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## THIOLS IN WHITES/ROSES

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Thiolic compounds are present as non-aromatic precursors in the grape skin. These precursors are typically sulfur-containing amino acids, such as cysteine and glutathione.

Both viticultural practices and winemaking techniques can influence the production and expression of thiolic compounds in red wines. Viticulturally, factors such as grape variety selection, canopy management, vineyard microclimate, and vineyard nutrition can impact the levels of thiolic precursors in the grapes.

In the winemaking process, techniques can be used to optimize the extraction of thiolic precursors, the expression of those precursors into volatile thiols and the preservation of thiols.

### FOCUS PRODUCTS

**Tanin gallique a l'alcool** – pure gallic tannin, developed for whites and roses, to scavenge oxygen radicals and inhibit oxidative enzymes such as laccase and PPO. It protects grapes and juice from oxidation. It has strong affinity with proteins, improving protein stability, thus reducing the need of bentonite on wine. Tannin Gallique a l'alcool can be added directly on grapes or in juice. Simply sprinkle it on the top of the grapes at picking.

**Excellence B-Nature** – non-Saccharomyces yeast, pure *Metschnikovia pulcherrima*, non fermentative. It inhibits the development of spoilage microbes such as other non-Saccharomyces, and bacteria on grapes and juice. Excellence® B-Nature® is an organic anti-microbial solution, used as alternative to SO<sub>2</sub> on grapes. It protects grapes/juice from microbial contamination during transport and processing, does not inhibit *Saccharomyces cerevisiae*, and reduces SO<sub>2</sub> combining compounds production, thus increasing SO<sub>2</sub> efficiency. Excellence B-nature can be added directly to grapes, without rehydration. Simply sprinkle the yeast on the top of the grapes at picking.

**Oenozym Crush** – maceration enzyme, pectinase, purified in cinnamyl esterase and anthocyanase. Added on grapes, it will improve extraction of skin compounds, such as polysaccharides and aromatic precursors and improve free run yield.

**GreenFine Must** – Pure pea protein, vegan, allergen-free fining agent used to prevent and treat oxidation. It helps preventing and eliminating oxidation by removing phenolic compounds and yellow shades from musts. GreenFine® Must is a clarifying agent that gives rapid and compact sedimentation. It is a versatile alternative to casein, gelatin and PVPP.

**Polymix Natur'** – PVPP, Yeast extracts, Bentonite. Vegan, allergen free fining agent focused on removing oxidized and easily oxidizable phenolic compounds. Polymix Natur' treats and prevents oxidation, improves oxidative stability, wine expression and elongates wine shelf life. We recommend using Polymix Natur' at juice stage, in prevention. It can also be used during fermentation and on wine during ageing.

**OptiThiols** – yeast derivatives rich in -SH compounds as thiolic precursors. Its formulation enriches the must of thiolic precursors, used by the yeast during the alcoholic fermentation to synthesize thiolic compounds. The GSH present also allows an anti-oxidant protection of the juice. This double role of antioxidant and aroma revelation helps to increase the wine's aromatic potential, leading to significantly greater quantities of thiols (4MSP, 3SH, A3SH) measured at the end of the alcoholic fermentation.

**Aroma Protect** - inactivated yeasts, naturally rich in glutathione, a natural antioxidant, sulfurous tripeptide with great reductive power. When used during ageing, Aroma Protect® gives immediate protection against the oxidative mechanisms, releasing glutathione (GSH) into the wine, significantly slowing down oxidation phenomena.

**KillBrett** – pure chitosan, wide spectrum anti-microbial agent. KillBrett eliminates and inhibits Brettanomyces, Lactic Acid Bacteria and Acetic Acid Bacteria. It can be used during the entire process of winemaking, we recommend using it as preventive, post MLF, at 4 g/hL.

**Oenozym Thiols** - Used during alcoholic fermentation, ageing and pre-bottling, it expresses the thiolic precursors into volatile thiols such as 4MMP (boxwood) and 3MH (citrus fruit). Used during fermentation, it also increases conversion by the yeast to A-MH (tropical fruits).

