MISSISSIPPI ANNUAL COOL-SEASON FORAGE CROP VARIETY TRIALS, 2017

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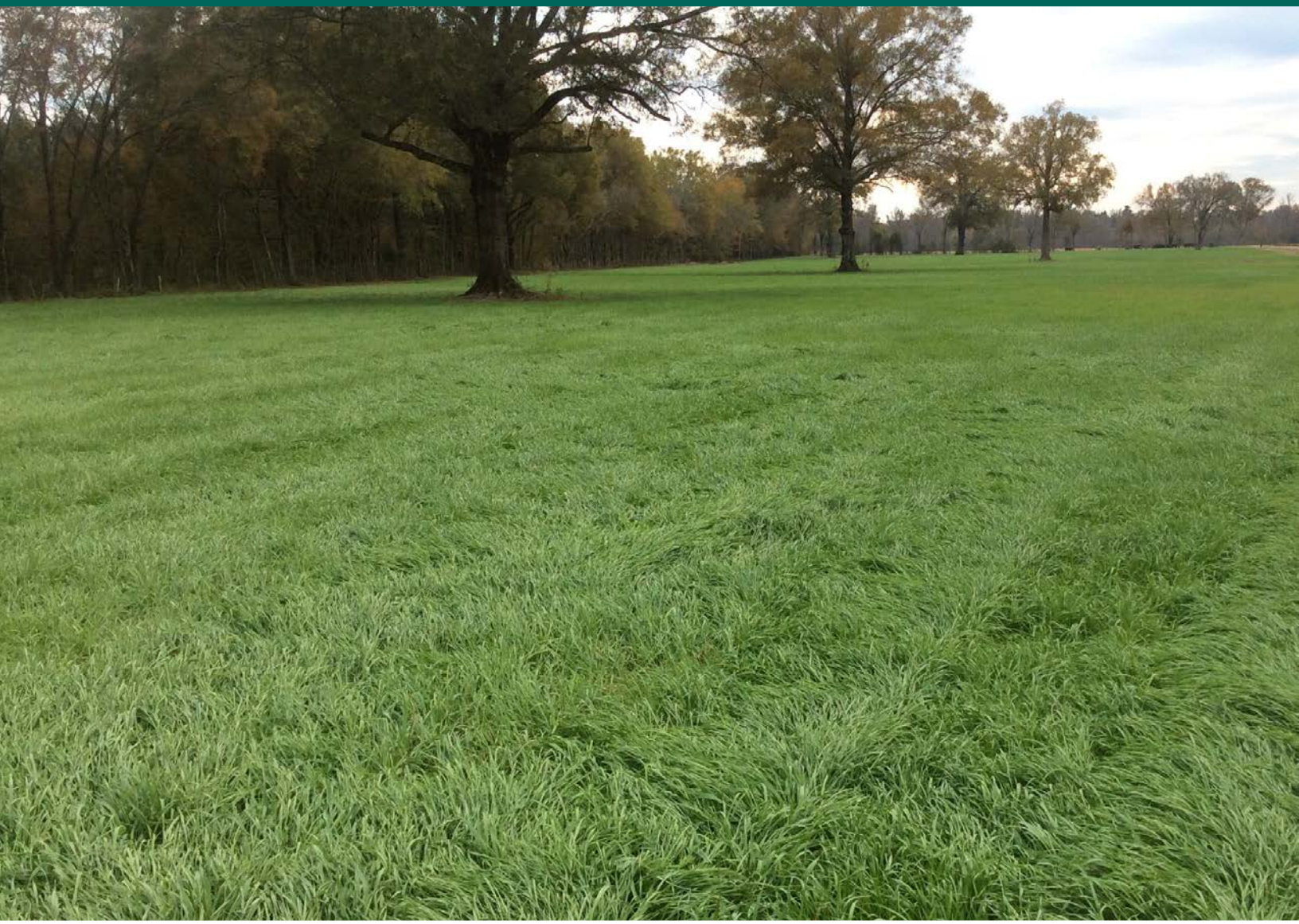

MISSISSIPPI'S OFFICIAL VARIETY TRIALS

MISSISSIPPI STATE UNIVERSITY™
MS AGRICULTURAL AND
FORESTRY EXPERIMENT STATION

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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 16 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 16.

