Break Fed Wintering

A guide to successful crop and pasture based wintering

DairyNZ

Successful wintering

Successful wintering systems require thought and planning

This guide explains how to develop a paddock wintering plan for feeding brassicas, fodder beet, greenfeed cereals and pasture (with high levels of supplement). It provides tips and options for farmers on how to identify and manage wintering risks in a range of situations. It covers both environmental and animal welfare risk management.

The principles also apply in autumn when transitioning cows onto crop, and when cows come home from winter grazing to crop in spring.

An effective wintering system

- supports good animal health and welfare
- minimises soil and nutrient loss to the environment
- complies with regional council regulations
- protects valuable topsoil
- complements the overall dairy farm system and the work of the team on farm
- has a contingency plan for periods of adverse weather

This will result in cost effective wintering, with cows achieving body condition score targets, and be mutually beneficial for the herd owner and grazier.

Farmer tip

"Communicating clear expectations with graziers and staff is important – on how you want your cows looked after and ensuring they are meeting environmental and animal welfare obligations."

Environment

The impact of break fed wintering on the environment

Nitrogen, phosphorus, soil and *E. coli* losses from winter forage crops are much higher than those from pasture grazed during other times of year. A relatively small area of winter crop can make a disproportionately large contribution to nitrogen losses from the dairy farm or grazing system. The amount of N and P lost from a crop paddock can be two to seven times as much as a pasture paddock, depending on soil type, climatic conditions and farm management practices.

Too much nitrogen, phosphorus, soil or *E. coli* in waterways can be toxic to aquatic life, cause human health issues, contribute to excessive plant growth, and reduce recreational and aesthetic values.

Careful management of winter forages will significantly reduce losses of nutrients, soil and *E. coli*.

Critical source area (CSA) management is essential

CSAs are parts of the landscape, such as swales and gullies, where overland flow and seepage converges to form small channels of running water, which may then flow to streams and rivers.

Identifying these CSAs and then managing them using buffer zones can significantly reduce losses to surface and ground water. CSAs can transport large amounts of soil, phosphorus and *E. coli* to waterways.

Farmer tip

"My farm is relatively flat. Each winter, after some heavy rain, I look at the paddocks I am hoping to crop next year. I mark out the CSAs then with fence standards because sometimes they are harder to see in Spring."

Leaving grass buffer strips will provide a filter and slow down water movement, allowing it time to soak into the soil rather than running off. In situations where a buffer is filtering a large amount of runoff, or it is fast flowing, a larger buffer is required. This includes situations where the crop paddock has a:

- heavy or weakly structured soil
- steeper slope
- higher rainfall
- higher stock density

✓ *Critical source area left uncultivated. In this picture, the crop is acting as a buffer and will be grazed at the end of winter in dry conditions.*

✓ *Critical source area left uncultivated and ungrazed.*

✗ *Critical source area cultivated, resulting in higher risk of soil, E. coli and phosphorus loss.*

✗ *Critical source area cultivated and unprotected, resulting in higher risk of soil, E. coli and phosphorus loss.*

Environment

Catch Cropping – reducing N loss

A catch crop is any crop that is sown with the primary objective of utilising excess nitrogen in soils that otherwise may be lost to the environment through leaching. Trials completed in Canterbury, Waikato and Southland have found that:

- cereals were more effective than grass species following winter grazing
- the earlier the crop is planted, the greater the opportunity to reduce nitrate leaching
- catch crops can increase total annual yield of a paddock

