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Bermudagrass as an Equine Forage

By Lucy Ray
Morgan County CEC

Chances are, if you have spent much time around horse people, at some point you have heard "I can't feed bermudagrass hay. My horse will colic on it". This myth, which is more prevalent in urban areas where the population is farther removed from agriculture, has been around for at least two decades. In some cases, horse owners refuse to plant bermudagrass in their pastures out of fear that this species of grass will cause colic in horses in either a fresh or cured state. However, this myth is not entirely accurate. Bermudagrass is an excellent forage choice for Georgia. It is heat tolerant, drought tolerant, and responds well to fertilization. When properly managed, bermudagrass has a high digestibility and handles overgrazing and treading fairly well.

So why the bad reputation? Horses need to consume approximately two percent of their body weight daily. At least one percent of their body weight needs to be in some type of forage. This is important because the fiber is necessary to maintain the integrity and fill of the horse's gastrointestinal tract. Because horses are hind gut fermenters, rather than foregut fermenters like cattle, they are more prone to digestive upsets such as colic. Impaction colic, where feedstuffs become impacted in a portion of the large intestine, are commonly blamed on whatever the horse had been eating prior to becoming sick. Fine stemmed forages have a bad reputation based on the thought that they are more easily impacted in the animal's gut. Several varieties of bermudagrass, such as Russell and Alicia are known for being fine stemmed. In addition, since the majority of horses in the Southeast are fed bermudagrass at some point via pasture or hay, the majority of horses that are admitted to a veterinary hospital for surgery have bermudagrass in their digestive tract.

Forage quality is important when considering hay for horses. Quality is most easily measured by RFQ (Relative Forage Quality) as this number takes into account both the total digestible nutrients (TDN) and dry matter intake (DMI). RFQ is able to compare forage quality across forage species. In essence, it provides a tool to compare Bermuda to alfalfa on the same scale. An RFQ of 100-120 is sufficient for an idle horse or one in light work. Bermudagrass is capable of meeting these qualifications. Research has shown that there is a correlation between high NDF values in hay and colic in horses. NDF, or neutral detergent fiber, is the indigestible portion of forage. This factor is more likely that this is the source of digestive upset, rather than a specific forage species. Thus, the take home message is that higher quality forages are better for your horse not only because they provide better nutrition, but are important in maintaining the health of their digestive tract as well.

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Equine Forage (cont.)

When feeding horses of any species, it is important to remember that hay should be free of mold, weeds, and foreign objects. Dry, dusty or moldy hay can also cause a respiratory condition called heaves. Any type of species of forage can make acceptable hay for horses, provided it is harvested at the proper stage of maturity and put up correctly. There is always a danger that impactions can occur when horses become dehydrated, thus access to fresh, clean water is important. Tifton 85, Russell, Alicia, Coastal, and Tifton 44 are all excellent varieties of Bermudagrass for both pasture or hay production in Georgia. Tifton 85 is naturally coarser stemmed than the other varieties. Regardless of forage species, it is more important to have forage tested than to buy simply on variety or age. For more information on equine forages, contact your local Extension office.

Utilizing Summer Annuals

By Sam Ingram
Effingham County CEA

Warm season annual grasses are a great compliment to our established perennial species. They are high in nutritive value, well known for strong yields and can be drought resistance. The most popular and most utilized species in our region are forage sorghum, sorghum x sudangrass and pearl millet. There are several varieties in each specie and choosing which variety is right for a particular farm is crucial. UGA College of Agricultural and Environmental Sciences Statewide Variety Testing program is a great resource to view varieties and their performance across the state. Results for last year's varieties and previous years, is available at www.caes.uga/commodities/swvt/. So, once the best variety is selected for a producer, it must be properly managed to maximize forage yield and quality.

Establishment
Making sure soil temperature is warm enough for seed germination is critical for establishing a good stand of grass. The correct time of year to plant grass can vary across the state. Table 1 helps a producer identify the best time to plant and how much seed to plant.

Table 1. Planting dates and seeding rates for selected warm season annual grasses.

