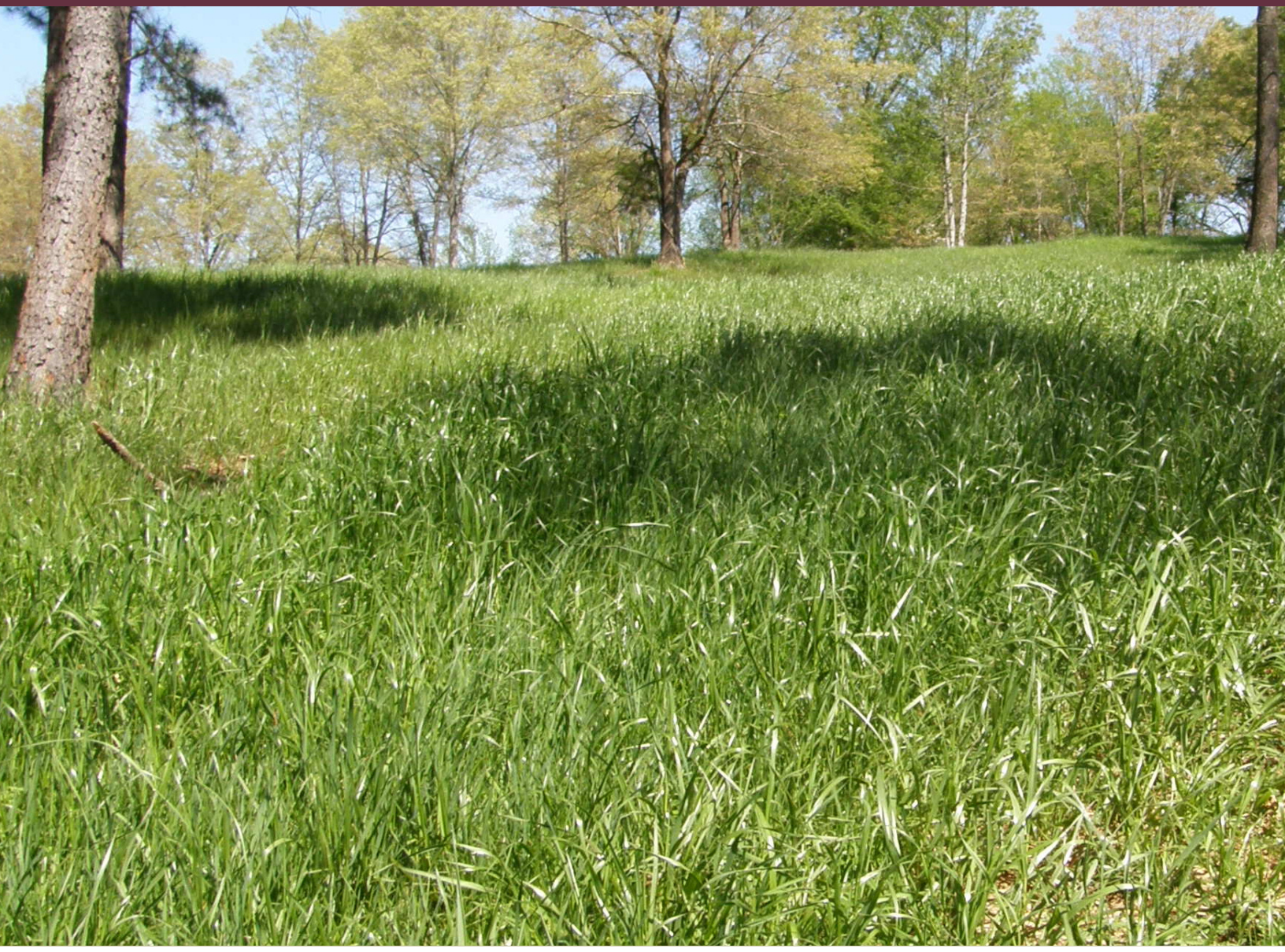
MISSISSIPPI ANNUAL COOL-SEASON FORAGE CROP VARIETY TRIALS, 2019

Information Bulletin 543 • November 2019



MISSISSIPPI'S OFFICIAL VARIETY TRIALS

MISSISSIPPI STATE UNIVERSITY™
MS AGRICULTURAL AND FORESTRY EXPERIMENT STATION

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This Mississippi Agricultural and Forestry Experiment Station Information Bulletin is a summary of forage research intended for the use of colleagues, cooperators, and sponsors. The interpretation of data presented herein may change after additional experimentation. Information included herein is not to be construed either as a recommendation for use or as an endorsement of a specific product by Mississippi State University, the Mississippi Agricultural and Forestry Experiment Station, or the Mississippi State University Extension Service.

