

MANAGING WARM SEASON GRASSES FOR GRAZING

03-08-06

Introduction

Warm season grasses have a distinctively different growth pattern than do cool season grasses, which most graziers are familiar with. Unless the characteristics of warm season grasses are understood it will be difficult, if not impossible, to maintain viable warm season grass pastures in much of Minnesota.

Cool season grasses have their major growth stages during periods of cool weather, in the spring and the fall of the year. During the mid summer months their growth slows and their production becomes limited. This mid summer “slump” of cool season grasses is affected by the following:

Weather conditions: The reduction in growth during the summer is greater with higher temperatures and with reduced rainfall.

Species of grass: Some species have more of a reduction in growth rate than others. Reed canarygrass has less of a midsummer slump than other commonly used cool season grasses. The growth rate of timothy is greatly reduced during the mid summer. Other species fall in between the ranges suggested by these two species.

Management of the grazing system: The “midsummer slump” is much more exaggerated in continuous grazing systems, or in poorly managed rotational grazing systems (high stocking rates, inadequate rest periods, inadequate residual stubble heights) than it is in systems that have the stocking rate within reason for the potential of the pasture to produce, where the forages are allowed an adequate rest period, and where residual stubble heights are closely monitored and overutilization is avoided.

Warm season grasses have their major growth period during the hottest time of the year, the opposite of cool season grasses. Generally they do not emerge from the soil until late May. Their slowest growth is during the spring and the fall, and their most rapid growth rate is during the middle of the summer.

Most producers do not have adequate acreage of warm season grasses to provide a diet of warm season grasses through the months of July and August. The best management strategy is to utilize warm season grasses to extend the rest period of the cool season paddocks, which will typically be the primary source of forage. For most operations a maximum of one fourth to one third of the pasture acreage should be established to warm season grasses.

The following management strategies for warm season grasses are based upon their growth characteristics and, when employed in a managed grazing system, will allow a producer to effectively utilize and maintain them in a managed rotational grazing system.

Maintain Purity of the Forage Stand

One of the most significant challenges to utilizing warm season forages is the problem with cool season forages invading the stand. Kentucky bluegrass, smooth brome grass, and quackgrass are three of the most problematic cool season grasses to deal with. The reason relates to the aggressive nature of the cool season grasses at a time of the season when warm season grasses have not come out of winter dormancy and cannot provide competition.

Over time, if left unchecked, the cool season grasses will become the predominant type of grass in the stand. This minimizes the advantages of having warm season grasses in the pasture system. Considering the cost of and the time it takes to get warm season grasses established, it makes economic sense to care for the stand.

Early Spring Grazing

A common method of maintaining the purity of the stand is to do an early spring intensive grazing of the warm season paddocks in the system. In the early spring when the cool season invaders are about 3 inches tall the livestock are moved into the paddock that requires treatment and they are allowed to graze the area very heavily. The intent is to damage the cool season grass plants by defoliating them before they can start replenishing root reserves used during their early spring emergence. The livestock are removed from the paddock at the approximate time that the warm season grasses are emerging.

In this process the cool season grasses have been weakened by overutilization of the leafy material, the soil surface has been exposed to the heat of the sun to help warm the soil more quickly, and the warm season grasses have less competition.

Some precautions are necessary for this to work without causing unwanted effects:

- 1.) Avoid grazing to the point of “pugging” the paddock unless the warm season grasses are well established and in healthy condition.
- 2.) Depending on the number of livestock in relation to the size of the paddocks, this treatment may be applied to a portion of a paddock by subdividing the paddock using temporary fence materials. This treatment can be rotated to other paddocks or partial paddocks through the next grazing seasons.

- 3.) Avoid this treatment on warm season grasses that are not yet well established. Damage to the crowns and root buds of the plants may be the result.
- 4.) The time to withdraw the livestock from the paddocks receiving this treatment is dependent upon the weather conditions at the time. Normally this treatment would be terminated in southern Minnesota by May 20-25 and in northern Minnesota by June 5. If the spring is warmer than normal, the treatment needs to terminate earlier than normal.
- 5.) Extending this treatment longer than the above recommendations may cause damage to the warm season grasses.

Fire

Another method of reducing the influence of cool season grasses in the warm season paddocks is to burn the paddock in the early spring. The effects are basically the same as with heavy grazing in the spring, namely that the cool season grasses are damaged or killed by the heat and the fire.

