

# Building up clover on hill country farms – for free

## Strategic grazing for legume persistence

**Why:** To assess whether deferring grazing over summer on hill country farms could encourage clover persistence in pasture while protecting vulnerable soils.

**Where:** A beef and sheep farm in Lower Kaimai, Bay of Plenty, with a financial and systems analysis on a sheep and beef farm in the Waikato.

**Who:** Blake Gunn (Agricom); Allen Coster and Paul Anselmi (Mataiwetu Station); Angee Nagra (Agricom); Brett Te Whare (Aramiro Station); Grant Rennie, Graeme Doole, Katherine Tozer, Tracy Dale and Maryann Staincliffe (AgResearch); Ian Tarbotton (Ballance); Jen Corkran (Barenbrug NZ); and Steve Howarth (AgFirst).

### What:

- December-deferred grazing reduced ryegrass pressure and saw clover already present able to thrive in pasture and persist once grazing was resumed.
- Undersowing saw an increase in red clover and lotus.
- Farmax modelling showed little change compared with the current management practices (without deferred grazing), as the farm was already high-performing, matching feed demand with pasture supply.
- There was no increased weight advantage for cattle on October-deferred grazing.
- Estimated there was little difference in greenhouse gases produced.

**More:** [ourlandandwater.nz/outputs/strategic-grazing-report](http://ourlandandwater.nz/outputs/strategic-grazing-report)

Tweaking deferred grazing times on hill country farms could encourage clover persistence in pasture while protecting vulnerable soils.

Farming the hill country has some unique challenges, particularly when it comes to establishing and maintaining pasture in areas too steep for machinery. Deferred grazing is a popular technique for some farmers.

Allen Coster has been using deferred grazing on his beef and sheep farm in Lower Kaimai, Bay of Plenty for 15 years. Not only does it provide late summer feed, but he also uses it to help establish his new ryegrass paddocks, sowing grass in the autumn and deferring these eight months later. It also helps him manage weeds, and reduces the facial eczema spore count.

Not far away in the Waikato, Bill and Sue Garland have also started using deferred grazing on their 362 ha sheep and beef property, Rahiri Farm, near Maungatautari Mountain. They have been happy with the results, including reducing the prevalence of some weeds without spraying.

Further west, Jon and Fiona Sherlock run breeding ewes and winter trade beef heifers on 660 ha of mostly steep hill country at Waingarua. Relatively new to deferred grazing, they have found it very useful for maintaining pasture quality in spring, supplying feed in the summer dry and rejuvenating pasture.

## What is deferred grazing?

Shutting up paddocks during the spring flush until the end of summer is a good way to let pasture grasses re-seed naturally, including in areas that are



Jon Sherlock, farmer interviewee

too steep for machinery. It is also a cheap, no-fuss option to provide feed in late summer when other pasture may be struggling.

Deferred grazing is a tool already used by some hill country farmers to better manage their feed. This practice sees them shutting up around 10% of their farm in late October until mid-February when paddocks are grazed again.

But timing is key to its success, and some farmers who have done it unintentionally have been less than happy with the results. This has left them with a negative opinion of deferred grazing overall.

Increasing clover content in pasture without over-sowing would be useful for all these farmers, which led Coster and the Garlands to offer up their farms for a project led by Blake Gunn, forage systems specialist with Agricom. The project received funding from the Our Land and Water Rural Professionals Fund. Gunn was looking at tweaking the lock-up time of the paddocks in an effort to encourage clover to persist more in pasture.

Deferred grazing is an old-school system that some farmers have used for decades, says Gunn. Because of this he reckons it flies under the radar a bit.

While some farmers use deferred grazing simply to help manage the rest of the farm during peak spring growth, it's getting more attention now as a low input system with other benefits, he says. This includes bigger root systems, better topsoil moisture

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## Using deferred grazing to add more clover to pasture would see better quality pasture for livestock, while costing farmers nothing.

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and better ground cover – holding onto vulnerable erosion-prone soil.

Plenty of nitrogen-fixing clover in pasture is good for animal health and aids fertility in poorer soils. Hill country farmers often struggle to maintain high levels of clover as it can be swamped by grasses. One way to reintroduce clover is by regular oversowing.

Gunn, along with senior scientist Katherine Tozer at AgResearch, wanted to know if allowing grazing later into early summer, before locking up the paddock, would knock the ryegrass enough to allow clover species to thrive and persist into the following season and beyond. Using deferred grazing to add more clover to pasture would see better quality pasture for livestock, while costing farmers nothing.