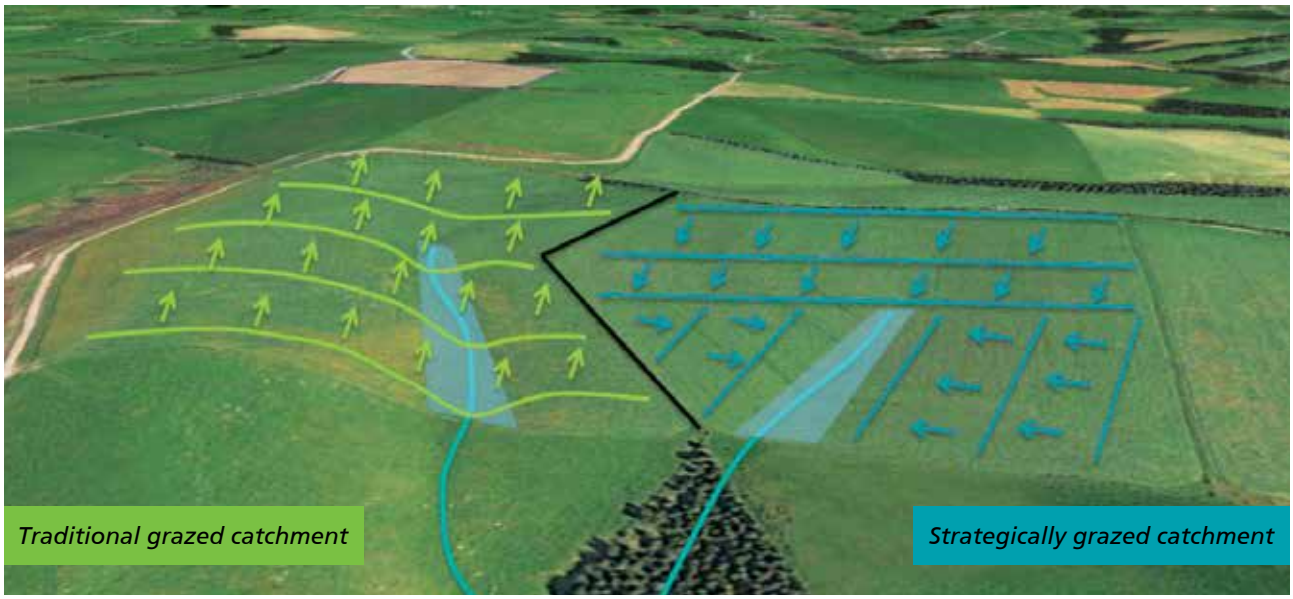
Sowing Date	Southland	Canterbury	Hawkes Bay	Waikato
June	22%	41%	20%	34%
July	17%	33%	7%	27%
August	8%	26%	4%	19%
September	0%	14%	2%	6%

Table 1: The table above shows the modelled nitrate loss reductions (%) at different planting dates of an oat catch crop following grazed fodder beet.

Environment

Strategic grazing - reducing soil, P and E. coli loss

The P21 Project at Telford Research Farm measured the impact of strategically grazing a winter crop paddock.



Strategic grazing of CSAs - arrows show the direction of grazing. The CSA is shaded in blue.

Control/traditional grazing

- Cows entered at the lower end of the paddock
- Strip grazed, moving in an uphill direction
- No protection of the CSA
- No back-fencing

Losses:
6635 kg/ha soil
6.9 kgP/ha

Strategic grazing

- Cows entered at the top end of the paddock
- Strip grazed moving in a downhill direction
- Protection of the CSA, back-fencing every 4-5 days
- Final time-restricted grazing of the CSA when soil conditions were suitable

Losses:
656 kg/ha soil
1.2 kgP/ha

Strategic grazing had significantly lower losses:

✓ 90% less soil lost
✓ 85% less P lost

The benefit of reducing soil and phosphorous loss is significant – it saves topsoil and reduces the need to apply nutrients to replace those lost.

Animal care

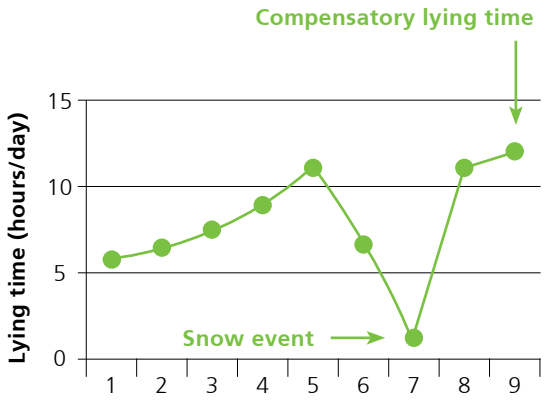
Animal care is an integral part of wintering success

A successful wintering system will take the cows' experience into account alongside the environmental, financial and practical aspects of wintering. A wintering taskforce recently released a report that highlighted seven key areas that are required to ensure good animal welfare in a crop-based wintering system.

