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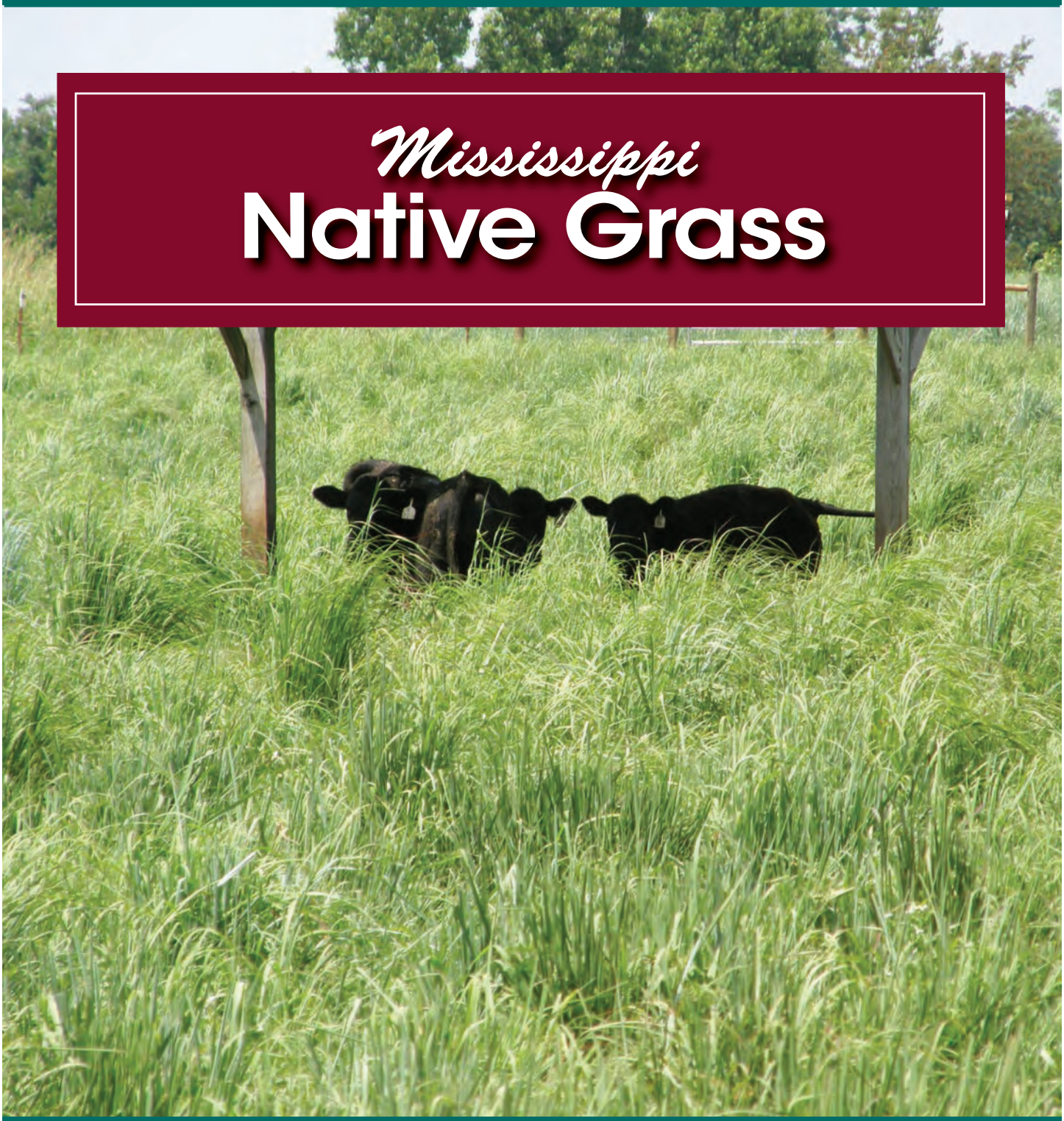

Mississippi Native Grass

VARIETY TRIALS, 2014

Mississippi's Official Variety Trials

MAFES

Mississippi Agricultural & Forestry Experiment Station • George M. Hopper, Director

Mississippi State University • Mark E. Keenum, President • Gregory A Bohach, Vice President

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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, 2014

MAFES Official Variety Trial Contributors

Joshua White
Variety Testing Manager
Department of Plant and Soil Sciences
Mississippi State University
Starkville, Mississippi

Rocky Lemus
Associate Extension/Research Professor,
Extension Forage Specialist
Department of Plant and Soil Sciences
Mississippi State University
Starkville, Mississippi

James R. Saunders
Facilities Coordinator
North Mississippi Branch Experiment Station
Mississippi State University
Holly Springs, Mississippi

Daniel Rivera
Assistant Extension Professor
South Mississippi Branch Experiment Station
Mississippi State University
Poplarville, Mississippi

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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 adaption to soil and climatic conditions in Mississippi, such as big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*), and indiangrass (*Sorghastrum nutans*). Typically, these cultivars are merely ecotypes chosen from specific areas and adapted for use at different locations. There is 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 the 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.

