Observe Sheep Behaviour to Help Grazing Management

Observing grazing animals can provide the livestock producer with valuable information on the quantity and quality of the forage available to the animals. Observation is perhaps the most important tool for making grazing management decisions. With a little practice, a producer can become adept at “eyeballing” the approximate amount and quality of forage being consumed by his livestock.

Ruminant animals graze wherever and whenever forage is available, therefore, a producer can say that he does practice “grazing management”. Grazing occurs either by design, when controlled by a knowledgeable manager, or by default, when animals are allowed to graze on their own without regard for plant and animal requirements. A livestock producer must visit his pastures frequently, not only to check the animals, but also to check the forage. This allows the producer to monitor what is happening with the pasture and to anticipate and correct any potential problem before it results in reduced livestock performance.

A grazing management plan must be designed with both plant growth and animal performance in mind. For long-term sustainability, there must be a balance between plant and animal requirements.

- Plant growth is maximized when they are “harvested” (or grazed) at maturity, but at that point the forage quality is low and animal performance may suffer because the nutritional needs of the animal are not met.
- Animal performance is maximized if the plant is grazed while it is actively growing (i.e. producing high-quality feed), but repeated, uncontrolled grazing will result in animals selectively consuming the highly nutritious and palatable plants while leaving the unpalatable ones. Over time, this will cause the disappearance of desirable plants (called decreasers) and the predominance of less desirable and undesirable ones (called increasers and invaders).

Some points to consider when observing animals and interpreting their grazing behaviour are:

- less time is spent grazing when forage is plentiful and of good quality; more time is spent grazing when quantity or quality is limited;
- herd animals tend to graze as a group when forage is plentiful and as individuals when forage is scarce;
- a well-established browse line indicates excessive grazing pressure (a browse line is a well-defined height to which browse such as leaves, twigs and woody growth has been removed by animals);
- midday grazing during hot weather indicates that forage is limited.
Sheep Grazing Patterns and Behaviour

Grazing animals are looking for green plant material. Their first preference is new green leaves. When new green leaves are not present, the animals will eat older green leaves, followed by green stems, then dry leaves, and finally dry stems. Grazing animals are also looking for plants that they consider palatable. Sheep have narrower mouths and more flexible lips than cattle; therefore, they can be more selective in their grazing by taking individual bites. Ruminants swallow their food as soon as it is lubricated and after they have consumed a certain amount, they ruminate. Cattle usually graze for four to nine hours a day, and sheep and goats for nine to 11 hours a day. Animals usually graze, then rest and ruminate. Sheep rest and ruminate more than cattle: seven to 10 hours a day as opposed to four to nine hours a day for cattle.

- Sheep can graze rugged terrain more easily than cattle.
- Sheep are reluctant to graze areas that have natural predator cover.
- Sheep may walk from three to five kilometres for water (depending on topography). The distance they have to travel has a significant influence on production. The greater the distance to water, the more energy and time is needed to satisfy the sheep's requirements.
- Sheep need from 7.5 to 10 litres of water per day.
- Livestock seek shade and cool locations during hot summer periods, which may result in excessive grazing under trees and in riparian areas.
- Livestock usually overuse dry southern exposures early in spring and then switch to riparian and shaded areas during hotter times of the year. North facing slopes usually remain underused.
- Sheep have a strong flocking instinct and maintain social spacing and orientation in pens as well as pasture. Breed, stocking rate, topography, vegetation, shelter and distance to water may influence this instinct, but isolation of individual sheep usually brings about signs of anxiety and may cause the sheep to try to escape.
- Sheep tend to “follow” one another even in activities such as grazing, bedding down, reacting to obstacles and feeding.

Some pasture characteristics that influence how close actual intake gets to potential intake are listed below.

