

WESTPAC AGRICULTURE CLIMATE CHANGE ASSESSMENT

Drought – sheep and beef

December 2022



This information sheet has been prepared as part of the Westpac Agriculture Climate Change Assessment series, summarising the impact of drought on the sheep and beef industry in New Zealand, as assessed by Lincoln University and NIWA.

Westpac has engaged Lincoln University and NIWA to provide an independent assessment of the potential cumulative impacts of climate change on New Zealand agriculture. The assessment provides a better understanding of the physical risks, transition risks, and opportunities for New Zealand agribusiness.

Summary:

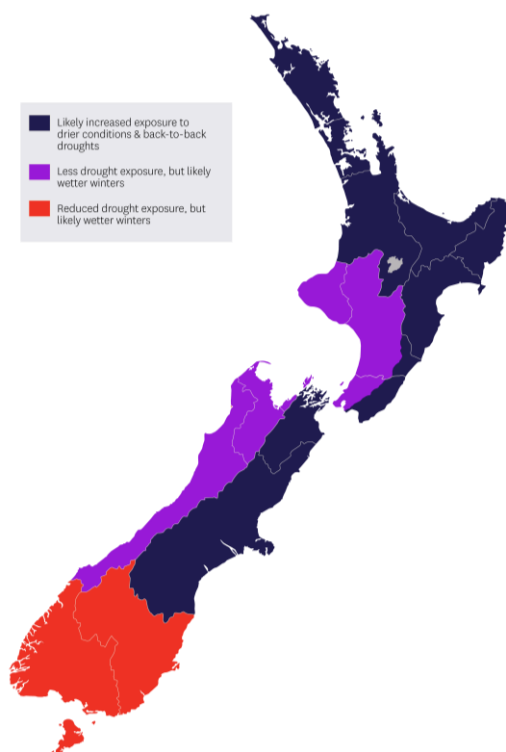
- Climate change will increase the severity and frequency of drought, including multi-year events.
- Adaptation and planning for these events now will assist mitigating some of the risks.
- Investing in adaptation sooner rather than later is key as building resilience takes time. An example of this is the time required to establish more drought tolerant pastures.

Sheep and beef systems that are lower input will generally be more affected by drought.

Reduced pasture growth, an increase in plant diseases and animal health issues are the main effects of drought.

Regions most likely to experience worsening droughts

Figure 1: Visual representation of expected change in drought patterns across the country



Drought defined as a severe decrease in water availability, and for agriculture it can be measured by the level of soil moisture deficit. Droughts are categorised by their frequency, severity, duration, and extent.

Farmers have always had to contend with drought, however climate change is increasing the frequency and severity of these weather events.

The general finding is that droughts will progressively intensify in the future, resulting in an increased risk of multi-year or 'back-to-back' droughts. These changes in drought patterns are already occurring around the globe and are something New Zealand farmers should expect in the future.

Heatwaves are likely to become more common, and rainfall patterns are expected to change with the north and the east of the North Island becoming drier.



Case studies

The Westpac Agriculture Climate Change Assessment looked at two case studies for drought systems, modelled on an El Niño drought over two years, resulting in a reduction of pasture growth from December to April.

North Island extensive hill country

Drought has always posed a significant challenge to North Island hill country breeding systems. The likelihood of consecutive year-on-year droughts will have devastating effects on farmers, posing many challenges to come. In the modelled scenario, profits reduced by just over ten percent in the first year, then by 46 percent in the second year.

Reduced pasture production coupled with heat stress means lambs and cattle may be sold earlier at lighter carcass weights. Lambing and calving percentages would likely drop in the second year of drought. Access to stock water may become increasingly challenging in severe or multi-year drought events.

The frequency of droughts such as these make it hard for a farm to recover. Not only would a farm likely take five years to recover in the drought event modelled, but another drought would be due when the farm is just getting back on its feet.

Drought Financial Impact: North Island extensive sheep and beef

	SU/ha	Lambing %	Calving %	Operating Profit (% /ha)	% Difference
Base	9.6	130	82	\$196	
Year 1 Drought	9.6	130	82	\$176	-10.2%
Year 2 Drought	8.7	123	80	\$106	-45.9%
Year 3	9.2	126	82	\$164	-16.3%

South Island intensive finishing

This case study has similar impacts to the North Island drought scenario, but the financial impact was intensified due to the higher operating costs incurred with intensive farming systems.