Cover photo by Rocky Lemus

Mississippi Annual Cool-Season Forage Crop Variety Trials, 2017

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

Mississippi Annual Cool-Season Forage Crop Variety Trials, 2017

Introduction

Varieties of several forage-crop species are evaluated every year in Mississippi Agricultural and Forestry Experiment Station (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. Standard varieties may be added by the MAFES variety-testing program as a reference for comparison purposes. In addition, varieties of interest may also be added when applicable. Sources of seed are presented in Table 19. Testing during 2017–18 was conducted at the North Mississippi Branch Experiment Station at Holly Springs, Leveck Animal Research Center Forage Unit at Mississippi State University, Coastal Plain Branch Experiment Station at Newton, and White Sands Research Unit at Poplarville.

Data presented in Tables 4–17 can be used to evaluate the performance of each forage crop within its respective trial. Mean and harvest comparisons were evaluated statistically by using the least significant difference (LSD) test at the probability level of $\alpha = 0.05$. The LSD value represents the minimum amount of yield that must be observed between any two varieties to determine if the difference was due to variety variation alone.

Protocol

Annual ryegrass, small grains, and annual clover trials across the state were established from late September until the first week of October in 2017. 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 were planted using a precision-cone seeder on a prepared seedbed. Trial design was a randomized complete block replicated four times. Recommended seeding rates were used and are

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

presented in Table 1. 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 dry matter (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, 2017–2018.

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*
						2017						
Poplarville	9.53	5.03	5.56	3.63	11.64	21.1	11.42	8.64	1.65	6.52	0.99	0.00
Starkville	5.30	3.41	4.72	4.24	6.07	9.18	3.79	7.70	4.85	2.19	1.13	5.47
Holly Springs	5.77	2.70	4.11	5.49	3.69	8.63	1.36	4.3	2.28	1.42	1.61	6.46
Newton	9.55	2.41	4.73	6.41	7.89	12.66	4.12	4.06	0.79	2.43	1.41	4.09
						2018						
Poplarville	4.74	8.63	4.2	5.4	0.90	—	—	—	—	—	—	—
Starkville	2.03	10.33	5.61	5.93	1.92	—	—	—	—	—	—	—
Holly Springs	3.37	12.98	3.74	7.49	4.44	—	—	—	—	—	—	—
Newton	2.48	9.46	5.35	6.52	2.66	—	—	—	—	—	—	—
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

Table 3. Mean high and low temperatures by month for Poplarville, Starkville, Newton, and Holly Springs, 2017–2018.

Location	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	°F	*°F*	*°F*	*°F*	*°F*	*°F*	*°F*	*°F*	*°F*	*°F*	*°F*	*°F*
						2017						
Poplarville												
High	57	70	73	80	81	82	74	85	86	76	70	—
Low	42	47	52	56	60	66	60	69	65	55	48	—
Newton												
High	64	68	74	79	80	87	93	90	88	80	71	56
Low	41	42	46	52	57	67	71	70	61	55	45	36
Starkville												
High	62	66	70	80	79	86	93	89	86	79	68	57
Low	42	42	47	54	59	67	72	70	63	53	42	35
Holly Springs												
High	60	66	68	78	81	86	93	89	85	77	66	53
Low	42	42	45	55	58	67	72	70	63	52	42	33
						2018						
Poplarville												
High	51	69	71	61	74	—	—	—	—	—	—	—
Low	30	48	47	40	53	—	—	—	—	—	—	—
Newton												
High	55	71	71	75	89	—	—	—	—	—	—	—
Low	30	50	46	48	64	—	—	—	—	—	—	—
Starkville												
High	49	65	67	71	88	—	—	—	—	—	—	—
Low	26	43	43	44	64	—	—	—	—	—	—	—
Holly Springs												
High	49	63	63	70	87	—	—	—	—	—	—	—
Low	27	44	41	46	65	—	—	—	—	—	—	—
MS 30-yr. avg.												
High	56	60	69	76	83	89	92	92	87	77	67	58
Low	35	38	45	52	62	69	72	71	65	53	44	37

Annual Ryegrass

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. Planting dates vary with location. Overall, the best planting time is September to 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 north. Annual ryegrass should normally be allowed to reach an initial height of at least 10 inches before grazing begins.

