Wintering with less mud

Ute guide

Getting started and making it work

Answering farmers questions

Findings from the "Improving wintering outcomes for winter forage systems "

MPI Sustainable Land Management and Climate Change project

agresearch

Ministry for Primary Industries
Manatū Ahu Matua

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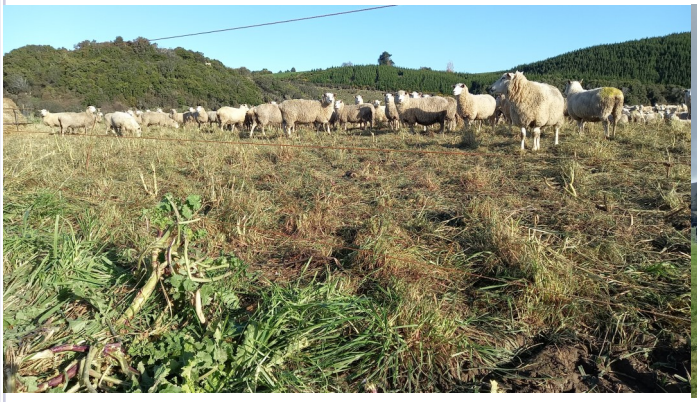

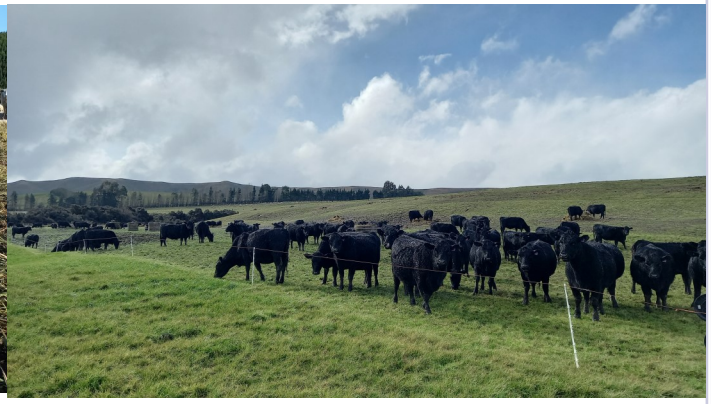

Acknowledgements

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Providing winter feed

The challenge in a temperate pastoral environment like NZ where animals are grazed outdoors all year is matching feed supply and demand to the regional pasture curve. The use of high yielding forage crops in winter to fill the feed gaps can have less than desirable environmental impacts including soil loss, nitrate and phosphate deposition and potentially degraded water ways.

The value of winter feeding

Providing winter feed is a key strategic and tactical farm management practice. Feeding stock well in winter is a critical component in the production system whether it is sheep, cattle, deer or dairy. It is required to:

maintain capital stock

meet requirements of pregnant stock

meet market specifications for livestock.

Traditional winter feed options include grazing forage crops in situ - such as swedes, kale, and turnips as well as the more recent uptake of fodder beet. The bulk of feed, which is grown during spring, summer and autumn, can be stockpiled into the winter. Thus, winter stocking rates can be optimised to ensure that the abundance of spring feed can be utilised to generate productivity profitably. Pasture replacement after crops provides the opportunity to refresh pasture with new pasture genetics, and to replace runout pastures.

The key advantages of traditional winter crop systems are:

- a high yield in a defined area
- continued growth into winter (to a lower temperature compared to pasture spp.)
- high feed energy and good utilisation
- a simple management system.

The change to new winter grazing systems requires some planning but for this you get peace of mind in winter. This booklet is designed to help you by providing some key practical messages.

Key concerns with winter grazing of forage crops

The key problems of traditional winter crop systems are:

- mud reduces intake
- lying on mud takes extra energy
- being in mud can increase disease
- soil damage can lead to sediment loss
- nitrate leaching in spring
- poor utilisation of feed leading to poor stock performance
- exposure during severe weather events.

Opportunities to reduce the impact of winter crops

Choosing your options

All-grass wintering

- Relies on autumn-saved pasture and good feed budgeting
- Lower yields over large areas of the farm

Multi-species crops

- Can be as simple as Italian ryegrass with your swedes
- Can be complex with many components
- May require grazing at several times to utilise different species
- Moderate yields on specified areas

Multi-graze crops

- Can be as simple as rape or Raphnobrassica
- Can be complex with many components
- Will require grazing at several times to maximise potential
- Moderate yields utilised several times

Bale grazing

- Good for older cattle
- Best on an old pasture with good ground cover
- Aim for moderate yields of both pasture and bales on a specified area
- See bale grazing guides for further information

Impacts across the year

There are several changes that need to be made when shifting from traditional winter crops

* More forward planning
* Increased management requirements
* Consideration of extra grazing requirements
* Potentially lower winter yields

What benefits can we get?

