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### G99-1393 Grazing Alfalfa

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## Grazing Alfalfa

Grazing alfalfa may be a cost efficient means of harvest for some producers. This NebGuide explores alfalfa and alfalfa/grass options, varieties and stand establishment, and grazing and bloat management.

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- [Alfalfa Grazing Options](#)
- [Varieties and Stand Establishment](#)
- [Alfalfa and Grass Mixtures](#)
- [Grazing Management](#)
- [Bloat Management](#)

Alfalfa is the most productive and versatile forage legume grown in Nebraska. Cutting for hay or silage has been the traditional method of harvest, but many opportunities and options exist for grazing. With current technology and proper management, beef gain can exceed 1,000 pounds per acre with acceptable stand persistence.

### Alfalfa Grazing Options

#### Season-long

With adequate soil moisture, alfalfa can produce relatively large quantities of grazable forage for five to six months. As a result, alfalfa can be grazed during the entire growing season or it can be harvested for hay or silage most of the time and grazed when the quantity or quality of forage in other pastures is inadequate. Grazing reportedly shortens the life of an alfalfa stand, compared to mechanical harvest, especially when grazing is season-long; however, management techniques can take advantage of grazing alfalfa, while reducing some of the potentially detrimental effects. The quality of alfalfa as a grazed forage is consistently high, which makes it ideally suited for growing yearling cattle or for lactating dairy cows. Weight gains of yearlings typically average 1.5 to 2.5 lb/day during the growing season. Its season-long productivity, particularly under irrigation, can support stocking rates as high as 12 animal-unit months/acre.

#### Spring

Alfalfa begins to grow early in spring. Grazing during this time has several advantages. First, livestock operations without adequate cool-season pasture can graze alfalfa in the spring as an alternative to feeding hay and/or to defer grazing warm-season grass pastures. Secondly, grazing alfalfa's first crop in the spring instead of haying avoids weather delays and loss of quality common during first cutting.

## **Summer**

Proper grazing management during summer will seldom harm an alfalfa stand. Older and thin stands of alfalfa may have considerable annual weeds, leading to decreased quality and quantity, which may not warrant hay harvest. Grazing is an excellent way to use this alfalfa.

Summer grazing of alfalfa may benefit livestock and other pastures. Typically, there is a 'summer slump' period (late-July and August) when quality and/or quantity of warm- and cool-season grass pasture declines substantially. Temporary alfalfa pasture can reduce grazing pressure on grass pastures and provide better quality forage. Yearling cattle often maintain high rates of gain when grazing alfalfa during late summer.

## **Fall and Winter**

Alfalfa can provide considerable high quality grazing in the fall. Grazing also avoids the problem of slow curing of hay due to low temperatures and high humidity. By fall, most warm-season pastures have been utilized completely and/or the quality of forage is low. Cool-season grass pastures will have some forage growth in the fall, but usually less than alfalfa. All classes of livestock can benefit from grazing fall alfalfa. Alfalfa makes excellent pasture for weaning calves. It can add weight to yearling cattle or increase cow condition prior to winter. Standing alfalfa also can serve as an excellent protein supplement for livestock that are grazing adjacent crop residues such as cornstalks. To provide much protein, though, alfalfa leaf material must be present, particularly after mid-November.

Grazing alfalfa in late fall or during winter can reduce alfalfa weevil infestations by removing stems and plant parts that serve as a wintering site or a spring laying site for weevil eggs. Some winter-annual weeds may be reduced by dormant season grazing.

## **Varieties and Stand Establishment**

There are many alfalfa varieties available, and they can vary greatly in yield potential, winter hardiness, disease and insect resistance, and grazing tolerance. When selecting an alfalfa variety, consider the planned primary use of the alfalfa; that is, if it will be primarily grazed or harvested with a combination of haying and grazing. Alfalfa varieties historically have been categorized as hay-type (tap-rooted) or grazing-type (creeping-rooted), but numerous recent varieties are classified as dual-purpose. These dual-purpose varieties have similar yield and disease resistance as top hay-type varieties. See Extension Circular EC99-153, *Selecting Alfalfa Varieties for Nebraska*, for more information.

