

Bison Pastures and Grazing Management



Introduction

This publication will discuss forage selection and pasture management information specific to bison, taking into account factors unique to this animal and industry.

Providing abundant and good quality forage for bison, especially during the summer, is one of the keys to successful bison ranching. Forage shortages during summer can often result in poor conception rates. **Adopt the philosophy that you are a forage producer first and a bison rancher second.** Bison are the self-propelled forage harvesters you have chosen to make use of your pasture.

The information in this publication was collected from forage specialists, pasture inspections, producer observations, and published papers. Some of the bison production and pasture management details may change as further research is conducted and ranchers gain more experience. Producers are encouraged to explore and adopt other practices that prove successful but are not mentioned in this publication.

Grazing History

Before European settlement, it is estimated there were 50-70 million bison in North America. The majority of the population roamed the middle of the continent - the North American Great Plains which stretched from Texas to the boreal forest of Western Canada. This area was a vast ocean of open prairie with grasses, sedges (grass-like plants) and forbs (broadleaf plants). Grasses and sedges were the dominant species. Averaged over locations and seasons, they accounted for about 90-98 per cent of the forage available for grazing. Trees and shrubs were kept in check by periodic fires and periodic intensive grazing by large herds of migrating bison.

Bison were the first rotational grazers. It is estimated 90 per cent of the population was migratory and 10 per cent was sedentary. In Western Canada, the sedentary population remained year round in the parklands. Prior to the 1800s, movement of the migratory herds on the Western Canadian prairies was seasonal and predictable. It resembled a two-paddock seasonal grazing system with a summer range and a winter range. This system evolved because it normally maximized forage quantity with adequate quality on both ranges.

Contrary to common belief, the western Canadian herds trailed north in winter to the parklands. The parkland offered shelter from winter storms and a greater certainty of snow for a water source. The native fescue range, which had been grazed lightly in summer by a small resident population, offered a large volume of stockpiled forage for winter grazing. With normal autumn moisture, a



flush of green growth late in the season ensured adequate forage quality.

A planned grazing system helps minimizing overuse (foreground) and underuse (background). In summer, the bison grazed the short grass prairie of South West Saskatchewan and South East Alberta. The cool season grasses were flowering and the warm season grasses were actively growing. Again, the timing of grazing in this region ensured maximum forage quality with good forage quality.

During the summer, the bison were dispersed into smaller herds and constantly on the move. In winter, they tended to gather in larger groups and only moved when forage supplies were depleted.

Maintaining Healthy Plants and Root Systems

In order for perennial forage plants to survive, resist weed invasion, and produce to their potential they need to have deep and robust root systems. The pictures below show the root systems of meadow brome grass, smooth brome grass and crested wheat grass after three years of clipping treatments.

1x – Clipped early July to simulate grazing once per year.

2x – Clipped mid June and mid August to simulate grazing twice per year.

5x – Clipped each time vegetation was six to eight inches high to simulate season-long continuous heavy grazing.



Grazing Systems Today

Grazing systems control livestock in a planned manner to allow grazed forage plants an opportunity to rest or re-grow and recover during the growing season. Recovering means allowing the root system to replenish and rebuild between grazing events. A deep and robust root system ensures that plants survive, resist weed invasion, and produce to their potential.

A grazing system does not need to be complicated or have a large number of paddocks to be effective. Grazing managers control what, when, where, and how much livestock graze. Through correct stocking rates and forage use levels, both bison and forage production can be optimized.

On native pasture, when grazed during the growing season, the general rules to ensure good range condition are: delay grazing until mid-June, graze individual plants only once per season, and leave behind 50 per cent of the current season's growth. With seeded forage, a twice through rotation leaving behind 30 per cent of the current season growth will usually maintain healthy plants. When native range and/or seeded species are stockpiled for late fall or winter grazing, utilization rates can be higher. All of the above recommendations can be altered in a given season, provided the grazing manager is monitoring the pasture and adjusting to changing range condition. For example, the recommended 30 percent carryover on seeded pasture can be occasionally reduced to 15 per cent if the plants receive extra rest the following year.

