

BAHIAGRASS



PRODUCTION & MANAGEMENT



Louisiana State University

Agricultural Center

Louisiana Cooperative Extension Service



Bahiagrass (*Paspalum notatum* Flugge) is grown from east Texas to the Carolinas and as far north as northern Arkansas and central Tennessee. It is principally adapted to the region encompassing Louisiana, Mississippi, Alabama, southern Georgia and Florida. It is adapted to a wide range of coastal plain soils but performs best on sandy soils with a pH of 5.5 to 6.5. It grows better on drought-prone soils with relatively low fertility and on sandier soils than do most other pasture grasses. Bahiagrass is a deep-rooted warm-season perennial. It forms a deep, extensive root system which few other plants are able to encroach after a sod has been developed.

Bahiagrass is popular in the South because of several factors. Namely, it tolerates a wider range of soil conditions than bermudagrass or dallisgrass, it is established by seed rather than sprigs, it resists encroachment of weeds, it can persist and produce moderate yields on soils of low fertility and it withstands heavy grazing. Bahiagrass can be used as a permanent pasture or as a hay crop. Beef gains on bahiagrass pasture have been intermediate to gains on common and Coastal bermudagrass, and bahiagrass hay with appropriate supplementation is satisfactory for beef cattle wintering programs.

Variety Descriptions

Pensacola: The most extensively used bahiagrass variety was generated from a stand found near Pensacola, Florida, in 1935. Characterized by long, narrow leaves and long stems, Pensacola generally has adequate cold tolerance for survival throughout Louisiana, but top growth is killed by moderate frosts.

Argentine: Introduced from Argentina in 1944, this variety has wider leaves, is not as cold tolerant and does not make as much spring growth as the other varieties. It produces fewer seedheads than the other varieties. Ergot can be a problem on seeds of this variety.

Tifton 9: Released from Georgia in 1987, Tifton 9 is a selection from Pensacola bahiagrass. Compared to Pensacola, Tifton 9 has longer leaves, is much more vigorous in the seedling stage, is more palatable, is equally digestible and has a similar level of cold tolerance.

Other Varieties for Which Seed Supplies Are Limited or Non-Existent: Paraguay, Paraguay 22 and Wilmington.

Establishment

Plant bahiagrass between March 1 and June 1 at a seeding rate of 15 pounds of pure live seed per acre. The superior seedling vigor of the variety Tifton 9 allows successful stand establishment from substantially lower seeding rates when environmental conditions are favorable. Bahiagrass can be planted in the summer and fall, but these seedings are usually riskier than spring seedings. One problem with summer seedings is that the soil dries out quickly and germinating seedlings may die. Also in north Louisiana, the risk of winterkill is a serious threat to stands that are seeded late.

Bahiagrass should be planted on a well-prepared seedbed at a depth of about ½ inch. Use a cultipacker or roller after seeding because it firms the soil, conserves moisture and speeds germination. Successful stands can be obtained from broadcasting the seed in mixture with the planting fertilizer application, but seed viability can be reduced if the mixture is stored before spreading.

Apply fertilizer

according to soil test recommendations. Apply only 20 to 40 pounds of nitrogen per acre at planting. Applying higher rates will encourage excessive weed competition. After the planted grass emerges and begins to cover, apply 40 to 60 pounds of nitrogen per acre. Small seedlings of bahiagrass are weak competitors with weeds. For fast establishment of a productive bahiagrass stand, weeds must be controlled.

Mow frequently during the months following seeding. This prevents other grasses and weeds from forming a canopy over the young bahiagrass seedlings. The herbicide 2, 4-D can be used to control many broadleaf weeds in bahiagrass, but don't apply it to bahiagrass less than 4 or 5 inches tall because it will damage or kill small bahiagrass seedlings. There are no selective herbicides that will take grassy weeds out of a bahiagrass stand. Frequent mowing is the only solution to eliminating these weeds. Grazing should not be practiced for about three months after planting or until the stand is thick enough that the ground cannot be seen.



20-40 LBS. OF NITROGEN PER ACRE AT PLANTING



40-60LBS. OF NITROGEN PER ACRE WHEN GRASS EMERGES

Be patient when attempting to establish bahiagrass. It contains a moderate to large percentage of dormant seed that germinate over a period of months. Toward the end of the summer, some plants may be full grown and others only several inches tall. It is difficult to evaluate a stand of bahiagrass before the end of the summer of the establishment year. Even if a stand contains only one plant per square foot,

it should probably be kept because the bahiagrass may out-compete the weeds during the spring of the next year.

Variety Performance and Quality

Research results comparing varieties have been variable. In experiments at the Rosepine Research Station, Argentine produced more forage than Pensacola in one year, and Tifton 9 produced more forage than Argentine or Pensacola in another year (Table 1).

Research at the Southeast Research Station has shown few differences in yield among Pensacola, Tifton 9 or Argentine when compared at three harvest frequencies, but Tifton 9 and Pensacola were more productive at the first harvest than Argentine. This slow spring growth for Argentine has also been reported in Florida research.

