



Forage cropping management

Forage cropping is an integral part of the farming system on many properties. It is a way to ensure a supply of good quality feed for maintenance of animal condition and when grazing pasture may not be possible or insufficient to meet animal requirements. Forage cropping has risks of nutrient and sediment loss to waterways as well as faecal contamination if good practices are not implemented or cropping occurs in high-risk locations. Long term soil damage and loss of subsequent pasture production can also result. When good management practices are implemented, including careful management before, during and after grazing, research shows that the risks can be significantly lowered.

Winter forage crop grazing is a specific type of forage cropping and often has a higher risk of negative impacts to the environment. It happens at a time of year when conditions are more likely to contribute to contaminant loss if the appropriate care is not taken. This section has strong links to the soil and freshwater sections in the farm plan. It may be useful to refer to these sections where necessary. Making sure that animals are cared for and fed appropriately is important for keeping stock healthy and in good condition. There are also a number of factsheets, resources and further information that can be found at beeflambnz.com/wintergrazing





In this section you can:

- Outline how forage cropping fits into your farming system
- Describe the crops used and where these are established on-farm
- Carry out a risk assessment
- Create a winter grazing action plan
- Outline any winter grazing monitoring that needs to be done

Why am I forage cropping?

Forage crops grown on-farm for supplementary feed are an important part of farm systems. They are often utilised as part of a resilient farm system to ensure adequate feed for stock when grass growth has slowed and there are potential feed gaps, such as during the winter or in summer-dry areas. They are also used if a high-quality feed is needed finish stock or increase production.

A forage crop is an area of crop that is grown to feed stock, usually directly from where the crop is grown (*in situ*). Forage crops include cereals (such as sorghum, barley, oats, rye-corn and triticale), brassicas (such as kale, turnips and swedes), fodder beet and maize and can include annual ryegrass.

Forage crops can also be used as part of the pasture renewal programme. Often as pastures age, the species composition changes and over a period of years, less palatable and less nutritious species can dominate a pasture. Weeds, pests and diseases can also become a problem. Pastures are often resown on a rotation of a period of 10 years or more, but this will be dependent on the farm system, soil type, pasture species and farm management objectives.

Intensive winter grazing is a common part of forage cropping and happens at a time of year when soils may be more vulnerable to damage. The higher stocking intensity of animals also adds to the risk of sediment and nutrient loss and damage to soils. Animal health also needs to be managed carefully due to the prevailing climatic and soil conditions and can be influenced by the crop type and amount/type of supplement also fed. If you are grazing a winter forage crop during the winter months you must undertake it in accordance with relevant regulations.



In **Template FC1** in “Our Plan” (example below) outline the main reasons for forage cropping. These might be things such as:

- Pasture renewal
- Providing additional feed to fill summer or winter feed gaps
- Limiting the impact stock may have on pastures


If forage cropping is used for winter grazing, also outline how winter grazing currently fits, or will fit into your farming system.

Why am I forage cropping?

FC1

Example

<input checked="" type="checkbox"/>	Pasture renewal
<input checked="" type="checkbox"/>	Providing additional feed to fill summer or winter feed gaps
<input checked="" type="checkbox"/>	Limiting the impact stock may have on pastures
<input checked="" type="checkbox"/>	Other: (please describe below)
<i>To replace ryegrass endophyte with one better for animal welfare and production</i>	
<i>Weed control for establishment of lucerne stands</i>	

 Blank templates can be found in **Our Plan** section

STEP 2

FORAGE CROPPING MANAGEMENT

Forage Crop Goals

It is a good idea to record the high-level objectives of your forage cropping. Some examples are:


- Keep animals healthy, with adequate feed and with appropriate shelter
- Minimise the risk of sediment, nutrient and faecal losses to waterways
- Keep stock out of waterways
- Have a written (winter) grazing plan
- Have a plan for adverse weather events to reduce risk to stock and the environment
- Minimise soil and pugging damage
- Undertake forage cropping in accordance with relevant regional rules and regulations

In “Our Plan” fill out **Template OT1** with your forage cropping goals. An example is shown below.

OT1

Example

Our forage crop grazing goals	Date:
<i>Keep stock out of waterways with appropriate buffer areas</i>	<i>1 February 2021</i>
<i>Create a winter grazing plan each year</i>	
<i>Use strategic grazing techniques for wintering to minimise sediment loss</i>	
<i>Replant winter paddocks as soon as practical after winter to reduce nutrient and sediment losses</i>	
<i>Keep animals well-fed and in good condition</i>	

 Blank templates can be found in **Our Plan** section

STEP 3**FORAGE CROPPING MANAGEMENT**

Description of forage cropping


It is good to have a written record of your current forage cropping programme. Fill out **Template FC2** Forage Crop Programme in “Our Plan”. An example is filled in below.

