



Media Release

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Australian research delivers expanded smoke taint toolkit

The Australian grape and wine community has grown its defences against the impacts of smoke from controlled burns and bushfires with recently completed research providing clarity on mitigation and treatment.

Teams at the Australian Wine Research Institute (AWRI), La Trobe University and Agriculture Victoria led the multi-faceted project spanning three-and-a half years, aiming to reduce losses from smoke-impacted fruit and wine by assessing a range of treatments and developing early stage predictions of smoke taint risk.

Wine Australia Chief Executive Officer Andreas Clark said the findings built on Australia's international reputation for smoke taint research.

'Australia is the leading nation when it comes to understanding smoke effects on wine and winegrapes. It's a very complex area of research, but our long-running and consistent studies have developed a solid knowledge base that can be called on in wine regions during fire events', Mr Clark said.

'The innovative developments from the project have broadened the mitigation and treatment toolbox for grapegrowers and winemakers and have laid groundwork for further vital research to support our sector.'

AWRI Managing Director, Dr Mark Krstic, said the research teams' findings proved vitally important during the 2020 vintage following widespread fires across Australian wine regions.

'We started this project in 2016 and were able to evaluate several mitigation options and remedial treatments in the vineyard and winery', Dr Krstic said.

'The timing of the fires earlier this year meant that there was an urgent need to deliver this information to our community and we were able work closely with winemakers to facilitate adoption of tailored techniques such as fining with activated carbon or dilution with unaffected wine for ameliorating smoke-affected juice and wines.'

'In addition, insights and experiences with the sensory evaluation of experimental wines were instrumental in setting up effective methods for industry-led sensory panels.'

Professor Ian Porter led the research program at La Trobe University and Agriculture Victoria, which determined how much smoke in a vineyard will cause tainted fruit and also established an early warning remote sensing network that enabled taint risk predictions.

'Through this research, we determined that it takes more smoke to cause smoke taint than was originally thought and we are close to setting smoke taint thresholds', Professor Porter said.

'Bushfires present a much higher risk of smoke taint than controlled burns, due to the larger volume of smoke and differing atmospheric conditions such as high winds.'

A number of smoke detection units were used in combination with the existing EPA networks in a number of states to monitor bushfires in the winegrowing regions of Tasmania, NSW and Victoria from 2018 to 2020. The researchers worked with local wine producers to determine the risk of taint according to the measurements determined by the smoke sensors.

'This experience demonstrated the value that a smoke detector network can provide as an early warning system to alert grapegrowers to the risk of smoke taint, based on the smoke dose measured', Professor Porter said. 'We also monitored over 40 controlled burns and showed that they generally were not a concern for smoke taint'.

The research teams also tested a number of commercially available coating products for their ability to reduce the uptake of smoke compounds by grapes in the vineyard. Whilst most actually increased the uptake of smoke taint compounds one of the tested products showed promising results for grapegrowers.

'We tested a number of different products for use in the vineyard and chitosan showed potential as a barrier coating on grapes. It is also already approved for use in wine processing, which means there are fewer technical barriers to its use as a barrier product', Tim Plozza from Agriculture Victoria said.

The projects are critical to supporting Australia's wine sector and received funding from Wine Australia and the Australian Government Department of Agriculture, Water and the Environment as part of its Rural R&D for Profit program.

Other outputs from the project included:

- Developing controlled burn planning and management protocols for land/fire managers and vineyard managers.
- Determining that the development of smoke taint is site-specific and due to proximity to fire, intensity of the fire, age of the smoke, prevailing weather conditions and atmospheric conditions.
- Establishing the baseline concentrations of smoke taint compounds (which occur naturally in grapes) for 12 commonly-grown Australian grapevine varieties, which is important for diagnostic analysis.
- Establishing that adsorption of smoke taint compounds into grape skin is rapid and any attempt to wash grapes following smoke exposure is unlikely to have any significant effect.
- Understanding that there is high variability among individuals in rating smoke-related sensory attributes in wine. In both experienced, trained tasting panel and among general consumers of wine, up to 20 per cent of people cannot taste smoke flavours in wines that others find unpalatable.

The three-and-a-half-year program *Mitigation of Climate Change Impacts on the National Wine Industry by Reduction in Losses from Controlled Burns and Wildfires and Improvement in Public Land Management* was a collaborative project between Wine Australia and its partners the Australian Wine Research Institute, Agriculture Victoria and La Trobe University. It was funded by Wine Australia and the Australian Government Department of Agriculture, Water and the Environment as part of its Rural R&D for Profit program.

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Notes

Adsorb versus absorb

Adsorption is not a typographical error. There is a distinction between adsorption when one material collects on the surface of another and absorption when one substance is taken up by the other.

What is smoke taint in wine and why is it undesirable?

Depending on the stage of the fruit's development, exposure to smoke can sometimes introduce undesirable flavours such as smoked meat, disinfectant, leather or char to wine, commonly known as smoke taint.

When grapes are exposed to fresh smoke, certain flavour compounds enter the skin of the grapes and are sequestered there – very little actually gets into the flesh of the berries. When the grapes are pressed to release the juice, and when the skin is left on the juice to extract tannins and colour, the compounds are released into the juice.

There's very little movement of smoke compounds from leaves into grapes, and they don't enter the grapes through the soil or roots either. Any smoke effects are present for a single season only: if a vineyard is affected by smoke one vintage, there is no carry over to the following vintage.

The characteristics of smoke flavour in wine change over time and smoke characters are experienced differently by different people. Sensory testing at the AWRI has shown significant differences among individuals. Up to 20 per cent of people cannot taste smoke flavours in wines that others find unpalatable.

Please refer here for further information: <https://www.wineaustralia.com/news/articles/smoke-taint-seeing-through-the-haze>

About Wine Australia

Wine Australia supports a competitive wine sector by investing in research, development and adoption (RD&A), growing domestic and international markets, protecting the reputation of Australian wine and administering the Export and Regional Wine Support Package (ERWSP).

Wine Australia is an Australian Commonwealth Government statutory authority, established under the *Wine Australia Act 2013*, and funded by grape growers and winemakers through levies and user-pays charges and the Australian Government, which provides matching funding for RD&A investments and funds the ERWSP.