The following are focus areas for dairy.

Lying time

- Lying down is very important to cows. It provides rest, opportunity to sleep, and reduces the risk of lameness, which leads to better animal welfare.
- Lying time in a grazed system is dependent on weather and ground conditions.
- The welfare code requires a minimum of eight hours lying time per day. In an outdoor system, short periods (less than 24hours) of some disruption to lying times are normal.
- Cows will compensate for shorter lying times during bad weather by increasing their lying time when the weather and ground conditions improve.
- If CSAs are well managed and soil type is suitable for wintering, then cows will experience the majority of their winter with a suitable lying area.



Lying time on kale crop with snow event on day 7.

Farmer tip

"I know that my cows are getting enough time resting if most of the cows are lying down when I check them in the afternoon, or if I can see lots of hollows where they have been lying."

Wet mud will impact available lying area. Consider triggering contingency plan if conditions do not improve within 24 hours

Comfortable lying conditions for cows

Animal care

Adverse weather

If a cow is clean and dry and there is little wind or rain, cold stress is rare until ambient temperatures fall below -10°C. The factors that increase the risk of cold stress are:

- combination of cold temperatures, rain and wind
- wet muddy ground conditions
- low body condition score
- low feeding levels
- sickness

In poor weather, allow for decreased feed utilisation and increased energy or feed demand. Depending on the BCS of the herd, and the weather situation, wet and windy conditions require an additional 0.5 – 3 kg DM/cow/day of intake.

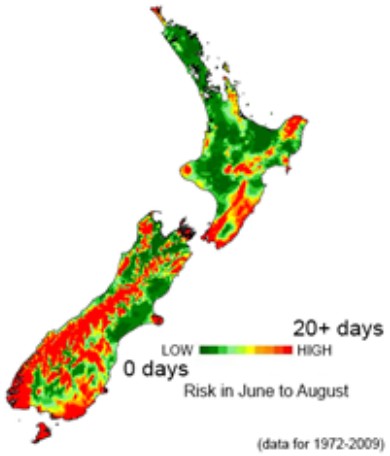


Figure 3.
Number of days at risk of cold stress from June-August.

Contingency plan

During prolonged periods of wet weather where the paddock becomes too wet and muddy, it is important to have a contingency plan. The contingency plan should ensure cows are in a drier, sheltered area that is easily managed by the team, and includes enough feed or access to feed. Consider the risk to the environment when choosing an area.

Create this plan with your team prior to winter to ensure that everyone knows when and how the contingency plan will be implemented. Some ideas for a contingency plan are given on page 13.

Tree blocks and hedges can provide excellent shelter in cold, wet and windy weather.

Access to fresh, clean water

- Cows drink approximately 45l/head of water each day over the winter period.
- Ensure that the water is easily accessible to reduce energy output used walking to a trough, and reduce the risk of a cow choosing to drink from a dirty puddle.

Portable trough setup using flexible garden hose for ease of shifting.

Farmer tip

"We use a portable trough with click in water fittings and non-return valves. It is so easy to shift that the team do it daily. This way we know that our cows always have fresh water nearby."

Cow diets and transitioning

- Cows must be transitioned onto winter crops to allow the gut bacteria time to adjust to a new feed source.
- Transitioning onto brassicas (kale, swedes, turnips and rape) can be completed over a shorter time frame (7-10days) than fodder beet (14-21days).
- Poorly managed transition will result in sick or dead cows.
- More information on transitioning and common animal health conditions on crops can be found on the DairyNZ website.

Calving in mud

- Calving in muddy conditions increases the risk of death and infections to both the cow and the calf.
- If possible, mob up cows by calving date. Be vigilant in mobs fed fodder beet, as bagging, or springing up, is limited in fodder beet fed cows.
- If a calf is born on crop, promptly collect and remove the calf and cow to the milking platform.