			Seeding Rate	
			Drilled	Broadcast
Species	Planting Dates*		—— lbs. of PLS/acre ——	
Pearl Millet	LV:	May 1 – July 1	10–15	25–30
	P:	April 15 – July 15		
	C:	April 1 – August 1		
Sorghum x Sudan Hybrids	LV:	May 1 – July 15	15–20	20–25
	P:	April 15 – August 1		
	C:	April 1 – August 15		
Sudangrass	LV:	May 1 – July 1	20–25	30–40
	P:	April 15 – July 15		
	C:	April 1 – August 1		
Forage Sorghum	LV:	April 25 – May 15	15–20	20–25
	P:	April 15 – May 15		
	C:	April 15 – June 1		

* *LV = Limestone Valley/Mountains Region; P = Piedmont Region; C = Coastal Plain Region.*

Upcoming Events

Pasture Walk - Establishment and Management of Switchgrass
July 21, 2016 | Carlton, GA

Grass Masters Forage Series
Sept. 6 - Oct. 11, 2016
Tuesday Nights 6:00 -8:30 pm | Alma, GA

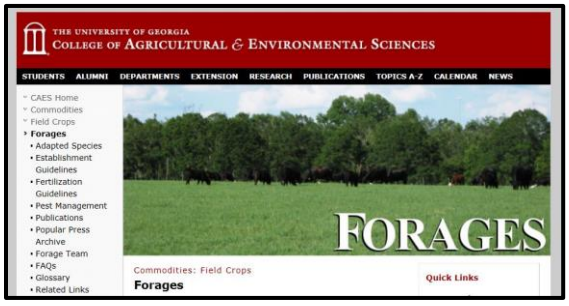
Georgia Grazing School - 2016
Sept. 20-21, 2016 | Tifton, GA

Southeastern Hay Contest (in conjunction with the Sunbelt Ag Expo)
October 18, 2016 | Moultrie, GA

American Forage and Grassland Council's Tour of New Zealand
Oct. 23 - Nov. 1/4, 2016

Looking for more forage information?

Be sure to visit **GeorgiaForages.com**!



Summer Annuals (cont.)

Fertilization
The goal of an annual crop is to grow quickly and produce. This is why these crops work well in a forage system, but to produce quality forage at a high quantity, nutrients must be provided to the crop. Before establishment, a soil sample should be taken to supply the exact nutrients needed for that specific forage. However, in the absence of a soil sample, apply 40 to 60 lbs. of N per acre for establishment and 50 to 60 lbs. of N per acre each month during the grazing season. When harvested for hay or silage, apply 40 lbs. of N per acre at planting and 40 to 60 lbs. of N per acre after the first two cuttings. Reduce N rates after the crop growth rate slows down.

Grazing Management
Remember, the goal of this annual grass is to produce quickly and if not managed properly it can "get ahead" of the animals and quality is lost. The best way to ensure production and quality are maximized is through some form of rotational grazing. This does not mean a producer has to establish an elaborate cross-fenced puzzle, but yet creating a system for the animals that will allow for a more uniform forage growth. Some "food for thought" that will create more food for the animals is listed below.

- Utilizing a tool such as a grazing stick or rising plate meter will help quantify the available forage and help in deciding when to move animals to the next paddock.
- Knowing the exact animal units grazing the forage and the size of each paddock will limit the issue of overgrazing.
- Knowing the daily forage requirement for each animal class present on the paddock will increase the efficiency of the grazing.

For more detailed information on any topic in this article or the points below, georgiaforages.com can be accessed or a producer can contact his or her county agent.

Water Use Efficiency in Forage Grasses

By Jeremy Kichler
Colquitt County CEC

As the summer months quickly approach, rainfall totally consumes the thoughts of the forage producer - too much rain, not enough rain, or the timing of rainfall events. The warm season perennial grasses use a lot of water to perform daily plant functions, like nutrient transport, cell division, growth, and plant cooling. It is not uncommon for forage crops to use over 1000 pounds of water (120 gallons) to produce one pound of dry forage if plant growth is less than optimal. That's over 2,000,000 pounds of water (almost 250,000 gallons) to produce one ton of dry forage. As you can see, plant water requirements are high.