There is no universally best grazing system. Each manager must develop a plan, tailored to the resources of the farm or ranch. Some of the variables that need to be considered include: type of pastures (native vs seeded), forage species of seeded pasture, season of use, pasture sizes, cost of subdividing fields, proximity of land parcels, location of water sources, current situation, future plans, level of investment, and manager's time.

There are at least eleven different grazing systems used in the Northern Great Plains. These systems and their applications are described in publications listed in the section "References and Suggested Reading". For assistance with planning a grazing system, contact your Regional Forage Specialist.

Bison Physiological Adaptation

Bison have the ability to digest low quality forages more completely than beef cattle. Studies have shown bison can extract five to 13 per cent more nutrients from various low quality feeds. This advantage occurs when protein levels of the feed are eight per cent or lower. Explanations for this increased efficiency are: a higher level of nitrogen recycling, differences in rumen micro flora, longer feed retention time in the rumen (79 hours for bison compared to 69 hours for cattle). At protein levels above 10 per cent, cattle digest feed equal to or better than bison.

The bison's metabolic rate decreases from summer to winter. In summer, the maintenance energy requirement of a 1000 lb cow is estimated at 22.4 Mcal/day. In winter, the requirement is about 12.5 Mcal/day. This reduction results in lower feed quality and quantity required during winter. Dry matter intake of cows is estimated to be 2.2 -2.8 per cent of body weight during summer. In winter, appetite drops to 1.4 - 2.0 per cent of body weight.

Bison are very adapted to cold weather. The lower critical temperature (temperature at which an animal increases feed intake or expends extra energy from body reserves to stay warm) of six month old bison calves is colder than -30°C. The lower critical temperature of adult bison has not been measured, but is expected to be significantly lower. As a comparison, lower critical temperature for beef cows in mid-winter is about -20°C. Cold resistance in bison is due to their excellent hair coat and reduced physical activity. Under extreme cold weather, it has been demonstrated physical activity greatly reduces thermal insulation.

Mature bison females in good condition are able to lose 10-15 per cent body weight from January to June. Producers are encouraged to manage for this weight loss to reduce calving problems due to overly fat cows. As well, there is speculation that longevity and fertility are reduced if cows are kept overly fat year round. With a lower body condition in spring, cows can gain the weight back by grazing on relatively low cost summer pasture. It is important to have the animals in good body condition prior to winter. Young females in their second and third winter can also lose 10-15 per cent body weight from January to June, provided they enter the winter in good condition.

Bison, along with other northern wild ruminants, prime themselves to exploit the brief flush of high quality summer vegetation. Pasture management is important to ensure the animals have both the required volume and quality of forage to meet their high summer demands. The comment is often made that bison are survivors; under poor summer forage conditions they will preserve themselves by not reproducing.

To meet forage quantity requirements, a pasture sward height of not less than four inches is recommended. Another measure is to graze only when there is more than 300 lb/acre of dry matter. This equals a height of about four inches but will vary with plant density. As a guide for forage quality, Table 1 lists the current estimated nutrient requirements of female bison at different ages and through the year. As more research is completed, these guidelines may be adjusted.

Table 1. Estimated nutrient requirements of female bison (dry matter basis)

<i>Table 5. Estimated energy, crude protein, calcium and phosphorus requirements of bison.</i>					
Age	DMI (% BW)	TDN (%)	Crude Protein	Calcium	Phosphorus (%)
Females					
6 mo. - 1 yr.	2.0-3.0	55-63	12-14	0.50	0.25
1 year	2.0-2.5	55-63	10-12	0.36	0.21
1.5 year	1.8-2.2	50-55	10-12	0.32	0.21
2 year	1.6-2.2	53-60	10-12	0.32	0.21
2.5 year	1.6-2.2	48-50	6-7	0.22	0.19
Late Gestation (April - May)	2.0-2.5	54-58	8-10	0.26	0.21
Lactation (May - November)	2.5-3.0	54-58	8-10	0.27	0.22
Maturity (Maintenance)	1.6-1.8	48-50	8	0.19	0.19
Males					
6 mo. - 1 yr.	2.0-3.0	55-63	12-14	0.50	0.25
1 year	2.0-2.5	55-63	10-12	0.36	0.21
1.5 year	1.8-2.2	50-55	10-12	0.32	0.21
2 year	1.6-2.2	55-60	10-12	0.32	0.21
2.5 year	1.6-2.2	50-52	8	0.22	0.19
Maturity (Maintenance)	1.6-1.8	48-50	8	0.19	0.19
DMI = Dry Matter Intake. BW = Body Weight. TDN = Total Digestible Nutrients.					

