



Pasture Gazette

Department of Soil & Crop Sciences

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Editor's Corner

Larry Redmon, Professor and State Forage Specialist
E-mail: l-redmon@tamu.edu

Welcome to the Pasture Gazette!

This is the inaugural edition of the Pasture Gazette, an electronic newsletter that will focus on forage and forage-related issues.

The Pasture Gazette has been created to provide you with the latest developments in forage establishment, management, and utilization and will be used to provide immediate information to you should an emergency or crisis issue develop. We plan to archive the issues so that you may refer back to earlier topics and with the aid of Adobe Reader, you may even do key word searches for topics of interest to you.

Bear with us as we launch this new publication as we will be making constant changes to enhance the look, and please email us with your (constructive) comments on how we can make the publication more useful to you.

In this issue you will read about Tifton 85 bermudagrass and the ongoing research from the Texas A&M University Agricultural & Research Center – Overton. Tifton 85 bermudagrass is the finest of the bermudagrass releases and is creating quite a stir among producers looking for hay with higher nutritive value or growing cattle performance that rivals winter pasture. Future articles will include information on a new burr medic, 'Devine', released from the Texas Agricultural Experiment Station at Beeville for overseeding into warm-season perennial introduced pastures. There will also be an article devoted solely to overseeding pastures with cool-season annual forages. We will also provide information on how to stockpile your bermudagrass for fall/winter grazing and help reduce your winter feeding costs.

So here it is! Enjoy and let us hear from you!

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The POWER of Bermudagrass: 1,000 Pounds of Gain Per Acre

Monte Rouquette, Ph.D., Forage Physiologist, Texas Agricultural Experiment Station, Overton

The POWER and legacy of bermudagrass reside in their sustainability in pastures under a wide array of management scenarios. Sustainability of bermudagrass is environment-specific and may be attributed to the root-rhizome-stoloniferous traits that have high tolerance to severe defoliation regimens. Other POWERS of bermudagrass are associated with forage production and animal performance per unit land area. Warm-season perennial grasses such as bermudagrass, lovegrass, kleingrass, buffelgrass, old world

bluestems, etc. are the basic pasture- rangeland forages in Texas. These persistent grasses, however, are in the lowest nutritive value category of forage types (Fig. 1). Thus, before the POWERS of bermudagrass can be realized, management must have knowledge of dry matter and nutritive value potentials and constraints for animal performance.



Animal Performance

What level of animal performance may I expect from bermudagrass?

Individual animal performance is often expressed as total gain for a season or average daily gain (ADG). The ADG from bermudagrass pastures is very variable and is dependent upon numerous factors related to: forage variety; animal (class, age, sex, weight, genotype); environmental conditions (total and distribution of rainfall, temperature, frost-free period); and management (fertility, stocking rate, stocking method, stocking strategies, etc.). Long-term grazing research with common and Coastal bermudagrass at TAES-Overton using F-1 Angus x Brahman or Hereford x Brahman cows with Simmental-sired, winter-born calves has



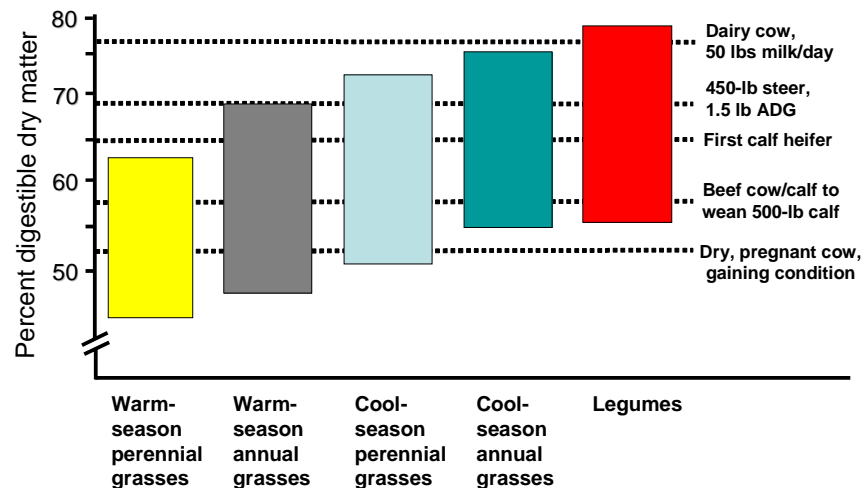
resulted in suckling calf ADG of 2.0 to 2.5 lbs/da under moderate to low stocking rates from June to October. Moderate to low stocking rates indicates that sufficient forage dry matter was available to allow animals to preferentially select forage components. In the past few years, suckling calf ADG from Tifton 85 bermudagrass stocked at moderate to low levels from June through September has been 2.5 to 3.0 lbs/da.

