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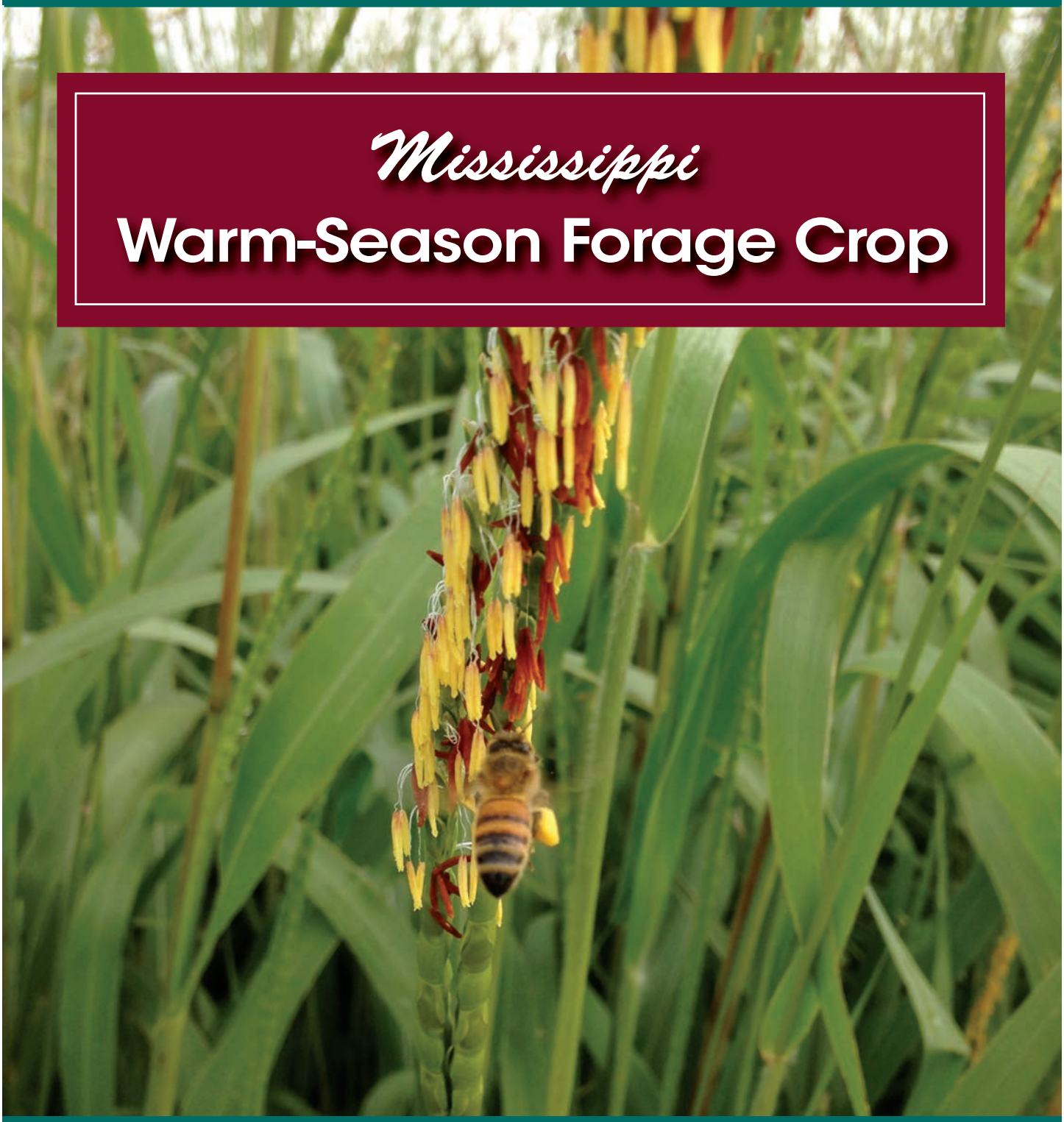
Mississippi Warm-Season Forage Crop



VARIETY TRIALS, 2014

Mississippi's Official Variety Trials

MAFES

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

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This report contains data generated as part of the Mississippi Agricultural and Forestry Experiment Station. Joint sponsorship by the organizations listed on page 5 is gratefully acknowledged.

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 5.

Mississippi Warm-Season Forage Crop Variety Trials, 2014

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

Mississippi Warm-Season Forage Crop Variety Trials, 2014

INTRODUCTION

Varieties of forage crops are evaluated every year in the 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 in 2014 from warm-season perennial and annual forage crops. Seeded bahiagrass (*Paspalum notatum*) yields include six varieties. Annual warm-season grass entries include nine varieties of sorghum and sorghum/sudangrass hybrids in the sorghum trial and 10 millet varieties in the millet trial. Seeded bahiagrass trials were evaluated only in Starkville and Poplarville, but due to poor stand establishment the Starkville location was replanted in 2014 and given a year to establish. The annual grass trials were evaluated in Starkville only. Seeding rates for each trial are listed in Table 2 and were adjusted for pure live seed (PLS) according to each entry's germination and purity percentage. Rainfall amounts during the 2014 growing season are presented in Table 1. Data presented in Tables 3–5 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]
Bahiagrass	20
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 1. Monthly rainfall totals for Poplarville and Starkville, 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
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

BAHIAGRASS

Background

Bahiagrass (*Paspalum notatum*) is very drought tolerant and can be planted throughout the state. Seeded bahiagrass should be planted between March and May at a seeding rate of 20 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 bahiagrass during summer months, but its availability has become limited due to regulations 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. To maintain a balance between yields and forage quality in a hay production system, it is recommended to cut hay in 30- to 35-day intervals.

