MISSISSIPPI BERMUDA GRASS

VARIETY TRIALS, 2022-2024

Information Bulletin 598 • December 2025

MISSISSIPPI'S OFFICIAL VARIETY TRIALS

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MS AGRICULTURAL AND
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This publication is a contribution of the Mississippi Agricultural and Forestry Experiment Station. Trade names of commercial and public varieties tested in this report are included only for clarity and understanding. All available names (i.e., trade names, experiment code names or numbers, chemical names, etc.) and varieties, products, or seed sources in this research are listed on page 6.

Mississippi Bermuda Grass Variety Trials, 2022-2024

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This document was approved for publication as Information Bulletin 598 of the Mississippi Agricultural and Forestry Experiment Station. It was published by Agricultural and Natural Resources Marketing.

Find variety trial information online at **mafes.msstate.edu/variety-trials.**

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INTRODUCTION

Varieties of forage crops are evaluated every year in the Mississippi Agricultural and Forestry Experiment Station (MAFES) small-plot trials. Seed is provided by seed companies and state universities and tested at one or more locations across Mississippi. All entries from privately owned companies are tested on a fee basis. Standard varieties may be added by MAFES as a reference for comparison purposes. In addition, varieties of interest may also be added when applicable. This report contains data collected from 2022-2023 for seeded Bermuda grass (*Cynodon dactylon*) varieties. Data presented in Tables 1-3 can be used to evaluate the annual biomass production of each forage variety within that test. Biomass production was statistically evaluated by using the least significant difference (LSD) at $\alpha = 0.05$. The LSD represents the amount of yield that must be observed between any two varieties to determine if the differences observed were due to variety variation alone. Figure 1 illustrates establishment ratings while Table 4 quantifies forage nutritive value in 2024 from each harvest.

SEEDED BERMUDAGRASS VARIETY TEST 2022-2024

Bermuda grass is very drought-tolerant and can be planted throughout the state. Seeded Bermuda grass cultivars should be planted between April and June at a seeding rate of 10 Lb PLS/A. Nitrogen and potassium fertilization are essential for high yields, especially for hay production. To maintain a balance between yields and forage quality in a hay production system, it is recommended to harvest hay in 30 to 35 cutting-day intervals. Bermuda grass production can be negatively affected by leaf spot disease (*Bipolaris cynodontis*) and leaf rust (*Puccina cynodontis*). In addition to these leaf diseases, a relatively new pest known as the Bermuda grass stem maggot (*Anterigona reversura*) can weaken Bermuda grass enough to encourage greater leaf disease. These effects can be further amplified when fertility management is lacking, especially at low soil potassium.

Figure 1. Establishment differences between a 5 (left) and a 1 (right) rating.

PROTOCOL

The experimental design was a randomized complete block with 4 replications. Plots were 6 ft x 10 ft in size with 2-ft alleys between plots and 3-ft alleys between blocks. The study was planted on May 5, 2022 in Starkville, MS, using an ALMACO plot drill. The initial fertilizer application was 335 lb/A of 15-5-10 two weeks after planting. Nitrogen was applied in July at a rate of 50 lb N/A using urea at each location after the initial clean-off harvest, and no data was collected due to the majority weed composition. Plots were harvested in the fall of the establishment year when 50% of the plots reached a forage height of 12-15 inches and made up much of the composition. Plots were harvested with a Winterstieger harvester to a 3-inch stubble height by removing a 52-inch swath. Yields were recorded, and sub-samples were collected for dry matter analysis. Data was analyzed using the General Linear Model (PROC GLM) of SAS, and mean separations were conducted using the LSD at $\alpha = 0.05$. Tables 1-3 present 2022-2023 dry matter yields of seeded Bermuda grass varieties in Starkville, MS. During the establishment year, only one harvest was collected in July, while in years 2023 and 2024, plots were harvested in May, July, and August or September. A subsample was collected and dried at 130°F until a constant weight was achieved to calculate dry matter (DM) concentration. Subsamples were ground to pass through a 1-mm screen using a Wiley mill (Thomas Scientific, Swedesboro, NJ). Forage nutritive value was estimated during 2024 using a Foss DS2500 NIR (FOSS, North America, Eden Prairie, MN) and applying the grass hay equation developed by the NIRS Forage and Feed Testing Consortium (Berea, KY). Establishment ratings for Bermuda grass were visual assessments using a rating of 1 through 5 for groundcover, with 1 representing poor establishment and 5 representing excellent establishment and groundcover.

