

Vintage 2014 - trends from the AWRI helpdesk

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The AWRI helpdesk provides technical support to Australia's grapegrowers and winemakers and monitors technical trends across the nation's wine regions. During vintage 2014, helpdesk enquiries were dominated by issues related to extreme weather events including frosts, heatwaves and bushfires. A regulatory issue concerning changes to the limits for copper, iron and manganese in wines exported to China also raised significant concern. The helpdesk responds to individual queries on a confidential basis, but also provides the latest information to industry via emails, the AWRI website, webinars and face-to-face extension events.

TECHNICAL SUPPORT A PHONE CALL AWAY

The AWRI's technical helpdesk is a key service offered to grapegrowers and winemakers across Australia. It provides rapid, confidential support on a wide range of topics, including winemaking, viticulture, health, regulatory and trade issues. Industry personnel can contact the helpdesk by phone or email to ask advice, seek information or discuss issues. Samples can be submitted for problem-solving investigations which may involve sensory, chemical or microbiological analysis. The helpdesk team includes winemakers and viticulturists with extensive industry experience and detailed knowledge of grape and wine technical issues. By identifying and quickly resolving issues as they arise, volume, quality and reputational losses can be minimised.

Because of its close relationship with industry, the AWRI helpdesk is in a unique position to capture knowledge and trends associated with the technical issues that are encountered each vintage. Each month, the team monitors the type and nature of queries and investigations against industry trends observed over the last 20 years. This allows the team to observe, react to and communicate any current issues to Australia's grapegrowers and winemakers; to develop targeted new extension content; to implement any required emergency response; or to communicate ideas for new research projects to the AWRI research team. This report provides an overview of the major technical issues encountered within the Australian wine industry during vintage 2014.

DOMINANT ISSUE FOR VINTAGE 2014: WEATHER EXTREMES

Vintage 2014 was dominated by weather-related challenges across Australia's

AT A GLANCE

- Vintage 2014 was characterised by a range of extreme weather events.
- Frosts significantly reduced yields in a number of regions, particularly in Victoria and New South Wales.
- While major bushfires occurred, levels of smoke taint have been relatively low. Q&A sessions on smoke were hosted in three states.
- Heatwaves were generally managed well via irrigation and other strategies, but those that occurred around veraison may have contributed to subsequent issues with uneven ripening.
- Wines to be exported to China should be tested for copper, iron and manganese to ensure that new limits for these metals are met.

wine regions, and queries to the helpdesk reflected this trend. Taking an overview of conditions for the 2013-14 growing and harvest season across Australia, Western Australia had a dry and warm summer in the south-west (eighth and tenth warmest for maximum and minimum temperatures, respectively), South Australia experienced extreme temperatures throughout summer (sixth warmest on record; record 13 days reaching 40°C or more in Adelaide), Victoria had its third hottest summer, and NSW experienced its driest summer in 30 years and fifth warmest on record.

Delving a little deeper, a month-by-month breakdown reveals some key points:

- **September 2013.** Warmest on record for maximum, minimum and mean temperatures nationally, particularly in the first half of the month. This, combined with higher than average temperatures in August, resulted in earlier than average budburst in most regions.
- **October 2013.** Well above average maximum and minimum temperatures. NSW had the worst bushfires since 1968. Rainfall was below average except in Tasmania and south-western Victoria. Southern NSW and north-eastern

Victoria experienced several severe frosts resulting in significant yield loss. There were strong winds in late October in south-eastern SA and Victoria.

- **November 2013.** Above average maximum and minimum temperatures. Above average rainfall on east coast and below average rainfall in SA, inland NSW and Victoria. Many regions experienced an early start to flowering due to a combination of early budburst and high mean temperature from budburst to flowering. In southern Australia, a period of low temperature in early November coincided with the flowering period.
- **December 2013.** Above average maximum and minimum temperatures and well below average rainfall.
- **January 2014.** Above average maximum and minimum temperatures for all states except WA—the 18th consecutive month with above average temperatures. Below average rainfall in southern and eastern Australia. Three significant heatwaves during this month resulted in heat damage to fruit. Bushfires from mid-January in Victoria, NSW and SA. Harvest commenced in some regions due to early flowering.

