

Vintage 2016 – observations from the AWRI helpdesk

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Since 1955 the AWRI has provided technical support to Australia's grapegrowers and winemakers. The AWRI helpdesk responds to queries, conducts investigations and monitors technical trends across the nation's wine regions, disseminating information via eBulletins, the AWRI website, webinars and face-to-face extension events. Vintage 2016 showed some similarities to vintage 2015, with an early and compressed harvest, rain close to harvest in certain areas and some concerns about bushfire smoke.

IDENTIFYING KEY TECHNICAL ISSUES

The close relationship between the AWRI helpdesk and industry places it in a unique position to capture knowledge associated with the technical issues encountered each vintage across Australia. This allows the team to predict, observe, react to and communicate any emerging issues to Australia's grapegrowers and winemakers; to develop and deliver tailored extension content; to implement any required emergency response; and to communicate ideas for new research projects to the AWRI research team. Vintage 2016 generated more than 700 enquiries to the helpdesk and 69 investigations between 1 January and 1 May, which are similar numbers to the past two vintages. The AWRI library delivered 765 articles and books in response to requests during the same time, with around 70 percent of articles requested on winemaking topics and about 27% related to viticulture. This report provides an overview of the growing conditions and the major technical issues encountered within the Australian wine industry during vintage 2016.

CONDITIONS DURING THE GROWING SEASON

The unpredictability of weather patterns across Australia was highlighted this season. A dry winter and spring meant that many vineyards started the growing season with little or no water reserves in the soil profile, increasing the requirement for supplementary irrigation. A very strong El Niño system was forecast by the Bureau of Meteorology early in the season. October 2015 was 3°C above the average temperature for most of the country and overall spring temperatures were warm, leading to an early bud break and then an early start to harvest. While some regions experienced long-term drought conditions throughout the season, others in coastal NSW and WA experienced intense late rains that put vines under high disease pressure. Overall, the shift towards early ripening and concurrent ripening of different varieties continues to compress vintages and pose challenges for growers and wineries.

DROUGHTS TO FLOODING RAINS

Rain late in the growing season in January was a welcome relief at many sites, delaying fruit maturity and giving harvest and winery

AT A GLANCE

- A warm spring led to an early budburst and harvest
- Large crop yields were seen due to higher bunch numbers
- Rapid, compressed vintages were experienced across many Australian wine regions
- Stuck fermentations were encountered in many regions
- Bunch rot occurred in some regions due to late season wet weather
- Some regions in South Australia, Western Australia, Victoria and Tasmania were exposed to smoke from bushfires
- Despite the challenges, the overall fruit and wine quality appear to be good to exceptional.

teams an opportunity to catch up. It added much needed moisture to the soil profile and a small 'top up' to dams. This was the first substantial rain seen in many vineyards for more than three months and was vital to maintain canopy cover at sites without an alternative water source. Unfortunately, the timing and intensity of the wet weather in some regions caused flooding, with rainfall in some regions between 150-200mm in just 24 hours. This caused both disease and vineyard access problems, with some significant fruit losses. The helpdesk received enquiries about the most appropriate methods to assess disease incidence and severity in the vineyard, and provided assistance with reviewing the limited options for late season botrytis management.

A WARM AND COMPRESSED VINTAGE

Above average yields due to higher bunch numbers (caused by warm conditions in spring 2014) and a compressed vintage once again placed stress on harvest and processing infrastructure. There was a delay in harvesting some blocks which resulted in high Baumé fruit and higher alcohol wines. Ferment speeds tended to be fast, either to turn tanks over quickly to be ready

Queries related to stuck fermentation

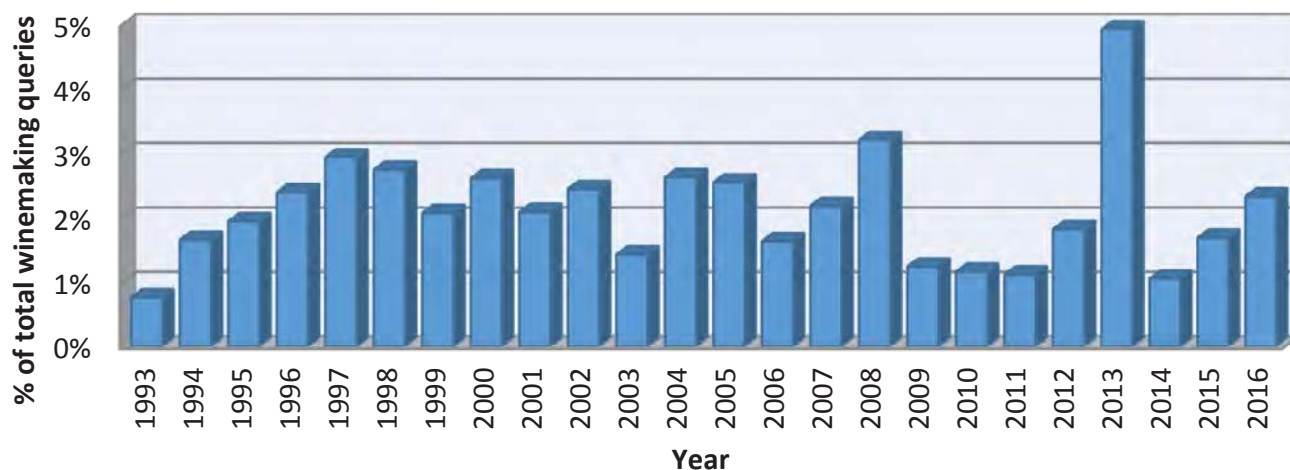


Figure 1. Percentage of total winemaking queries that related to stuck fermentations, by calendar year (2016 data covers January to April only).

for the next batch of fruit or because of strains on refrigeration capacity to cool both grapes and ferments. Fermentation issues were also observed, with winemakers having little time or spare tank space to deal with stuck ferment issues promptly.

