

Topdressing Lime Won't Rescue Alfalfa

If you are planning to seed alfalfa, incorporate the lime first, recommends **George Rehm**, University of Minnesota soil scientist.

“Some growers seed alfalfa without checking soil pH, and later find that the pH is acid,” he says. “This raises the question of whether to topdress lime on the established alfalfa as a rescue treatment.”

In a Minnesota study, topdressed lime did not improve yield.

“Lime is used to establish a good pH environment for the bacteria that cause nodulation,” Rehm explains. “The majority of the nodules are 4-6” deep. Surface-applied lime that is not incorporated won't change the pH at this depth. Incorporation is necessary to get the full benefit of the lime.”



Printed with permission from Hay & Forage Grower (www.hayandforagegrower.com)

Return Service Requested

1108 South 9th Street
Noblesville, IN 46060

CONSERVATION DISTRICT



HAMILTON COUNTY
Soil & Water

Hoos-Your Grazing Network

Spring 2006



Is Rotational Grazing Right For You?

Scott and Linda Hixson
South Whitley, Indiana

There are many reasons we chose to use rotational grazing on our farm. Our farm is very hilly and if row crops were planted, we soon had erosion problems. By using grasses, we could stabilize the fields and give back to the soil instead of taking away.

Rotational grazing is something that we can do as a family. In the evenings we go out together and move the herd into a new paddock. We both work full time off of the farm and what a great stress reliever to go out and see the cows grazing on the hill. You soon forget the rotten day you may have had and appreciate what you and your family are doing together.

We are hearing more research about the benefits to the meat by being raised on grasses. By using our own beef and providing it to our family and friends, we are aware of the side effects from using steroids and other chemicals. We want the meat to be safe and have a superior flavor compared to the meat you may get at the store. These are some of the reasons that lead us to use rotational grazing on our farm.

To get started, we had an old pasture that we used while we converted the previous crop fields to pasture. We used a Grazing Specialist to give us ideas on how to best use the fields, set up fences and run water lines. Of course, the year we started this it didn't rain and the seed just sat there, and we thought it was a total waste. But to our surprise it did finally rain and the fields came on. When we ran our fencing, it was beastly hot. We recruited friends and family to help. At the time, they thought we were trying to kill them, but they talk to us now. We rented a hydraulic post driver that worked great even though there was little moisture, and the ground was extremely hard. This was another learning lesson. Because we weren't accustomed to high tensile fence, we didn't think it could possibly keep our cows in. Again, we were very happy with the end result.

Next lesson - will the cows have enough to eat through the summer and part of the winter? The spring flush is when the cool season grasses that dominate our pastures explode. The challenge is to return the cows to the paddocks at the right time. Returning too soon or too long will

NONPROFIT ORG.
U.S. Postage
PAID
Noblesville, IN 46060
Permit 280

Is Rotational Grazing Right For You? continued

damage the growth of the plant. By using rotational grazing we were able to let paddocks rest between grazings. Many times we have not timed it correctly and end up clipping the pastures to prevent them from getting out of control. This is not always a bad thing because it gives us forage for the winter. When it gets later in the season, we would start to stockpile to help stretch the fields and delay feeding hay. During the late winter, we have tried to frost seed areas that were abused during the previous year's grazing. We like to use either red or white clovers. In 2004, we had lush clover stands and had excellent results with high conception rates, strong calves at birth and an unusually high number of twins. In 2005, the dry weather caused the clover to not be as vigorous, and we are waiting to see how it affects the calving.

Our hay fields have become dual purpose since the dry conditions of 2005. Originally, they were planted with a mix of alfalfa with orchardgrass or Hakari bromegrass. Typically we will take three or four cuttings for our winter feed forage, but with the dry conditions, a few changes had to be made. Alfalfa will stand the dry weather, allowing us to graze it when the growth on the other pastures slowed down or didn't grow at all. The best time to fertilize is prior to grazing or immediately after, remembering to allow enough time before grazing again.