Differences in forage quality among varieties also appear to be fairly small (Table 2). Since these three bahiagrass varieties have been shown to be similar in productivity and quality, producers should base variety selection on seed availability and cost.

Table 1. Dry forage yields of three bahiagrass varieties for two different planting years at the Rosepine Research Station

Variety	1990 planting	1991 planting
	----- tons/acre -----	
Argentine	5.7 a	5.3 b
Pensacola	5.1 b	5.3 b
Tifton 9	5.3 ab	6.0 a

Values within a column followed by a different letter are significantly different ($P < 0.05$).

Table 2. Bahiagrass forage quality as affected by variety at the Rosepine Research Station^a.

Variety	Crude protein	Digestibility
	----- % -----	
Argentine	12.1 ^b	66.1 ^b
Pensacola	12.0 ^b	64.6 ^c
Tifton 9	11.5 ^b	64.6 ^c

^aAverage of three harvest years and five harvests per year.

^{b,c}Means with different superscripts are significantly different ($P < 0.05$).

Fertility Management

Bahiagrass has a somewhat undeserved reputation for not responding to nitrogen fertilization and rarely receives high nitrogen fertilizer rates. Research at the Southeast Research Station has demonstrated that bahiagrass is very responsive to nitrogen fertilization (Table 3).

Bahiagrass stands produce a dense sod with large storage reserves of energy which can support re-growth following abusive grazing, severe drought or other disturbance. This dense sod allows bahiagrass to take up large amounts of nitrogen, even from a single fertilizer application, and store this nutrient for later use. Growth responses to a single application of 200 pounds of nitrogen per acre (600 pounds of ammonium nitrate per acre) were obtained through two years after application in a Florida grazing trial.

When growing conditions are favorable, bahiagrass typically produces a sudden burst of growth in response to nitrogen fertilization. This rapid growth actually can contribute to subsequent low-quality forage because rapid late spring and early summer forage is often only partially used when grazed at typical stocking rates. Patches are grazed and then regrazed as long as regrowth is rapid. When the growth rate decreases, the

Table 3. Dry matter yield, crude protein (CP) and yield of CP per acre of Pensacola bahiagrass at four nitrogen fertility levels.

Nitrogen -- lbs/acre --	Yield -- tons/acre --	CP -- % --	CP/acre -- lbs/acre --
0	1.8	10.5	370
200	5.3	12.6	1350
300	6.4	13.6	1740
400	7.0	14.4	2010



pasture is a mosaic of excessively grazed spots and tall, rank, unpalatable, poor quality areas. This aspect of bahiagrass use is the greatest challenge in effective use of nitrogen fertilizer on bahiagrass pastures.

While intensive rotational grazing may enhance management of bahiagrass pastures during periods of rapid growth, another approach is to apply nitrogen only at times and in amounts that will meet forage needs. Some accumulated late summer and autumn growth can be effectively used for winter forage when

appropriately supplemented. Accumulated spring and early summer growth is detrimental, however, to both subsequent production of regrowth and quality of available forage from mid-summer through autumn.

If bahiagrass is to be used as a pasture, apply all of the phosphate and potash recommended by soil analysis and 60 to 80 pounds of nitrogen in the spring soon after the grass begins to grow. An additional 60 to 80 pounds of nitrogen should be applied in early to mid June. In South Louisiana, another 30 to 40 pounds of nitrogen may be applied in late August or early September for late fall grazing if ryegrass is not going to be overseeded in the field.

If bahiagrass is to be used as a hay crop and cut three to four times per year, apply 300 to 400 pounds of nitrogen per acre per year. If only one or two cuttings are planned, then about 200 pounds of nitrogen per acre per year should be adequate. Use these rates in split applications with no more than 100 pounds of nitrogen applied at any one time.

Forage Quality

Bahiagrass has a reputation as a low quality forage. The quality of bahiagrass hay tends to be lower than the quality of bermudagrass or mixed warm-season grass hay (Table 4).

Table 4. Average forage quality of warm-season hay samples sent to the Southeast Research Station Forage Quality Laboratory in 1992.

Hay type	Crude protein	Total digestible nutrients ----- % -----	Acid detergent fiber
Bahiagrass	8.3	50.0	44.2
Bermudagrass	10.7	54.4	40.4
Mixed grass	9.3	50.7	43.1

When the quality of bahiagrass is adequate for making good quality hay, the grass seems too short to cut. Once it seems tall enough to cut for hay, forage quality is low, and there are many seedheads. Often during July, August and early September the quality is low even on relatively young growth. For optimum production of high quality bahiagrass hay, take the first cutting at the boot to early heading stage and then every 30 to 35 days if growth permits.

Grazing Management

Since bahiagrass has predominantly low-growing dense growth, it is an excellent grass for use in grazing. About 40 percent of bahiagrass forage is produced between 0 and 1 inch in height. Bahiagrass must be closely grazed or clipped to keep it tender and succulent with good quality. When bahiagrass has grown 8 to 10 inches tall, it is very tough, low quality and unpalatable. It produces very little new growth after it reaches this stage, and the quality drops the longer it stands. Research conducted in Georgia found that the digestibility of bahiagrass declined from 68% in mid May to 45% by late August.

