



# Growing Chardonnay wine grapes (cool region) in New South Wales: preparing for a changing climate

Chardonnay wine grapes will likely to continue to experience high to very high climate suitability in cool growing regions by 2050.

## Developing industry-informed climate planning information

Climate change is altering the growing conditions for many agricultural commodities across NSW. Primary producers need evidence-based information about the changing climate and the risks and opportunities it may bring.

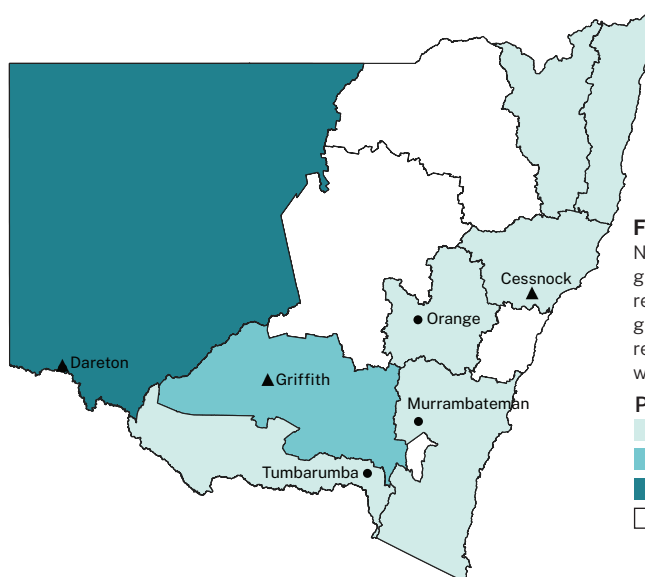
Through its Vulnerability Assessment Project, the NSW Department of Primary Industries is enhancing the resilience of our primary industries by providing information and data to help the sector better plan for, and respond to, climate change. The project has assessed climate change impacts for extensive livestock, broadacre cropping, marine fisheries, forestry, horticulture and viticulture, and important biosecurity risks associated with these industries to inform sound planning, risk management and adaptation decisions.



## Wine grapes in NSW

NSW is the birthplace of wine grape production in Australia, with the first vines planted in the 1800s. Today, it is Australia's third-largest producing state, behind South Australia and Victoria.

Chardonnay represents approximately 70% of NSW's total white varietal crush (Source: Wine Australia). These are grown in both cool and warm climates across the state. Figure 1 shows key cool region wine growing sites which include Orange, Murrumbateman and Tumbarumba in NSW.



**Figure 1.** NSW Chardonnay wine grape growing regions. Darker colours represent higher production of grapes. Circles indicate cool wine regions, and triangles show warm wine regions.

**Production (t)**

- 0–5000
- 5000–10,000
- >10,000
- No Wine Grapes

# Climate and cool wine growing regions

Chardonnay wine grape cool growing regions in NSW are expected to remain highly suitable for the production of high-quality Chardonnay grapes by 2050 under a changing climate. Climate risks to the NSW Chardonnay wine grape industry affect the phenophases of the grape lifecycle in different ways.

Climate change risks to the NSW cool wine growing regions industry include:



**Extreme heat:** Increased maximum temperatures and hot days may affect sensitive phenophases, such as veraison and bloom.



**Frost:** Reduced frost risk will likely increase suitability in some regions, such as Orange, Murrumbateman, and Tumbarumba, especially during budburst and shoot growth.

## Climate impacts: what to expect

**Dormancy** in the cool growing regions is expected to maintain very high climate suitability, except Murrumbateman in a high emissions scenario which will decrease to high suitability (*moderate to high confidence*).

**Budbreak (Budburst & Shoot Growth)** in the cool growing region of Murrumbateman is expected to maintain very high climate suitability (*high confidence*). An increase to very high climate suitability is projected at Orange and Tumbarumba due to reduced frost (*high confidence*).

**Bloom (Flowering & Berry Development)** in the cool growing regions of Murrumbateman and Orange is expected to maintain very high climate suitability, and Tumbarumba will likely increase from high to very high suitability (*moderate to high confidence*).

**Veraison** in all cool growing regions is likely to experience a slight decrease in suitability due to an increase in hot days, however the region is expected to maintain very high climate suitability (*moderate to high confidence*).

**Harvest, maturation, post-harvest and leaf fall** in all cool growing regions is expected to maintain very high climate suitability (*high confidence*).

### FOR MORE INFORMATION

Please get in touch with [vulnerability.assessment@dpi.nsw.gov.au](mailto:vulnerability.assessment@dpi.nsw.gov.au)  
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### Wine quality

Cool winegrowing regions are expected to remain very highly suitable for sugar and acid quality (*high confidence*).

### Irrigation water requirements

Irrigation water requirements are likely to increase for cool winegrowing regions (*low to moderate confidence*). The increase is likely to be greatest under the high emissions scenario.

## How to adapt

Climate variability, pests and diseases all affect wine grape production. Understanding the likely impacts of climate change on each wine region will help with management, including identifying priority adaptation and mitigation strategies.

Adapting to extreme heat  
Applying organic mulch to the under-vine area may improve soil moisture and temperature. The application of sunscreen products to reduce sunburn damage and anti-transpirants to maintain berry integrity and reduce water loss could alleviate some of the impacts. Installation of over-row netting could also be used to limit sun exposure under high temperatures. New varieties may cope better with higher temperatures but can take up to 30 years to develop and market. The wine industry may also need to improve water efficiency through changing irrigation practices, upgrading water infrastructure or adopting new technologies.

## Methodology and data

Climate projections were sourced from Climate Change in Australia's 'Application Ready Data'. This dataset is comprised of projections from an ensemble of 8 global climate models, each presenting a plausible future climate. The models differ in their projections, giving rise to uncertainty in our modelling which is reflected in the confidence statements given in brackets in the text. Care should be taken when interpreting these results.

The Vulnerability Assessment Project is intended to highlight potential industry- or regional-level changes. Intermediate and high emissions scenarios were used in the assessments (RCP4.5 and RCP8.5), but these are not the only future scenarios possible. The inclusion of climate variables important to the commodities production was based on published research, expert knowledge and data quality and availability.

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