Under the same forage and climatic conditions, ADG from weaned, stocker calves has been more variable and less than that from suckling calves. Season-long, stocker calf ADG on bermudagrass may range from less than 0.5 lbs/da to more than 2.5 lbs/da. Most of this variation is related to previously mentioned animal factors. However, the nutritive value differences between Tifton 85 and Coastal bermudagrass, for example, can result in .5 lbs/da or more gain advantage for Tifton 85. In general, optimum-maximum stocker ADG from bermudagrasses occurs with Brahman-influenced, yearling steers with initial body condition scores of 4 or less and weight of 550 to 650 lbs. These stocker conditions would match genotype adaptivity and age-weight scenarios for compensating gains. Conversely, the lowest stocker ADG on bermudagrass pastures often results with non-Brahman, lightweight, 4- to 6-month old calves that are weaned immediately prior to initiation of grazing. Stocker grazing research at TAES-Overton has shown that fall-born, mid-June weaned, 25% Brahman steer and heifer ADG

"Individual animal performance is often expressed as total gain for a season or average daily gain."

to be about 1 lb/da from Coastal and about 1.5 lbs/da from Tifton 85 bermudagrass from late June through September. With the same calving-weaning date conditions, F-1 Hereford x Brahman steer ADG has been about 1.6 lbs/da from Coastal and 2.3 lbs/da from Tifton 85 bermudagrass. Additional ADG may be achieved with specific protein supplementation (Tables 1 & 2).

Figure 1. Forage digestibility ranges and their suitability for different classes of livestock



Adapted from: H. Lippke and M.E. Riewe. 1976. Texas Agric. Exp. Stn. Res. Monograph RMGC:169-206.

Table 1. Average daily gain comparisons for two experiments during the grazing-backgrounding summer period on Coastal and Tifton 85 bermudagrass.

Pasture	Average Daily Gain				
	EXP 1 ¹ HHAB ³	EXP 1 ¹ HxB ³	EXP 2 ² SIM X ³	EXP 2 ² HxB ³	EXP 2 All Cattle
	----- (lbs / da) -----				
Coastal PAS			.91 d	1.64 c	1.01 d
Coastal + SUPL ⁵	1.54 a ⁴	2.03 b	1.18 c	2.04 b	1.30 c
Tifton 85 + PAS	1.61 a	2.30 a	1.58 b	2.33 b	1.69 b
Tifton 85 + SUPL			1.86 a	2.89 a	2.02 a

¹EXP 1 grazing from 6-16 to 8-31.

²EXP 2 grazing from 6-25 to 9-25.

³Breed types included Hereford x (Angus x Brahman) [HHAB], Simmental x (AxB) [SIMX] and F-1 (Hereford x Brahman) [HxB].

⁴Means in a column followed by a different letter differ (P<.05).

⁵SUPL = 2 lbs/hd/da of a 1:1 (Corn:soybean meal), 28% protein ration containing minerals and Rumensin, and hand fed daily.

From F. M. Rouquette, Jr., *et al.* Overton Research Center Technical Report 2004-1, Page 69-70.

Table 2. Stocking rate, gain per animal and per acre, extra gain from supplement, and supplement:extra gain ratio for Trial 2.

Pasture	Stocking Rate	Gain/Animal	Gain/Acre	Extra Gain Suppl.	Suppl. Extra Gain	Suppl. Cost/lb ¹ Extra gain, \$
	(hd/ac)	(lbs)	(lbs)	(lbs)		
Coastal PAS	3	93	279	—	—	—
Coastal + SUPL	3	120	360	.29	6.9	.69
Tifton 85 PAS	3	155	465	—	—	—
Tifton 85 + SUPL	3	186	550	.33	6.1	.61

¹Supplement costs estimated at \$200/ton (0.10/lb).

