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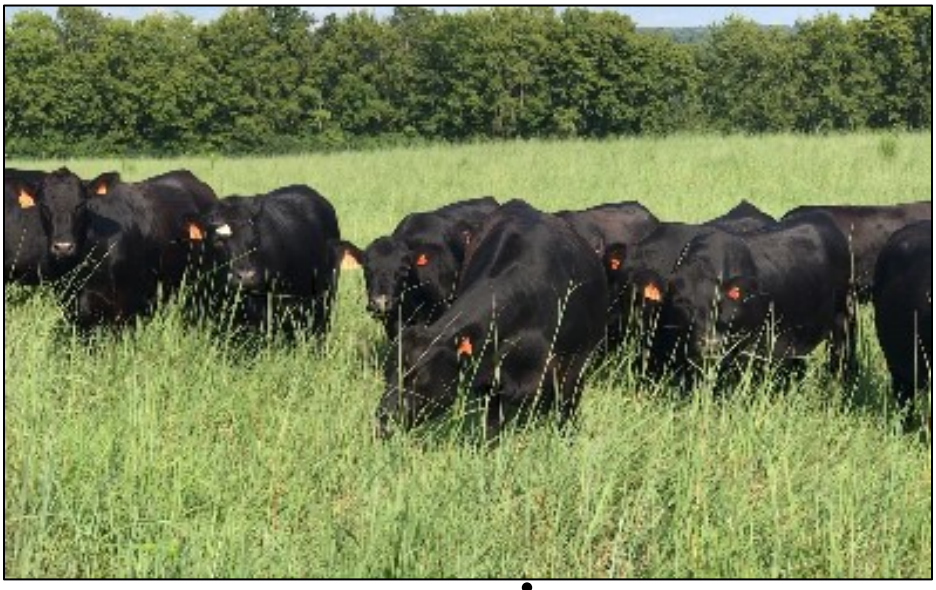

Are warm season native grasses an option for you?

By Will Lovett
Bacon County CEC

There are several perennial warm-season grasses that are native to the Eastern United States. The Native Warm Season Grasses (NWSG) most commonly used for forage are switchgrass, eastern gamagrass, indian grass, big bluestem and little bluestem. These NWSG are clump-forming, bunchgrasses that grow during the summer. They can provide good quality forage with reduced input cost, if a producer is willing to manage them correctly.

Native warm season grasses produce their growth from April to September. This warm season production period makes them very complementary to cool season grasses such as tall fescue. Grazing NWSG during the summer will reduce the effects of fescue toxicosis on livestock and can allow your farm to increase forage quality over a longer portion of the year. These grasses are deeply rooted and efficient users of water. This makes them very drought tolerate and useful to include as a portion of a farm's perennial forage base. Native warm season grasses have very modest fertilization requirements. For forage production, pH should be maintained at a 5.5 or greater, phosphorus and potassium should be applied according to soil test recommendations (University of Tennessee literature indicates maintaining P and K in the "medium" soil test range). Nitrogen requirements are 50-75 pounds per acre.

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Native grasses cont.

The NWSG tend to be very efficient at utilizing these modest amounts of fertilization to produce forage yields that are quite comparable to bermudagrass. Yields for hay production tend to range from 3-6 tons per acre (Figure 1).