- **Forage Selection.** Grazing animals are very selective in what they eat. Their choices are influenced by the presence of secondary compounds (phenolics, volatile oils), plant morphology (such as thorns and thick cuticles, dried “stemmy” material) and past grazing experience. Sheep tend to avoid the older seedstalks or “stemmy” grass. An increase in the number of seedstalks in a pasture will reduce the sheep’s grazing intensity; however, when seedstalks are removed (such as by cutting during the previous fall), sheep’s preference for the non-stemmy forage increases.
- **Preference.** An animal’s forage selection is more a function of its past experience than its breed. Grazing is an acquired skill, which is learned at an early age. This means it is possible to train an animal to consume certain plants, such as leafy spurge, for vegetation control.
- **Palatability.** Livestock select food that has the most pleasing texture. They also choose familiar foods. Green material is preferred over dry material, and leaves over stems. Palatability is affected by fibre content, bitterness or sweetness, water content and plant abundance.

See Table 1, the relative proportions of grass, forbs and browse in the diets of cattle, sheep and goats.

**Understand Forage Growth**

Plants obtain their energy from sunlight by producing carbohydrates through photosynthesis. In order for pasture to remain productive and provide a steady source of grazing year after year, the grass must feed itself first before providing feed for animals.

Photosynthesis produces carbohydrates, which the plant uses for growth, maintenance, storage and reproduction, in that order. In plants, growth is the first priority for any available carbohydrates. If the green leafy areas of actively growing plants are repeatedly removed or consumed (grazed, clipped or mowed), the plant will use its energy (mostly stored from previous production) to continually replace the leaves. If the plant produces more than enough carbohydrates to meet its growth and maintenance demands, then the excess is stored for later use. Since growth takes priority over storage, repeated defoliation (e.g. heavy uncontrolled grazing) during the growing season will seriously deplete a plant’s stored carbohydrates, leaving very little or no energy for reproduction. This gradual weakening of the plant is the basis for using grazing or mowing as a tool for weed control or vegetation management.

It is important to note that carbohydrate storage increases when the growth slows and the leaf area is large. Conversely, storage decreases when leaf area is small and growth is fast. Perennial plants must have sufficient stored energy to survive the winter, initiate growth in the following spring and recover after complete defoliation. Defoliation occurs as a result of grazing but also as a result of clipping and mowing, disease and insect outbreaks, and frost and hail. In order to maintain a long-lived and vigorous perennial forage stand, adequate levels of carbohydrates must be maintained. This can be done by:
1. Delaying defoliation or keeping early defoliation periods short;
2. Allowing adequate leaf area to remain after defoliation;
3. Allowing adequate time between defoliations to permit the leaf area to regenerate and carbohydrate reserves to build; and
4. Leaving adequate residual leaf area and time late in the season to permit carbohydrate build-up and bud development.

Rotational grazing is most necessary on perennial pastures, especially if several forage species are mixed together in the pasture. Without rotational grazing, sheep can selectively graze the plants they prefer and avoid others. Over-grazing soon weakens the preferred species and they are soon crowded out, leaving only the less desirable plants for future grazing. Rotational grazing forces sheep to consume all species more or less equally, and gives all grazed plants time to recover and regrow while sheep graze other pastures.

Grazing Management Principles and Planned Grazing Systems

The traditional herded system (where the flock is herded and bedded in an open area near the shepherd's mobile camp) is most suited to large tracts of land that are grazed only once per season for a short time. Herding is not often used in Saskatchewan. The system of choice for Saskatchewan sheep producers is confined (fenced) grazing, which requires planning to manage and control the areas where the sheep are permitted to graze.

Fences, water developments, the strategic placement of salt or mineral supplement and herding can result in more uniform livestock distribution on a pasture. Grazing systems are designed to control the timing, intensity and frequency of grazing.

Over the long-term, a successful grazing system does the following:

- Balances livestock numbers with the forage supply;
- Uniformly distributes livestock over the pasture and reduces selective grazing;
- Alternates periods of grazing with periods of regrowth. (Regrowth must occur during active growing periods to be effective);
- Maintains a healthy plant community with a desirable distribution of species and plant age classes;
- Avoids damage to grazed plants when they are most susceptible;
- Maintains healthy watersheds and soil;
- Meets the physiological needs of grazing animals;
- Maximizes livestock gain per acre;
- Uses methods that are environmentally sound, practical to implement, simple to operate and flexible in case of unforeseen circumstances; and
- Addresses the needs of the entire ecosystem, including plants, wildlife, domestic livestock and soil.

