

---

# LIVESTOCK NEWSLETTER

---

## PRODUCING HIGH QUALITY HAY

*Steve Duckett, Buncombe County Extension Director*

Hay is an integral part of most livestock production systems in the southeast. Producers can either produce their own hay or purchase it from a hay producer. It is vital for livestock producers to understand the processes of growing, harvesting and storing hay if they are producing their own hay or purchasing their hay. These processes influence the nutritive value of the hay which can alter livestock performance. By understanding the changes that can take place during hay production the nutritional program can be altered to maintain livestock performance.

**Prior to the hay season and before each harvest all hay equipment should be thoroughly examined and serviced.** All equipment should be greased, gear oil levels should be checked and filled, wheel bearings should be serviced, and tires should be checked and inflated. Mower sections and blades need to be sharpened or replaced prior to the start of the haying season and should be checked before each mowing. Failure to ensure that the haying equipment is in good working condition can delay harvest. We all know that a spring shower can pop up at any time and this broken equipment can affect whether or not you get your hay up in good shape. This delay in harvest results in an inestimable amount of damaged hay on a yearly basis.

**Hay should be harvested at the point when quantity and quality are both optimized.** Factors such as weather, equipment failures, off-farm employment and other obligations can lead to delaying the harvest of hay. Forage quality typically decreases with increasing maturity. As forages mature, the leaf-to-stem ratio decreases. Higher proportions of stem result in higher concentrations of fiber and lower concentrations of crude protein and digestible dry matter. The management of forage crops is not just limited to producing a single high-quality crop. Most forages that are utilized for hay need time for adequate regrowth to maintain the stand. Cool-season grasses such as tall fescue and orchardgrass should be harvested at the boot or early heading stages of growth for the first

### IN THIS ISSUE

- Producing High Quality Hay
- Soil Fertility and Spring Weed Management
- 10 Simple Steps To Improve Your Herd
- Controlling Foxtail In Your Pastures
- Warm-Season Annual Grasses

### CONTACT US

Adam Lawing  
Livestock Agent  
adam\_lawing@ncsu.edu  
828-652-8104

Dr. Deidre Harmon  
Mountain Livestock Specialist  
ddharmon@ncsu.edu

cutting and then at 45-60 day intervals thereafter. These harvest times should provide the best compromise between nutritive value and yield whenever possible.

**Special attention should be paid to the height at which you cut your hay.** The height at which forages can be cut is dictated by where they store their growth reserves. For instance, alfalfa stores its growth reserves underground and can be mowed very close to the ground. Bermudagrass and white clover both store growth reserves in stolons or “runners” that lay on the soil surface and are unaffected by cutting height. In contrast cool-season grasses such as orchardgrass, smooth bromegrass and tall fescue need a stubble height of 2 to 3 inches as they store their growth reserves in the stem base. When these forages are mowed too close to the ground the stand may be weakened. Most summer annual forages require a higher (6-8 inches) mowing height for adequate regrowth. Another reason for increasing the cutting height in these forages is the accumulation of nitrates. Concentrations of nitrates typically are greatest in the lower portions of the stem, by increasing the cutting height this portion of the forage remains as stubble. Maintaining a cutting height of at least 8 inches will encourage regrowth and decrease the risk of nitrate poisoning.

### **Hay Moisture**

Hay moisture at baling is a critical factor in determining superior hay quality and long term storage life. Moisture in the form of dew or rain can seep through the hay to some degree, while moisture in the hay stems will not. However, stem moisture at high levels can cause even more spoilage. Moisture for large square bales should be no more than 12 to 15 percent at baling. For round bales, 16 to 20 percent is acceptable. Moisture content for small square bales is similar at 18 to 20 percent. We should also avoid baling at very low moisture, as this increases leaf shatter which results in nutrient loss.

### **Hay Storage**

Storage of hay at the edge of the hay field on the ground leads to greater deterioration of the hay. Approximately 50 percent of the storage losses can be attributed to the soil/hay interface when hay is stored outside and on the ground. Dry hay acts like a wick drawing moisture out of the soil and into the hay bale. Air movement may not be as great around the bottom of the bale as it is around the top. This can be affected by the shape, and density of the bale and the storage site. Improper storage can lead to moist conditions within the bottom of the bale that promote microbial activity.

Numerous methods have been used to elevate hay stored in the open. These include using telephone poles, pallets, railroad ties and pipe to raise the hay off of the ground. These bases should allow for some air movement under the bales and also prevent the hay from sitting in standing water. The storage site for hay stored outside should be in a sunny, breezy, well-drained area. This location should be near the top of a slope if possible and have a southern exposure. Rows should be oriented so they run up and down the slope, as rows running across the slope will trap runoff after a rainfall event. Bales should be butted up against each other within a row while adjacent rows should not touch, with a gap of at least three feet between rows.