Feed cows a well balanced diet on crop.

If a calf is born on crop, promptly collect it.

Farmer tip

"We do a dating scan on our herd so that we know when each cow is expected to calve. Cows are drafted off the crop and into a pre-calving mob 10 days before their expected calving date, or earlier if they udder up."

Farmer tip

"Our cows are wintered in BCS mobs initially, and then we redraft them into calving date mobs a couple of weeks before calving starts. The drafting is easy because we tail paint our cows according to their calving date before they go to the winter crop."

Creating and implementing your winter grazing paddock plan

Successful wintering is an 18 month process of planning, calculating and implementing. Follow these guidelines to make the most of your paddock wintering system.

12-18 months prior to grazing: Paddock Selection

Paddock selection is a crucial element of successful wintering. Consider the risk matrix below. If your paddock is high risk, consider options to mitigate the risk. Where a paddock is high risk for more than one factor, consider options to winter in an alternative paddock.

Factor	Good	Not Ideal	Bad
Slope	Flat (less than 7°)	Rolling (7-15°)	Steep (more than 15°)
Soil type	Light	Medium	Heavy
Winter rainfall	Low	Medium	High
Waterways	None	Alongside paddock	Within paddock
Critical Source Areas	None	Drain to grass	Drain to waterway
Shelter available	Yes	Very little	No
Paddock history (soil fertility and weed and pest issues)	Good fertility and no weed and pest problems	Fertility OR weed and pest issues	Fertility AND weed and pest issues
Ease of management for staff	Multiple access points and easy access to reticulated water		One access point and no reticulated water

Consider creating a draft grazing plan prior to sowing your crop. This will help to highlight any factors of the paddock that will make the paddock difficult to manage.

Note that it is important to check your regional council's regulations and use these to guide your wintering decisions. Information about wintering regulations for your region can be found at your regional council website.

Farmer tip

"We put up a semi-permanent fence around CSAs before the paddock is cultivated. This guarantees that it is not cultivated or grazed."

An unsprayed, uncultivated grass buffer.

Critical source areas can occur in all parts of the farm, even if relatively flat.

6-9 months pre grazing: Crop establishment and paddock setup

Once you have chosen a suitable paddock, focus should shift to growing a high yielding crop and setting up the paddock for grazing.

- **Cultivate across slopes rather than up and down.** If the paddock is too steep to cultivate across the slope it is likely that it is not suitable for winter cropping.
- **Consider which cultivation type you will use.** In recent research no till cultivation has been shown to deliver good yields and improved crop utilisation rates during grazing.
- **Leave grass buffers at the bottom of slopes.** This will filter and slow down runoff from the paddock, reducing the amount of sediment lost from the paddock.
- **Plan how the paddock will be grazed with your team.** Get together with the team and use the paddock plan template to create a grazing plan, including your contingency plan strategy. Consider the risk factors identified during paddock selection.
- **Set up the paddock early, while the soil is drier, to save time in winter.** If you are laying out baleage, remember to keep bales out of swales and lower lying areas of the paddock, and away from waterways.

Leaving grass buffer strips will provide a filter and slow down water movement, allowing it time to soak into the soil rather than running off.