Precautions to use with fire include:

- 1.) Do not let the fire get too close to the fences. Fire never has a positive effect on posts, wire, or insulators.
- 2.) Timing is critical. Burning too early will stimulate the cool season grasses, and burning too late will damage the warm season grasses.
- 3.) Permits are required.
- 4.) A burn plan is required.
- 5.) Burning is dangerous.
- 6.) Grazing in the year prior to a burn must be done in a manner that will leave an adequate amount of fuel to carry a fire.
- 7.) A fire that burns too hot will likely damage the warm season grasses. A fire that burns too cool will not have the desired effect on the cool season grasses.

Clean Out the Livestock

Many warm season grass stands are but one or two paddocks within the entire pasture system. Rotation of livestock from the cool season paddocks to the warm season paddocks can cause invasion of cool season species if the cool season grass they were rotated from was mature enough to have viable seeds. These seeds will pass through the livestock and be deposited in the warm season paddock, will germinate and establish, thus contaminating the stand of warm season grasses.

It is recommended that the livestock have a 3 day period of time to “clean out” prior to moving them into warm season grass paddocks. During this three day window of time the livestock should be provided seed free hay or other stored feeds that do not have seeds associated with them. Another option is to graze the livestock on a cool season grass paddock where seed heads have not yet emerged.

Avoid Winter Feeding on Warm season Paddocks

Feeding hay to livestock on warm season grass paddocks will contaminate the stand of warm season grasses, unless the hay is clean warm season grass hay. Cool season grass hay generally has considerable viable seed that will germinate, and establish through the practice of feeding the hay on warm season grass paddocks.

When to Terminate Grazing

The height of the residual stubble, at which time grazing should be terminated, is dependent upon the species of warm season grass that is the primary component of the forage stand. This is the “key” species. There may be more than one key species in a pasture, and the termination of grazing would be at the time when any one of the key species gets grazed to the desired height for that species.

The residual stubble heights, at which grazing should be terminated, are outlined below:

Big bluestem	6 inches
Indiangrass	6 inches
Switchgrass	8 inches
Little bluestem	3 inches
Sideoats grama	3 inches
Blue grama	2 inches

Grazing below the heights stated above will have detrimental effects in the following ways:

- 1.) Much of the leaf area that is required to enable photosynthesis (producing food for the plant to grow with) will be gone. It takes additional time form adequate leaf area to grow back, thus effectively extending the rest period required for the plant to get back to a productive state.
- 2.) Many active growing points will be removed from the plant. It takes time for these to become established again, effectively extending the required rest period for the plant to get back to a productive state.

These minimum residual stubble heights should be maintained through the winter months, as well as through the grazing season.

When to Initiate Grazing

The following chart indicates the minimum height of the warm season forage at the time when grazing should be initiated:

Big bluestem	10-14 inches
Indiangrass	10-14 inches
Switchgrass	12-20 inches
Little bluestem	5-7 inches
Sideoats grama	5-7 inches
Blue grama	4-5 inches

Initiating grazing too early will deplete the root reserves of the plants. Waiting too long will lead to forages with poor quality.

Fall Management

Grazing of warm season grasses should terminate prior to August 20 in southern Minnesota, and August 10 in the northern part of the state. This allows time for the plants to store food reserves in the roots prior to going dormant. This root reserve is extremely important for rapid growth in the early part of the next season. In addition, an excess of livestock traffic on the warm season grasses in the fall will damage buds that have formed for the growth period *next spring*.

If regrowth of the grasses has been significant from the time grazing is terminated to the time that the killing frost occurs, the excess growth can be harvested with the livestock. It is preferred to use a rotational method of harvesting this excess. The grazing of it should not allow the livestock to take the forage height below the residual stubble heights of any of the key species.

The residual stubble heights listed in the section “When to Terminate Grazing” should be maintained throughout the winter months if quick growth response is desired the next grazing season. It is never a good idea to open the gates in the fall and let the livestock have the run of the farm to graze it down as far as they want to.

Wet Weather Conditions

At some times during the grazing season the weather may be wet enough so that livestock traffic will cause “pugging” which could cause damage to the soil in terms of compaction, and to the forage in terms of damage to the roots and crowns of the plants.

The extent of the damage that can be done is dependent upon the soil in the paddock. Organic soils will be easily damaged, as will very sandy soils. Most warm season grasses are “clump grasses”, meaning they do not form a sod and there is a fair amount of open soil between the grass plants. They leave the soil very vulnerable to damage from livestock traffic during times of wet soil conditions.

If livestock traffic appears to be damaging to the forages or the soil, the livestock should be moved to a feedlot or to a sacrificial paddock and fed emergency feed until the pastures dry out to the point that a normal rotation can again be initiated.