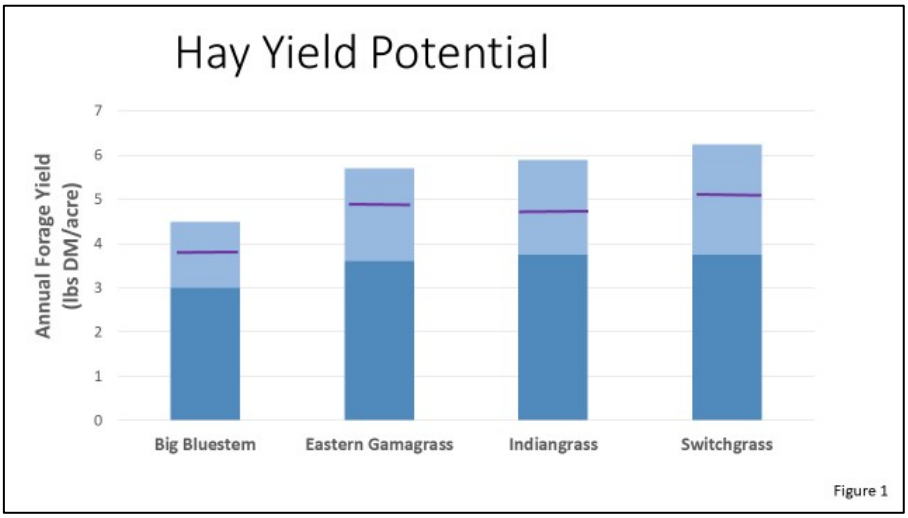

Figure 1

These native grasses are quite palatable to livestock and can produce respectable summer gains when grazed. Recent grazing trials at University of Tennessee Ag Research and Education Centers indicate 600 lb. stockers and 1,000 lb. replacement heifers both achieved respectable gains on native warm season grasses (Table 1).

Table 1. Beef cattle performance on native warm season grasses (Data from Univ. of TN).

Animals Grazed	Grazing System	Forage Species	ADG	Days Grazed	Total Animal Days/ac	Total Gain/ac
Stockers	Early season	Big bluestem/indiangrass blend	2.40	30	77	198
(600 lb)		Switchgrass	1.94	30	101	188
		Eastern gamagrass	1.86	30	121	226
	Full season	Big bluestem/indiangrass blend	2.12	71-115	171	370
		Switchgrass	1.75	71-115	244	435
		Eastern gamagrass	1.06	95	244	248
Bred heifers	Full season	Big bluestem/indiangrass blend	1.99	56	263	161
(1000 lb)		Switchgrass	1.54	56	199	163
		Eastern gamagrass	1.26	112	217	274

Native warm season grasses have many advantages but do have several special considerations for establishment. A successfully established NWSG pasture or hayfield is a sizeable investment. Seed may cost $125 -$225 per acre, plus the cost of fertilizers, tillage, herbicides and planting. Some of the NWSG have fluffy appendages to the seed, which necessitates agitators in the drill's hopper box so that the seed properly flows out of the hopper. The native warm season grasses tend to have a high degree of seed dormancy, therefore, they germinate slowly. This characteristic along with limited herbicide options to use at planting make pre plant weed control and planning critical to successful stand establishment. By the second and third year, native warm season grass plants will be more tolerant of post emergent herbicides.

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Upcoming Events

Hay and Baleage Production Short Course
Mar. 8/9, 2018 | Burke Co. Extension Office | Waynesboro, GA

SE Beef Cattle Short Course
Mar. 6, 2018 | Bull Test Center | Irwinville, GA

Fescue Pasture Renovation and Grassland Renewal
Mar. 13, 2018 | Clemson University's Simpson Research Farm | Westminster, SC

Georgia Forages Conference at GCA Convention
Apr. 5, 2018 | Georgia National Fairgrounds | Perry, GA

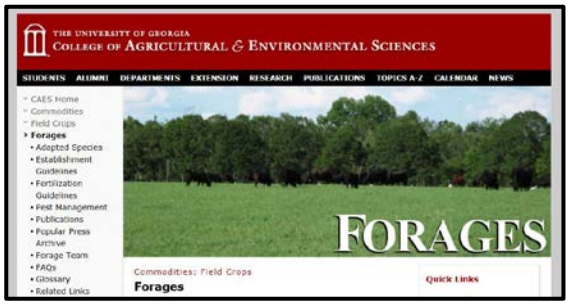
Alfalfa in the South Workshops
May 1, 2018 | Calhoun County | Edison, GA
May 8, 2018 | Bacon County | Alma, GA
May 9, 2018 | NESPAL Building (2356 Rainwater Rd, Tifton, GA) | UGA-Tifton
May 10, 2018 | Irwin County | Fitzgerald, GA

UF/UGA Corn Silage and Forage Field Day
May 24, 2018 | UF Citra Research Station | Citra, FL

Sunbelt Ag Expo Field Day
Jul. 24, 2018 | Sunbelt Ag Expo Grounds | Moultrie, GA

Looking for more forage information?

