

Planning for winter

Best options for deer and their environment

What does good look like?

Done well, winter forage cropping and supplementary feeding will:

- Meet the nutrition and welfare needs of stock
- Protect soils from damage by compaction and pugging
- Ensure minimal loss of sediment, nutrients and bacteria to waterways
- Comply with regional council rules and national environmental and animal welfare regulations.

The benefits include:

- Healthy, productive deer
- Healthy, productive soils
- Healthy, productive pastures
- Healthy streams and wetlands
- Responsible compliant management.



Fodder beet may provide much higher yields than other fodder crops, but what does this mean environmentally?

How much of the farm should I crop?

The area of winter crop you need depends on your farm and farming system. Basically, the smaller the cropped area, the lower the cost of establishing the crop and the lower the environmental risk during grazing.

But not always. Fodder beet, because of its potentially high yields, may allow the area cultivated for crop to be reduced. But if this means wintering the same number of animals on the smaller area for longer, there may be a greater environmental risk. See the next page for ways to mitigate this.

On farms where soil fertility is high and little of the pasture needs to be renewed, all-grass wintering may be an option. However it does make the farm dependent on having good pasture growth in late spring and summer so that sufficient baleage/hay/silage can be harvested and stored for winter.

Factors to take into account when all-grass wintering include:

- To minimise soil compaction and soil damage could baleage be located in the feeding out areas before winter?
- Is self-feeding silage an option? If so, where would be the most suitable place logistically and environmentally to locate the pit and feedpad?



Yearling hinds being wintered on baleage. Flat, well-drained paddocks like this pose less risk of the overland flow of run-off than sloping land. But they may be more prone to N leaching

Photo: Jamie Ward

Getting it right from the get-go

Intensive winter feeding has become controversial. New regulations and rules have been introduced in response to public concerns and the science about its effects on the welfare of stock and the environment.

These regulations and rules had not been finalised when this *Deer Fact* was drafted. So this publication deals with the principles that need to be considered when planning intensive winter feeding on a deer farm.

The most important of these is to actively plan your winter cropping and feeding programme well ahead. Before drafting your plan, it may help to ask yourself the following questions:

- How much crop do I really need?
- Are there alternatives to cropping?
- Could I indoor winter my velvet stags and heavier breeding animals?
- Could I winter my velvet stags and heavier breeding

animals on a feed pad, in a mature forestry block or in a barn?

- Could I cut and carry forage such as fodder beet to the deer?
- What is the best paddock for the crop, environmentally and practically?
- What is the best crop for the paddock? High yields are important, but what will be the environmental effects?
- Do I still need to replace run-out pastures via a winter crop? Could I go grass to grass? Or grass to summer forage or grain crop, to grass?
- Where will I move the deer if a weather bomb hits?
- Have I taken animal welfare into account?
- What are the rules relating to winter cropping, feed pads and sacrifice paddocks in my region?

Read this *Deer Fact* in conjunction with the *Deer Fact*, 'Intensive winter feeding: minimising the environmental risk'.

Select a paddock

Winter crops and feeding-out areas need to be in paddocks where the risks of stream pollution and soil erosion can be managed during winter storms and prolonged periods of wet weather. If the slope is greater than 10 degrees, a low-slope assessment and a resource consent may be required. Paddocks due for pasture renewal are often selected. But is the risk of sediment run-off too great? Is grass-to-grass an option for renewal? Or via a spring-sown summer crop?

- Avoid cropping or feeding out in steep paddocks, near waterways or on soils that are prone to pugging
- Minimise soil disturbance, especially on hills. Direct drill or strip till rather than cultivate
- Select paddocks that are free draining (if N is not an issue)
- Have a wide buffer of pasture or rank grass between the crop and the nearest waterway or Critical Source Area.

Catchment considerations

Consider catchment-specific water quality issues when selecting paddocks for intensive winter feeding.

- If N is an issue in the catchment, avoid cropping free-draining soils where nitrogen may leach into groundwater during feeding. Or consider lifting/cutting the crop and feeding it elsewhere
- P and sediment loss are major issues on farmed hill country. Avoid using paddocks where it will be difficult to prevent sediment flowing into waterways during prolonged wet weather. Where these paddocks are used consider using a series of mitigations (filter strips, bunds, grazing direction) and remedial actions (sediment traps, detainment bunds).

Flat, well-drained paddocks pose less risk than sloping land of the overland flow of run-off. But they may be more prone to N leaching.

