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Mississippi *Warm-Season* FORAGE CROP

VARIETY TRIALS, 2011

MAFES

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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 6 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 6.

Mississippi Warm-Season Forage Crop Variety Trials, 2011

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Mississippi Warm-Season Forage Crop Variety Trials, 2011

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 2011 from warm-season perennial and annual forage crops. Seeded bermudagrass data consisted of the establishment year of 18 different varieties. Annual warm-season grass entries included four crabgrass and four teffgrass varieties.

Monthly spring precipitation was less than normal with the exception of April, which averaged nearly 40% more rainfall (Figure 1). An overall dry May followed with no rainfall until June 13. This lack of rain led to poor germination of all warm-season varieties. Consequently, bermudagrass, crabgrass, and teffgrass plots were replanted later in June and early July. Temperatures throughout 2011 remained consistent with the 30-year average (Figure 2).

Data presented in Tables 1–3 can be used to evaluate the performance of each forage variety within that test. 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 varieties to determine if the differences observed were due to variety variation alone.

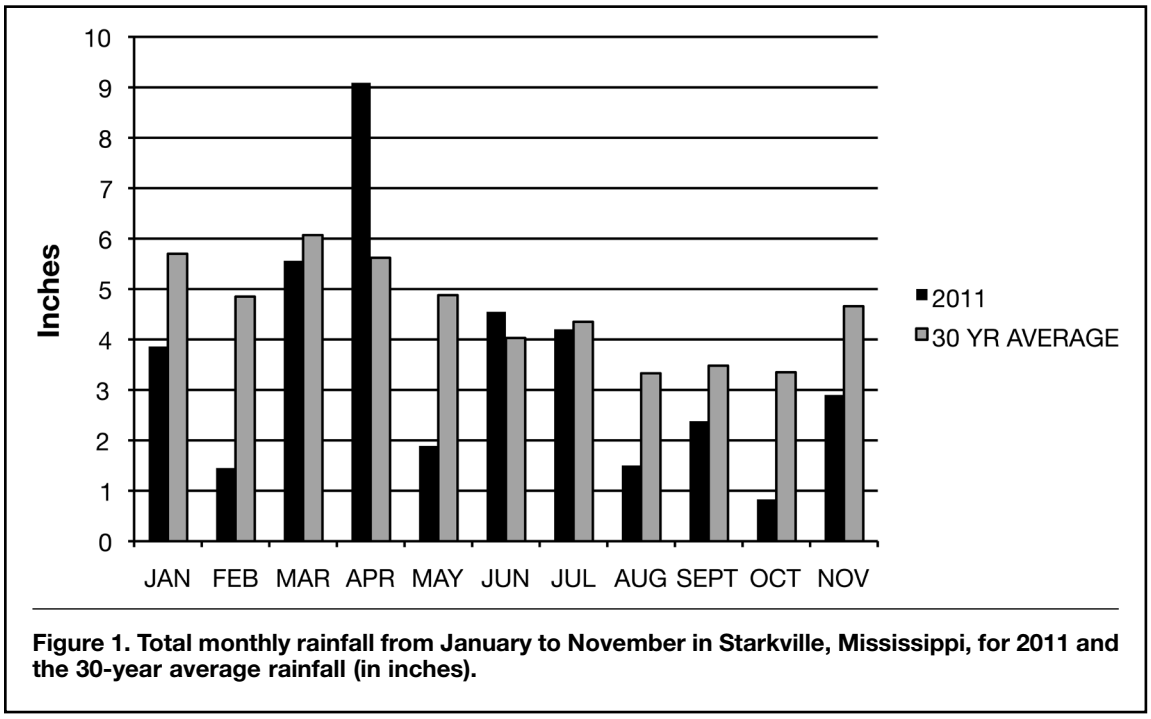

Figure 1. Total monthly rainfall from January to November in Starkville, Mississippi, for 2011 and the 30-year average rainfall (in inches).

