

Utilization Workgroup
Seeded Bermudagrasses

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Bermudagrass is the most widely grown warm-season perennial grass in the southeastern US. Its popularity is due to adaptability to a wide range of soil types, drought tolerance, and persistence under intensive grazing (Burton and Hanna, 1995). The most productive varieties have been hybrids that produce little viable seed and must be established vegetatively by sprigs (portions of shoot, crown, roots, rhizomes, and stolons) or with some varieties, tops (6 to 8 week old topgrowth). Recommended planting rate is from 20 to 40 bu/acre. A bushel equals 1.25 cu ft and contains about 100 sprigs. Establishment costs including land preparation, sprigs or tops, planting, fertilizer, and weed control range from \$125 to \$200 per acre depending on variety. Tifton 85 has become the new standard because of its high productivity and nutritive value (Hill et al., 2001).

Seeded bermudagrasses

There has been a great deal of interest in establishing bermudagrasses from seed as opposed to sprigs. In addition to being less expensive and not as burdensome as sprigging, seeded bermudagrasses can be used on small acreages that are not economical to sprig and on steep slopes and cut-over timberland where good seedbed preparation necessary for sprigging is not feasible. Most seeded bermudagrasses on the market are blends that contain giant, usually common, and sometimes a third pure line or variety. Components of some of the blends on the market are reported in Table 1. Common bermudagrass is well adapted to all soils. Because it is a good seed producer, common bermudagrass seed is less expensive (about \$2/lb) than other seeded bermudagrasses. Giant is used in blends because it has rapid establishment and good first year growth. However, it will not persist for more than 2 or 3 years in the eastern half of Texas. As

giant bermudagrass goes out, the other bermudagrasses in the mixture fill in. Giant has persisted in drier climates in the western half of Texas under irrigation (Marsalis et al., 2003). Seed of giant bermudagrass is more expensive (\$6/lb) because it is a poor seed producer.

Establishing seeded bermudagrass

Recommended seeding rates for bermudagrass are from 5 to 10 lb/acre. Both hulled and unhulled seed of common and giant are available. Hulled bermudagrass has the outer seed brackets removed and germinates quicker than unhulled seed. A pound of hulled bermudagrass seed contains about 2 million seed and a pound of unhulled bermudagrass seed contains 1.5 million seed (Wheeler and Hill, 1961). Some of the bermudagrass seed is coated and some is not. A clay material that may contain some plant nutrients is coated on the seed increasing seed size and doubling the weight. Because the clay coating doubles the seed weight, a pound of coated seed contains only about half the seed that a pound of uncoated seed does. The price per pound of coated and uncoated seed is usually similar.

1997-2002 Study

A 5-year study at the TAMU Agricultural Research and Extension Center at Overton compared sprigged bermudagrasses (Tifton 85 and Coastal), some seeded bermudagrasses, and bahiagrasses. The first 2 years were very dry resulting in low yields (Table 2). Some of the seeded blends were as productive as Coastal but not as productive as Tifton 85 bermudagrass (Evers and Parsons, 2002). Similar forage production of Coastal and seeded varieties and blends as also been reported in Georgia (Hoveland, 1996) and Virginia (Teutsch and Tilson, 2003). Pensacola and Tifton 9 bahiagrass were the least productive. Under drought conditions in 1998, Tifton 85 had superior drought tolerance to Coastal and the seeded bermudagrasses.

In the third year common, giant, and Wrangler bermudagrass and kikuyugrass were added to the study. The first year (1999) production of giant was twice that of common, but by the third year (2001) the giant stand had thinned and common produced twice as much as giant. Because these last four entries were only grown for the last 3

years, their long term averages were not included in the statistical analysis of 5 year averages.

2002-2004 Study

Because of the strong producer interest in seeded bermudagrasses, a joint project between the Texas Agricultural Experiment Station at Overton and Seeds West, Inc. at Maricopa, Arizona was initiated in 2002 to evaluate 166 half-sib families of seeded bermudagrasses and compare them to Coastal and Tifton 85 bermudagrass. Tifton 85 was the most productive variety both years (Table 3). Coastal produced about 1 ton/acre less forage than Tifton 85, which is typical. Seeded entries of common, giant, and Cheyenne produced yields similar to Coastal as in the previous study. The range in production of the 166 half-sib families is also listed. Each year there were from 25 to 35 entries that were as productive as Tifton 85. There were 14 entries with forage production similar to Tifton 85 all 3 years.

