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Mississippi *Warm-Season* FORAGE CROP

VARIETY TRIALS, 2013

MAFES

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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 Warm-Season Forage Crop Variety Trials, 2013

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Mississippi Warm-Season Forage Crop Variety Trials, 2013

Introduction

Varieties of forage crops are evaluated every year in MAFES small-plot trials. Seed for the entries are 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 in 2013 from warm-season perennial and annual forage crops. Seeded bermudagrass yields include 3 years of data from 18 varieties. Annual warm-season grass entries include 14 varieties of sorghum and sorghum/sudangrass hybrids in the sorghum trial and 11 millet varieties in the millet trial. Seeded bermudagrass trials were only evaluated in Starkville. The annual grass trials were evaluated in Starkville, Holly Springs, and Poplarville. Seeding rates for each trial are listed in Table 1 and were adjusted for pure live seed (PLS) according to each entry germination and purity percentage. Rainfall during the growing season of 2013 is indicated in Table 2. Data presented in Tables 3–10 can be used to evaluate the performance of each forage variety within that test. Comparisons can be statistically evaluated by using the least significant difference (LSD). 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.

Table 1. Seeding rates.

Species	Seeding rate
	lb/A PLS[1]
Bermudagrass	10
Pearl millet	35
Sorghum	20
Sorghum/Sudan	35

[1]Rates listed are the recommended seeding rates used to calculate pure live seed (PLS) for each entry.

Table 2. Total monthly rainfall in Starkville, Holly Springs, and Poplarville from April 2013 to October 2013.

Month	Starkville	Holly Springs	Poplarville	Mean	30-yr. avg.
	in	*in*	*in*	*in*	*in*
April	7.19	7.69	8.28	7.72	4.87
May	7.23	6.95	4.89	6.36	3.99
June	2.76	4.89	4.13	3.93	5.45
July	4.00	2.84	8.25	5.03	3.34
August	2.27	1.39	6.05	3.24	3.64
September	4.90	5.20	2.96	4.35	3.28
October	3.20	1.96	1.27	2.14	4.95

Seeded Bermudagrass Variety Test 2012–13

Background

Bermudagrass is very drought-tolerant and can be planted throughout the state. Seeded bermudagrass should be planted between March and May at a seeding rate of 5 to 10 pounds per acre. Nitrogen and potassium fertilization are essential for high yields, especially for hay production. Ammonium nitrate (34-0-0) has been the fertilizer of choice for bermudagrass during summer months, but its availability has become limited due to regulations imposed by the Department of Homeland Security. Urea ammonium sulfate is the N fertilizer available to Mississippi's livestock producers for hay and pasture. The new 33-0-0 is a blend of urea and ammonium sulfate that should be just as effective as ammonium nitrate in most situations. These yield results can differ from location to location in the state. There are a great number of seeded blends available for planting. Most producers have the notion that these blends usually "revert back to common bermudagrass." This belief is not surprising given the composition of the blends. In this situation, it is not a case of the variety suddenly, or even gradually, turning into common bermudagrass; rather, it is the common bermudagrass already present in the blend gradually replacing the other varieties due to its greater persistence. To maintain a balance between yield and forage quality in a hay production system, it is recommended to cut hay in 30- to 35-day intervals. Biomass production was impacted in 2013 due to lower temperatures and pest pressure caused by leaf spot (*Bipolaris cynodontis*) and bermudagrass stem maggot (*Atherigona reversura*).

Protocol

The experimental design was a randomized complete block with four replications. Plots were 6 × 11 feet in size with 5-foot alleys between plots and 10-foot alleys between blocks. The study was initially planted on June 4, but because of poor germination, it was replanted on July 13, 2011. Initial fertilizer application was 335 pounds of 15-5-10 at planting date. Nitrogen was applied after each harvest at a rate of 50 pounds of N per acre using urea-ammonium sulfate (33-0-0S). Harvests were conducted when more than 50% of the plots reached a forage height of 12–15 inches or every 4–5 weeks, depending on environmental conditions. Plots were harvested with a "Zero Turn" mower to a 3-inch stubble height and 52-inch swath. Yields were recorded, and subsamples were collected for dry matter analysis. Data were analyzed using the General Linear Model (PROC GLM) of SAS, and mean separation was conducted using the LSD at $\alpha = 0.05$. Table 3 presents 2011–13 dry matter yields of seeded bermudagrass varieties, while Table 4 presents yields by harvest in 2013.

Table 3. 2011–13 seeded bermudagrass total annual dry matter yields in Starkville.