This report contains data generated as part of the Mississippi Agricultural and Forestry Experiment Station. Joint sponsorship by the organizations listed on Page 17 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 17.

Mississippi Annual Cool-Season Forage Crop Variety Trials, 2019

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Recognition is given to research technician Melvin Gibson at the South Mississippi Branch Experiment Station for ground preparations. In addition, recognition is given to student worker Joey Hester for his assistance in cultivating, packing, planting, harvesting, and recording plot data.

This document was approved for publication as Information Bulletin 543 of the Mississippi Agricultural and Forestry Experiment Station. It was published by the Office of Agricultural Communications, a unit of the Mississippi State University Division of Agriculture, Forestry, and Veterinary Medicine. It is a contribution of the Mississippi Agricultural and Forestry Experiment Station.

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

Mississippi Annual Cool-Season Forage Crop Variety Trials, 2019

Introduction

Varieties of several forage-crop species are evaluated every year in the Mississippi Agricultural and Forestry Experiment Station's (MAFES) small-plot forage trials. Entries are provided by seed companies and forage and breeding programs at state universities. Experimental and commercially available varieties are tested at one or more locations across Mississippi. All entries from privately owned companies are tested on a fee basis. Some varieties may be added by the MAFES forage variety-testing program as a reference for comparison purposes. In addition, varieties of interest may also be added when applicable. Testing during 2018–2019 was conducted at the following Mississippi locations: North Mississippi Branch Experiment Station (Holly Springs), Prairie Research Unit (Prairie), Leveck Animal Research Center Forage Unit (Mississippi State campus), Coastal Plain Branch Experiment Station (Newton), and White Sands Research Unit (Poplarville).

Data presented in Tables 3–17 was used to evaluate the performance of each forage crop within its respective trial. Mean and harvest comparisons were statistically evaluated by using the least significant difference (LSD) test at the probability level of $\alpha = 0.05$. The LSD value represents the minimum amount of dry matter (DM) yield (pounds per acre) that must be observed between any two varieties to determine if the difference was due to variety performance alone. Sources of seed are presented in Table 19.

Protocol

Annual ryegrass, small grain, and annual clover trials across the state were established from late September until the first week of October in 2018. At all locations, soil samples were taken and analyzed by the Mississippi State University Soil Testing Laboratory. Trial areas were amended with lime and fertilized with phosphorus (P_2O_5) and potassium (K_2O) according to the soil-test recommendations for individual species. The annual ryegrass and small grain trials were fertilized with 300 pounds of 15-5-10 at the time of planting and with 50 pounds of N per acre after each harvest using urea ammonium sulfate (33-0-0S). Annual clover trials were fertilized with 50 pounds per acre of 0-0-60 (K_2O) at planting and an additional 100 pounds per acre of phosphorus (P_2O_5) and potassium (K_2O) early in the spring using 0-20-20. Plots were 6 feet by 10 feet and planted using a precision cone seeder on a prepared seedbed. Trial design was a randomized complete block replicated four times. The recommended seeding rates were

Table 1. Recommended seeding rates for cool-season forage crops.

Type/Species	Seed weight
	lb/A
Small Grains	
Rye	100
Oat	100
Triticale	100
Annual Ryegrass	30
Annual Clovers	
Arrowleaf	10
Berseem	25
Balansa	4
Ball	3
Crimson	30
Persian	8

used and are presented in Table 2. Individual trials were harvested when 75% of the plots achieved 15 inches of growth. All plots were harvested to a 3-inch stubble height. Plots were harvested using a Winterstieger equipped with a forage Cibus S plot harvester reel-type header that collected a 4.8-foot by 10-foot swath to calculate total yield. A subsample was collected and dried at 130°F until constant weight was achieved to calculate DM concentration. Data were analyzed using the General Linear Model (PROC GLM) of SAS and mean separation was conducted using LSD at $\alpha = 0.05$.

Table 2. Monthly rainfall totals for Poplarville, Starkville, Newton, and Holly Springs, 2018–2019.

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*
						2018						
Poplarville	4.74	8.63	4.20	5.40	0.90	3.82	8.95	2.24	7.24	3.27	7.57	2.35
Starkville	2.03	10.33	5.61	5.93	1.92	4.34	4.98	2.82	11.08	2.97	7.51	8.67
Holly Springs	3.37	12.98	3.74	7.49	4.44	7.50	3.05	5.02	6.92	1.93	7.70	6.73
Newton	3.34	9.14	4.92	7.11	3.40	1.97	4.65	6.90	7.71	1.76	7.30	9.83
						2019						
Poplarville	6.27	6.72	1.94	5.4	13.22	7.36						
Starkville	7.86	8.77	4.24	14.05	7.57	8.33						
Holly Springs	5.41	15.61	2.69	8.82	5.44	5.51						
Newton	6.62	6.46	3.04	9.68	7.13	3.66						
MS 30-yr. avg.	4.96	4.76	5.04	4.96	4.37	4.13	4.8	4.25	3.03	3.94	4.76	5.16