* Increased winter feed quality
* Lower labour inputs
* Improved animal welfare
* Potentially lower environmental impacts
* Multiple grazings

Farmers Frequently Asked Questions

The key focus of farmers questions is how to change wintering practices and how they fit into their farming system.

Q ***What about yield?***

A Yields may range in the 3.5 (all-grass) to 15 t/ha (multi-species/bale grazing) in total.

Yield may be harvested at different times from traditional winter crops, so planning must ensure that other feed is available.

Lower yield than conventional winter crops may mean more area is required.

Farmer case study *- an example of the change in feed supply when using a multi-graze rahpno, annual and perennial legumes, Italian ryegrass*

First graze - finishing lambs late January at 50/ha for 10 days, liveweight 30 kg, growth rate 300 g/d, intake 2 kg DM/head/d = 1 tDM/ha eaten.

Second graze - during April with ewes at 50/ha for 42 days, liveweight 68 kg, growing at 100 g/d intake 1.7 kg DM/head/d = 3.57 t DM/ha.

Note: At the same time pasture area is released to either accumulate feed for winter or improve the feeding of other animals. This is equivalent to an area of 4.25 ha of pasture for every 1 ha of crop grazed.

Final grazing was programmed for late winter anticipated at 500 ewes/ha for 3 days at an intake of 2.2 kg DM/head/d = 3.3 t DM/ha. Total feed used 7.87 t DM/ha. Estimated yield of winter crop to replace this is 7.87/0.85 (expected utilisation) = 9.25 t DM/ha.

Q ***Establishing a good crop?***

A Good cropping practices, including weed and pest control and fertiliser, are required to establish a good multi species mix.

Paddock preparation will depend on any issues such as drainage, soil fertility and weed populations of each paddock. For example, pre-cropping the year before may be required to control Californian thistles.

Check any chemicals used for effects on the multi-species components.

Drilling options range from direct drilling all seeds together to drilling the larger seed and then mixing the small seed component into the fertiliser mix and applying via the bulky.

Q ***What should I sow?***

A Components of a multi-species mix all need to have a function.

* A high yielding brassica for bulk energy.
* A regrowing brassica if multiple grazing.
* One or two pasture grasses with winter activity and feed quality.
* One or two cereals for bulk, fibre and bedding.
* Some legumes for feed quality and nitrogen fixation, potentially annual and perennial.
* Other species may be included for environmental reasons.

Always check for a purity and germination certificate to ensure correct sowing rate and clean crop establishment.

Sowing rates should be balanced so rapidly growing plants do not crowd out slower growing ones.

Q ***What does it cost to sow?***

A Establishment costs are relatively similar to conventional cropping.

Seed costs may be higher with more seed used, but the number of seeds reduces weed loads.

Q ***When do I make my decisions?***

A Start in spring.

Planning is essential.

Aim for planting multi-species mixtures when soil temperatures are over 15°C to maximise germination and emergence.

Check crop development regularly and prepare to use the feed in summer and autumn if it is starting to die off.

Monitor during the following spring and resow (into crop or new pasture) if groundcover is not complete.

Hay for bale grazing can be made in late spring/summer. Consider using the paddock it is made in as the winter feeding site.

Q ***What should my grazing management look like?***

A **These guidelines apply to all wintering options.**

Block grazing not strip grazing.

2-4 day grazing periods.

> Winter grazing practices have demonstrated less stock movement and less damage to forage when block grazing over 2-4 day periods is used.

Always back-fence to maximise regrowth potential and limit soil damage.

Move stock forward if weather conditions cause mud formation.

Come back later to clean up if need be.

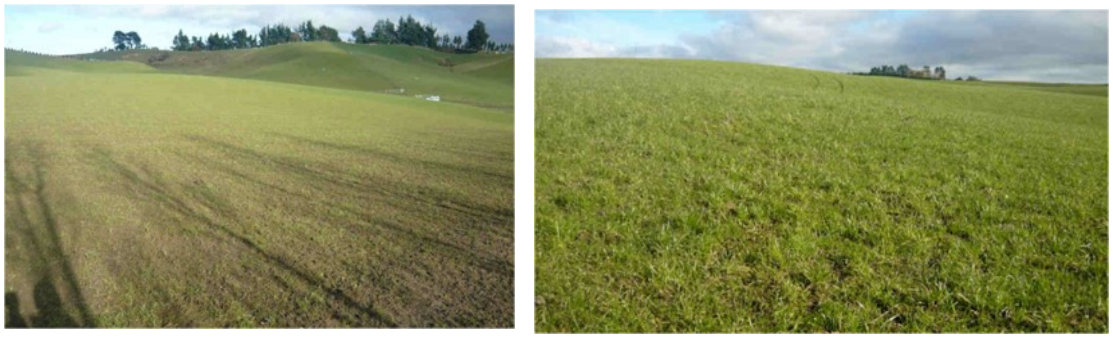
Use accurate feed allocations - try measuring crops and feeding apps (using weekly calculations).