Variety	2011	2012	2013	3-yr. avg.
	lb/A	*lb/A*	*lb/A*	*lb/A*
Amarillo King	3586	9873	6561	6673
Buckaroo	3979	10881	6428	7096
Cheyene II	3612	9334	5941	6296
Common	3725	10619	7333	7226
Cowboy	3426	10054	7301	6927
Highlander	2379	10880	6159	6473
KF-1M	3204	9819	5960	6328
KF-2M	3990	11716	6754	7487
Laredo	3410	9975	6654	6680
Mohawk	3163	9739	6321	6408
Numex Sahara	3201	10293	6772	6755
PST-R6P0	1267	11457	6347	6357
PST-R6SB	2201	10300	6559	6353
PST-R6WL	1862	10311	5841	6005
Rancher	2830	9740	6085	6218
Ranchero Frio	3051	10374	7013	6813
Sungrazer +	3516	11281	6599	7132
Texas Tough+	4646	11488	7618	7917
Mean	3169	10452	6569	6730
CV %	29	7	9	12.8
$LSD_{0.05}$	1315	1109	800	694

Planted: June 4, 2011 (Replanted July 13, 2011)
Fertilizer: 335 lb/A of 15-5-10 at planting; 50 lb/A of N using (33-0-0S) after each harvest
Herbicide: 2 oz/A of Pastora (nicosulfuron/metsulfuron methyl)

Table 4. 2013 seeded bermudagrass dry matter yields in Starkville.

Variety	Harvest date				Total
	5/21/13	6/12/13	7/10/13	8/30/13	
	lb/A	*lb/A*	*lb/A*	*lb/A*	*lb/A*
Amarillo King	1608	2092	1511	1351	6561
Buckaroo	1928	1954	1352	1194	6428
Cheyene II	1492	1878	1583	988	5941
Common	2196	2226	1654	1257	7333
Cowboy	1880	2117	1609	1693	7301
Highlander	1721	1942	1225	1271	6159
KF-1M	1612	1913	1314	1122	5960
KF-2M	2209	1911	1533	1101	6754
Laredo	1633	2101	1659	1261	6654
Mohawk	1659	2031	1508	1123	6321
Numex Sahara	1955	2147	1467	1202	6772
PST-R6P0	1798	1978	1502	1069	6347
PST-R6SB	1426	2119	1492	1521	6559
PST-R6WL	1540	1910	1312	1080	5841
Rancher	1610	1952	1248	1274	6085
Ranchero Frio	1988	2109	1461	1456	7013
Sungrazer +	1918	2112	1463	1106	6599
Texas Tough+	2594	2029	1687	1309	7618
Mean	1820	2029	1477	1243	6569
CV %	25	11	10	21	9
$LSD_{0.05}$	NS	NS	221	NS	800

NS = Not Significant
Planted: June 4, 2011 (Replanted July 13, 2011)
Fertilizer: 335 lb/A of 15-5-10 at planting; 50 lb/A of N using (33-0-0S) after each harvest
Herbicide: 2 oz/A of Pastora (nicosulfuron/metsulfuron methyl)

Sorghum and Sudangrass Variety Test 2013

Background

The sorghum variety test includes varieties from sorghum and sorghum/sudangrass hybrids. Sorghum is usually used only for forage in the form of silage due to the high moisture content. It is not tolerant of acidic soils and is adapted well to sandy loam and clay loam soils with a pH ranging between 6 and 7. When harvested for silage, sorghum seed should be in the dough stage and can possibly be harvested twice in Mississippi if planted by May and weather conditions are favorable. Prussic acid and nitrate accumulations can occur under environmental stress (drought or frost). Sorghum/sudangrass hybrids and sudangrass can be used for pasture, hay, or silage production. They are very responsive to nitrogen and can be rotationally grazed with a high stocking rate to utilize rapid growth. Hay quality is best when harvested at 30 to 40 inches.

Protocol

The experimental design was a randomized complete block with four replications. Plots were 6 × 10 feet in size with 3-foot alleys between plots and blocks. Tests were planted in Starkville, Holly Springs, and Poplarville. Initial fertilizer application was 335 pounds of 15-5-10 at planting. Harvests were conducted when more than 50% of the plots reached soft dough stage. The entire plot was harvested using a Winterstieger Cibius S (Austria). Yields were recorded and subsamples collected for dry matter determination. Tables 5–7 present 2013 dry matter yields collected from Holly Springs, Starkville, and Poplarville. Data was analyzed using the General Linear Model (PROC GLM) of SAS and mean separation using the LSD at $\alpha = 0.05$.

Table 5. 2013 sorghum and sudangrass yields in Holly Springs.