In summary, growth, appetite, and energy requirements of bison are seasonal and decrease from summer to winter. These features along with the ability to thoroughly digest low quality forages make bison well adapted to the Northern Great Plains. During summer, the higher nutritional requirements can be met by grazing on relatively inexpensive well managed pasture. In winter, the animal can be maintained cheaply on stockpiled pasture, annual crop residues, and lower quality hay. During winter grazing, supplemental feeding may only be required during periods of extreme snow conditions.

Bison Grazing Behavior

A study conducted in summer found bison spend less time grazing per day than beef cattle. Time measurements were made during daylight hours, as almost no grazing occurred at night in this study. During the non-rut period, bison grazed four per cent less daylight hours than cattle. During rut, this reduction increased to 12 per cent less grazing time.

The literature indicates strong time investment by bison in non-feeding activities, particularly during the rut. It has been well documented that play, aggression, defense, and grooming behaviour may consume considerable amounts of time. Since the daily activities of bison cow groups are often led by an older cow, the limiting physiological needs of a few animals may influence the foraging behaviour of the entire herd. As a consequence, forage quantity and quality cannot be lacking during rut.

Studies have shown bison do not simply forage at random. The animals select locations in a paddock and upper parts of the vegetation that are higher in feed value than the sward average. To compensate for reduced grazing time per day, especially during the rut, bison will select the actively growing plants with higher protein and energy. To ensure the whole herd receives adequate nutrition for summer weight gain, the pasture manager needs to supply paddocks with

second growth and/or actively growing vegetation from July to October.

At times, the foraging behaviour of bison appears irrational. In early spring, they have been observed to ignore new lush growth in favour of the previous season's growth. In winter, they have been observed to walk past good quality hay bales in favour of grazing stockpiled perennial forage in the snow. When possible, provide both actively growing and mature vegetation (stockpiled standing forage, hay bales, crop residues) in each paddock throughout the grazing season and observe what they select.

Similar to beef cattle, bison prefer to graze areas of gentle terrain, especially during the rut. Summer pastures may need to be subdivided to avoid overgrazing on flat areas and undergrazing on steeper slopes. During winter, bison will graze the steeper slopes if there is a high volume of stockpiled forage.

Diet Selection

Ruminant animals are grouped into three categories: 1) Grazers: select mostly grasses and sedges; 2) Browsers: select mostly forbs and the leaves, twigs, and bark of trees and shrubs; 3) Mixed Feeders: adapted to grazing grasses, forbs, and woody plants.

Bison are classified as grazers. Studies conducted on the Great Plains have demonstrated bison have a strong preference for grasses and sedges over forbs and shrubs. Grasses are often reported at 90-100 per cent of the diet, depending on the availability and time of year. In northern and mountainous environments where upland grasses are limited, sedges and wetland grasses dominate the diet.

Bison can adjust their diet to as high as 20-40 per cent shrubs (often willows) when grasses are limited. Forcing them to browse at these levels is not recommended because production may be compromised. Producers have noted bison will browse on willows and poplar leaves, even when there is plenty of grass available. They have also been observed to select for weedy forbs, such as dandelion, but the times and intervals are unpredictable

Grazing Alfalfa

As indicated above, bison have the reputation of being grass eaters. This is a commonly reported behaviour, and it has led some producers to provide them with 100 per cent grass pastures. But will bison graze alfalfa? Some producers have overlooked the advantages of this plant when establishing tame pastures, believing alfalfa is not palatable to bison. This section will discuss why alfalfa should be considered for bison, and suggest alfalfa levels producers should consider.

