



ADAPTING TO A CHANGING CLIMATE: CASE STUDY 25

CLIMATIC VARIABILITY

Coping in an organic merino production system

BUSINESS/FARM DETAILS

- Owner and manager, Murray Elliot.
- The Waikora property is located in the Hakataramea Valley, in the Waimate District of the South Island.
- It consists of 2335 hectares of moderate rolling-to-steep hill country ranging in altitude from 300–900 metres.
- Annual rainfall varies between 360–700 mm, averaging around 500 mm per annum.
- It runs 2500 merino ewes, winters 1100 wethers and finishes 2000 hoggets.
- All lambs are retained and finished as hoggets prime to the works in November and December.
- Waikora also runs 105 Simmental cross-breeding cows and 32 dry heifers. Calves are sold as weaners.
- The Waikora Station clip is at the fine end of the range with most ewe wool falling between 16.1–17.4 microns, hogget wool between 15.1–16.2 microns and wether wool between 16.3–18 microns in the 2007/08 season.
- The property produced 94, 85, and 100 bales in 2007, 2006, and 2005 respectively, all sold through auction or direct contracts facilitated by the NZ Merino Company.

Organic conversion has led to a significant number of changes to the existing farming system, including stocking policies, feed and soil management. Complicating these has been the highly variable climate experienced at Waikora.

ORGANIC FARMING IN A CHANGING CLIMATE

After 22 years of farming Waikora under a conventional production system, Murray Elliot's conversion to organics was motivated by:

- **FINANCIAL SUSTAINABILITY:** decreasing margins for sheep and beef products prompting a review of the current system. Price premiums for organic produce (particularly meat) were a major driver.
- **THE FARMING ENVIRONMENT:** Murray's interest in soil health and philosophies around this align closely with those of organic production.
- **PERSONAL CHALLENGE:** the stimulation of adapting to a new farming system.
- **HEALTH.**

During the conversion process Murray received advice and encouragement from a variety of sources including other organic farmers,ASUREQuality NZ, The NZ Merino Company and the SmartStart programme run by Organics Aotearoa.

Murray achieved full organic certification for his property in July 2009 – becoming only the third large-scale Merino property in New Zealand to achieve such an accreditation.



Owner and manager, Murray Elliot.

THE WAIKORA CLIMATE AND IMPACTS ON ANIMAL PRODUCTIVITY AND DISEASE MANAGEMENT

The particularly dry climate experienced at Waikora, and an inability to irrigate any sizeable portion of the farm, makes water the single most influential and limiting factor for farm productivity.

Murray says: "Rainfall is more important than temperature and we always stock to a drought scenario because our ability to buffer the effects of low rainfall has historically been quite limited. Waikora also experiences significant rainfall variability.

"One of the very early decisions we made was to move away from the half-bred sheep originally on the station and into finer Merino types, which are more resilient to dry conditions and afford a greater focus on the wool – which is a side I enjoy."

Climatic variability impacts most significantly on liveweight gain for cattle and sheep. A dry year necessitates the purchase of supplementary feedstock in the form of either lucerne hay (in 2008) or a clover/ryegrass mix (in 2009). This is a significant cost and addressing this is the primary focus of Murray's plan to improve the resilience of his farming system.

However, Murray also notes positive benefits of the dry climate with respect to disease management. For example, foot rot is all but unknown on Waikora along with lice which can be readily controlled using organic certified treatments such as Extinosad.

"Even things like a wet winter can have some benefits, for example, in terms of wool quality and quantity," he says. "Think of a scenario where you have hoggets grazing winter green feed under dry conditions - this can lead to much higher levels of dust contamination in the wool."

Flystrike is the most important animal health issue encountered at Waikora, although Murray says its incidence is not widespread and is being managed with a higher level of monitoring, timely application of organic certified ectoparasiticides (for example, at tailing), stock management and selection of sheep for low levels of breech wrinkle.

"Farm to your environment, not your diary. You have to be flexible, and constantly monitor your own performance." Murray Elliot

In the future, it is intended that blood tests taken by a vet will establish the mineral requirements of the stock on the property and that feed blocks customised to the nutrient requirements of the stock will be prepared. This is an important component of the animal health plan for the organic system and it is hoped that provision of minerals appropriate to the stock requirements will minimise disease on the property. Vaccination of stock has not been a feature of the animal health programme in the past, and this is expected to continue.

Rabbits are not a major issue and are controlled through night shooting and RCD (rabbit calicivirus disease). Murray also suggests that his policy of understocking and the resultant higher vegetation growth rates creates in an environment less favorable for rabbit proliferation.

A ferret control programme of trapping took place in 2008, complying with organic standards which prohibit poisoning.

STOCKING POLICIES

A focus on merino production has introduced greater resilience into the Waikora system with the negative impact of a dry year being a reduction of around 10 percent on total wool income compared to a 20–25 percent impact on calf or sheep sales.

Murray also maintains a somewhat greater proportion of wethers than might be normal because of the extra flexibility they offer in times of climatic hardship.

