

What can we learn from climate change adaptation in Australia's wine industry?

Brullo, T, Barnett, J, Boulter, S, Waters, E

A case study that takes a closer look at what has enabled some wine growers in Australia to begin taking action to adapt to climate change.

Climate change is and will continue to affect all aspects of the wine industry. Some of the conditions which cause major concern include:

- Extreme heat
- Changes in temperature patterns
- Changes in rainfall patterns, humidity and moisture
- Drought and uncertain water supplies
- Flooding and waterlogging
- Hail
- Frost
- Bushfire smoke taint
- Fruit sunburn or shrivelling

These climatic conditions can have significant impact on disease, pests, vine health and ripening times. Ripeness also impacts the sugar content, colour, flavour and alcohol content of a wine.

On top of this, changes in harvest times are intensifying logistical challenges and putting pressure on infrastructure required for harvest, as well as winery processing equipment and tank space. Fruit pickers and other workers face additional occupational health and safety concerns from working in extreme heat conditions.

Australian wine growers are well accustomed to the challenges that arise from different seasonal patterns. However, with changes in temperature and rainfall, and increases in frequency and severity of extreme events, these climate challenges become increasingly destructive.

As part of recent research, we interviewed wine growers and professionals from the wine industry to understand how they have been undertaking climate change adaptation and what has enabled them to take steps towards resilience.



Adaptation options for wine growers in Australia

Historic experience managing climate variability means the wine sector, and agriculture more broadly, are well placed to build on existing knowledge and skills when extending into climate change adaptation. The wine sector is already implementing and testing an impressive number of different adaptation techniques.

Location

Winemakers are beginning to source grapes from, or grow grapes in, cooler regions or high altitudes to reduce heat stress (although high altitude areas often face increased risk of smoke taint from bushfires). It is for this reason that Tasmania, Australia's coolest climate, are of increasing interest. With increasing irrigation infrastructure, the amount of suitable land in Tasmania for wine growing is increasing.

Varietals

Investing in new varietals of grapevine is also gaining significant attention. This can include later or earlier ripening grape varieties, importing new varieties from hotter climates, or developing and trialling new more heat-resistant varieties (as has been done by CSIRO). Later-ripening varietals may be better suited to cooler or higher-altitude regions with limited sunlight, while earlier-ripening varieties often require less water during the hot and dry seasons. Some vineyards with existing infrastructure are 'retrofitting' or replanting with these different varietals.

Technology

Real-time monitoring of climate conditions is used to identify and mitigate risk factors. Adoption of technology into the vineyard management can include weather, plant and soil sensors, satellite and remote sensing. New technology is also used in site selection, vineyard layout and design.

Vineyard Structure

Different trellis systems are used to manage canopy and shade. Changing row orientation from the traditional North-South rows to East-West Rows is becoming increasingly common in areas like Victoria. Some older vineyards have been completely re-designed.

Other adaptation techniques include changes to irrigation practices to increase efficiency, protecting fruit from extreme heat and sunburn, changes to harvest time, and changes to winemaking practices.

"There's not too many brand-new threats to a vine due to climate change. There's just a higher frequency of the same threats that we've always had."

BROWN
FAMILY WINE GROUP

Example: Brown Family Wine Group

Brown Family Wine Group is a family-owned company based in North East Victoria, Australia. For over 136 years the Brown Family's sense of adventure and innovation has led them to where they are now: creating exciting new wines, pushing boundaries, and developing vineyards in some of the best regions in Australia. Their flagship brand, Brown Brothers, is one of Victoria's oldest and well-known wineries dating back to 1885. They are now in their fifth generation of wine growers.

Brown Family Wine Group began to observe an increasing impact of climate on their production in the early 2000s during the height of the millennium drought. Limited water supply in the Murray-Darling Basin placed significant strain on the company, forcing them to take on huge additional costs purchasing water, as well as significant losses. Smoke taint from nearby bushfires also caused significant crop damage. Although retail shelf space was reduced and sales faced challenges during this period, the experience created opportunities to innovate and adapt for future success.

The Brown Family has become well known for their adaptation responses to these climate challenges. As one of Victoria's leading wine brands, Brown Family Wine Group's decision to invest in vineyards in Tasmania captured significant media attention and sparked widespread discussion. Here we discuss some of the factors that led to their adaptive decisions.



Strategic planning

Vineyards typically operate on at least a twenty-year timeframe, however, for the Brown Family thinking further ahead for future generations has always been important.

“The expectation is that future generations are going to have a viable business to work in over the next 130 years.”

Experiences during the millennial drought, coupled with increased discussion about climate change at the time, had brought climate to the attention of the Brown Family Wine Group’s board. In 2008, the Victorian Department of Primary Industries (DPI, now Department of Environment and Primary Industries) was invited to present to the board and senior management team about the future impact of climate change. Together this led to a board resolution to assume a 2-degree temperature increase by 2050, ensuring that climate change had to be factored into the decision-making process for all capital projects.