The Alfalfa Advantage

When properly inoculated, legumes obtain a portion of their nitrogen requirement from the atmospheric nitrogen fixed by bacteria in nodules associated with their roots. Nitrogen is also made available to the plants as the roots die and release nutrients to the soil.

Alfalfa has been labelled as the queen of forage crops. With a proven record for persistence, forage quantity, and forage quality, alfalfa is the best choice of perennial legumes in most situations. A rule of thumb states a pasture with equal amounts of alfalfa and grass will produce 50 per cent more beef than a pure grass pasture.

The bloat risk in beef cattle can be relatively high when grazing alfalfa. However, with bison there is no documented case of bloat. The reasons for this apparent non-bloating are not well understood. Some suggestions are: they can sense when to stop eating alfalfa; they prefer grass over legumes; they graze more times per day and do not gorge themselves. The result is producers can include this plant in the pasture sward with a much lesser risk of animal death or cost of bloat prevention. The industry can take advantage of this nitrogen fixing legume to significantly and cheaply increase forage quantity and quality.

Will Bison Graze Alfalfa?

There is ample research concluding bison select for grasses over forbs (alfalfa is a legume forb). Studies conducted on native range find grasses and sedges make up 90-100 per cent of the diet, depending on the season. Forbs seldom exceed 10 per cent, and are only selected at this level in mid-summer when at their highest nutritional state.

Observations on seeded grass/alfalfa pastures confirm that bison will readily graze alfalfa. Alfalfa plants are grazed when adequate grass is still available, dispelling the belief bison have to be forced into grazing the plant. Often the plants appear ungrazed, but close inspection shows the tips of the plants are selected. It appears only lush, actively growing plants are grazed during summer and fall. Mature stems will be grazed during winter.



Bison grazing alfalfa regrowth in September with crested wheatgrass available (background).

What Level of Alfalfa?

What percent alfalfa should be targeted for the pasture sward? Will some herds "tolerate" higher levels because they have had previous exposure to grazing alfalfa? Is there a high level where alfalfa becomes counterproductive to longevity, growth, and reproduction of the animal? Do alfalfa levels need to be adjusted through the seasons to match animal requirements? These are questions the industry needs to answer through research and ranch experience.

In one case a producer has grazed paddocks very high in alfalfa during summer. It appears the animals would prefer a higher percentage of grass, because grass plants in the paddock are grazed heavily. In this case, it is estimated 80 per cent of the bison diet is alfalfa. There does not appear to be any adverse reaction from the animals.

A formal recommendation based on scientific research for an optimum pasture mix is not available. From observing paddocks with varying levels of alfalfa, it appears 30 per cent alfalfa and 70 per cent grass is a level where both the grass and alfalfa will be grazed uniformly during summer. To establish these levels, seed alfalfa at about one lb/acre with three to 10 lb/acre of grass, depending on the grass species used. This mixture may be dominated by alfalfa for two to three years, but will stabilize with more grass over the long term.

Grass/alfalfa seed mixtures are often sold based on percent seed weight in the bag, rather than percent seed count. For example, a seed mix of 30 per cent alfalfa and 70 per cent meadow bromegrass by weight will give approximately equal seeds per square foot of both grass and alfalfa. This seed mix will normally result in a field dominated by alfalfa. Refer to forage manuals for weights and calculations to ensure you are applying a grass/alfalfa seed mix that gives the desired stand.

Perennial Forage Species Selection

When selecting perennial forages to seed, there are three questions to consider:

1. Which species are palatable to bison through the seasons?
2. Which species give high weight gains and conception rates?
3. Which species survive, resist weed invasion and produce the highest forage yield along with optimum forage quality?

Producer comments and pasture inspections consistently agree with one statement: "Bison will graze virtually every species of grass." However, it is sometimes difficult to predict which species they will prefer and when. At times bison are observed to graze dry, mature plants when succulent, vegetative plants are available. Select forage species based on forage production and long term survival, given your soil and climatic conditions. The management of the pasture can have more effect on palatability, weight gains, and conception rates than the species of plants.