RESULTS

Establishment ratings in 2022 differed among bermudagrass cultivars and experimental entries. 'Giant' and 'Grit' Bermuda grass exhibited the poorest stand by 2023, which were no longer considered in the biomass collection. Biomass yields were the greatest in 'Giant' and 'Sungrazer Plus' in 2022, with the least yields in 2023 exhibited by 'Common' and exp 2009-1-18B'. By 2024, biomass yields were similar except for 'Grit', which yielded the least. The 2024 forage nutritive value was not different among cultivars but was mostly influenced by harvest date. Generally, crude protein decreased after the 1st harvest while neutral detergent fiber (NDF) and lignin concentrations increased. Concentrations of acid detergent fiber (ADF) were the greatest in the second harvest and the lowest in the 1st and 3rd harvests. Water-soluble contents (WSC) and total digestible nutrients (TDN) were consistent throughout the first two harvests but decreased significantly in the fall harvest.

Table 1. Seeded Bermuda grass dry matter yields and stand ratings from 2022 at Starkville, MS.

Variety/Brand Name	†Rating 9/26/2022	Harvest Date 7/1/2022 lb DM/ac
Giant	4.5	1140
Common	4.3	530
Texas Tough +	4.3	840
RSF001	4.5	960
Sungrazer plus	3.8	1025
Cheyenne II	4.3	850
Tierra Verde	3.5	605
exp 2009-1-18B	1.6	620
Grit	3.3	720
MEAN	**3.8**	**810**
CV%	**29.0**	**35**
LSD$^{0.05}$	**1.7**	**325**

†Rating = 1-5: 1 poor ground cover/ 5 excellent ground cover
Soil Type: Savannah fine sandy loam
Planted: 5/02/2022
Herbicide: Quinclorac (75%) at 1 lb/A
Fertilizer: 335 lb/ac of 15-5-10 after planting; 50 lb N/A using (33-0-0S) in July after clean off harvest

Table 2. Seeded Bermuda grass dry matter yields and stand ratings from 2023 at Starkville, MS.					
		Harvest Date			
Variety/Brand Name	**†Rating**	**5/25/23**	**7/1/23**	**8/16/23**	**Total Yield**
	11/14/23		**lb DM/ac**		
Giant	1.0	.	.	.	.
Common	4.8	620	1156	1206	2982
Texas Tough +	3.6	900	1602	1482	3984
RSF001	3.8	1026	1405	1204	3635
Sungrazer plus	3.5	942	1325	1632	3899
Cheyenne II	4.0	790	1204	1255	3249
Tierra Verde	4.8	800	1203	1623	3626
exp 2009-1-18B	5.0	460	620	530	1610
Grit	3.3	720	1403	1607	3730
MEAN	**3.7**	**782**	**1240**	**1317**	**3339**
CV%	**25.0**	**32**	**37**	**31**	**32**
LSD$^{0.05}$	**1.5**	**NS**	**621**	**521**	**1006**

†Rating = 1-5: 1 poor ground cover/ 5 excellent ground cover
Soil Type: Savannah fine sandy loam
Planted: 5/02/22
Herbicide: Quinclorac (75%) at 1 lb/A
Fertilizer: 335 lb/ac of 15-5-10 after planting; 50 lb N/ac using (33-0-0S) in July after clean off harvest

Table 3. Seeded Bermuda grass dry matter yields from 2024 at Starkville, MS.				
	Harvest Date			
Variety/Brand Name	**5/23/24**	**7/9/24**	**9/30/24**	**Total Yield**
		lb DM/ac		
Common	1443	2805	2107	6355
Texas Tough +	1313	3020	1634	5967
RSF001	1236	3210	2033	6480
Sungrazer plus	1243	3504	1312	6059
Cheyenne II	1408	2696	1965	6070
Tierra Verde	1807	3024	2244	7074
exp 2009-1-18B	2438	2359	2650	7446
Grit	1356	1764	1776	4896
MEAN	**1531**	**2798**	**1965**	**6293**
CV%	**31**	**30**	**29**	**20**
LSD$^{0.05}$	**716**	**NS**	**NS**	**1937**