Water use efficiency differs among forage species. Water use efficiency is a production index that describes the amount of water needed to produce a unit of forage. For example, if one inch of water falls on an acre of bermudagrass (approximately 27,200 gallons or 226,000 lbs of water) and 300 lbs of dry forage are produced as a result of this rain then the water use efficiency is equal to 753 pounds of water per pound of dry forage. According to Southern Forages, Fifth Edition, C4 plants (warm season plants) are twice as efficient as C3 plants in dry matter production per unit of water. This is interesting because the majority of C4 forage production is during the summer during hot, stressful times. Cool season grasses have advantages over warm season grasses in their higher nutritive quality and productivity during cooler months of the year.

Plant stress such as drought conditions, high temperatures, low fertility and soil pH and overly mature plants can lower the efficiency of forages. So when the forage stresses, more water is used for plant maintenance, and thus lowers forage production. Forages such as bermudagrass and bahiagrass have deeper root systems that allow them to obtain water from greater depths when compared to forages such as clovers. Rooting depth of forages can be affected by compaction, subsoil acidity, and nematodes. Subsoil pH levels below 5.0 will increase aluminum availability and stop root growth. This results in lower water use efficiency. If subsoil acidity is an issue then a forage such as pearl millet would be a good choice.

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Water Use (cont.)

Research (Table 2) in south Georgia shows that well fertilized Coastal bermudagrass and Pensacola bahiagrass with high rainfall used less water per pound of forage than common bermudagrass due to the higher yield potential. However, in a dry year, Coastal bermudagrass was far more efficient, due to the deeper root system that was measured in this study. So in terms of drought tolerance, the grasses ranked: Coastal > Pensacola bahiagrass > common bermudagrass.

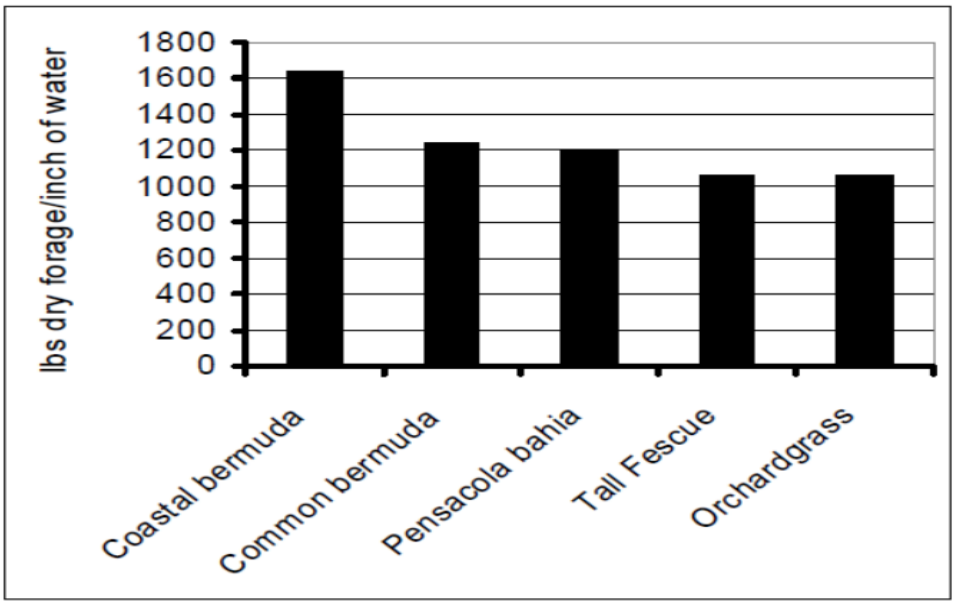
Table 2. Water Use Efficiency of Several Warm Season Perennial Grasses in South Georgia in a Wet Year and a Drought Year.

Grass	Lb water used/lb of dry matter	
	Wet Year	Dry Year
Coastal Bermudagrass	800	640
Pensacola Bahiagrass	870	1,240
Common Bermudagrass	1,550	4,340
Rainfall April 1 – October 31, in	40	14
Rainfall as % of normal	135	47

G.W. Burton, E.H. DeVane, and R.L. Carter, Agron. J. 46:229-233.