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



Native grasses cont.

Grazing and haying management of native warm season grasses is different from other commonly used warm and cool season perennial grasses. These grasses are relatively tall growing and have leaf and stem sizes much larger than leaves and stems of commonly used forages such as bermudagrass or fescue. Additionally, the NWSG's growing points are further away from the soil surface, so minimum haying and grazing heights are also greater. To maintain a healthy stand target an 8-inch stubble height for hay production and 15 inch stand height for grazing. If stands are routinely grazed below this height, they will begin to thin and fail within a few years.

Native warm season grasses require proper planning for successful stand establishment and changes in haying equipment and grazing management to maintain stand longevity. However, NWSG are very productive in marginal soils and under lower input management, all while complementing perennial cool season forages and provide a hedge against drought.

There is more information on establishing and managing native grasses available at http://nativegrasses.utk.edu/, or contact your local county extension agent.

Comparing summer annual forages

By Jeremy Kichler
Colquitt County CEC

Summer annual forages can provide high yields of good quality forage during late spring and summer for both beef and dairy producers. Most of the warm season annual grasses emerge and establish quickly and are very drought tolerant. They can be used for grazing, hay or silage. Producers need to manage these species carefully in stressful conditions because they can accumulate levels of prussic acid and nitrates that can be toxic to livestock. There are many choices when it comes to summer annual forages, let's compare a few of them.

New varieties of warm-season annual grasses are released periodically, so one should frequently evaluate yield data from UGA's Statewide Variety Testing Program. This information can be obtained from the following link (http://www.caes.uga.edu/commodities/swvt/).

Below are seeding rates, planting dates for summer annual forages.

Table 3. Planting dates and seeding rates for selected warm season annual grasses.

Species		Planting Dates*	Seeding Rate	
			Drilled	Broadcast
			—— 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.

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Summer annual forages cont.

Pearl millet can be grazed or harvested as hay or silage. It is a medium to high yielding summer annual forage and is more productive in drought conditions. Planting can begin when the 2 inch soil temperature reaches 65 degrees F. Seed can be broadcasted (25-30 lbs of PLS/Acre) or drilled (10-15 lbs of PLS/Acre). The seeding depth needs to be around ½ to 1 inch deep. Pearl millet can tolerate lower soil pH than sorghums and is very responsive to nitrogen.

Growers can begin to graze pearl millet once the plants reach 20 to 24 inches, but regrowth rate and animal performance is best if a 9 to 12 inch stubble height is maintained. Pearl millet tillers well, making it very suitable for grazing.

Pearl millet can make good quality hay if cut when plants reach 2 to 3 feet tall. This prevents the forage from maturing beyond the boot stage and therefore being too mature to provide high quality. The drying rate of millet hay can be sped up if a roller/crimper-style conditioner is used.

If harvested prior to advanced maturity stages, the range of total digestible nutrients (TDN) can be expected to be 52 to 58 percent, while crude protein (CP) will range from 8 to 11 percent. There is some evidence to suggest that seeding rates at the high end of the recommended ranges will promote a higher leaf:stem ratio. This may improve forage quality, but these gains may not compensate for the expense of the higher seeding rate.

Pearl millet has one major advantage over sorghum, sudangrass, and sorghum x sudangrass hybrids in that it does not produce prussic acid. This advantage allows pearl millet to be grazed or harvested at any growth stage and during droughts without the risks associated with prussic acid poisoning. However, pearl millets can have high nitrate levels similar to other warm season sorghums. Horses may suffer from subclinical and acute prussic acid poisoning, so species in the sorghum family should not be fed to them.

Sorghum x sudan hybrids have the highest yield potential of the summer annual forages if adequate rainfall or irrigation is received. However, sorghum x sudan yields are more severely affected by drought than pearl millet and are less tolerant of poor soil conditions and soil pH values less than 5.8. Seed can be broadcasted (20-25 lbs of PLS/Acre) or drilled (15-20 lbs of PLS/Acre). Sorghum x sudans can be used for grazing or silage, but like other annual sorghums, their forage is difficult to dry to moistures suitable for hay production.