From F. M. Rouquette, Jr., *et al.* Overton Research Center Technical Report 2004-1, Page 69-70.

Pasture Performance

How many pounds of gain per acre can be achieved with bermudagrass? Gain per acre is the product of ADG x stocking rate. Stocking rate is environment-specific and management-controlled!! When inquiring about stocking rates for any grazing scenario, the following information is needed: (1) animal weight; (2) duration of the stocking period; (3) initiation and termination dates; (4) environmental conditions; (5) location or vegetation region; and (6) fertility-management of pastures. Although bermudagrasses initiate growth 30 to 45 days after the last frost, the primary grazing period usually begins in late spring to early summer and continues into early autumn. Thus, the grazing period for active growing bermudagrass may range from May through October, and an additional 30 to 75 days of grazing deferred, stockpiled bermudagrass in November and December.

Long-term stocking rates with Coastal bermudagrass at TAES-Overton during June through September has averaged about 1.5 1500-lb cow-calf units on low stocked to about 2.25

1500-lb cow-calf units on medium stocked pastures. If, however, one uses 1000-lb as an animal unit to calculate stocking rates, then there would be 2.2 animal-units/ac on the low stocked and 3.4 animal-units/ac on the medium stocked Coastal bermudagrass pastures.

Hence, this illustration of animal unit or cow-calf unit definition has drastic impacts on resultant, reported gain per acre of suckling calves which could range from 300 lbs/ac on low stocked to 480 lbs/ac on medium stocked pastures using 1500-lb units, and from 475 lbs/ac on low stocked to 775 lbs/ac on medium stocked pastures using 1000-lb units. Using a conservative 1500-lb = 1 cow + calf, bermudagrass that is overseeded with ryegrass and grazed from mid-February through September can produce suckling calf gains of 700 to 1050 lbs/ac. However, at 1000 lbs = 1 animal-unit, calf gain per acre on overseeded pastures ranged from 1050 lbs/ac to 1600 lbs/ac.



How can one obtain 1000 lbs/ac gain from bermudagrass pastures? The “quick” answer is that pastures must have water . . . either as rainfall or irrigation and adequate soil fertility. Stocker calf gains that reach or exceed 1000 lbs/ac usually require about a 150 to 180-day grazing period, which is generally from May through September-October. During this period, and with an ADG of 1.5 lbs/da, a stocking rate of about 4.5, 650-lb stockers/ac would be required to achieve 1000 lbs/ac gain. At the TAES-Overton location in the Pineywoods of East Texas, the 4.5 stockers/ac (2925 lbs body weight per acre at initiation) would be generally classified as low to moderate stocking rate insofar as appropriate fertilization rates have been applied. Thus, stocking rate or carrying capacity potential of fertilized bermudagrass pastures in East Texas is not the primary concern. Gain per animal, ADG, becomes the primary issue. . . obstacle. . . in obtaining 1000 lbs/ac gain. Once again, selection of cattle genotype, age, class, and body condition are critically important to reaching or exceeding 1.5 lbs/da gain from stockers grazing bermudagrass. Previous grazing research at TAES-Overton, as well as from other units in Texas and the southeastern US, suggests that a protein-based supplement may be required to sustain and exceed 1.5 lbs/hd/da. In addition, the supplement rations are critical to success and, in general should contain an ionophore to implement additional ADG. Although, there are numerous commercial protein supplements available, management choices usually focus on method of delivery, labor involved, and cost of product. Biological-and cost-effective gains have been attained with several experiments at TAES-Overton using a “basic” mixture of 1:1 or 2:1 soybean meal:cracked corn ration with an ionophore and fed at 0.3% to 0.4% body weight per head per day. For example, if steers weighed 650 pounds, initial daily supplement would be about 2 to 2.5 lbs/hd/da. These supplements have been converted to extra gain from about 3:1 to 7:1. Thus, if steers converted at 6:1 on

average, the 2.5 lbs/hd/da supplement should provide an additional .3 to .4 lb/hd/da. The major concern . . . obstacle . . . is the method of delivery of either hand-fed or self-limiting. Self-limiting rations require physical or palatable limitors to prevent excessive consumption.

