

MISSISSIPPI NATIVE GRASS

VARIETY TRIALS, 2016

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MISSISSIPPI'S OFFICIAL VARIETY TRIALS



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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 source seed in this research are listed on page 8.

Mississippi Native Grass Variety Trials, 2016

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

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INTRODUCTION

In recent years, a renewed interest in the use of native crops for forage has prompted selections of ecotypes and development of cultivars that may be better adapted to current forage production systems. This information bulletin discusses the results of trials with the most common native grasses that show adaptation to soil and climatic conditions in Mississippi, such as big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*), and indiagrass (*Sorghastrum nutans*). Typically, these cultivars are merely ecotypes chosen from specific areas and adapted for use at different locations. There now exists a need to reevaluate the performance of many of these improved varieties for use in Mississippi.

Big bluestem is a perennial bunchgrass, native to the Great Plains and eastern U.S. It is extremely deep rooted, encouraging superior drought tolerance when compared with other warm-season perennials. Big bluestem is one of the most palatable native crops, maintaining excellent forage quality throughout the summer. It does not tolerate close grazing, and improper grazing pressure could lead to stand thinning. Grazing to a residual stubble height of 6 inches using rotational stocking is recommended.

Indiagrass is a perennial bunchgrass native to the eastern Great Plains and eastern U.S. This grass can spread not only by seed, but also by rhizomes. It can be used for both pasture and hay and, like big bluestem, maintains good forage quality throughout the summer. It can tolerate semiclose grazing in a rotational system,

but in continuous systems a stubble of 10–16 inches is recommended.

Switchgrass is one of the most widespread natives of North America. It is a perennial bunchgrass that can become tall and stemmy much sooner than indiagrass or big bluestem. Due to rapid maturity, intense rotational stocking is recommended to maintain stands and good forage quality. Switchgrass is more tolerant of acid and poorly drained soils than the other native species. This grass has two ecotypes: upland (northern U.S.) and lowland (southern U.S.). Lowland switchgrass yields can reach 6–10 dry tons per acre.

Little bluestem is a perennial bunchgrass that on occasion propagates through rhizomes. Though it is found across the continental U.S. with the exception of the far Pacific Coast, it is most prominent in the dryer Midwest. It is more drought tolerant than switchgrass, big bluestem, and indiagrass and can tolerate more intensive grazing than the other native grasses. However, forage quality and palatability quickly decreases with maturity.

In the results presented, comparisons can be statistically evaluated by using the LSD (least significant difference). The LSD represents the amount of yield that must be observed between any two entries to determine if the differences observed were due to cultivar variation alone. The coefficient of variation (CV) represents the variation within the trial to measure the quality of the data presented. Typically, a lower CV represents a trial with low variation between replications.

PROTOCOL

Trials were planted with an ALMACO plot drill in 6-foot by 10-foot plots arranged in a randomized complete block design with four replications. Seeding rates were adjusted to account for pure live seed (Table 2). Trials were separated by species due to different optimum harvest times. Plots were not amended with any fertilizer, lime, or irrigation at any time to represent a minimum-input system that often characterizes native-grass systems. Seedbed was cultivated 5 months before planting and allowed to settle, receiving glyphosate treatments as needed to eliminate weeds and create a stale seedbed. Plots from individual species were harvested to a 6-inch stubble height after they reached between 24 and 30 inches of growth. Harvesting was performed using a “Zero Turn” mower equipped with a bagging system and taking a 52-inch swath from the middle of the plot. To determine dry matter percentage, subsamples were taken from each plot and then weighed and dried in a forced-air oven at 131°F until weight remained constant. Statistical analysis was performed using PROC GLM in SAS, and means were considered

Genus/Species	Seeding rate (PLS)
	<i>lb/A</i>
Big bluestem	12
Indiangrass	10
Little bluestem	5
Switchgrass	8
¹ PLS = Pure Live Seed	

different at $P < 0.05$. Subsamples were further used to evaluate forage nutritive value using NIR and the grass hay equation of the NIRS Forage and Feed Testing Consortium (Madison, Wisconsin). Plateau (imazapic) was used at a rate of 6 ounces per acre as both a preemergence and postemergence application during the establishment year in the indiagrass, big bluestem, and little bluestem. Switchgrass trials received a postemergence application of Pastora (nicosulfuron and metsulfuron methyl) at 1.5 ounces per acre.

