

How one McLaren Vale vineyard is keeping cool during heatwaves

Summary

Modifying his irrigation strategy and mulching during winter and spring, means that James Hook is better able to operate under heatwave conditions (with minimal losses) across a 20 ha vineyard he manages in McLaren Vale, South Australia. Since making the first of ongoing changes 10 years ago, more vines are surviving extreme conditions in terms of resilience and yield with an overall dollar impact improvement of \$400–500 per hectare.

Name James Hook, Agronomist and Grape Grower Manages 200 ha in McLaren Vale

Business DJ's Growers

Vineyard size 20 ha (Shiraz, Tempranillo and Cabernet Sauvignon)

Tonnes harvested 280 (2019 vintage)

Growing Region McLaren Vale, South Australia

Heatwave events in the summer of 2008–09 sent temperatures soaring (up to 45°C) in McLaren Vale, South Australia. Many vineyards found these extreme conditions difficult to manage after experiencing more temperate summers through the 1980s and 90s

Agronomist and grapegrower, James Hook, explained that the very high temperatures caused large losses (at least a quarter of the crop) due to shrivelling 'because the vines couldn't supply enough water to the fruit'.





A Wine Australia factsheet about heatwaves (2012) described the March 2009 heatwave as ‘a major concern’ with vines being defoliated and grapes suffering sunburn and heat damage. It said that ripening was temporarily delayed and harvest intake schedules thrown into disarray.

These losses, along with promising results from a couple of local Wine Australia trials¹, became the catalyst for James to make changes to the business’ irrigation strategy to help limit and prevent shrivelling as much as possible during heatwave events. Ten years ago, taking the research into account, he started tackling the problem in two ways.

The first was to increase organic carbon in the soil by mulching during the wet times of year (winter and spring). James said this improved soil conditions, as organic carbon helps retain soil moisture during summer and helped to limit further damage. ‘We’ve definitely made these processes the first job to be completed every year.’

And the second was to modify their standard irrigation systems. ‘Irrigation during hot weather events was ineffective because soil temps became too high and the vines were not able to access the water. We needed to pre-water vineyards in the days leading up to a heatwave.’

James explained that they used to irrigate on a weekly cycle but found that this strategy meant parts of the vineyard may not have been irrigated in the lead up to hot weather events. This led to replacing the original irrigation system that had a high output over a large area and installing a new irrigation system allowing short frequent irrigations providing more control and ‘more flexibility in infrastructure.’

For others interested in similar changes, he recommended looking at constructing an irrigation system in terms of litres per hour. James explained that many of the vineyards established in the 1980s and 90s had a standard irrigation set up (4 litre dripper per vine) regardless of vine variety or soil type.

Matching the output of drippers to the infiltration rate of the vineyard soil has been a key improvement. James said, ‘For a red clay loam we were finding that the standard 4 litre dripper would run off and pond on the surface. We now have switched to having 2 inline drippers which put out 1.25 litre per hour and soak into the topsoil.’

With increasingly hot daytime temperatures in summer, James said that the business has progressed the changes as part of an ongoing irrigation strategy. One of the main challenges has been the availability of water. James highlighted the importance of water security and taking steps to secure its supply.

¹ Comparison of short frequent irrigations and longer less frequent irrigations in relation to water use efficiency and winegrape quality (RT0201-1) and *The influence of soil management on ecosystem services in viticulture* (GWT 1412)

‘Without having a reliable supply of water, we cannot do the intensive pre-watering. We are using less water in total than we were using 20 years ago but we are being more strategic in when we apply it.’

As a result of the changes made, James said that when faced with record hot days in January 2019 where temperatures were up to 46°C, the vines survived much better than compared to a decade ago in terms of resilience and yield. ‘In 2008, we experienced 25 per cent loss compared with 9 per cent in the past year. These losses were on par with those of the McLaren Vale wine region.’

‘The impact in terms of dollars would be an overall improvement of \$400–500 per hectare.’

Resources

Hayman, P., Longbottom, M., McCarthy, M. and Thomas, D. (2012). **Fact Sheet: Managing vines during heatwaves.** [pdf] Wine Australia. Available at: https://www.wineaustralia.com/getmedia/90cf20af-1579-462d-b06e-35f343cbe129/201201_Managing-vines-during-heatwaves.pdf

Hyde, L. (2004). **Comparison of short frequent irrigations and longer less frequent irrigations in relation to water use efficiency and winegrape quality.** [ebook] McLaren Vale Grape, Wine and Tourism. Available at: <https://www.wineaustralia.com/getmedia/d9e8de22-b22a-45c5-96d3-2dd68192afec/RT-02-01-1>

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