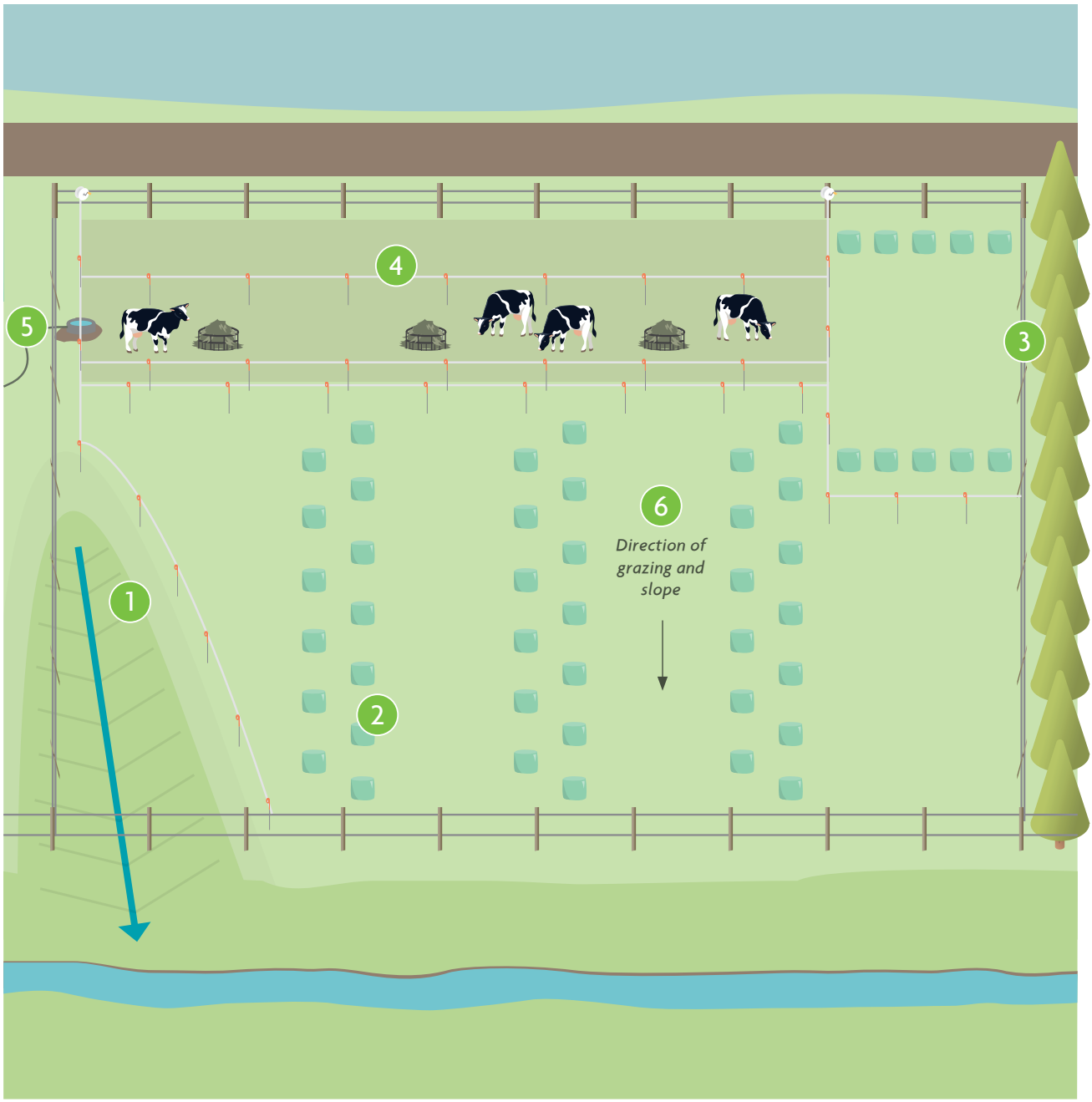
Farmer tip

"I have to be clear on the direction I want the paddock cultivated. I want the contractors to cultivate across the slope to avoid soil getting washed out in heavy rain."

Farmer tip

"I plan how I am going to transition cows onto crop – I either leave the first 6m of the paddock in pasture, or work out how I am going to on off graze them for the first week so they don't get too much crop before their rumens adapt."

6-9 months pre grazing: Crop establishment and paddock setup



1. Fence off CSAs with a semi-permanent fence. Ideally, graze this area last and lightly in dry conditions.
2. If placing bales out, do so away from waterways and CSAs. Use bale rings to improve utilisation.
3. Consider a contingency plan for poor weather. In this case, feed has been left in a well sheltered, drier part of the paddock. Cows will be moved here in adverse weather.
4. Shift back fence at least weekly to reduce movement of animals and damage to soils.
5. Use a portable trough to give cows easy access to fresh clean water. Place the portable trough at the side of the break for ease of shifting.
6. Graze paddock from top to bottom, to reduce the speed and maximise the filtering of overland flow. Alternatively, graze uphill and leave a significant buffer to CSAs and waterways.