Another factor in this case study and the North Island extensive case study was the way the livestock market generally works against farmers who are de-stocking or re-stocking due to regional weather impacts. When many farms within the region are de-stocking, prices are depressed. The market moves to re-stock at the same time as well, so stock prices are generally overvalued.

Drought Financial Impact: South Island intensive sheep and beef finishing

	SU/ha	Lambing %	Sheep v Cattle %	Operating Profit (% /ha)	% Difference
Base	13.5	137	91%	\$1,140	
Year 1 Drought	12.7	137	90%	\$782	-31.4%
Year 2 Drought	11.7	128	89%	\$400	-64.9%
Year 3	13.5	134	91%	\$912	-20.0%

GHG considerations on de-stocking

The New Zealand Government is working with the agricultural industry to establish an emissions scheme for the sector. This project assumes greenhouse gases will reduce by up to -12.5% if lower stock numbers are carried. The likely savings calculated from the reduced emissions costs will not have any significant impact on the dramatically reduced operating profits.

Adaptation options to combat the financial impact of drought

It can take up to five years for a business to recover from two successive years of droughts. These figures won't be a surprise to most farmers; but with the likelihood of increasing drought events the focus moves to how to build more resilience into farming operations.

Reducing stocking rates on farm is a commonly used mitigation option for a drought event, despite reduced production and profitability. De-stocking does increase feed supply for the remaining animals on farm; it reduces operating costs and provides a cash injection from the sale of those stock, so remains a viable option for multi-year drought.

Consider adaptation options you could implement now so they have time to become established to create a more resilient business.

Other adaptation options to consider

- **Drought tolerant pasture species:** incorporating some alternative species known to be tolerant to drought for example lucerne, chicory, or cocksfoot into your pasture rotation.
- **Using grass and brassica species:** these have been developed specifically for their water use efficiency.
- **Expand stock water resilience:** expanding stock water storage dams to cater for multi-year drought events.
- **Install reticulated water systems:** allowing more efficient use of stock water.
- **Livestock heat stress:** planting more on farm shelter trees for shade and shelter to reduce heat stress.
- **Planting trees:** Trees also provide an alternative feed source if needed e.g., willows.
- Additional benefits could be gained with ETS sequestration credits.
- **Consider fire risk:** considering fire risk in your farming infrastructure and planting plans, as fire danger will be an increasing hazard with climate change.
- **Investment:** consider investing in a block with irrigation to provide additional drought resilience.
- **Build a resilient balance sheet:** Often your financier may be providing working capital through drought events, so repaying debt in the good times to build your balance sheet for the tough times is a good strategy.

- **Utilise available technology:** there is a raft of technology available for feed budgeting, water storage monitoring, cashflow calculating etc. Use this tech to your advantage in drought events.
- **Consider your land use options:** with a changing climate, are there other land use options available that could help build resilience to drought?
- **Expand your knowledge:** Build your management skills by joining farmer networks or using farm consultants.

Summary

This research project has worked through the expected farm level effects of multi-year droughts and the associated financial impacts.

Westpac's experience supporting farmers through drought is consistent with the financial impacts outlined in this research. Westpac wants to use this research to assist the agricultural sector build resilience, adapt and successfully transition into a future affected by climate change.

About the Westpac Agriculture Climate Change Assessment series

Westpac has put together information sheets summarising the research conducted by Lincoln University and NIWA.

1. Background of the project and summary of the work.
2. Sheep and beef sector impacts and opportunities.
3. Drought impact on dairy and resilience options.
4. Transition risk for the dairy industry.
5. Kiwifruit impacts and opportunities.
6. Agri sector adaptation and transition options to climate change.

The information sheets plus the full assessment can be found at westpac.co.nz or through your Westpac Agribusiness Manager.

For further information



Contact Jo Faber



Call me on 027 612 0495



Email me at jo.faber@westpac.co.nz