Even though an alfalfa variety may be grazing-tolerant, it still can cause bloat. There are currently no alfalfa varieties recommended in Nebraska with reduced bloat potential.

Carefully select fields when planning to use alfalfa for grazing. Ideally, the field should have livestock water available and a shape that allows efficient fence construction to create several paddocks. Proximity to other pastures and livestock working facilities also is desirable. Avoid fields with substantial areas of low, wet soils, especially when spring or season-long alfalfa grazing is planned.

Alfalfa thrives on deep, fertile, well-drained soils with a pH of 6.2 to 7.5, but it can be grown with

conservative management on more marginal soils. Sandy soils can produce substantial alfalfa yields when properly irrigated and fertilized. Take soil samples to determine fertilizer needs.

**Alfalfa and Grass Mixtures**

Combining grass with alfalfa in fields to be grazed provides several benefits, but also can create additional challenges with fertilizer, irrigation, and grazing management. Including grass and non-bloating legumes like birdsfoot trefoil and cicer milkvetch in a mixture with alfalfa can lower the bloat potential compared to pure alfalfa. Grass usually develops a solid, stable sod compared to pure alfalfa and some grasses will spread and fill in areas where plants have died. This also can reduce weedy plant invasion. Vegetative alfalfa is very high in degradable protein and low in fiber. Energy of pure alfalfa also can be low relative to the high protein levels. By adding grass, the overall diet mixture may provide a better energy-to-protein ratio for the grazing animal than alfalfa alone.

**Mixtures and Proportions**

Because of their growth characteristics and productivity, cool-season grasses are most often seeded in mixtures with alfalfa. Orchardgrass and smooth brome grass are commonly used, but other grasses and legumes can be included (*Table I*). When the primary objective is to have a high quality alfalfa-based pasture with reduced potential for bloat, a mixture that produces about 50 percent alfalfa and 50 percent grass in the available forage is recommended. This mixture percentage, or even one with a lesser percentage of alfalfa, does not guarantee that it will be bloat-free, but it will sharply reduce the potential for bloat.

A mixture that contains about 3 to 5 lb/acre of alfalfa with the remainder of the mixture being the desired grasses at their appropriate seeding rates will generally result in a balanced mixture. Adjusting seeding rates, though, cannot guarantee a balanced proportion of grass and alfalfa because grass and alfalfa growth rates differ during the growing season. In particular, after mid-June, grass growth may be much slower than alfalfa. This can result in a higher proportion of alfalfa in the available forage for the remainder of the growing season. Because of their ability to spread, sod-forming grasses may increase in abundance over time. In contrast, bunchgrass stands usually are limited to the plants initially established and tend to thin over time. Use the higher end of the recommended seeding rate for bunchgrasses to ensure a dense stand. The composition of the mixture also may change over time depending on fertilizer, irrigation, and grazing management.

Another option for older and thinning alfalfa hay fields is to inter-seed grasses and other legumes to create a high producing pasture. This will extend the useful life of the alfalfa field and provide excellent grazing for livestock. Seed perennial cool-season grasses at the same rate as when seeding them with new alfalfa. Alfalfa competition with the new grass seedlings will need to be controlled. An early hay harvest before buds develop or flash grazing usually works well. See NebGuide G81-543, *Establishing Dryland Forage Grasses*, and NebGuide G03-1502, *Perennial Forages for Irrigated Pasture*, for more information.

Table I. Growth form and seeds per pound and recommended seeding rates of perennial cool-season grasses and legumes <sup>1</sup> .				
Grasses	Growth form	Seeds per pound	Seeds/sq. ft. when seeded at 1 lb/acre	Recommended seeding rates when seeded alone (lb/acre) <sup>2</sup>