If you are thinking rotational grazing might be something you want to try, we strongly suggest attending pasture walks and grazing conferences. A pasture walk is a great way to meet other graziers and get first hand experience on what has or has not worked for them. Graziers are very open and love to share. Conferences are another way to learn more about different ways to do things. We have learned about the value of using annuals and a variety of grasses in our paddocks. This variety helps to cover your bases when Mother Nature isn't cooperating. In our fields we have used turnips, sorghum-sudan, forage peas, and late triticale plus Italian ryegrass with great success. This year we are trying the sorghum-sudan that will dry down more quickly and can be made into hay.

We have learned a lot in the past 5 years, and we know we have a lot more to learn. But what better way to learn than with your family.

Upcoming Events

June15	Forage Management Workshop	West Lafayette, IN
June 22	Forage Day	North Liberty, IN
January 24 and 25	Heart of America Grazing Conference	Mount Vernon, IL
February 2	Northern Indiana Grazing Conference	Shipshewana, IN

The Forage Management Workshop will be a "hands on" activity at the Diagnostic Training Center/Purdue Agronomy Farm. **Forage Day** will feature educational sessions in the morning and machinery demonstrations in the afternoon. For information, contact **Keith Johnson** at 765 494-4800 or johnsonk@purdue.edu

Pasture Management

To revive forage crops and guard pastures from future stresses, **Keith Johnson**, Purdue University Forage Crops Specialist, outlines a four-step rehabilitation plan:

1. **Assess the forage stand** -- Tour the pasture and identify the plants that are present. If unsure whether a plant is a forage or weed, refer to the Purdue Forage Identification Web site at <http://www.agry.purdue.edu/ext/forages/forageid.htm>.
2. **Address soil fertility problems** -- "Soil fertility issues ought to be resolved," Johnson said. "If we have low phosphorus, potassium, and pH concerns -- those are things that we have some control over to alleviate stresses or inefficiencies or weak stands. We need to be soil testing, if we haven't done so, and follow through with appropriate amendments of fertilizer and limestone."
3. **Strengthen weak stands by reseeding pastures** -- "The base pasture in Indiana ought to be a productive cool-season grass and legume that's adapted to the site," Johnson said. "As a producer walks a pasture he needs to assess what is really there, whether it's a productive legume and grass. The legume ought to be contributing somewhere in the neighborhood of 30 percent of the stand, which is roughly the equivalent of two plants per square foot of legume.

"A productive pasture's going to have 90 percent or greater cover of land surface, so there should not be a lot of bare soil." Johnson advises against mixing cool-season grasses and legumes in a broadcaster, combining red clover and alfalfa seed, and overseeding an alfalfa field with alfalfa.

4. **Provide pastures a rest through rotational grazing** -- Continuous grazing prevents forages from recuperating, which slows productivity.

"We need to provide some rest for forages, which is critical for longevity of the stand and its vigor and health," Johnson said. "So as one thinks about the future, we need to think about incorporating some form of rotational system to provide that rest.

"In terms of getting the program off and going, that ought to be thought about in the fall and winter. Then begin implementation by breaking the pasture into paddocks at the first opportunity as time permits in the late winter and springtime."

⌘ ⌘ ⌘ ⌘ ⌘ ⌘ ⌘ ⌘ ⌘ ⌘ ⌘ ⌘ ⌘ ⌘

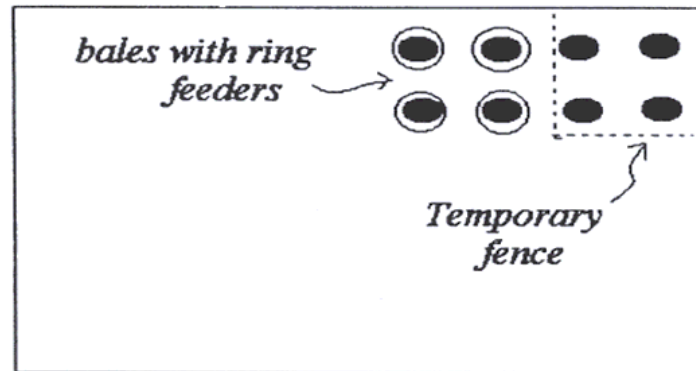
All programs and services of the Hamilton County Soil and Water Conservation District are offered on a nondiscriminatory basis without regard to race, color, religion, sex, age, marital status or disability.