To put storage losses in perspective, a Kentucky study (Burdine et al., 2005) evaluated five different hay storage methods and the effect each method had on dry matter loss:

Outside on the ground – 30% DM loss

Outside on gravel pad – 20% DM loss

Outside on gravel pad w/tarp – 10% DM loss

Plastic bale cover – 7% DM loss

Under roof – 5% DM loss

The data above shows that even if we do a near perfect job getting hay harvested, we can waste all that effort if we don't use good storage techniques. If you have questions on this topic, please call your local Extension Agent for more information. Special thanks to Addison Bradley and Jeff Bradley for their contributions to this article.

# SOIL FERTILITY AND SPRING WEED MANAGEMENT

Micah Orfield, Ashe County Livestock Agent

## Soil Fertility

Soil fertility is an essential part in the milk production and growth of our livestock. Proper soil fertility maximizes the growth potential of our forages, which in turns maximizes the growth potential of our livestock.

The first step in managing soil fertility is soil sampling. If you have questions or need assistance, your local extension office is a great resource. After mailing a sample of your soil to the North Carolina Department of Agriculture Agronomics Lab, you will receive a report online. The report will recommend how many tons of lime should be applied per acre. If the report recommends more than two tons per acre, the application should be applied at two different times. Lime adjusts pH levels in the soil and those levels need to be between 5.8 and 6.2 for fertilizer to work efficiently. Keep in mind it takes 6-12 months for lime to work in the soil. Spreading lime in the fall allows it to work into the soil during the winter months, so the soil can be ready for fertilizer in the spring.

Nutrient recommendations are given in units not pounds. Nitrogen moves within the soil and is difficult to test. Typical nitrogen recommendations are 120-200 units and should also be two separate applications. Your local extension agent can help determine the best fertilizer and timing for your operation.

Grasses best utilize fertilizer when they are actively growing. Keep in mind the quick spring growth, to ensure your livestock can utilize fast growing forages before adding fertilizer.

## Spring Weed Management

Spring weed management should begin with asking these questions.

- What is the weed?
- What is the life cycle?
- Is it a problem in your pastures or hay field?

Your local extension office can help with these questions. If the weed is toxic to livestock or prohibits their growth, it should be controlled. This can be done with chemicals, mowing, or grazing (if it is safe and they will consume it). The best time to control any weed is while it is still young and tender. Once many weeds mature and seed, their life span is complete and they will die. There is no reason to try to control the weed at this life cycle stage. Mowing is an option if you want to keep your pastures clean.

Spraying chemicals is a good way to control weeds. However, you want to first choose the correct herbicide for the weeds you want to control. In order to choose correctly you must know the type of weed you want to control. You will need to read the label on the herbicide to ensure you have chosen the correct herbicide. The label will tell the rate of herbicide to mix and spray as well as the proper protective equipment to wear during mixing, loading and application. You should always calibrate your sprayer prior to use to ensure proper application. Skipping this step can cost you both time and money.