RESULTS

All locations were initially planted in May 2013 and allowed 1 year of establishment before data collection was initiated. During the establishment year, occasional mowing and clearing of the plots was performed to minimize weed competition. In general, big bluestem across every location showed superior stand establishment and was considered fully established for most varieties by the end of the first year. All species were fully

established in Poplarville by the end of 2013, but indiagrass and switchgrass had to be replanted in May 2014 in Starkville and Newton due to incomplete stands in the plot. Little bluestem ranked as the most difficult to establish with only complete stands available for harvest in Poplarville after two plantings. In Starkville, only data from big bluestem is presented due to incomplete stand establishment with the other species.

Table 2. Forage dry matter yields at Poplarville, 2016.

Species/Variety	Ecotype	Harvest date		Total
		5/16/16	7/17/16	
		<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>
Big bluestem				
Earl	—	4121	2732	6853
Kaw	—	4866	3783	8649
OZ-70	—	5139	3617	8755
Roundtree	—	4572	2815	7387
Suther	—	4573	3271	7844
Indiangrass				
Cheyenne	—	2674	2464	5137
Cycle 7 IG	—	3342	3108	6450
Little bluestem				
Aldous	—	—	2224	2224
Cimmarron	—	—	1333	1333
Switchgrass				
Alamo	Lowland	5176	2864	8039
Blackwell	Upland	2893	1351	4243
Cave n Rock	Upland	3465	2506	5970
Cycle 7 UPSG	Upland	3526	2532	6057
Espresso	Lowland	5764	2546	8310
Kanlow	Lowland	3011	2728	5740
Mean		4086	2658	6199
CV, %		13	26	17
LSD (0.05)		812	1014	1521
Planted: May 29, 2013	Soil type: Basin Loam			

Table 3. Total annual forage dry matter yields from 2014–16 at Poplarville.

Species/Variety	Ecotype	Harvest date			3-yr. avg.
		2014	2015	2016	
		<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>
Big bluestem					
Earl	—	5829	5879	6853	6186
Kaw	—	9311	7359	8649	8440
OZ-70	—	10379	7967	8755	9034
Roundtree	—	9418	7455	7387	8087
Suther	—	9031	8367	7844	8414
Indiangrass					
Cheyenne	—	5155	2234	5137	4175
Cycle 7 IG	—	6658	2449	6450	5186
Little bluestem					
Aldous	—	4408	2502	2224	3045
Cimmarron	—	4432	2211	1333	2659
Switchgrass					
Alamo	Lowland	6880	5809	8039	6909
Blackwell	Upland	4964	3730	4243	4313
Cave n Rock	Upland	4946	5271	5970	5396
Cycle 7 UPSG	Upland	6555	4705	6057	5772
Espresso	Lowland	5992	6747	8310	7017
Kanlow	Lowland	5649	5286	5740	5558
Mean		6640	5198	6199	6013
CV, %		14	21	17	11
LSD (0.05)		1368	1585	1521	984
Planted: May 29, 2013		Soil type: Basin Loam			

Table 4. Forage dry matter yields at Newton, 2016.

Species/Variety	Harvest date		Total
	6/18/16	8/25/16	
	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>
Big Bluestem			
Earl	2970	2549	5519
Kaw	3910	3748	7658
OZ-70	3593	3332	6925
Roundtree	2857	3296	6153
Suther	3476	3533	7008
Indiangrass			
Cheyenne	4262	3301	7563
Cycle 7 IG	3493	3190	6682
Little Bluestem			
Aldous	2423	3752	6174
Cimmarron	2249	3239	5489
Mean	3180	3403	6583
CV, %	22	20	15
LSD (0.05)	NS ¹	NS	1503
¹ NS = Not Significant Planted: May 24, 2013 Replanted: June 5, 2014 Soil type: Prentiss Fine Sandy Loam			

Table 5. Total annual forage dry matter yields from 2014–16 at Newton.