Annual Ryegrass

Introduction

Annual ryegrass is the most relevant and versatile cool-season annual grass for livestock producers in Mississippi. In pasture and hay systems, annual ryegrass is a popular forage because of its ease of establishment, high nutritive value, high yielding potential, good reseeding ability, and adaptability to a wide range of soil types. Annual ryegrass can be established in pure stands or mixed with small grains and/or clovers for cool-season forage production. For these reasons, annual ryegrass is a staple for many cool-season grazing programs in Mississippi. Recommended planting dates vary by location but usually fall between September and mid-October for prepared seedbeds or late October if overseeded on a warm-season, perennial-grass pasture. Seeding rates are 30 pounds per acre for pure stands and 20 pounds per acre for mixtures with small grains and/or clovers. Annual ryegrass is very responsive to nitrogen fertilizer, and its use should be split into two applications for grazing systems. Reasonable productivity can be expected from November to May in the southern part of Mississippi and February to May in the northern part. Annual ryegrass should normally be allowed to reach an initial height of at least 10 inches before grazing begins.

Data in Tables 3–6 present the yield performance of ryegrass varieties at four locations within the state ranging from Holly Springs in the north to Poplarville in the south. Entries were further analyzed by ploidy level represented in Tables 7–10. Ploidy level refers to the number of chromosome sets in a biological cell and is often used in characterizing ryegrass varieties as either diploid (2x) or tetraploid (4x). Whether ploidy level is advantageous to a specific variety in regards to performance is more dependent on location. Tetraploids tend to yield more on the southern coastal regions of the state, and diploids tend to have greater yields in the rest of the state but showed no differences at any location this year.

Results

The greatest average DM yields were observed at Starkville and Newton, while the least DM accumulation occurred in Holly Springs. At all locations, diploid and tetraploid varieties performed similarly. Ryegrass plots in Holly Springs were heavily grazed by wildlife, resulting in only one relatively late harvest. In the sole harvest at Holly Springs, Gulf and Flying A produced the greatest DM yield. Statistical differences between varieties at Starkville and Newton were not observed at any harvest or total yield. In Poplarville, the varieties ME4, Jackson, and WMWL produced the greatest DM yields during the second harvest.

Table 3. Annual ryegrass production by harvest date and total yield (pounds of dry matter per acre) in Holly Springs, Mississippi.

Variety	5/1/19[1]
	lb/A
07-ME	3257
07-WW	3421
Attain	1209
Baqeuano	2753
Big Boss	2120
Diamond T	3157
Double Diamond	2195
Flying A	3863
Fria	3579
Frost Proof	3173
Grits	3320
Gulf	3729
Jackson	2791
KO14-Wear	3014
KO14-WEMA	2506
KO14-WLS	2691
KO14-WM	2735
Lonestar	3396
LSC-B1191	3423
M2CVS	2821
Marshall	2073
Marvel	1676
ME4	2532
ME-94	3137
Nelson	1472
Passerel Plus	2703
PPERC2	2570
PPERC7	2746
PPG-LWT-105	1460
Ranchers Choice	1650
Rapido	3516
SELWT 110	1505
TAMTBO	1584
Tetrastar	2093
Triangle T	1155
Trinova	2198
Winterhawk	2976
WMWL	2676
WMWL-2	2473
Mean	2599
CV, %	39
LSD (0.05)	1491

[1]Single end-of-season harvest due to heavy herbivore pressure
Planted: 10/4/18
Fertilizer: 300 lb/A of 15-5-10 at planting
Soil type: Grenada Silt Loam

Table 4. Annual ryegrass production by harvest date and total yield (pounds of dry matter per acre) in Starkville, Mississippi.