Data in Tables 4–7 present the yield performance of ryegrass varieties at four locations within, ranging from Holly Springs in the north to Poplarville in the south. Entries were further analyzed by ploidy level (Tables 8–11). 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 in coastal areas, while diploids tend to have greater yields in the rest of the state.

Results

Ryegrass harvest dates were typical in the northern locations despite a dry, cold fall and early winter. In Holly Springs, first harvest yields by Passerel Plus, Flying A, Grits, Fria, ME4, and Lonestar were the greatest. By the second harvest, the majority of the ryegrass varieties produced similar dry matter (DM) yields. Diploid varieties produced on average 25% and 12% greater yields in the first and second harvest, respectively. In Starkville, Flying A, Passerel Plus, Marshall, Fria, PS12, Lonestar, WMWL, Attain, and ME4 produced the greatest DM yield in the first harvest with no difference among diploid and tetraploid varieties throughout the season. By the third harvest in Starkville, Fria, PS12, Lonestar, WMWL, Attain, and ME4 were still the greatest producers of DM yield.

In Newton and Poplarville, the first seasonal harvest was delayed by at least 30 days due to dry and cold fall conditions. In Newton, diploid varieties, on average, outproduced tetraploid counterparts by 9% in the first and third harvests. However, ryegrass varieties were mostly similar in DM yield production until the third harvest, when only Marshall, Attain, and LSC-B1191 were the greatest producers at this location. In Poplarville, tetraploids, diploids, and most varieties with the exception of a few low-yielding entries were similar in DM production throughout the season.

Table 4. Ryegrass yields, Holly Springs.

Variety	Harvest date		Total yield
	4/16/18	5/10/18	
	lb/A	*lb/A*	*lb/A*
Attain	1321	4203	5524
Big Boss	1780	3900	5680
Diamond T	1392	3515	4907
Double Diamond	1601	3426	5027
Flying A	2722	3795	6516
Fria	2162	3791	5953
Grits	2387	3979	6366
Jackson	1913	3974	5887
Koga	1861	4286	6147
Lonestar	2117	4050	6167
LSC-B1191	2004	4375	6379
M2CVS	1879	4231	6110
Marshall	1840	4562	6402
ME4	2129	4367	6496
ME-94	1779	4221	6000
Nelson	1285	2327	3611
Passerel Plus	2222	4180	6402
PPERC2	1808	4102	5910
PPERC7	1330	3710	5040
PPG-LWT 105	1701	3604	5305
PS12	1251	3137	4388
PS15	1768	3791	5559
SARG-FL	1860	3910	5769
TAMTBO	1707	3959	5666
Tetrastar	1690	3699	5389
Triangle T	1050	3250	4299
Winterhawk	1769	3998	5768
WMWL	1933	3828	5760
Mean	1795	3863	5658
CV, %	25	16	14
$LSD_{(0.05)}$	636	923	1183

Planted: 10/17/17
Soil type: Grenada Silt Loam

Fertilizer: 300 lb/A of 15-5-10 at planting and 50 lb/A of N (33-0-0S) after each harvest

Table 5. Ryegrass yields, Starkville.

