

Impacts of climate change on livestock production in south eastern Australia

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Predicted climate change in south eastern Australia

Year-round average temperatures in southern Australia are predicted to rise by 1.0°C, 1.5°C and 2.4°C by 2030, 2050 and 2070 respectively. Higher temperatures will increase evaporation rates.

Average annual rainfall is expected to decline and shift from winter to summer dominance. A reduction in rainfall of up to 50% is predicted in winter and spring as summer rainfall increases by 10-20%.

The intensity, frequency, and duration of extreme weather events are likely to increase in the future.

Australia has a high degree of natural climate variation and this is expected to continue with climate change.

Impact on livestock production

Climate change is likely to impact on livestock production in four main ways:

1. Quantity and quality of pasture
2. The production, availability and price of supplementary feed
3. Animal health, growth and reproduction, and
4. Alter the incidence of pests and disease.

Although warmer temperatures in winter and increased CO² levels may lead to higher pasture growth rates, total annual production is likely to decline due to less water availability. Models have shown that annual pasture production can continue at the current rate if temperatures increase by 1°C and we receive 10% less rainfall. Levels above this will result in decreased production. Increased atmospheric carbon dioxide concentration is likely to increase the growth of pasture but decrease the quality through reduced digestibility and protein content. Warmer temperatures also favor tropical C4 grasses

which are generally lower in quality than temperate C3 grasses.

Increasing temperatures will also have a direct impact on animal health. Heat stress in livestock will reduce feed intake which will slow growth rates. Reproduction rates can be detrimentally impacted on by heat stress and extreme heat stress can be fatal. The incidence of pests and disease is also likely to change with climate. However the extent and impact on livestock production is still unknown.

The higher level of climate variability reduces the certainty of weather forecasts, impeding on the decision making process and increasing the level of risk in farming systems. Work is currently being undertaken on how to improve the accuracy of both short and long-term forecasts.

Industry adaptations

A number of adaptations have been modelled for different livestock enterprises in range of locations in southern Australia to examine the effects of climate change on total profitability.

Improving soil fertility through the application of phosphorus fertiliser was found to be the most effective, returning profitability to the reference period in high rainfall regions. Adding lucerne to the feedbase to take advantage of summer rainfall was also relatively effective. Confinement feeding when pasture mass was

low to prevent soil and pasture degradation was the third most effective strategy; however its effect on profitability was dependent on the cost of supplementary feed. Even so, by 2070 there are locations in which no pasture adaptation strategy could prevent a decline in gross income.

Conclusion

Although pasture production is likely to remain stable in the short to medium-term despite the predicted changes in climate, it would be wise to begin considering suitable adaptation options that will help maintain productivity and profitability well into the future.