Some experiments at TAES-Overton has shown Tifton 85 bermudagrass to produce 25 to 50% higher ADG than Coastal bermudagrass. A recent experiment used both fall-born, June weaned 8-month old steers (25% Brahman) and long-yearling, 15-month old Brahman steers grazing Tifton 85 bermudagrass. Tifton 85 bermudagrass was deferred during early June and grazing was initiated in late June when forage was at the 16-18 inch hay stage that had about 7500

"Steer gains of greater than 1,000 lbs./A in 60 days were Tifton 85 bermudagrass pastures"

lbs forage per acre available for grazing. In the first 60-days of grazing, pastures stocked at 8.5 650-lb steers per acre and supplemented with 0.4% body weight/hd/da of a 36% protein supplement gained 970 lbs/ac when grazed by fall-born, 25% Brahman steers, or 1300 lbs/ac when grazed by long-yearling Brahman steers. These first 60-day ADG were

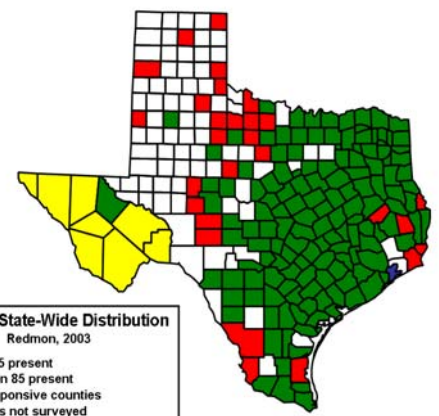
1.9 for fall-born and 2.5 for long-yearling steers. Total seasonal gains, however, are controlled by rainfall; thus, at these high stocking rates, only a 60- to 70-day grazing period may be possible without reducing stocking rate and/or ADG.

Sustainability and Adaptability

Is Tifton 85 bermudagrass adapted to my area? The northern and western boundaries are not known for sustainable Tifton 85 bermudagrass production. The plant breeder, Dr. Glenn Burton from USDA/ARS Tifton, GA, cautioned that Tifton 85 was likely not as cold tolerant as Coastal bermudagrass. At this time, boundary demarcations for Tifton 85 are not



method of delivery, labor involved, and cost of product. Biological-and cost-effective gains have been attained with several experiments at TAES-Overton using a “basic” mixture of 1:1 or 2:1 soybean meal:cracked corn ration with an ionophore and fed at 0.3% to 0.4% body weight per head per day. For example, if steers weighed 650 pounds, initial daily supplement would be about 2 to 2.5 lbs/hd/da. These supplements have been converted to extra gain from about 3:1 to 7:1. Thus, if steers converted at 6:1 on



clearly delineated. However, for the past 8 to 9 years at TAES-Pecos, Tifton 85 bermudagrass has been well-sustained under irrigated, hay production management where about 1-inch of water was applied per week during the growing season. A statewide map is provided that shows countywide distribution and survival of Tifton 85 through the fall of 2004 (Fig. 2). Bermudagrass sustainability can usually be enhanced by applying adequate potash, K_2O , to at least moderate soil levels, and to enter winter conditions with an elevated stubble height. Although there has been no specific research regarding stubble height of Tifton 85, heights of 6 to 10 inches would be more likely to tolerate cold, dry conditions compared to a 2-inch stubble.

What does it cost to establish Tifton 85 bermudagrass? Bermudagrass establishment costs vary with numerous factors and conditions. Estimated costs associated with establishing Tifton 85 include the following factors:

- ✓ **Site preparation.** A well-drained site should be prepared via disking, etc. as a clean-tilled area that would be suitable for planting a grain or fiber crop. A soil test is mandatory prior to establishing to allow for proper fertilizer and/or lime applications. If soil type is sandy or sandy loam, the site should be roller-packed prior to establishment to conserve moisture.
- ✓ **Weed control.** The first “weed” that can cause eventual failure is the presence of common bermudagrass or any other sod-forming grass. Prior to site preparation, all other bermudagrasses should be eradicated using herbicides such as Roundup or similar-action product. The next weed problems are usually those of crabgrass and other warm-season annual grasses, as well as broadleaf plants. A pre-emergence herbicide such as Direx 4L or Diuron 4L should be used before establishment.
- ✓ **Planting.** Tifton 85 may be planted using sprigs (roots) or top growth. Establishment should be delayed until Tifton 85 has broken dormancy and is actively growing. In general, the more bushels/ac of sprigs used the less

risk of stand failure and the faster the cover of soil surface. A recommended rate is 20 to 40 bushels/acre. If vegetative, top growth is used, the best planting material has stolons with at least four nodes. Rooting initiates from these nodes, or joints, that connects the internodes (stems). A variety of techniques may be employed to place the nodes via disking, etc. at about one to two inches deep. Sprigs or nodes placed deeper than 4 inches or so have less opportunity for survival.