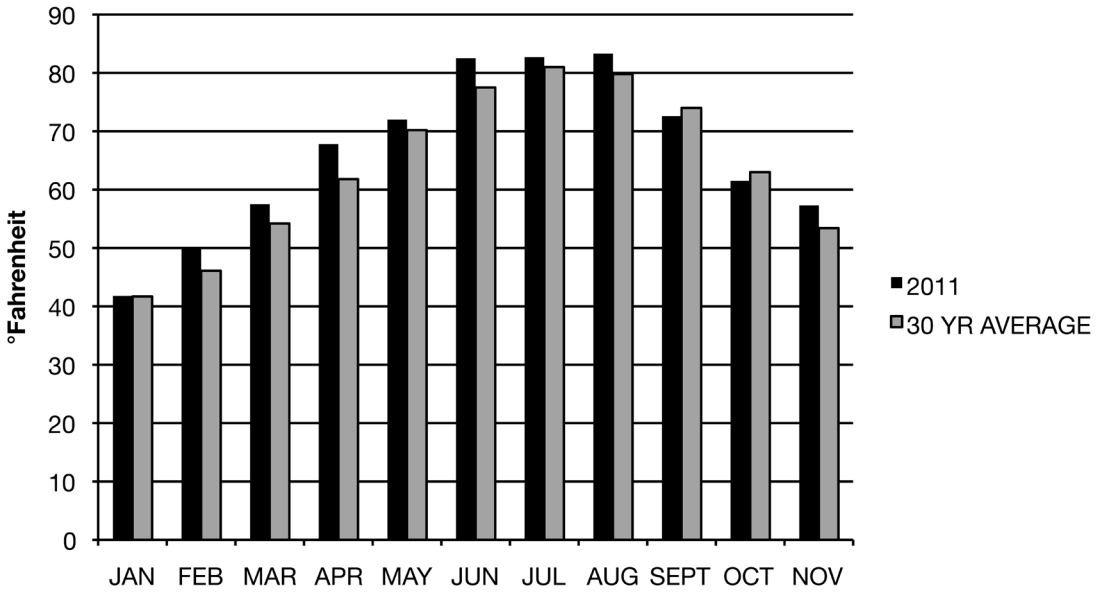

Figure 2. Average monthly temperatures from January to November in Starkville, Mississippi, for 2011 and the 30-year average (in degrees Fahrenheit).

Seeded Bermudagrass Variety Test 2011

Background

Bermudagrass is extremely 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. Bermudagrass is best adapted to sandy soils. Nitrogen and potassium fertilization is 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 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 33-0-0-12 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 is not surprising given the nature of 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.

Protocol

Bermudagrass was planted at a seeding rate of 10 pounds of pure live seed per acre at the Henry Leveck Animal Research Farm in Starkville, Mississippi. 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 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 Sensation mower to a 3-inch stubble height and 36-inch swath

(two passes). 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 Least Significant Difference (LSD) at $\alpha = 0.05$. Table 1 presents 2011 dry matter yields of seeded bermudagrass varieties during the establishment year.

Table 1. Dry Matter Yields of Bermudagrass at Starkville, Mississippi, 2011.[1]

Variety	Harvest date		Total yield
	8/25/11	10/17/11	
	lb/A	*lb/A*	*lb/A*
AmarilloKing	866	2,720	3,586
Buckaroo	1,001	2,978	3,979
CheyenelI	909	2,702	3,612
Common	911	2,814	3,725
Cowboy	719	2,708	3,426
Highlander	546	1,833	2,379
KF-1M	722	2,482	3,204
KF-2M	1,097	2,893	3,990
Laredo	749	2,660	3,410
Mohawk	808	2,355	3,163
Numex Sahara	886	2,315	3,201
PST-R6P0	145	1,122	1,267
PST-R6SB	435	1,766	2,201
PST-R6WL	334	1,528	1,862
Rancher	672	2,159	2,830
Ranchero Frio	728	2,323	3,051
Sungrazer+	851	2,665	3,516
Texas Tough+	1,165	3,481	4,646
LSD (0.05)	507	1,053	1,402
CV%	47	31	31
Mean	753	2,417	3,169

[1]Planting date: June 4, 2011 (replanted July 13, 2011). Fertilization: 335 pounds of 15-5-10 at planting; 50 pounds of N per acre with urea-ammonium sulfate (33-0-0S) after first harvest. Irrigation: 2 days after planting with 1 inch of water per acre.

Teffrass and Crabgrass Variety Test 2011

Teffgrass

Teff is a warm-season C_4 annual grass that originated in Africa with great potential for hay production in the Southern U.S. It can be used as a summer rotation crop in fallow areas where only annual ryegrass is used as winter forage. Teff is characterized by a small seed (about 1.3 million seeds per pound), a large crown, and fine stems (which decrease curing time when used for hay production). Its inflorescence is a loose or compact panicle. It is not recommended for grazing since it has a very shallow root system. Teff grass should be planted in the spring after danger of frost on a firm seedbed no deeper than .75 inch. If broadcasted, a cultipacker is recommended to encourage good seed-to-soil contact. Seasonal nitrogen requirements are relatively low, ranging from 50–70 pounds per acre. Overfertilizing with nitrogen can cause plants to lodge. Crude protein content of Teff hay ranges from 12–17% and total digestible nutrients from 55–64%. The nutritive quality is comparable to timothy hay and can fill a gap in summer forage production to make excellent hay for horses and livestock.

Crabgrass

Crabgrass is a warm-season C_4 grass with long stolons and high reseeding ability. Crabgrass is very leafy with a tall ligule. Leaves are sparsely hairy, and the collar region has very long hairs. Seed has three or more spikes. Crabgrass has been used in the South for forage production as pasture, hay, silage, and green chop. It can be double-cropped with temperate, cool-season forages, such as small grains or annual ryegrass. It is often considered a weedy grass species because of its invasive tendency, particularly into established warm-season perennial pastures subject to heavy close grazing. Crabgrass should be planted in late spring on a firm seedbed no lower than .75 inch. To maintain pastures, leave strips of standing crabgrass to reseed for the following year. In grazing situations, the cows should be pulled off in late summer to allow plants to mature before the first killing frost. Like bermudagrass, crabgrass responds well to nitrogen and requires a minimum of 120 pounds per acre. When harvested at the optimum maturity, crabgrass hay can have greater ruminal digestibility than bermudagrass. However, due to the