"They are tougher animals and better able to withstand environmental changes and reductions in feed availability and they can also be



relatively easily on-sold should conditions dictate a rationalisation of stock numbers.

“I finish all my own hoggets and these are the main users of supplementary feed bought in from outside Waikora. Ideally I'd like to keep the calves, currently all sold as weaners, as keeping these animals maximizes the possible income from them, probably even more so for an organic production system than on a normal farm. It also gives me more flexibility to match my time of weaning to climatic conditions rather than in time for a particular sale,” says Murray.

PASTURE/CROP MANAGEMENT AND SUPPLEMENTARY FEED

Prior to organic conversion, pasture management on inaccessible areas of the property involved burning to clear excess vegetation and *Matagouri*. Organic conversion means that permission must be sought from AsureQuality NZ for such activities, with provision of specific justification as to why burning needs to take place.

Nasella tussock is the weed of greatest economic importance to this production system, although the level of infestation is low. Currently it is controlled by the Canterbury Regional Council who grub *Nasella* on the property. This strategy aligns with the principles of weed control under organic systems, so will continue to be the main method of control in the future.

In an effort to increase productivity and resilience to drought, Murray also began cultivating 125 hectares of his farm in 2001, planting rye corn (24 hectares), ryegrass, plantain, cocksfoot, fescue and white/red clover. Because of contour, it is only possible to make baleage from one-third of this area.

Whilst this has improved the availability of winter feed at Waikora, it has only met a portion of Murray's requirement, the remainder of which needs to be purchased externally. All supplementary feed must be organic which raises costs. For this reason Murray will

Key points

- 1. Reliance on a small and highly variable annual rainfall means developing farming systems that ensure maximum return while managing the risk of both long and short-term climate change.**
- 2. Key strategies to address the constraints imposed by climatic variability have included:**
 - Conversion from half-bred to merino sheep;
 - Limiting stocking rates;
 - Careful management of number and ratio of the various stock classes present.
- 3. Conversion to an organic system was initiated to address diminishing farm returns and to capitalize on opportunities provided by this growing market sector.**
- 4. A reliance on externally sourced supplementary feed was a key driver for the development of areas of the property suitable for green-feed and hay production.**
- 5. Waikora becomes only the third large-scale merino property to achieve organic certification in New Zealand.**

FOR MORE INFORMATION

- For more information on the companies mentioned in this case study visit their websites:
 - AsureQuality NZ www.asurequality.com
 - The NZ Merino Company www.nzmerino.co.nz
 - Organics Aotearoa www.oanz.org.nz



“Be aware of your own climate, but also that of your customers – the environmental pressures they experience are often equally important in dictating demand/price for your produce.” Murray Elliot

plant 14 hectares of his cultivated area in lucerne, all of which will go into hay, with the goal of becoming completely self-sufficient in terms of feed within 24 months. Lucerne was chosen due to its strong drought tolerance and suitability for the soil types present at Waikora.

SOIL FERTILITY MANAGEMENT

Under the previous conventional system, soil fertility was managed through annual application of superphosphate at 50 kg/hectare (or higher) over the entire property and on occasion with 5 kg/hectare raw sugar to stimulate microbial activity. Difficulties and the expense involved in sourcing organic sugar, plus the inability to use superphosphate within an organic system, means Murray has had to investigate completely new fertiliser combinations.

Superphosphate has been replaced with fine-ground reactive phosphate rock (RPR), which has increased the expenditure on soil fertility maintenance slightly. Along with the RPR, Murray has aerially applied a mixture of fish industry byproduct and humate (as a suspension) onto about 25 percent of his hill country and paddocks. He aims to have the whole property covered within the next three years.

Humate is a form of coal dust sourced from Australia. Murray has noted preferential grazing of these fertilised areas and, when applied at a rate of 1 kg/hectare mixed with seed, a marked improvement in seed strike rates. The cultivated areas on his property have also received lime (0.5 t/hectare) and humate (25 kg/hectare).



Regular soil testing takes place. “It can be expensive,” says Murray, “but many things like weed control can only be achieved in an organic system by getting your soils right. Levels of essential elements, bacteria, yeasts and Brix content are very important indicators of soil health.”

A VISION FOR THE FUTURE

Increased returns from the niche organic market is an exciting prospect for Waikora, however, sourcing supplementary feed and controlling both internal and external parasites are likely to remain significant challenges. Under an organic system the purchase of external inputs is discouraged and purchase of feed from a conventional system may threaten the organic status of the property or animals so considerable effort is focused on making the property self-sufficient in terms of feed.

The stock policy at Waikora is likely to remain relatively unchanged with conversion to organic production. Sheep numbers are not expected to decline, although the size of the wether flock may be reduced in favour of running more ewes. This will maximise financial gain from premiums for organic lamb.

As always, the climate of Waikora will remain the dominant factor influencing farm management and Murray's current focus is on building resilience to climatic variability.

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

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