Variety	Harvest date		Total yield
	7/17/13	8/23/13	
	lb/A	*lb/A*	*lb/A*
CHR-FS3	2413	1924	4337
CHR-FS4	1336	1704	3041
CHR-FS9	1615	1568	3183
CHR-SGI	1889	1915	3804
CHR-SS2	1695	2075	3770
Cowvittles II Forage Sorghum	2918	1469	4388
Forage King SS Hybrid	2026	1666	3692
Greengrazer V	2136	2027	4163
Hay King BMR	1632	2300	3931
Monarch V	1601	2079	3680
Pacesettter BMR	1578	2298	3876
Piper	1755	2104	3859
Promax BMR	1298	1593	2891
Sweeter 'N Honey II BMR	1499	1578	3076
Mean	1814	1879	3692
CV%	36	25	23
$LSD_{0.05}$	NS	NS	NS

NS= Not Significant
Planted: May 31, 2013
Fertilizer: 335 lb/A of 15-5-10 at planting
Herbicide: 1 pt/A of 2,4-D amine (dimethylamine salt of 2, 4-dichlorophenoxyacetic acid)

Table 6. 2013 sorghum and sudangrass yields in Starkville.

Variety	Harvest date		Total yield
	7/15/13	8/20/13	
	lb/A	*lb/A*	*lb/A*
CHR-FS3	3213	1933	5521
CHR-FS4	2963	1282	4443
CHR-FS9	1969	1457	2570
CHR-SGI	3480	1771	5178
CHR-SS2	3769	1933	5895
Cowvittles II Forage Sorghum	2678	1714	4647
Forage King SS Hybrid	2603	2266	5379
Greengrazer V	4320	2152	4511
Hay King BMR	3666	2255	6007
Monarch V	3582	1496	5339
Pacesettter BMR	2215	1308	3534
Piper	5164	2011	7017
Promax BMR	1381	2117	2732
Sweeter 'N Honey II BMR	2137	1987	4500
Mean	3081	1834	4805
CV%	22	28	27
$LSD_{0.05}$	1544	NS	NS

NS = Not Significant
Planted: May 30, 2013
Fertilizer: 335 lb/A of 15-5-10 at planting
Herbicide: 1 pt/A of 2,4-D amine (dimethylamine salt of 2, 4-dichlorophenoxyacetic acid)

Table 7. 2013 sorghum and sudangrass yields in Poplarville.

Variety	Harvest date 7/16/13
	lb/A
CHR-FS3	3688
CHR-FS4	3358
CHR-FS9	3377
CHR-SGI	4639
CHR-SS2	5321
Cowvittles II Forage Sorghum	3242
Forage King SS Hybrid	3424
Greengrazer V	5490
Hay King BMR	3575
Monarch V	1766
Pacesettter BMR	1827
Piper	4188
Promax BMR	3215
Sweeter 'N Honey II BMR	2932
Mean	3574
CV%	18
$LSD_{0.05}$	898

Planted: May 29, 2013
Fertilizer: 335 lb/A of 15-5-10 at planting
Herbicide: 1 pt/A of 2,4-D amine (dimethylamine salt of 2, 4-dichlorophenoxyacetic acid)

Forage Millet Variety Test 2013

Background

Millets are used extensively as grain crops, but they are becoming increasingly popular as forage crops. Generally, millets perform best in soils with a pH between of 5.5 and 7.5. Pearl millet can have up to 17% crude protein in multiple-cut systems. Japanese millet, also known as barnyard millet, can become weedy if seeds are allowed to form. Pearl millet and Japanese millet are not usually cut for hay because of their thick stems. Foxtail and proso millets have limited regrowth after the initial harvest, but they can produce 2 to 3 tons of dry matter per acre in one cut. Foxtail millet hay should not be fed to horses due to a laxative effect. Nitrogen should be applied in 50-pound-per-acre increments after planting and harvest. Millets are very productive in pasture and silage systems, but they usually do not yield more than sorghum and sudangrass varieties in normal Mississippi conditions. However, unlike sorghum and sudangrass, millets do not accumulate prussic acid.

Protocol

The experimental design was a randomized complete block with four replications. Plots were 6 × 10 feet in size with 3-foot alleys between plots and blocks. Tests were planted in Starkville, Holly Springs, and Poplarville. Initial fertilizer application was 335 pounds of 15-5-10 at planting. Harvests were conducted when more than 50% of the plots reached boot stage or 36 inches in height. The entire plot was harvested using a Winterstieger Cibius S (Austria). Yields were recorded and subsamples collected for dry matter determination. Tables 8–10 present 2013 dry matter yields collected from Holly Springs, Starkville, and Poplarville. Data was analyzed using the General Linear Model (PROC GLM) of SAS and mean separation using the LSD at $\alpha = 0.05$.