Variety	Harvest date			Total yield
	3/9/18	4/3/18	5/8/18	
	lb/A	*lb/A*	*lb/A*	*lb/A*
Attain	1315	1216	3308	5839
Big Boss	786	1575	4410	6771
Diamond T	700	1765	3448	5912
Double Diamond	794	1165	3945	5904
Flying A	1005	1777	3251	6032
Fria	1066	1393	5061	7520
Grits	830	1559	3984	6372
Jackson	648	1814	4324	6786
Koga	479	1513	3776	5769
Lonestar	1189	817	2951	4958
LSC-B1191	934	1602	3661	6197
M2CVS	863	1680	4967	7510
Marshall	1064	1867	4313	7243
ME4	1350	2031	3917	7298
ME-94	891	1767	3204	5861
Nelson	963	1640	3399	6002
Passerel Plus	1007	1715	3781	6503
PPERC2	526	1399	5559	7484
PPERC7	589	989	3490	5067
PPG-LWT 105	736	1888	4298	6922
PS12	1182	1304	3487	5972
PS15	937	1516	4989	7442
SARG-FL	882	1432	3226	5540
TAMTBO	768	1287	2801	4855
Tetrastar	713	1254	3617	5584
Triangle T	805	1702	3721	6228
Winterhawk	873	1200	4541	6614
WMWL	1240	1492	2850	5582
Mean	898	1513	3867	6277
CV, %	28	24	19	16
$LSD_{(0.05)}$	365	529	1116	1472

Planted: 10/8/17
Soil type: Marietta Fine Sandy Loam

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

Table 6. Ryegrass yields, Newton.

Variety	Harvest date			Total yield
	3/9/18	4/6/18	5/4/18	
	lb/A	*lb/A*	*lb/A*	*lb/A*
Attain	2031	1571	1995	5597
Big Boss	2142	1565	2106	5812
Diamond T	1729	1562	2329	5620
Double Diamond	1887	1745	2482	6114
Flying A	2296	1414	2388	6098
Fria	2484	1757	2152	6393
Grits	2246	1664	3001	6911
Jackson	2365	1763	2615	6742
Koga	1831	1593	2113	5536
Lonestar	2045	1488	2318	5851
LSC-B1191	2319	1540	2452	6310
M2CVS	2044	2185	2569	6798
Marshall	1787	1870	2389	6045
ME4	2574	2106	2453	7132
ME-94	2099	1767	2346	6212
Nelson	1948	1724	2560	6231
Passerel Plus	1959	1670	2286	5915
PPERC2	2084	1653	2363	6101
PPERC7	1866	1716	2067	5650
PPG-LWT 105	2232	1485	2382	6098
PS12	2039	1754	2667	6461
PS15	1828	1513	2198	5538
SARG-FL	2245	1565	3200	7010
TAMTBO	2063	1658	2312	6033
Tetrastar	1683	1833	2090	5605
Triangle T	2109	1820	2264	6193
Winterhawk	1679	1746	2156	5581
WMWL	2009	1684	2256	5949
Mean	2058	1693	2375	6126
CV, %	24	16	16	12
$LSD_{(0.05)}$	NS[1]	NS	535	1036

[1]NS: Not significant
Planted: 10/19/17
Soil type: Prentiss Sandy Loam

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

Table 7. Ryegrass yields, Poplarville.

Variety	Harvest date		Total yield
	3/14/18	4/25/18	
	lb/A	*lb/A*	*lb/A*
Attain	1237	5741	6978
Big Boss	1065	4966	6031
Diamond T	2220	5327	7547
Double Diamond	2351	4380	6730
Flying A	2551	5277	7828
Fria	2130	4117	6247
Grits	1840	5139	6978
Jackson	2220	5373	7592
Koga	535	4862	5397
Lonestar	1598	4566	6164
LSC-B1191	1390	4287	5677
M2CVS	546	5814	6360
Marshall	1554	4528	6082
ME4	1288	5613	6901
ME-94	2118	5903	8021
Nelson	2560	5305	7864
Passerel Plus	1155	4584	5739
PPERC2	665	5549	6214
PPERC7	829	4775	5603
PPG-LWT 105	1474	4804	6277
PS12	1743	4693	6436
PS15	1533	5018	6551
SARG-FL	1647	4826	6473
TAMTBO	1437	5657	7095
Tetrastar	1947	4968	6915
Triangle T	1774	5410	7184
Winterhawk	1351	4968	6319
WMWL	1153	4823	5976
Mean	1568	5045	6613
CV, %	40	19	22
$LSD_{(0.05)}$	1245	NS[1]	NS

[1]NS: Not significant
Planted: 10/19/17
Soil type: Basin Loam

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

Table 8. Ryegrass yields by ploidy level, Holly Springs.