Range improvements and grazing systems attempt to control livestock behaviour. Range management can be defined as the art and science of manipulating, using and conserving grazing land resources, while maintaining ecosystem integrity. The four basic principles of range or pasture management lead to increased livestock production, improved watershed and ecosystem stability, and long-term sustainability. They are:

1. Graze range or pasture at the right time of year and to the right degree;
2. Leave adequate leaf area for regrowth to ensure the restoration of individual plant vigour;
3. Allow adequate “rest” for the forage in your pastures. Livestock should be kept off the range for a period during the active growing season to allow adequate regrowth for next year; and
4. Control livestock distribution and access to minimize selective grazing and prevent excessive regrazing of plants.

These principles are fundamental to the wise management of grazing resources, and are applicable to both tame and native pastures. Grazing can cause long-term harm if these principles are not followed. Poor management will lead initially to reduced plant vigour. Continued poor management will cause the loss of valuable forage plants, drought resistance, ground cover and range productivity. Ultimately, the condition or health of the range will deteriorate to such an extent that animal weight gains and productivity are affected.

Multi-species Grazing

Grazing a variety of species on the pasture, either simultaneously or in sequence, can be used to distribute grazing pressure, maintain or improve plant diversity and diet quality and spread economic risk. Also, the effects of multi-species grazing can be duplicated by grazing two groups of the same species which have different nutritional requirements, as determined by their class and stage of production. For example, lactating ewes with lambs should be placed on the highest quality pasture available to promote desired levels of milk production and lamb growth. Dry, non-pregnant ewes or ewes in early to mid-gestation should be placed on lower quality forages or serve as second grazers behind young, growing lambs. Strategies that match stage of animal production with type and quality of forage improves overall forage utilization while maintaining optimum animal performance.
Producers should keep in mind that different animals prefer different forages, as shown in Table 1 (Taylor, 1981):

- Cattle diets consist primarily of grass.
- Sheep tend to prefer forbs over grass and browse.
- Goat diets contain large amounts of browse compared to cattle and sheep diets.

### Table 1: Relative proportions of grass, forbs and browse in the diets of cattle, sheep and goats

<table>
<thead>
<tr>
<th>Kind of Forage</th>
<th>Cattle</th>
<th>Sheep</th>
<th>Goats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass</td>
<td>60%</td>
<td>40%</td>
<td>20%</td>
</tr>
<tr>
<td>Forbs</td>
<td>20%</td>
<td>40%</td>
<td>30%</td>
</tr>
<tr>
<td>Browse</td>
<td>20%</td>
<td>20%</td>
<td>50%</td>
</tr>
</tbody>
</table>


Because of the different dietary preference, mixing kinds of livestock under certain conditions is possible. However, the forage source must have the necessary diversity and production for the animals to meet their dietary preferences. For example, cattle and sheep will compete if grazed together in a predominately grass pasture. However, they will complement each other if grazed in a pasture with a high proportion of forbs and browse. Whatever the forage source, grazing cattle and sheep together will place increased management requirements on the operator. The fencing and other infrastructures needed to handle the two kinds of livestock are different. The herd health issues (recognizing, treating and dealing with sick animals) will also be different.

Making use of combinations of animal species in a grazing plan can benefit the range resource, the grazing animals and the producer:

- Small ruminants can control and utilize plants that cattle will not or should not eat.
- By grazing taller, courser forage, cattle can provide sheep better access to the short, tender regrowth.
- Multi-species grazing may spread the economic risk between the commodity prices - at any given time, one species may provide better returns while the other is not as profitable.

The disadvantages of multi-species grazing are the increased need for fencing, water distribution and storage troughs, handling facilities and management skills. Access to and knowledge of the markets for more than one species may also constrain multi-species grazing.

