MISSISSIPPI PERENNIAL COOL-SEASON FORAGE CROP

VARIETY TRIALS, 2021

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MISSISSIPPI'S OFFICIAL VARIETY TRIALS

MISSISSIPPI STATE UNIVERSITY™
MS AGRICULTURAL AND
FORESTRY EXPERIMENT STATION

Mississippi Perennial Cool-Season Forage Crop Variety Trials, 2021

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Visit our website at ***mafes.msstate.edu/variety-trials/forage.asp***.

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INTRODUCTION

Varieties of forage crops are evaluated every year in MAFES small-plot trials. The 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 were added by MAFES as a reference for comparison purposes. Seed sources are presented in Table 11. This report contains data for tall fescue (*Festuca arundinacea)*, perennial clovers (white clover, *Trifolium repens*; red clover, *Trifolium pretense*) alfalfa (*Medicago sativa*), and chicory (*Cichirium intybus*) established in fall 2020. Trial locations are Leveck Animal Research Farm Forage Unit at Starkville, Black Belt Branch Experiment Station at Brooksville, and Coastal Plain Branch Experiment Station at Newton.

Data presented in Tables 2–10 can be used to evaluate the performance of each forage variety or species within that test. Comparisons were statistically evaluated by using the LSD (least significant difference) at the 0.05 probability level. 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. Coefficient variation (CV) describes the accuracy of the test compared to other tests. Highly variable results between replications will be reflected in a high CV.

PROTOCOL

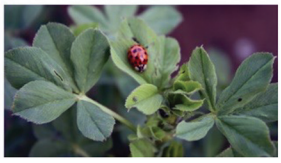
Tall fescue, perennial clovers, and alfalfa trials across the state were established in October 2020. Soil samples from each location were taken and analyzed at the Mississippi State University Soil Testing Lab. Each trial area was fertilized with lime, phosphorus (P_2O_5), and potassium (K_2O) according to soil test recommendations. Recommendations for phosphorus and potassium in the grass were usually fulfilled with one application of 13-13-13. Tall fescue trials were fertilized with 350 pounds per acre of 13-13-13 at planting, followed by 50 pounds per acre of N using urea ammonium sulfate (33-0-0S) after each harvest. Plot dimensions were 6 feet by 10 feet and planted using a precision cone seeder on a prepared seedbed. Plots were arranged as a randomized complete block replicated four times. Recommended seeding rates were based on pure live seed (PLS) and are presented in Table 1. All grass plots were harvested when 75% of the plots achieved 15 inches of growth. Alfalfa was harvested at 50% bloom, and clovers were harvested when 75% of plots were 10–15 inches in height. Perennial clovers, alfalfa, and tall fescue were harvested to a 4-inch stubble height. Plots were harvested with a Winterstieger plot harvester equipped with a forage header. A subsample was collected and dried at 131°F to calculate dry matter percentage (DM). 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. Seeding rates used in variety trials.[1]

Variety	Seeding rate (PLS)
	lb/A
Alfalfa	
Red Clover	
Tall Fescue	
White Clover	
Chicory	

[1]PLS = Pure Live Seed.

PERENNIAL CLOVER AND ALFALFA



Alfalfa is a perennial legume common in the Midwest and irrigated in the West and North. Alfalfa varieties have been bred for more Southern climates, but stand persistence can be a problem. Several diseases and pests such as crown rot (*Sclerotinia trifoliorum)*, stem rot (*Phytophthora medicaginis*), alfalfa weevil (*Hypera hostica*), and leafhoppers (*Empoasca solana*) are major problems. Alfalfa is also very sensitive to soil pH and should be maintained at 6.5 or greater. Alfalfa is one of the few forages that include both RoundUp Ready and conventional varieties. Planting should take place between September and October at a seeding rate of 20 pounds per acre on a firm seedbed. Most of the yield distribution for alfalfa is in early summer to early fall. Alfalfa can also be successfully established in warm-season sod grasses to increase hay quality and yield distribution, especially in low nitrogen input situations.

Red clover is a short-lived perennial in Mississippi, rarely surviving the summers. In central to southern Mississippi, it should be treated as an annual. Red clover tolerates wet, acidic soils and withstands shading during the seedling stage, which gives it the potential to be overseeded in sod grasses. When seeding in an established pasture system, it is best to plant between October 15 and November 20. In grass mixtures, plant red clover at 4–8 pounds per acre, but in pure stands, 12 pounds per acre will be sufficient.

White clover is more persistent than red clover, but yields are typically less. It does offer more opportunity in grazing situations than in hay harvest because of its prostrate growth habit. White clover is tolerant of wet soils and prefers a pH of 6 or above. Plant white clover at 3–4 pounds per acre in pure stands or 2–3 pounds per acre in mixtures between September and October. Like red clover, white clover acts as an annual in the southern part of the state, but it has a greater reseeding potential. Both species of clovers have excellent forage quality, but white clover tends to have a greater potential to cause bloat. When grazing white clover, it is recommended to interseed with grass to reduce bloat potential.