Indiangrass is a perennial bunchgrass, native to the eastern Great Plains and the East. 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, it 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 indiangrass 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.

Table 1. Monthly rainfall totals for Poplarville, Starkville, Holly Springs, and Newton, 2014.

Location	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	in	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*
Poplarville	1.32	6.61	4.61	3.11	8.48	9.57	5.00	3.59	1.12	0.96	3.67	6.19
Starkville	1.92	6.71	4.44	10.11	3.98	7.51	2.19	3.29	0.34	2.44	4.20	5.27
Holly Springs	1.69	0.51	2.52	1.68	0.00	3.28	0.67	0.9	0.01	1.53	0.46	0.00
Newton	2.47	6.88	5.74	14.03	2.6	2.55	1.92	2.42	1.69	2.29	3.18	8.68
MS 30-yr. avg.	5.30	4.70	5.80	5.60	5.10	3.30	4.50	3.80	3.60	3.30	4.80	5.90

Little bluestem is a perennial bunchgrass that on occasion uses rhizomes to propagate. 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 indiangrass and can tolerate more intensive grazing than the other native grasses. However, forage quality and palatability quickly decrease 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 PLS and are listed in 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. Seedbed was cultivated 5 months prior to 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, weighed and dried in a forced-air oven at 120°F until weight remained constant. Statistical analysis was performed using PROC GLM in SAS and means were considered different at $P < 0.05$.

Table 2. Seeding rates.[1]

Genus/Species	Seeding rate (PLS)
	lb/A
Big bluestem	12
Indiangrass	10
Little bluestem	5
Switchgrass	8

[1]PLS = Pure Live Seed

Subsamples were further used to evaluate forage nutritive value using NIR and the 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 preemergence and postemergence applications during the establishment year in the indiangrass, 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 indiangrass and switchgrass had to be replanted in May 2014 in Starkville, Newton, and Holly Springs due to incomplete stands in the plot. Little bluestem ranked as the most difficult to establish, with complete stands available for harvest only in Poplarville after two plantings. In Starkville, only data from big bluestem is presented due incomplete stand establishment with the other species.

Table 3. Forage dry matter yields at Poplarville, 2014.[1]

Variety	Harvest date			Total yield
	5/3/14	7/3/14	10/17/14	
	lb/A	*lb/A*	*lb/A*	*lb/A*
Big bluestem				
Earl	1385	3145	1298	5828
Kaw	2425	4661	2225	9311
OZ-70	2511	5308	2560	10379
Roundtree	2488	5165	1765	9417
Suther	1760	4950	2320	9031
Indiangrass				
Cheyenne	705	3403	1046	5155
Cycle 7 IG	1449	3546	1663	6658
Little bluestem				
Aldous	—	4408	—	4408
Cimmarron	—	4432	—	4432
Switchgrass				
Alamo	2298	2502	2080	6880
Blackwell	597	2276	2091	4964
Cave n Rock	664	2268	2014	4946
Cycle 7 UPSG	1662	2477	2416	6555
Expresso	1133	2138	2721	5992
Kanlow	1042	2036	2570	5649
Mean	1548	3514	2059	6640
$LSD_{0.05}$	923	813	862	1338
CV%	41	16	29	14

Planted: May 29, 2013 Soil type: Basin Loam

Table 4. Forage nutritive value at Poplarville, 2014.[1]

Species/Variety	Harvest date								
	5/3/14			7/3/14			10/17/14		
	NDF	ADF	CP	NDF	ADF	CP	NDF	ADF	CP
	%	%	%	%	%	%	%	%	%
Big Bluestem									
Earl	61	36	12	68	40	7	70	42	9
Kaw	61	37	13	70	42	8	68	41	8
OZ-70	62	36	13	69	41	8	68	40	8
Roundtree	63	38	12	72	43	7	70	42	8
Suther	59	35	15	69	42	8	66	40	9
Indiangrass									
Cheyenne	63	38	11	67	42	9	66	42	9
Cycle 7 IG	65	39	10	67	42	9	68	43	10
Little Bluestem									
Aldous	—	—	—	64	40	8	—	—	—
Cimmarron	—	—	—	66	42	8	—	—	—
Switchgrass									
Alamo	57	32	14	65	37	10	61	38	13
Blackwell	57	33	13	63	38	10	69	42	10
Cave n Rock	55	32	15	63	37	10	69	42	10
Cycle 7 UPSG	57	33	13	65	38	9	69	42	9
Expresso	58	33	14	65	38	10	68	40	10
Kanlow	59	33	14	64	38	10	70	44	10
Mean	60	35	13	66	40	8	68	41	9
$LSD_{0.05}$	4	3	2	3	2	2	NS	NS	2
CV%	3	3	7	2	3	10	4	4	11

[1]NS = Not Significant
NDF= Neutral Detergent Fiber, ADF= Acid Detergent Fiber, CP= Crude Protein