### Sheep Stocking and Nutrient Requirements

Forage supply and forage demand are both expressed in a standardized unit called an “Animal Unit” or AU. An Animal Unit is a 1,000-pound mature cow. An “Animal Unit Month” or AUM is the amount of forage required by an Animal Unit for one month. “Animal Unit Equivalents” or AUE are used to maintain the standardization when converting from or to different kinds and classes of animals. Sheep have Animal Unit Equivalents (AUE) of 0.20 for ewes and 0.26 for rams. This means that one AUM of forage would supply enough feed for five ewes or five ewes will demand one AUM of forage.

To illustrate the initial stocking rate for a “typical” tame pasture in southern Saskatchewan (an unfertilized, four- to six-year-old stand in the brown soil zone with coarse “light” texture) follows:

The initial stocking rate for five ewes (or one AUM - equivalent to one 1,000-pound cow) that are to be grazed and using the previous assumptions:
Table 2: Sample initial stocking rates

<table>
<thead>
<tr>
<th>Forage</th>
<th>AUM/ac</th>
<th>Five ewes grazing days/ac</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfalfa</td>
<td>1.0</td>
<td>28</td>
</tr>
<tr>
<td>Crested Wheatgrass</td>
<td>0.5</td>
<td>14</td>
</tr>
<tr>
<td>Meadow Bromeagrass</td>
<td>0.5</td>
<td>14</td>
</tr>
<tr>
<td>Russian Wildrye</td>
<td>0.4</td>
<td>11</td>
</tr>
<tr>
<td>Altai Wildrye</td>
<td>0.4</td>
<td>11</td>
</tr>
<tr>
<td>Smooth Bromeagrass</td>
<td>0.4</td>
<td>11</td>
</tr>
<tr>
<td>Western Wheatgrass</td>
<td>0.4</td>
<td>11</td>
</tr>
</tbody>
</table>

(Note - specific details for other soils and forage stands can be obtained from the Saskatchewan Agriculture publication, Initial Stocking Rate Recommendations for Seeded Pastures in Saskatchewan.)

The most critical periods in the sheep production cycle are:
1. breeding through very early pregnancy;
2. late pregnancy through the neonatal period;
3. overall lactation; and
4. weaning.

Selection of breeding season dictates when each of the critical periods falls in relation to the forage cycle. Nutrients in forages are highest soon after the forage emerges and before it matures. Therefore, animals with low production potential or with low nutritional requirements (dry, non-pregnant adults) could be used to graze mature forage. Animals in the breeding, late pregnancy or lactation periods, or newly weaned lambs should use a pasture that is producing high quality forage.

Bloat

Bloat occurs in ruminants when gas produced during fermentation becomes trapped inside the rumen rather than being expelled through eructation or belching. The resulting rumen distension can exert pressure on the animal’s respiratory and circulatory systems to the point of death.

Management to lessen problems with bloat

Bloat can be reduced through the following pasture management methods:

- Plant pastures so that no more than 50 per cent of the forage mixture is alfalfa or clover.
- Consider planting non-bloating legumes such as birdsfoot trefoil, sainfoin and cicer milkvetch (AC Grazland is an alfalfa variety that can reduce but not eliminate bloat).
- Fill up animals on dry roughage or grass pastures before turning them out onto legume pastures. A hungry animal may overeat when given access to fresh pasture and develop bloat.
- Move the livestock onto alfalfa at mid-day instead of the prime grazing times of morning or evening.
- Minimize bloat by turning animals onto alfalfa that has reached the bloom stage or later. The more mature the alfalfa, the less the risk of bloat. Once alfalfa has flowered, the risk of bloat is greatly reduced.
- Bloat also appears to be more prevalent if the animals eat only the upper portion of the plant, which is high in rapidly degradable protein. Grazing animals at a high stocking rate will minimize this problem.
- Provide the animals with grass pasture, hay, crop residue or grain along with the legume on pasture to reduce their consumption of the legume.
- Graze in a rotation using different grass and legume pastures or strip-graze (with electric fencing) to force animals to eat most of the plant material rather than just the succulent top growth.