Feeding extra supplement during transition to the crop is usually not required.

Autumn grazing of multi-species mixtures may be needed to maximise forage use and regrowth potential.

Regrowth can be grazed in spring.

Follow seed company guidelines regarding forage maturity requirements and grazing needs.



Grazing outcomes after sheep all-grass wintering on 1-day (left) breaks or 4-day (right) breaks

Q ***What else should I consider ?***

A Take the usual care when grazing plants like rape during autumn to avoid potential animal health issues such as photosensitivity.

Using a 3- to 4-day shifting regime can reduce overall labour costs and reduce weekend work.

The flexibility provided by the multi species mix can provide more options for the farmer, with grazing potentially available from mid-summer onwards. Regrowth during spring can be used to feed stock, though this option is most likely under sheep grazing rather than cattle or deer grazing.

Low yields from multi-species mixtures during winter may lead to increased need for supplementary feed or increased area sown in mixtures compared to traditional crops.

Increased complexity in management and greater management precision may be required to extract the benefits of alternative wintering practices.

Later sowing times and post-winter regrowth will result in a net reduction in bare ground on-farm leading to improved overall feed supply.

Use of herbicides and pesticides is usually reduced, but an increase in area, and potential increase in seed costs may result in little net change in cropping costs.

Feed nutrient content is usually more balanced, resulting in less need for balancing dietary transitions and more consistent stock performance. Care must be taken to ensure chosen species do not introduce toxins to the diet.

In Summary

This project follows on from and adds to best management practices for winter forage crops.

Changing practice is not simple and requires a range of resources and skills. Consider the availability of advice when making change.

This guide outlines a range of potential practices that may be used, and provides four case studies over the next 4 pages to provide some insight for the reader.

Critical to changing practice is to identify your challenges and find a solution that fits.

Challenges may include:

* Length of winter
* Type of livestock
* Availability of labour
* Environmental impacts
* Simplicity
* Stock performance
* Soil type

