FACT SHEET: SMOKE TAINT IN GRAPES AND WINE

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 7 days post veraison until harvest the uptake of smoke into grapes is at its highest.

How is smoke taint measured?
Guaiacol and 4 methylguaiacol (G & 4MG) are considered good marker compounds for smoke taint. These are measured by Gas Chromatography Mass Spectrometry (GCMS) at part per billion (ppb) levels, with a detection limit of 1 ppb. One research report showed that a panel of tasters could detect the presence of guaiacol in a dry white wine at the 6 ppb level.
In one study four wines were analyzed by GCMS for smoke taint compounds. G & 4MG were found in the wines made from the “smoked” grapes, but were not detected in the wines made from the “unsmoked” grapes.

What limitations are there with this test?
The test only measures marker compounds; smoke taint is caused by many compounds, not only these 2.
One major issue is that these compounds are bound in juice and only the free portion is measured. Once the juice is made into wine more of these compounds can be released and so the effect of smoke taint can increase.

What level of the marker compounds is acceptable?
One recent report quotes anecdotal evidence from winemakers stating that guaiacol was a good marker for smoke taint and that most tasters could detect the presence of guaiacol in a dry white wine at the 6 ppb level. The report did recommend that further work needs to be done to ascertain if this threshold level was relevant for all grape varieties. A lot of research is being done at the moment to try to better understand the problem.

Author: Greg Howell
Date: February 2012