Prepare to Manage Through Drought

Predicting Drought: If drought is an unanticipated period of below-normal precipitation that affects the amount of forage available for livestock, then predicting and compensating for the decrease in forage production would “drought-proof” a livestock enterprise. It is best to begin managing for drought far in advance of the next dry period. Monitor and evaluate the season’s forage growth potential by knowing and understanding the region’s historical rainfall patterns during the prime forage growing season. As the rain is becoming deficient for the growing season it is time to act. For example, Environment Canada’s 30-year average April, May and June cumulative rain recorded at the Elbow, Kindersley and Saskatoon stations in west central Saskatchewan is slightly greater than four inches. If the cumulative rain is only 25 to 30 per cent of the normal (no greater than 1.25 inches) by the time the growing season reaches early to mid-June, there will not be much opportunity for significant growth because the chances of above-average rainfall during the rest of June (to compensate for the early season’s shortage) is slight.
It has been said that “it is not how much one makes in the good years but how much is not lost in the bad years that keeps you in the livestock business.” Once the monitoring has determined that the extended dry period (or early stages of a drought) is imminent, there are a number of decisions and actions (strategic – what we do to plan for the foreseeable future? tactical – what we do this year? and, operational – what we need to do this week?) that could help producers better survive drought.

Strategic: A longer-term livestock production strategy should provide flexibility for marketing livestock, provide longer recovery periods for pastures and include adequate water for the animals.

- Plan and develop long-term water availability; water is often the first thing that becomes limited in a drought; therefore, new sources, efficient delivery (such as shallow pipeline) and increased storage and trough capacity should be developed in the non- or pre-drought years.
- Choose an enterprise mix compatible with drought risk. It is important to have a significant (relative to your drought tolerance) proportion of the livestock in the operation that can be liquidated on relatively short notice. These classes of livestock should be relatively easy to market in early to mid-summer (or alternatively to choose not to purchase early). Sheep producers could consider beef steers or heifers.
- Divide the grazing areas into smaller pastures to allow for longer recovery periods (for the forage). Relatively large numbers of pastures per flock (herd) are an advantage during drought because the number of days in the season that an area is grazed will be reduced and, at the same time, the days available for forage recovery are increased. Having more recovery days during the season increases the chance of getting rain and grass growth while the livestock are gone.

Tactical: An action plan a producer can make to help determine what to do at the time of the drought during the year.

- Monitor forage demand and effective rainfall, and adjust demand (stocking) to match it more closely with the expected reduction in forage supply in a timely manner.
- Determine de-stocking policies well in advance of implementation. The longer adjustments are delayed the greater the difference between supply and demand will become.

Operational: Day-to-day operational management decisions and actions to more effectively deal with the drought.

- Know rainfall patterns for your region and when the prime time for forge growth can be expected. (Example: the April to July accumulated rainfall is just over four inches in west central Saskatchewan.)
- Monitor the forage use and cumulative rainfall on pastures, and adjust stocking rate on a timely basis.
- Lengthen forage recovery periods to provide adequate recovery for plants between grazing periods in order to compensate for slow growth rates (slow plant growth = long recovery; while rapid plant growth = fast recovery).

Weed/Vegetation Control Using Sheep

Sheep producers can use their animals for weed or vegetation control. Sheep grazing has been shown to be an effective method for controlling vegetation. Sheep can provide an alternative to chemical control; they can be used where herbicides cannot be applied, such as near environmentally sensitive areas and in terrain where it is difficult to conduct chemical spraying.

Sheep and goats definitely eat weeds, but these animals may not be a practical method of weed control for landowners who have only minor weed infestations or small patches. Alternative vegetation control may be more suited for such circumstances. As well, in more extensive infestations or large areas that require vegetation control, significant infrastructure (such as water and fencing) may need to be put in place.

