

FORAGE AND LIVESTOCK RESEARCH - 1988

RESEARCH CENTER TECHNICAL REPORT 88-1

Texas A&M University Agricultural Research & Extension Center
at Overton

Texas Agricultural Experiment Station
Texas Agricultural Extension Service

Overton, Texas

April 21, 1988

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SEASONAL PRODUCTION OF ANNUAL FORAGE LEGUMES AT OVERTON, 1985-86

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SUMMARY

Fifty annual clovers, including arrowleaf, crimson, subterranean, berseem, ball, and six vetches were evaluated for forage production and adaptation at Overton in 1985-86. Twenty-seven annual clovers and six vetches were evaluated in 1986-87. Annual clover production in 1985-86 ranged from 3601 lbs DM/ac for Meechee arrowleaf to 1142 lbs DM/ac for MS Expl. 1 berseem clover. Vetch production in 1985-86 ranged from 3238 lbs DM/ac for Hairy vetch to 91 lbs DM/ac for Nova II. In 1986-87, Mt. Barker subterranean was the most productive annual clover with 5126 lbs DM/ac, while Meechee arrowleaf produced 1077 lbs DM/ac. Woodford vetch produced 4316 lbs DM/ac in 1986-87 while Vantage produced 204 lbs DM/ac.

INTRODUCTION

Reseeding winter-annual legumes have the potential to provide high quality grazing during late fall, winter and spring without the costs of nitrogen fertilizer. The distribution of forage production from these legumes is a direct complement to warm-season perennial grasses. The objectives of these experiments were: 1) to determine seasonal distribution of annual forage legume dry matter production; and 2) to determine the general adaptation of annual forage legumes to East Texas soil and climatic conditions.

PROCEDURE

Fifteen annual clovers and six vetches were drilled into a mixed Coastal and common bermudagrass sod on October 15, 1985. Twelve annual clovers and six vetches were drilled into a native sod of common bermudagrass and Paspalum setaceum on October 7, 1986. A small-plot drill with six double disk openers, spaced nine inches apart, was used to place the seed one-half inch deep in the 5x10 foot plots. All plots were fertilized according to soil tests prior to planting. Fertilizer applied in 1985 was 100 lbs P₂O₅, 162 lbs K₂O, and 1.5 lbs B/ac. Fertilizer applied in 1986 was 100 lbs P₂O₅, 180

lbs K₂O, and 1.5 lbs B/ac. The clovers were harvested at 2.25 inches and the vetch at 1.75 inches with a rotary mower.

Thirty-five varieties or experimental lines of sub clover were established on October 18, 1985 in a prepared seedbed. Fifteen varieties of sub clover were established on October 10, 1986. Plot size for both years was 4x4 ft. harvested at 1.5 inches. Fertilizer applied was the same as the annuals for both years.

Seeding rates and Rhizobium inoculants for each legume species are shown in Table 1. Peat inoculant, supplied by the Nitragin Co., was applied at 1.6 oz. per pound of seed with Pelgel solution used as adhesive to stick inoculant to the seed.

Each experiment was arranged in a randomized complete block design with four replications for the annual clover and vetch evaluations and three replications for the sub clover tests. At each harvest, subsamples were weighed, dried at 60°C for 48 hours and weighed again, to calculate dry matter yield per acre.

RESULTS

1985-86

Arrowleaf was the most productive forage legume evaluated in 1985-86, followed by ball clover, hairy vetch, and crimson clover (Tables 2, 3, and 4). Common vetch, berseem clover, and sub clover were severely stressed by low rainfall (0.7 in.) in March, resulting in low forage yield. Crimson clover was the most productive in March and April while arrowleaf was more productive in April and May. Woogenellup was the earliest maturing sub variety in this study yielding 1830 lbs DM/ac in late March. Miss. Ecotype and Tallarook were the most productive varieties in the late April harvest. Hairy and Woodford vetch produced as well as many of the annual clovers.

1986-87

Mt. Barker sub was the most productive forage legume in 1986-87 (Table 5). Sub clover production ranged from 5126 lbs DM/ac for Mt. Barker to 1727 lbs DM/ac for Daliak. Peak production was in the March 31 harvest with Nangeela and Koala producing 2363 and 2242 lbs DM/ac, respectively. The earlier varieties, Nungarin, Dalkeith, Daliak, Geraldton, and others, decreased in yield by the April 27 harvest.

Tallarook, a later variety, topped the other varieties in the April 27 harvest.

Production of Woodford vetch was higher than the previous season with 4316 lbs DM/ac (Table 6). Hairy vetch followed with 3055 lbs DM/ac, a drop from the previous season yield. The common vetches, Vanguard, Cahaba White, Nova II, and Vantage, are not well-adapted to east Texas growing conditions. Production of these vetches is generally well below that of Woodford and Hairy vetch.

Annual clover forage production in 1986-87 ranged from 3549 to 1077 lbs DM/ac for Dixie crimson and Meechee arrowleaf, respectively (Table 7). This is a reversal of the expected forage production potential for crimson and arrowleaf at Overton. Forage production of arrowleaf and ball clover was depressed relative to crimson and berseem. Both crimson and berseem clover maintained their expected seasonal yield relative to previous years.

TABLE 1. SEEDING RATES AND RHIZOBIUM INOCULANTS USED IN EVALUATION OF ANNUAL FORAGE LEGUMES

Species	Seeding Rate ---lbs/ac---	Inoculant Type ¹
Arrowleaf	14.3	0
Ball	3.6	B
Berseem and Crimson	19.6	R
Rose and Subterranean	19.6	WR
Common Vetch	35.0	C
Hairy and Bigflower Vetch	25.0	C

¹Supplied by the Nitragin Co., Milwaukee, WI. Applied at 1.0 oz. per pound of seed with Pelgel solution as an adhesive.