- **February 2014.** Above average temperatures in south eastern Australia and WA and below average rainfall in southern Victoria. Bushfires continued in Victoria. Thunderstorms occurred mid-month in SA. Harvest commenced earlier than average due to early flowering.
- **March 2014.** Variable conditions across the country: above average temperatures for south-western WA; warmer than average in the first half, cooler days and nights in second half for SA; warmer in Victoria; and slightly warmer in NSW. Rainfall was average for south-western WA, below average for SA and Victoria and weather was wet and cloudy in NSW. This vintage of extremes presented a number of viticultural and winemaking issues.

SMOKE TAIT

One of the biggest issues of vintage 2014 was smoke taint. The bushfires experienced in SA, Victoria and NSW created significant concern among growers and winemakers, resulting in a high percentage of calls to the helpdesk (18% of calls received to date in 2014, Figure 1.).

While some callers required general information about smoke taint and others sought advice on when to sample and conduct testing, many callers sought interpretation of analytical results from testing volatile phenols and their non-volatile glycoside precursors. Figure 2 shows the AWRI's interpretation of the potential risk of smoke taint based on the results of smoke taint analysis of grapes, juice and wine. Given that many of the vineyards in question were exposed to smoke prior to veraison, the majority of results were either similar to, or only slightly higher than, levels that might be expected for non-smoke exposed vineyards. Consequently, the risk of smoke taint development was considered to be nil or low for the majority of wines tested. In the case of some wine samples, interpretation was complicated by the fact that the wines had been in contact with oak, which can also contribute volatile phenols to wine.

To respond to the high levels of concern, in November an eBulletin was distributed and two smoke taint question and answer sessions were held in NSW and Victoria. A further Q&A session was held in the Barossa Valley in January in response to bushfires experienced in that region. Information about smoke taint and analysis was also updated on the AWRI website. Overall, despite significant concern about smoke during vintage 2014, the timing and duration of smoke exposure meant that many producers appear to have 'dodged a bullet', with their wines not seriously affected.

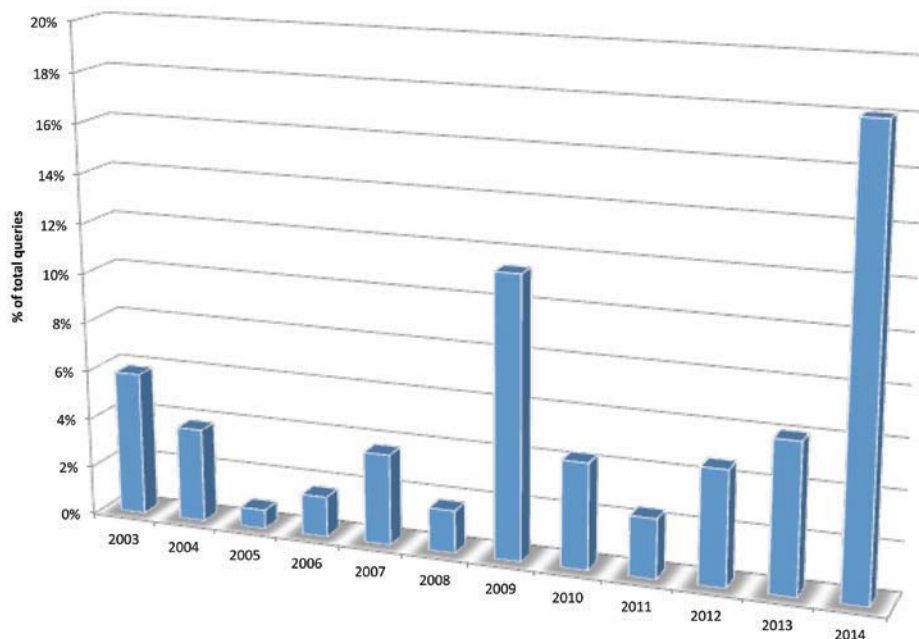


Figure 1. Percentage of queries regarding smoke taint by year, highlighting years 2003, 2009, 2013 and 2014. Note that the final percentage for 2014 may change by the end of the year.