Variety	1/9/19	3/7/19	4/16/19	5/15/19	Total yield
	lb/A	*lb/A*	*lb/A*	*lb/A*	*lb/A*
07-ME	1611	1765	3044	671	7091
07-WW	1803	1493	2657	673	6625
Attain	1875	1736	3202	790	7601
Baqeuano	1881	1575	2136	993	6586
Big Boss	1849	1869	2368	804	6889
Diamond T	2053	1601	2155	1049	6857
Double Diamond	1903	1598	2283	1061	6845
Flying A	2218	1262	2505	690	6674
Fria	1605	1617	2053	794	6069
Frost Proof	2229	1766	2452	788	7234
Grits	1604	1528	3350	728	7210
Gulf	2310	1714	3094	492	7609
Jackson	1871	1923	3556	701	8051
KO14-Wear	1321	1724	2875	878	6798
KO14-WEMA	1564	1671	2776	692	6702
KO14-WLS	1780	2455	2544	783	7561
KO14-WM	1535	1680	2788	629	6631
Lonestar	2223	1620	2484	587	6914
LSC-B1191	1478	2076	2320	765	6638
M2CVS	1375	2199	2276	758	6606
Marshall	2410	2130	2501	871	7911
Marvel	1660	1486	2399	533	6078
ME4	2421	1988	2714	1047	8170
ME-94	1541	1457	2789	760	6547
Nelson	2427	1707	3077	703	7915
Passerel Plus	2129	1532	2999	645	7304
PPERC2	1820	993	2853	577	6243
PPERC7	2143	2057	2415	654	7269
PPG-LWT-105	1876	1534	2504	500	6413
Ranchers Choice	1824	1369	2749	648	6590
Rapido	1765	1408	3226	663	7061
SELWT 110	2576	1839	2490	627	7532
TAMTBO	2082	1649	1920	777	6427
Tetrastar	2245	1644	2884	971	7744
Triangle T	2105	1780	2542	865	7292
Trinova	2062	1481	3547	583	7673
Winterhawk	1210	1999	2523	880	6612
WMWL	1857	1791	2380	767	6795
WMWL-2	1592	2268	3725	741	8326
Mean	1893	1717	2696	747	7054
CV, %	34	33	24	36	19
LSD (0.05)	NS[1]	NS	NS	NS	NS

[1]Not Significant
Planted: 10/5/18
Fertilizer: 300 lb/A of 15-5-10 at planting and 50 lb/A of N (33-0-0S) after each harvest
Herbicide: 1 qt/A of GrazonNext® (aminopyralid and 2,4-D) after first harvest
Soil type: Marietta Fine Sandy Loam

Table 5. Annual ryegrass production by harvest date and total yield (pounds of dry matter per acre) in Newton, Mississippi.

Variety	1/10/19	2/27/19	4/10/19	5/4/19	Total yield
	lb/A	*lb/A*	*lb/A*	*lb/A*	*lb/A*
07-ME	1607	1312	2903	2049	7871
07-WW	1816	1112	3031	1963	7922
Attain	1646	1083	2449	2375	7553
Baqeuano	1560	1003	2662	1568	6793
Big Boss	1747	1328	3584	2233	8892
Diamond T	1973	1061	3102	1999	8136
Double Diamond	2002	1133	3023	2318	8476
Flying A	1618	1150	2727	1673	7167
Fria	1842	1216	2639	1856	7553
Frost Proof	1516	1144	2524	1702	6886
Grits	1714	2921	2527	1735	8896
Gulf	1554	1031	2124	1601	6310
Jackson	1287	988	3061	1625	6961
KO14-Wear	1441	1036	2665	1830	6971
KO14-WEMA	1242	957	3215	1721	7136
KO14-WLS	1377	972	2572	1575	6496
KO14-WM	1236	939	2718	2190	7083
Lonestar	1777	1016	3059	1556	7408
LSC-B1191	1775	1316	2835	1992	7917
M2CVS	1392	1004	3217	1663	7275
Marshall	1207	1020	2727	1873	6827
Marvel	1890	1155	3806	2432	9283
ME4	1494	1148	2997	1918	7557
ME-94	1579	1432	3222	1961	8195
Nelson	1525	1066	2975	1929	7495
Passerel Plus	1656	1178	3149	2160	8143
PPERC2	1314	851	2657	1771	6592
PPERC7	1555	1118	2677	1697	7047
PPG-LWT-105	1679	1075	3760	1946	8460
Ranchers Choice	1447	749	2500	1923	6619
Rapido	1899	958	2721	1727	7303
SELWT 110	1356	1179	3193	2065	7794
TAMTBO	1729	1088	3048	2316	8181
Tetrastar	1760	985	3044	1545	7334
Triangle T	1481	908	2820	1660	6869
Trinova	2031	1199	3664	2189	9083
Winterhawk	1110	920	3176	1938	7144
WMWL	1572	1237	3236	2133	8178
WMWL-2	1350	842	3112	1725	7030
Mean	1584	1124	2952	1901	7560
CV, %	27	56	22	28	21
LSD (0.05)	NS[1]	NS	NS	NS	NS

[1]Not Significant
Planted: 10/12/18
Fertilizer: 300 lb/A of 15-5-10 at planting and 50 lb/A of N (33-0-0S) after each harvest
Herbicide: 1 qt/A of GrazonNext® (aminopyralid and 2,4-D) after first harvest
Soil type: Prentiss Sandy Loam

Table 6. Annual ryegrass production by harvest date and total yield (pounds of dry matter per acre) in Poplarville, Mississippi.

