Wintering on crops in the South Island

A land management guide to good environmental practice
Wintering – Good environmental practice

Winter in the South Island is a critical period for setting up a cow’s productive and reproductive performance. This guide provides solutions to minimise the environmental impacts of wintering and includes tips on managing the following:

**Paddock selection | Overland flow | Cultivation | Strategic crop grazing**

Successful wintering will:
- help achieve body condition score targets
- be cost-effective
- complement the overall dairy farm system
- be sustainable for people, cows and the environment
- help minimise contaminant loss to the environment and comply with local regulations
- protect valuable topsoil.

Wintering on crops contributes significantly to the loss of four key contaminants from the dairy farm or grazing system: nitrogen (N); phosphorus (P); sediment and faecal microorganisms such as *E. coli*.

This guide suggests key actions which will help reduce the loss of these contaminants from wintering systems.

**Good management – cost effective wintering solutions**

Good wintering practice doesn’t need to cost more. By taking into account the areas of environmental risk on your farm, a suitable winter cropping and grazing plan can be put together which will decrease the environmental impact of wintering.

Check regional council rules for your local area. They may affect your wintering decisions.
Critical source areas

Most sediment and phosphorus is lost from relatively small areas on-farm – referred to as critical source areas (CSAs). Managing these areas to reduce overland flow is one of the best ways to reduce sediment and nutrient losses.

What are critical source areas?

Critical source areas are low-lying parts of farms such as gullies and swales that act as highways for overland flow of water, transporting sediment and phosphorous to waterways.

The first step to reducing contaminant loss is to identify the CSAs on your farm. These areas need to be managed carefully in your winter cropping and grazing plan to reduce the amount of soil and nutrients lost to waterways.

If CSAs have a tile drain underneath, contaminants have a direct route to waterways.

TIP

Google Earth provides an aerial view of your farm, allowing you to easily identify and map all your critical source areas.

What does the science tell us about wintering?

Research trials at Woodlands and Five Rivers show N losses from winter forage crops are much higher than those from pasture. A relatively small area of winter crop can make a disproportionately large contribution to N losses from the dairy farm or grazing system.

Protection of CSAs and strategic grazing management on a research farm at Telford reduced sediment and P losses by 80 to 90 percent.

The amount of N and P lost will vary dependent on soil type and climatic conditions.
Selecting crop paddocks

Many paddocks have challenging features which can increase the risk of contaminant loss, such as slopes or waterways. Paddock selection needs to consider the environmental risks and how these will be minimised. If the risks are too great or cannot be minimised, a different paddock should be considered.

Crop paddock selection to minimise losses

- Identify where critical source areas (CSAs) (gullies, swales and tile systems) are on-farm.
- Select paddocks with fewer CSAs which will be easier to manage. If there are CSAs in the paddock, leave a grass strip uncultivated in and around them to filter contaminants before they reach the wet area.
- Select paddocks that are a greater distance from waterways to increase the chance of contaminants being filtered before reaching the water.
- Select paddocks with soils less susceptible to pugging or compaction.

Filtering overland flow

Buffer zones or grass strips in and around CSAs and next to waterways act as filters by slowing overland flow to trap suspended contaminants. The buffer zone should be left uncultivated and ungrazed to operate effectively. The faster the water is flowing into a buffer zone, the wider the buffer zone will need to be to provide time for effective filtering. This is particularly important on sloping land or in a critical source area (figure right).

TIP

For more advice on crop paddock selection check out DairyNZ’s crop paddock selection factsheet: dairynz.co.nz/crop-paddock-selection.

Buffer zone fencing example in a CSA.

Crop paddocks that are steep and have waterways or CSAs will be more problematic during wintering than those without them.

Good use of grass buffers in crop paddocks.