Table 5. Forage dry matter yields at Newton, 2014.[1]

Variety	Harvest date		Total yield
	6/25/14	9/25/14	
	lb/A	*lb/A*	*lb/A*
Big Bluestem			
Earl	657	1911	2568
Kaw	1157	2199	3356
OZ-70	1152	3117	4269
Roundtree	659	1597	2256
Suther	918	2153	3071
Mean	909	2196	3104
$LSD_{0.05}$	NS	NS	NS
CV%	50	32	33

[1]NS = Not Significant
Planted: May 24, 2013 Replanted: June 5, 2014 Soil type: Prentiss Fine Sandy Loam

Table 6. Forage nutritive value at Newton, 2014.[1]

Species/Variety	Harvest date					
	6/25/14			9/25/14		
	NDF	ADF	CP	NDF	ADF	CP
	%	%	%	%	%	%
Big Bluestem						
Earl	58	39	14	65	39	10
Kaw	65	40	12	59	42	12
OZ-70	67	40	11	68	41	9
Roundtree	55	38	16	59	41	12
Suther	57	38	15	62	39	13
Mean	60	39	13	62	40	11
$LSD_{0.05}$	7	NS	NS	NS	NS	NS
CV%	4	5	9	9	5	16

[1]NS = Not Significant

Table 7. Forage dry matter yields at Starkville, 2014.[1]

Variety	Harvest date		Total yield
	6/18/14	8/13/14	
	lb/A	*lb/A*	*lb/A*
Big Bluestem			
Cycle 7 BG	1681	2094	3775
Earl	1219	2023	3242
Kaw	1377	1959	3336
OZ-70	1658	1919	3578
Roundtree	1208	2256	3464
Suther	1401	1681	3083
Mean	1490	1989	2408
$LSD_{0.05}$	NS	NS	NS
CV%	37	23	22

[1]NS = Not Significant
Planted: May 30, 2013 Soil type: Marietta Fine Sandy Loam

Table 8. Forage nutritive value at Starkville, 2014.[1]

Species/Variety	Harvest date					
	6/18/14			8/13/14		
	NDF	ADF	CP	NDF	ADF	CP
	%	%	%	%	%	%
Big Bluestem						
Cycle 7 BG	64	40	7	66	39	8
Earl	62	38	7	67	40	8
Kaw	61	38	8	68	41	7
OZ-70	65	41	7	67	40	7
Roundtree	58	37	9	67	40	8
Suther	60	39	8	65	39	9
Mean	62	39	7	66	40	8
$LSD_{0.05}$	6	NS	NS	NS	NS	NS
CV%	5	7	32	2	2	9

[1]NS = Not Significant
NDF= Neutral Detergent Fiber, ADF= Acid Detergent Fiber, CP= Crude Protein

Table 9. Forage dry matter yields at Holly Springs, 2014.[1]

Variety	Harvest date		Total yield
	6/25/14	9/05/14	
	lb/A	*lb/A*	*lb/A*
Big Bluestem			
Cycle 7 BG	2970	1115	4085
Earl	770	617	1386
Kaw	1809	711	2520
OZ-70	1142	672	1814
Roundtree	1797	692	2488
Suther	1034	739	1773
Indiangrass			
Cheyenne	1173	900	2073
Cycle 7 IG	1940	1417	3358
Mean	1579	858	2437
$LSD_{0.05}$	874	272	1019
CV%	37	21	28

[1]Planted: May 31, 2013 Soil type: Grenada Silt Loam

Table 10. Forage nutritive value at Holly Springs, 2014.[1]

Species/Variety	Harvest date					
	6/25/14			9/5/14		
	NDF	ADF	CP	NDF	ADF	CP
	%	%	%	%	%	%
Big Bluestem						
Cycle 7 BG	68	42	8	64	39	11
Earl	66	40	9	64	38	11
Kaw	69	42	9	62	37	13
OZ-70	70	43	8	66	40	11
Roundtree	68	42	9	64	38	12
Suther	64	40	10	60	37	13
Indiangrass						
Cheyenne	67	41	9	—	—	—
Cycle 7 IG	66	41	8	—	—	—
Mean	67	41	8	63	38	12
$LSD_{0.05}$	7	NS	NS	NS	NS	NS
CV%	4	5	9	10	5	16

[1]NS = Not Significant
NDF= Neutral Detergent Fiber, ADF= Acid Detergent Fiber, CP= Crude Protein

Table 11. 2014 forage dry matter yield for species at Poplarville and Holly Springs.[1]

Species	Poplarville	Holly Springs
	lb/A	*lb/A*
Big bluestem	8793	2344
Indiangrass	5906	2715
Little bluestem	4419	—
Switchgrass	5830	—
Mean	6237	2529
$LSD_{0.05}$	1966	NS
CV%	20	44

[1]NS = Not Significant

Table 13. Seed suppliers for native grass variety trial.

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

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