

# Grazing Alfalfa

THE SAMUEL ROBERTS  
**NOBLE**  
FOUNDATION

by Eddie Funderburg / erfunderburg@noble.org

NF-SO-09-01

**Alfalfa** (*Medicago sativa*) has probably been grazed for as many years as it has been planted. However, most of the grazing has been done as a minor component of a hay production system and not as a stand-alone grazing system. Historically, alfalfa was not grazed heavily due to possible stand damage by the animals and widespread fear of bloat. Recently, varieties have been developed to tolerate heavy continuous grazing pressure and still persist. Grazing alfalfa varieties can also be hayed, and their yields have been found to be equivalent to hay-type varieties.

Grazing alfalfa has received a great deal of attention due to the fact that alfalfa produces high yields of high quality forage without nitrogen fertilizer. Grazing alfalfa can be used in either a stocker or a cow/calf operation.

This publication will briefly cover the site selection, stand establishment, fertilization, grazing management and cattle bloat management of grazing alfalfa. It is important to properly manage all these components to make grazing alfalfa work well. This publication is not intended to be a step-by-step blueprint to producing alfalfa, but an overview of how grazing alfalfa can fit into your operation.

## Site Selection

The most important decision in growing alfalfa is site selection. Alfalfa used for any purpose should be planted on deep, well-drained soils. Grazing alfalfa is no different. The best soils are those that are flat, deep and well-drained in a river or creek bottom that does not flood. The land should be



level or nearly level and relatively free of low areas and potholes where water can collect. Alfalfa can be grown on gently rolling upland soils that are deep and have good water retention and release properties, but usually does not persist as long as stands planted in bottomland sites.

Grazing alfalfa should *not* be planted on shallow, steep or rocky sites. These sites might provide a good stand for a short time, but alfalfa planted on these sites is highly unlikely to persist. In certain areas of the country, cotton root rot is a problem. Grazing alfalfa should not be planted in fields known to contain cotton root rot.

The soil survey published by the Natural Resources Conservation Service can aid in identifying suitable

sites for alfalfa on your property. It can be accessed online at [websoilsurvey.nrcs.usda.gov/app](http://websoilsurvey.nrcs.usda.gov/app).

## Fertilization and liming

Soil testing is an essential part of alfalfa production. Collect good soil samples and submit them for laboratory analysis, then follow the recommendations for lime and nutrients. This publication is meant to highlight the differences between alfalfa grown for hay and grazing, but is not intended to give detailed fertilizer recommendations.

Grazing alfalfa should be limed to the same soil pH as hay alfalfa. However, a major difference between hay and grazing systems is that there is a lower total requirement for phosphorus (P) and potassium (K) in ►

a grazing system. The reason is that large amounts of P and K are removed in hay. In a grazing system, most of the nutrients are recycled back into the soil and little is removed from the system. However, the redistribution of nutrients by livestock is not uniform and tends to build up around watering points. Sample soils by proximity to water areas after the fields have been grazed a few years to see if the nutrients are building up in certain areas and decreasing in certain areas.

### Lime

Alfalfa is not tolerant of acidic soils. Yield and stand life will be decreased if the soil pH is highly acidic. We recommend a soil pH of 6.5 or above for alfalfa production. According to Oklahoma State University, alfalfa production can be reduced by 50 percent if the soil pH is 5.5 and stand failure is likely at a pH of 5.0.

If the soil pH is below 6.5, apply lime at a rate necessary to bring the soil pH up to this level. This rate cannot be determined without a soil test. If the soil is low in magnesium, use a dolomitic lime. If the soil is not low in magnesium, you can use either a dolomitic or calcitic lime.

### Nitrogen

Since alfalfa is a legume, the seed should be properly inoculated with the correct *Rhizobium* bacteria (*Rhizobium meliloti*) to allow the plant to utilize atmospheric nitrogen. This species of bacterium forms colonies in nodules on the roots of alfalfa and fixes nitrogen from the atmosphere. The plant has access to some of this nitrogen. This eliminates the need for commercial nitrogen fertilizer and removes a large cost item from the grazing budget.

A relatively small amount of nitrogen (15-30 pounds N per acre) can be beneficial to newly planted alfalfa.

This amount can be provided in 18-46-0 if phosphorus is recommended. If phosphorus is not needed, we do not recommend applying nitrogen alone to alfalfa.

### Phosphorus and potassium

Phosphorus and potassium are needed in larger amounts for alfalfa than for most other forage crops. The rates should be based on soil test results. If the grazing alfalfa is occasionally hayed, the need for P and K is greater since their removal is increased. Alfalfa will not grow well in soils low in phosphorus and potassium unless they are provided by fertilizers.