Critical source areas and waterways

Avoid, if possible, intensive winter feeding in paddocks with large or multiple Critical Source Areas (CSAs) that may pose too many environmental risks and be difficult to manage.

CSAs include ephemeral waterways (ones that appear in wet weather), swales, gullies or seeps. Because these are likely to be the source of sediment on a deer farm, they should not be cropped or grazed during winter.



The importance of fencing ephemeral waterways in intensively-grazed paddocks is clearly demonstrated on this CNI deer farm

Photo: Phil Stewart

Create buffer strips (areas that are not cultivated) along the edges of CSAs and waterways. The steeper the paddock the wider the buffer strips need to be. On flat land they need to be at least 5 metres back and on slopes, up to 15 metres back, depending on how steep the slopes are.

Treat the rules for your region as a minimum requirement for preventing run-off into waterways.

If you graze CSAs in summer, leave enough grass (a sward of 10–15 cm) to capture overland flow from the crop in winter. Fence CSAs off with either electric or permanent fences before grazing the crop.

Even under the best management, there is always some sediment run-off during the winter wet. To reduce the effect this has on water quality, build and maintain sediment traps, ponds, bunds and artificial wetlands where sediment can settle before it reaches a stream.

More? See the *Deer Fact*, 'Protecting waterways from wallow and feed pad run-off'.

Crop selection and establishment

Soil-test crop paddocks so you know how much fertiliser to apply.

Drill starter fertiliser (DAP or other phosphate-based fertilisers) close to the seed if possible rather than broadcasting – this reduces the amount of fertiliser needed. Also, there is less risk of it being washed off by heavy rain.



Strip tilling a paddock before sowing fodder beet

Arable land

Consider the pros and cons of each crop type.

Fodder beet will produce a lot of dry matter but may be more environmentally risky on sloping ground than kale, because animals may be feeding on it for longer. Consider lifting it and feeding it in a less sensitive area.

To maintain soil structure and reduce the risk of wind and water erosion, consider using strip tillage when growing fodder beet. Strip tillage involves cultivating only those strips where the crop will be sown, after first spraying out pasture or weeds.

Kale has a fibrous root system that remains in the ground and lowers the risk of pugging or soil loss. On the downside, the roots of kale can penetrate and block sub-surface tile and Novaflo drains.

Hills and sloping land

Sow crops across the hill rather than top to bottom. The crop rows will act as mini buffers to water flow. Where crops are drilled up/down the slope, water flow can create channels that speed the flow of run-off down the hill, causing erosion.

Avoid sowing bulb crops like turnips on sloping land, as deer

dislodge them when feeding, potentially increasing soil loss. Rape and kale are better options.

Consider:

- How the crop will be established: no-till systems pose the least risk of soil loss
- What animals will be grazing the paddock: if a paddock is too steep to get a tractor on, it might be too steep for wintering velvetting stags or mature wapiti/elk
- How the paddock will be grazed.

See the *Deer Fact*, 'Intensive winter feeding: minimising the environmental risk' for advice on winter grazing management in forage crops and sacrifice paddocks.

Animal welfare

The welfare of deer during winter is not normally an issue. Experienced deer farmers are well aware of the importance of providing deer with adequate feed and good shelter.

However it is important, when drawing up your winter feeding plan, to consider animal welfare. In 2020, the farmer-led Winter Grazing Action Group came up with an 'Expectations Document' that lists seven outcomes farmers must aim to achieve:

1. We ensure our animals give birth in the right environment
2. We are prepared for all weather conditions
3. Our animals can easily access acceptable drinking water
4. We plan for successful winter feeding
5. Our animals can lie down comfortably
6. We work together to provide care to our animals during winter
7. We find opportunities to improve.

All these desired outcomes, apart from the first (because of the timing of fawning), apply to winter management on deer farms. Probably the most important is to be prepared for all weather conditions.

Have a contingency plan that identifies where you will move your deer if the proposed crop or feeding area is subject to severe weather or flooding. It needs to be a sheltered paddock where your deer can be fed and lie down, away from ponded water or mud.

See www.bit.ly/3mCRISP for more information.

Protecting soils

Water quality and animal welfare rules emphasise the importance of avoiding pugging of pastures during winter. Pugging damages soils and can greatly reduce pasture production. Sub-soils become compacted, leading to reduced pasture root activity, less clover, more weeds, fewer earthworms, less nutrient recycling and long-term damage to the soil structure.