When selecting legumes, the current recommendation is to seed alfalfa (see previous section). Alfalfa is the highest producing legume in most situations. There is limited information about palatability of other legumes for bison, but it appears they will consume many of them.

It is normally recommended one grass and one legume be seeded together in a paddock. Complex pasture mixes can be difficult to properly manage because different species have different optimum uses. For example, crested wheatgrass is suited for early spring grazing, whereas meadow bromegrass produces best with late spring and summer grazing. Mixtures also create the opportunity for some species to be overgrazed and others to be undergrazed. Over time, the most palatable species have a greater chance of being grazed out, leaving behind the least palatable species.

A case for recommending multi-species mixtures is when the topography and soils within a paddock are highly variable. Species suitable for sandy and/or eroded hilltops may not survive in potholes or saline areas. If it is not practical to seed similar soil types separately, a complex mixture over the entire field will help ensure each acre is producing.

Grazing Management

Pasture Economics

When pastures are grazed heavy and continuous, the forage plants are weakened. If this management continues, forage production will be lowered and desired plants may be reduced and replaced by weeds. If this results in a shortage of forage for grazing, there will be an increased need for supplemental feeding.

The cost/day of providing supplemental feed is generally considered double the cost of grazing. Extra feed cost due to poor pasture management can have a large impact on profitability in the bison industry.

Stocking Rates - Seeded Pasture

Table 2 lists the acres of seeded pasture required by a 1000 lb bison based on a seven month grazing season. The figures are calculated from the publication: "Initial stocking rate recommendations for seeded forages in Saskatchewan", Saskatchewan Agriculture and Food, 1995. The estimates in the table are based on an unfertilized 30 per cent creeping-rooted alfalfa and 70 per cent meadow bromegrass pasture in good condition. An allowance of 30 per cent carry over is included to maintain the pasture in good condition. It is assumed a 1,000 lb. bison in summer consumes the equivalent forage of a 1,000 lb. beef cow which is considered the standard Animal Unit (AU).

As an example, an operation with 50 cows averaging 900 lb./cow would be similar to 45 Animal Units ($50 \times 900/1000 = 45$ AUs). If the herd used four bulls averaging 1500 lbs., they would consume about the same as six AUs ($4 \times 1500/1000 = 6$ AUs). This totals 51 AUs. Using table 2, a ranch located in the Dark Brown Soil Zone on medium (loam) textured soil with a five year old pasture would require approximately 357 acres ($51 \text{ AUs} \times 7 \text{ acres}$) for a seven month grazing season. Ideally, the 357 acres would be subdivided to allow for controlled grazing.

Table 2. Acres/1000 lb. bison (or Animal Unit) based on seven month grazing season, 30 per cent carry over, 30 per cent creep-rooted alfalfa and 70 per cent meadow brome grass pasture in good condition.

Soil Texture						
	Heavy and Medium			Light		
	Stand Age Years					
Soil Zone	1 - 3	4 - 6	7+	1 - 3	4 - 6	7+
Brown	8.5	10	15	10	12	20
Dark Brown	5	7	10	6	7.5	12
Black and Grey	4	5	8.5	5	5.5	8.5

The acres required will vary depending on pasture condition, forage species, forage mix, and fertilizer rates. To calculate the acres required for conditions other than those in the above example, refer to the Initial Stocking Rate publication mentioned above or contact a Regional Forage Specialist.

Stocking Rates - Native Range

Table 3 lists the acres of native pasture in each soil zone required by a 1,000 lb. bison based on a seven month grazing season. The figures are calculated from the publications: Managing Saskatchewan Rangelands and Range Plan Development. The estimates are based on season long grazing, with an allowance for 50 per cent carryover to improve or maintain range condition. The estimates take into account the current range condition of the native pasture.

Table 3. Acres/1000 lb. bison (or Animal Unit) based on seven month grazing season, 50 per cent carryover, and season long use of native range (Loam or Clay range sites).

Soil Zone	Range Condition			
	Excellent	Good	Fair	Poor
Brown (dry)	28	35	47	70
Brown (moist)	20	28	35	47
Dark Brown	16	20	28	35
Black	13	16	21	29
Grey	18	23	35	47

The acres required will vary depending on range site, season of use, and utilization levels. For assistance in evaluating range condition, contact a Forage Specialist.