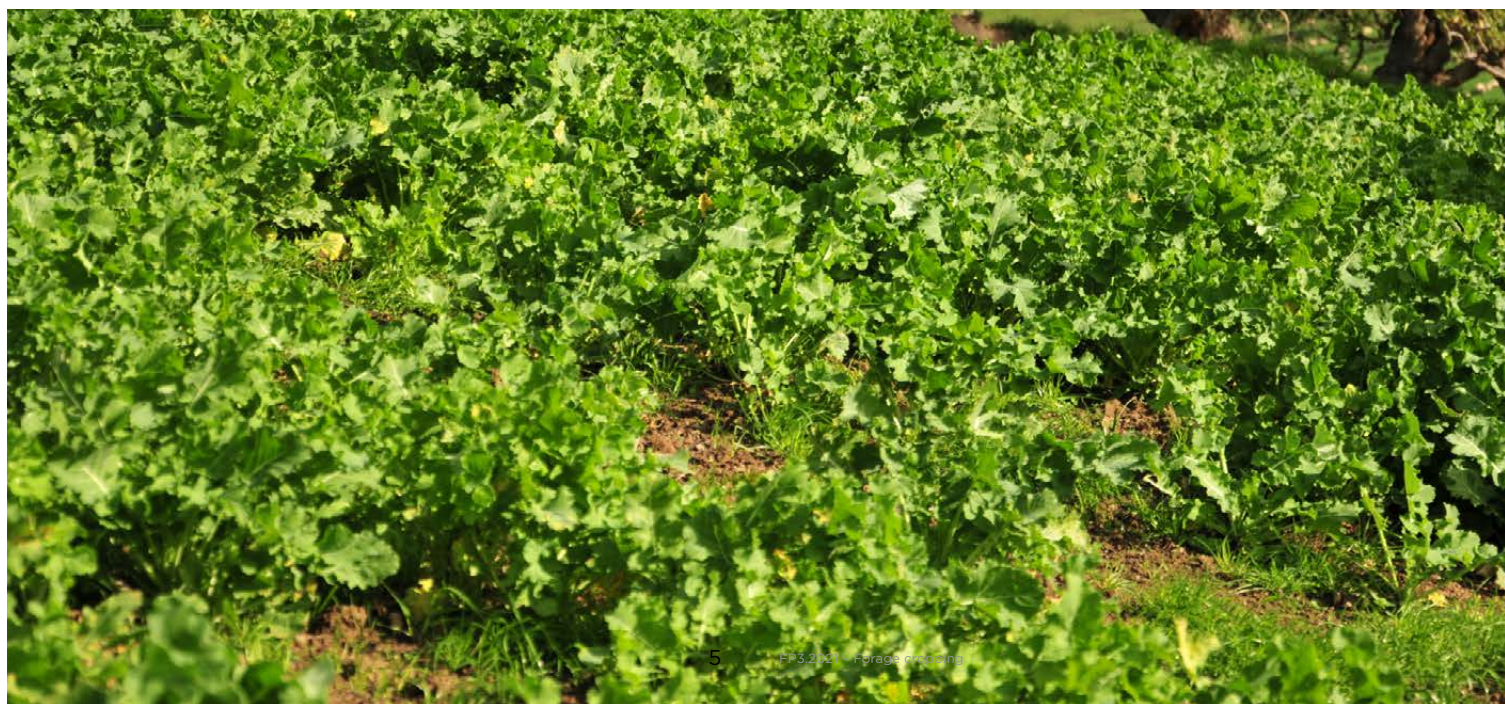
To help with this, map out the areas (paddocks or land management units) you intend to graze next season. You may have already done this in previous sections, but if you haven't, create a map of your forage cropping paddocks.

Forage Crop Programme

FC2**Example**

Year:	2021-22		
Crop type sown	Kale	Summer turnips	Swedes
Season or month the forage crop fed	Winter	Summer	Winter
What month do you usually sow?	October	September	November
Cultivation and sowing method	Spray and drill	Spray and drill	Ridged
Location/Land management units used	Lower flats	Easy rolling block	Lower flats
Identification of any unfenced waterways in winter crop paddocks	No- always fenced off	No- always fenced off	None in swede paddocks
Area sown in crop (ha)	14ha	10ha	4ha
Typical yield (t DM/ha)	14	11.5	18t
Fertiliser used	DAP 200kg/ha	150kg/ha DAP	DAP 350kg/ha sown 55kg/ha urea
What class(es) of stock graze this crop?	R1 and R2 Beef cattle	Mixed age ewes/ cattle as needed	MA ewes

 Blank templates can be found in **Our Plan** section



Intensive winter forage cropping

You need to be aware of the national and regional rules and graze in accordance with the regulations for your region. Information on rules, including requirements for record keeping, and regulations can be found in the National Environment Standards for Freshwater (2020) subpart 3 Intensive Winter Grazing (a link and more information can be found at beeflambnz.com/wintergrazing) or from your local regional council.

In some cases you may need to apply for a resource consent to winter graze on crops.

The definition of 'intensive winter grazing' under the National Environmental Standards for Freshwater (2020) is:

- grazing livestock on an annual forage crop at any time in the period that begins on 1 May and ends with the close of 30 September of the same year

An 'annual forage crop' is:

- a crop, other than pasture, that is grazed in the place where it is grown

The definition of 'intensive winter grazing' does not include stock which are only grazed on pasture during winter months or forage crops fed outside the winter period (1 May-30 September).



Farm mapping and winter forage cropping details

If your forage cropping system meets the definitions of an intensively winter grazed forage crop then you will have to make sure that you record (and keep updated) some extra information. Some of the information you need to collect and have recorded is suggested below in templates FC3 and FC4. If you are unsure of the rules and requirements for winter grazing, talk to your local regional council. Further information can also be found at beeflambnz.com/wintergrazing

All areas proposed to be winter cropped and grazed on the farm need to be identified on a map. Use this section to include a farm map showing paddocks to be used for wintering. Please include key paddock features such as:

- Paddock boundaries
- Waterways
- Wetlands
- Drains
- Critical source areas
- Slope
- Areas prone to erosion

You will also need to relate this section to your soil and freshwater sections. Having the land management units mapped will also help to determine if you are winter forage grazing in the most appropriate areas on your farm to reduce environmental losses and avoid damage to your soils.


If required, complete **Templates FC3** and **FC4** in “Our Plan”, each year you intensively winter graze. Examples are below.