“It became very clear that what we had experienced was a taste of what was to come.”

Opportunity arises

Brown Family Wine Group began risk assessments on their existing vineyards, analysing how they were expected to cope into the future. Various adaptation responses started to be built into business as usual, such as more efficient irrigation practices, and planting of heat tolerant species. Safeguarding cooler-climate grape varieties against rising temperatures proved to be a greater challenge.

“All the signs kept pointing toward Tasmania at that moment in time.”

It was therefore timely when Brown Family Wine Group was contacted about purchasing three vineyards in Tasmania’s Tamar Valley. Tasmania offered opportunity for expansion into a cooler climate region and new markets. With the backing of the company, this purchase was finalised in 2010.

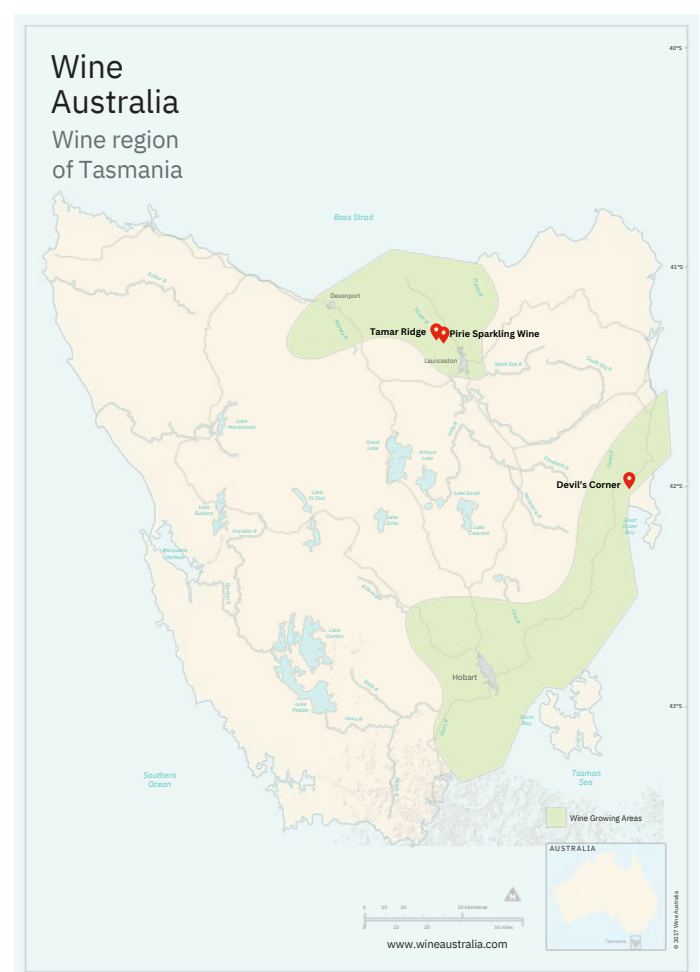


Figure 1: A map of Tasmania’s wine region (Wine Australia), overlaid with the location of Brown Family Wine Group’s key labels.

Investing in Tasmania quickly proved to be a success, as cooler-climate varieties like Pinot Noir performed exceptionally well, becoming a valuable addition to the company's portfolio. Building on their success, Brown Family Wine Group made significant investments in Tasmania's infrastructure, focusing on planting new vines and forming partnerships with landowners interested in becoming growers. Among their investments, the creation of the award-winning Devil's Corner cellar door became a standout attraction for visitors, solidifying their growing presence in the region.

Enabling Environment

This case from Brown Family Wine Group demonstrates clearly that institutionalised or mandated support from within an organisation is just as influential in the private sector as has previously been discussed in research on state and local governments. Such support enables adaptation actions to progress.

The decision to move to Tasmania was opportunistic, however, the board resolution had laid the groundwork and created an enabling environment that allowed the company to make use of the opportunity to produce in Tasmania when it arose. The strategic decision of Brown Family Wine Group, and leadership demonstrated by their board, have allowed them to become an industry leader in climate adaptation, building on their reputation and brand name.

Their decision was underpinned by a strong commitment to investing in strategies that enhance their ability to address climate change and foster resilience.

The future-planning mindset of Brown Family Wine Group, and their concerns for the wellbeing of future generations, played a major role in their decision-making. As a family company, they were also able to take risks on investing based on values and good outcomes rather than solely short-term financial gain. Return on investment for adaptation can sometimes be slow and counter-intuitive, i.e. if new irrigation infrastructure is not used until the next drought period. Even so, the outcome may merely prevent losses rather than drive additional revenue.

“Adopting a policy at the board level, following through with tangible actions, and ultimately transforming it into a highly successful commercial investment.”

For further details see the full report **Enterprise Suitability Mapping and Tasmania's wine sector.**

Visit www.nesp2climate.com.au
Contact: tia.brullo@unimelb.edu.au

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