



Growing irrigated rice in New South Wales: preparing for a changing climate

NSW irrigated rice growing regions are likely to maintain high to very high climate suitability for rice production under a changing climate, with minimal increases in suitability in some areas.

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 cross-cutting biosecurity risks associated with these industries to inform sound planning, risk management and adaptation decisions.



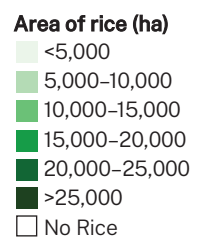
Rice in NSW

Rice is a grain related to other cereal grass plants such as wheat, oats and barley. Australia has grown rice since the late 1800s. Most Australian rice is medium grain, the majority of which is exported. Australia's annual rice production and the number of farms growing rice depend on the volume of available irrigation water each year.

Almost all of Australia's rice is planted in the Murray and Murrumbidgee regions of southern NSW (Figure 1). These regions generally have clay-based soils and relatively flat land suitable for mechanised rice production. The regions also have well-developed irrigation infrastructure and rice storage and milling facilities.



Figure 1. Major NSW rice growing regions. Darker colours represent larger areas of rice grown.



Climate and the rice industry

Rice growing regions in NSW are likely to become marginally more suitable by 2050 due to the changing climate.

Climate risks and opportunities include:



Increased irrigation water requirements are expected by 2050. The increase is likely to be greatest under the high emissions scenario (*high confidence*).



Increased minimum temperatures are likely to improve the climate suitability of rice growing regions (*moderate to high confidence*).

Climate impacts: what to expect

Establishment is likely to experience minimal to moderate positive change in the southern rice growing regions due to the reduction of minimum temperatures (*high confidence*).

Vegetative growth and panicle initiation (start of reproduction) climate suitability is unlikely to significantly change (*moderate to high confidence*).

Microspore (reproductive growth) and flowering are likely to experience minimal to moderate positive change in climate suitability due to the reduction of minimum temperatures (*moderate to high confidence*).

Grain-fill is the final stage in rice development. Climate suitability is not expected to significantly change (*high confidence*).

Irrigation water requirements

Growing rice in NSW is likely to require more water under a warming climate, particularly for rice planted in inland NSW. There are, however, other varieties of rice that require less water and management strategies that could potentially reduce water demand. Future research and development into these areas could present new opportunities for NSW rice growing regions to mitigate the potential impacts of increased water demand in 2050.

Rice quality

Rice quality is expected to be maintained under a warmer climate. Adaptation strategies are unlikely to be required, but if they are, they should focus on increasing resistance to heat, such as developing heat-resistant rice varieties.

Adapting to the changing climate

A changing climate will likely result in marginal increases in climate suitability for rice growing in NSW. As a result, the rice industry is unlikely to need to implement large-scale adaptation activities.

Climate projections suggest that the climate will be more suited to growing rice in the Murray Valley, and there may be the opportunity to expand to the eastern Murray Valley region.

Due to historical reasons, rice is often grown in some parts of NSW which do not have the most suitable climate. Rice growing has developed as a cooperative industry in southern NSW with significant infrastructure, such as rice mills and grain drying and storage facilities. To date, these factors have been more important than the climate in determining the location of the rice industry using current crop husbandry systems.

Expansion of the industry may be possible using an aerobic rice system. This will only be possible with the development of higher-yielding aerobic rice varieties and farming systems to manage weeds, pests and diseases common to aerobic rice.



Methodology and data

A ponded rice production system was modelled in this assessment, with a fixed sowing date of October 10th.

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.

FOR MORE INFORMATION

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

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