Winter forage crop grazing – Farm details

FC3

Example

Farm details	Farm Name	<i>Top Station Farm</i>
	Farm Address	<i>195 Station Road, RD2 Otago</i>
	Total farm area (ha)	<i>640 ha</i>
Farm owner details	Name	<i>Jane Farmer</i>
	Phone number	<i>021 123 456</i>
	Email address	<i>Stationfarm@mail.nz</i>
	Mailing address	<i>As above</i>
Manager details (if applicable)	Name	<i>As above</i>
	Phone number	
	Email address	
	Mailing address	
Stock owner details (if applicable)	Name	
	Phone number	
	Email address	
	Mailing address	
Staff details	Name	<i>Jimmy Moover</i>
	Phone number	<i>021 123 567</i>
Other	<i>Spray Contractor</i>	<i>Spray Easy – 027 234 567</i>

 Blank templates can be found in **Our Plan** section


Fill out **Template FC4** in “Our Plan” with the numbers of stock in different stock classes that will be wintering on crop, the type of crop and the size of the area that will be grazed, and type and quantity of supplements you will use. You can with fill this in over your whole farm or where appropriate give more detail for each land management unit (or paddock)

Winter forage crop grazing – Animal details

FC4

Example

	Stock type and class or crop type	Total Across farm	Number of stock, area or supplement		
			Location (on-farm) Name	Name	Name
Stock numbers wintered on forage crop (break up by age or class as required, e.g., R1/R2 cattle, mixed-age cattle, mixed-age ewes, lambs, hoggets, weaners, stags, hinds)	Beef Cattle				
	R1/R2		120	80	
	Breeding cows			110	
	Dairy Cattle			40	
	Dairy cows				
	Sheep			800	
	Hoggets				
Deer				100	
Weaners				140	
Hinds					
Area of Winter forage crop to be grazed over coming winter (ha)	Bulb brassica (swede/turnip) (ha)		15		
	Kale (ha)			20	
	Fodder beet (ha)				
Other (please specify) (ha)					
			40	60	
Other supplements to be fed to winter grazed stock (e.g. silage, baleage, hay, straw)			Round bales baleage	Round bales baleage	
	Other				

 Blank templates can be found in **Our Plan** section

Risk Assessment

Forage cropping, particularly in winter can pose a significant risk to freshwater ecosystem health. Waterways can be at risk through sediment, nutrient and faecal/microbial contamination. Soils are also at risk of short and long-term damage, through compaction, pugging, loss of soil structure and reduced infiltration potential. There are national and regional regulations that need to be adhered to if you are winter forage crop grazing. These relate to both environmental management and animal welfare.

This risk assessment section will help you to identify potential risks on your farm and with your farming system.

What is a critical source area?

Critical source areas are areas in a paddock or on a farm that can contribute to relatively large amounts of nutrient and sediment losses to waterways. They are often wet areas such as gullies and swales, where overland surface runoff converges and can transport sediment and nutrients. The surface flow in critical source areas usually occurs during or after rainfall event of sufficient size and intensity to move water over the surface of the soil rather than draining through it.

Photos showing examples of Critical Source Areas



Table 6.1 shows common risks, impacts and risk factors associated with intensive winter forage crop grazing. You can use this as a guide when filling out the risk assessment in “Our Plan”. There is also space in our plan to add other risks that you identify with your wintering areas.

Use the Risk Matrix Chart to assess risk factors that you have in and around your winter grazing areas. You can also attend the B+LNZ workshops on forage cropping and winter grazing. There are also great resources and factsheets about forage cropping and winter grazing risks and risk management that can be found on the link beeflambnz.com/wintergrazing

For each risk factor you have identified, assess the likelihood and consequence and determine the risk rating, high, medium or low. This can then be recorded in **Template FC5** in “Our Plan”. An example is given after Table 6.1.

Risk Assessment Matrix

Likelihood	Consequence		
	Slight	Serious	Major
Low	Low	Low	Medium
Medium	Low	Medium	High
High	Medium	High	High



Table 6.1 Risk factors to consider for your farm forage crop grazing

Risks of winter forage crop grazing	Impact	Risk Factors	On-farm considerations that are higher risk
<p>Sediment and Phosphorus loss</p>	<p>Phosphorous and sediment can be transported in overland flow. Phosphorous entering waterways may cause excess algae growth in water bodies. Sediment can reduce or change habitat by smothering and clogging spaces in the stream bed making it less suitable for a wide diversity of stream life.</p>	<p>Slope Risk</p> <p>Erosion risk</p> <p>Overland transport of sediment and nutrients</p>	<ul style="list-style-type: none"> • Steeper slopes have greater risk • If erosion is visible or likely within the area to be cropped it will be a higher risk • Stock type (deer and large cattle are more likely to cause erosion) • Paddock is prone to flooding • Presence of a Critical Source Area within the paddock • Waterway is within or close to the paddock being winter grazed • Surface flow within paddock to be winter grazed will flow directly into nearby waterway • Soils are heavy or poorly drained • Soil surface is pugged or damaged reducing water infiltration • Cultivation is done via a method where soil is exposed (i.e. not direct drill) • Cultivation is done down the slope rather than across it • High soil Olsen P levels
<p>Faecal microbial loss</p>	<p>Pathogens or microbes such as <i>E. Coli</i> may potentially have an impact on human or animal health if they are able to enter into waterways.</p>	<p>Contamination of freshwater</p>	<ul style="list-style-type: none"> • Water can directly flow overland from the paddock being winter grazed into a waterway • Stock have unrestricted access to waterways • Drinking water bore or takes are close to paddocks or downstream of winter grazed area • Winter Grazing is occurring on stony soils close to a drinking water bore
<p>Nitrogen loss</p>	<p>Nitrogen can potentially enter waterways and cause excess algae growth. Nitrogen usually moves through the soil profile with water. High nitrogen leaching can also impact nitrate levels in drinking water impacting human health.</p>	<p>Nitrogen Leaching</p> <p>Nitrogen sources</p>	<ul style="list-style-type: none"> • Winter grazing is occurring on free-draining/stony soils • Sub-surface drains are present within paddock • Soils are left bare for more than 2 weeks post-grazing • Higher density stocking will mean more animals in a given area, leading to higher deposition of N • Critical Source Areas will be cultivated or grazed • Crops have differing concentrations of N and may alter the amount of N excreted by animals • Urinary concentration of N is often higher in mature cattle compared to sheep deer or younger cattle

