

## Pasture Management: Maintaining Permanent Pastures for Livestock

### Introduction

The maintenance of permanent pastures for livestock requires as much thought and planning as pasture establishment. By following recommended pasture management practices, forage dry matter yields can be maximized and the recommended ratio of grass and legume species can be maintained. Somewhat less maintenance is required for 100 percent grass pastures, although total nutritional yield of the pasture will be less too.

The following management recommendations will allow maximum carrying capacity for all livestock species.

### Principles of Pasture Growth

To better understand how to properly maximize pasture production and thereby maximize forage nutritional content, the manager should understand the principles of plant growth.

Grasses have both aboveground and belowground parts. Root growth and development are extremely important to plant growth. The number of aboveground tillers or shoots is directly related to root density and soil fertility. Besides providing food to the plant, roots help anchor the plant and maintain soil contact when the plant is grazed.

When plants are grazed or clipped with a mower, provided adequate soil moisture is available, new growth is encouraged. The rate of plant regrowth following grazing is directly dependent on the leaf surface area remaining.

Grasses should be maintained in a vegetative state, where new leaf growth predominates. If not grazed or mowed, the grass plant will elongate and go into the reproductive stage and produce seed. As grasses mature, their nutritional content declines quickly.

Legumes differ somewhat from grasses in that they have the ability to produce their own nitrogen through a symbiotic relationship with certain soil bacteria. They produce more nitrogen than they need, which allows grass plants growing nearby to utilize it.

Most legumes have broad leaves, and the most common pasture legume species like alfalfa, red clover and ladino clover produce terminal seedheads. The nutrient content of legumes declines less rapidly with maturation than that of grasses.

Legumes are very sensitive to soil pH, and thrive when pH stays above 6.7. Some legumes are not adaptable to continuous grazing. For example, alfalfa requires about 30 days between grazing for maximum production and retention in the pasture stand. Rotating livestock periodically to different fields or pastures will adequately maintain the desired grass and legume species in the pasture. Pastures that are continuously grazed will result in a reduction of these plant species to primarily bluegrass and white clover stands.

### Rotational Grazing

It is easier to maintain a wide variety of desirable pasture plant species through the use of rotational grazing than it is with continuous grazing. Dividing the total pasture

area in a sufficient number of lots or paddocks to allow for a 20 to 30 day rest period for each paddock between grazing will maximize dry matter production per acre. But keep in mind that labor availability will dictate how often livestock can be moved to new paddocks. Greater live animal gain per acre is achieved through rotational grazing than with continuous grazing.

Continuous grazing can result in excellent individual animal performance, but strict adherence to stocking rates, dragging manure clumps and clipping pastures must be followed.

### **Grazing Management to Maintain Productive Pastures**

Delay spring grazing until the pasture is at least 4 to 6 inches in height for low growing species, and 6 to 8 inches for tall growing ones. This will create increased root development that will encourage rapid plant regrowth.

Encouraging even grazing will help maximize forage production. Designing paddocks in a square rather than a rectangular shape will promote even grazing. Moving salt and mineral feeders to different locations will also change livestock grazing and resting patterns.

Avoid overgrazing in rotational systems. Remove livestock when the pasture has been grazed to 3 to 5 inches in height for tall growing grasses and 1 to 2 inches in height for

Kentucky bluegrass. Grazing below these recommended minimum levels will weaken plants, causing them to die prematurely. Overgrazing will also extend the time it takes pasture plants to regrow. Maintaining enough leaf surface area on the plants will optimize plant regrowth and reduce intervals between rotational grazing periods.

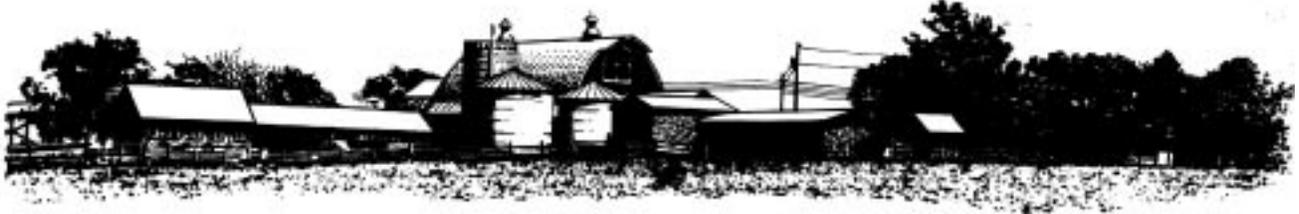
If pastures are not fully utilized and the field's plants reach maturity and produce seed, mowing is recommended to encourage new plant growth. Livestock will not readily consume plants that reach the seed stage, primarily because the plants become less palatable.