Soil Type: Savannah fine sandy loam
Planted: 5/02/22
Herbicide: Quinclorac (75%) at 1 lb/A
Fertilizer: 335 lb/ac of 15-5-10 after planting; 50 lb N/ac using (33-0-0S) in July after clean off harvest

Table 4. Seeded Bermuda grass forage nutritive value from harvest in 2024 at Starkville, MS.						
Variety/Brand Name	ADF	Lignin	CP	NDF	WSC	TDN
			5/23/24			
			% of DM			
Common	25.2	3.4	24.4	53.0	7.1	73.6
Texas Tough +	25.0	3.1	24.5	53.6	7.5	73.8
RSF001	22.6	3.1	26.5	50.5	7.0	76.5
Sungrazer plus	24.7	2.9	24.8	52.9	7.5	74.2
Cheyenne II	24.1	3.2	22.5	51.6	8.7	73.1
Tierra Verde	23.4	3.0	25.9	53.0	6.9	75.6
exp 2009-1-18B	26.4	3.2	23.5	56.8	6.8	72.4
Grit	23.4	2.8	26.1	52.4	7.1	75.8
MEAN	**24.2**	**3.1**	**25.0**	**52.8**	**7.3**	**74.4**
CV %	**2.5**	**7.1**	**4.9**	**3.9**	**6.5**	**0.8**
LSD$^{0.05}$	**1.5**	**NS**	**NS**	**NS**	**NS**	**NS**
			7/9/24			
Common	31.2	4.3	14.1	60.0	7.1	73.6
Texas Tough +	31.2	4.3	16.0	59.8	7.5	73.8
RSF001	31.3	4.5	11.8	61.9	7.0	76.5
Sungrazer plus	32.4	4.8	12.9	61.3	7.5	74.2
Cheyenne II	32.3	4.5	14.4	59.2	8.7	73.1
Tierra Verde	30.3	4.4	14.5	61.8	6.9	75.6
exp 2009-1-18B	31.1	4.6	12.1	62.0	6.8	72.4
Grit	31.7	4.3	15.2	62.0	7.1	75.8
MEAN	**31.4**	**4.4**	**13.8**	**61.0**	**7.3**	**74.4**
CV %	**2.4**	**30.0**	**4.2**	**3.6**	**4.4**	**1.7**
LSD$^{0.05}$	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
			9/30/24			
Common	29.7	5.8	18.0	63.0	6.4	67.0
Texas Tough +	29.9	5.5	18.1	63.4	6.3	66.9
RSF001	31.1	6.0	15.4	66.1	6.4	64.6
Sungrazer plus	30.4	5.5	17.0	64.6	6.1	66.0
Cheyenne II	32.2	6.0	13.8	68.2	5.6	62.9
Tierra Verde	32.5	6.4	16.7	65.3	5.7	64.5
exp 2009-1-18B	30.8	5.8	15.3	66.0	5.7	64.7
Grit	29.7	6.1	18.6	64.6	5.8	67.4
MEAN	**30.7**	**5.8**	**16.7**	**65.0**	**6.0**	**65.5**
CV %	**8.0**	**7.2**	**12.0**	**4.8**	**8.7**	**4.2**
LSD$^{0.05}$	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**

CONCLUSIONS

Generally, seeded Bermuda grass has the potential to produce from 6,000 to 7,000 lbs DM/ac depending on fertilizer management. The establishment year tends to reveal the greatest differences among varieties, mainly through establishment. While little differences were observed among varieties concerning forage nutritive value, timing was significant. Spring harvests generally had the greatest nutritive value, with each harvest declining with successive harvests. However, with proper fertilizer management, crude protein never averaged less than 14% and was greater in the fall relative to the summer harvest.

Table 5. Varieties and seed sources for the 2022-2023 warm-season forage variety trial.

Bermuda grass Varieties/Brand Names	Seed Company
Giant	MSU Check
Common	MSU Check
Texas Tough +	East Texas Seeds
RSF001	Rubin seeds
Sungrazer plus	Rubin Seeds
Cheyenne II	Pennington
Tierra Verde	Pennington
Exp 2009-1-18B	Barenburg
Grit	Barenburg

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