The Basics and Benefits of Bale Grazing

Benefits of Bale Grazing Beef Cows

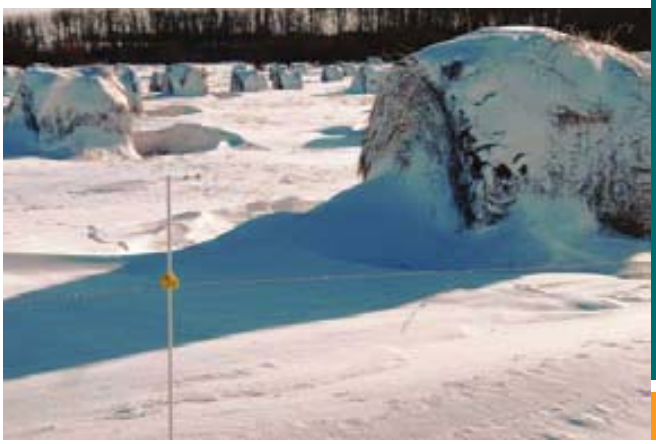
Bale grazing beef cattle during Manitoba's long winters can save producers time, effort and money and, with proper management, reduce environmental risk.

Bale grazing involves setting a large number of feed bales out in the fall and regulating the cows' feed intake using electric fencing. Producers move cows to a new set of bales in two-to-five-day rotations. To ensure all cows have equal access to the feed, a minimum of two days of feed per move is needed. The longer the rotation cycle, the more feed is lost as a feed source on the field.

While bale grazing does reduce the amount of manure concentrated in a confined feeding area, nutrient management is still necessary. Producers should adopt management practices that maximize benefits and minimize risks on bale-grazed fields.

Benefits of Bale Grazing

- animals feed themselves
- tractor wear and tear is reduced as tractor use is concentrated to one period in fall when bales are placed
- operating costs are lowered
- less manure to manage in the corral means lower haul-out costs and reduced greenhouse gas emissions from manure piles/packs and diesel burning
- less wear and tear on corral fencing
- land fertility is improved
- manure nutrients are spread out and increase future forage production
- residual feed conserves soil moisture
- chore time is reduced



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Getting Started

The number of cows you are feeding and the length of time are used to calculate the amount of land and the number of bales required for bale grazing.

Calculations:

# of cows X cow's weight X dry matter (DM) intake per day % X feeding period (number of days) = feed (dry matter) needed

$$\frac{\text{amount of feed (DM) needed}}{\text{feed dry matter \%}} = \text{feed needed (as-fed)}$$

$$\frac{\text{feed needed (as-fed)}}{\text{bale weight}} = \text{bales needed}$$

Note: The amount of dry matter/feed needed will be 2.5 per cent to three per cent of each cow's bodyweight. The amount of feed waste can be up to 20 per cent of the feed needed and must be included in the calculations.

Example:

You have 200 cows, each weighing 1,400 pounds (635 kilograms). Daily dry matter/feed intake is 2.7 per cent of cow's body weight and the feeding period is October to December (92 days). The bales are 1,200 pounds (544 kilograms) each and the feed is 85 per cent dry matter.

200 X 1,400 lb (635 kg) X 0.027 per day X 92 days = 695,520 lb (315,488 kg) DM

$$\frac{\text{695,520 lb (315,488 kg)}}{\text{0.85 DM}} = \text{818,259 lb (371,162 kg) as fed}$$

$$\frac{\text{818,259 lb (371,162 kg) as fed}}{\text{1200 lb bale}} = \text{682 bales}$$

*Remember to allow for feed waste. See calculation below.

682 bales X 20% = 136 bales in addition to the 682 bales calculated may be needed for feed wastage.

Locating the Bales

When bale grazing, producers have the option of placing bales on annual cropland, seeded perennial forages, or native prairie.

Seeded perennial fields are preferred for bale grazing and should have at least one rhizomatous grass species present (smooth bromegrass, quackgrass , Kentucky bluegrass). If, after grazing, a relatively thick layer of residual material remains where bales were placed, these grasses have a greater chance of growing through the layer and filling in from new shoots produced by their rhizomes. On fields dominated with bunchgrass species (crested wheatgrass, meadow bromegrass, Russian wild ryegrass) there is greater potential for "dead spots" and weed growth where bales were placed.

Bale grazing on native prairie sites should be used with caution and is generally not recommended because these species do not usually respond to elevated soil nutrient levels as tame species. Bale grazing may also create the conditions for an otherwise avoidable invasion of tame species into the native stands.