This issue is sponsored by the **Indiana Grazing Lands Conservation Initiative**. The mission of **GLCI** is to provide high-quality technical assistance on privately owned grazing lands on a voluntary basis and to increase the awareness of the importance of grazing land resources.

Placing Bales for Winter Feeding

Jim Gerrish
American Grazinglands Services LLC

The focus of this article is a system for large round bales that was used both at Forage Systems Research Center and my own farm, when I lived in Missouri. In this system we try to only handle a bale once, moving it from where the baler deposits it to where it will be fed. The basic set up of the feeding system is illustrated below. Large round bales are pre-set prior to winterfeeding time to reduce labor, tractor usage, and pasture damage from running trucks or tractors in the pasture during muddy times. The pasture can really be any size, and the number of bales set in the pasture can be varied. We generally figure one ring per 12 to 15 cows with a 1000-pound bale lasting 2 to 3 days depending on exact cow number per ring. Bales are spaced on 20 foot centers. The number of bales set per paddock is based on the herd size and the planned length of stay. If there are 50 cows in the herd and you want to move them about once a week, then you would need eight 1000-pound bales (50 cows x 35 lbs hay/cow/day x 7 days = 7350 lbs) and four bale rings. A temporary fence of polytape is used to protect the remaining bales from the cattle during the feeding period or if the paddock is being grazed during the growing season. If the ground is frozen and step-in posts won't step in, just stick them in the sides of the bales.



We prefer to use untreated sisal twine for the bales that are set in place during summer. It is critical that twine spacing be kept to less than three inches to minimize storage waste. Net wrap and plastic twine must be cut off the bales and the remaining net wrap picked up after feeding. It adds one more step to the feeding process and reduces efficiency. Plus I'm just cheap and lazy. The narrow twine spacing provides excellent storage protection for grass dominant hay. For high legume content hay that must be stored indoors, a modified spaced-bale system can be used. Most hay deterioration occurs during summer and fall, not winter. Large square bales of alfalfa or other legume dominant hay can be stored indoors and then be pre-set at the beginning of winter. Even setting a month's worth of hay at a time is much more efficient than feeding on a daily basis. We have compared the time required to feed 8 bales at a time with spaced-bale feeding to taking hay from a barn, transporting it with an 8-bale mover, and feeding it in rings. One person can feed 6 pre-set bales in 12 to 15 minutes while the barn-stored hay feeding system required 40 to 45 minutes.

While the system has for the most part proven very effective in accomplishing those goals, it does have its drawbacks. One consideration is that the longer cattle are in the same paddock, the more damage they will do to that paddock. For this reason, I prefer a small number of bales in many paddocks rather than large number of bales in just a few paddocks. During the coldest part of winter when the ground is reliably frozen, cattle may stay a month or so on the same paddock; but when the spring thaw comes, I prefer to move them every few days. If severe trampling damage occurs around the feed rings, light disking or harrowing may be required to smooth the ground out and re-establish forage. Our general experience has been that this is not necessary.

Graziers' Comments

Ed Heckman

No force on earth will give such response and such reward as Nature when you understand and work with her. Louis Bromfield, OH

Plant 20 pounds per acre of tetraploid forage type, annual ryegrass with a grain drill. It is great for thickening up old hay fields. It is a heavy nitrogen user. Russ Thompson, WI

Oats and purple-top turnips are very versatile. Oats build the soil better than soybeans and provide good, early summer forage. When pastures run short, the turnips kick in and get the herd through the late summer grazing season. Tim Nissen, NE

