

Aims of the project:

Increase understanding of how smoke affects wine composition by:

- Identifying smoke taint compounds and their mode of entry into grapevines and fruit
- Identifying the impact of smoke composition from different fuel types
- Determining the relative impacts of controlled burning and wildfires
- Predicting shelf-life of wines made from smoke exposed grapes
- Exploring strategies to manage and reduce uptake of smoke taint compounds.
- Examining varietal differences in accumulation and identifying critical periods in grape berry development to develop and evaluate a risk assessment tool to enable industry and fire managers to determine windows of opportunity for controlled burning.
- Communicating activities and results with industry.



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The Australian Wine
Research Institute

Curtin
University of Technology



Department of
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Further reading:

Australian Journal of Grape and Wine Research
Special issue: Volume 17, issue 2, June 2011



Project updates on Facebook, 'Research at Mildura'.

If you would like to receive this information/publication in an accessible format (such as large print or audio) please call the Customer Service Centre on: 136 186, TTY: 1800 122 969, or email customer.service@dpi.vic.gov.au

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Centre for Expertise in Smoke Taint Research

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Smoke taint caused by bushfires poses a serious threat to Victoria's grape and wine industries, but little is known about smoke uptake and smoke taint development in grapes and wine.

Implementation of the 2009 Victorian Bushfire Royal Commission recommendations will lead to a tripling in the area of prescribed burning, as part of the strategy to reduce fuel loads so that wildfires are not as extensive and destructive.

The optimal time for effective planned burning is in Autumn, which coincides with key berry development phases during which grapes may be susceptible to smoke taint. Until the relationship between smoke susceptibility, smoke quantity and time of burning are accurately determined, it is difficult to optimise trade offs between burning and wine grape production. The development of guidelines based on risk assessment for industry and land managers would help to reduce the impact of smoke on grape and wine production.

The Centre for Expertise in Smoke Taint Research is investigating the links between smoke exposure of grapes and development of smoke taint in finished wine with the aim to develop a web-based risk assessment tool to help growers determine the potential risk of smoke taint in grapes and wine as a result of controlled burning or bushfires.

The Centre is home to a comprehensive research and development program that will significantly improve the industry's knowledge of how smoke impacts wine and how to minimise the risk of smoke taint from both planned burning and wildfires.

The impact of smoke from wildfires (compared to planned burns) is generally greater due to a combination of intensity, duration, topography and proximity to the fire, although this is yet to be fully quantified.



"The Victorian wine industry is a vital part of the state's agricultural sector and it is critical that we address the threat posed by smoke taint".

The Hon. Peter Walsh, MP, Minister for Agriculture and Food Security.

"Many vineyards and wineries in North East Victoria have had fruit rejected, or the wine was made only to discover it was tainted and had no commercial value".

Dr Mark Krstic, AWRI.



"Smoke has become an unexpected problem within our industry. Smoke moves, so you can be impacted at great distances from the fires. It is essential that we understand the mechanism of the taint so we can combat it. If we don't have the knowledge, then we can not fight the problem with its high economic cost."

Chris Pfeiffer, Pfeiffer Wines.



"The centre for expertise in smoke taint research is a national collaboration that aims to find solutions for the wine industry and fire and land managers".

Dr Mark Downey, DPI Mildura.

"We are trying to understand the mechanism of taint development and explore how smoke exposure of grapes will translate into smoke taint in the wine".

Dr Craige Trenerry, DPI Knoxfield.



Current knowledge

- Although all grapevines are sensitive to smoke, research conducted on Merlot has shown the highest sensitivity was seven days after the onset of ripening.
- There is no carry over effect of smoke taint from one growing season to the next.
- Guaiacol and 4-methylguaiacol are associated with the smoke taint in fruit and wines.
- Repeated exposure to smoke increases guaiacol and 4-methylguaiacol.
- Some techniques can reduce the smoke taint, including hand harvesting, chilling grapes after harvest, altering strength and duration of pressing and reverse osmosis treatment of the wine.
- Levels of "smoke" compounds increase in bottled wine over time due to release of smoke taint compounds from their bound forms (glycosides).
- The shelf life of finished wines may be able to be predicted due to a negative correlation between free and bound guaiacol.

Collaborative research

A national collaborative approach is being undertaken to address the issue of smoke taint in grapes and wine.

- Effect of stage of development and variety on susceptibility of grapevines to smoke taint – DPI, Department of Agriculture and Food WA (DAFWA) and the University of Adelaide.
- Location of smoke compounds in grapes and vines and their mode of entry into grapevines and fruit – DPI Victoria and Curtin University of Technology.
- Investigating the effect of smoke from different fuel types on fruit and wine – DPI and Curtin University.
- Investigating smoke compounds and their bound forms (other than guaiacol and 4-methylguaiacol) that contribute to smoke taint – DPI, Curtin University, University of Adelaide and the Australian Wine Research Institute (AWRI).
- Extractability of smoke compounds into wine in relation to management processes - AWRI.