Sorghum x sudan hybrids should be rotationally grazed, allowing the forage to reach 24 inches before grazing (i.e., managed like sudangrass). This species can be harder to manage in a grazing situation due to the fact it does not tiller as well as other summer annual species. This property can impact recovery time if sorghum X sudan is grazed too hard. Sorghum x sudans will generally have TDN values in excess of 53 to 60 percent and CP concentrations of 9 to 15 percent. Brown midrib (BMR) varieties are usually preferred varieties for grazing or conserved forage since they have less lignin and higher digestibility than other varieties.

Sudangrass has finer stems, tillers profusely and is leafier than forage sorghums. They produce very few seed. When compared to other sorghums, the growth rate is better after a cutting or a grazing event. This growth characteristic makes it a great candidate for rotational grazing. They tend to have less prussic acid accumulation than forage sorghums, and these levels tend to decrease with maturity. Sudangrass seed can be broadcasted (30-40 lbs of PLS/Acre) or drilled (20-25 lbs of PLS/Acre).

Photoperiod-sensitive sorghum x sudan and forage sorghum cultivars are available. These varieties are capable of sustaining more consistent growth over a longer growing season because they remain in a vegetative stage late into September (until daylength is less than about 12 hours and 20 minutes). This trait may negate or lessen the need for staggered plantings.

Forage sorghum is a high yielding summer annual forage. They may contain 0 to 50 percent grain in the forage depending on the hybrid and stage of maturity at harvest. As plants mature, lignification can increase which results in reduction in forage quality. Forage sorghum have thick stems that make hay production difficult but makes excellent silage. Nutritive value is often times 85 to 90 percent of corn silage. Highest crude protein and digestibility will usually be obtained when harvested in a vegetative stage of growth but dry matter production can be increased as plants mature. Harvesting in the late grain dough stage will maximize TDN. Forage sorghum seed can be broadcasted (20-25 lbs of PLS/Acre) or drilled (15-20 lbs of PLS/Acre).

There are a variety of options for summer annual forages that can provide excellent grazing or harvested forages for livestock producers. If you need assistance selecting a variety or comparing options, contact your local extension office.

Managing internal parasites through better grazing

By Adam Speir
Madison County CEC

Internal parasites can cause significant production losses in livestock, which results in significant economic losses for livestock producers. These parasites affect cattle, horses, sheep, and goats. Many times, the effects are subclinical and may go unnoticed, but severe infestations can cause disease and death. Subclinical effects caused by internal parasites include reduced milk production, reduced weaning weights, delayed puberty, decreased fertility and pregnancy rates, as well as reduced feed intake, diarrhea, anemia, and immune suppression. Because of the potential health and production impacts of internal parasites on livestock, proper planning and management is important. Livestock producers will often use dewormers, but many of these have lost their effectiveness due to resistance in the parasite populations. Aside from chemical control measures, other management strategies exist. This article will specifically address how good pasture management can help reduce internal parasite pressure on livestock.

Good pasture management related to managing internal parasites requires an understanding of the lifecycle and preferences of the most problematic internal parasites. Most of the problematic parasites we deal with are roundworms (nematodes) which have a direct lifecycle – meaning they require only one host to complete their lifecycle. For example, *Ostertagia ostertagi* (Brown Stomach Worm) is a common parasite in cattle while *Haemonchus contortus* (Barber Pole Worm) is the most common parasite of concern in small ruminants. Most internal parasites are host-specific, meaning that different livestock species often do not share the same parasite species. Cattle and goats or sheep do not share many of the same parasites, but sheep and goats will share the same parasites.

Mature parasites reproduce inside the host and eggs are released in the feces. These eggs hatch inside the feces. Warm, wet weather conditions are most favorable for egg hatching and larvae development. Once the larvae hatch, they travel up the blades of grass in order to be ingested by livestock while grazing where they will mature and begin reproducing, repeating the cycle. Larvae are able to travel 2-3 inches up the plant but could travel further under ideal conditions. In areas where fecal matter accumulates (near water & feed sources or shade) or where pastures are overstocked, parasite density will be high. When conditions are moist and warm, larvae will be more prevalent. In dry conditions, larvae stay close to the soil surface where there may be enough moisture to survive.