Summary

Yields of most available seeded bermudagrass lines and blends are similar to Coastal bermudagrass but not Tifton 85. Observations in 1998 indicate Tifton 85 has superior drought tolerance to Coastal and seeded bermudagrasses. Percent crude protein, ADF, and NDF were similar for Tifton 85 and seeded bermudagrasses tested in 2002-2004. However the superior nutritive value of Tifton 85 can only be detected by IVDMD analysis. Tifton 85 has less ether ferulic acid (ether bonds in the lignin can not be broken by rumen bacteria) than Coastal (Hill et al., 2001). Result from these studies suggest the a seeded bermudagrass can be developed that is as productive as Tifton 85. However Tifton 85 has exceptionally high nutritive value and drought tolerance. The most productive half-sib families from the 2002-2004 study are in crossing blocks in southern Arizona this year. Seed of any potential new varieties will be available for testing until 2006.

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Table 1. Blends of seeded bermudagrasses.

Trade name	Components
Pasto Rico	common, giant
Texas Tough Plus	common, giant, Majestic
Pasture Supreme	common, giant
Tierra Verde	common, giant
Ranchero Frio	Cheyenne, Mohawk, giant
Sungrazer Plus	KF 194, CD90160, giant
Vaquero	CD 90160, Mirage

Table 2. Warm-season perennial grass yields from 1997 through 2001.

Entry	1997	1998	1999	2000	2001	Average
	-----lb dry matter/acre-----					
Tifton 85 bermuda ¹	5044 a ²	8064 a	12915 a	12032 a	15680 a	10747 a
CD 90160 bermuda	2737 b	3550 d	9696 bc	10347 b	13395 a-c	7945 b
Texas Tough bermuda	2480 bc	5262 b	11749 ab	7956 e-g	10993 c,d	7688 b
Ranchero Frio bermuda	1943 cd	2912 de	8984 c	9991 bc	12428 b-d	7251 b,c
Terra Verde bermuda	2085 cd	4885 bc	9054 c	8318 d-f	11748 b-d	7218 b,c
Coastal bermuda ¹	1611 d	3739 cd	8507 cd	9440 b-d	11549 b-d	6969 b,c
Cheyenne bermuda	2408 bc	3430 de	6640 d-f	8928 c-e	13431 a,b	6967 b,c
KF CD 194 bermuda	1914 cd	3664 cd	7407 c-e	7525 fg	10075 d,e	6117 c
Pensacola bahia	583 e	2167 e	4771 f	6809 gh	7682 e,f	4402 d
Tifton 9 bahia	767 e	2203 e	5470 ef	5967 h	7398 f	4361 d
Common bermuda ³			383	7445 fg	11352 b-d	6393
Giant bermuda ³			836	7356 fg	6643 f	4945
Wrangler bermuda ³			188	6744 gh	7550 f	4827
Kikuyugrass ³			0	7620 e-g	5539 f	4386

¹Bermudagrass varieties established from sprigs.

²Yields within a column followed by the same letter are not significantly different at the 0.05 level, Fisher's Protected LSD Test.

³Entries planted in 1999. All other entries planted in 1997.

Table 3. Three-year yields of several varieties and 164 seeded bermudagrass lines at Overton, Texas.

Variety	2002	2003	2004	Average
	Yield (lb dry matter/acre)			
Coastal	6383	11,618	14,966	10,989
Tifton 85	8878	13,810	13,716	12,135
Common†	7557	10,624	12,908	10,363
Giant†	5675	9,062	10,230	8,322
Cheyenne†	6370	10,438	13,183	9,997
Wrangler†	4966	10,123	9,713	8,267
Seed lines	3532-9691	5119-15,619	7962-16,121	6879-13,402

†Seeded.