Two similar paddocks on Allen Coster's beef and sheep farm were used to trial deferred grazing

timing. One was shut up between mid-October 2022 and mid-February 2023, and the other between mid-December and mid-February. Red clover (two varieties) was undersowed at 8 kg/ha along with 6 kg/ha of lotus, which contains condensed tannins. These tannins can reduce methane production when eaten by ruminant livestock, although it does not persist well in most grazing systems.

### Hiccup proves an eye-opener

The pastures were grazed in late summer. By early winter, there was a higher clover and lower ryegrass content in the December-deferred paddock than the October-deferred paddock, although there was also more unwanted Yorkshire fog, annual poa and broadleaf weed.



**Figure 1: October-deferred paddock: a) on 28 February 2023 just after grazing the deferred pasture; and b) on 4 May 2023 showing prolific perennial ryegrass seedling emergence from the seedbank within the strips to which glyphosate had been applied to reduce pasture competition prior to undersowing legumes. December-deferred paddock: c) on 28 February 2023 soon after grazing the deferred pasture; and d) on 4 May showing prolific clover regrowth. Clover was not killed by the glyphosate application but regrew from existing stolons. Emergence of white clover seedlings from the seedbank was minimal. All photos are of pasture in the undersowing treatments**

There was a hiccup during the preparation for the undersowing part of the trial when the weak solution of glyphosate spray, intended to knock back ryegrass growth, killed it instead. The upside to this was it clearly showed the team how much locking up the paddock had replenished the seedbank. It was equivalent to broadcasting a few hundred kilograms of seed to get the amount of ryegrass that established. Another surprise was the lotus seed mix turned out to be half white clover. Commercial lotus seed can only be bought from smaller growers and had cost \$60/kg.

“The amount of white clover seed in the lotus was an eye-opener, given the cost of it,” says Tozer “It’s very difficult to keep it out and is the reason why main seed companies don’t sell it – they can’t guarantee the purity of it.” By winter, small red clover and lotus plants were visible in the drill rows, which amounted to about 5% of the total amount of seed sown.

The October-deferred and December-deferred scenarios (**Figure 1**) were then compared in Farmax for Bill and Sue Garland’s Rahiri Farm. This farm runs a high-performance ewe flock of 1,700 ewes, 120 finishing steers and 240 finishing bulls over winter. Production, profitability, as well as environmental impacts and gains, were all looked at.

### Results from deferring grazing

Both pasture growth and feed eaten was slightly higher under both deferred scenarios.

In the October-deferred scenario there were minor gains from a small increase in the number of bulls. This was accompanied by a minor reduction in bull carcass weights, due to lower weight gains while grazing the deferred area.

In the December-deferred scenario, the bottom 25% of mature aged ewes and ewe lambs grazed the deferred area, which resulted in improved tugging weights.

In the model, the improved feed quality on the deferred area enabled growth rates of 160 g/day for ewe lambs and 100 g/day for ewes. This resulted in an increase of 3 kg in tugging weights of the ewes and lambs grazing the deferred area, or an overall lift of 6% in lambs weaned. Because the hoggets at lambing are heavier, the weaning weight of hogget lambs increases by 0.7 kg.

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**At a whole-farm scale, the October-deferred and December-deferred scenarios led to an improved gross margin of \$2,445 (\$7/ha) and \$5,032 (\$14/ha), respectively.**

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ha), respectively. Overall, there was little difference in greenhouse gas emissions between the two scenarios, with only slightly greater emissions for the October-deferred scenario.

Adding a dry summer to the mix had little effect on the scenario outcomes, with similar financial performance.

Under perfect grazing management a similar amount of spring feed is carried into summer, whether this is spread across the whole farm or contained in a deferred grazing area. In practice, however, having an area shut as deferred grazing would provide more certainty that this feed will be available in February.

Overall, the modelling showed little change compared with the current management practices without deferred grazing because the farm was already operating well, with a high level of performance and good matching of feed demand and pasture supply. Therefore, further gains to pasture production and financial benefits were small.

If the farm was performing poorly, changes may well have been more pronounced.

“This was a pilot study, with preliminary evidence that you might be able to shift the composition in favour of legumes,” says Tozer. “It’s worth looking into it further. Deferred grazing shows great potential as a tool to increase the legume content of hill country pastures. We need to now do some really robust [research] work.”

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*Delwyn Dickey for the Our Land and Water National Science Challenge*