A sheep producer must decide whether he is managing for maximum sheep production or vegetation management. Grazing will control top-growth of weeds and unwanted vegetation, but an exclusive diet of weeds may not result in optimum weight gain for the animals’ production.

Grazing will control but not eliminate weeds. For adequate long-term weed control, grazing can be implemented as part of a larger, integrated weed-control strategy. The sheep will eat the undesirable plants, thus reducing competition for the desirable plants which permits them to become more vigorous and increase. However, while visual fence line contrasts and stem density counts at the Mortlach Provincial Sheep Pasture showed a considerable reduction in leafy spurge, the weeds are still present in the pasture even after 30 years of sheep grazing. This means that once the sheep are removed, the weed problem will reappear.

Proper management of the flock is critical to evenly remove unwanted vegetation yet maintain the desired plants over the entire area. Some recommended techniques are:

- Keep the sheep together as a cohesive unit.
- Use well-trained dogs.
- Camp next to night corrals to ward off predators.
- Never leave the sheep unattended.
Some findings on sheep grazing preferences (in the forested areas) are:

- sheep prefer new, succulent growth, whether it is the spring flush or regrowth after a first graze;
- vegetation degraded by frost or drought is less palatable to sheep;
- target vegetation should be less than one metre tall so that the sheep can graze the entire plant; and
- target vegetation must not be woody, as sheep will leave stems and graze only the leaves in the late summer.

For further information on leafy spurge control using sheep, see Saskatchewan Agriculture’s publication titled *Reducing Leafy Spurge’s Impact by using Sheep and Goats*.

**Contacts:**

Saskatchewan Sheep Development Board
Saskatchewan Sheep Breeders’ Association

**Further Information:**

Visit Saskatchewan Agriculture’s website at [www.agriculture.gov.sk.ca](http://www.agriculture.gov.sk.ca)

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Sheep Predator Control

There has been editing for Length

Introduction

Control of predation among sheep flocks is a serious problem. Manitoba's major problems are coyotes and domestic dogs. Other predators are rarely involved in predation of sheep, although losses caused by them can be severe when they occur. Losses can be reduced by the use of electric fences, guardian animals and management practices. Generally, producers use a combination of these control methods. Prevention cannot be stressed enough because after predators kill once they are more likely to return and kill again.

Fencing

Electric fencing has proven to be an effective non-lethal method of preventing predation. It also provides the opportunity to tie in temporary electric fencing to facilitate pasture subdivision for improved grazing management. Electric fences are relatively easy to maintain and are cheaper to build than conventional fences. However, the fences must be designed and built properly, be grounded properly and be powered by a sufficient energizer. They also require routine inspection and maintenance to reach full protection capabilities.

Guardian animals

A livestock guardian is one that stays with the flock without harming the sheep and aggressively repels predators. Dogs, donkeys and llamas have all been used successfully to protect livestock. The choice depends on the livestock being protected, local terrain, acreage, predator threats, budget, and personal preference. Whichever animal you choose, count on some training, extra feed, vet care, and housing expenses. Guardian animals can be effective, but in some situations, packs of coyotes will defeat the most diligent guard animals. If you are following an aggressive rotational grazing program, with flocks in several paddocks at the same time, you may need a guard animal for each paddock. The major advantages of using guard animals include decreased predation, reduced labour to confine sheep at night and more efficient use of pastures for grazing.

Guard dogs

Guard dogs are a useful tool for reducing livestock losses to predators. An important thing to remember is that they are a fulltime member of the flock, they are not a herding dog or a pet. There are many breeds that are suitable. An advantage of using dogs is that multiple dogs do not reduce individual effectiveness. Guard dogs work well in both fenced pasture and range operations. In fact, they are the most effective weapon in large flock, range-type operations or in heavily treed pastures where more than one guard animal is required.

In rare instances dogs may harass or injure sheep, or wander off and not stay with the sheep. Guard dogs have higher feed costs than guard donkeys or llamas and require daily feeding. However, guard dogs will alert the owners to any disturbances near the flock. They will also protect the livestock and the farm property.