Warm season forages like bermudagrass, bahiagrass and dallisgrass normally utilize water more efficiently than cool season forages like orchardgrass and tall fescue according to data that was previously summarized in the 2nd Edition of Southern Forages (Figure 1). In this study, Coastal bermudagrass produced about 50% more forage per inch of water than tall fescue or orchardgrass. Common bermudagrass and Pensacola bahiagrass produced slightly more forage per unit of water than cool season forages. Also take note that the hybrid bermudagrass produced approximately 30% more forage per unit of water than common bermudagrass or bahiagrass.

Figure 1. Water use efficiency of selected warm and cool season grasses (Adapted from Doss et al. 1962, Bennett and Doss, 1963).



There is no doubt that weather can be very erratic during the year in the South. Row crops can suffer losses if they do not receive adequate water to meet requirements during flowering and fruiting periods of development. Forages have more flexibility and can put on growth when water is available after dry periods if soil fertility is good. Producers need to select the correct forages for their local weather conditions, fertilization programs, and cultural techniques to maintain deep root growth to maximize yields.

Causes of Bermudagrass Decline

By Carole Knight
Bulloch County CEA

Bermudagrass decline is a term that broadly describes the gradual thinning and sometimes the outright loss of grass stands over time. The term is broad because the problem is often linked to several different causes. These primary causes are often exacerbated by extreme environmental stresses like drought, heavy rainfalls, harsh winters, and late spring freezes. Let's look at some of the primary causes.

Poor Fertility
Probably the number one cause of bermudagrass stand decline is the lack of an appropriate fertility program. Although nitrogen (N) is an important nutrient in forage production, it is often the only nutrient applied. Potassium (K) and Phosphorus (P) are essential for forage production and persistence. Grass requires phosphorus for photosynthesis, energy, cell division, carbohydrate production, protein synthesis, root development and early growth, winterhardiness, and nitrogen fixation. Potassium plays an equally, if not more important role in improving the crop's tolerance to drought, minimizing susceptibility to disease, and promoting rhizome and stolon production. In most cases potassium is the limiting factor in a forage fertility program.

Low Soil pH
Low soil pH causes a problem by creating the opportunity for toxic levels of certain nutrients, such as aluminum, to be absorbed by the plant. This can burn back fine root hairs and prevent root growth. Low soil pH also reduced the availability of other important nutrients, such as phosphorus, potassium, magnesium, calcium, and others. Essentially, low soil pH staves the plant of water and other nutrients.

Overgrazing / Mowing too close
When pastures are overgrazed, it places excessive pressure on forage resources. Heavy, continuous grazing can decrease plant vigor, just as mowing hayfields too closely can. Grass plants must be given adequate rest times between grazing / cuttings and be left with enough green leaf material to replenish depleted nutrient stores.

Soil Compaction
With frequent use of heavy machinery in hayfields and excessive animal foot traffic in pastures, soil compaction can become an issue. Georgia soil types, particularly in the Piedmont, can be low in organic matter and are predisposed to compaction. Compacted soil particles create a barrier holding air and water from passing through. It results in soil layers that are difficult for roots to penetrate and thus reduces grass productivity.

Overseeded Cool Season Forages
Many bermudagrass production systems utilize cool-season annual forages, like ryegrass to supplement nutrition programs in the fall and winter. In years where the ryegrass is extremely productive well into the time when bermudagrass begins to emerge from winter dormancy, it can compete with the bermuda for sunlight, moisture and nutrients. Particularly, a heavy growth of ryegrass during the spring can remove a large amount of potassium from the soil, thus reducing the amount available for the newly emerging bermudagrass.

Pest Pressure
Invasive weeds can dominate pastures, compete with grasses, and reduce the productive capability of bermudagrass. Insect infestations, like fall armyworms, grasshoppers, and grubs, can have a devastating effect on grass production and cause severe damage. Most often these pest pressures combines with other stressors, like drought and poor fertility, can lead to decline.

It is important to understand that the loss of bermudagrass stands is often a combination of numerous stressors that ultimately lead to grass death. Proper management and a good fertility program and help keep bermudagrass decline from becoming an issue. For more information on how to properly manage pastures and hayfields go to georigaforages.com or talk to your local county extension agent.