In the late fall, remove livestock so that pasture plants can replenish root reserves before going dormant in the winter. Encouraging healthy plants to maximize the storage of carbohydrates in the roots will result in a pasture that initiates early productive growth the following spring.

### **Mowing Pastures**

Mowing is a critical management practice in optimizing forage production from pastures. Mowing achieves at least two basic purposes. It can keep a majority of tall growing weeds from going to seed, thereby reducing weed problems in the pasture. Mowing will also keep grasses in a vegetative state where leaf surface area will be maximized and the plant will not produce a seed head.





Under an intensive rotational system, where large numbers of livestock are pastured on relatively small paddocks for short periods of time, little mowing will be required. With less intensive rotational programs or continuous grazing, more mowing will be required as livestock have the opportunity to selectively graze various plant species.

Mowing should be done immediately after livestock are removed from the pasture. Mowing off tall, uneaten plants will stimulate new growth. Set equipment to leave 3 to 5 inches of growth for tall grass species like orchardgrass and tall fescue, and 2 to 3 inches for primarily bluegrass pastures.

## Fertilizing Pastures

Monitoring soil fertility is one of the most important practices to ensure adequate growth and persistence of desired pasture species. Pastures should be soil tested every 2 to 3 years to determine soil pH and phosphorous, potassium and magnesium fertility levels. Most grass and legume species require a pH between 6.0 and 7.0 for maximum performance. Legume species such as alfalfa, red clover and ladino clover perform better when the pH is closer to 7.0.

If your soil test results recommend the addition of lime, this can be done anytime field conditions are appropriate. Ground limestone is the most common liming material used to raise soil pH to the proper level. It can be applied to the pasture while livestock are grazing the pasture.

Spring applications of fertilizer are best applied in late February and March, while fall applications should be applied in September. For permanent pastures where there are less than 25 percent legumes, additional nitrogen fertilizer is required in the spring and fall to assure good production from the pasture. Tall growing grasses containing less than 25 percent legumes which

are cut for hay should be fertilized in spring, after the first cutting, and in the fall.

Permanent pastures that contain over 25 percent legumes usually need little or no nitrogen fertilizer. However, lime, potassium, and phosphorous are important to the fertility of the grass-legume pasture. These nutrients are best applied in the spring according to soil testing recommendations.

Fertilizing pasture plants with the proper nutrients not only produces more forage but also helps to keep plants vigorous, thus enabling them to withstand heavier grazing, resist insects and disease, and compete against weed infestations. Maintaining proper fertility will increase the carrying capacity of your pasture, because a greater amount of feed will be produced, enabling more animals to be pastured on it.

## Dragging Pastures

Dragging pastures with a chain harrow to spread manure droppings has several benefits. It helps reduce selective grazing and encourage more uniform pasture growth. Scattering the livestock droppings more evenly spreads the manure to ensure an even distribution of this important fertilizer source. Dragging also helps to destroy internal parasites by exposing them to the ultraviolet rays of the sun.

Ideally fields should be dragged after livestock is rotated out of the pasture. Dragging is especially important in summer and fall when manure has less moisture content or when pasture quality is low, resulting in large deposits that can smother grass and promote weed growth.

## Stocking Rates

One of the most important factors in maintaining productive pastures is the maintenance and adjustment of stocking

rates. Total annual rainfall and the distribution of that rainfall throughout the year affects pasture production more than any other factor. Managing livestock to adhere to the principles listed above will maximize animal performance.

In most areas of the Mid-Atlantic region, one animal unit (1,000 lbs.) per acre of pasture is recommended. Adjustments to this level should be made relative to pasture productivity. Table 1 lists the animal unit values for various livestock classes and species.

**Table 1. Animal unit values for various livestock classes and species**

Livestock Class	Number of Animal Units
Cow (1,000 lbs.)	1.0
Cow/calf pair	1.3
2-year-old steer	0.9
Yearling cattle	0.8
Calves (under 12 mos.)	0.5
Mature bulls	1.5
Horses	1.2
Sheep/Goats	0.2

## Reintroducing Legumes to Pastures

In typical orchardgrass, red clover and ladino clover pastures, red clover will need to be replanted every 3 to 4 years. Red clover plants rarely survive more than 2 years. It is important that overseeded red clover stands be lightly grazed periodically in the spring to allow the new plants to develop adequate root growth.

## Conclusion

Proper pasture maintenance will ensure fields that will be productive and free of weeds. Adhering to the basic principles of pasture management will also maximize stocking rate if that is a goal of the farming operation.

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