Smooth brome	sod-forming	134,000	3.0	8 - 12
Creeping foxtail	sod-forming	750,000	17.2	2 - 3
Reed canarygrass	sod-forming	550,000	12.6	3 - 5
Intermediate wheatgrass	sod-forming	88,000	2.0	12 - 16
Pubescent wheatgrass	sod-forming	100,000	2.3	10 - 14
Perennial ryegrass	bunchgrass	228,000	5.2	6 - 10
Orchardgrass	bunchgrass	590,000	13.5	4 - 6
Meadow brome	bunchgrass	90,000	2.1	12 - 16
Timothy	bunchgrass	1,230,000	28.2	2 - 3
Tall fescue	bunchgrass	228,000	5.2	6 - 10
<b>Legumes</b>				
Alfalfa	-	210,000	4.8	12 - 18
Red clover	-	275,000	6.3	5 - 7
White clover	-	802,000	18.4	3 - 5
Alsike clover	-	680,000	15.6	3 - 4
Cicer milkvetch	-	130,000	3.0	6 - 9
Birdsfoot trefoil	-	418,000	9.6	6 - 8
<sup>1</sup> Information on specific varieties and adaptability to regions within Nebraska can be found in EC 90-120, <i>Certified Perennial Grass Varieties Recommended for Nebraska</i> , or by consulting your local Extension office. <sup>2</sup> Rates for mixtures of grasses and/or legumes need to be adjusted based on the number of species in the mixture or the desired composition.				

## Cultural Practices for Alfalfa and Grass Mixtures

Alfalfa-grass mixtures need less nitrogen fertilizer because the grass uses some of the nitrogen fixed by the alfalfa. As little as 10 to 20 percent alfalfa in a mixture may increase grass production when alfalfa seed is properly inoculated; however, there must be at least 70 percent alfalfa in the mixture before adding nitrogen does not increase grass response.

Soil tests are needed to accurately determine the most cost-effective fertilizer needs for alfalfa/grass mixtures. Fertilizer can be used to alter the proportion of alfalfa and grass in a mixture. Applying only phosphorus, for example, will enhance the vigor and production of alfalfa with a minimal effect on the grass. Applying nitrogen will stimulate grass growth if the proportion of alfalfa in the mixture is less than 70 percent. Over time, grazing intensity also can affect the alfalfa and grass proportion. Close grazing to leave a short stubble followed by adequate rest will favor alfalfa while grazing that leaves a tall stubble will favor grasses.

Irrigation management for alfalfa/grass mixtures also is important. Compared to alfalfa, grasses have much shallower roots. To maintain consistent and active growth of the grasses, irrigate more frequently using lesser amounts.

## Grazing Management

## Stocking Rates

Productivity of the alfalfa will influence the number of animals a given area will support. Stocking rate is defined as the number of animals grazing an area for a period of time. Often, it is expressed as animal-unit months (AUM)/acre or animal-unit days (AUD)/acre where one animal unit equals 1,000 lb of live animal weight.

The actual stocking rates that can be used on alfalfa depend on grazing management and production. A general rule is that one ton of standing alfalfa will provide about 50 AUD of grazing using good grazing management in a six-pasture rotation (see *Rotational Grazing*). For example, alfalfa that typically produces six tons of hay/acre would provide 300 AUD of grazing/acre. These 300 AUD/acre could be harvested over a 120-day period. To accomplish this, about four yearling animals per acre could be used. The animal's average weight over the 120-day period should be used in stocking rate calculations. For example, animals with a 500-lb initial weight could weigh about 740 lb after 120 days. Their average weight for the grazing period would be 620 lb. Using four of these animals (2.4 AU) per acre for 120 days (2.4 AU times 120 days) equals 288 AUD.

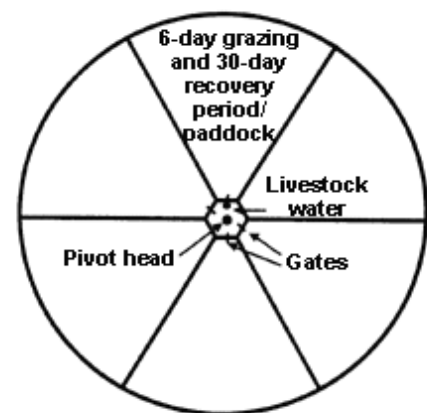
## Seasonal Grazing Considerations

**Spring.** Wait until alfalfa is at least 4 inches tall before beginning grazing. Extended rainy periods with wet and muddy soil conditions are common during spring. To prevent alfalfa stand damage, move livestock to a nearby grass pasture or to a designated 'sacrifice' paddock during wet periods. Also, observe livestock frequently during spring grazing because young and rapidly growing alfalfa may have a higher bloat potential. After the spring grazing period ends, allow the alfalfa to regrow for about 25 to 40 days before cutting for hay. The length of this regrowth period depends on the remaining stubble height and growing conditions.