Protocol

The experimental design was a randomized complete block with four replications. Plots were 6 feet ×10 feet in size with 5-foot alleys between plots and 10-foot alleys between blocks. The study was planted on May 29, 2013 and given a year to establish in Poplarville. The initial fertilizer application was 335 pounds of 15-5-10 at planting. Nitrogen was applied after each harvest at a rate of 50 pounds of N per acre using urea-ammonium sulfate (33-0-0S). Plots were harvested 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 the center 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. Seeded bahiagrass dry matter yields at Poplarville, 2014.[1]

Variety	Harvest date				Total
	5/6/14	7/3/14	8/14/14	10/17/14	
	lb/A	*lb/A*	*lb/A*	*lb/A*	*lb/A*
Argentine	3039	5130	6044	5110	19324
Pensacola	2111	4185	5288	4276	15860
TifQuik	2704	5701	5110	4574	18089
Tifton 9	2184	3939	5082	4428	15633
UA Sand Mt.	2413	4812	5066	4673	16963
UF-Riata	2017	4851	6459	4106	17432
Mean	2411	4769	5508	4528	17217
$LSD_{0.05}$	NS	757	NS	NS	2021
CV%	20	10	14	13	7

[1]NS = Not Significant
Planted: May 29, 2013
Fertilizer: 335 lb/A of 15-5-10 at planting; 50 lb/A of N using (33-0-0S) after each harvest

SORGHUM AND SUDANGRASS

Background

The sorghum variety test includes varieties from sorghum and sorghum/sudangrass hybrids. Forage sorghum is usually only used 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 feet ×10 feet in size with 3-foot alleys between plots and blocks. Tests were planted only in Starkville. Initial fertilizer application was 335 pounds per acre of 15-5-10 at planting. Plots were harvested when more than 50% of the plots had reached soft dough stage. The entire plot was harvested using a Winterstieger Cibus S (Austria). Yields were recorded and subsamples collected for dry matter determination. Table 4 presents 2014 dry matter yields collected from Starkville. Data was analyzed using the General Linear Model (PROC GLM) of SAS and mean separation using the LSD at $\alpha = 0.05$.

Table 4. Sorghum and Sudangrass yields in Starkville, 2014.[1]

Variety	Harvest date		Total yield
	7/30/14	9/10/14	
	lb/A	*lb/A*	*lb/A*
Cowvittles II Forage Sorghum	4018	1028	5047
Forage King SS Hybrid	3869	1847	5716
Greengrazer V	5350	1584	6934
Hay King BMR	4661	2778	7439
Monarch V	3978	1674	5652
Pacesettter BMR	4848	939	5788
Piper	4064	2797	6861
Promax BMR	4343	2585	6928
Sweeter 'N Honey II BMR	4488	1589	6077
Mean	4402	1869	6271
$LSD_{0.05}$	NS	710	NS
CV%	19	26	17

[1]NS = Not Significant
Planted: June 4, 2014 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

Background

Millets are used extensively as grain crops but 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 seed is allowed to form. Both, pearl millet and Japanese millet are not usually cut for hay because of the thick stems. Foxtail and proso millets have limited regrowth after the initial harvest, but 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 at 50 pounds of N per acre increments after planting and harvest. Millets are very productive in pasture and silage systems, but does not usually yield greater 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 feet × 10 feet in size with 3-foot alleys between plots and blocks. Tests were planted only in Starkville. Initial fertilizer application was 335 pounds per acre of 15-5-10 at planting. Plots were harvested when more than 50% of the plots reached 36 inches in height or boot stage. Plots were harvested with a Zero Turn mower to a 3-inch stubble height and the center 52-inch swath. Yields were recorded and subsamples collected for dry matter determination. Table 5 presents 2014 dry matter yields collected from Starkville. Data was analyzed using the General Linear Model (PROC GLM) of SAS and mean separation using the LSD at $\alpha = 0.05$.

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

Variety	Harvest date		Total yield
	7/16/14	8/20/14	
	lb/A	*lb/A*	*lb/A*
Brown Top	2290	1221	3511
Cropland BMR 4611	1439	—	1439
Dove Proso	2257	—	2257
German Foxtail	2387	—	2387
Hybrid Pearl	1200	—	1200
Japanese	1936	1284	3220
Leafy 23	1656	1103	2759
Leafy 24	1964	1364	3328
Tif leaf 3	2216	1338	3554
White Proso	1851	966	2817
Mean	1920	1213	2647
$LSD_{0.05}$	419	NS	520
CV%	15	22	13

[1]NS = Not Significant
Planted: June 4, 2014 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. Bahiagrass, sorghum/sudangrass, and millet seed sources, 2014.[1]

Species	Variety	Company
Bahiagrass	Argentine	NA
	Pensacola	NA
	Tifton 9	NA
	TifQuik	NA
	UF-Riata	NA
	UA Sand Mountain	NA
Sorghum, Sorghum/Sudan	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
	Cropland BMR 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

mafes.msstate.edu/variety-trials