# 10 SIMPLE STEPS TO IMPROVE YOUR HERD

Adam Lawing, McDowell County Livestock Agent

- 1. Bull Selection-** Going to the stockyards to purchase your bull is probably not the most efficient way to go. Most times, we take livestock to the sale barn because we culled them out of our operation for numerous reasons. Sometimes to make money, you have to spend money. Robert Wells at the Noble Research Institute says that by spending as little as \$750 on a better bull, could, in the end, give you an additional \$1,475 more per bull. The reason behind this is that if you buy a better bull, he should be able to pass higher quality genetics to calves that will excel in growth traits. Which will allow you to sell the maximum pounds of calves off your operation.
- 2. Cattle Marketing Alliance-** Here in WNC we have the opportunity to be part of the Mountain Cattle Alliance. The purpose of this program is to add value to calves through preconditioning them and selling them in truckload lots, rather than selling them straight at the sale barn. There are also other programs like graded sales and pre-conditioned sales that also provide an added premium. Yes, some of the programs require a little extra time and effort, but you are producing vaccinated, weaned, and bunk broke cattle which buyers find attractive and are willing to pay more for.
- 3. Cow Size-** Bigger Cows are not always better. Larger cows require more feed on a daily basis. For example, a cow that is 200 pounds heavier than another cow requires 11% increase in forage intake. If you are already dealing with grass or hay shortage, this can be a pretty significant number. Although she may wean a heavier calf, the heavier calf may not weigh enough to offset the extra cost of feed and forage.
- 4. Your Cattle Are Your Employees-** If you have a company or work for someone, then you know that the employees are an essential part of keeping that company running. Well, the same goes for your operation. Your cattle are working for you and they should be expected to work daily for your operation. A productive cow will efficiently deliver a calf each year, with little cost or problems along the way. In order to do this, you need to select the right female, then develop her so she will be successful on your operation. To add to that, make sure you are taking care of you cattle. Pay attention to them, watch them to see if there are cows that are having any issues and take care of any issues you see.
- 5. Culling- Again, Your Cattle Are Your Employees -** If an employee is not performing high enough at their job they get kicked to the curb. Same goes for your "employees". If a cow is having issues or not meeting your production requirements then she needs to be culled. There is a little saying that is a guide to culling called the 3 O's: Old, Open and Ornerly. Old cows have a tougher time maintaining weight while weaning a smaller calf. A cow should have a calf once a year. If she is not doing that she is open, meaning not bred. Open cows are just like hiring and paying an employee to do nothing. Last is ornerly cattle. Cattle that are crazy and stubborn damage equipment, hurt people, reduce efficiency when they are difficult to work with, and have been shown to have lower performance.
- 6. Create A Short And Defined Calving Season-** Year round calving is not the best way to raise cattle. Having a group of cows that calve in a short window are easier to manage and maintain. Selling a group of calves rather than selling them 1 or 2 at a time can put a little extra cash in your pocket. Increasing the number of earlier calving cows will increase the average weaning weight come sale time. If a calf is born 30 days earlier in the season than another calf is, and they both put on 2 pounds a day the earlier

calf will weigh 60 pounds heavier than the later calf at weaning. That is 60 more pounds of beef you are selling.

- 7. Control Feed Expenses-** Feed is expensive, but if you have to buy hay or grain you might as well spend a little more and get quality feedstuffs. If you buy hay that contains a lot of digestible nutrients then you may not need to provide additional grain supplementation. At the highest nutritional requirement, a free choice diet (28.4 pounds of dry matter) that is higher than 9.9% crude protein and 57.6% total digestible nutrients will meet the nutritional requirements of a 1,200 pound lactating cow. If your hay and forage quality is low, but the quantity is not, the most economical thing to do is feed the right supplemental feed to prevent poor body conditions in your cows, and low weaning weights in your calves. Choose a feed based on either energy or protein deficiencies (or both) in your forage and look around for the most economical source of the nutrient(s). Also try to maximize your pasture use because grass is cheap compared to hay and supplemental feed. Good pasture management and developing a grazing strategy can go a long way to more efficient pasture use.
- 8. Heterosis-** Heterosis is a tool that often gets overlooked at times. Heterosis is crossbreeding to obtain quality genes and traits to be passed down to their offspring. It is an easy tool to use and it can increase weaning weights, longevity, improve feedlot performance and produce more desirable calves.
- 9. Feeding Hay-** Hay is probably the most expensive way to deliver forage to an animal. If you are having to feed a lot of hay, make sure it is getting consumed and not trampled on. A hay feeder can save a lot of hay when compared to setting out a round bale without some kind of protection.
- 10. Keep Records-** Keeping good herd records is one of the most important things a manager can do. A lot of people think that record keeping is too hard and a waste of time, but it's pretty simple and can help your operation run smoother and more efficient. You can't manage what you don't measure. The more records you keep the more powerful your management decisions can be. Records can be how much hay/minerals/feed are fed, weaning weights, percent of weaned calves, medications, vaccinations, dystocia incidences, etc. All those records are important to keep. Records on expenses and income are also important and can gauge future operational management decisions.

# CONTROLLING FOXTAIL IN PASTURES

*Dr. Leanne Dilliard, Auburn University Forage Specialist*

In the last 3-4 years foxtail seems to have taken over many farms throughout Alabama. The name 'Foxtail' refers to a variety of different plant species including green foxtail, giant foxtail, yellow foxtail, bristly foxtail, and knotroot foxtail (Figure 1). Yellow, green, and giant foxtail are non-native annual weedy grasses and knotroot foxtail is a perennial grass that is native to North America. While grasses, these weeds are not palatable to livestock (though some report grazing will occur when young and tender), and in late summer and fall can dominate pastures reducing desirable forages and possibly causing gum or eye damage in livestock. For all foxtail species, the combination of large seed production and long seed dormancy creates large seed banks in the soil meaning that multiple years of suppression is required to reduce or eliminate the weed from pastures and hayfields. Research has shown that foxtail seed can survive in the soil from 13-30 years depending on species.

