Broadacre cropping

Climate Vulnerability Assessment

Dryland Canola Factsheet

Growing canola in New South Wales: preparing for a changing climate

NSW dryland canola growing regions are likely to maintain low to moderate climate suitability for canola production under a changing climate, with likely increases in canola quality and germination reliability.

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.

Canola in NSW

Canola was first grown as a commercial crop in Australia in 1969. Australia now exports 3.3 million tonnes of canola annually, representing 15-20% of international trade. Canola can be used to produce oil for human consumption or protein meal for stock feed; it can also be grazed. As well as a profitable crop in its own right, canola is also a 'break' crop used in rotation with other crops to reduce cereal weed, disease and pest levels.

NSW grows around 575,000 hectares of canola crops annually. On average, NSW crops produce 1.2 tonnes per hectare, but under favourable conditions, they can produce 4 tonnes per hectare in the south and 3 tonnes per hectare in the north of the state (Figure 1).

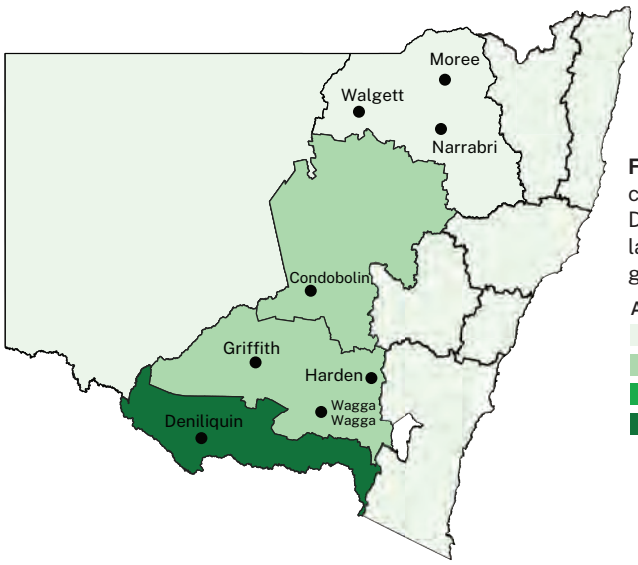

Figure 1. Major NSW canola growing regions. Darker colours represent larger areas of canola grown.

Department of Primary Industries

NSW GOVERNMENT

Climate and the canola industry

High-quality canola growing regions in NSW will likely increase by 2050 under a changing climate.

Climate risks and opportunities include:

Decreased frosts are likely to make the upland regions in the centre and north of the state more reliable for growing canola (*high confidence*).

Changes in rainfall will impact climate suitability for canola production across the current growing region (*low confidence*). The direction and magnitude of these changes are uncertain, but greater changes to rainfall are expected under the high emissions scenario (RCP 8.5).

Climate impacts: what to expect

Germination reliability is likely to remain high or very high across most of the state, although some reduction in reliability is likely in parts of the central-northern region of NSW (*low to moderate confidence*).

Vegetative growth is unlikely to change under a future climate (*high confidence*).

Flowering and maturity may experience minimal positive change in the north of the state and similar to historcal climate suitability across the rest of NSW (*moderate to high confidence*). Less severe frost may lead to a minimal to moderate increase in climate suitability in the centre of the state (*high confidence*).

Canola quality

Canola quality will likely improve under future climate scenarios, particularly with reduced incidence of shrivelled grains caused by frost (*high confidence*).

Length of growing seasons

The canola growing season will likely be shorter in future, particularly under higher emission scenarios (*high confidence*).

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.

Adapting to the changing climate

A changing climate is likely to result in an increase in climate suitability across canola growing regions in NSW. Less frost damage is likely to result in greater growing reliability in the central and northern regions. As a result, the canola industry is unlikely to need to implement large-scale adaptation activities.

To maximise canola growth in the northwest regions where rainfall is less reliable, NSW industry could consider growing alternative dryland summer crops when rainfall patterns are suitable or growing shorter-season varieties when summer rainfall is low.

Methodology and data

The model describes a medium phenology variety of canola. A dynamic phenology was used to model this crop, with a fixed sowing date of April 1st, after which germination is initiated when 15 mm or more of rain falls in any period of 14 consecutive days. Following germination, the model applies thermal time thresholds to define the start and end dates of each phenological stage of plant development. As a result, these dates varied across the state, with crops maturing faster in warmer areas.

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.