Risks of winter forage crop grazing	Impact	Risk Factors	On-farm considerations that are higher risk
Soil damage	Soil health and structure is damaged impacting on nutrient and sediment flow pathways as well as productive capacity of the soil in the future.	Stock class type Soil Type Crop type	<ul style="list-style-type: none"> • Heavier stock classes increase the risk of damage • Supplementary feeding areas and water troughs are not located in drier parts of the paddock • Soils that are not free draining are more at risk to damage and pugging and compaction • Crops with higher yields may mean animals are concentrated on a smaller area of crop which will increase risk • Crops are not established using minimum tillage or direct drilling to minimise soil structural damage
Cultural and Social Values	Your values or catchment values could be at risk from winter grazing activities.	Social Cultural	<ul style="list-style-type: none"> • Proximity to sites or areas that may be impacted by winter grazing or effects • Winter grazing in close proximity to sites or areas of cultural significance such as areas used for māhinga kai (traditional food gathering)
Animal Welfare	Animal health and wellbeing is compromised and limits the production of high value products.	Climate and shelter Feed and water Soil surface Transition to crop	<ul style="list-style-type: none"> • Limited provision of adequate shelter and a dry resting place (areas retained in grass, stand-off area, or an alternative paddock to move stock to when conditions are wet) • Temperature conditions are cold for significant lengths of time • Animals birthing in a winter crop paddock without stand-off area • Limited supply of good quality feed and non-convenient access to clean water • No use of Feed budgeting to ensure animals nutritional needs are being met • Limited soil surfaces that animals can comfortably lie down on and not excessively wet or muddy will reduce animal health risk • Transition time on and off a forage crop is curtailed
Human factors	People are a key part of the winter grazing system as they are required to make decisions and carry out tasks.	People	<ul style="list-style-type: none"> • No plan or lack of planning • Lack understanding or training for staff • Poor decision making

Risk Assessment for forage cropping



Blank templates can be found in **Our Plan** section

FC5

Example

Risk	Risk factors on your farm	Risk rating (High, Medium, Low)		
		Whole farm	Land Management Unit (LMU) or paddock (if applicable)	Name
		Name <i>Top block</i>	Name <i>Lower flats</i>	Name
Sediment and Phosphorus loss risks Sediment or phosphorus potentially entering waterways may cause excess algae growth, habitat loss other harm to freshwater health.	Slope risk	High	Low	
	Erosion potential risk	Medium	Low	
	Overland transport of sediment and nutrients risk	Medium	Low	
	Other risk			
Faecal microbe loss risks Contaminants, like pathogens such as <i>E. Coli</i> , potentially impacting on human health	Contamination of freshwater risk	Low	Medium	
	Other risk			
Nitrogen loss risks Nitrogen potentially entering waterways impacting freshwater health or drinking water quality	Nitrogen leaching risk	Low	High	
	Nitrogen sources risk	Medium	Medium	
	Other risk			
Soils damage risks Soil health and structure is damaged impacting on nutrient and sediment flow pathways as well as productive capabilities.	Stock class type risk	Medium	Medium	
	Soil Type risk	High	Medium	
	Crop type risk	Medium	Medium	
	Other risk			
Social or cultural values at risk Your values or catchment values at risk from your winter grazing activities.	Social risk	Low	Low	
	Cultural risk	Low	Low	
	Other risk			
Animal Welfare risks Animal health and wellbeing considerations	Temperature and shelter risk	High	Medium	
	Feed and water risk	Low	Low	
	Ground surface risk	Medium	Low	
	Other risk			
Human risks Risks created or increased by people (rather than risks to people) that may impact on winter forage cropping activities	Training and skills risk	Low	Low	
	Other risks			

Identify actions and mapping

Although grazing animals on a forage crop may create risks to animal welfare and the environment, the risk can be reduced by careful management. Follow the link on beeflambnz.com/wintergrazing for more information and resources on management of (winter) forage cropping systems to reduce the risks.

Strategic winter grazing uses a range of techniques to minimise sediment and nutrient loss. Research has shown that when used in combination, the techniques can reduce sediment loss by up to 80% when compared to more traditional winter grazing methods. Soil loss and structural damage can be reduced and will help keep valuable topsoil on your paddock. Strategic grazing usually involves grazing down the slope, (usually fences run across the slope starting with breaks at the top and then moving towards the bottom), regular back fencing and no grazing in critical source areas.

On your winter grazing maps it can be useful to draw arrows on the paddocks to indicate the way you will move the feed breakfences. Make sure you consider the slope and proximity to waterways and critical source areas.

Considerations for forage cropping, particularly in winter

- Plan early for stock class, animal welfare, access, biosecurity, and the use of catch crops – use a feed budget to work out appropriate crop type and area of crop.
- Record what you are doing and where. Make sure you share it with staff, contractors and anyone involved in winter grazing. This may be required as part of your compliance obligations with the Regional Council.
- Look after your stock – provide adequate feed, shelter, fresh clean water, and dry areas for suitable for resting and loafing
- Have a plan for adverse weather events such as a safe area to move stock to if heavy rain or snow is forecast
- Minimise excessive disturbance of wet soil by animals and machinery
- Steeper paddocks come with greater risks; do you really need to crop certain paddocks or the entire paddock?
- Consider proximity to waterways and gullies, as well as flood risks
- Soil type can determine the suitability of a paddock as well as impact productivity, nutrient loss and animal welfare
- The greater the risk of soil, phosphorus, or nitrogen loss, the smaller the animal you should be grazing on the paddock or the lower the stocking rate for heavier animals
- Keep stock out of waterways and Critical Source Areas
- Leave ungrazed buffer zones around Critical Source Areas
- Graze from the top down in sloping paddocks, and from the opposite end of a paddock to a waterway if present
- Use long and narrow breaks, particularly with cattle
- Back-fence to protect soils while allowing animals access to shelter in adverse weather events
- Allow soils time to dry sufficiently before cultivating
- Use a catch-crop where possible and practical, to reduce nutrient loss, minimise bare soil and increase feed production.