Table 2. Dry matter yields of alfalfa, red clover, and white clover varieties by harvest date in Starkville.

Variety	4/21/21	6/16/21	
	lb/A	*lb/A*	*lb/A*
Alfalfa			
Bulldog		2660	2949
GO-FU		1673	2658
UF 2015		—	—
Red Clover			
CV30091		2616	3950
CW040040		2979	3487
Dynamite		2398	4399
Q		2033	3836
White Clover			
AberLasting		2116	3027
Cresendo		2382	3833
Domino		1277	3337
Stamina		1677	3523
Mean		2181	3500
$LSD_{0.05}$		NS	1061
CV,%		40	21

Planted: 10-8-20
NS: not significant
Herbicide: 5 oz/A of imazethapyr
Soil type: Marietta Fine Sandy Loam

Table 3. Dry matter yields of alfalfa, red clover, and white clover varieties by harvest date in Newton.

Variety	5/21/21	7/9/21	
	lb/A	*lb/A*	*lb/A*
Alfalfa			
Bulldog		1118	1262
GO-FU		843	1259
UF 2015		961	1375
Red Clover			
CV30091		1659	1474
CW040040		1877	1674
Dynamite		1694	2214
Q		2214	2609
White Clover			
AberLasting		460	956
Cresendo		1383	1968
Domino		519	1685
Stamina		353	1022
Mean		1189	1591
LSD $_{0.05}$		1034	1246
CV, %		45	43

Planted 10-16-20
Herbicide: 5 oz/A of imazethapyr
Soil type: Prentiss Fine Sandy Loam

Table 4. Dry matter yields of alfalfa, red clover, and white clover varieties by harvest date in Brooksville.

Variety			5/14/219/27/21	7/16/2021
	lb/A	*lb/A*	*lb/A*	*lb/A*
Alfalfa				
Bulldog		3123	2628256	
GO-FU		1334	2417178	
UF 2015		2075	2790403	
Red Clover				
CV30091		1703	3046—	
CW040040		2476	3035	
Dynamite		2274	3156—	
Q		2331	2723 —	
White Clover				
AberLasting		847	1959—	
Cresendo		2050	3270—	
Domino		410	1812—	
Stamina		2394	2870 —	
Mean		1911	2701912	
LSD $_{0.05}$		2257	373NS	
CV, %		42	41 40	

Planted 10-7-20
NS: not significant
Herbicide: 5 oz/A of imazethapyr
Soil type: Silty Clay

TALL FESCUE

Tall fescue is a perennial grass with short rhizomes and is primarily grown in the northern part of the state. It does well on poorly drained soils, making it popular in lowland areas. Tall fescue should be established from September to October at a seeding rate of 15–20 pounds per acre. During the establishment (mid-March to late June) year, avoid grazing below 4 inches and do not graze from July to September to minimize stand failure. Tall fescue tolerates soil pH of 5.8 to 7.5 and responds well to nitrogen. Endophyte toxicity can be an issue; however, the inclusion of clovers and the use of novel-endophyte and endophyte-free varieties can be used to mitigate the harmful effects of the toxin.

Table 5. Dry matter yields of tall fescue varieties by harvest date in Brooksville.

Variety	4/22/21	12/2/21	6/1/21
	lb/A	*lb/A*	*lb/A*
Armory	4532	1528	225
BAR 9301BTR1	3079	449	1452
BAR BTR NEA23	4519	840	1445
BAR FA6 BTR 179	2636	138	1789
BarOptima PLUS e34	2881	433	1138
Estancia/ArkShield	5124	1085	604
GALA16101T	3161	457	796
Kentucky 32	4237	1647	707
SLTF10-3	1724	328	282
Mean	3543	1306	617
LSD $_{0.05}$	NS	414	NS
CV, %	40	42	40

Planted 10-7-20
NS: not significant
Fertilizer: 50 lb/A N (13-13-13) after planting and 50 lb/A N (33-0-0S) after each harvest
Herbicides: 1 qt/A of aminopyralid and 2,4-D after first harvest
Soil type: Silty Clay

Table 6. Dry matter yields of tall fescue varieties by harvest date in Starkville.

Variety	11/29/21		
	lb/A	*lb/A*	*lb/A*
Armory	1114		1629
BAR 9301BTR1	748	1254	
BAR BTR NEA23	771	1639	
BAR FA6 BTR 179	669	1407	
BarOptima PLUS e34	1670		879
Estancia/ArkShield	1107	1985	
GALA16101T	783	2590	
Kentucky 32	1000	2145	
SLTF10-3	501	1565	
Mean	841		1765
LSD $_{0.05}$	NS		616
CV, %	44		24

Planted: 10-1-20
NS: Not Significant
Fertilizer: 50 lb/A N (13-13-13) after planting and 50 lb/A N (33-0-0S) after each harvest
Herbicides: 1 qt/A of aminopyralid and 2,4-D after first harvest
Soil type: Stough Fine Sandy Loam

Table 7. Dry matter yields of tall fescue varieties by harvest date in Newton.