Grazing the paddock

Make the most of your crop through careful management and attention to detail.

- **BCS your cows in mid winter.** Redraft cows into the appropriate mobs to ensure they reach calving at target BCS.
- **Monitor cow health daily.** Get together with your team and discuss common cow health problems prior to winter. Early detection of a cow health problem will greatly increase the cow's chance of recovery.
- **Collect and roll up baleage wrap as it is taken off the bales.** This ensures that it will not be blown away. Clean baleage wrap can be recycled .
- **Use a back fence and portable trough, and shift these at least weekly.** A back fence and portable trough will reduce cow walking and therefore limit unnecessary energy movement and soil damage.

Farmer tip

"We move our back fence each day. It's a great opportunity to look for sick or springing cows. Ever since we've done this, we haven't had any surprise empty cows in spring."

"No one knows my cows like me – I check them at the graziers place every week."

"We graze the paddocks furthest from the cowshed first. This means that the cows are close to the shed in spring when we need to draft out springer cows."

✗ *Be a tidy kiwi and collect baleage wrap as it is taken off the bales.*

✓ *CSAs fenced off to ensure soil doesn't enter the creek.*

✗ *Careful management of CSAs will ensure that soil remains in the paddock.*

✓ *Monitor cow health daily.*

Adverse weather contingency plan

Have a contingency plan for periods of wet or adverse weather when the crop paddocks become very muddy, or grazing conditions are affected. When creating your plan:

- consider the welfare of your cows, including shelter, the lying surface, and availability of appropriate feed.
- consider the environment, including potential soil damage, runoff to surface and ground water, and any flood risk.
- ask yourself, will our adverse weather plan be easily and quickly implementable? And, will we be able to manage with power supply to electric fences?

Cows behind a hedge.

Contingency plan options include:

- shifting the cows to a drier, low risk paddock.
- saving crop in a drier, low risk part of the paddock.
- standing cows off on a laneway or concrete yard. However, if standing off for more than a few hours, hard surfaces are no better than wet muddy paddocks for standing or lying.
- standing cows off in a tree block.
- Increase area allocated to herd by giving them another break. This may not be possible on fodder beet.

Where possible, continue to feed crop in the diet throughout the adverse weather event. If the herd is off crop for longer than 24 hours you will need to consider re-transitioning them onto the crop, particularly with fodder beet.

Farmer tip

"When I plan how much feed I need for winter, I add an extra 10 percent to cover extreme weather events."

"We lift enough fodder beet to feed our herd for five days. This way, if the cows are taken off the crop in bad weather, we can maintain their diet and will not have to retransition them."

