Cattle tick: an increasing biosecurity risk under a changing climate

A warmer climate is likely to increase the occurrence and expand the distribution of cattle tick in some areas of NSW. This poses a threat to the State's beef and dairy industries.

Developing industry-informed climate planning information

Climate change is altering the biosecurity risks 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 Climate Vulnerability Assessment, 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.

Cattle tick in NSW

Cattle ticks (*Rhipicephalus australis*) are a major pest of beef and dairy cattle in NSW, posing significant challenges to livestock health and productivity. In NSW, cattle tick infestations are primarily found in the northeast (Figure 1) where warmer temperatures and high humidity create favourable conditions for tick survival and reproduction.

The lifecycle of cattle tick is divided into two distinct stages: the parasitic and non-parasitic stages. During the parasitic stage, the tick resides on the host, feeding and developing. The non-parasitic stage, from the egg stage to when they hatch into larvae, occurs on the pasture.

These parasites are responsible for a range of detrimental effects on cattle including blood loss, decreased weight gain, and a weakened immune system which can make the animals more susceptible to diseases. Additionally, cattle ticks are vectors for several diseases including cattle tick fever which is often fatal and can cause abortions.

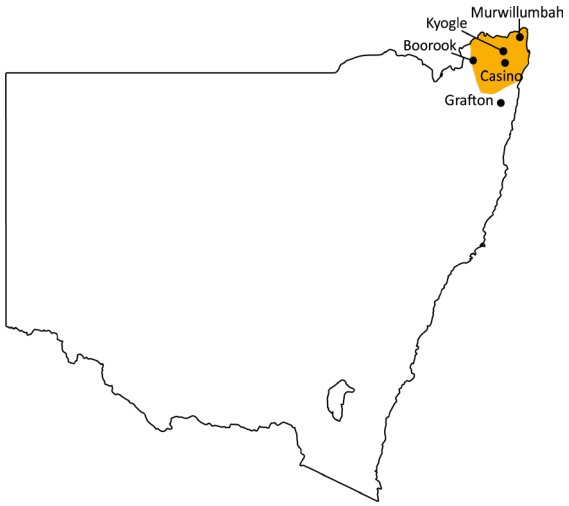

Figure 1: Cattle tick region where cattle tick infestations primarily occur in NSW (yellow) with important sites marked by black dots.

Climate and cattle ticks

Overall, the impacts of cattle tick in NSW are projected to increase in autumn, spring and winter in 2050. Changes in climate suitability are likely to occur across the adult, egg and larvae stages of the life cycle.

Climate risks likely to increase the occurrence and distribution of cattle ticks include:

Increased temperatures are favourable for cattle tick increasing their occurrence and allowing them to spread further.

Climate impacts: what to expect

Adult tick

- **Increased climate suitability** in the cattle tick region from March to November.
- **Decreased climate suitability** in parts of the the cattle tick region in January and February.
- **Maintained historical climate suitability** in the cattle tick region in December.

Larvae

- **Increased climate suitability** in the cattle tick region from April to July and in September and October.
- **Decreased climate suitability** in the cattle tick region from November to February.
- **Maintained historical climate suitability** in the cattle tick region in March and August.

Egg

- **Increased climate suitability** in the cattle tick region in May and June.
- **Decreased climate suitability** in the cattle tick region in January and December.
- **Maintained historical climate suitability** in the cattle tick region from February to April and July to November.

Impact on key NSW primary industries

An increase in climate suitability in areas south of the current cattle tick region could significantly impact these beef and dairy industries, which have not been previously affected. These industries may need to adjust their control measures accordingly. To support these regions, it is important to implement comprehensive cattle tick education programs that communicate effective management strategies.

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. Low confidence in the projected changes due to differences between the models is noted in the text. Care should be taken when interpreting these results.

The Climate Vulnerability Assessment 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 each biosecurity risk was based on published research, expert knowledge and data quality and availability.

FOR MORE INFORMATION
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