Variety	5/21/21		
	lb/A	*lb/A*	*lb/A*
Armory	3038		1648
BAR 9301BTR1	2886	2510	
BAR BTR NEA23	2410	1975	
BAR FA6 BTR 179	2223	1192	
BarOptima PLUS e34	1605		3358
Estancia/ArkShield	2787	1971	
GALA16101T	2511	1865	
Kentucky 32	2493	1892	
SLTF10-3	2662	1658	
Mean	2707		1813
LSD $_{0.05}$	671		NS
CV, %	17		37

Planted 10-16-20
NS: Not Significant
Fertilizer: 50 lb/A N (13-13-13) after planting and 50 lb/A N (33-0-0S) after each harvest
Herbicides: 1 qt/A of aminopyralid and 2,4-D after first harvest
Soil type: Prentiss Sandy Loam

CHICORY

Chicory (*Cichorium intybus*) is a perennial, short-lived herb native to Europe with growth potential in Mississippi from April to August. It produces a deep taproot and easily reseeds itself if allowed to flower. It is ideally planted in the fall and allowed to establish before winter. Chicory is highly nutritive and extremely succulent, and it tends to be resistant to armyworms herbivory. By late spring and throughout the summer, it readily produces seed heads and may become less palatable to livestock. Heavy grazing with nitrogen fertilizer application is suggested to maintain good forage quality.

Table 8. Dry matter yields of chicory varieties by harvest date in Newton.

Variety	5/21/21		
	lb/A	*lb/A*	*lb/A*
Additive		2218	985
DLF		1512	692
Endure		1533	846
Oasis		2157	638
Six Point		2380	1029
Trigger		2276	785
Mean		2013	829
$LSD_{0.05}$		37	31
CV, %		NS	NS

Planted 10-16-20
NS: not significant
Fertilizer: 50 lb/A N (13-13-13) after planting and 50 lb/A N (33-0-0S) after each harvest
Soil type: Prentiss Sandy Loam

Table 9. Dry matter yields of chicory varieties by harvest date in Starkville.

Variety	6/16/21	7/21/21	8/29/21	
	lb/A	*lb/A*	*lb/A*	*lb/A*
Additive	1860	1894	1698	716
DLF	754	1667	1921	302
Endure	1132	1764	1508	1111
Oasis	1609	1984	1907	593
Six Point	1380	1800	2012	691
Trigger	1509	1944	1890	404
Mean	1374	1842	1822	636
$LSD_{0.05}$	39	25	28	40
CV, %	796	NS	NS	571

Planted 10-8-20
NS: not significant
Fertilizer: 50 lb/A N (13-13-13) after planting and 50 lb/A N using (33-0-0S) after each harvest
Soil type: Savannah Fine Sandy Loam

Table 10. Dry matter yields of chicory varieties by harvest date in Brooksville.

Variety	6/1/21	7/2/21	7/16/21	8/12/21	
	lb/A	*lb/A*	*lb/A*	*lb/A*	*lb/A*
Additive	1827	3324	1810	844	7
DLF	265	884	1812	969	93
Endure	1774	3386	1665	884	77
Oasis	2013	3539	1791	668	80
Six Point	1857	3381	1953	728	79
Trigger	1940	3195	1743	810	76
Mean	2011	3451	1795	817	80
$LSD_{0.05}$	27	14	20	30	
CV, %	836	NS	NS	NS	1

Planted: 10-7-20
NS: not significant
Fertilizer: 50 lb/A N (13-13-13) after planting and 50 lb/A N (33-0-0S) after each harvest
Soil type: Silty Clay

Table 11. Seed sources and support for the perennial cool-season forage variety trial.	
Variety	
Perennial Clover	
CV30091	
CW040040	
Cresendo	
Stamina	Grassland Oregon
Dynamite	Grassland Oregon
Q	Grassland Oregon
Domino	Grassland Oregon
AberLasting	Grassland Oregon
GO-FU	Grassland Oregon
Bulldog	
UF 2015 AP	University of Florida
Tall Fescue	
BAR FA6 BTR 179	
BAR BTR NEA23	
Armory	
BAR 9301BTR1	
BarOptima PLUS e34	
Estancia/ArkShield	Mountain View Seeds
Kentucky 32	
SLTF10-3	
GALA16101T	University of Georgia
Chicory	
Oasis	Mountain View Seeds
Additive	Mountain View Seeds
Six Point	Mountain View Seeds
Endure	Mountain View Seeds
Trigger	Mountain View Seeds
DLF	Mountain View Seeds

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Scott Willard, Director **www.mafes.msstate.edu**