Action Plan for an Intensively Grazed Winter Forage Crops

Some paddocks and land areas will pose higher risks than others based on the characteristics of the topography, soil, and site. These are things that can't always be controlled but they can be managed so that the risks to freshwater, soil, human and animal health is lowered. It is usually best to address the higher risk factors first.

Table 6.2 has a range of risk factors, and actions that can be considered to reduce the risk rating. Use this table to help you fill out **Template IT1** in "Our Plan". (An example is filled out overleaf). Some of the common risk areas are in the table, where relevant you can use these to help address the risks on your farm. Add in the actions you identify to help address these risks and also any other risks and actions you identify. Fill in the other parts of the table such as location and time frame. The location can be all, or part of your farm, such as a paddock or land management unit. This will depend on the scale of your winter forage cropping and the detail you require.

You can find more information about management options for winter grazing at beeflambnz.com/farmplan



Table 6.2 Management options for winter grazed forage cropped areas

Risk area	Management goal	Actions or management options to consider
Sediment or phosphorus entering waterways	Slow the flow of water over the surface of exposed soils	<ul style="list-style-type: none"> • Maintain as much vegetation down slope as possible. This could include the use of strategic directional grazing moving breaks from top of paddock down the slope with long-narrow feed breaks • Cropping on less steep areas - , if it is too steep for a tractor, then it is too steep for stock on a winter crop
	Reduce the likelihood of contaminants entering waterways	<ul style="list-style-type: none"> • Buffer strips established within paddock to slow the flow of water and trap sediment and nutrients • Riparian buffer strips or ungrazed areas established around Critical Source Areas and waterways (note this must be 5m width for waterways) • Sowing of crops along, rather than up and down, the slope of the paddock where safe to do so • Sediment is prevented from entering larger waterbody via sediment trap/dam • Start grazing at in areas of a paddock that are the least risk to waterways (often this will mean starting grazing in areas furthest from waterways)
	Reduce the time and extent of bare soil exposed to stock and the elements	<ul style="list-style-type: none"> • Regularly back-fence to reduce the stock impact on bare soil • Use of direct drilling or minimum till cultivation • Re-sow the paddock as soon as is it practical to do so (based on weather and soil moisture levels). • Leave Critical Source Areas uncropped and ungrazed wherever possible • Leave some residual crop after grazing where practical
Faecal microbes contaminating waterways and impacting on human and animal health	Stock have limited or no access to waterways or contaminant transport pathways	<ul style="list-style-type: none"> • Stock are excluded from waterways by a 5m vegetated buffer. • Stock water reticulation system operating effectively and efficiently • Balage/feed sites where stock tend to congregate are away from waterways and critical source areas
Nitrogen entering waterways (either directly or indirectly via groundwater)	Record and estimate/calculate the inputs, utilisation, and losses of nutrients from the farming system	<ul style="list-style-type: none"> • Use of nutrient modelling tool to understand and manage nitrogen losses occurring on-farm • Soil nutrient status is used to guide post- grazing plant nutrient requirements and fertiliser application.
	Low Nitrogen Feeds	<ul style="list-style-type: none"> • Use of a low-N feed such as a fodder beet crop (note that the management benefit can be lost if high yields are used to increase stock density) • Use of supplementary feeds with low Nitrogen (like Grass Silage) to reduce the overall content of Nitrogen in the diet, and thus urine
	Utilise excess nutrients	<ul style="list-style-type: none"> • Establishment of a 'catch crop' to soak up excess nutrients remaining in soil • For heavier soils, fallow periods are kept to a minimum
	Limit risk of nutrient concentration transport via above or below ground drainage	<ul style="list-style-type: none"> • Exclude stock from drains • Avoid grazing cattle in paddocks with tile or mole drains and if this is done, limit grazing to lower stock classes and total stocking units
	Avoid high risk areas or soil types	<ul style="list-style-type: none"> • Avoid grazing cattle on stony soils or limit grazing to lower stock classes and total stocking units


Risk area	Management goal	Actions or management options to consider
Soil health and structure	Limit stock movements and concentration	<ul style="list-style-type: none"> • Portable troughs and reticulated water system for clean stock drinking water • Back-fencing behind sheep and cattle, especially cattle • Paddock has multiple entry/exit points to prevent stock congregation around one gateway
	Limit heavy machinery use on fragile soils	<ul style="list-style-type: none"> • Place baleage/additional feed in paddock before it is too wet to access
	Reduce structural damage risk to soils	<ul style="list-style-type: none"> • Stock can be moved to an alternative area, such as a run-off block or laneway, to prevent damage to soil or animal health during storm events • Rotate paddocks that are being winter grazed so that the same area is not pugged year after year • Exclude stock from steep or erosion prone parts of a paddock, as stock presence is likely to cause extensive soil damage and more erosion. This is especially the case for deer.
	Minimise fence pacing and wallowing by deer	<ul style="list-style-type: none"> • Provide a 'safe' wallow that is not connected to a waterway • Have weaner deer in a paddock out of line-of sight of hinds to reduce fence pacing • Provide shelter to reduce fence pacing
Cultural and social values	Social	<ul style="list-style-type: none"> • Awareness of locations that are socially important in the community that are in close proximity to winter forage crop activities
	Cultural	<ul style="list-style-type: none"> • Be aware of sites or locations of cultural significance that may be affected by winter grazing activities and manage potential impacts
Animal Welfare	Animals are transitioned onto crops well and have appropriate feed and shelter	<ul style="list-style-type: none"> • Stock are given required time and space to safely adjust their diet to the crop • Stock have sufficient feed allocation though good feed budgeting. • Animals have protection from adverse weather (like storms) • Stock are able to lie down and rest comfortably for sufficient periods to meet their behavioural needs. • Stock have access to sufficient supply of clean drinking water
Human factors	Appropriate training, knowledge and equipment	<ul style="list-style-type: none"> • Give appropriate training to staff • Have effective communication with all people involved with winter grazing • Make sure you stay updated with current regulatory requirements and latest information • Keep equipment well serviced