Dry Weather Conditions

At some times during the grazing season the weather may become dry enough so that forage growth will be very slow. Continued grazing of the forages below the minimum residual stubble heights will reduce the ability of the forages to resume their growth once the weather conditions return to normal. Excess livestock traffic will cause compaction of the soil and possible physical damage to the forage roots and crowns. Removal of the residual stubble of forage removes the protective cover that helps to buffer the soil and forages from temperature extremes.

If the forages are grazed to the proper residual stubble height and there is not adequate growth in any of the other paddocks in the grazing system, then it is time to move the livestock to a sacrificial paddock or to a feedlot. Provide emergency feed until the weather conditions improve, forage growth resumes, and a normal rotation of the livestock through the paddocks can resume.

Sacrificial Paddock Use and Management

A sacrificial paddock is a portion of one of the paddocks that will intentionally be utilized for a holding area while the remainder of the paddocks rest. This takes place when soil conditions are very wet, very dry, or when the forage production has diminished and no paddock is ready to graze.

Areas used as regular calving or lambing paddocks are also considered to be sacrificial paddocks. These normally tend to get heavy use during the spring, or in the fall with fall calving operations.

Because of the expense of establishment and the time required, it is recommended that warm season grass paddocks *not* be used as sacrificial paddocks.

Overwintering

Because of the expense of establishment and the time required, it is recommended that warm season grass paddocks *not* be used as overwintering sites.

Extended Rest

Extended rest periods provide an opportunity for forages to develop from seedlings through maturity without interruption by the grazing process. This benefits the forage plants by allowing maximum root growth and development. With an enhanced root system, the forage plants are better able to draw nutrients and water from the soil.

Extended rest periods can be for a full growing season or for a portion of the growing season. To be of the most benefit this period of time should be at least allow the plant to produce viable seeds.

The major benefit of this management technique is development of the root mass of the forage base, resulting in increased forage yields in the near future. Additional benefits include:

- improved wildlife habitat, especially for song birds and ground nesting game birds.
- increased soil porosity because of reduced livestock traffic.
- increased soil organic matter.
- an emergency source of feed in the event of drought.

To provide this kind of extended rest period requires planning ahead. Obviously the area given extended rest will not be available for grazing, so the forage balance for the season must take this into account.

Some areas that are good candidates for this treatment include sensitive areas that need additional rest to benefit the desired plant community, and warm season paddocks that have been overutilized and need the extra time to recover.

Fertilization and Nutrient Management

Proper fertilization of pastures will increase yields of forages. This is especially noticeable when the pastures are already in poor condition, with the forage plants stressed from overutilization. Proper fertilization improves the vigor of the forages, allowing them to compete with other plants.

Unless hay is removed from a pasture, most of the nutrients in a pasture are recycled within the pasture. Any feed brought into the pasture adds nutrients. This should be accounted for when determining if additional nutrients need to be applied. Soil tests should be the basis for the application of any nutrients to pastures. Soil tests can be taken every 4-5 years.

Prior to applying fertilizers or liming materials, a cost analysis should be done to determine if applying these soil amendments is cost effective.

Manure Management

The most important factor to consider in fertility management in pastures is the management of the herd using rotational grazing concepts. This provides for more uniform manure distribution across the entire pasture. In contrast, in a continually grazed pasture the manure tends to be deposited in a few areas such as watering facilities, feeders, and shade.

P and K

Phosphorus and potassium levels are rather stable in pastures. These elements are important for legume survival. The levels of these nutrients should be in the optimum to high range so the legumes can successfully compete with the grass species. Once the levels are built up in the soil there should not be a need for additional applications for quite some time.

Nitrogen

Warm season grasses are quite efficient in utilization of nitrogen. The application of nitrogen may not be economical. A cost analysis should be done prior to making applications.

Nitrogen can easily be supplied by commercial fertilizers. The amount to apply is based upon the predicted forage yield. On warm season grasses the application of nitrogen should be delayed until the forages are mature enough to utilize it, normally in mid to late June. Use the following chart to determine the quantity of actual N to apply.

Expected dry matter yield (T)	2	3	4
N to apply (lb/acre)	30	45	60

Using legumes in a warm season grass stand is generally detrimental to the grass stand because the legumes are very aggressive at times of the year when the warm season grasses are not.

Soil pH

Soil pH should be kept as close to neutral as practical to enhance nutrient availability and microbial activity in the soil. Most of the warm season grasses are better adapted to neutral to alkaline soil conditions. Application of lime may be the most cost effective soil treatment for them.