Variety	2/1/19	3/22/19	Total yield
	lb/A	*lb/A*	*lb/A*
07-ME	1107	2819	3926
07-WW	670	3087	3757
Attain	930	3058	3988
Baqeuano	872	1932	2804
Big Boss	729	2705	3435
Diamond T	1194	2242	3436
Double Diamond	736	2779	3515
Flying A	763	2757	3520
Fria	1350	2357	3706
Frost Proof	966	3202	4168
Grits	1429	2520	3949
Gulf	918	2586	3504
Jackson	846	3306	4153
KO14-Wear	808	2672	3479
KO14-WEMA	906	2700	3606
KO14-WLS	927	2110	3037
KO14-WM	811	2310	3120
Lonestar	910	2272	3181
LSC-B1191	618	2440	3059
M2CVS	962	2716	3678
Marshall	1258	2913	4170
Marvel	712	2970	3682
ME4	1152	4105	5257
ME-94	1392	3148	4540
Nelson	1073	3065	4138
Passerel Plus	1158	3281	4439
PPERC2	735	2245	2980
PPERC7	672	2525	3196
PPG-LWT-105	945	2394	3339
Ranchers Choice	1366	1866	3231
Rapido	1023	2040	3063
SELWT 110	745	2740	3485
TAMTBO	830	2692	3522
Tetrastar	800	2541	3341
Triangle T	708	2651	3359
Trinova	729	3135	3864
Winterhawk	732	3081	3813
WMWL	909	3300	4208
WMWL-2	1076	3067	4143
Mean	935	2726	3661
CV, %	53	17	18
LSD (0.05)	NS	937	NS

[1]Not Significant
Planted: 10/12/18
Fertilizer: 300 lb/A of 15-5-10 at planting and 50 lb/A of N (33-0-0S) after each harvest
Herbicide: 1 qt/A of GrazonNext® (aminopyralid and 2,4-D) after first harvest
Soil type: Basin Loam

Table 7. Harvest and total annual ryegrass yield (pounds of dry matter per acre) by ploidy level in Holly Springs, Mississippi.

Ploidy	5/1/19
	lb/A
Diploid	3121
Tetraploid	2042
Mean	2582
CV, %	39
LSD (0.05)	NS[1]

[1]Not Significant

Table 8. Harvest and total annual ryegrass yield (pounds of dry matter per acre) by ploidy level in Starkville, Mississippi.

Ploidy	1/9/19	3/7/19	4/16/19	5/15/19	Total yield
	lb/A	*lb/A*	*lb/A*	*lb/A*	*lb/A*
Diploid	1979	1726	2644	748	9903
Tetraploid	1991	1567	2648	818	8785
Mean	1985	1647	2646	783	9344
CV, %	34	33	24	36	19
LSD (0.05)	NS[1]	NS	NS	NS	NS

[1]Not Significant

Table 9. Harvest and total annual ryegrass yield (pounds of dry matter per acre) by ploidy level in Newton, Mississippi.

Ploidy	1/10/19	2/27/19	4/10/19	5/14/19	Total yield
	lb/A	*lb/A*	*lb/A*	*lb/A*	*lb/A*
Diploid	1588	1256	2869	1827	7542
Tetraploid	1719	1037	2935	1958	7650
Mean	1654	1147	2902	1893	7596
CV, %	27	56	22	28	21
LSD (0.05)	NS[1]	NS	NS	NS	NS

[1]Not Significant

Table 10. Harvest and total annual ryegrass yield (pounds of dry matter per acre) by ploidy level in Poplarville, Mississippi.

Ploidy	2/1/19	3/22/19	Total yield
	lb/A	*lb/A*	*lb/A*
Diploid	999	2711	3775
Tetraploid	900	2553	3537
Mean	950	2632	3656
CV, %	53	17	18
LSD (0.05)	NS[1]	NS	NS

[1]Not Significant

Small Grains

Introduction

In Mississippi, small grains (oat, wheat, rye, and triticale) are not utilized as extensively for forage production as annual ryegrass because of lower annual DM yields. However, some small grains tend to be more drought- and cold-tolerant than ryegrass and can provide highly digestible forage when other forages are not available. They can also be used for early grazing during the transition period from summer perennial grasses to annual ryegrass grazing. Cereal rye and triticale are the most cold-tolerant of forage crops, and therefore have potential to continue vegetative growth during the fall and winter months in Mississippi. Data presented in Tables 11–14 represent forage DM yields among small-grain varieties at four locations.

Results

The greatest average DM yields were observed in Starkville. With the exception of Holly Springs (which was only harvested once) and Poplarville, the first harvest at Starkville and Newton was greatest among triticale and cereal rye varieties compared to wheat and oats. In Poplarville, oats and triticale averaged greater DM yields than rye and wheat. In Starkville, Newton, and Poplarville Trical 342 produced the greatest DM yield in the first harvest. With the exception of Poplarville, total yield was similar among varieties. In Poplarville, Trical 342 and Rackmaster produced the greatest seasonal yield compared to other varieties.