**Fall/Winter.** Bloat remains a potential problem when grazing alfalfa in the fall, especially during the first three to five days after alfalfa has been exposed to freezing temperatures. In general, the risk of bloat will be minimal only after a significant portion (about 50 to 70 percent) of the alfalfa top growth has been frozen and dried. The fall freeze-down is often a slow process with many freezes over several weeks. The time it takes to reach the point where 50 to 70 percent of the alfalfa top growth has been frozen and dried will depend on the severity of the freezes and amount of standing alfalfa.

To help alfalfa survive the winter, allow plants to grow without cutting or grazing for at least four to six weeks prior to the first killing freeze. In Nebraska, this period is from about September 1 to October 15. This rest period allows plants to store higher levels of energy needed to keep plants alive through the winter and develop new shoots in the spring. Stands that have been adequately winterized typically are less susceptible to winter damage and the following year's first growth will be more productive.

Fall grazing can be managed to meet alfalfa's winterization needs. One way is to graze rotationally. This will allow most paddocks and plants to receive at least four weeks rest during September and October. If this is not practical, control grazing to maintain at least 6 to 8 inches of standing alfalfa at all times. With adequate standing forage, the alfalfa can be grazed and winterize itself at the same time. In fact, properly managed



**Figure 1.** Example of the paddock layout for a six-pasture rotational grazing system under a center pivot irrigation system.

grazing will have less impact on the plant than cutting for hay.

Also, avoid reducing stubble height to less than 2 or 3 inches in late-fall because some stubble left on the field will catch snow and help protect alfalfa from winter damage.

## **Rotational Grazing**

Graze rotationally to harvest alfalfa efficiently and to maximize stand life. At a minimum, divide the pasture into five or six paddocks so each paddock has 24 to 40 days to regrow after each grazing (*Figure 1*). This will require each paddock to be grazed for about six to eight days. Flexibility exists in the grazing time, but do not graze for more than 10 to 12 days. This reduces the chance of grazing or trampling new shoots emerging from the crown buds.

Alfalfa should be grazed closely enough so that regrowth is stimulated to occur from the crown. On the average, about 4 to 6 inches of remaining stubble should be the goal, except during the fall winterizing period when a 6- to 8-inch stubble is recommended. Taller stubble may be justified, however, if animals with very high nutrient demands (e.g. lactating dairy cows) are grazing, because forage quality and intake generally decline as stubble becomes shorter. Also, grazing that leaves very short stubble could lead to a greater risk of bloat if livestock are hungry when turned into the next paddock.

Alfalfa growth is very rapid during spring and early summer and then slows during the warmer part of summer. To accommodate this difference in growth rate, one or more paddocks could be cut for hay in the spring while other paddocks are grazed. Another option to manage this change in growth rate is to reduce the number of livestock after the rapid growth period.

Special consideration should be given when grazing new stands. To avoid damage, plants need to become well established before grazing. The first crop could be cut for hay with grazing beginning on the next growth.

More management intensive approaches can be very effective when grazing alfalfa. Strip grazing techniques or developing 30 to 35 paddocks and using proper stocking would allow growth to be removed from one paddock in one day. These more management intensive approaches can result in even greater harvest efficiency. However, it is usually best to obtain experience with rotational grazing using a smaller number of paddocks (10 or fewer) before developing more paddocks and management intensive systems.