Ploidy	Harvest date		Total yield
	4/16/18	5/10/18	
	lb/A	*lb/A*	*lb/A*
Diploid	2068	4088	6113
Tetraploid	1533	3591	5125
Mean	1801	3840	5619
CV, %	26	18	16
$LSD_{(0.05)}$	S[1]	S	S

[1]S: Significant

Table 9. Ryegrass yields by ploidy level, Starkville.

Ploidy	Harvest date			Total yield
	3/9/18	4/3/18	5/8/18	
	lb/A	*lb/A*	*lb/A*	*lb/A*
Diploid	972	1587	3984	6543
Tetraploid	851	1480	3785	6116
Mean	912	1534	3885	6330
CV, %	32	28	23	18
$LSD_{(0.05)}$	NS[1]	NS	NS	NS

[1]NS: Not significant

Table 10. Ryegrass yields by ploidy level, Newton.

Ploidy	Harvest date			Total yield
	3/9/18	4/6/18	5/4/18	
	lb/A	*lb/A*	*lb/A*	*lb/A*
Diploid	2151	1749	2529	6429
Tetraploid	1959	1651	2291	5901
Mean	2055	1700	2410	6165
CV, %	22	17	19	12
$LSD_{(0.05)}$	S[1]	NS[2]	S	S

[1]S: Significant
[2]NS: Not significant

Table 11. Ryegrass yields by ploidy level, Poplarville.

Ploidy	Harvest date		Total yield
	3/14/18	4/25/18	
	lb/A	*lb/A*	*lb/A*
Diploid	1666	5058	6724
Tetraploid	1656	5094	6750
Mean	1661	5076	6737
CV, %	50	19	21
$LSD_{(0.05)}$	NS[1]	NS	NS

[1]NS: Not significant

Small Grains

In Mississippi, small grains (oat, wheat, rye, and triticale) are not utilized as extensively for forage as annual ryegrass because of lower annual 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. Rye and triticale are the most cold tolerant of forage crops; therefore, they have potential to continue vegetative growth during the fall and winter in Mississippi. Data presented in Tables 12–15 represent forage yields among small-grain varieties at four locations.

Results

The first small-grain harvest at all locations except Holly Springs were at least 30 days before the first ryegrass harvest. Cumulative forage yields of small grains were greater than that of ryegrass by the first ryegrass harvest only in Starkville and Poplarville, but ryegrass always produced greater seasonal forage yield. Small-grain DM yields in Holly Springs and Newton were similar throughout the growing season. In Starkville, by the second harvest, DM production was the greatest in NF95319B, EK201, NF00108, Trical 342, NF101, ON13PO16, NF97325, and Fl08128. By the third harvest, only EK201 and Elbon were the greatest DM yield producers.

Table 12. Small grain yields, Holly Springs.

Species/Variety	Harvest date		Total yield
	4/13/18	5/18/18	
	lb/A	*lb/A*	*lb/A*
Oat			
Bob	1529	2251	3780
Rye			
Bates RS4	1475	1930	3405
Elbon	2233	2418	4651
NF95319B	1695	2018	3713
NF97325	1629	1785	3414
Triticale			
FL01143	1267	1141	2408
FL08128	1273	2079	3352
Trical 342	1482	1191	2673
Trical Merlin Max	1332	2190	3522
Wheat			
EK201	1835	2699	4534
NF00108	1936	1500	3436
NF101	2252	1738	3990
NF97117	1400	1472	2873
ON13PO16	2253	2118	4371
ON14319	1694	1830	3524
Mean	1686	1891	3576
CV, %	36	40	28
$LSD_{(0.05)}$	NS[1]	NS	NS

[1]NS: Not significant
Planted: 10/17/17
Soil type: Grenada Silt Loam
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

Table 13. Small grain yields, Starkville.