Understanding these concepts helps provide some important strategies to help manage pastures to reduce parasite pressure –

1) **Do not overstock or overgraze** – Regardless of livestock species, overstocking pastures results in a variety of issues. Related to parasite management, overstocking will ultimately lead to shorter forages to graze and increases the likelihood of animals ingesting parasites. Maintain a healthy grazing height of your forages and work with your Extension agent to balance your animal stocking rate with available forages to reduce grazing pressure.

2) **Rotate Pastures** - Rotating livestock through different pastures helps to reduce parasite pressure by removing animals before parasite eggs hatch and larva are ingested. For example, the complete lifecycle of *H. contortus* can be about 3-6 weeks, with the time of egg drop to larvae hatching within 4-5 days. If livestock are allowed to graze in a paddock for 3-4 days, and then rotated to another paddock, this keeps the animals from continuing to ingest parasite larvae. If conditions allow, keeping the livestock off that original pasture for 4-6 weeks can allow the parasite larvae to die and the pasture to be "clean" of the parasite larvae that originally hatched. The length of time it takes for parasite eggs to hatch and larva can depend greatly on temperature and moisture conditions. Parasites eggs can sit idly for a long period of time until conditions are favorable. While a lifecycle of 3-6 weeks is realistic during a humid summer in Georgia, that time could be extended by months during drought or cooler times of the year. To ensure that a pasture is totally "clean" of parasites, it should not have been grazed by livestock for 12 months, or the ground has been prepared for planting of a crop or utilized as a hay field.

3) **Consider Mixed-Species Grazing** – As mentioned earlier, many common internal parasites are host-specific. This means that cattle can help "break" the cycle for sheep or goat parasites by ingesting them but not providing an environment where they will reproduce - the same is true for cattle and horses by bringing in sheep or goats. You can graze mixed species simultaneously, or alternate livestock species to achieve the same purpose. Grazing different livestock species can also achieve the goal of better utilization of different forage types and improved "weed" control.

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Managing internal parasites cont.

4) **Incorporate Improved or Alternative Forages** – Utilizing different forage crops such as legumes or summer annuals can provide higher quality forages that improve the nutritional status of animals which helps reduce stress of internal parasites and also can provide a situation where parasites populations are not as prolific (prepared seed bed for annual crops, taller crops that larvae can't utilize, etc.). Other crops are considered "bioactive," meaning they can provide a medicinal effect against parasite infestation. These crops include chicory and sericea lespedeza, which are especially helpful for sheep and goat producers.

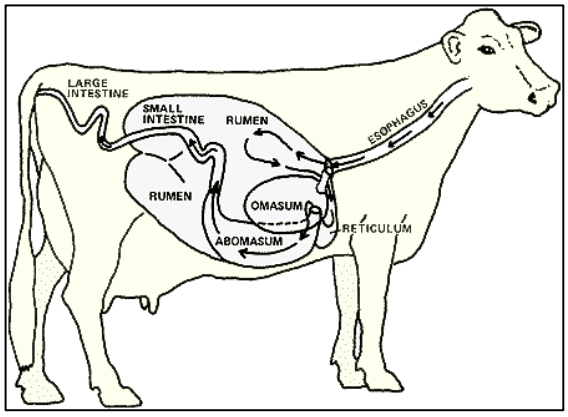
As much as any other tool, good pasture management can help be the difference in maintaining a healthy herd free of heavy parasite loads. Coordinating with your veterinarian and Extension agent on ways you can strategically manage your herd and forages will quickly pay off.

The amazing ruminant

By Carole Knight
Bulloch County CEA

It's a match made in grazing heaven – the ruminant animal and the forage producer. No digestive system is better suited for a diet of grasses and legumes. The ruminant animal is uniquely designed to digest fibrous, high roughage feedstuffs through fermentation. An understanding of how the ruminant digestive system works can be beneficial to producers striving to feed livestock on a forage based nutritional program. There are livestock nutritionists out there that have spent their lives studying the ruminant digestion system; this is only a quick overview of this amazing process.