Table 8. 2013 forage millet yields in Holly Springs.

Variety	Harvest date		Total yield
	7/17/13	8/23/13	
	lb/A	*lb/A*	*lb/A*
Brown Top	3844	—	3844
Cal/West	2766	2335	5101
Cropland 4611	2618	2603	5221
Dove Proso	1122	—	1122
German Foxtail	1543	—	1543
Hybrid Pearl	2220	2519	4739
Japanese	2919	—	2919
Leafy 23	2354	2339	4693
Leafy 24	3810	2182	5992
Tif leaf 3	1824	2329	4153
White Proso	805	—	805
Mean	2348	2385	3648
CV%	31	26	26
$LSD_{0.05}$	1051	NS	1376

NS = Not Significant
Planted: May 31, 2013
Fertilizer: 335 lb/A of 15-5-10 at planting
Herbicide: 1 pt/A of 2,4-D amine (dimethylamine salt of 2, 4-dichlorophenoxyacetic acid)

Table 9. 2013 forage millet yields in Starkville.

Variety	Harvest date		Total yield
	7/12/13	8/20/13	
	lb/A	*lb/A*	*lb/A*
Brown Top	1601	—	1601
Cal/West	1388	4239	5628
Cropland 4611	1265	4174	5439
Dove Proso	952	—	952
German Foxtail	1468	—	1468
Hybrid Pearl	1141	4682	5823
Japanese	1183	—	1183
Leafy 23	1543	4853	6396
Leafy 24	1389	4667	6056
Tif leaf 3	1244	4369	5613
White Proso	634	—	634
Mean	1255	4643	4284
CV%	21	12	13
$LSD_{0.05}$	373	NS	690

NS = Not Significant
Planted: May 30, 2013
Fertilizer: 335 lb/A of 15-5-10 at planting
Herbicide: 1 pt/A of 2,4-D amine (dimethylamine salt of 2, 4-dichlorophenoxyacetic acid)

Table 10. 2013 forage millet yields in Poplarville.

Variety	Harvest date 7/16/13
	lb/A
Brown Top	1326
Cal/West	1911
Cropland 4611	4055
Dove Proso	1351
German Foxtail	2367
Hybrid Pearl	4426
Japanese	1902
Leafy 23	5670
Leafy 24	8518
Tif leaf 3	4905
Mean	3643
CV%	41
$LSD_{0.05}$	3457

Planted: May 29, 2013
Fertilizer: 335 lb/A of 15-5-10 at planting
Herbicide: 1 pt/A of 2,4-D amine (dimethylamine salt of 2, 4-dichlorophenoxyacetic acid)

Table 11. 2012 bermudagrass, sorghum/sudangrass, and millet seed sources.

Species	Variety	Company
Bermudagrass	Amarillo King	Barenburg USA
	Buckaroo	Amigos Genetics LLC
	Cheyenne II	Pennington Seed
	Common	NA[1]
	Cowboy	Amigos Genetics LLC
	Highlander	K-F Seeds
	KF-1M	K-F Seeds
	KF-2M	K-F Seeds
	Laredo	Allied Seeds, LLC
	Mohawk	Pennington Seeds
	Numex Sahara	Pennington Seeds
	PST-R6PO	Pure-Seed Testing Inc.
	PST-R6SB	Pure-Seed Testing Inc.
	PST-R6WL	Pure-Seed Testing Inc.
	Rancher	DLF International Seeds
	Ranchero Frio	Pennington Seed
	Sungrazer+	MBS Seed LTD
	Texas Tough+	East Texas Seed Company
Sorghum, Sorghum/Sudan	CHR-FS4	Chromatin Inc.
	CHR-FS3	Chromatin Inc.
	CHR-FS9	Chromatin Inc.
	CHR-SGI	Chromatin Inc.
	CHR-SS2	Chromatin Inc.
	Cowvittles II Forage Sorghum	Farm Science Genetics
	Forage King SS Hybrid	Producers Choice Seed
	Greengrazer V	Farm Science Genetics
	Hay King BMR	King's Agriseeds
	Monarch V	Cal-West Seeds
	Pacesetter BMR	Richardson Seeds
	Piper	NA
	Promax BMR	Ampac Seed Company
	Sweeter 'N Honey II BMR	King Seed
Millet	Brown Top	NA
	Cal/West	Cal-West
	Cropland 4611	NA
	Dove Proso	NA
	German Foxtail	NA
	Hybrid Pearl	NA
	Japanese	NA
	Leafy 23	NA
	Leafy 24	NA
	Tif leaf 3	NA
	White Proso	NA

[1]NA: Source provided by MSU forage seed inventory.

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