

## FACTSHEET: SMOKE TAIN

### What is smoke taint?

Smoke from fires, particularly bushfires, can affect the flavour of grapes. The impact of smoke on grapes and the resultant wine varies considerably and a lot of research is being done at the moment to better understand this important issue.

Wine made from grapes that have been smoke affected have been described as having some of the following attributes: 'burnt', 'ashtray', 'charred', 'salami', 'disinfectant' etc. Wine can be unfit for sale if the taint is too great.

### When are grapes most susceptible to smoke taint?

The time of the season is critical for the impact that smoke uptake can cause. Grapes have a low to medium uptake potential in the early stages of the season. However, from around seven days post-veraison until harvest, the uptake of smoke compounds into grapes is at its highest.

### When should grapes be tested?

In the event of a vineyard being exposed to smoke, the most effective time to test smoke-exposed grapes is as close to the expected harvest date as possible.

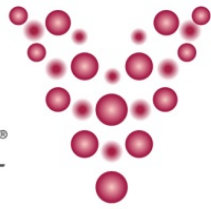
### What compounds from fires cause smoke taint?

Smoke contains thousands of different compounds. Smoke itself has been described as being highly variable, with the composition of smoke emissions varying as a function of fuel composition and combustion conditions. However, the key compounds that influence taint in grapes and wine have been shown to be the following volatile phenols:

- Guaiacol
- 4 methyl-guaiacol
- o-cresol
- m-cresol
- p-cresol
- Syringol
- 4 methyl-syringol

### Bound Forms of Smoke Taint Compounds

Once volatile phenols enter or come in contact with grapes, research has shown that these volatile phenols can undergo biotransformation to give glycoside, or 'bound' forms of the phenols.



During fermentation, a portion of smoke taint glycosides can release their volatile phenols, causing a smoke tainted wine. An analysis of Free and Bound forms of the volatile phenols in grape juice can be used to predict the likelihood of perceptible smoke taint following fermentation. Similar predictions could also be made in relation to wine aging, where there may be potential for Bound forms of volatile phenols to be released into their Free forms over long time periods in the mildly acidic wine solution.

Our experience has shown that the majority of the volatile phenols present in pre-fermentation grape and juice samples are present in their glycosidically Bound forms. In such cases, analysis of Bound forms is highly important, as considering the Free forms alone is likely to under represent the extent of smoke taint potential.

### **How is Smoke Taint Measured?**

Due to the relationship between Free and Bound volatile phenols it is recommended that an analysis of both forms is conducted when assessing grape, juice or wine samples for smoke taint. We offer a smoke taint analysis, which tests for the presence of seven Free and Bound volatile phenol compounds and offers interpretation of these results.

### **Background Levels of Smoke Taint Compounds**

Grapes that have not been exposed to smoke naturally contain very low levels of the various compounds targeted by the analysis. It has also been observed that the levels of the various compounds vary somewhat from grape variety to variety. Such variation may lead to scenarios where the level of a particular compound could be considered normal in one variety but the same level could be considered a taint in another variety. This of course is not so relevant where high smoke taints levels are found

Various compounds targeted by the analysis can also be present from the charred wood of toasted oak barrels. In such cases it may be advantageous for the winemaker to consider the total of both smoke and barrel contributions to the final wine.

### **Smoke Taint Analysis**

The Vintessential smoke taint analysis report provides 14 analytical results. Each analyte can be detected down to a level of 1ppb (part per billion).

Vintessential can provide analysis at our Dromana lab in Victoria. This analysis is particularly important during harvest periods. Results can then be used to make informed decisions regarding the harvest of grapes and production of wines from smoke-exposed fruit.