Action Plan for Intensively Grazed Winter Forage Crops

IT1

Example

Identified Risks from winter grazing	Action to address risk	Location, Land Management Unit or paddock	Timeframe or date implemented	Person responsible	Others involved	Budget	Priority (Low, Medium, High)	Evidence of completion and storage location e.g. photo	Date completed
Sediment and Phosphorus loss	Moving breaks from top of paddock down the slope with long-narrow feed breaks	Top Block	June 2021 - ongoing	Manager	Staff		High	Photo stored in 'winter grazing' in Environment folder on desktop	
Faecal microbe loss	Not cropping the CSA at the bottom of the hill and leaving a 5m buffer strip	Whole farm	June 2021 - ongoing	Manager	Staff		High	Photo stored in 'winter grazing' in Environment folder on desktop	
Nitrogen loss	Use of nutrient modelling tool to understand and manage nitrogen losses occurring on-farm	Lower flats	Jan 2021	Manager	Fertiliser Rep	\$800	High	OVERSEER nutrient file link and summary stored in 'winter grazing' in Environment folder on desktop	Feb 2021
	Sowing a catch crop to soak up excess nutrients remaining in soil	Lower flats	Sept 2021		Contractor		Medium		December 2021
Loss of soil structure and soil health	Back-fencing regularly behind sheep and cattle	Whole farm	August 2021	Staff	Staff		Medium	Notes in diary	
Cultural and social risks	Check with catchment group for sensitive sites close by	Whole farm	March 2021	Manager	Staff		Medium	Email to catchment group	June 2021
Animal welfare risks	Stock are transitioned properly Animals have protection from adverse weather events Stock are able to lie down and rest comfortably Feed requirements are calculated with a feed budget	Whole farm	September 2020	Manager	All staff		High	Notes in diary	October 2021
Human risks	All staff to attend B+LNZ wintering workshop and weekly farm meetings to discuss winter grazing progress and issues	Whole farm	June 2021 - ongoing	All staff	All staff		Medium	Notes in diary	
Other		High	Feb 2021 - ongoing weekly						

 Blank templates can be found in **Our Plan** section

Paddock winter forage cropping plan

Include a representative paddock scale map that will show how you intend to graze your paddocks. Choose a paddock that is representative of the characteristics and risks you will have in your winter grazing paddocks and fill out **Template FC6** in "Our Plan". An example is given below. Depending on the extent of your winter cropping activities you may need to show more than one paddock plan.

Winter grazing paddock plan template

FC6

Example

On your paddock map draw on or indicate:

Physical features of this paddock		Action plan for this paddock	
Feature	Key (symbol)	Feature	Key (symbol)
Fences and gates		Cultivation direction	
Slope direction		Grazing direction (which way the breaks will move)	
Waterways and drains		Areas not grazed	
Critical source areas		Buffer areas around waterways and critical source areas	
Waterlines and troughs		Other (such as backfences or reserve areas)	
Shelter		Other	

Notes

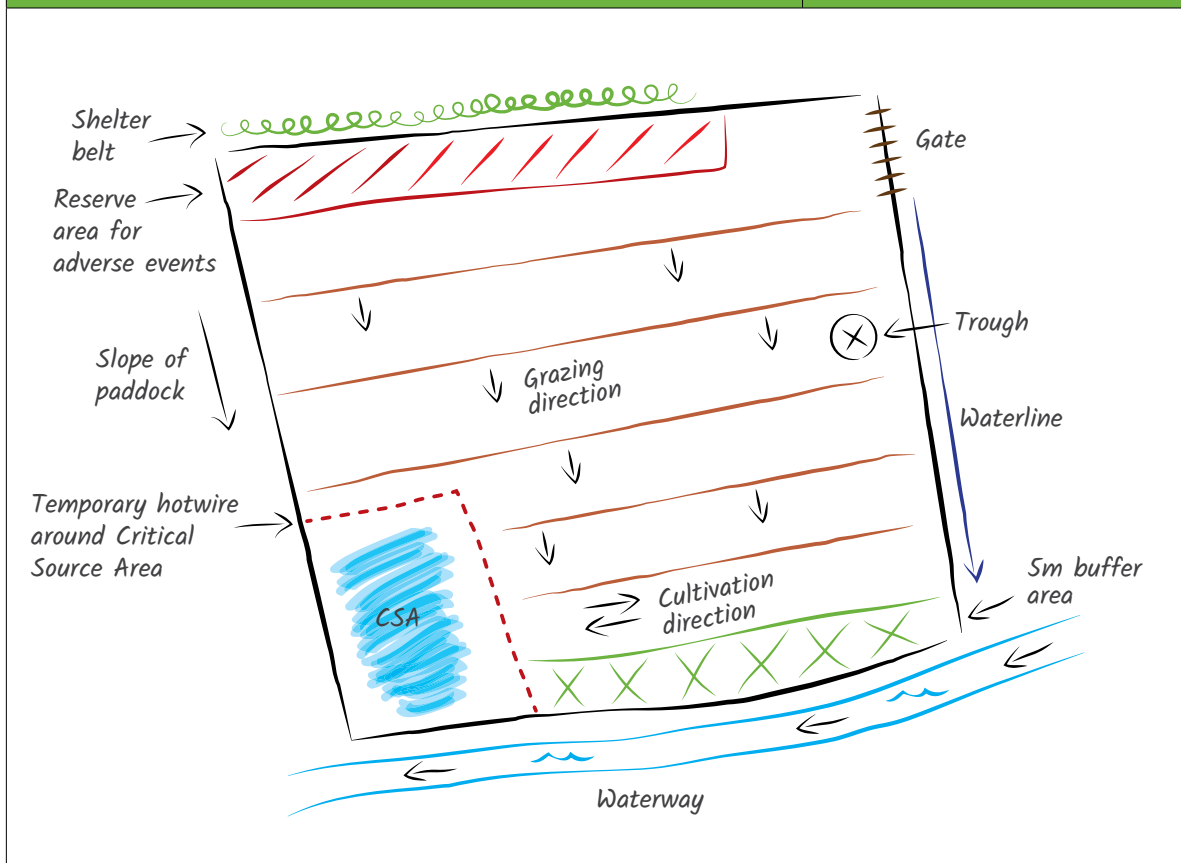
- Cultivate across slope
- 3 days feed in reserve area
- No grazing or cultivation in CSA
- Direct drilled crop
- Start grazing at top of slope and move to bottom
- Will use portable trough and regular back fencing