Table 11. Small grain yield (pounds of dry matter per acre) in Holly Springs, Mississippi.[1]

Species/Variety	5/1/19
	lb/A
Oats	
Bob	1529
RackMaster	1736
Rye	
Bates RS4	2163
Elbon	2600
NF95319B	1753
NF97325	1534
NF99362	2047
Triticale	
Trical 342	2441
Trical Merlin Max	3170
Trical Surge	3044
Wheat	
NF00108	4272
NF101	2620
NF97117	4010
ON11D25005	3217
ON13PO16	3179
ON14319	2942
ON15111	1964
Sunny South 700	1846
Mean	2559
CV, %	31
LSD (0.05)	1162

[1]Single end-of-season harvest due to heavy herbivore pressure
Planted: 10/4/18
Fertilizer: 300 lb/A of 15-5-10 at planting and 50 lb/A of N (33-0-0S) after each harvest
Herbicide: 1 qt/A of GrazonNext® (aminopyralid and 2,4-D) after first harvest
Soil type: Grenada Silt Loam

Table 12. Small grain yield (pounds of dry matter per acre) in Starkville, Mississippi.

Species/Variety	1/9/19	3/5/19	4/16/19	Total yield
	lb/A	*lb/A*	*lb/A*	*lb/A*
Oats				
Bob	712	1175	1439	3327
RackMaster	779	1466	1288	3533
Rye				
Bates RS4	1930	2076	817	4823
Elbon	825	1554	1499	3878
NF95319B	1250	2172	884	4306
NF97325	1615	1856	804	4275
NF99362	1332	2159	741	4232
Triticale				
Trical 342	2314	1609	423	4346
Trical Merlin Max	1357	1285	742	3383
Trical Surge	1391	1685	1001	4077
Wheat				
NF00108	925	2007	529	3461
NF101	782	2777	710	4268
NF97117	873	1935	782	3590
ON11D25005	332	2211	1020	3563
ON13PO16	416	3114	616	4146
ON14319	416	2711	929	4056
ON15111	884	1633	859	3376
Sunny South 700	501	2324	1363	4187
Mean	1035	1986	914	3935
CV, %	50	34	33	24
LSD (0.05)	807	NS	442	NS

[1]Not Significant
Planted: 10/5/18
Fertilizer: 300 lb/A of 15-5-10 at planting and 50 lb/A of N (33-0-0S) after each harvest
Herbicide: 1 qt/A of GrazonNext® (aminopyralid and 2,4-D) after first harvest
Soil type: Marietta Fine Sandy Loam

Table 13. Small grain yield (pounds of dry matter per acre) in Newton, Mississippi.

Species/Variety	1/10/19	2/27/19	4/10/19	Total yield
	lb/A	*lb/A*	*lb/A*	*lb/A*
Oats				
Bob	833	309	580	1722
RackMaster	1159	294	743	2195
Rye				
Bates RS4	1701	330	1411	3441
Elbon	957	403	1529	2889
NF95319B	1707	485	589	2781
NF97325	1200	302	745	2247
NF99362	1620	456	764	2840
Triticale				
Trical 342	2417	201	787	3405
Trical Merlin Max	1942	362	1055	3359
Trical Surge	1607	429	634	2670
Wheat				
NF00108	1810	440	504	2754
NF101	793	832	412	2037
NF97117	1979	842	562	3382
ON11D25005	811	519	786	2117
ON13PO16	972	671	1252	2895
ON14319	688	457	1040	2184
ON15111	1037	564	931	2531
Sunny South 700	1300	541	1648	3489
Mean	1363	469	887	2719
CV, %	36	51	46	36
LSD (0.05)	753	NS	616	NS

Planted: 10/12/18
Fertilizer: 300 lb/A of 15-5-10 at planting and 50 lb/A of N (33-0-0S) after each harvest
Herbicide: 1 qt/A of GrazonNext® (aminopyralid and 2,4-D) after first harvest
Soil type: Prentiss Sandy Loam

Table 14. Small grain yield (pounds of dry matter per acre) in Poplarville, Mississippi.			
Species/Variety	**1/11/19**	**2/22/19**	**Total yield**
	lb/A	*lb/A*	*lb/A*
Oats			
Bob	755	2490	3246
RackMaster	875	2829	3704
Rye			
Bates RS4	686	1903	2589
Elbon	342	1574	1916
NF95319B	558	2337	2895
NF97325	482	2126	2608
NF99362	851	2594	3446
Triticale			
Trical 342	1418	2127	3545
Trical Merlin Max	907	1782	2689
Trical Surge	848	1119	1967
Wheat			
NF00108	459	2169	2628
NF101	500	2408	2908
NF97117	692	2757	3448
ON11D25005	179	1658	1837
ON13PO16	320	2608	2928
ON14319	339	2269	2608
ON15111	383	2188	2571
Sunny South 700	691	2074	2766
Mean	627	2167	2794
CV, %	28	21	17
LSD (0.05)	292	766	803

