

WEST COAST SMOKE EXPOSURE TASK FORCE

Grape Sampling Protocol for Growers

BACKGROUND

Much remains to be understood about how smoke compounds interact with grapes in the vineyard and the potential risks for smoke damaged grapes and effects on wine quality. A lab analysis of smoke exposed grapes can reveal useful information, but normally such analysis alone is insufficient to reliably predict the risk of smoke affected wines. Consequently, researchers recommend the use of lab analysis and sensory analysis of wine made from a micro fermentation of smoke exposed grapes.

Fermenting a grape field sample is one of the best tools currently available to predict smoke exposure markers (both free and bound volatile phenols) that may be present in a wine post-fermentation. A winemaker can use the finished micro-fermented lot to evaluate the presence of off-aromas and ashy flavors and submit a wine sample to a lab for volatile phenol and glycoside analysis to understand the potential risk of smoke damage. *This method is most accurate as a predictor of risk when used closer to harvest.* This method is adapted from the [AWRI Fact Sheet Small-lot fermentation method](#).

SENSORY

Sensory analysis, when coupled with post-fermentation analysis for the presence of smoke markers, is the best method for detecting smoke damage in grapes. While sensory analysis may prove more revealing and useful than lab analysis alone, it's important to remember that even with experienced experts, taste and smell remain subjective experiences. So, a significant number of wine analyses may fall within a grey zone of uncertainty. Growers should encourage winery partners to use the best available tools, which includes small lot fermentations to smell and taste the kind of wines that can be made from smoke exposed grapes. Taste each sample at least twice within a short period of time. Maintain a two-minute minimum interval in between lots because there is a strong sensory carryover effect after tasting impacted wines. Test that evaluators are sensitive to smoke taint by screening, using both heavily smoke impacted and non-impacted wines as controls. Many people are not sensitive to smoke taint.

SAMPLE COLLECTION FOR CROP INSURANCE ANALYSIS

- To support a loss claim due to smoke damage, crop insurance carriers require the collection of grape samples prior to harvest and submission to an accredited third-party lab for analysis. It is important for growers to discuss with their claims adjuster the preferred method of testing and applicable standards for the claim (as standards and procedures may vary by carrier). Berry samples must be taken by vineyard location and variety. The third-party lab will dictate the

minimum number of berries in a sample required for testing, but typically it is between 200-300 berries for each test. Samples should be taken from different areas representative of a block.

- Evaluating risk through sensory and lab analytics is more accurate when conducted closer to harvest. Collect samples as close to harvest as feasible and/or <22 brix. If sample is taken too early, a second sample collection will be necessary to further evaluate risk.
- A 200 to 300 berry sample of a single variety should consist of clusters collected from across all corners and areas of the vineyard or block. Again, discuss with your crop insurance claims adjuster to determine if they prefer an alternate method.
- The sample must be collected and submitted to a third-party lab for analysis prior to harvest, but the lab results are not required before the start of harvest.
- A lab analysis of a wine sample made from grapes collected from a smoke exposed vineyard, when combined with a lab analysis of the grapes, will provide a more useful indication of the presence of smoke damage. If doing a micro-fermentation of a grape sample from a vineyard/block/variety, it is important to preserve the identity and chain of custody of the grapes and resulting wine.
 - **Note:** For purposes of a crop insurance loss claim, an analysis of a micro-ferment sample can support the berry test, but it is important to communicate to the claims adjuster all processes used and test results.

ANALYSIS

Fill a bag that can be tightly sealed (Ziploc) marked for *smoke volatile markers* and submit to an accredited third-party lab for analysis.

Note: Third-party lab analysis and results are required for crop insurance claims. However, USDA's Risk Management Agency has not established specific threshold levels for the presence of smoke compounds in grapes or wine for purposes of determining smoke damage.

- Lab analysis will deliver results for guaiacol ug/kg and 4-methylguaiacol ug/kg. These are the only results needed to support a loss claim for crop insurance. For the purposes of claiming a loss, lab results must support a finding of "elevated levels" of guaiacol and 4-methylguaiacol present in the grapes. While USDA RMA does not define what is elevated, most labs consider a value greater than 0.5 ug/kg (ppb) in grape samples or 1.0 ug/L (ppb) in wine or juice as an elevated level.
- Another option is *smoke volatile markers extended panel*, which will also give you Cresols (sum and individual), Phenol, 4-methylsyringol, and Syringol; this option may not be available during harvest due to time constraints.
 - **Note:** These compounds are naturally present in grapes without smoke exposure, so without baseline data over time for a specific grape or wine variety, positive lab results don't necessarily correlate to taint.
- An additional option is wine *smoke glycosylated markers*, reporting total bound smoke compounds, but this option may not be available during harvest due to time constraints.
 - **Note:** These compounds are naturally present in grapes without smoke exposure, so without baseline data for a grape or wine variety, positive results don't necessarily correlate to taint.