September 2016

TECHNICAL NEWSLETTER

STEPS TO ATTAIN THE MAXIMUM PHENOLIC POTENTIAL FROM YOUR GRAPES

1. Determine Harvest Date Based on Phenolic Potential

Grape maturity is a subjective process often evaluated in the context of wine style. Several tools exist to measure grape maturity such as chemical analysis and berry sensory evaluation. While these traditional methods of assessing grape ripeness can indicate certain degrees of maturity, the use of phenolic data can provide relevant information to directly link grape composition to wine quality.

Grape PHENOLIC FINGERPRINT

Phenolic data can be used to define the peak of ripeness or to establish a harvest date. Additionally, winemaking techniques can be adjusted based on the targets or desired wine-style. While this information is important, the process to obtain the data can be challenging, with protocols that are time-consuming and require dedicated personnel to provide reliable information.

In order to quickly measure tannins, color and phenolic attributes in red grapes and wine, the AWRI has created a fast and reliable method based on a model that uses UV/visible spectra readings.

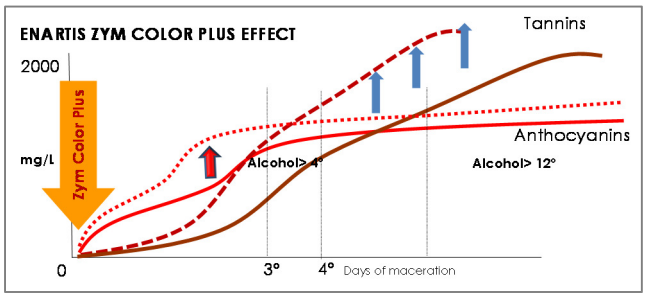
The **Grape Phenolic Fingerprint Panel** offered by **Vinquiry Laboratories**, relies on the AWRI and the Adam-Harbertson methods for measuring phenolics in grapes and the Glories method for measuring decision-making parameters such as the **anthocyanin extractability index** and the **contribution of seed tannins**.

Tools like the **Grape Phenolic Fingerprint Panel** or the **WineCloud™** can be used in-house and help with harvest and winemaking decisions. They aid in benchmarking for vineyard block selection, as well as fruit grading and allocation.

2. Maximizing Extraction of Phenolic Compounds

Anthocyanins are located within the vacuole of berry skin cells. The extraction of these phenolic compounds requires that the berry cell wall be degraded to allow diffusion into must. This process is impacted by the degree of berry ripening, which in turn, can also be influenced by growing conditions. During berry ripening, a breakdown of cell wall pectins by endogenous pectolytic enzymes occurs, leading to berry softening. However, even when grapes achieve their maximum anthocyanin content, this does not automatically mean all these pigments will be extracted during fermentation. Additionally, the extraction of tannins from grapes into red wine is important for the organoleptic properties of wine, color stability and ageing potential (Ribereau Gayon et al 1983).

Fermentation temperature, cap management and alcohol content can improve extraction of phenolic compounds. One of the ways to maximize phenolic extraction is with the use of maceration enzymes such as **Enartis Zym Color Plus**, which contains pectinases, protease and various cellulases and hemicellulases (arabinase, xylanase, etc.). This assures the degradation of berry cell walls, increasing permeability which facilitates the diffusion of anthocyanins to must. **Enartis Zym Color Plus** can reduce total maceration time for the extraction of phenolic compounds and potentially increase yields up to 8%; a factor which becomes significantly important especially during low-production seasons. **Enartis Zym Color Plus** activities are formulated specifically to degrade the cell wall without unnecessarily degrading the cap.



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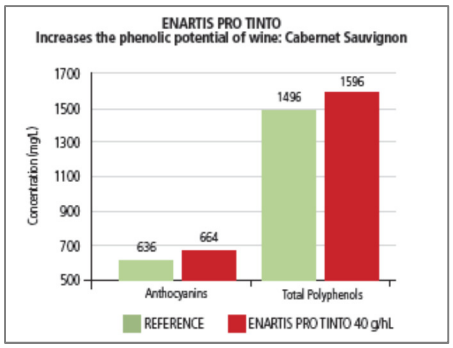
3. Use of Exogenous Tannins to Protect and Stabilize Pigments

Anthocyanins and tannins are extracted at different stages during the fermentation process. Anthocyanins are water soluble and are extracted earlier in the process making them more susceptible to oxidation if not stabilized rapidly. Conditions during cold soak make anthocyanins even more vulnerable to oxidation reactions. Antioxidant protection can be achieved with the addition of enological tannins, which can also benefit color stability. **Enartis Tan Fermcolor** or **Enartis Tan Rouge** are mixtures of hydrolysable and condensed tannins designed to be added during the early stages of maceration. Hydrolysable tannins are capable of quickly reacting with oxygen and preventing the oxidation of pigments, while condensed tannins participate in stabilization reactions to form more stable color pigments.

4. Use of Yeast Polysaccharides to Improve Color Stability, Develop Mouthfeel and Preserve Wine Aroma (Enartis Pro Tinto, Pro Uno and Enartis Tan Color)



The release of mannoproteins during yeast autolysis requires a complete degradation of the yeast cell wall. Certain winemaking techniques such as *sur lie* ageing and the use of glucanase enzymes allow this process to occur over time. However, mannoproteins can also be prepared from isolated cell wall fractions. These blends of products have the benefit of quickly integrating into wine.

Additives containing readily available mannoproteins, such as **Enartis Pro Tinto and Enartis Pro Uno**, can be used during fermentation to improve wine colloidal stability. The interaction between yeast polysaccharides and tannins can significantly impact the perception of tannin astringency, creating a fuller structure and better integration on the palate. For optimal performance during fermentation, the range of yeast derivatives contained in the **Enartis Pro Range** can provide a source of readily available mannoproteins. These polysaccharides are also capable of interacting with color and aroma compounds, enhancing the persistence of flavors.

5. Last Opportunity to Stabilize Color: Use of MicroOx at the End of Fermentation

Precision additions of oxygen can only be managed using specialized equipment. The rate and speed at which oxygen is incorporated into wine dictates whether the reaction taking place is benefitting the stabilization of color or causing the oxidation of other compounds.

Oxygen added during the final stages of fermentation induces the production of acetaldehyde, a product of ethanol oxidation. This compound acts as a bridge in polymerization reactions involving tannins and anthocyanins, creating more stable color compounds. Micro-oxygenation treatments during this stage can also be used to develop and improve structure, as well as reduce potentially detrimental herbaceous and reductive characters. The concurrent use of other enological products, outlined below, together with micro-oxygenation, produce additional positive results.

Tannins **Enartis Tan E, Enartis Tan Microfruit:** for wines with low tannin content to promote polymerization reactions for color stability and mouthfeel improvement.

Oak Alternatives **Incanto Natural or Incanto Special Fruit:** oak chips to mitigate the impact of green herbaceous characters and add mid-palate structure.

The **Enartis MicroOx system** offers the ability to diffuse a precise amount of oxygen into wine during a variety of stages.

For more information about **MicroOx** units and products, please contact (707) 838-6312.