TABLE 2. SEASONAL FORAGE PRODUCTION OF SOD-SEEDED ANNUAL CLOVERS AT OVERTON, TX, 1985-86

Variety	Harvest Date			Total
	3-13-86	4-8-86	5-9-86	
-----lbs DM/acre-----				
Meechee arrowleaf	774	1135	1692	3601
Yuchi arrowleaf	822	1194	1575	3591
Common Ball	304	967	2176	3447
Segrest Ball	447	850	2004	3301
Amclo arrowleaf	599	1029	1559	2187
Autauga crimson	1105	1535	521	3161
Chief crimson	859	1541	664	3064
Dixie crimson	1089	1440	468	2997
Tibbee crimson	1008	1434	351	2793
MS Expl. 3 berseem	385	382	878	1645
Bigbee berseem	388	411	843	1642
84 Bigbee berseem ¹	322	349	678	1349
MS Expl. 2 berseem	349	330	669	1348
85 Bigbee berseem ²	290	358	670	1318
MS Expl. 1 berseem	314	251	577	1142
C.V. = 36.2%			LSD (0.05) = 409	

¹Supplied by Funk's in 1984.

²Supplied by Funk's in 1985.

TABLE 3. SEASONAL FORAGE PRODUCTION OF SUBTERRANEAN CLOVER AT OVERTON, TX, 1985-86

Variety/Line ¹	Harvest Date		Total
	3-24-86	4-29-86	
-----lbs/DM/acre-----			
Woogenellup	1830	875	2705
Tallarook	1250	1307	2557
SE 22	756	1322	2078
SK 43	649	1408	2057
SI 35	737	1291	2028
LO 32	1074	947	2021
Miss. Ecotype	659	1357	2016
SG 1	726	1289	2015
311499	1018	980	1998
319145	851	1132	1983
168638	861	1103	1964
SC 2	971	985	1956
LO 712	740	1146	1886
Nangeela	974	894	1868
SB 28	1005	826	1831
311498	838	962	1800
LO 593	753	978	1731
LO 1598	711	1017	1728
209924	1175	551	1726
291917	852	867	1719
184962	867	846	1713
SK 15	472	1235	1707
SB 23	636	1069	1705
SH 2	489	1174	1663
SE 23	512	1147	1659
SB 20	877	771	1648
SD 26	801	846	1647
Meteora	442	1198	1640
Mt. Barker	899	699	1598
SK 42	544	911	1455
SF 26	635	781	1416
401573	648	744	1392
SD 42	526	853	1379
SG 16	325	1006	1331
SI 41	389	895	1284

C.V. = 27.5%

LSD (0.05) = 805

¹Numbers or letter-number combinations denote experimental sub clover lines from the Overton clover breeding program.

TABLE 4. SEASONAL FORAGE PRODUCTION OF VETCH AT OVERTON, TX, 1985-86

Variety	Harvest Date			Total
	3-14-86	4-8-86	5-12-86	
-----lbs DM/acre-----				
Hairy	692	1443	1103	3238
Woodford bigflower	450	930	1095	2475
Cahaba White	639	206		845
Vantage	538	157		695
Vanguard	417	202		619
Nova II	63	28		91
C.V. = 33.5%			LSD (0.05) = 634	

TABLE 5. SEASONAL FORAGE PRODUCTION OF SUBTERRANEAN CLOVER AT OVERTON, TX, 1986-87

Variety	Harvest Date			Total
	2-11-87	3-31-87	4-27-87	
-----lbs DM/ac-----				
Mt. Barker	1291	1950	1885	5126
Nangeela	869	2363	1757	4989
Tallarook	830	1945	2058	4833
Enfield	1328	1920	1291	4539
Esperance	1061	2051	1419	4531
Larisa	615	2139	1755	4509
Karridale	746	2033	1364	4143
Koala	1091	2242	708	4041
Miss. Ecotype	303	1673	2011	3987
Meteora	347	1754	1879	3980
Woogenellup	1193	1635	787	3615
Geraldton	1239	1545	267	3051
Dalkeith	995	1904	75	2974
Nungarin	980	1181	0	2161
Daliak	145	1331	251	1727
C.V. = 11.3%			LSD (0.05) = 732	

TABLE 6. SEASONAL FORAGE PRODUCTION OF SOD-SEEDED VETCH AT OVERTON, TX, 1986-87

Variety	Harvest Date		Total
	3-20-87	4-24-87	
	-----lbs DM/ac-----		
Woodford	2117	2199	4316
Hairy	1067	1988	3055
Vanguard	368		368
Cahaba White	367		367
Nova II	267		267
Vantage	204		204
C.V. = 25.7%		LSD (0.05) =	549

TABLE 7. SEASONAL FORAGE PRODUCTION OF SOD-SEEDED ANNUAL CLOVERS AT OVERTON, TX, 1986-87

Variety	Harvest Date			Total
	2-13-87	3-24-87	4-30-87	
	-----lbs DM/ac-----			
Dixie	512	2523	514	3549
Chief	357	1922	862	3141
Tibbee	521	1931	319	2771
Bigbee	348	1454	555	2357
Bigbee (84)	498	1306	550	2354
Bigbee (85)	453	1293	603	2349
OVB-1	311	1390	492	2193
Common Ball		1044	889	1933
Segrest Ball		1122	702	1824
Yuchi		415	990	1405
Amclo		299	782	1081
Meechee		256	821	1077
C.V. = 12.8%		LSD (0.05) =	401	