

ADAPTING TO A CHANGING CLIMATE: CASE STUDY 2

DROUGHT
Learning from the past

THE STUDY

- Completed by Dr Rob Burton and Dr Sue Peoples of AgResearch in June 2008, funded by the Ministry of Agriculture and Forestry.
- The complete study is published:

  Learning from past adaptations to extreme climatic events: A case study of drought
  - **Part A: Summary report**
  - **Part B: Literature review**
  - **Part C: Full report.**
- Sampled 20 farmers and one drought advisor from the Rural Trust, in North Otago/South Canterbury.
- The pastoral farms ranged in size from 160 to 15 000 hectares.
- The minimum age of the farmers involved was 45 years (this farmer would have been 25 at the time of the 1988 drought).
- In total, the farmers have more than 500 years experience in dealing with farming in dry conditions, with averages of 29 years of general farming experience, and 22 years farming on their current farms.
- Farm produce included dairy, sheep, beef, deer and cropping production (depending on the farm) and farms were spread across the geographical area.
- All three publications can be found on the MAF website: **www.maf.govt.nz**

Adaptation to climate change is likely to benefit from experience gained in reaction to extreme climate events, specifically by implementing proactive climate change risk management adaptation plans. – International Panel on Climate Change, 2007

HISTORICAL ADAPTATION TO DROUGHT

This study addresses the observation above, by exploring farmers' experiences of extreme climate events in North Otago/South Canterbury.

In particular, it focuses on historical adaptation to two of the most serious droughts in the region in the periods 1988-89 and 1997-99.

The focus of this study is the exploration of farmers' personal, often experience based, and context dependent knowledge of drought adaptation.

The study addresses two main questions concerning farmers' experiences of drought and adaptation to drought, namely:

1. How have farmers in the study area historically adapted their farms to cope with the extreme drought events of the 1980s and 1990s and how did the context of the drought influence their response?

2. What adaptive strategies do farmers need to follow to best cope with any increase in drought events in the future?

Climate models have projected that under global warming, drought conditions will extend northwards to cover the entire east coast of New Zealand and droughts that were 1 in 20-year events could soon become 1 in 5-year events.

Drought resistant strategies

What is presented is not a "best strategy" for drought response, but an analysis of strategies that dryland farmers in North Otago/South Canterbury have developed over many years in response to drought events.

Selecting the best strategies for any individual farm requires the farmer to consider the context of their own farm (climate, soils, labour supply, and so on), the market they are targeting and the wider economic context of the drought.

From the analysis of the farmer interviews, the study concluded there are three key areas the farmer has to adapt to, to develop drought resistance.

1. STRATEGIES TO MAKE THE FARM DROUGHT RESISTANT

Farmers need to develop the farm so that it is able to resist drought (should it occur) as well as build up and maintain resources that may be needed to fight drought in future years.

Farms can be made more drought resistant by taking measures to ensure water supplies or purchasing holdings are in different climatic zones.

2. STRATEGIES TO MAKE THE FARM SYSTEM DROUGHT RESISTANT

Farmers need to develop a farming system that provides them with some flexibility to deal with drought when it occurs (that is, on recognition of a drought to act immediately and effectively).

Actions such as creating pivot points in the farm system (where a quick decision can be made to take a different course of action if drought seems likely), and keeping options flexible for part of the farming system (for example, maintaining only 75 percent capital stock) can also produce considerable dividends when coping with drought.

3. STRATEGIES TO DEAL WITH THE DROUGHT ONCE IT IS HAS BEEN PERCEIVED

Once the drought is perceived the farmer must have strategies capable of dealing directly with the drought situation and minimising the impact of the drought on livestock, capital and family.

If a drought strikes, having a suite of appropriate risk-management measures is necessary to ensure the direct stressors of drought are coped with.

DROUGHT ADAPTATION STRATEGIES

1. MAKE THE FARM DROUGHT RESISTANT	Structure the farm for drought	Distribute land over different areas or climate zones Select vegetation and livestock to suit drought and farm Plant shelter belts Invest in irrigation and/or water storage
	Build up reserves	Ensure there is sufficient stored feed Use capital wisely during good years
2. MAKE THE FARMING SYSTEM DROUGHT RESISTANT	Implement flexible farming systems	Diversify production types on farm Develop a system with a pivot point for drought Keep spare capacity to allow flexibility
3. HAVE STRATEGIES TO SURVIVE DROUGHT	Respond quickly to drought	Make decisions fast and take action early Wean lambs early Adjust stock grazing depending on drought conditions Cull surplus stock immediately
	Raise capital to survive drought	Use land to raise capital for farm Sell stored feed to take advantage of high prices Off-farm employment for farmer or spouse
	Reduce costs	Reduce household and farm expenditure Increase family workload (and decrease labour)
	Find extra feed for stock	Buy in feed Agist of stock Put stock on the roadside (if possible)
	Maintain networks	Talk to other farmers and listen to what they are doing Keep in close contact with industry
	Deal with stress	Get away from the farm Play sport Keep making decisions (be positive) Talk to people

THIS IS ONE IN A SERIES OF CASE STUDIES CALLED ADAPTING TO A CHANGING CLIMATE

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