weeks.