Climate projections suggest that early and compressed vintages are likely to increase in frequency due to more regular heatwave events and less water availability (Department of Environment 2016). As such, a review of the tactics employed in 2015 and 2016 could provide valuable preparation for future vintages.

Planning for future compressed vintages should focus on logistics, with key steps including:

- starting vineyard assessments early, before the new year in warm regions
- conducting regular vineyard assessments as maturity can increase rapidly in warm years
- harvesting heat susceptible fruit first
- identifying compositional changes expected through greater dehydration
- expecting lower acidity and/or higher pH and making adjustments before fermentation
- expecting higher pectin levels, higher enzyme requirement needs and longer settling times for white juice
- expecting higher protein levels as these are also typical with riper fruit.

STUCK FERMENTATIONS

Due to a strong El Niño forecast prior to harvest a hot and compressed vintage was predicted. In the past, hotter vintages have tended to result in higher than average numbers of stuck fermentation problems as seen for the 2008 and 2013 vintages in Figure 1. The main drivers for slow and stuck ferments are normally high sugar and associated high alcohol levels due to increased ripening in hotter years. The likelihood of sub-optimal ferments can also increase in a compressed vintage where there is increased demand on staff time, refrigeration and tank capacity. At such times, a step such as managing pump-overs can sometimes be neglected, even though it is critical in moderating cap temperatures and also introduces a level of aeration, both of which are important in maintaining a healthy ferment.

Occasionally, other season-related compositional factors can contribute to higher than average occurrences of stuck ferment problems. Early in the vintage the helpdesk team began investigating stuck ferment wines to see if any such compositional factors might apply this year. In particular, the team looked for unusual acidity or nutrient profiles, higher Baumé levels and unusual vineyard microbial populations or agrochemical residues due to more rapid ripening of fruit. Several wine regions were also visited later in the vintage to try to understand the root causes behind stuck fermentation issues.

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Winegrape BERRY SENSORY ASSESSMENT in Australia

Of the ferments that were examined, the findings revealed:

- agrochemical residues from late sprays had not impeded fermentation
- sulfur dioxide levels in grapes and ferments were within acceptable ranges and, therefore, unlikely to have caused fermentation problems
- acidity levels, including organic acid profiles, were within typical ranges compared to other vintages. Compressed vintages can lead to pH and TA imbalances. A few wines did have volatile acidity levels >0.8g/L which can have a negative effect on fermentation
- nutrient levels (YAN and amino acids) were considered typical and no sulfide issues occurred during fermentation.

All of these 'typical' results suggested that higher sugar and alcohol levels were likely to be the main causes of this year's stuck or sluggish fermentations. Most winemakers had inoculated with alcohol-tolerant yeast strains this vintage, so strain choice did not appear to be a major factor, but winemakers did report that fermentations had been faster than usual. This may have increased stress on yeast, making it more difficult for them to finish fermenting the last 1-2 Baumé of ferments. Lack of time and tank space to deal with stuck ferments immediately was also an issue.

Key steps that can be taken to reduce the risk of stuck fermentations include:

- checking YAN levels up to 7-10 days before harvest, and making appropriate adjustments
- choosing a yeast strain that is tolerant of higher sugar and alcohol levels
- judicious use of sulfur dioxide and well-timed acid additions to minimise the influence of undesirable microorganisms.

If a stuck fermentation is encountered, winemakers are encouraged to take action quickly to rack the ferment off lees and conduct a restart using a scale-up yeast culture. More information on managing stuck fermentations can be found on the AWRI website.

SMOKE TAIN

Early season smoke events were experienced in a number of regions. While the risk of taint from smoke exposure prior to veraison is lower than for exposure closer to harvest, there were still some cases where grapes were rejected after early season smoke exposure. The AWRI recommends assessing the risk of smoke taint via a combination of analytical testing of grapes and sensory assessment of a small-scale ferment made from the same grapes. More details are available on the smoke taint page of the AWRI website. To assist with interpretation of smoke taint analytical results, the AWRI helpdesk team has recently commenced a two-year project to expand its database of background levels of smoke taint compounds in grapes that have not been exposed to smoke. This database allows a simple 'traffic light' indication of risk of smoke taint to be provided when grapes are analysed.

MOST UNUSUAL QUERY

Every year the helpdesk receives a number of enquiries and carries out investigations that can only be described as odd or unusual. This year a winemaker contacted the helpdesk asking

for advice on a wine that contained floating particles of organic material. The subsequent investigation identified the material to be vinegar fly (*Drosophila*) pupa cases. The term pupa means that the vinegar fly was at the immobile non-feeding stage of development, between larva and adult, which suggests that these might have been present in the bottle prior to filling.

ARE EARLY AND COMPRESSED VINTAGES BECOMING THE NORM?

The helpdesk's report on the 2015 vintage concluded with a speculative question about whether the early vintage was 'a sign of things to come' for grapegrowing in Australia's changing climate. A year later, vintage 2016 did seem to live up to this statement, with another early and compressed vintage and further examples of challenging extreme weather. What's in store for 2017 is, of course, impossible to predict; however, what is certain is that learnings from both these vintages should be remembered as Australia's wine community adapts to a changing climate.

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