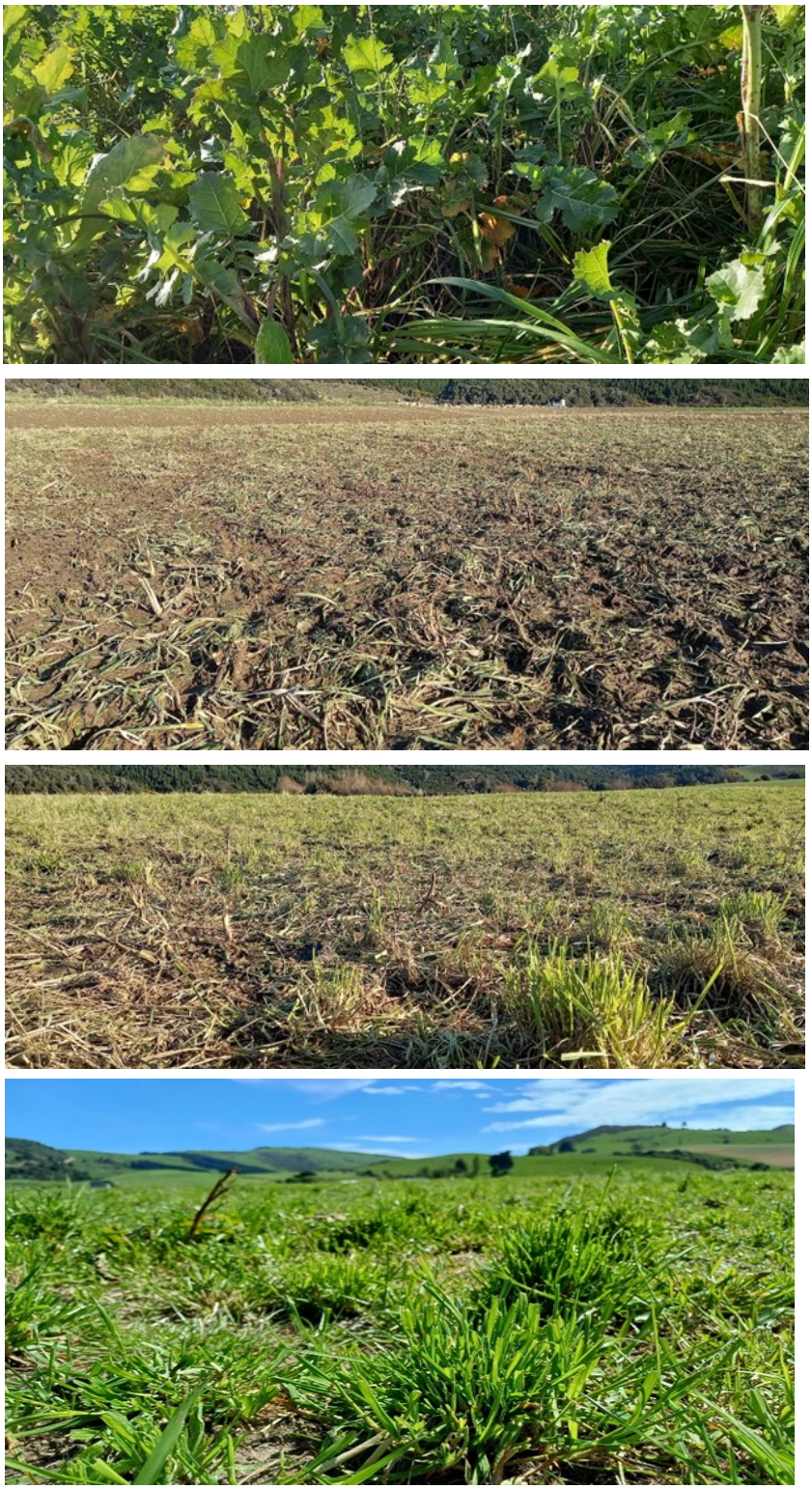
Case study Sheep (1): The establishment of a multi-species crop allowed different species to establish in different areas of the paddock. A traditional brassica crop may not establish consistently across environments like this. The inclusion of other species reduced the potential for bare ground, providing a more consistent feed supply across the paddock, and protected the soil, often on stepper and lower fertility parts of the paddock (see photo 1 below). Total yield was 9.1 t DM/ha. Estimated rainfall from 1 May to 6 July, when this grazing event was recorded, was similar to the long term average of 270 mm over the same period.

During grazing photo 2 shows the residual of grasses and plantain. When grazing was complete (photo 3) the residual herbage mass is depleted (measured at approximately 1400 kg DM/ha) though still provides some protection for the soil and a residual stubble for regrowth. This paddock recovered to provide feed for late-lambing twin-bearing ewes stocked at 8/ha from mid-September until December, with an estimated feed consumption of 2,310 kg DM/ha.

A multi-species forage mixture before (top), during (middle) and after (bottom) grazing by sheep on 6 July 2023. Estimated rainfall from 1 May to the grazing date of 6 July was 260 mm.

Case Study Sheep (2): A multi-species mixture including Raphnobrassica, turnips and grasses, cereals and plantain of 6.1 t DM/ha was grazing by mixed age ewes of approximately 65 kg liveweight. Estimated rainfall was similar to the long-term rainfall during this period of approximately 257 mm.

A significant residual cover of the grasses remained after grazing which enabled the rapid recovery of the sward. This recovery growth was not measured. Subsequent grazing during the spring by hoggets consumed an estimated 1,900 kg DM/ha between August and November.



A multi-species forage mixture before (a) and after grazing (b) by sheep on 5 July 2023, and after 20 days of regrowth (c) and in November (d). Rainfall from 1 May until grazing on 5 July was estimated to be approximately 260 mm.