## **Identification of Foxtail Species**

One of the most distinguishing features of foxtail is the color and size of the fuzzy foxtail seed heads. Identifying the specific foxtail species is important for creating a control plan. Annual foxtails establish from seed in the spring, grow throughout the summer, and complete their lifecycle in fall. They have a clumped growth habit with fibrous root systems (Figure 2). Knotroot foxtail is a warm-season perennial with short rhizomes. This species may rapidly infest grazed pastures when forage competition is low. It may germinate from seed or from rhizomes in the spring. The easiest method of identification is to dig up 1-2 plants and observe the root structures (Figure 3).

## **Cultural Control**

Promoting forage plants in pastures with foxtail problems is important for the long-term success of control. Thin areas where the soil is open can

quickly become areas of foxtail invasion. Many producers have reported, since the 2016 drought, have observed a tremendous amount of foxtail in their pastures. This is likely a result of thinned pastures due to unavoidable overgrazing and extreme drought stressed forage plants. Reseeding thin areas to promote forage growth will reduce foxtail competitiveness. Grazing may suppress foxtail populations in early summer when it is palatable and mowing/clipping can inhibit foxtail growth and limit the spread of seed in pastures. Actively growing foxtail will regenerate seedheads in ~2 weeks and therefore, regular mowing may be required for effective suppression. However, mowing does not eradicate foxtails.

## **Chemical Control**

Annual foxtails (green, yellow, and giant) can be controlled in established grass pastures and hayfields using Prowl H<sub>2</sub>O (active ingredient: pendimethalin), a pre-emergent herbicide. This herbicide can be used on cool-season grasses (e.g., tall fescue) that have at least 6 tillers and when the warm-season grasses are still dormant. 1.1-4.2 qt should be applied in spring. The higher rate will increase the length of time weed control will last. There is no grazing or haying restriction on the use of Prowl H<sub>2</sub>O.

Facet L (active ingredient: quinclorac), a post-emergent herbicide, has been shown to be effective on knotroot foxtail. Application of 22-32 fl. oz. in combination with a 1% v/v crop oil concentrate (COC) or a methylated seed oil (MSO) at 1-2 pints per acre is most effective. Apply when weeds are small and actively growing. There is no grazing restriction on Facet L, but do not cut field for hay within 7 days after application. Facet L is labeled for use in warm-season and cool-season pastures. Regardless of the herbicide always check



the current label to ensure proper application rate and timing and any use or forage restrictions.

For more information on control of Foxtail in Pastures refer to IPM-0028 Insect and Weed Control Recommendations for Pastures and Forage Crops or visit [aces.edu](http://aces.edu). If you have any forage related questions contact your local Cooperative Extension agent or email [alabamaforages@auburn.edu](mailto:alabamaforages@auburn.edu).



Figure 1. Knotroot foxtail in an Alabama hayfield. Photo courtesy of Bradley Greer.



Figure 2. Fibrous roots of yellow foxtail. Photo courtesy of Patrick McCullough.



Figure 3. Rhizomous roots of knotroot foxtail. Photo courtesy of Patrick McCullough.

# WARM-SEASON ANNUAL GRASSES

Dr. Deidre Harmon, Mountain Livestock Specialists, NC State University

Warm-season annual grass and legume species are important forage crops due to their known forage quality, yield, and drought resistance. They provide forage when temperatures in the summer exceed 80° F, or when cool season species become unable to produce adequate amounts of tonnage and high quality forage. To fill the “summer slump”, producers have the option of relying on warm season perennial grasses, such as native prairie grasses, or bermudagrass and bahiagrass in the piedmont and coastal regions of North Carolina. However, in some situations, it is better to use summer annuals rather than perennials, especially when renovating perennial pastures or when higher quality forage is desired. Although there are several warm-season annuals available, forage sorghum, sorghum x sudangrass, pearl millet, and crabgrass are among the most popular grass species.

## **Forage sorghum**

Forage sorghums perform well when moisture is limited, can grow to a height of 8-13 feet tall, and typically yield 4-8 dry tons/acre. Most varieties have the ability to produce a ratoon crop (regrowth) that may be grazed or used for multiple harvests. Depending on the variety, forage sorghums can contain 0-50% grain in the forage and are best suited for silage or baleage. The thick stems of forage sorghum readily hold moisture. Combining this with the high tonnage, curing forage sorghum for hay is difficult and therefore not recommended, even with the use of a conditioner. Seed should be drilled 1 – 1 ½ inches deep at 6 – 8 lb/acre or broadcast at 10 – 12 lb/acre.