The better job I do of grazing, the fewer weeds I have. Greg Koether, IA

Cows can become deficient in magnesium when they are on forage-based diets, especially fresh spring pasture and small grain forage pastures. A commercial supplement that contains 10-20% magnesium should be used. Kern Hendrix, IN

You get the biggest bang for your buck from the first split of your pastures. Mark Boswell, IA

Do not go where the path may lead. Go instead, where there is no path and leave a trail. Ralph Waldo Emerson

With the constant management and all the manure they get, our pastures just keep getting better. David Collier, PA

Creating a 19-paddock intensive grazing system generated more return on my investment than any other medium or long term investment that I've made in farming. Russell Hughes, IA

It takes 10 pounds of organic material to make one pound of organic matter. Eddie Funderburg, OK

By seeding 16.8 acres of drylots to brown midrib sorghum-sudangrass, we were able to carry seventy beef heifers for eight to ten days on each rotation, with three rotations per year (1890 head days). Kirk Vanzant, IN

Once a cool-season grass makes a seedhead, its goal in life is accomplished, and it doesn't make any more leaf. Keep it vegetative, and it will keep making more leaves. Stan Smith, OH

A cow grazing on pasture can emit more than 8 ounces (230 grams) of methane per day. Lowry Harper, agricultural microclimatologist, Agricultural Research Service

Applying the Pareto Principle of 80-20 Management

Vilfredo Pareto is the economist and sociologist who described the ultimate challenge of managing a cow-calf operation. It's now known as the Pareto Principle or the 80-20 rule.

Simply — 80% of progress is created by 20% of our actions and vice versa. The first step in applying the Pareto Principle is to decide to be among the 20% and move away from the 80% mired in mediocrity and essentially running their operation as their neighbors do or ancestors did. Perhaps the most difficult challenge is accepting that you will be in the minority from that point forward. You can see this 80-20 principle applied with beef industry marketing issues. Inevitably, 80% of the people will advocate solutions that will redistribute revenue streams or revert to the past. Meanwhile, 20% will focus on increasing revenue and creating new opportunities. Not only will the 20% always be in the minority, but they must accept more risk in the short-term. (Nothing is more risky than the status quo in the long-term, however).

We're not talking about haphazardly saying you want your operation to be more profitable or merely hoping your operation will be in a position to be passed onto the next generation. It's a commitment and a resolve that, regardless of outside influences, your operation will be changed for the better. The characteristics of the 20% begin with resolve and persistence, supported by a passion that provides the foundation of endless energy and effort. It takes a complete understanding of your business, beginning with an intimate understanding of your resources (land, genetics and management), and progressing to a working knowledge of all the disciplines needed (range management, nutrition, herd health, genetics and marketing). It also demands planning and preparation.

The demands of a cow-calf operation manager are so varied that most managers plan to avoid wrecks rather than maximize results. To be among the 20% means going the extra mile, not merely leading. The 20% are continually searching for better ways to do things, and always trying to adapt new insights from research that is obscure to others.

Finally, the 20% realize that they have a responsibility to a higher power beyond economics — a faith or trust that governs everything they do. Once you've committed to being among the 20%, the next step is to analyze your operation and determine which 20% of your actions create 80% of the results. Then, work to shift your time so that 80% of it is spent on the important 20%.

Source: Troy Marshall, Cow-Calf Weekly

Editor's Note: This article was written for cow-calf operators. The idea of applying 80% of your effort to the most important 20% of your activities applies to all livestock species and activities.

Got grazing questions? 'Stick' with it for answers

Indiana livestock producers who are unsure how many animals their pastures and paddocks can support need to get on the stick. A grazing stick, that is.

Through support from the Grazing Lands Conservation Initiative, the Indiana Forage Council (IFC) is producing 1,500 grazing sticks for livestock farmers and agribusinesses. The sticks can be purchased through **Keith Johnson**, Purdue University Extension forage specialist and forage council secretary-treasurer.

Grazing sticks have been around for many years, Johnson said. On each side of the four-sided rods are imprinted tables and equations for determining a field's grazing potential.