### Secondary and micronutrients

According to Oklahoma State University, secondary and micronutrient deficiencies in alfalfa are rare in Oklahoma. Boron deficiencies are sometimes seen in overlimed soils, and sulfur deficiencies are sometimes seen in very sandy soils. However, these deficiencies are rare. Confirm suspicions of secondary or micronutrient deficiencies with a tissue analysis. Tissue analysis is more accurate than soil analysis for determining deficiencies of secondary and micronutrients.

### Varieties

Most states publish variety trial results. In this publication, differences between grazing and hay varieties will be discussed. Both types of varieties can be either grazed or hayed, but there are differences in management of the two types.

Hay varieties grow quickly until they reach a certain maturity stage and then growth dramatically slows. They make excellent yields because they grow quickly and are then ready to harvest. Grazing varieties grow at a more uniform and steady pace. Because of this, hay varieties are best grazed in a high intensity, short

duration rotation system that mimics the harvest by haying (one week grazing, or until the alfalfa is grazed to a stubble height of 6-8 inches, and three weeks rest). Even with rotational grazing, treading damage from livestock can cause stand thinning in hay-type varieties. If hay varieties are grazed constantly, their stand life is quickly diminished.

Grazing varieties were developed and selected to maintain stand life under constant and intense grazing pressure and to resist livestock treading effects. These can be rotationally grazed (and will yield better), but they can also be continuously grazed if that management system must be used. Grazing alfalfa can be hayed without harming the stand if excess forage is produced, which is why it is termed "dual purpose."

### Livestock Performance

Livestock performance will vary with obvious factors such as rainfall, temperature, stocking rate and other factors. Work at the Noble Foundation showed average daily gains of stocker calves of about 2 pounds per head per day and total gains of about 320-420 pounds per acre per year. Work at the University of Georgia showed about the same performance. It will be hard to find a summer grazing program that will perform as well as grazing alfalfa.

Grazing alfalfa can also fit into a cow-calf system. Advantages are higher stocking rates, better calf performance and the ability to produce high quality hay if the forage outgrows the cattle.

### Stand Establishment

When establishing alfalfa, examine the past history of the field to determine if herbicides with long soil residuals that can harm alfalfa have been recently used. Some common

pasture and wheat herbicides with long residuals include picloram (found in Grazon® P+D and Tordon®), aminopyralid (found in Grazonnext® and Milestone®), Cimarron®, Glean® and Amber®. Check the labels on all herbicides used in the field the previous two years to determine if they could cause a problem in obtaining an alfalfa stand. In some areas of the Southern Great Plains, cotton root rot disease can greatly diminish stands.

Alfalfa stands will be more consistent and last longer if planted as a pure stand rather than overseeding into a perennial grass.

Alfalfa can be planted no-till, but it is usually planted into a well prepared, firm seedbed. Seed should be drilled at a depth of one-fourth to one-half inch at a rate of 15-20 pounds of seed per acre.

Alfalfa can be planted in either fall or spring, depending on the environment in your location. However, fall plantings are greatly preferred in the Southern Great Plains because they typically yield more than spring plantings. Fall planted stands usually persist longer than stands from spring planting. The best stands and yields in Oklahoma are usually obtained when planted in September.

Seed should be properly inoculated with the appropriate *Rhizobium* bacteria as discussed in the section on nitrogen fertilization. Commercial inoculants should be applied to the seed just before planting. The inoculant is a live bacteria and must be protected from heat, drying and direct sunlight before being added to the seed to be effective. Most seed from proprietary varieties are pre-inoculated. Check the seed tag for the expiration date and to be sure they are pre-inoculated. Pre-inoculated seed and commercial inoculants must be stored in a cool, dry area until time to plant.

When replanting alfalfa, the field should be fallowed or planted to a crop other than alfalfa for at least one full year. Before planting back to alfalfa, two years without alfalfa is preferred.

### **Pest control**

Pests, such as weeds, insects and diseases, are not as prevalent in grazing alfalfa systems as they are in haying systems. The main reason is that the cattle will eat many of the disease spores, insect eggs and weeds. In fact, dormant-season grazing is sometimes used as an insect control strategy in hay alfalfa systems.

Weeds may be a problem in the establishment year, especially winter annual grasses. There are labeled herbicides for all the weeds that are likely to cause a problem in the establishment year. Weeds are less problematic in established grazing alfalfa stands because cattle consume most of the weeds and grasses in the stand.

If insects or weeds become a serious problem, follow the control recommendations for the particular pest. These recommendations can be found in many places. Always read the label to see if there is a grazing or haying restriction for the pesticide you use.