Species/Variety	Harvest date			3-yr. avg.
	2014	2015	2016	
	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>
Big Bluestem				
Earl	2568	3443	5519	3844
Kaw	3356	4721	7658	5245
OZ-70	4269	5192	6925	5462
Roundtree	2256	3489	6153	3966
Suther	3072	4068	7008	4716
Indiangrass				
Cheyenne	—	4722	7563	—
Cycle 7 IG	—	4382	6682	—
Little Bluestem				
Aldous	—	3582	6174	—
Cimmarron	—	4756	5489	—
Mean	3072	4302	6583	4716
CV, %	36	25	15	14
LSD (0.05)	NS ¹	NS	1503	1039
¹ NS = Not Significant Planted: May 24, 2013 Replanted: June 5, 2014 Soil type: Prentiss Fine Sandy Loam				

Table 6. Forage dry matter yields at Starkville, 2016.

Species/Variety	Ecotype	Harvest date		Total
		6/13/16	9/1/16	
		<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>
Big Bluestem				
Cycle 7 BBS	—	2728	3044	5772
Earl	—	2350	2437	4787
Kaw	—	2069	2595	4664
OZ-70	—	2360	2687	5047
Roundtree	—	2710	2913	5624
Suther	—	2305	3055	5360
Switchgrass				
Alamo	Lowland	3025	—	3025
Blackwell	Upland	1787	—	1787
Cave n Rock	Upland	2058	—	2058
Cycle 7 UPSG	Upland	2769	—	2769
Espresso	Lowland	2092	—	2092
Kanlow	Lowland	1609	—	1609
Mean		2322	2789	3716
CV, %		30	15	20
LSD (0.05)		NS ¹	NS	NS
¹ NS = Not Significant Planted: May 30, 2013				
Soil type: Marietta Fine Sandy Loam				

Table 7. Total annual forage dry matter yields from 2014–16 at Starkville.

Species/Variety	Ecotype	Harvest date			3-yr. avg.
		2014	2015	2016	
		<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>
Big Bluestem					
Cycle 7 BBS	—	3775	6727	5772	5425
Earl	—	3242	6686	4787	4905
Kaw	—	3336	5814	4664	4605
OZ-70	—	3578	6544	5047	5056
Roundtree	—	3464	6359	5624	5149
Suther	—	3083	6698	5360	5047
Switchgrass					
Alamo	Lowland	2407	7135	3025	4189
Blackwell	Upland	719	3741	1787	2082
Cave n Rock	Upland	1578	3745	2058	2460
Cycle 7 UPSG	Upland	1349	4573	2769	2897
Espresso	Lowland	2234	5108	2092	3145
Kanlow	Lowland	1049	4756	1609	2471
Mean		2484	5657	3716	3953
CV, %		32	21	20	20
LSD (0.05)		NS ¹	1774	NS	NS
¹ NS = Not Significant Planted: May 30, 2013					
Soil type: Marietta Fine Sandy Loam					

Table 8. Three-year average forage DM yield for species at Poplarville, Newton, and Starkville.

Species	Poplarville	Newton	Starkville
	<i>lb/A</i>	<i>lb/A</i>	<i>lb/A</i>
Big bluestem	7405	4182	6471
Indiangrass	2341	4551	—
Little bluestem	2356	4169	—
Switchgrass	5257	—	4842
Mean	4339	4300	5656
LSD (0.05)	1827	NS ¹	827
CV, %	24	27	25
¹NS = Not Significant			

Table 9. Seed suppliers for native grass variety trial.

Species/Variety	Company/Source
Big bluestem	
Earl	Bamert Seed Company
Kaw	Bamert Seed Company
OZ-70	Bamert Seed Company
Roundtree	Bamert Seed Company
Cycle 7 BBS	Mississippi State University
Suther	Public
Indiangrass	
Cheyenne	Bamert Seed Company
Cycle 7 IG	Mississippi State University
Little bluestem	
Aldous	Bamert Seed Company
Cimmarron	Bamert Seed Company
Switchgrass	
Alamo	Bamert Seed Company
Blackwell	Bamert Seed Company
Cave n Rock	Public
Cycle 7 UPSG	Mississippi State University
Espresso	Mississippi State University
Kanlow	Public



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