## **Continuous Grazing**

Continuous season-long grazing of alfalfa generally is not recommended because it results in lower harvest efficiency than rotational grazing and may result in a more rapid stand decline. If alfalfa is grazed for an extended period (more than 30 days) during the growing season, maintain a stubble height of 6 to 8 inches. This may require adjusting the numbers of livestock as growing conditions change. Grazing-tolerant varieties will persist much longer than hay-type varieties and can be grazed to an even lower stubble height.

Grazing will cause little damage if it lasts for only a short time (less than 30 days) and if the field does not become excessively wet and muddy during the grazing period. Short-term grazing can be used on an alfalfa field when there is an immediate need for pasture and it avoids the expense and effort needed to construct paddock fencing or to develop multiple water points. This also applies to situations where grazing may be used to harvest alfalfa growth once during the growing season and other harvests are taken as hay.

## Bloat Management

Bloat occurs in ruminant livestock when gas produced during fermentation becomes trapped inside the rumen. Normally, this gas is expelled by the animal through eructation or belching. Several plant, environmental, and animal factors may contribute to the development of bloat. The resulting rumen distention can exert pressure on the animal's respiratory and circulatory systems to the point of death.

### Causes of Bloat

A primary plant factor contributing to bloat is believed to be a high initial rate of digestion. Alfalfa leaves can be digested rapidly by rumen microbes and subsequently produce relatively large amounts of gas and a stable foam. Younger, less mature alfalfa and alfalfa grown at lower than normal temperatures often cause more bloat. Frost may increase the incidence of bloat by rupturing plant cell walls, leading to a high initial rate of digestion. Other environmental conditions that increase the possibility of bloat include grazing alfalfa when it is wet from dew, rain, or irrigation water. Certain individual animals have a tendency to bloat more than others. These 'bloat-prone' or 'chronic bloating' animals should be removed from the pasture. Because this tendency to bloat may be partly genetic, offspring or other relatives of bloat-prone animals should be considered for culling or at least observed more closely.

### Managing Potential Bloat Problems

There are many management strategies available to reduce bloat potential. These strategies generally fall into the categories of pasture establishment, livestock diet supplements, and grazing management (*Table II*). In general, they attempt to minimize the bloat potential of the forage available for grazing and minimize changes inside the rumen of the grazing animals.

Using combinations of these strategies will make the bloat potential of grazing alfalfa a manageable problem. Above all, it is important to not become complacent or over-confident regarding bloat-management. See NebGuide G74-149, *Bloat Prevention and Treatment*, for more information.

**Table II. Management strategies and options to minimize bloat while grazing alfalfa-based pastures.**

#### *Pasture Establishment*

- Plant mixtures of alfalfa and grass with alfalfa providing no more than 50 percent of the available forage. Observe plant growth rates and alfalfa - grass proportions throughout the growing season. (See section on *Alfalfa and Grass Mixtures*)
- When they become available, plant 'bloat-reduced' (low initial rate of digestion) alfalfa varieties that are adapted to Nebraska growing conditions. Note: current grazing-tolerant varieties are not bloat-reduced.

#### *Livestock Diet Supplements*

- Provide a bloat preventative (poloxalene) to livestock several days prior to and while grazing alfalfa.
- Provide bloat-reducing compounds such as Laureth-23, antibiotics (oxytetracycline, penicillin), or ionophores (Rumensin or Bovatec).
- Provide mineral supplement with adequate sodium (salt) and avoid excessive potassium, calcium, and magnesium.
- Allow livestock free-choice access to grass hay while grazing lush alfalfa or windrow



portions of pasture several days prior to grazing.

### ***Grazing Management***

- Never turn hungry livestock into an alfalfa pasture.
- Make paddock rotations mid-day or later.
- Avoid dramatic changes in forage quality when rotating from paddock to paddock by leaving adequate residue.
- Observe livestock closely the first several days and remove any 'chronic-bloating' animals.
- Avoid grazing alfalfa before the 10 percent bloom stage. This may not be possible when spring grazing or grazing season-long. Closer observations for bloat should be made when many plants are at a younger growth stage.
- Be extra observant for bloat when a rapid flush of alfalfa growth occurs such as during cloudy wet periods in the spring and after a plant stress such as hail or drought.
- Delay grazing alfalfa for three to five days after freeze damage.

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