## **Sorghum x sudangrass**

Sorghum x sudangrass is a hybrid cross between forage sorghum and sudangrass. Stems and leaves of the hybrid are generally taller and thicker than sudangrass and consequently produce larger yields. Seed should be drilled 1 – 1 ½ inches deep at 15 – 20 lb/acre or broadcast at 25 – 30 lb/acre. Plants grow to be 5-12 feet tall, and yields have been found to vary from 4-10 tons/acre, depending on management and environmental conditions. The best use of sorghum x sudangrass is for grazing or for silage. Plants should not be grazed lower than 8-12 inches tall to ensure rapid and timely regrowth. Typically, stems are too thick to be used for hay and may require an elongated period of drying. If using this species for hay, it is recommended that a roller/crimper-style conditioner be used to maximize drying.

## **Pearl millet**

Pearl millet is a deep-rooted, drought-tolerant bunchgrass that grows 3-8 feet tall. In general, one can expect pearl millet to yield 4-6 tons/acre under good management conditions. Pearl millet is well suited for grazing but may also be used for silage and hay production. It grows back rapidly and produces many tillers (several stems) at its base. Pearl millet should be established at 12-15 lbs/acre drilled or 25-30 lbs/acre broadcast. A no-till drill can be used to drill the seed at ¾-1 inch in depth. Grazing can begin once the plant reaches a height of 20-24 inches, and the cutting or grazing height should not be lower than 4-6 inches to promote timely regrowth and reduce plant injury.

## **Crabgrass**

Crabgrass is an annual grass that is present in most pastures across the Southeastern U.S. It has historically been considered a weed species in many cultivated crops, but the combination of its yield



potential and quality attributes make it an agronomically important forage crop. The first improved forage variety of crabgrass was released in 1988, and since then, several more have entered the market. Improved varieties of crabgrass can produce as much as 5 tons per acre when moisture is not limited and cattle will selectively graze it over fescue, bahiagrass, or bermudagrass. Forage from crabgrass is very palatable, highly digestible, and generally the highest quality of all the summer annuals. Crabgrass forage ranges from 11 - 15.5% CP and 58 - 63% TDN. The productive season is from May until October, though most of the forage will be produced in late summer. Crabgrass can be planted whenever the ground reaches 65°F and can be drilled or broadcasted. Seed crabgrass at a rate of 4 – 6 lbs/acre in May – June and no deeper than ¼ inch. Care should be taken when planting crabgrass to ensure that the seed flows through the drill or spreader. Crabgrass seed often builds up static electricity and clings to metal or plastic surfaces. Mixing lime, sand, or some other carrier that is uniform and of similar size to the seed in a 2:1 ratio with crabgrass seed can help to ensure it will flow satisfactorily.

### **Challenges**

Summer annuals do have their challenges. However, all of these challenges can be minimized or avoided with proper forage management. A common concern for using any member of the sorghum family is the risk of prussic acid poisoning. Prussic acid poisoning occurs when cyanide-forming compounds found naturally in the plant are released in response to extreme drought or frost injury. Prussic acid poisoning is of greatest risk in young plants and the stressed tissues of older plants. Fortunately, prussic acid is volatile and will dissipate over time. Therefore, it is important to allow at least 10 days of rest before grazing after severe drought stress or a major frost event that damages green leaves.

Nitrate poisoning is another concern when cattle are provided summer annual forages. If periods of limited moisture or drought occur after fertilization with nitrogen, summer annuals will store that nitrogen as nitrates in their vegetative tissue until adequate moisture allows for growth. Concentrations of nitrates are often highest in the stems and leaves closest to the ground. Therefore, lightly grazing the forage so that only the top of the plant tissue is removed will reduce the risk of nitrate poisoning. Unlike prussic acid, nitrates are stable in plant tissues and high nitrate concentrations will persist in both hay and ensiled forages, although there is typically a 40% reduction in nitrates from the ensiling process.

# UP COMING EVENTS

## **Dairy Steer Project Workday**

May11, 2019

WNC Regional Livestock Center, Canton, NC

## **Small Grains Whistle Stop Forage Tour**

May13, 2019, 2:30-4:30 p.m.

Mountain Research Station, Waynesville, NC

## **Fencing School**

June 04, 2019

Piedmont Research Station, Salisbury, NC

## **Mountain Research Station Field Day**

July 18, 2019

Mountain Research Station, Waynesville, NC

## **WNC Beef Commission Tour of Alabama**

July 28-31, 2019

Huntsville Alabama Area

---

North Carolina Cooperative Extension

60 East Court Street

Marion, NC 28752

Recipient Name  
Recipient Address