The actual definition of a ruminant is "an even-toed ungulate mammal that chews the cud regurgitated from its rumen." Ruminant animals include cattle, sheep, goats, deer, moose and even giraffes. Cud is a food bolus that is regurgitated, re-chewed, and re-swallowed. (Imagine the force needed to regurgitate cud up the neck of a giraffe. Wow!) These animals eat copious amounts of forage at a time and then relax and ruminate. Ruminant animals are further classified by their foraging behavior: grazers, browsers, or intermediate grazers. Grazers, such as cattle, consume mostly grasses while browsers such as moose and mule deer stay in the woods and eat highly nutritious twigs and shrubs. Intermediates, such as sheep, goats, and white tail deer, have nutritional requirements midway between grazers and browsers. Of this group, sheep are more of a grazer, while goats and deer are browsers.



The ruminant digestive system is made up of the mouth, tongue, salivary glands, esophagus, four compartment stomach, pancreas, gall bladder, small intestine, and large intestine. The process all begins when the animal uses its mouth and tongue, by either grazing or consuming harvested forages. These animals eat rapidly, swallowing much of what they consume without chewing it sufficiently. Ruminants only have lower front teeth, but don't have top front teeth, instead having a hard dental pad. They do however have powerful back molars and these teeth crush and grind plant material during initial chewing and rumination. Consumed forage and feed mixes with saliva, which helps to buffer rumen pH, to form a bolus. That bolus then moves through the esophagus towards the stomach. The esophagus functions bi-directionally, allowing ruminants to regurgitate the bolus or "cud" for further chewing.

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The amazing ruminant cont.

Contrary to popular belief ruminants do not have 4 stomachs but rather have 1 very large stomach with 4 compartments: the rumen, reticulum, omasum, and abomasum. Once the cud is adequately chewed, then swallowed again, it passes into the reticulum. Then the solid portion slowly moves into the rumen for fermentation, while most of the liquid portion rapidly moves from the reticulorumen into the omasum and then abomasum. The solid portion left behind in the rumen typically remains for up to 48 hours and forms a dense mat in the rumen, where microbes can use the fibrous feedstuffs to make precursors for energy.

The reticulum sits underneath and toward the front of the rumen. Contents flow freely between the reticulum and rumen. The main function of the reticulum is to collect smaller digesta particles and move them into the omasum, while the larger particles remain in the rumen for further digestion. The rumen is where the real magic happens. The rumen acts as a fermentation vat by hosting microbial fermentation. About 50 to 65 percent of starch and soluble sugar consumed is digested in the rumen. It is home to a population of "rumen bugs" that include bacteria, protozoa, and fungi. These microbes ferment and break down tough plant cell walls and produce volatile fatty acids (VFAs) from these carbohydrates. The animal later uses these VFAs for energy. These microbes also synthesize protein from nonprotein nitrogen, and synthesize B vitamins and vitamin K.

The omasum is spherical and connected to the reticulum by a short tunnel. Water absorption occurs in the omasum. The abomasum is the "true stomach" of a ruminant. It is the compartment that is most similar to a stomach in a nonruminant. The abomasum produces hydrochloric acid and digestive enzymes that help prepare proteins for absorption in the intestines.

The small and large intestines follow the abomasum as further sites of nutrient absorption. The small intestine measures about 20 times the length of the animal. Digesta entering the small intestine mix with secretions from the pancreas, liver, and gall bladder. Active nutrient absorption occurs throughout the small intestine, including rumen bypass protein absorption. The intestinal wall contains numerous "finger-like" projections called villi that increase intestinal surface area to aid in nutrient absorption. Muscular contractions aid in mixing digesta and moving it to the next section.

The large intestine absorbs water from material passing through it and then excretes the remaining undigested material as feces from the rectum. The cecum is a large blind pouch at the beginning of the large intestine. The cecum serves little function in a ruminant, unlike its role in horses.

To effectively feed livestock, like cattle, sheep and goats, it is necessary to understand, at least to some degree, the complexities of the ruminant digestive system. The ability of these amazing animals to digest material that is mostly indigestible to other food animal species provides an important place for ruminant livestock in the food production industry.

Are you a forage enthusiast?

Join the Georgia Forages and Grassland Council!

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and follow us on Facebook at https://www.facebook.com/gaforageandgrasslandcouncil/

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