



Raising sheep (Merino) in New South Wales: preparing for a changing climate

Climate change is likely to offer both opportunities and challenges for Merino production in NSW 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.



Sheep in NSW

Sheep are distributed widely throughout NSW, except for the wetter tropical and subtropical coastal areas. Merino sheep are the dominant sheep breed in NSW, with Merino ewes comprising 51% of total NSW ewe listings in 2021-22.

Reproduction, survivability and feed intake were chosen as key drivers of production performance in a sheep enterprise because they are affected by climate conditions such as heat stress and chill conditions.

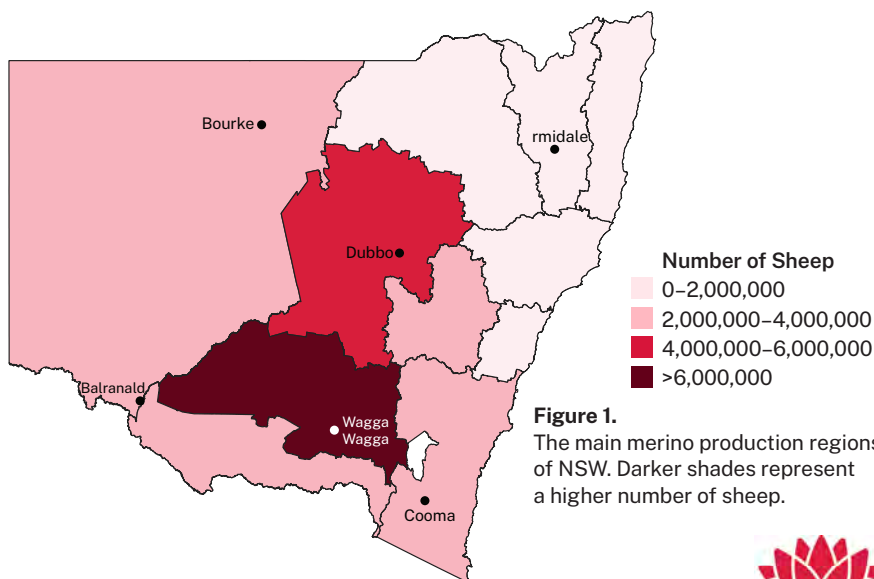


Figure 1. The main merino production regions of NSW. Darker shades represent a higher number of sheep.

Climate and the sheep industry

Sheep regions across NSW are expected to maintain high to very high suitability across the entire state under both emissions scenarios. Climate change impacts to the NSW sheep industry affect the production systems of Merino in different ways.

Climate change risks to the NSW sheep industry include:



Heat stress: increased temperature and humidity is likely to impact reproduction due to increased heat stress during pre-joining and joining. However, in colder locations the risk of losses due to wind chill may diminish.

Climate impacts: what to expect

Spring lambing

Reproduction is likely to experience increased heat during pre-joining and joining (*moderate to high confidence*). This is likely to minimally decrease suitability around Bourke in an intermediate emissions scenario, and across north-west NSW in a high emissions scenario (*moderate to high confidence*).

Survivability is expected to experience similar climate suitability across NSW to what has been historically experienced (*high confidence*). However, in a high emissions scenario suitability during lambing is expected to minimally increase in the Armidale region due to reduced chill (*high confidence*).

Feed intake is expected to remain similar to what has been historically experienced (*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.

Winter lambing

Reproduction is likely to experience increased heat during pre-joining and joining (*moderate to high confidence*). This is likely to minimally decrease suitability at Bourke, Wagga Wagga and west of Armidale and Dubbo (*high confidence*).

Survivability is expected to experience similar climate suitability across NSW to what has been historically experienced (*high confidence*).

Feed intake is expected to remain similar to what has been historically experienced (*high confidence*).

Adapting to Climate Change

Adapting to heat stress

To prepare for future increases in temperature, industry could invest in thermal tolerance research. Management changes, such as moving the joining time to a cooler period, could also help with tolerating warmer temperatures.

Methodology and data

This model for sheep has been run with two lambing dates:

- Spring (September) lambing
- Winter (June) lambing

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. 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.

