Sainfoin In Alberta.

Bulletin 2: Profitable Grazing Management

Legume-Dominated Pastures

Field Layout

Grazing systems for legume dominated pastures need to be well-planned to accommodate increased forage volume, forage palatability and plant maturity, and to give the manager greater control during periods of high bloat risk or severe weather. These pastures are normally seeded on cultivated fields that can be re-seeded, harvested several different ways, rotated to other crops, fertilized and treated for weed infestations.

- The best design will have a laneway leading through a series of paddocks that are flexible in size.
- The laneway should also have access to livestock pens, handling facilities and other pasture sites that are either native range or a sod type grass.
- The laneway and gates to the paddocks need to be wide enough to accommodate farm equipment, such as a mower-conditioner.
- A single controlled water source is preferred to permit the use of products like AlfasureTM if incidences of bloat arise. Livestock may water in sloughs, puddles or springs in the field during the grazing season but the main source of water should be from a tank or fountain.

Critical Limits and Production Strategies

Legume fields are usually located on cultivated soils. The soils are typically soft, erodible and may be compacted by hooves and vehicles. The soils can be severely damaged by intense animal activity.

- Leaving a herd on a field during heavy rains can severely damage the crop's productive capacity. During a 24 hour rain event, a small herd can churn a clay soil into soup, burying the plants, and creating a hard crust when it dries. Always have a grass pasture available that can be easily accessed by the herd during a rain.

Bloat

Legumes such as alfalfa can cause bloat but not all bloat is caused by legumes. Some animals are chronic bloaters and some animals bloat as a symptom of respiratory infections or other disease. Not all bloat leads to death losses but sub-clinical bloat can reduce rates of gain.

- Singleton bloats, may occur for no apparent reason or with only one or two other animals showing any warning signs. Move these individual animals out of the herd and onto less digestible feed (grass pasture or hay).
- General left hindquarter swellings throughout the herd and a lack of cud-chewing indicates widespread sub-clinical bloat. Move the herd to available grass pasture or a more mature legume. If the condition persists, mow the paddock and let it wilt for 24-36 hours to reduce the digestibility of the forage.
- Chronic bloat and prevention of death losses can be managed by adding a registered bloat control agent to the water, such as AlfasureTM, available from the local veterinarian.

Maintaining Sainfoin Productivity

Legume plants regenerate in the spring from carbohydrates stored in their roots from the previous fall. Legume plants need to produce enough leaf surface during the summer to produce the photosynthate necessary to replenish these root carbohydrate stores. All the while, the plants are utilizing carbohydrates to keep the nodulation bacteria and the microrhiza fed to help with nutrient uptake.

Growing Forward 2
A federal-provincial-territorial initiative
Alberta Government
Canada

A few legumes also spend a great amount of energy creating flavonoids and tannins for special purposes, such as keeping small herbivores from eating their leaves.

- Sainfoin has a lower leaf area index than other legumes, such as alfalfa. In other words, sainfoin has less surface area for gathering light to produce carbohydrates however sainfoin retains its leaves longer than alfalfa and can be harvested later (50% bloom) without loss of nutritive value.
- Sainfoin produces tannins in all parts of the plant except the roots. Tannins are produced by tannosomes that sequester large amounts of photosynthate from the chloroplasts of each cell. Alfalfa can produce more leaf and biomass than sainfoin because it does not produce tannins.

In other words, sainfoin, whether it is a single cut or double cut variety, is short of energy most of the time. This means:

- Sainfoin will regrow more slowly after cutting or grazing than other components in the sward, including weeds. Where alfalfa cultivars with rapid regrowth will regrow to early flower stage within 45 days of harvest, sainfoin may take 50-60 days (The newer cultivars such as 'Mountainview' may be beneficial here, because its regrowth cycle seems to match that of alfalfa).
- Sainfoin will suffer more from root damage during the growing season than alfalfa.
- Maintaining stand integrity (maintaining plant density and productive capacity) will depend on a harvest cycle over several years that supports at least one seed fall and an extended critical carbohydrate storage period for the roots.

Effects of Grazing

Sainfoin is not tolerant of frequent and severe grazing practices. As a consequence, most harvesting regimes will show reductions in plant density and consequent reductions in forage production.

- Sainfoin survival is reduced the most by heavy grazing at bud or vegetative stages, reducing stands by more than 40% over two years.
- Sainfoin survival is enhanced by delaying grazing to after the seed shattering stage during two years.
- In order to store sufficient root reserves for the winter, late summer grazing should be curtailed at least 50 days before the first killing frost in Alberta. In southern Alberta that could be into October but in northern Alberta it could be in mid-August. Winter grazing does not apparently harm the stand.

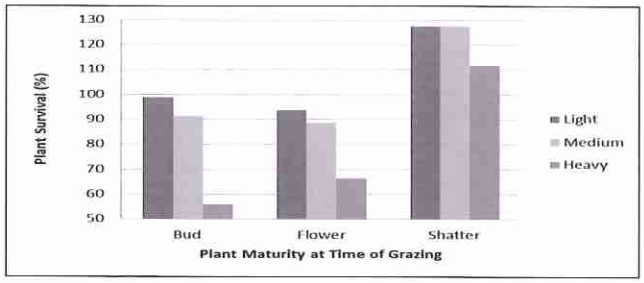

Figure 1 Effect of light, moderate and heavy grazing, at 3 stages of maturity, on plant survival (%) in sainfoin. (means over 2 years, from Mowrey, D. P., 1989)

Sainfoin feed quality declines with advancing maturity. The quality of sainfoin is generally sufficient for most classes of cattle and sheep. By the shattering stage the amount of leaf loss will make the feed stemmy and unpalatable. Sainfoin may form small, green rosettes at the base of the plant before winter. Animals will try to graze these and may harm the overwintering capacity of the plant.

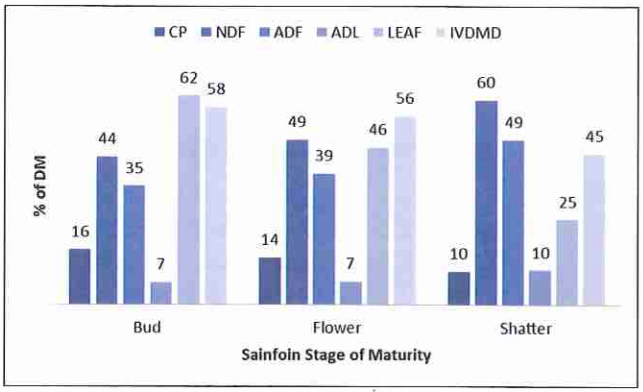

Figure 2 Feed quality components of sainfoin at 3 stages of maturity (average across all level of grazing intensity. (Data from Mowrey, D. L. 1989)