Planted: 10/12/18
Fertilizer: 300 lb/A of 15-5-10 at planting and 50 lb/A of N (33-0-0S) after each harvest
Herbicide: 1 qt/A of GrazonNext® (aminopyralid and 2,4-D) after first harvest
Soil type: Basin Loam

Annual Clover

Introduction

Annual clovers may reduce nitrogen input and improve forage quality in pastures. For this reason, they can be beneficial in Mississippi when interseeded into annual cool-season grass pastures. Crimson clover is an early-maturing clover that produces excellent forage though it has relatively poor reseeding abilities, necessitating reseeding each fall. Crimson clover will produce more forage at lower temperatures than other clovers. Ball clover is very tolerant to poor drainage, is more tolerant to acidity than crimson clover, and tolerates heavy grazing while maintaining good reseeding potential. Berseem clover is tolerant of alkaline and wet soils, though most varieties are not cold tolerant. Data presented in tables 15–18 represent forage DM yield data from annual clover trials at four locations across the state.

Results

Clover yields were the greatest in Starkville and the least in Prairie. Variety performance was variable by location. In Prairie, Frosty berseem and B-18.1885 crimson clover produced the greatest total yields. In Starkville, Frosty berseem was one of the greatest producers of DM yield in the second harvest and total yield, while GO-F2 and Taipan balansa clovers were among the greatest yields. Fixation and GO-FBG balansa clovers were the greatest producing in Newton for the first harvest and overall total yield.

Table 15. Annual clover production by harvest and total yield (pounds of dry matter per acre) in Prairie, Mississippi.

Species/Variety	4/24/19	6/1/19	Total yield
	lb/A	*lb/A*	*lb/A*
Balansa			
Fixation	876	—	876
GO-F2	836	—	836
GO-FBG	1371	—	1371
Taipan	2304	—	2304
Berseem			
Balady	1033	446	1479
Frosty	2018	890	2908
Crimson			
B-18.1885	2040	—	2040
Kentucky Pride	1751	—	1751
SECCB18	567	—	567
SECCM18	1402	—	1402
Persian			
GO-PER12	950	—	950
Red Clover			
Dynamite	761	439	1200
GA 9908	638	692	1330
Mean	1273	617	1463
CV, %	63	54	62
LSD (0.05)	1153	NS[1]	1256

[1]Not Significant
Planted: 10/12/18
Fertilizer: 100 lb/A of 0-0-60
Herbicide: 5 oz/A of Pursuit® (imazethapyr)
Soil type: Houston Clay

Table 16. Annual clover production by harvest and total yield (pounds of dry matter per acre) in Starkville, Mississippi.

Species/Variety	3/27/19	5/15/19	Total yield
	lb/A	*lb/A*	*lb/A*
Balansa			
Fixation	2725	1696	4420
GO-F2	3636	1766	5402
GO-FBG	1727	2049	3776
Taipan	3567	485	4052
Berseem			
Balady	2028	726	2754
Frosty	2829	2391	5220
Crimson			
B-18.1885	2371	1266	3637
Kentucky Pride	1804	1483	3286
SECCB18	1964	1622	3586
SECCM18	1503	1153	2656
Persian			
GO-PER12	1814	1920	3733
Red Clover			
Dynamite	2166	1736	3902
GA 9908	1186	2188	3374
Mean	2255	1575	3830
CV, %	40	29	28
LSD (0.05)	1453	780	1496

Planted: 10/5/18
Fertilizer: 100 lb/A of 0-0-60
Herbicide: 5 oz/A of Pursuit® (imazethapyr)
Soil type: Marietta Fine Sandy Loam

Table 17. Annual clover production by harvest and total yield (pounds of dry matter per acre) in Newton, Mississippi.

Species/Variety	4/10/19	5/14/19	Total yield
	lb/A	*lb/A*	*lb/A*
Balansa			
Fixation	2777	1033	3809
GO-F2	2034	1130	3164
GO-FBG	2753	1157	3910
Taipan	2083	594	2677
Berseem			
Balady	1145	1194	2339
Frosty	2301	1036	3336
Crimson			
B-18.1885	2214	906	3120
Kentucky Pride	1958	1041	2999
SECCB18	2685	608	3293
SECCM18	2380	1252	3632
Persian			
GO-PER12	1816	775	2591
Red Clover			
Dynamite	1245	718	1963
GA 9908	970	872	1842
Mean	2028	947	2975
CV, %	31	33	27
LSD (0.05)	921	NS[1]	1103

[1]Not Significant
Planted: 10/12/18
Fertilizer: 100 lb/A of 0-0-60
Herbicide: 5 oz/A of Pursuit® (imazethapyr)
Soil type: Prentiss Sandy Loam

Table 18. Annual clover production by harvest and total yield (pounds of dry matter per acre) in Poplarville, Mississippi.