Guard donkeys

Donkeys have been used for centuries to protect sheep and other herding animals. Donkeys are extremely intelligent, with acute hearing and sight, and they are conservative by nature. They do not like change in their surroundings, and will drive off a coyote or stray dog as much because it is an intruder as from any instinctive dislike of canines. Donkeys are easy to care for - good pasture or hay and water is all they need - and delightful barnyard pets, if you accept that they are clever and rigid. But not all donkeys are instinctive guards. Some will ignore an intruder, and there are stories of donkeys who run away from intruders, and donkeys who attack the sheep and goats they are supposed to protect. There is wide variation in how individual donkeys interact with sheep. Be aware that the donkey's behaviour and mood may be unpredictable during estrus, or when the ewes are lambing.

Researchers recommend using only one jenny (female) or gelded jack (male) per pasture; intact jacks are too aggressive, and two or more donkeys might stay together instead of being with the sheep. They also recommend about a four to six week period for the donkey to bond with the sheep. The donkeys' distinct dislike of canines may also include the farm or herding dog. Donkeys are apparently most
effective in small, open pastures or where sheep are cohesive and graze together. Feeds containing anabolic agents, such as monensin (Rumensin) and lasalacid (Bovatec) are poisonous to donkeys.

**Guard llamas**

Llamas are intelligent, instinctively dislike canines, and are capable of protecting a flock from some predator attacks. A tall, alert llama can be intimidating to a coyote. Because they are ruminants, llamas can eat the same diet as a flock of sheep or goats they are guarding. In many areas, vets have little experience with llamas. A guard llama should always be gelded. It is generally recommended that llamas not be gelded before one year of age because of problems in the growth of leg bones if the male hormones are not available.

Llamas are naturally aggressive toward coyotes and dogs. Typical responses of llamas to coyotes and dogs are being alert; alarm calling; walking to or running toward the predator; chasing, kicking, or pawing the predator; herding the sheep; or positioning themselves between the sheep and predator. Although the snorting and stomping of a llama can be an effective deterrent against a prowling coyote, llamas can themselves be vulnerable to packs of coyotes, dogs, wolves, and cougars. Many llama breeders now refuse to sell llamas as livestock guards because their guarding manner - out of natural curiosity, a llama walks toward a marauding predator - can increase their vulnerability. Also be aware that the llamas may spit at you.

**Management practices**

**Health of flock**

Healthy sheep tend to be less susceptible to predation. So, if ewes are in good condition they will generally produce stronger lambs. This may decrease predation, as orphaned and otherwise abnormal lambs are likely to be initial victims of predation.

**Recordkeeping**

Knowing how many sheep you have in a particular pasture helps to quickly determine when losses begin. Keeping track of losses can be very beneficial in eventual control or removal of the problem predator. They can help identify loss patterns, or high risk pastures.

**Season and location of lambing**

Highest predation typically occurs from late spring through September-October due to high feed requirements of raising the predators young and the fact that the sheep are on pasture during this time. Lambs born on pasture are more likely to be at high risk to predation than older lambs or mature sheep. On the other hand, winter born lambs, raised indoors and hand fed may be as much at risk since they are not as alert or suspicious of humans or strange animals as those born on pasture are.

**Corrals and night confinement**

Although this may be a practical option for small flocks, or flocks of dry ewes that lambed during the winter, it is not a feasible option for large, commercial flocks that have young lambs with them on pasture.

**Deadstock disposal**

An Alberta study indicated that predator losses on farms where deadstock were promptly removed and disposed of were lower than on farms where deadstock were left about.

**Human presence**

Frequent checking of flocks can discourage predation from the beginning. As well, periodic changing of when the flock is checked can deter coyotes from attempting kills.

**Novelties**

Things like bells on a number of sheep in the flock; aluminum pie plates hung around the perimeter of the pasture, playing the radio, etc. can discourage coyotes from preying on flocks. Anything that causes an irregular sound or reflection can be effective. Again, these sorts of things may be suitable to some producers and not others. Each individual situation must be assessed as to what is most suitable.