Plant Stage

The stage of plant growth has more effect on nutrition and palatability than plant species or time of year. For example, alfalfa is normally considered a higher quality forage plant than crested wheatgrass. However, a mature, stemmy plant of alfalfa will have lower quality than a growing, vegetative plant of crested wheatgrass. As another example, the quality of mature crested wheatgrass in August is considered relatively poor, whereas the quality of vegetative crested wheatgrass in August is considered relatively good.

During summer grazing, bison are selective grazers. They will select areas in the pasture, plant species, and portions of a plant that supply higher nutrition than the average of the sward. They are usually selecting for new vegetative growth, particularly as plants become more mature late in the growing season.

Bison have high nutritional requirements during July and August. **One main objective during the grazing season is to maintain plants in a vegetative state for as much of the season as possible.** This is a challenge because nature quickly advances vegetative plants in spring to their reproductive phase in early summer. Perennial forages need to be cut or grazed earlier in the season to keep them vegetative through July and August. Otherwise, the majority of growth is condensed into May and June. During dry years when new growth in fall is limited, pastures may need to be supplemented with higher quality feeds during the breeding season.

Paddock Size

A natural instinct of bison is to group together and be on the move. Is there a stocking density and/or a schedule of moving from one paddock to another that will cause unhealthy social stress? Is there a paddock size required to allow individuals to flee from confrontation with the herd or flee from stresses such as humans, wind, lightning and wildlife? No formal research data are available to answer these questions. However, producers experiences may help address some of those questions.

One producer has grazed 175 feeders on 10 acre parcels (stocking density of 17.5 feeders/acre). The herd is moved every three days. It does not appear weight gain is sacrificed due to stress of overcrowding. Caution is advised when starting high stocking densities, especially if the animals are not accustomed to that type of management.

Effective grazing systems do not require a multitude of small paddocks. In the Dark Brown Soil Zone on native range in good condition, paddock sizes of three acres/cow would require a move every 30 days. A single pass grazing on native range, staying in each paddock for 30 days, is considered good pasture management.

In the Dark Brown Soil Zone on seeded pasture, a paddock size of one acre/cow is usually required to control forage growth with grazing, especially in the early years of a stand. During rapid spring growth, animals may be moved every week. In later summer, as growth slows and forage is stockpiled, the rotation may occur every two to three weeks.

In situations of one large pasture with relatively few animals, portions of the field can be cut mechanically at different times during the summer. This will help keep areas inside the paddock vegetative through the grazing season. In terms of range management, this method is not optimum because the animals have continued access to the entire paddock.

Fencing

There is a wide variety of fence types being used today. These include regular barbed wire, high tensile wire, salvaged hydro lines, high tensile page wire, and electric wire. For details on fencing for bison, refer to the publication *Bison Production: Economic and Production Information for Saskatchewan Producers* listed under References.

Rotational grazing requires internal fencing. The cost of the internal fence must not outweigh the economic gain the improved pasture system will generate. In the beef cattle industry, pastures can be divided cheaply with a single strand of electric wire. Once the animals are trained, this method is quite effective. Electric fences make rotational grazing systems more economically viable.

Rest Requirements

There is a saying that forage plants cannot be overgrazed, they can only be under-rested.

Plants can tolerate a one-time high utilization, provided they are given adequate time to recover. When a hay field is cut in midsummer, most of the plant top growth is removed. To compensate for the high utilization, the plants are given a 364 day recovery period to ensure a good hay crop the next year.

Forage plants are generally adapted to grazing. However, they do not tolerate repeated and continuous grazing with little rest to recover from the previous grazing event. This practice will weaken and eventually kill the plants. There is a balance between animal production and range health. On native range, the general rule is to graze once per year and leave 50 per cent carryover. Seeded pastures can normally be grazed twice/year, leaving 30 per cent carryover to maintain a healthy stand. If utilization rates are higher, the plants will need added rest the following year.