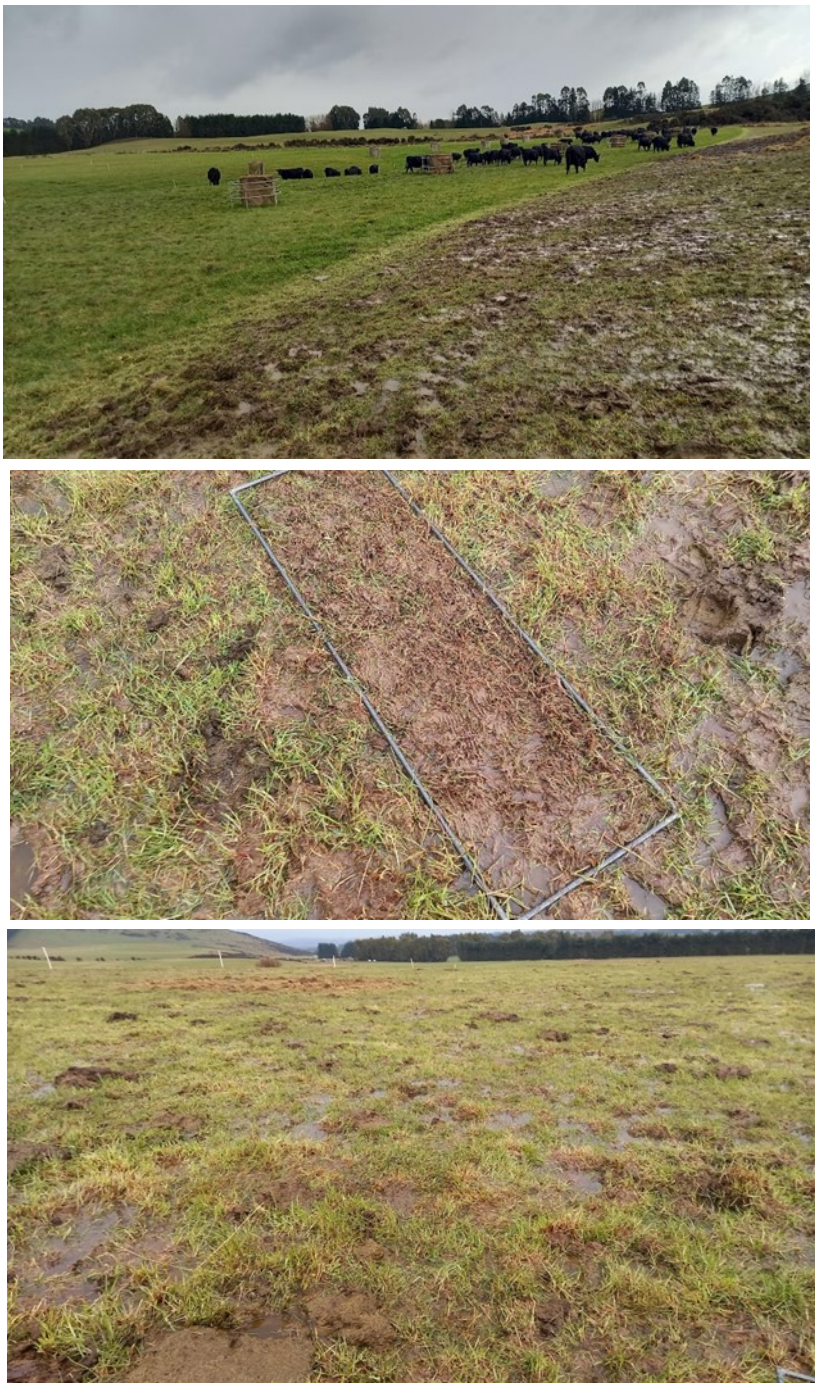
Case Study Beef (1): This farm employed an extensive multi-species mixture which yielded approximately 8.4 t DM/ha, aimed at wintering beef cattle, with an expectation that some spring grazing may be available.

A wetter than normal winter period meant saturated soils were disturbed by cattle grazing to approximately 15 cm depth. There was no grazable regrowth though a small amount of groundcover was present in some areas. The opportunity for the multi-graze species to recover was minimal due to the soil disturbance and little remanent forage cover. Rainfall during this time of 366 mm was greater than the long-term average of approximately 280 mm.

A mixed species crop before (a), directly after grazing (b) by rising-2-year-old cattle of approximately 300-400kg and in November (c) after 3 months of recovery. Rainfall from 1 May until grazing on 5 July totalled approximately 366 mm.

Case Study Beef (2): Rising 3-year-old pregnant heifers of approximately 435 kg were bale-grazed on old pasture where hay was made on 18 January 2023 and the pasture was left to recover until grazing. Rainfall from 1 May until 1 August was estimated to be approximately 420 mm, compared with the long-term average of 297 mm over that time.

The old pasture helped keep the soil together during bale grazing. The amount of feed on offer was measured to be approximately 10,550 kg DM/ha. Cattle were shifted once every three days and were stocked at a rate of 250/ha within each break. While individual hoof damage penetrated to approximately 15-20 cm the photographs show the intact groundcover over the area.



Examples of bale grazing of 435 kg rising-3-year-old pregnant heifers on 1 August 2023 depicting conditions during grazing (a), after grazing (b) and after 10 days of regrowth (c). Rainfall from 1 May until the grazing date of 1 August was estimated to be 420 mm.