Paddock name or number:

21

Date:

1 February 2021



Blank templates can be found in **Our Plan** section

Adverse weather plan

We can't predict the future, but we can plan for it. During winter there are usually some particularly bad weather events, either storms, cold weather and snow or high rainfall events. There is a need to have a contingency plan for cold weather and storm events as these may have a large impact on the environment and animals. Typically this includes planning to allow more feed and shelter for stock, and where possible options to keep stock further away from waterways or wet areas and put them in areas less prone to mud.

Some actions you may consider using during adverse events are:

- Feed an area of crop saved in a drier, lower risk part of the paddock, or a different paddock further away from waterways, preferably with some shelter such as a shelter belt. This will help keep water ways and critical source areas protected.
- Use races/laneways, yards, rough grass areas away from waterways as stand-off areas for animals.
- Utilise tree blocks that have a lower risk of environmental losses and provide shelter.
- Budget more feed as stock will require more feed to stay warm. Allow for an extra 10% above usual winter intake during cold and wet conditions.
- Consider offering larger breaks with several days allowance at once.
- Grass support block paddocks can be used when the weather is poor, and there are options to utilise feed supplements while on these areas.
- Get livestock to sheltered areas with reticulated drinking water available whenever possible.

In **Template FC7** in “Our Plan” (example below) note down what plans you have in place to identify when stock should be moved to an alternative location, what and where this area is, and any other actions you may take to reduce the risk to soil or animal health if there is a serious storm or adverse weather event.

Adverse weather event planning

FC7

Example

	Location or area that stock will go to	Feed type and allocation	Number of days of feed budgeted for adverse events	Preparation before winter	Conditions when stock will return to regular winter grazing
If there is an adverse (large) rainfall event	<i>Will move animals to grass area next to yards</i>	<i>Baleage put next to yards Have enough for ad lib feeding.</i>	<i>14 days</i>	<i>Place bales next to yards</i>	<i>When rain stops and waterways have lowered levels, paddock has no surface water</i>
If there is an adverse (very cold) storm event	<i>As above but if a large snow event also have tree block available to put stock in.</i>	<i>As above. Also have bales in reserve if have to feed in tree block</i>	<i>As above</i>	<i>As above</i>	<i>When storm is over and paddock is not too wet and waterways levels dropped/snow cleared.</i>



Blank templates can be found in **Our Plan** section

Monitoring and review

Throughout the season it is important to monitor your forage cropping, particularly over the grazing period. This will be important for all types of forage cropping systems. If you monitor during the season you can make adjustments where necessary to reduce the risks. You can use this information to refine your forage cropping system in future seasons. If you are winter forage crop grazing make sure you are familiar with your local regional council requirements as in some situations you may need to let them know of any issues or changes to your plan.