Results from grazing trials have been variable. Florida research has demonstrated that cattle grazing bahiagrass do not gain more than about 1 pound per day over the entire grazing season. Animal performance is higher in the spring, but from July through September cattle gain very little or have even lost weight. In contrast, Georgia research has reported that cattle gained more than 1.5 pounds per day grazing Pensacola bahiagrass. When comparing performance of cattle grazing bahiagrass to that of bermudagrass, most studies have demonstrated higher animal gains on bermudagrass (Table 5).

Table 5. Average daily gain and beef production per acre for steers grazing three grass varieties during four years at Tifton, Ga.

Variety	Average daily gain ----- lbs -----	Beef production ---- lbs/acre ----
Pensacola bahiagrass	0.95	222
Coastal bermudagrass	1.08	331
Coastcross-1 bermudagrass	1.50	469

As a general rule, it is a good management practice to clip bahiagrass pastures periodically to remove seedheads and keep the plants in a vegetative and palatable growth stage. Stocking rates on bahiagrass pasture during the growing season should be in the range of about one cow per 1.5 to 2 acres.

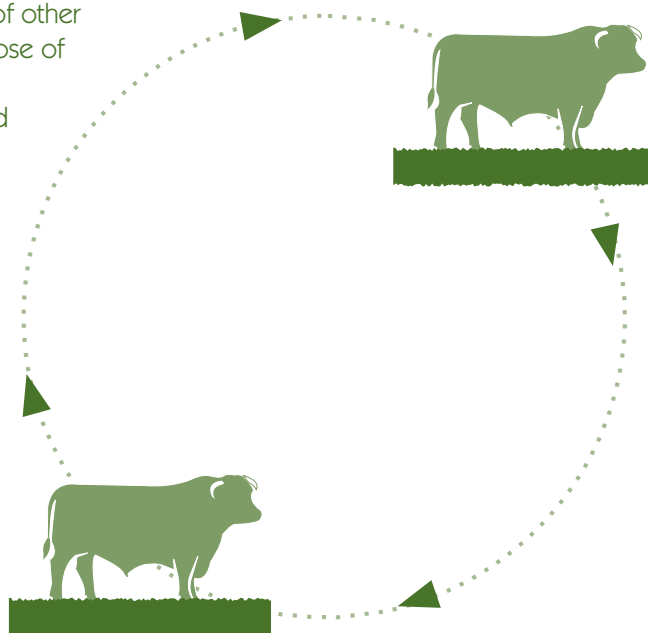
Overseeding

Since bahiagrass forms a dense, tough sod, it is sometimes difficult to obtain adequate stands of winter annual grasses such as ryegrass when they are overseeded into an established stand of bahiagrass in the fall. Before overseeding, clip or graze the bahiagrass as close to the ground as possible. Harrowing or light-disking the area after seeding is recommended to get the seed in contact with the soil and speed germination. Results with overseeding of legumes into bahiagrass sod have been variable. Crimson clover and white clover are probably the best choices to overseed into an established stand of bahiagrass.

Invasive Nature of Bahiagrass

In contrast to the typical slow establishment of new plantings of bahiagrass, this grass can be an aggressive invader of other species. Rotating cattle from bahiagrass pastures to those of other species such as bermudagrass can bring in bahiagrass seed the cattle have consumed. These seed can establish small patches of bahiagrass which spread aggressively and can dominate the pasture after a few years. Since most bahiagrass hay contains mature seed, feeding such hay on bermudagrass pastures often results in introduction of the spreading bahiagrass. This invasive nature limits the use of bahiagrass where a management objective is to maintain pure stands of other grass species, especially hybrid bermudagrasses.

If bahiagrass invades a common or hybrid bermudagrass field, it can be controlled by using the herbicide Ally at a rate of 0.3 ounces per acre plus a surfactant. Ally can be applied anytime the bahiagrass is actively growing and there are no grazing restrictions.



Summary

Bahiagrass is a competitive, well-adapted perennial summer grass that grows throughout Louisiana. It's also the easiest forage crop to maintain in Louisiana. Bahiagrass responds well to fertilizer, but has lower nutrient requirements than bermudagrass. Even with overgrazing and poor management, bahiagrass will maintain a stand. With good management, bahiagrass can produce ample amounts of forage through the summer. Bahiagrass offers a dependable, easily established, competitive and relatively low-cost option for summer pastures in Louisiana. Many livestock producers desire good stands of dependable forage with low to moderate fertilization. For those producers, it's hard to beat bahiagrass.



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This publication was prepared by the following personnel of the LSU Agricultural Center:

Edward K. Twidwell, Associate Specialist (Agronomy)

W. D. Pitman, Associate Professor, Rosepine Research Station

Greg J. Cuomo, Former Assistant Professor, Southeast Research Station

Louisiana State University Agricultural Center, William B. Richardson, Chancellor
Louisiana Cooperative Extension Service, Jack L. Bagent, Vice Chancellor and Director

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