Species/Variety	Harvest date			Total yield
	12/13/17	3/2/18	4/13/18	
	lb/A	*lb/A*	*lb/A*	*lb/A*
Oat				
Bob	592	247	345	1183
Rye				
Bates RS4	544	521	351	1416
Elbon	355	553	784	1693
NF95319B	598	641	375	1614
NF97325	271	843	391	1506
Triticale				
FL01143	625	569	201	1396
FL08128	273	859	254	1386
Trical 342	364	753	353	1471
Trical Merlin Max	520	611	580	1711
Wheat				
EK201	330	645	613	1587
NF00108	545	702	279	1526
NF101	455	792	307	1554
NF97117	834	542	428	1804
ON13PO16	510	804	389	1702
ON14319	404	637	340	1381
Mean	481	648	399	1529
CV, %	53	24	31	25
$LSD_{(0.05)}$	NS[1]	225	227	NS

[1]NS: Not significant
Planted: 10/18/17
Soil type: Marietta Fine Sandy Loam

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

Table 14. Small grain yields, Poplarville.

Species/Variety	Harvest date		Total yield
	1/26/18	3/14/18	
	lb/A	*lb/A*	*lb/A*
Oat			
Bob	438	3359	3797
Rye			
Bates RS4	385	3335	3720
Elbon	293	2572	2865
NF95319B	403	3179	3582
NF97325	343	2936	3278
Triticale			
FL01143	345	4147	4492
FL08128	262	3127	3389
Trical 342	334	4050	4385
Trical Merlin Max	444	2321	2765
Wheat			
EK201	582	2836	3418
NF00108	295	3011	3306
NF101	327	3018	3345
NF97117	406	3248	3654
ON13PO16	339	3419	3758
ON14319	374	2352	2726
Mean	371	3127	3499
CV, %	22	20	20
$LSD_{(0.05)}$	143	944	1005

[1]Planted: 10/19/17
Soil type: Basin Loam

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

Table 15. Small grain yields, Newton.

Species/Variety	Harvest date		Total yield
	2/2/18	3/5/18	
	lb/A	*lb/A*	*lb/A*
Oat			
Bob	1102	1132	2234
Rye			
Bates RS4	1681	1071	2752
Elbon	1066	1342	2408
NF95319B	1269	1552	2820
NF97325	964	1360	2324
Triticale			
FL01143	528	1692	2220
FL08128	876	1001	1877
Trical 342	1035	1467	2502
Trical Merlin Max	1005	888	1893
Wheat			
EK201	587	1161	1748
NF00108	480	1278	1758
NF101	361	1254	1615
NF97117	1026	1369	2396
ON13PO16	1200	1477	2677
ON14319	633	1113	1746
Mean	921	1277	2198
CV, %	50	32	44
$LSD_{(0.05)}$	NS[1]	NS	NS

[1]NS: Not significant
Planted: 10/19/17
Soil type: Prentiss Sandy Loam
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

Annual Clover

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. Arrowleaf clover has been highly productive with excellent reseeding potential. It matures later than most annual legumes and can grow 2–4 feet tall. Arrowleaf clover remains more productive if grazed to a height of 2–4 inches in early spring. However, if it is cut too late or early in maturity, regrowth will be limited. Crimson clover is an early-maturing clover that produces excellent forage, but 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 16–18 represent forage yield data from annual clover trials at four locations across the state.

Results

Annual clovers in Holly Springs were flooded due to heavy rainfall shortly after planting. Therefore, these plots were poorly established and were not harvested. Clover yields were similar in Starkville for the first harvest, but, by the second harvest, Bigbee berseem produced the greatest forage yields followed by Frosty Berseem. In Newton, Dixie crimson clover and Frosty berseem were the greatest DM producers during the first harvest, with the second harvest producing only meager yields by all varieties. By the second harvest in Poplarville, Dixie crimson and Frosty berseem were again the greatest producers or forage yields.

Table 16. Annual clover yields, Starkville.