"A grazing stick is a yardstick with lots of information," Johnson said. "Once you know how to use a grazing stick, you can calculate the number of animals that might be able to graze a pasture or a particular paddock, which is a subunit of a pasture. In a pre-grazing season, a person can calculate the number of stocker calves that they ought to be purchasing, whether it is 30 or 300 or some number in between.

"These sticks are good management tools for people who are beginning to do rotational grazing or are getting into the livestock business."

Using a grazing stick requires few skills outside of mathematics.

"Take a walk in the pasture, place the stick vertically into the field and measure the height of the forage, freestanding," Johnson said. "From that, subtract four inches of height, because we like to leave some residual. Then, based on the numbers you get from the grazing stick and dependent upon the stand density, you'll know how many hundred pounds of forage per inch of grazing that you have. You can then calculate the production per acre."

In addition to calculating forage growth, the grazing stick gives livestock producers an idea of how much forage their animals will consume. "For example, a thousand-pound beef cow might be consuming 3 percent of dry matter based on her weight. So 3 percent of a thousand is 30 pounds of dry matter intake," Johnson said.

One side of the grazing stick is a traditional yardstick. The three remaining sides contain animal grazing formulas and tables on harvest efficiency, optimum grazing periods, daily forage intake and dry matter yield per acre inch of forage.

The grazing sticks are \$5 each for orders of nine or fewer and \$4 each for orders of 10 or more, plus Indiana sales tax and shipping and handling. To order, visit the Purdue Forage Information Web site at <http://www.agry.purdue.edu/ext/forages/> or contact **Johnson** at (765) 494-4800 or by e-mail at johnsonk@purdue.edu.

Source: Purdue-Ohio State Ag Answers

Extending the Grazing Season

Pastures provide many days of nutritious forage for livestock. Unfortunately, sixty percent of the forage is produced in April, May and June. One of the goals of increased grazing management is to provide additional forage for grazing during other times of the year.

Below are several strategies that are available to increase forage production during early spring, mid/late summer, fall, and winter.

Nitrogen fertilizer applied to grass pastures in late May to extend spring grazing forage flush

Strip or rotationally graze later hay field cuttings

Alfalfa, red clover, and birdsfoot trefoil with grasses

Oats and turnips for summer grazing

Warm season grasses

Pearl or Japanese millet, sudangrass, or sorghum-sudangrass mixtures for late summer grazing

Grazing corn

Brassicas – turnips, kale, rape, and swedes

Forage sorghum, oats, and forage soybeans

Graze wheat stubble that has had red clover frost seeded into to it in the early spring

Annual ryegrass or BMR sorghum/sudan after wheat is harvested for late summer and fall grazing

Apply nitrogen fertilizer in early August for stockpiling of specific grasses that will provide late fall and winter grazing

Oats, cereal rye, and turnips for fall grazing

Small grain, turnips, and annual ryegrass seeded into standing corn or soybeans for early fall grazing

Cereal rye or other small grains for fall or early spring grazing

Small grain, turnips, or annual ryegrass seeded after soybean or corn silage harvest to provide late fall or winter grazing

Place round bales in a checkered fashion in a harvested cornfield; strip graze the corn residue and the bales

Ed Heckman, Grazing Consultant & Jerry Perkins, NRCS NE Indiana Grazingland Specialist

Why Do We Make Hay?

Jim Gerrish – American Grazinglands Services LLC

Do you ever stop and think why exactly do we make hay? That is, what is the primary objective for making hay? The most common response would be: "To provide winter feed." That certainly is a high priority, but what happens when we let that be our main objective?

Generally, we start the season by identifying where we are going to make hay, based on the expectation of harvesting X number of bales, so that we can feed hay for X number of days. We tend to delay harvest, until we have favorable weather, which results in lower quality hay as cool-season grasses mature. Frequently, harvest comes so late that the regrowth following hay harvest is poor, offering limited opportunities for fall grazing. The net outcome is that the grazing season is shortened, and we are left facing a long, hay-feeding season with marginal quality hay.

