



WINEMAKING GUIDELINES

Smoke Taint White Wines

How are grapes and vines affected by bushfire smoke?

Numerous volatile phenols are present in bushfire smoke and can be absorbed by grape berries and vine leaves during a smoke event. Vineyard and grape exposure to smoke may result in wines with undesirable sensory characteristics such as smoky, burnt, bacon, medicinal or ash, usually described as 'smoke tainted'.

What compounds are responsible for smoke taint?

The primary compounds in smoke responsible for taint are free volatile phenols (guaiacol, 4-methylguaiacol, o-cresol, p-cresol, m-cresol, etc) which are produced and released into the atmosphere when lignin in wood is burnt.

How can I assess the level of smoke taint risk?

Vinquiry Laboratories by Enartis USA has developed a robust method for the quantification of smoke taint markers (free and bound) in grapes, juice and wine. Vinquiry Laboratories offers analysis for total guaiacol and 4-methylguaiacol (free and bound), which have been identified as smoke taint markers. A representative grape, juice or wine sample is required.

Sample volume: grapes = 5 clusters or 200 berries; juice or wine = 50 mL.

Which factors affect smoke uptake by vines?

The risk of smoke exposure causing a perceptible taint in wine is a function of the stage of grapevine growth and development, the grapevine variety, smoke concentration, duration of exposure and the volatile phenol concentration and composition of the actual smoke. Grape sensitivity gets higher from 7 days post veraison to harvest.

Key winemaking steps when dealing with smoke tainted grapes:

1. **Hand harvest** and sort out **leaf material** that can release smoke-related compounds
2. Process fruit **cold** to limit extraction
3. **Limit skin contact** to reduce extraction of off-aromas: whole cluster press, no crushing, no destemming
4. **Separate press fractions** and clean hard presses with **carbon fining**
5. **Fast and strong clarification**: solids are bound to off-flavors, green characters and toxins that can alter fermentation and wine quality
6. Select an aromatic and complex yeast strain
7. Mask smoke aromas by enhancing aromatic precursors via yeast nutrition or tannins
8. Rack off lees early: some off-aromas bound to lees and can be eliminated by racking off early
9. **Mask** smoke related off-aromas with untoasted oak chips or tannins with aromatic precursors. Oak chips can reduce intensity of smoke characteristics through increased wine complexity
10. Balance wine mouthfeel with mannoproteins and fermentation tannins
11. Market for early release: smoke-related characteristics can evolve in bottle as wine ages



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WINEMAKING STAGE	OBJECTIVE	ENARTIS RECOMMENDATIONS	DOSAGE
Harvest/ Vineyard	Antioxidant	AST is a blend of ascorbic acid, gallic tannins and SO ₂ for complete antioxidant protection. 100ppm of AST = 28 ppm SO ₂	
<i>Reduce skin contact - keep low temperature – gentle press cycle – limit rotation - separate press fractions. Recommended analysis: Juice Panel, Smoke Taint Markers</i>			
Press Pan	Settling Enzyme	Enartis Zym RS : Pectinase and hemicellulase developed for difficult settling. Rapid settling and intense clarification.	2-3 mL/hL
	Fining Agent	Claril SP : Blend of bentonite, PVPP, potassium caseinate and silica. Remove laccase, oxidable and oxidized phenols and negative “moldy” aromas. Increase dosage to 50- 80 g/hL on pressings. Fenol Free : Activated carbon fining agent with high affinity for volatile phenols responsible for smoke taint. Recommended for press fractions.	30-50 g/hL
<i>Recommended turbidity < 150 NTU</i>			
Inoculation	Nutrients	<i>At inoculation, adjust YAN>150 ppm with complex nutrient</i> Nutrifer Arom Plus provides essential nutrients for proper yeast development: amino acids, vitamins and mineral salts and aromatic precursors to enhance fermentation aromas.	30 g/hL
	Yeast (select one)	Enartis Ferm ES181 : <i>S.cerevisiae</i> strain with a short lag phase, fast fermenter and low nitrogen need that produces a large amount of secondary aromas. Enartis Ferm Aroma White : <i>S. cerevisiae</i> with β-lyase and β-glycosidase activities. Increases varietal aroma production and produces high amount of secondary aromas.	20 g/hL
	Polysaccharides	Enartis Pro Blanco : Yeast cell wall polysaccharides rich in sulfur-containing peptides. Promotes varietal aromas production, balances mid-palate and reduce green characters.	40 g/hL
<i>Fermentation temperature: 14-18°C (57-64°F) – not higher than 20°C (68°F) Rack wine from gross lees early toward end of fermentation</i>			
1/3 Fermentation	Yeast Nutrients	Nutrifer Advance : Organic and inorganic nitrogen, yeast cell walls rich in sterols and fatty acids and cellulose. Helps yeast with stress resistance, detoxifies wine, ensures complete fermentation and reduces production of H ₂ S.	30-50 g/hL
	Oxygen	Via Enartis MicroOx or pump-over to improve yeast membrane health.	10 mg/L
	Oak Alternative	Incanto NC White : Soluble oak extract (untoasted oak tannin, acacia tannins and yeast polysaccharides). Mimics the effect of untoasted oak chips. Decreases off-flavors, protects against oxidation, prevents reduction and increases wine volume.	
1/2 Fermentation	Yeast Protection	Nutrifer No Stop : Yeast cell walls rich in fatty acids and sterols to improve yeast cell membrane fluidity, yeast resistance and fermentation activity. Highly recommended in high temperature fermentations.	20 g/hL
<i>Recommended analysis: Alcohol, Residual Sugar, pH, TA, Malic Acid, Microscan Rack from fermentation lees + add SO₂ For ageing, use 20 g/hL of Surli One</i>			