The wetter a soil, the weaker it becomes and the less it's able to withstand compaction and pugging. This weakness varies with soil type. In pugged soils, the top 4 cm to 8 cm acts as a seal and prevents further rain from dispersing through the soil. On hill paddocks, the topsoil can form a wet slurry which flows downhill in heavy rain.

Post-winter catch crops

It is important, if your wintering plan includes intensive feeding of supplements on sacrifice paddocks, to plan for the renovation of these pastures afterwards. Options include sowing a catch crop or establishing a summer fodder crop.

In locations where N leaching is an issue, catch cropping is an effective way to capture and utilise the nutrients that



A triticale catch crop being harvested for silage on the West Coast

remain after intensive winter feeding.

After grazing, as soon soil conditions allow, sow a cool-tolerant grain crop such as oats, ryecorn or triticale. These can be harvested in summer for silage or, in drier regions, harvested as grain.

Factors to consider:

- Does the paddock have free-draining soils that can be cultivated and sown in early spring?
- If weeds are likely to be a major issue, how will you manage them?
- Is the soil likely to be friable enough for direct drilling? If not, some cultivation will be needed to loosen the subsoil and ensure good germination
- Catch crops remove moisture from the soil. On dryland this may compromise the establishment of subsequent winter crops.

Other wintering systems

To reduce feed wastage and protect wet paddocks from hoof damage by heavier animals, a growing number of farmers are winter feeding stags and/or hinds on feed pads, self-feeding silage stacks or indoors.

This allows precious saved autumn pasture to be reserved for weaners in order to maximise their growth during winter and into early spring.

Feed pads

Self-feed silage stacks in trees or other sheltered sites can be successful if they are well managed.

Feed pads need good surrounding shelter and space where deer can rest that is relatively dry. Unroofed feed pads can generate a lot of run-off that needs to be directed into sediment traps and/or ponds where the contaminants can be captured before they reach a waterway.

See the *Deer Fact* 'Protecting waterways from wallow and feed pad run-off' for more information.

Indoor wintering

Some farmers have converted former hay barns, woolsheds and other buildings into successful wintering barns for velvetting stags and larger mature breeding animals.

Because deer wintered indoors do not generate large volumes of urine and wet manure when being fed

baleage and some grain, these barns do not normally produce liquid effluent.

For marketing reasons, weaners and young deer intended for Cervena® venison must not be housed. This means they must be principally fed on grass (including baleage, hay and silage) and have access to pasture at all times. This must be confirmed by farmers on the Animal Status Declaration when sending Cervena deer for slaughter.

The Deer Code of Welfare (2018) lays out specific minimum standards and recommended best practices for indoor wintering including pen density, minimum light, water and feeding requirements etc.

See www.bit.ly/Deer-Welfare-Code for more information.

Sediment ponds

Sediment ponds or detainment bunds placed downstream of wintering areas can help capture sediment and some P particles from run-off during storms and prolonged wet weather.

Sediment and P need time to settle out. To achieve this, sediment ponds need to have a storage to catchment



Downstream detainment bunds can do a great job of preventing run-off sediment from contaminating waterways

ratio of not less than 100:1 – in other words, 100 cubic metres of temporary pond storage for each hectare of contributing catchment.

Two or three-pond systems have been shown to work well on deer farms. Unlike wetlands, sediment ponds should be designed so the sediment can be cleaned out and spread back on paddocks in summer.

For more information, see:

- *Deer Fact 'Protecting waterways from wallow and feedpad run-off'*
- *Using detainment bunds for mitigating diffuse-source phosphorus and soil losses*, www.bit.ly/DetainBunds

More >>

Deer Code of Welfare: www.bit.ly/Deer-Welfare-Code

Winter Grazing Action Group, Expected Animal Welfare Outcomes: www.bit.ly/3mCRISP

DINZ Deer Facts

www.deernz.org

Effective nutrient management on deer farms

Fence-pacing: costs and solutions

Intensive winter feeding: minimising the environmental risk

Protecting waterways from wallow and feed pad run-off

DINZ website

www.deernz.org

The NZ Deer Industry Environmental Management Code of Practice

Beef + Lamb NZ Fact sheets

Preparing for winter grazing:

www.beeflambnz.com/wintergrazing/pre-grazing

Feed planning in a tough winter:

www.bit.ly/ToughWinter

Research

Using detainment bunds for mitigating diffuse-source phosphorus and soil losses: www.bit.ly/DetainBunds

Videos

Best Environmental Practice on Canterbury Deer Farms

– 5 videos, NZ Landcare Trust,
www.bit.ly/DEER_ENV_VIDEOS