Unmanaged CSAs without buffer zones can lead to loss of soil and nutrients.
Winter cropping and grazing plan (example)

Farm name: CROPPING FARM
Paddock: 15
Date: 14TH OCTOBER

Step 1: Draw an outline of the paddock
- Paddock number: 15
- Note map direction (e.g. North arrow): N
- Mark on obvious features: ✓

Step 2: Identify risk areas/paddock features
- Critical source areas and slopes (not to be cultivated): C.S.A
- Waterways and wetlands
- Gateways: G
- Troughs: T

Step 3: Plan
- Direction of cultivation: ←
- Direction of grazing: →
- Buffer zones: ✓
- Critical source areas that are to be strategically grazed: C.S.A
- Baleage placement: ✗ ✗ ✗
- Portable troughs: PT
- Back fence: ✓
- Front grazing fence: ✓
- Catch fence (tomorrow's grazing fence): ✓
# Winter cropping and grazing plan template

**Farm name:** ____________________________  **Paddock:** __________  **Date:** ________________

## Step 1: Draw an outline of the paddock

<table>
<thead>
<tr>
<th>Symbol or Complete (tick)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paddock number</td>
</tr>
<tr>
<td>Note map direction (e.g. North arrow)</td>
</tr>
<tr>
<td>Mark on obvious features</td>
</tr>
</tbody>
</table>

## Step 2: Identify risk areas/paddock features

<table>
<thead>
<tr>
<th>Symbol or Complete (tick)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical source areas and slopes (not to be cultivated)</td>
</tr>
<tr>
<td>Waterways and wetlands</td>
</tr>
<tr>
<td>Gateways</td>
</tr>
<tr>
<td>Troughs</td>
</tr>
</tbody>
</table>

## Step 3: Plan

<table>
<thead>
<tr>
<th>Symbol or Complete (tick)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direction of cultivation</td>
</tr>
<tr>
<td>Direction of grazing</td>
</tr>
<tr>
<td>Buffer zones</td>
</tr>
<tr>
<td>Critical source areas that are to be strategically grazed</td>
</tr>
<tr>
<td>Baleage placement</td>
</tr>
<tr>
<td>Portable troughs</td>
</tr>
<tr>
<td>Back fence</td>
</tr>
<tr>
<td>Front grazing fence</td>
</tr>
<tr>
<td>Catch fence (tomorrow's grazing fence)</td>
</tr>
</tbody>
</table>
Cultivation

**Actions when cultivating**

- When it is safe to do so, it is good practice to cultivate across slopes rather than up and down, which can speed up overland flow (Figure 1).
- Leave grass strips across slopes of cultivated paddocks to act as filters to trap sediment running off cultivated areas (Figure 1).
- Understand where water flows in a paddock during wet periods. Avoid cultivation in critical source areas (CSAs) such as seeps, gullies and dry streambeds, to minimise soil loss (Figure 2).

**Benefits of improving cropping areas**

- Reducing soil disturbance and minimising overland flow will mean less sediment and nutrients entering waterways.
- Reducing erosion of cropping areas will reduce the risk of seed or crop loss at establishment and help retain valuable topsoil.

**TIP**

Check with your regional council what buffer rules you need to adhere to.

**Figure 1.** Cultivate across slopes where possible to reduce soil loss by redirecting water flows. Leaving grass strips will provide a filter and slow water movement.

**Figure 2.** Leaving grass strips undisturbed in gully/swale areas helps to trap sediments.
Good practice winter crop grazing

Strategic winter crop grazing is a planned approach which helps to improve utilisation of crops, animal condition and environmental performance.

Key actions for good practice winter crop grazing

- Place bales away from waterways and critical source areas (CSAs).
- Place portable water troughs at the front of feeding face.
- Back fence to reduce movement of animals and damage to soils.
- Graze top to bottom to reduce overland flow.
- Place portable water troughs at the front of feeding face.
- Back fence to reduce movement of animals and damage to soils.
- Graze top to bottom to reduce overland flow.
- Fence off (leave ungrazed) CSAs or graze quickly in dry conditions, and ideally, graze last.

Benefits of good practice winter crop grazing

- Crop grazing and management of CSAs can reduce losses of sediment and phosphorus by 80-90%.
- Avoiding wet areas as much as possible is important for maintaining teat health and improving general cow wellbeing.
- Good practice will retain more nutrients in your crop paddock reducing the need for additional fertiliser.

FARMER’S TIP

Leave room close to the gate, so if crop yields are lower than budgeted, more supplements can be easily added.

TIP

For more information on strategic grazing and reducing overland flow visit dairynz.co.nz/grazing-management.