As bale feeding tends to concentrate manure around the feeding area, it is not appropriate to set the bales in a field drainage swale or area of the field that normally allows the field to drain during spring melt. Bales should be located in a manner which lessens the possibility of transportation of nutrients off the property.

Bale Grazing Nutrient Management

Producers should anticipate the need for more intensive management of bale grazing sites in order to control long-term soil nutrient build-up. Nutrients are imported to a bale grazing field at relatively high rates in the form of feed and are exported from the field at very low rates in the form of animal weight-gain. The nutrients that are left behind increase the fertility of the field but can lead to localized areas of excess nutrient accumulation in the soil. Although pasture productivity can benefit from additional nutrients, the lack of uniform distribution of the nutrients is a concern. The nutrients left behind from bale grazing will tend to be concentrated in the immediate vicinity of the bales as waste feed, feces and urine. Producers need to intensify their management to address localized "hot spots" of nutrient accumulation in order to minimize environmental risk.

Addressing this risk will also lead to greater agronomic benefits as pasture fertility is improved throughout a producer's land base. Management practices that should be adopted include:

- Careful site selection
- Employing a reasonable density of bales
- Building or using existing fencing, shelter and watering site placement to control movement of livestock
- Using portable windbreaks where insufficient natural wind protection is available
- Regular movement of cattle to facilitate more uniform distribution of manure and urine.

- Rotation of fields to allow recovery of any damaged standing crop and draw down soil nutrient levels with subsequent crops
- Soil testing

Selecting suitable sites based on soil and landscape characteristics will reduce the risk of nutrient loss to the environment from leaching and runoff. Producers should avoid or more carefully manage bale grazing on very coarse textured soils in which water drains downward quickly as excess nutrients can be carried with the water and enter groundwater. Similarly, sloping lands as well as very fine textured or dense soils on which water runs off the surface need to be managed to ensure that manure contaminated water does not enter a surface watercourse. Compaction of soil caused by cattle traffic also promotes surface runoff. Parts of the landscape with consistently high water tables should be avoided.

Annual soil testing will provide producers with the soil nutrient status of their bale grazing sites and ensure that nutrient build-up does not become excessive. When soil is sampled, the management history of the site should be taken into account and areas where cattle have tended to congregate in the past should be sampled separately from areas of historically low livestock density. Samples should be analyzed for nitrate-nitrogen and phosphorus in the 0 to 6 in. (0 to 15 cm) depth and for nitrate-nitrogen in the 6 to 24 in. (15 to 60 cm) depth.

The Livestock Manure and Mortalities Management Regulation prohibits pollution of ground and surface water by manure and escape of manure from a property. Therefore, the proximity to waterways, natural habitats and wildlife migration paths should all be considered when setting up a bale grazing site. Locate livestock waterers so manure that may accumulate cannot contaminate watercourses. Cattle should be kept off stream banks and out of water sources with either portable or permanent fencing and an alternative water source should be provided. When surface water bodies (dugouts, sloughs) are used as a water source, pumping to a winterized system is recommended to minimize the risk of cattle falling through the ice. These systems also reduce the potential for manure and nutrient contamination of the water source.

When possible, avoid the natural shelter of riparian areas. If riparian and upland wooded areas have to be used, limit access with fencing to prevent damage to trees and to avoid excess nutrient accumulation.

In locations with high populations of big game, it may not be possible to leave bales unprotected in a field during winter due to consumption and fouling of feed by wildlife. In these situations, one option may be limiting bale grazing to early winter or choosing a less traveled area.

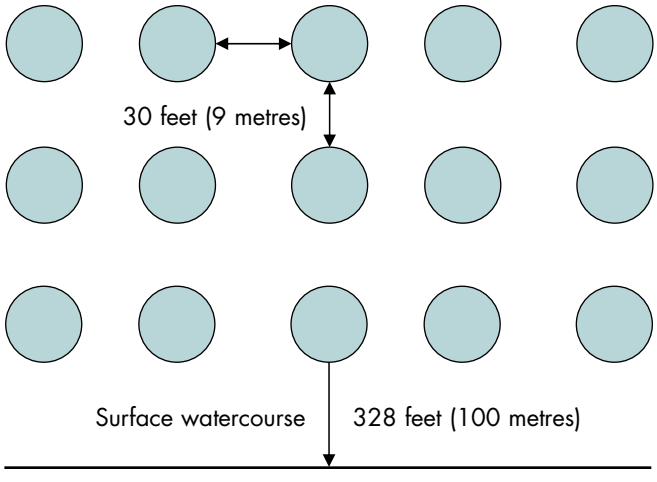
Producers choosing to use bale grazing as a management practice must be aware that under the *Wildlife Damage Compensation Regulation* they will not be eligible for compensation. Producers must weigh the economic benefit of this management practice against potential forage losses due wildlife damage.