After grazing

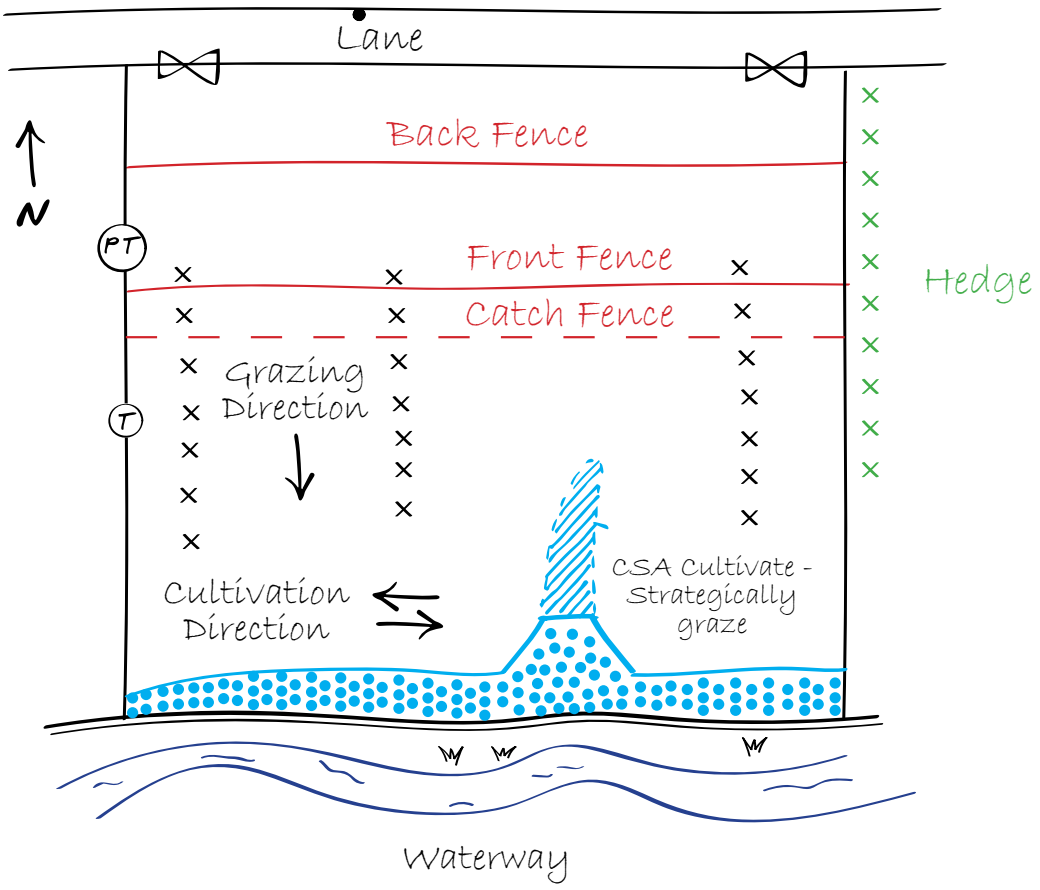
Bare ground continues to be a risk for overland flow of nutrients and soil from the paddocks after grazing has finished.

- **Minimise the time that the land is fallow.** The establishment of new pasture or a catch crop will reduce overland flow risk.
- **Consider planting a catch crop** to take up some of the urinary nitrogen left from the previous winter grazing.
- **Maintain the grass buffers to** ensure sediment is not lost from the paddock.

Catch crops can be a high yielding part of the crop rotation.

Wintering Template Example

Farm name: Jones ltd Paddock: 15 Date: 14th october



Contingency plan: Move cows to paddock 4 (also in crop). Set up fences in paddock 4 at the same time as this paddock.

Step 1: Draw an outline of the paddock	Symbol or Complete (tick)
Note map direction (e.g. North arrow)	N
Mark on obvious features	✓
Direction prevailing wind	S W

Step 2: Identify risk areas/ paddock features	Symbol or Complete (tick)
Critical source areas and slopes (not to be cultivated)	
Waterways and wetlands	
Gateways	
Permanent troughs	T

Step 3: Plan	Symbol or Complete (tick)
Direction of cultivation	
Direction of grazing	
Buffer zones	✓
Critical source areas that are to be strategically grazed	
Baleage placement	X
Portable troughs and pipe	PT
Back fence	
Front grazing fence	
Catch fence (tomorrow's grazing fence)	

Winter cropping and grazing template

Farm name: _____ Paddock: _____ Date: _____

Contingency plan: _____

Step 1: Draw an outline of the paddock	Symbol or Complete (tick)
Note map direction (e.g. North arrow)	
Mark on obvious features	
Direction prevailing wind	

Step 2: Identify risk areas/ paddock features	Symbol or Complete (tick)
Critical source areas and slopes (not to be cultivated)	
Waterways and wetlands	
Gateways	
Permanent troughs	

Step 3: Plan	Symbol or Complete (tick)
Direction of cultivation	
Direction of grazing	
Buffer zones	
Critical source areas that are to be strategically grazed	
Baleage placement	
Portable troughs and pipe	
Back fence	
Front grazing fence	
Catch fence (tomorrow's grazing fence)	

DairyNZ

Want more help?

www.dairynz.co.nz/wintering

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