### **Grazing management**

There are a few things to consider in grazing alfalfa to maximize the life of the stand. These management practices are not difficult and are inexpensive.

- Have a sacrifice area of perennial grass for cattle to congregate on when the alfalfa fields are very wet. Since most farms have land that is not suited to alfalfa, this should not be a problem. Remove animals from the alfalfa fields as soon as (and preferably before) they begin to bog.
- Do not overgraze the alfalfa. Alfalfa is very productive and will tolerate heavy grazing pressure, but should

not be grazed into the ground. Try to maintain a plant height of 12-15 inches (800 pounds dry matter) during continuous stocking periods to maintain plant health and ensure good yields. Also, some studies suggest that resting the field in August will lengthen the life of the stand.

- If hay varieties of alfalfa are being grazed, rotational grazing is essential to maximize stand life. If grazing varieties are used, rotational grazing is beneficial, but not essential. A good rotation to follow is to graze the alfalfa when it begins to bloom for about a week, or until it is grazed to a stubble height of 6-8 inches, and then rest it for 25-30 days. This mimics a hay production system.

### **Stocking Rate**

It is impossible to give a hard and fast stocking rate because of yield differences due to productivity of soil site, temperature, rainfall, stand age, rotation differences and many other factors. On good sites with good stands and average rainfall, we generally figure you can run one adult cow per acre during the growing season or two to three calves (depending on size) during the growing season. The growing season is considered late April through mid-October. The stand should be rested in very dry times of the summer.

A suggested strategy is to stock a little lighter than what you consider full carrying capacity and then add animals or cut hay if the forage starts to get ahead of the cattle.

### **Bloat Management**

All ruminant animals can bloat when grazing alfalfa. However, they can also bloat when grazing other high quality grasses and legumes. Following the strategies listed in this section will not eliminate bloat, but will reduce the incidence.



- Do not turn hungry cattle into an alfalfa field, especially if plants are wet with dew.
- Provide hay for the first week after turning cattle into the field for the first time.
- Do not graze immature alfalfa. It is best if plants are beginning to bloom before turning cattle into the field for the first time. Remember that this does not only include the first time the alfalfa is grazed in the spring, but is also true if you cut the alfalfa for hay. Do not turn cattle into a field that is immature because it has recently been cut for hay.
- Do not graze alfalfa for at least three days after a killing frost.
- Feed Rumensin®.
- Use bloat-preventing compounds.
- Closely observe cattle when turning them onto alfalfa the first time or during cool, cloudy and rainy weather.

### Profitability of Grazing Alfalfa

Grazing alfalfa can be very profitable if the guidelines above are followed. Enhanced profitability may be realized in several ways.

- Alfalfa produces high tonnage. Alfalfa will make as much or more tonnage as highly fertilized bermudagrass with better quality. This allows you to run more animals per acre and improve stocker gains or weaning weights on calves.
- No nitrogen fertilizer requirement – alfalfa is a legume and does not require nitrogen fertilizer. This reduces input costs considerably.
- Alfalfa can be used for hay if it outgrows the grazing cattle's forage needs. Grazing alfalfa can be cut for high quality hay if there is more forage than the cattle can consume. It will make higher quality hay than any other summer forage in the Noble Foundation's service area. Grazing alfalfa can require more up-front costs than a perennial grass like bermudagrass. At least three factors may contribute to increased costs.
- Alfalfa has a higher pH requirement. This was discussed earlier, but a lime application that would not have been needed for summer grasses may be required to grow alfalfa.
- Alfalfa has a higher P and K requirement. This was also discussed

earlier, but a substantial up-front cost for P and K may be needed if soil test values for these elements are low.

- Alfalfa must be replanted when the stand falls below acceptable levels. In the Southern Great Plains, this is usually about every three to six years. This is another cost to be considered with alfalfa that will likely not be needed with perennial summer grasses.

Budgets have shown greater net returns with grazing alfalfa over bermudagrass for both cow/calf and stocker systems. The increased profitability will likely be even greater with higher fertilizer prices.

### Summary

Grazing alfalfa can produce high quality, high tonnage forage in many areas. It must be planted on suitable sites to persist and be profitable. It requires special management to make the stand last as long as possible and to reduce the incidence of bloat. If these things are done, grazing alfalfa can enhance profitability in a cow-calf or stocker system. ■

THE SAMUEL ROBERTS  
**NOBLE**  
 FOUNDATION

The Samuel Roberts Noble Foundation  
 2510 Sam Noble Parkway  
 Ardmore, Oklahoma 73401  
 Phone: (580) 223-5810  
[www.noble.org](http://www.noble.org)