Tifton 85 Field Days are Popular Events

- ✓ **Fertilizer.** Fertilize according to soil test recommendations. It's important for $N-P_2O_5-K_2O$ to be present in adequate quantities to initiate growth. Once bermudagrass initiates growth and begins to cover the soil (4 to 8 weeks), then an application of N may be appropriate to stimulate forage production for a potential hay harvest prior to fall.
- ✓ **Costs.** Costs will vary by vegetative region and management objective. Some of the following costs may be incorporated in the East Texas Region:
 - a. Site preparation and herbicide to eradicate common bermudagrass = \$ 75/ac
 - b. Fertilizer and pre-emergence herbicide = \$ 40/ac
 - c. Planting 40 bushels of sprigs/acre = \$ 160/ac
 - d. Top dressing with N = \$ 25/ac
 - e. Approximate costs of establishment for above mentioned inputs = \$ 300/ac

How do I justify spending \$300/ac to establish Tifton 85? Because of the enhanced digestibility of fiber and reduced lignin content, Tifton 85 bermudagrass has the nutritive value to enhance ADG over all other bermudagrasses available. At TAES-Overton, Tifton 85 has shown about a 0.5 lb/da advantage over Coastal bermudagrass. The gain advantage for Tifton

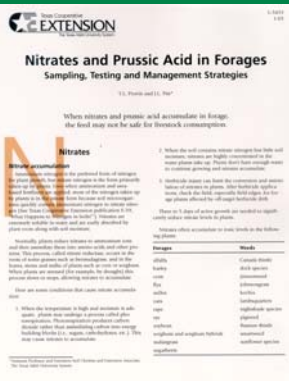
85 would be about 75 lbs/per animal (.5 lbs x 150 days). At 3 hd/ac, Tifton 85 would produce about 225 lbs/ac more than Coastal bermudagrass. The additional 225 lbs/ac with stockers valued at \$1.00/lb returns \$225/ac. Stockers would have to be sold for \$1.33/lb to return \$300/ac. However, at 4 hd/ac, Tifton 85 would produce about 300 lbs/ac more than Coastal bermudagrass. At this stocking rate, cattle sold for \$1.00/lb would essentially pay for the \$300/ac costs of establishment. But, this stocking rate and production could not be expected until the year following establishment wherein additional fertilizer costs would likely be incurred.

Is it worth the effort to establish bermudagrass and especially Tifton 85?

The worth or value of a pasture has been described from the “eye of the beholder” to “show me the money!” The “total costs of doing

business” on pastures, however, has to include all fixed and variable costs. In addition, estimates of climatic risks need to be factored into the projections to provide realistic cash flow opportunities to determine the worth of the pasture. With efficient forage utilization management, pasture costs per pound of gain are the major contributors to profit from a grazing venture. More often than not the major contributor to economic losses in grazing operations will focus primarily on purchase price and selling price. The intrinsic values and worth of pastures are linked with positive environmental impacts and stewardship of the natural resources. Thus, in many instances, pastures are worth more than they cost. With bermudagrasses, the POWER lies in its ability to stabilize potential erodible sites, its sustainability and resilience to severe defoliation regimens, and its potential to produce an abundance of forage dry matter to be utilized via hay and/or grazing,

Remarks



Due to the extremely dry growing conditions in Texas this year, producers should be aware of the potential for nitrate accumulation to the point of being toxic in plants belonging to the genus Sorghum (grain sorghum, forage sorghum, sorghum-sudan hybrids, johnsongrass) and other warm-season annual forages such as the millets. A quick and simple test kit is available to producers to test their forage prior to baling and additional

information is available from the publication “Nitrate and Prussic Acid in Forages, L-5433. This publication may be found at <http://forages.tamu.edu>, click on the button marked “Publications” and then click on “Nitrate and Prussic Acid”.