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## Seasonal Production of Annual Forage Legumes at Overton, 1985-86

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### Summary

Sixty-three annual clovers, including arrowleaf, crimson, rose, ball, and berseem, were evaluated for forage production and adaptation at Overton in 1985 to 1986. Six vetches, including common, hairy, and bigflower were also evaluated. Annual clover forage production ranged from 4,104 to 1,142 lbs DM/A for 'RH-18' rose clover and 'MS Expl. 1' berseem clover, respectively. Vetch production ranged from 3,238 to 91 lbs DM/A for 'Hairy' and 'Nova II', respectively.

### 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

Twenty-eight annual clovers and six vetches were drilled into a mixed 'Coastal' and common bermudagrass sod on October 15, 1985. A small-plot drill with six double-disk openers, spaced 9 inches apart, was used to place seed one-half inch deep in 5 X 10-ft plots. The clovers were harvested at 2.25 inches and the vetches at 1.75 inches with a rotary mower.

Thirty-five varieties or experimental lines of subterranean (sub) clover were established in 4 X 4-ft plots on a prepared seedbed October 18, 1985. Square-foot quadrants were hand-harvested at 1.5 inches.

All plots were fertilized prior to planting and according to soil tests with 100 lbs/A P<sub>2</sub>O<sub>5</sub>, 162 lbs/A K<sub>2</sub>O, and 1.5 lbs/A B. 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 oz per pound of seed with Pelgel solution used as an adhesive to stick inoculant to the seed.

Each experiment was arranged in a randomized complete block design with four replications. At each harvest, forage samples were weighed, dried at 70°C for 48 hours, and weighed again. Percent dry matter was calculated and used to estimate forage production per acre.

### Results and Discussion

Arrowleaf and rose clover were the most productive forage legumes evaluated in 1985 to 1986, followed by

crimson clover, ball clover, and hairy vetch (Tables 2-5). Common vetch, berseem clover, and sub clover were severely stressed by low rainfall (0.7 in) in March, resulting in low forage production. Seasonal distribution of forage production varied widely according to species. Crimson clover was the most productive in March and April with yield dropping sharply in May. In contrast, ball clover production peaked in May, but early season yields were low. The highest yielding rose clover experimental lines produced the most forage in April with production extending into May. Early maturing rose clover varieties, such as 'Kondinin' and 'Hykon' were very unproductive due to low yields in April and May. Arrowleaf clover was productive in April with peak forage yields in May. Forage production of hairy vetch peaked in April and extended into May. Due to low rainfall in March, sub clover production in 1985 to 1986 was somewhat atypical. 'Wooegenellup' was the earliest maturing variety in this study and was the highest yielding in late March. 'Mississippi Ecotype' and 'Tallarook' were the latest varieties and the most productive at the late April harvest. Forage production of 'Mt. Barker' and 'Nangeela', mid-season varieties, was strongly limited by the dry conditions in March.

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

Species	Seeding Rate	Inoculant Type <sup>1</sup>
	—lbs/A—	
Arrowleaf	14.3	O
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

<sup>1</sup>Supplied 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, TEXAS, 1985 TO 1986

Variety	Harvest Date			Total
	3-13-86	4-8-86	5-9-86	
	pounds of dry matter per acre			
Meechee arrowleaf	774	1,135	1,692	3,601
Yuchi arrowleaf	822	1,194	1,575	3,591
Common Ball	304	967	2,176	3,447
Segrest Ball	447	850	2,004	3,301
Amclo arrowleaf	599	1,029	1,559	2,187
Autauga crimson	1,105	1,535	521	3,161
Chief crimson	859	1,541	664	3,064
Dixie crimson	1,089	1,440	468	2,997
Tibbee crimson	1,008	1,434	351	2,793
MS Expl. 3 berseem	385	382	878	1,645
Bigbee berseem	388	411	843	1,642
84 Bigbee berseem <sup>1</sup>	322	349	678	1,349
MS Expl. 2 berseem	349	330	669	1,348
85 Bigbee berseem <sup>2</sup>	290	358	670	1,318
MS Expl. 1 berseem	314	251	577	1,142

C.V. = 36.2%

LSD (0.05) = 409

<sup>1</sup>Supplied by Funk's in 1984. <sup>2</sup>Supplied by Funk's in 1985.

KEYWORDS: Forage/clover/vetch.

**TABLE 3. SEASONAL FORAGE PRODUCTION OF SOD-SEEDED ROSE CLOVER AT OVERTON, TEXAS, 1985-1986**

Variety/Line <sup>1</sup>	Harvest Date			Total
	3-13-86	4-7-86	5-13-86	
	pounds of dry matter per acre			
RH-18	693	1,908	1,503	4,104
RD-3	668	2,009	1,260	3,937
RH-7	561	1,891	1,479	3,931
RD-17	652	1,931	1,191	3,774
RM-13	648	1,890	1,230	3,768
RF-20	765	1,827	1,081	3,673
RM-16	648	1,749	1,245	3,642
Wilton	628	1,440	1,524	3,592
RR-12	619	1,413	1,532	3,564
RO-15	676	1,699	1,136	3,511
RJ-3	622	1,656	1,220	3,498
Kondinin	935	311	128	1,374
Hykon	788	334	78	1,200

C.V. = 7.9% LSD (0.05) = 383

<sup>1</sup>Letter-number combinations denote experimental rose clover lines from the Overton clover breeding program.

**TABLE 4. SEASONAL FORAGE PRODUCTION OF SUB-TERRANEAN CLOVER AT OVERTON, TEXAS, 1985-1986**

Variety/Line <sup>1</sup>	Harvest Date		Total
	3-24-86	4-29-86	
	pounds of dry matter per acre		
Woogenellup	1,830	875	2,705
Tallarook	1,250	1,307	2,557
SE 22	756	1,322	2,078
SK 43	649	1,408	2,057
SI 35	737	1,291	2,028
LO 32	1,074	947	2,021
Miss. Ecotype	659	1,357	2,016
SG 1	726	1,289	2,015
311499	1,018	980	1,998
319145	851	1,132	1,983
168638	861	1,103	1,964
SC 2	971	985	1,956
LO 712	740	1,146	1,886
Nangeela	974	894	1,868
SB 28	1,005	826	1,831
311498	838	962	1,800
LO 593	753	978	1,731
LO 1598	711	1,017	1,728
209924	1,175	551	1,726
291917	852	867	1,719
184962	867	846	1,713
SK 15	472	1,235	1,707
SB 23	636	1,069	1,705
SH 2	489	1,174	1,663
SE 23	512	1,147	1,659
SB 20	877	771	1,648
SD 26	801	846	1,647
Meteora	442	1,198	1,640
Mt. Barker	899	699	1,598
SK 42	544	911	1,455
SF 26	635	781	1,416
401573	648	744	1,392
SD 42	526	853	1,379
SG 16	325	1,006	1,331
SI 41	389	895	1,284

C.V. = 27.5% LSD (0.05) = 805

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

**TABLE 5. SEASONAL FORAGE PRODUCTION OF VETCH AT OVERTON, TEXAS, 1985-1986**

Variety	Harvest Date			Total
	3-14-86	4-8-86	5-12-86	
	pounds of dry matter per acre			
Hairy	692	1,443	1,103	3,238
Woodford				
bigflower	450	930	1,095	2,475
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