



FLASH NEWSLETTER: MANAGING SMOKE TAINT AFFECTED GRAPES

Grape exposure to smoke may result in wines with undesirable sensory characteristics such as smoky, burnt, bacon, medicinal or ash.

The stage of grapevine growth and development, smoke concentration, exposure time and composition of smoke impact the level of volatile phenol precursors present in grapes. Winemaking practices will strongly impact smoke taint levels in finished wines.

Assessing the level of smoke taint risk before harvest is strongly recommended in order to adjust the winemaking process and limit the extraction of smoke taint compounds.

What Compounds are Responsible for Smoke Taint?

Free volatile phenols (guaiacol, 4-methylguaiacol) are mainly responsible for smoke taint in wines. When absorbed by grapevines, these compounds become bound to glycosides, non-volatile and inodorous). In grapes, the glycosylated form can be 3 to 100 times greater than the volatile form and then slowly hydrolyzed during fermentation, ageing and wine storage.

To have a full understanding and the best estimation of the final concentration of smoke compounds in wine, it is important to quantify the concentration of volatile and glycosylated phenols.

How to Assess the Level of Smoke Taint Risk?

To best assess the risk of smoke taint, it is important to analyze **volatile and glycosylated phenols** in grapes. Once analyzed, we recommend conducting a small-scale ferment to evaluate the impact of smoke on wine and better understand the effect of winemaking practices.

At **Vinquiry Laboratories by Enartis USA**, we understand the importance of having an accurate and complete evaluation of the **total "smoke taint" risk**. For this reason, we offer a robust method for the quantification of total **Smoke Taint Markers** (volatile and glycosylated smoke markers) in grapes, juice and wine.

How to Sample?

The most effective time to test levels of smoke markers in grapes is as close to harvest as possible. Take a representative sample of grapes, juice or wine and send it to Inquiry Laboratories in Windsor, CA. Sample volume: grapes = 5 clusters or 200 berries; juice or wine = 50 mL.

When are Grapes and Vines Affected by Bushfire Smoke?

Volatile phenols, produced and released into atmosphere as free volatile phenols when the lignin in wood is burnt, can be absorbed by grape berries and vine leaves. Grape sensitivity to smoke taint becomes high **seven days past veraison**. The closer the fruit is to being harvested, the higher the risk associated with smoke exposure.

How Much Smoke Causes a Smoke Effect in Wine?

Studies have shown that just 30 minutes of exposure to heavy smoke (30% obscuration/m) at a sensitive stage of vine growth was enough to cause a smoke effect in wine (Kennison et al. 2008).



How to Interpret Analysis?

Guaiacol and 4-methylguaiacol can be found in non-smoke exposed wines when aged in toasted barrels (up to 100 µg/L for guaiacol and 20 µg/L for 4-methylguaiacol) or wines made from some varieties rich in glycosylated guaiacol such as Syrah and Merlot (up to 50 µg/L). The sensory thresholds of guaiacol and 4-methylguaiacol in model wines are respectively 20 µg/L and 30 µg/L (Kennison et al. 2007). When levels of smoke markers in grapes are close to these thresholds, it becomes necessary to adapt winemaking practices to the style of wine to be produced.

The Best Way to Handle Smoke Tainted Grapes

Smoke taint compounds are present in grape skins and leaves, therefore their levels increase with maceration time. We recommend avoiding machine harvesting, removing leaf material, keeping fruit cool, reducing skin contact, and separating press fractions. Vineyard washing does not reduce the concentration of smoke taint markers, however removing ashes with fans or leaf blowers has been successful in reducing the concentration of smoke taint markers. See our full Winemaking Guidelines for [Red Wines](#) and [White Wines](#) for recommendations on how to manage smoke tainted grapes.

For more information, please call (707) 838-6312.