



Growing Radiata pine in New South Wales: preparing for a changing climate

Climate change may present challenges to Radiata pine production in NSW, with some areas expected to decrease in climate suitability.

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 increasing 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 determined climate change impacts for extensive livestock, broadacre cropping, marine fisheries, forestry, horticulture and viticulture, and important cross-cutting biosecurity risks to inform sound planning, risk management and adaptation decisions.



Radiata pine in NSW

Radiata pine (*Pinus radiata*) is an integral part of forestry in NSW, and makes up the majority of the state's softwood plantations. NSW has significantly invested in Radiata pine plantations as they are important for economic growth and meeting local demand for timber.

In regions like the South West Slopes and Bombala, the Radiata pine industry is an important employer and economic contributor. As NSW seeks to rebuild and replant following the 2019-2020 bushfires, the regional importance of the industry is expected to grow.

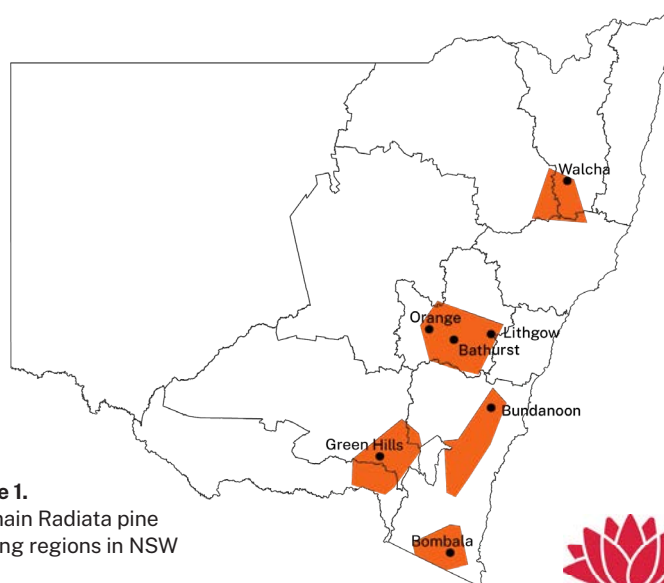


Figure 1.
The main Radiata pine growing regions in NSW

Climate and the forestry industry

All life stages of Radiata pine production are likely to experience similar changes in climate suitability by 2050 in NSW.

Climate risks and opportunities include:



An increased prevalence of hot days, as well as the combination of generally hot and dry conditions in summer (and, to a lesser extent, autumn and spring), are likely to negatively impact climate suitability for Radiata pine in the western reaches of the Walcha, Bathurst and Green Hills growing regions (*high confidence*).



Reduced prevalence of very low temperatures during winter under future climates will likely reduce the probability of frost-induced seedling mortality (*high confidence*).

Climate impacts: what to expect

Seedling trees (0-2 years) are likely to experience a decrease in climate suitability in western pine-growing regions (*moderate to high confidence*). This is mainly driven by changing rainfall patterns, and expected increase in hot days during spring and summer (*moderate to high confidence*). However, the Walcha and Southern Highlands regions are expected to increase in seedling climate suitability (*moderate confidence*).

Juvenile trees (2-5 years) are likely to experience similar climate suitability to what has been historically experienced (*low to high confidence*). Some western regions are expected to moderately decrease in climate suitability, due to rising average temperatures and changing rainfall in spring, and increased prevalence of hot days in summer (*low to high confidence*).

Adolescent trees (5 to 11 years) are likely to experience an increased number of hot days in summer, and reduced rainfall (*low to moderate confidence*), leading to a decrease in climate suitability for adolescent trees in the western parts of some growing regions. However, most regions will experience climate suitability similar to what it has been historically (*moderate to high confidence*).

Mature trees (11 to 30 years) are likely to experience similar climate suitability to what it has been historically (*moderate to high confidence*). Heat impacts during spring and summer may lead to decreased suitability in some areas (*low to moderate confidence*).

Adapting to the changing climate

Adapting to hotter, drier conditions

Forest managers could investigate strategies such as ripping and/or mounding to increase soil water availability, spacing of seedlings at planting to increase the volume of soil available for soil water extraction, timing of thinning to reduce intra-stand competition.

In the medium term, the development of a genetics program could help to maintain NSW's Radiata pine production. Such a program could aim to produce trees that can better tolerate expected hotter and drier conditions whilst optimising production (growth) and consider other tree species.

FOR MORE INFORMATION

Please get in touch with vulnerability.assessment@dpi.nsw.gov.au

This work has been produced by the NSW Primary Industries Climate Change Research Strategy funded by the NSW Climate Change Fund.

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.