**What to do if you have a predator problem?**

Contact your local Manitoba Conservation office. You may eliminate predators in defense of your property on lands that you legally occupy with livestock without a special permit, or authorize someone else in writing to do so (a licensed trapper is recommended). Live traps may be used, but you should consult Manitoba Conservation and the Manitoba Trapping Guide for
which traps you may use. Actions taken must be in a safe and appropriate manner, as prescribed by provincial (see the latest Manitoba Hunting Guide and Trapping Guide), federal and municipal laws. Carcasses must be reported to Manitoba Conservation within 10 days and disposed of in a manner acceptable to provincial, federal and municipal laws. If you are taking problem coyotes, during a Big Game hunting season or a trapping season, it is particularly important that you notify the nearest Manitoba Conservation office beforehand.

**Lithium chloride** may be used in aversive conditioning baits. Ingesting it will cause the predator to experience short-term, acute digestive discomfort and vomiting. It is neither a poison nor a repellant and has no long-term physical effects on the species that consumes it. However, lithium chloride is effective at persuading a would-be predator to revert to other food sources. Specifically designed, sheep-like bait or laced carcasses are used to make sure the predator makes the psychological connection between the effects of the taste-aversion bait and the species being protected. More information and instructions for using lithium chloride can be found in the MAFRI fact sheet entitled, "Aversive Conditioning of Sheep Predators."

**Compensation**

Unfortunately, despite our best efforts, losses due to predators do occur. There is a livestock predation compensation program operated by Manitoba Crop Insurance Corporation. The program compensates producers for livestock killed or injured by bears, cougars, wolves, foxes and coyotes. It does not compensate for livestock killed or injured by domestic dogs. Claims must be filed within 72 hours of discovering that an attack has occurred and the Crop Insurance adjuster will inspect the carcass or injury as soon as possible. For further information on this program contact the Manitoba Crop Insurance Corporation.

For further information on predator control, contact Your local Manitoba Conservation or MAFRI office.

**This fact sheet was initially prepared by:**

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Introduction

Forages constitute 75 to 90 percent of the total diet for sheep. Sheep are excellent converters of forage to meat and fiber and are capable of producing a USDA Choice carcass from forage alone. Sheep consume a wide variety of forages, and selectively graze numerous weeds and other pasture menaces such as multiflora rose and blackberry. Companion grazing of sheep with other species of livestock, such as cattle or goats, results in greater pasture utilization and higher quality pastures than when a single species is grazed alone. Sheep prefer to graze hillsides and steep slopes and provide a means for improving forage utilization and fertility on areas not accessible to farm equipment.

Class and stage of production of the animals dictate the type and quality of forage to be grazed. Lactating ewes with lambs are placed on the highest quality pasture available to promote desired levels of milk production and lamb growth. Dry, non-pregnant ewes or ewes in early to mid-gestation are placed on lower quality forages or serve as second grazers behind young, growing lambs. Strategies that match stage of animal production with type and quality of forage improves overall forage utilization while maintaining optimum animal performance.

Although year-round grazing programs are not attainable in most parts of Virginia, the combined use of permanent and annual forages can come within four to six weeks of a year-round supply of non-harvested feed. Strategic allocation of pasture forages through the use of controlled grazing provides a tool by which producers can lengthen the grazing season and improve overall forage utilization per unit of land area. The advent of high tensile electrified wire and electrified temporary fence has made the application of controlled grazing economical, practical, and profitable.

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Nutrient Requirements and Stocking Rates

Animal classification (breeding ewe or growing lamb), stage of production (maintenance, gestating or lactating) and bodyweight determine the quantity and quality of forage required to meet the animals' nutrient requirements. Recommended average dry matter intake, as a percentage of body weight, for 154 lb ewes is 1.7, 2.0 and 4.0 percent for maintenance, gestation and lactation, respectively. The digestibility (quality) of a forage affects dry matter
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