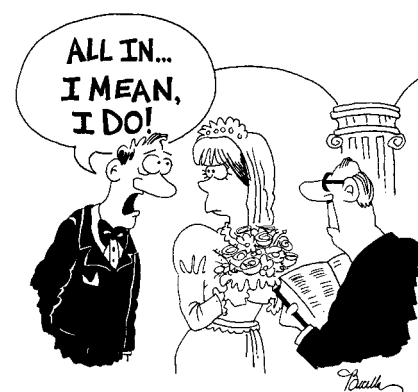
I would suggest another approach to hay making starting from a fundamentally different point of view. Rather than having to generate X number of bales as the basic reason for making hay, consider hay making as a tool to manage pasture quality and supply. With this approach, we will generally start making hay earlier in the season, accepting greater risk of unfavorable weather, but most likely producing higher quality hay, though lower yield. Regrowth is likely to be significantly greater than following later hay harvests due to more favorable soil moisture and temperature levels. Because of better regrowth on hayed pastures, the main body of pasture will not need to be grazed as severely, allowing for a rest period going into the fall season and allowing more pasture to be stockpiled, thus shortening the hay feeding season.

Plant maturity is generally considered to have the greatest effect on pasture and hay quality. Digestibility typically decreases at a rate of about one-half percent per day following boot stage in cool season grasses. Based on this rate of decline, delaying harvest for three weeks after boot to wait for more favorable weather would result in a digestibility loss of 10%. To put this in context, if digestibility is 60% at boot and declines to 50% three weeks later, the hay has gone from being adequate for a lactating beef cow to being inadequate for even maintenance of a cow.

Several researchers have reported the quality loss due to increased grass maturity to be significantly greater than loss incurred if the hay had been harvested at boot stage and rained on. While this trend is certainly true for grass and grass-dominant hay, alfalfa and other legumes are much more susceptible to serious weather damage. However, if we are considering hay harvest from pastures, in all likelihood it will be a grass-dominant sward.

If we are harvesting hay from paddocks in a rotational grazing system, there are again two different approaches to determine where hay is harvested. One approach is to designate certain paddocks at the beginning of the season to be harvested for winter feed. An advantage of this approach is that paddocks may be selected on the basis of ease of harvest or managing a particular weed problem. An alternative approach is to graze all the pastures initially and then identify the paddocks, where grazing management has been least effective, and use hay harvest as a tool to clean up grazing management mistakes. This approach certainly makes the farm look more attractive for a summer field day!

So before you fire up the equipment this spring or even before you turn the stock out, think about why you are making hay and what you would really like to accomplish with haying in the context of your total forage-livestock system. Good pasture management extends the grazing season and reduces the need for hay. Poor hay crop management shortens the grazing season and increases the need for hay.



Signs You Play Too Much
Texas Hold 'Em

Use Cattle Behavior to Improve Grazing Management

When it comes to food preferences, cattle are a lot like people. They prefer the feeds and forages they ate when they were young. They like the things their mother showed them to eat as calves.

Fred Provenza, a professor at **Utah State University** Department of Rangeland Resources, found that exposing a calf to a feed it will encounter later in life makes the calf more willing to eat that feed as a mature animal. A very short exposure time is all that is needed. What's more, if both the calf and its dam are fed the novel feed for a few hours for a week, the calf will eat more of this feed after it matures. For this to work, however, the mother must eat the feed along with the calf because she teaches her calf what to eat.

In one experiment, animals moved to a new pasture with strange, novel forage spent 25% more time foraging and ate 40% less compared to animals that had been raised on the same type of forage. Provenza also found young cattle adapt better to eating new, novel feeds compared to mature animals. But, even young cattle, such as stockers, will perform better if they are moved from a familiar type of pasture to another pasture that contains similar forages. If stockers or weaned calves have to be moved to a totally different type of pasture, it's best to move them into high-quality pasture. The worst scenario is to move animals from a poor pasture to another poor pasture with totally different forages. If the animal must be moved to another poor pasture, it should contain similar forages.