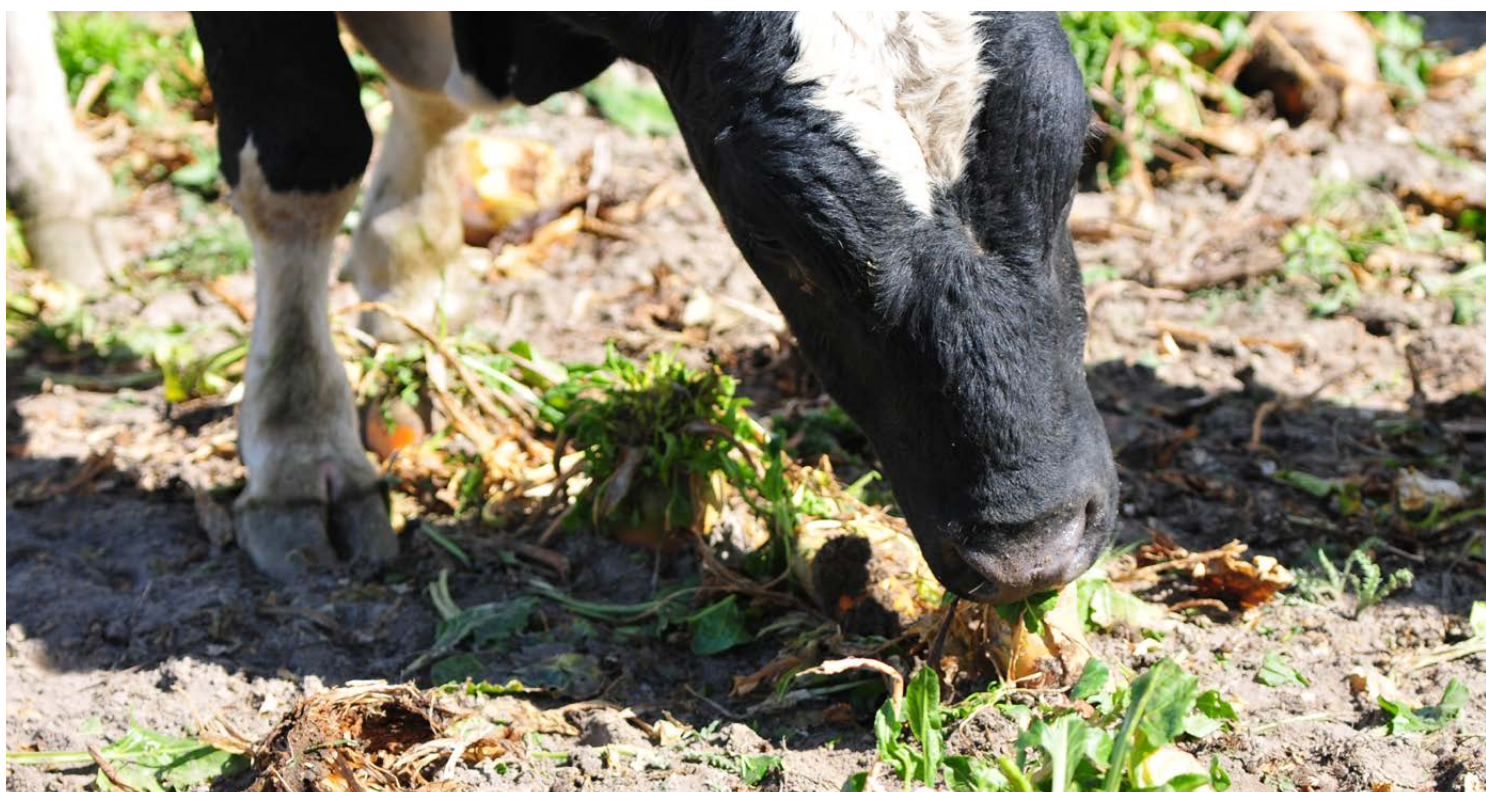
At the end of the season or cropping period it is important to reflect and review on:

- 1) What worked well
- 2) Areas that need improvement
- 3) Things that you learned over the cropping period or action that you will implement next season.


Taking photos can be a useful way to record observations in the field. If possible take some representative photos with the location recorded (geolocated- using the GPS in your mobile phone, or location noted in a diary). This will help show the good management actions that you are using to reduce the risk of contaminant losses. Photos can also serve as a reminder of things that need to be improved.

Taking some photos before the forage crop is grazed, some during and some after grazing will help keep a record of the winter forage crop grazing.

Fill out **Template FC8** in “Our Plan” or use the questions to help record your observations from over the forage cropping season. Use this information in future years to help refine your grazing management and forage crop grazing plan. An example of FC8 is given below.



	Yes/ No	Notes
Was the paddock sown to plan?	Yes	Left Critical Source Areas uncultivated
Was the paddock grazed to plan?	Yes	Grazed, top to bottom and away from Critical Source Areas
Were you able to avoid significant pugging in the paddock(s)?	Yes	Paddock 15 got too wet. Moved animals into next paddock which was drier underfoot, put animals back into 15 when it dried out
Do you have some photos of the forage cropping paddocks before, during and after grazing?	Yes	A before, during and after picture for each paddock saved on computer in "Winter photos" folder
Do you have locations recorded for each photo e.g. geolocated with GPS on mobile phone camera?	Yes	Locations of photos taken in mobile phone with GPS enabled. Also noted in farm diary where each photo taken
Have you saved photos in a place you can easily access?	Yes	Saved on computer in "Winter photos" folder
Have you taken some notes over the forage cropping season?	Yes	Noted comments in farm diary and asked staff to report back too.
Did you need to action your adverse weather event plan for extreme weather?	Yes	Large snow event, actioned adverse weather plan when I heard the forecast. Moved stock to near yards, where there was long grass area and baleage
Did you have sufficient feed and area allocated for your adverse weather plan?	Yes	Allowed for more feed during the cold
Did you sow any catch crops?	Yes	Put in on stony lower flats paddocks that were dry enough to sow catch crop with direct drilling. Too wet on other paddocks in top block
Based on your check, at the end of the season or cropping period it's important to reflect and review on:		
1) What worked well		
<ul style="list-style-type: none"> • Adverse event area worked well, kept stock happy and warm in the snowstorm. It also reduced the pugging. • Non cultivation of critical source areas worked well, just need to work with contractor to make sure right areas left unsprayed and uncultivated. • Top to bottom grazing- worked well and looked like less pugging at end of winter, just need to make sure that had portable troughs for water 		
2) Areas that need improvement		
<ul style="list-style-type: none"> • Back fencing more regularly- need to talk with staff • Getting the baleage and supplements in the right place before winter • Have more portable troughs for water so will make it easier to backfence • Planning earlier 		
3) Things that you learnt over the cropping period or action that you will implement next season?		
<ul style="list-style-type: none"> • Planning winter grazing earlier next season • Adverse event planning made it easier as I had the feed and areas ready-to-go • Will reserve some crop in dry parts of wintering paddocks and use if very wet and then save area next to yards if more shelter needed for animals 		

 Blank templates can be found in **Our Plan** section