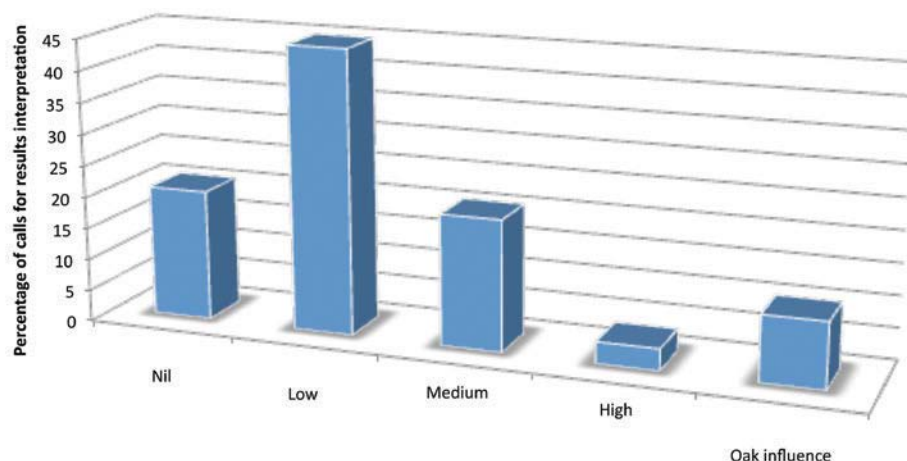


Figure 2. Interpretation of risk of potential smoke taint based on the results of smoke taint analysis of grapes, juice and wine. 'Oak influence' indicates the risk was difficult to assess due to contact of the wine with oak.

FROST

Significant frosts were experienced in October 2013. Growers from large and small vineyards were affected, with reports from widely divergent regions across WA, NSW, Victoria, ACT and SA. 'Radiation' frost conditions were prevalent with dry, clear nights and little or no wind. To respond to the frost issues encountered, a number of strategies to reduce frost risk were provided—including pruning, irrigation, cover crops and soil management. In November, the helpdesk issued an eBulletin covering these strategies and organised for a webinar to be delivered on managing frost in the vineyard. Post-frost management strategies were also delivered in later presentations. As the climate warms,

causing earlier grapevine development and drier spring weather, risks of frost are likely to increase.

HEATWAVES

Heatwaves were another major feature of vintage 2014. Three significant heatwaves occurred during January 2014. In early January, the helpdesk sent out an eBulletin, alerting growers across southern Australia of the severe heatwaves that had been forecast. This was written in conjunction with the Bureau of Meteorology and featured an early application of its new heatwave forecasting tool.

Growers who were able to increase irrigation from early January to maintain vine canopies and leaf condition were

able to limit heat damage to bunches. Those who had been proactive in canopy management and use of 'sunscreen' sprays also experienced minimal damage. Most regions reported minimal to small losses from sunburn, even in regions such as the Yarra Valley where exposed fruit is common. For some variety and region combinations, the heatwaves coincided with veraison. This did not appear to cause significant yield loss because bunches have low susceptibility to sunburn at this stage. However, it is likely that it was a contributor to the uneven ripening (also known as 'sweet and sour' condition) that was seen later in the season.

FRUITSET

Most indications are that potential bunch numbers in 2013-14 were average to slightly above average; however, lower than average yields and uneven ripening were experienced in many regions. In some areas, frosts in October caused yield losses of 5-100%. The worst-affected areas were in NSW and north-eastern Victoria, for example, an 80% loss in the Canberra district. In part, the severe damage was caused by advanced shoot development as a consequence of higher-than-average temperature in early spring. Another cause of low yield was a high incidence of both coulure (failure of grapes to develop after flowering) and millerandage (bunches with significant variation in berry size and maturity). Both of these effects were caused by low minimum temperatures at flowering. Millerandage was also one of the causes of the uneven ripening observed in the 2013-14 season. An 'Ask the AWRI' article about uneven ripening was published in the February 2014 edition of the sister publication of the *Wine & Viticulture Journal, Australian & New Zealand Grapegrower & Winemaker*.