### WHITES / ROSES WINEMAKING GUIDELINES – THIOLIC PROFILE

<p><b>HARVEST AND GRAPE TRANSPORT</b></p>	<p>Thiol precursors are in grape skins; therefore, skin contact is highly beneficial. It has been found that the highest concentration in thiolic precursors in grapes is found at night when temperature is cool with no sun exposure.</p> <p><b>Work fast, at low temperature and protect from oxygen with inert gas.</b> As anti-oxidant and anti-oxidasic protection, add <b>Tanin gallique a l'alcool, 50 g/ton</b>, at picking or during fruit processing.</p> <p><b>Excellence B-Nature at 30-50 g/ton</b>, sprinkle directly on grapes, as soon as possible after picking to prevent any microbial contamination and spoilage.</p>
<p><b>MACERATION / PRESSING</b></p>	<p><b>Oenozym Crush at 25 mL/ton</b>, on grapes, at press filling to improve aromas and polysaccharides extraction, increase free run yield, improve clarification, and wine filterability.</p> <p>Protect from oxidation during pressing with <b>Bucher Inertys</b> presses or <b>inert gas</b> through the entire press cycle (dry ice: 1-2 kg/ton). Press program should allow a slow increase in pressure with minimum rotations. Press fractions separation: press cut to be decided by tasting, conductivity or pH increase.</p>
<p><b>CLARIFICATION</b></p>	<p>Fining is essential to eliminate oxidized and oxidable phenolic compounds and stabilize wine. <b>GreenFine Must</b> and <b>Polymix Natur'</b> both will treat and prevent oxidation, improve oxidative stability, wine expression and elongates wine shelf life. For gentler fining, more focused on 'yellow' color removal, choose the GreenFine Must. To eliminate more 'red' color chose Polymix Natur.</p> <ul style="list-style-type: none"> <li>- Low pressure fractions: <b>Polymix Natur' or GreenFine Must at 20 g/hL</b></li> <li>- Hard press fractions: <b>Polymix Natur' or Greenfine X-Press at 40 g/hL</b></li> </ul>
<p><b>ALCOHOLIC FERMENTATION</b></p>	<p>Turbidity: 200-250 NTU, Temperature: 62-66°F</p> <p><b>Excellence FTH at 20 g/hL</b> to produce thiolic and citrus profile, fresh wines with linear mouthfeel. <b>Excellence TXL at 20 g/hL</b> to produce thiolic, tropical fruit profile with round and rich mouthfeel.</p> <p>Rehydrate yeast with <b>OenoStim at 30 g/hL</b> to reinforce yeast activity, increase aromatic production and optimize grape expression.</p> <p><b>OptiThiols® at 30 g/hL</b> to stimulate thiolic compounds production and increase wine's antioxidant potential.</p> <p>Ensure good yeast nutrition and limit off-flavors production with <b>Optiflore O® at 40 g/hL</b> (complete organic nutrient based on inactivated yeast).</p> <p><u>AT 1/3 FERMENTATION</u></p> <p>If low initial YAN (&lt;150), add <b>20-30 g/hL of OptiFerm</b> (ammonium salts and vitamin B1).</p> <p>For protein stability: <b>10-40 g/hL of Bentosol Poudre</b></p> <p>To boost expression to thiolic compounds, use <b>Oenozym Thiols</b> at 4 mL/hL.</p>
<p><b>AGEING</b></p>	<p>Once AF completed: rack off gross lees after fermentation. Use inert gas during transfer.</p> <p><b>Aroma Protect at 15 g/hL</b> to reduce redox potential and increase natural wine resistance to oxidation.</p> <p>To increase expression to thiolic precursors and boost freshness in wine, use <b>Oenozym Thiols</b> at 6 mL/hL at least 1 month before bottling. Ask Us for Samples.</p>