Species/Variety	3/22/19	5/6/19	Total yield
	lb/A	*lb/A*	*lb/A*
Balansa			
Fixation	748	1639	2387
GO-F2	526	1499	2025
GO-FBG	1035	1298	2333
Taipan	858	—	858
Berseem			
Balady	1184	—	1184
Frosty	1429	1104	2533
Crimson			
B-18.1885	2235	692	2927
Kentucky Pride	1992	2425	4417
SECCB18	1675	917	2592
SECCM18	1580	1068	2648
Persian			
GO-PER12	1001	1332	2333
Red Clover			
Dynamite	—	859	859
GA 9908	—	1079	1079
Mean	1297	1265	2167
CV, %	58	56	50
LSD (0.05)	NS[1]	NS	NS

[1]Not Significant
Planted: 10/12/18
Fertilizer: 100 lb/A of 0-0-60
Herbicide: 5 oz/A of Pursuit® (imazethapyr)
Soil type: Basin Loam

Table 19. Seed sources for the 2018–19 annual cool-season forage variety testing program.

Species/Variety	Seed company/source	Species/Variety	Seed company/source
Annual Ryegrass		**Annual Clovers**	
Ranchers Choice	Ash Swale Seed Company	B-18.1885	Blue Moon Farms
Marvel	Pennington	SECCB18	Smith Seed Services
Passerel Plus	Pennington	SECCM18	Smith Seed Services
PPERC7	Pennington	GA 9908	Smith Seed Services
PPERC2	Pennington	Taipan	Smith Seed Services
Fria	Allied Seed	Fixation	Grassland Oregon
LSC-B1191	Lewis seed Company	GO-FBG	Grassland Oregon
Grits	Lewis seed Company	GO-F2	Grassland Oregon
Double Diamond	Oregro Seeds	GO-PER12	Grassland Oregon
Triangle T	Oregro Seeds	Dynamite	Grassland Oregon
Diamond T	Oregro Seeds	Frosty	Grassland Oregon
Flying A	Oregro Seeds	Balady	Grassland Oregon
TAMTBO	Oregro Seeds	Kentucky Pride	Grassland Oregon
07-WW	Oregro Seeds		
07-ME	Oregro Seeds	**Small Grains**	
KO14-WM	Oregro Seeds	NF00108	The Noble Foundation
KO14-WEMA	Oregro Seeds	NF97117	The Noble Foundation
KO14-WLS	Oregro Seeds	NF101	The Noble Foundation
KO14-Wear	Oregro Seeds	ON13PO16	The Noble Foundation
Winterhawk	Oregro Seeds	Bates RS4	The Noble Foundation
Big Boss	Smith Seed Services	ON14319	The Noble Foundation
Baqeuano	Smith Seed Services	NF97325	The Noble Foundation
Rapido	Smith Seed Services	ON11D25005	The Noble Foundation
Attain	Smith Seed Services	ON15111	The Noble Foundation
Trinova	Smith Seed Services	NF95319B	The Noble Foundation
Frost Proof	Smith Seed Services	NF99362	The Noble Foundation
SELWT 110	Smith Seed Services	Trical 342	Trical Superior Forage
Jackson	The Wax Company	Trical Surge	Trical Superior Forage
M2CVS	The Wax Company	Trical Merlin Max	Trical Superior Forage
Marshall	The Wax Company	Elbon	
ME4	The Wax Company	Rack Master	Pennington
ME-94	The Wax Company	Sunny South 700	Hurt Seed Co.
WMWL	The Wax Company	Bob	
WMWL-2	The Wax Company		
Nelson	The Wax Company		
Gulf	MSU Check Variety		
Lonestar	Grassland Oregon		
Tetrastar	Grassland Oregon		
PPG-LWT-105	Mountain View Seeds		

MS AGRICULTURAL AND
FORESTRY EXPERIMENT STATION

The mission of the Mississippi Agricultural and Forestry Experiment Station and the College of Agriculture and Life Sciences is to advance agriculture and natural resources through teaching and learning, research and discovery, service and engagement which will enhance economic prosperity and environmental stewardship, to build stronger communities and improve the health and well-being of families, and to serve people of the state, the region and the world.

George M. Hopper, Director **www.mafes.msstate.edu**