Provenza suggests that, in purchasing adult cows, buyers should make sure those cattle are from a ranch with forages similar to those on the buyer's ranch. Because older animals are less adaptable than younger animals, buying adult cows from another part of the country with totally different pastures isn't recommended. Cows and calves also can be taught to eat less palatable forages by using high stocking densities for a short period of time. This forces the animals to eat their "broccoli" along with their "ice cream," so to speak, Provenza says. It also helps prevent less desirable plants from overtaking pastures. Calves raised by mothers that eat the less palatable forage will still like to eat such feed when they are older. In fact, one approach to keep cattle out of riparian areas is to ensure the calf is exposed to, and eating, some of the less palatable plants with its mother. When it matures, it will be less motivated to eat the riparian forage.

Provenza also states that, like people, cattle don't like their food mixed together. Humans don't like their peas, ice cream and mashed potatoes mixed together. Neither do cattle. Research with dairy cows showed that cows gave 11% more milk when clover and grass were planted in separate rows instead of mixing the clover and grass seed together.

Temple Grandin, Colorado State University and Cow-Calf Weekly



A low-tech pasture probe was developed by **Ralph Quillin**, Paris, Kentucky. It is called the "STAC" method of estimating dry matter yields.

It requires 1 foot (human). The calibration procedure is simple. Place your foot in the forage to be measured. Note where the average height of the standing forage hits your foot or leg. Convert the height to:

S = grass covering the sole of your shoe; this would equal about 300 pounds of available dry matter per acre (DM/ac).

T = top of your foot; now you have about 600 pounds of DM/ac.;

A = ankle height; this would approximate 900 pounds DM/ac.

C = calf of your leg; the available forage is about 1200 pounds DM/Ac.

Promoting Summer Pasture Growth

Daryl Clark

Ohio State University Extension

August forage production will not equal May forage production. However, the forage producer can implement some practical management practices which will increase both the quality and quantity of available summer pasture production.

Consider these management practices:

Use a grazing plan. The forage producer who maintains the forage plant in a vegetative state will cause the plant to grow longer into the summer months. The plant's dormancy after seed production can be eliminated; however, temperature and moisture factors will still be at work. A vegetative plant will continue to produce summer foliage.

Early summer fertilization. Although early applications can significantly increase yield, a late May or early June application will help to extend growth into the summer months. Forage which is vegetative at the time of application will be "jump-started" to produce another "flush". This application should be just prior to a significant (1/4 inch plus) rainfall. Nitrogen alone may increase growth, but it may translocate phosphorus and potash from root stores. Develop a fertility management program which gives balanced nutrition to the plants.

Maintain root development. Although developing a grazing plan is a distinct subject, a vegetative plant must have rest periods to restore root reserves to continue to make significant growth. A short (2-4 day) grazing period, followed by significant rest to restore root reserves (16-18 days in the spring and 30 days in the summer) is critical. The above ground plant growth will be a reflection of the below ground root growth. Healthy, abundant roots will result in greater top growth to be grazed.

Leave more forage stubble. By leaving greater stubble after grazing, the soil surface will be shaded to allow less evaporation from hot, summer weather. At the same time, longer stubble will leave more leaves. Therefore, initial regrowth can be from energy produced by photosynthesis in these leaves rather than from root reserves. A large part of maintaining more stubble is to lengthen rest periods between grazings. Greater length of growth will help to keep animals from grazing as closely, so stubble length can be maintained.

Use deep-rooted legumes. Deep-rooted forage legumes and grasses help capture moisture and soil fertility from greater depths.

Clip overgrown plants. Pasture clipping to keep plants from producing seed can be useful in maintaining forage in a vegetative state. Clipping after seed formation is mostly cosmetic. The pasture looks better, but the clipping did not make the plants more productive.

Although this is not an exhaustive list, many of these factors are highly related. Management in one area can assist in other areas.