Table 2. Dry Matter Yields of Teffgrass and Crabgrass Planting 1 at Starkville, Mississippi, 2011.[1]

Species	Variety	Harvest date			Total yield
		7/13/11	7/26/11	8/15/11	
		lb/A	*lb/A*	*lb/A*	*lb/A*
Teffgrass	CW604	1,431	1,241	514	3,186
Teffgrass	Dessie	1,048	1,417	662	3,127
Teffgrass	F-11	1,352	1,240	676	3,268
Crabgrass	NFCG07-1	475	1,330	719	2,524
Crabgrass	NFCG07-2	564	1,266	591	2,421
Crabgrass	Quick-N-Big	940	930	637	2,507
Crabgrass	Red River	594	1,220	707	2,520
Teffgrass	Tiffani	1,185	1,359	523	3,067
LSD (0.05)		426	319	282	646
CV%		31	17	30	16
Mean		949	1,250	629	2,828

[1]Planting date: June 4, 2011. Fertilization: 300 pounds of 15-5-10 at planting; 50 pounds of N per acre with urea-ammonium sulfate (33-0-0S) after first harvest. Irrigation: 2 days after planting with 1 inch of water per acre.

poor appearance of crabgrass hay it is most commonly grazed. Many varieties of crabgrass used as forage are naturally occurring ecotypes.

Protocol

Teffgrass and crabgrass varieties were planted at a seeding rate of 10 pounds of pure live seed per acre at the Henry Leveck Animal Research Farm in Starkville, Mississippi. The experimental design was a randomized complete block with four replications. Plots were 6×11 feet in size with 4-foot alleys between plots and blocks. There were two trials planted on June 4 and June 16, 2011. Initial fertilizer application was 300 pounds of 15-5-10 at planting date. Nitrogen was applied after each harvest at a rate of 50 pounds per acre using urea-ammonium sulfate (33-0-0S). Plots were harvested when more than 50% of the plots had reached forage height of 12–15 inches or every 4–5 weeks, depending on environmental conditions. Plots were harvested with a Sensation mower to a 3-inch stubble height and 36-inch swath (two passes). Yields were recorded and subsamples collected for dry matter analysis. Data was analyzed using the General Linear Model (PROC GLM) of SAS and mean separation using the Least Significant Difference (LSD) at $\alpha = 0.05$. Tables 2 and 3 present 2011 dry matter yields collected from two different plantings.

Table 3. Dry Matter Yields of Teffgrass and Crabgrass Planting 2 at Starkville, Mississippi, 2011.[1]

Species	Variety	Harvest date		Total yield
		7/23/11	8/15/11	
		lb/A	*lb/A*	*lb/A*
Teffgrass	CW604	2,448	880	3,328
Teffgrass	Dessie	2,198	763	2,962
Teffgrass	F-11	2,625	766	3,391
Crabgrass	NFCG07-1	1,796	1,341	3,137
Crabgrass	NFCG07-2	1,568	1,561	3,129
Crabgrass	Quick-N-Big	1,553	739	2,292
Crabgrass	Red River	1,345	1,781	3,126
Teffgrass	Tiffani	2,366	796	3,162
LSD (0.05)		441	414	642
CV%		15	26	14
Mean		1,987	1,078	3,066

[1]Planting date: June 16, 2011. Fertilization: 300 pounds of 15-5-10 at planting; 50 pounds of N per acre with urea-ammonium sulfate (33-0-0S) after first harvest. Irrigation: 2 days after planting with 1 inch of water per acre.

Table 4. Sources of Bermudagrass, Crabgrass, and Teffgrass Seed, 2011.

Seeded Bermudagrass		Crabgrass and Teffgrass		
Variety	**Seed Company/Source**	**Variety**	**Species**	**Seed Company/Source**
Amarillo King	Barenbrug USA	CW604	Teffgrass	Cal/West Seeds
Bukaroo	Amigos Genetics L.L.C.	Dessie	Teffgrass	Allied Seeds L.L.C.
Cheyene II	Pennington Seed	F-11	Teffgrass	Mountain View Seeds
Common	No Source	NFCG07-1	Crabgrass	Noble Foundation
Cowboy	Amigos Genetics L.L.C.	NFCG07-2	Crabgrass	Noble Foundation
Highlander	K-F Seeds	Quick-N-Big	Crabgrass	Elstel Farm and Seeds
KF-1M	K-F Seeds	Red River	Crabgrass	Elstel Farm and Seeds
KF-2M	K-F Seeds	Tiffani	Teffgrass	Producers Choice Seeds
Laredo	Allied Seeds L.L.C.			
Mohawk	Pennington Seed			
Numex Sahara	Pennington Seed			
PST-R6P0	Pure-Seed Testin, Inc.			
PST-R6SB	Pure-Seed Testin, Inc.			
PST-R6WL	Pure-Seed Testin, Inc.			
Rancher	DLF International Seeds			
Ranhcero Frio	Pennington Seed			
Sungrazer+	MBS Seed, LTD			
Texas Tough+	East Texas Seed Company			

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