Winter Grazing

The cost of grazing stockpiled forage in the field is generally considered about half the cost of feeding stored forage. Today there is considerable discussion around lengthening the grazing season to reduce annual feed costs. The grazing season can be lengthened by stockpiling standing perennial forages, swath grazing annual cereal crops, field grazing annual crop residues, and bale grazing.



Bison bale grazing in winter

Bison are naturally adapted to winter grazing. Before European settlement they followed predictable movement patterns. Contrary to popular belief, the majority of the bison in Western Canada converged to the Brown Soil Zone (SW Saskatchewan and SE Alberta) for their summer range. For fall and winter range, they migrated to the Black and Grey-Wooded Soil Zones (Manitoba, east and north Saskatchewan, north and west Alberta). Bison migrated to the parklands in winter for

1. Shelter from winter storms;
2. Higher volume and quality of forage; and
3. Availability of snow as a water source.

Undoubtedly, losses due to starvation and a reduced calf crop would have been extreme in some winters. In many other winters, losses would likely have been higher than producers would tolerate

today. Winter grazing should not be pushed to the point of economic loss, but exploited as a natural adaptation and advantage bison have developed. There are reports of bison grazing in two feet of snow. Some animals would require training to function with winter grazing.

One law of ecology is "There is no such a thing as a free lunch." Perennial forage paddocks that receive growing season use followed by dormant season grazing will usually require greater rest the following spring to maintain plant vigor. Extended grazing seasons require planning to stockpile sufficient growth and monitoring to ensure range health.

Producers need to be careful when grazing fields in early winter with open water bodies. Bison are not cautious about walking onto thin ice. There are reports of animals walking on thin ice and breaking through, often with fatal results.

Parasite Control

Many of the internal parasites that infect bison have a direct life cycle. This means they are spread from one bison to another without the need for another insect or animal host. Transmission occurs when adult worms in an infected bison lay eggs that exit with the feces. On the ground, these eggs hatch and develop into larvae. The larvae migrate from the feces onto the surrounding vegetation where they develop to the infective stage and are swallowed by bison while grazing. The adult worms live a few weeks in the host and the cycle is repeated.

During warm and humid weather, survival and transmission of the parasites is high. Some eggs can hatch and develop into infective larvae within a week. Some parasites can survive all summer on pasture and some can overwinter.

Through history, most of the bison population was migratory. Generally, it is believed a given region was grazed for only a few days and once per season. This grazing system helped prevent the spread and increase of parasite loads. On most bison ranches today the animals are more confined. Parasite loads will increase when pastures are grazed season long, when rotational paddocks are grazed more than once per season, when grazing is close to the soil surface and when animals graze close to manure pats.

A common recommendation when de-worming on pasture is to treat and move around mid-June. The move should be to fresh pasture that has not been grazed in the current year. This is also an important time of year to increase nutrition and flush females prior to breeding season.

Sustainable, Environmentally Friendly Agriculture

Agriculture faces a continued public challenge to produce safe and nutritious food, conserve and enhance the natural resources being used, provide habitat for wildlife, and assist in protecting the environment. Grazing rangelands with livestock is considered one of the most environmentally friendly and sustainable forms of agriculture.

The vegetation and root system of properly managed perennial forages protect the soil from wind and water erosion. Protecting the soil resource is critical for sustainable agriculture.

Perennial forages enhance and maintain high levels of organic matter in the soil. This improves soil fertility, plus the soil organic matter stores carbon removed from the air. The carbon originates from carbon dioxide in the atmosphere, which contributes to greenhouse gases believed to be causing global climate change.

Animals converting forage to meat through grazing do not require the burning of fossil fuels. The main contributor to the increase in atmospheric carbon dioxide is the burning of fossil fuels. A longer grazing season with less dependence on stored forages and machinery would reduce the amount of fossil fuels used by the bison industry. A well-managed pasture system provides habitat for a wide variety of wildlife. Agriculture production systems that accomplish the above goals will continue to be viewed favourably by the public.

For more information:

Contact the Agriculture Knowledge Centre at 1-866-457-2377; or E-mail aginfo@gov.sk.ca.

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