For more information see the MAFRI fact sheet: *Livestock Wintering: Locating and managing your site to make it more sustainable.*

Setting the Bales

- Place bales with sisal twine on their sides, because it will rot.
- Place bales with plastic twine on their ends, so the twine can be removed in the fall before feeding.
- Provide shelter around the feeding area with trees or portable wind breaks.
- To prevent animals breaking through to the next set of bales, use an extra lead wire for the fencing or use a double wire (hot wire on top and second wire connected to a good ground source).
- Snow is a good insulator. If there is a lot of snow, a single wire will not produce an effective electrical current to keep the animals inside the fence.
- A high output energizer and wire combination is a better choice than string or tape.
- Fiberglass rods or rebar speared into bales is an easy alternative to drilling or driving posts into the ground.
- Place bales on a grid of 40 ft centers (Leaving 30 to 35 feet (9 to 10 metres) between the bales, to allow uniform manure nutrient coverage).
- Wire should be placed between the rows to ease the animals' movement for the next feeding.
- The bale grazing area must be 328 feet (100 metres) from a surface watercourse, sinkhole, spring or well. (See Figure 1)
- Set bale grazing areas to prevent surface runoff into watercourses.

Figure 1



Nutritional Considerations

- Deliver a balanced ration of nutrients for all the animals.
- Avoid mixing different qualities of feed in a set of bales, especially on a two-day move. It can make cows weak if they're only consuming only poor quality feed every day.
- When using different qualities of feed, put out good feed for two days and then poor feed for two days, to ensure all cows have access to enough good nutrients. (e.g. If you're feeding 2/3 hay and 1/3 green feed in a set of bales, move the cows every four days, so all cows have access to the feed).
- Thin cows should be taken out of the bale grazing rotation and fed separately.
- Use body condition scoring to assess animal performance. For information on scoring, call your local MAFRI GO Centre or Office; or visit www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex3450?opendocument.
- In colder weather, adjust the feeding rotation length down a day (e.g. If your rotation is three days, reduce it down to two days) to increase the amount of feed to compensate for colder temperatures.
- Give grazing cows access to good quality water from an appropriately located watering source **or** access to clean snow daily. If using snow, make sure the cows are licking it and have plenty of soft clean snow available. Icy snow is a poor source of water. If the cows aren't licking the snow, you need to have an alternative water source. For more information see MAFRI's fact sheet titled *Snow as a Water Source for Wintering Beef Cattle*.
- Provide salt, mineral and vitamin supplements in the field.
- Some cows may also require an energy and/or protein supplement – watch for thinning cows and heifers that may need to be fed separately.
- Feed test to be sure nutritional requirements are met. See Table 1 for detailed nutritional requirements of your breeding herd.

Table 1 Nutritional requirements of the breeding herd[1]

Class	Total Digestible Nutrients % (TDN)	Crude Protein % (CP)	Calcium% (Ca)	Phosphorus % (P)
Mature cows				
Mid gestation	50-53	7	0.20	0.20
Late gestation	58	9	0.28	0.23
Lactating	60-65	11-12	0.30	0.26

[1] Nutritional requirements vary with body weight, frame size, predicted average daily gain (ADG) and stage of production. Contact your local Manitoba Agriculture, Food and Rural Initiatives GO Team Office or Centre for ration formulation services. All rations must be balanced for protein, energy, vitamins and minerals.

For more information

- Your local Manitoba Agriculture, Food and Rural Initiatives Growing Opportunities Centre or office.
- Manitoba Agriculture, Food and Rural Initiatives website: **www.manitoba.ca/agriculture/production.**
- Forage Beef website: **www.foragebeef.ca.** A forage and beef production website that contains information gathered from Manitoba, Alberta and Saskatchewan.
- Your local Agriculture and Agri-Food Canada (PFRA) office.
- Manitoba Forage Council website: **www.mbforagecouncil.mb.ca**

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