Species/Variety	Harvest date		Total yield
	3/27/18	5/8/18	
	lb/A	*lb/A*	*lb/A*
Arrowleaf			
Yuchi	1356	1339	2696
Balansa			
Fixation	1982	1209	3191
Cobra	1300	109	1409
Berseem			
Bigbee	1199	2831	4031
Frosty	1619	1717	3335
Crimson			
Dixie	1833	876	2709
Mean	1548	1347	2895
CV, %	42	16	38
$LSD_{(0.05)}$	NS[1]	482	1608

[1]NS: Not Significant
Planted: 10/18/17
Soil type: Marietta Fine Sandy Loam
Fertilizer: 100 lb/A of 0-0-60
Herbicide: 5 oz/A of Pursuit® (imazethapyr)

Table 17. Annual clover yields, Newton.

Species/Variety	Harvest date		Total yield
	4/6/18	5/4/18	
	lb/A	*lb/A*	*lb/A*
Arrowleaf			
Yuchi	1356	1339	2696
Balansa			
Fixation	1982	1209	3191
Cobra	1300	109	1409
Berseem			
Bigbee	1199	2831	4031
Frosty	1619	1717	3335
Crimson			
Dixie	1833	876	2709
Mean	1548	1347	2895
CV, %	42	16	38
$LSD_{(0.05)}$	NS[1]	482	1608

[1]NS: Not significant
Planted: 10/18/17
Soil type: Prentiss Sandy Loam
Fertilizer: 100 lb/A of 0-0-60
Herbicide: 5 oz/A of Pursuit® (imazethapyr)

Table 18. Annual clover yields, Poplarville.

Species/Variety	Harvest date		Total yield
	3/14/18	4/25/18	
	lb/A	*lb/A*	*lb/A*
Arrowleaf			
Yuchi	—	741	741
Balansa			
Fixation	—	591	591
Cobra	—	30	30
Berseem			
Bigbee	—	1488	1488
Frosty	876	1606	2482
Crimson			
Dixie	663	2667	3330
Mean	770	1187	1444
CV, %	5.6	45	50
$LSD_{(0.05)}$	NS[1]	1106	1389

[1]NS: Not significant
Planted: 10/19/17
Soil type: Prentiss Sandy Loam
Fertilizer: 100 lb/A of 0-0-60
Herbicide: 5 oz/A of Pursuit® (imazethapyr)

Table 19. Sources of seed, 2017.

Species/Variety	Seed company/source	Species/Variety	Seed company/source
Annual Ryegrass		**Annual Clovers**	
Fria	Allied Seed LLC	Cobra	Mountain View Seeds
Lonestar	Grassland Oregon	Fixation	Grassland Oregon
Tetrastar	Grassland Oregon	Frosty	Grassland Oregon
LSC-B1191	Lewis Seed Company	Bigbee	—
Grits	Lewis Seed Company	Dixie	—
PPG-LWT 105	Mountain View Seeds	Yuchi	—
Double Diamond	Oregro Seeds Inc.		
Triangle T	Oregro Seeds Inc.		
Diamond T	Oregro Seeds Inc.		
Flying A	Oregro Seeds Inc.	**Small Grains**	
TAMTBO	Oregro Seeds Inc.	NF00108	The Noble Foundation
Winterhawk	Oregro Seeds Inc.	NF97117	The Noble Foundation
Passerel Plus	Pennington Seed	NF101	The Noble Foundation
PS12	Pennington Seed	ON13PO16	The Noble Foundation
PS15	Pennington Seed	Bates RS4	The Noble Foundation
PPERC7	Pennington Seed	ON14319	The Noble Foundation
PPERC2	Pennington Seed	NF97325	The Noble Foundation
Big Boss	Smith Seed Services	NF95319B	The Noble Foundation
Koga	Smith Seed Services	Trical 342	Trical Superior Forage
SARG-FL	Smith Seed Services	Trical Exp 70126	Trical Superior Forage
Attain	Smith Seed Services	FL01143	University of Florida
Jackson	The Wax Company LLC	FL08128	University of Florida
M2CVS	The Wax Company LLC	Elbon	—
Marshall	The Wax Company LLC	Bob	—
ME4	The Wax Company LLC	EK201	—
ME-94	The Wax Company LLC		
WMWL	The Wax Company LLC		
Nelson	The Wax Company LLC		

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