POWDERY MILDEW

Despite the thunderstorms of February, there were no reports of significant yield losses due to fruit splitting and bunch rot. However, 2014 was a season that favoured powdery mildew, a common vine disease that is well understood and largely controllable. Growers should be proactively implementing a protective program and monitoring to ensure that the disease is under control. Once established, powdery mildew is difficult to control because it thrives in the denser, less exposed sections of the canopy that can be difficult to reach. To avoid the development of agrochemical resistance, the registered agrochemicals should only be used for prevention and not as curatives. In the lead up to harvest and in periods of very hot and dry weather,

ripening may advance quickly so it's important to be aware of withholding periods to ensure all regulatory requirements are met.

In January, an eBulletin was sent out in response to a number of queries about the use of elemental sulfur to prevent powdery mildew, and concerns about the effect of any residues on fermentation. A withholding period of 30 days was recommended for elemental sulfur.

MANGANESE

Not all of the major issues encountered during vintage 2014 were weather-related – one significant one related to exporting wines to China. In March 2014, the Australian Grape and Wine Authority (formerly known as Wine Australia) issued a warning to wine exporters regarding increased scrutiny of manganese, iron and copper levels in wine by Chinese authorities. Chinese authorities are now imposing maximum regulatory levels of 2mg/L for manganese, 1mg/L for copper and 8mg/L for iron. The new limit for manganese in wine has caused concern across wine-exporting countries. It is well established that there are natural background levels of this metal which vary significantly across vintages, regions and varieties. However, there is currently not sufficient information to reliably predict if any particular region, soil type or set of environmental conditions will be at higher risk of producing wines which exceed the 2mg/L level. There is also evidence that while manganese is not directly added during the winemaking process (as it is not a permitted winemaking additive or processing aid), certain viticultural and winemaking processes may contribute to the levels found in finished wine.

Since the introduction of the limit, the AWRI has analysed the manganese levels of more than 800 wines. A significant number of wines were found to exceed the 2mg/L limit, with higher manganese levels seen in red wine than in white wine. Wines from the 2014 vintage have generally had similar manganese levels to the 2012, 2011 and 2010 vintages, and lower than those from the 2013 vintage, where potentially 20-25% of wines may exceed the 2mg/L level.

The AWRI has also tested a number of wine fining treatments for their effects on manganese concentration. To date, none tested have shown a satisfactory impact on reducing the manganese concentration of wine. Work is continuing to assess other possible processing and fining options. In the mean time, the current recommendation is that all wines destined for export to China should be tested for copper, iron and manganese.

MOST UNUSUAL QUERY FOR THE VINTAGE

From time to time the AWRI helpdesk will receive a 'left field' query never encountered before. The most unusual one during vintage 2014 was from a winemaker who wanted to add blue colouring to a wine (presumably to obtain a marketing edge). The answer to this query isn't as straightforward as you might think. 'Brilliant blue' food colouring is not a permitted additive under Standard 4.5.1 Wine Production Requirements (Australia only). It would be permitted, however, if the product was a wine-based beverage rather than a wine according to Standard 2.7.4 Wine and Wine Products. A wine product must be based on wine but other permitted foods such as colourings and flavourings can be added, and brilliant blue is permitted under Standard 1.3.1 Food Additives. If such an addition was made, the product in question could not be labelled a wine, but must be labelled as a wine-based product. Queries about labelling should be directed to the Australian Grape and Wine Authority to ensure compliance with current labelling laws.

A VINTAGE TO REMEMBER

Despite the challenges posed up by frosts, fires and heatwaves, many regions are reporting excellent quality for their 2014 wines, even if grape yields in some areas were low. The AWRI helpdesk will continue to provide support to winemakers and grapegrowers now that vintage has wound up, malolactic fermentations are going through and thoughts turn to packaging.

The knowledge gained during vintage 2014 and previous vintages will feed into future seminars and workshops, eBulletins and eNews items, helping industry to deal with similar issues next time they occur. In particular, the AWRI's current workshop 'Adapting to Difficult Vintages', provides tools for both viticulturists and winemakers to manage the types of weather-related issues encountered during 2013-14. The AWRI has also launched a new extension program.

Opportunities in a New Climate which provides tailored information to help grapegrowers and winemakers build sustainable businesses in the face of changing economic and climatic conditions.

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