

AGRI-FACTS

Practical Information for Alberta's Agriculture Industry

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Feeding Legumes to Cattle

Legumes can be a valuable part of a cattle feeding program. In fact, legumes can actually improve animal performance by encouraging intake, by providing greater feed efficiency and by fostering a better use of forage nitrogen content.

Legumes can capture nitrogen from the air and use it for their own growth as well as for the benefit of other plants around them. The bacteria that inhabit root nodules trigger a chemical reaction to convert nitrogen gas into a form that is easily used by the plant.

Alfalfa is by far the most widely used forage legume; however, other legumes can provide significant benefits (see Table 1). And all these legumes can increase soil fertility:

- alfalfa
- sweet clover
- white clover
- red clover
- alsike clover
- bird's-foot trefoil (non-bloating)
- cicer milk-vetch (non-bloating)
- sainfoin (non-bloating)

Grazing legume pastures

Rotational stocking (intensive grazing management) is practiced to retain legume leaf area for continued photosynthesis and plant growth. Livestock are rotated into a new section of a field before entire plants are grazed down. This type of grazing management allows for optimum returns as it benefits both the cattle and the pasture.

Legumes must have appropriate rest to recover and re-grow. This rest period will help maintain the health and sustainability of the pasture. For example, once cattle are removed from an alfalfa pasture, the pasture should rest for 28 to 35 days before re-grazing.

Continuous stocking (extensive grazing management) may be sufficient to maintain a grazing animal, but the practice does not optimize either animal or pasture productivity. This type of management has lower input costs, but it also results in lower rates of gain, since animals spend more time searching for food. In addition, legumes will not tolerate continuous grazing, and the plants will not survive if they are not given enough time to recover and re-grow.

Frothy bloat

Producers have found that feeding/grazing legumes can sometimes cause frothy bloat in cattle. The condition results from the quick degradation and fermentation of plant material and the rapid release of plant cell contents.

The fermentation gases produced in the animal accumulate and become trapped in a thick foam. The foam prevents the animal from being able to burp up the gases, and this factor may lead to the animal's death.

High bloat risk factors

Forage maturity is the most significant contributing factor in pasture bloat. A producer's knowledge of the stages of plant maturity can go a long way toward preventing bloat.

The highest risk of bloat occurs when legumes are in the pre-bud or vegetative stage. As the plant matures, the risk of bloat declines. Studies have found bloat to be twice as likely to occur when plants are grazed at a height of 8 to 10 inches rather than at a height of 20 to 30 inches.

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If immature plants are wet from morning dew or rain, there is also an increased risk of bloat since the water tends to speed up the rate of digestion.

In the fall, there is an increased potential for bloat after a frost because plant cells burst and become readily digestible.

Soil type also seems to play a role in the incidence of pasture bloat. There tends to be more bloat in the Gray Wooded soil zones and less in the Dark Brown to Brown soil zones. However, there is no direct link between pasture bloat and the mineral composition of plants grown in different soil zones.

It is possible to determine when the bloat risk is high. However, a visual evaluation of a legume-containing pasture does not give a concrete prediction of bloat potential. Therefore, producers should also rely on good management practices to reduce the risk of legume bloat.

10 tips to manage bloat

1. Use non-bloating legumes
 - cicer milk-vetch, sainfoin and bird's-foot trefoilBe aware, these forages are not as good as alfalfa in terms of yield, re-growth and persistence in the stand.
2. Low-bloat potential alfalfa
 - AC Grazeland (LIRD alfalfa)This variety results in a slower initial rate of digestion, which helps prevent the onset of bloat.
3. Legume-grass mixtures
 - improves animal and pasture productivity as well as managing bloatWhen legumes are planted with grasses, their presence can improve animal performance by as much as 30 per cent, and even more when seeded in pure stands.
4. Products or supplements to manage bloat
 - Alfasure™ (available by a veterinarian prescription only), Bloat Guard® (Poloxalene) and ionophores
5. **NEVER** move hungry cattle into legume pastures in the morning.
6. Put animals out to pasture in the afternoon, so plants have a chance to dry off.
7. Feed another source of dry roughage (long fibre) before grazing bloat-causing legumes.
8. Maintain a uniform and regular intake of forages. Once cattle have started grazing, leave them on the pasture, even at night.
9. When animals are first put on pasture, check them at least twice a day. Some animals are chronic bloaters. Watch for these animals, and remove them from the pasture if needed.
10. Graze full bloom mature plants.

Table 1. Legumes: advantages and disadvantages

	Advantages	Disadvantages
Alfalfa	+ highest protein yield per acre + high digestibility + long-term persistence with good management + deep rooted for drought tolerance + moderately tolerant of saline soils + rapid re-growth following cutting and grazing + high nitrogen fixation + good for crop rotations + can bring leached nitrogen to the surface	- can cause bloat - not tolerant to poor drainage - losses from insects and diseases - not tolerant to heavy grazing - requires neutral pH and high fertility
Sweet Clover	+ drought tolerant + high nitrogen fixation + tolerant to a range of soil conditions + easy to establish	- can cause bloat - low quality and palatability at maturity - does not re-grow well-biennial growth - damaged by the sweet clover weevil - coumarin in older cultivars - not grazing tolerant
Red Clover	+ tolerant to poor drainage + tolerant to low pH or acid soils + easy to establish + shade tolerant	- short persistence - can cause bloat - poor drought tolerance - limited winter hardiness
Alsike Clover	+ easy to establish + tolerant to poor drainage + tolerant to low pH or acid soils	- does not re-grow well - poor persistence - poor drought tolerance - can cause bloat - limited winter hardiness
White Clover	+ grazing tolerant + drought tolerant	- limited winter hardiness - can cause bloat
Bird's-foot Trefoil	+ non-bloating + tolerant to poor drainage + tolerant to low pH or acid soils + grazing tolerant + higher quality at maturity than alfalfa + long-term persistence	- difficult to establish - lower nitrogen fixation than alfalfa - lodges easily - lower yields than alfalfa - slow re-growth after cutting or grazing
Sainfoin	+ non-bloating + drought tolerant + can grow in soils that are low in phosphorus	- not grazing tolerant - poor persistence
Cicer Milk-vetch	+ non-bloating + drought tolerant + tolerant to saline soils + tolerant to poor drainage + grazing tolerant	- hard to establish

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Alberta Agriculture's website www.agric.gov.ab.cawww.ForageBeef.ca (Website available in Summer 2003)