

Seasonal Forage Production of Annual Clovers

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Summary

Thirty-four varieties or experimental lines of annual clover were evaluated for seasonal forage production at Overton from 1983 to 1984. Sixteen entries of subterranean (sub) clover were evaluated as reseeding stands on plots established in 1981. Yields of reseeding sub clover ranged from 3,206 to 1,349 lb dry matter (DM/A). Eighteen annual clover varieties of arrowleaf, crimson, rose, ball, and berseem were evaluated with total yields from three harvests ranging from 4,411 to 1,189 lb DM/A.

Introduction

Forage quality and cool-season production can be improved by the use of annual clovers in forage systems. The forage legume breeding program at Overton evaluates commercial varieties, experimental germplasm, and breeding lines of clovers and other legumes each year. These experiments provide current information on commercial varieties and comparisons with new varieties, breeding lines, and plant introductions. The objectives of these experiments were: (1) to determine seasonal dry matter yield of annual clover varieties and experimental lines, and (2) to determine reseeding ability of sub clover varieties and experimental lines.

KEYWORDS: Annual clover/sod-seeding/ forage production/reseeding.

Procedure

Eighteen annual clovers were drilled into a native sod (common bermudagrass and *Paspalum setaceum*) in 5x7-foot plots on October 14, 1983. A small plot drill with six double disk openers, spaced 9 inches apart, was used to place the seed at one-half inch depth. Soil pH (0-6 inches) was 6.8. Prior to planting, 450 lb/A of 0-20-20 fertilizer were applied to the Sawtown fine sandy loam soil. The grass was mowed to 2 inches prior to sod-seeding. The annual clovers were arranged in a randomized complete block design with four replications. These plots were harvested at 2.25 inches with a rotary mower.

The 16 reseeding varieties of sub clover were established in 6x12-foot plots on a prepared seedbed September 17, 1981. Two foot borders were left between plots to help prevent mixing. Soil pH was 7.1. Fertilizer was applied September 8, 1983 to the Bowie fine sandy loam soil at 450 lb/A (0-20-20). Previously, these plots were fertilized at planting and in fall 1982 with 450 lb/A 0-20-20. Summer growth of grass and weeds was removed by mowing at 2 inches. The sub clover lines were arranged in a randomized complete block design with four replications. Only two replications were harvested in the 1983-84 season due to winter freeze injury. Entries were harvested with a rotary mower at 1.25 inches.

Seeding rates and *Rhizobium* inoculants for each clover species in both experiments are shown in Table 1. Peat inoculant, supplied by the Nitragin Company, was applied at the rate of 1 oz/lb of seed. Pelgel solution was used as an adhesive to stick inoculant to the seed. Sub samples from both experiments were weighed, dried at 70°C for 48 hours, and weighed again. Percent dry matter of subsamples was used to calculate dry matter yield per acre.

Results and Discussion

Total production in the sod-seeded annual clover test ranged from 4,411 to 1,189 lb DM/A for Chief crimson and CH-N crimson clover, respectively (Table 2). The annual clovers produced more in May with the exception of Autauga, Tibbee, Dixie crimson, and Kondinin Rose clover which peaked in April. Tibbee, Autauga, and Chief crimson were the highest yielding at the first harvest. Arrowleaf clover yields in 1983-84 were lower than expected (Table 3). Total rainfall during March, April, and May 1984 was 5 inches below the 17-year average. This low soil moisture condition was a factor in reducing arrowleaf clover yields at the last harvest in May.

TABLE 1. SEEDING RATES AND RHIZOBIUM INOCULANT USED IN EVALUATION OF ANNUAL CLOVERS

Species	Seeding Rate	Inoculant Type ¹
	Pounds Per Acre	
Arrowleaf	14.2	O
Crimson	19.6	R
Subterranean	19.6	WR
Rose	19.6	WR
Berseem	19.6	R
Ball	3.5	B

¹Supplied by the Nitragin Company, Milwaukee, Wisconsin

TABLE 2. SEASONAL PRODUCTION OF ANNUAL CLOVERS AT OVERTON, TEXAS, 1983-84

Variety	Harvest Date			Total
	Mar. 19	Apr. 12	May 11	
	Pounds Dry Matter Per Acre			
Chief ³	564	1,914	1,933	4,411 a ¹
Wilton Rose	293	1,472	2,113	3,878 ab
Autauga ³	797	1,752	915	3,464 abc
Tibbee ³	872	1,595	838	3,305 abc
287973 Rose	151	1,121	1,978	3,250 abc
RRPS-5 ²	265	666	2,123	3,054 abc
Dixie ³	522	1,487	1,029	3,038 abc
Kondinin Rose	548	1,241	1,014	2,803 abcd
Meechee ²	117	430	2,249	2,796 abcd
Syn 4 ²	174	658	1,891	2,723 bcd
Yuchi ²	256	659	1,657	2,572 bcd
Syn 2 ²	87	489	1,912	2,488 bcd
Syn 3 ²	78	650	1,738	2,466 bcd
Amclo ²	103	756	1,472	2,331 bcd
Segrest Ball	0	392	1,565	1,957 cd
Common Ball	0	373	1,500	1,873 cd
Bigbee Berseem	124	360	751	1,235 d
CH-N ³	175	447	567	1,189 d

C.V. = 21.1 percent

¹Yields followed by the same letter are not significantly different at the 0.01 level using Student Newman-Keuls Multiple Range Test.

²Arrowleaf clover.

³Crimson clover.

TABLE 3. SEASONAL PRODUCTION OF RESEEDING SUBTERRANEAN CLOVER AT OVERTON, TEXAS, 1983-84

Variety	Harvest Date		Total
	Mar. 28	May 14	
	Pounds of Dry Matter/Acre		
209924	2,132	1,074	3,206 a ¹
Woogenellup	2,040	970	3,010 a
Tallarook	1,683	1,233	2,916 a
Miss. Ecotype	1,344	1,301	2,645 a
239907	1,213	1,363	2,576 a
319146	1,057	1,474	2,531 a
Nangeela	1,259	1,175	2,434 a
291917	768	1,629	2,397 a
311499	744	1,571	2,315 a
168638	636	1,586	2,222 a
311498	660	1,455	2,115 a
184962	858	1,230	2,088 a
209927	588	1,350	1,937 a
Mt. Barker	578	1,392	1,970 a
319145	463	886	1,349 a
Nungarin ²	0	0	0

C.V. = 18.4 percent.

¹Yields followed by the same letter are not significantly different at the 0.05 level using Student Newman-Keuls Multiple Range Test.

²Did not reseed in 1981-82.

Production of sub clover varieties and lines in their second reseeded stand ranged from 3,206 to 1,349 lb DM/A for line 209924 and 319145, respectively. The reseeded sub clover test was harvested twice with P.I. 209924 and Woogenellup as the highest producers during the March harvest. The experimental line 209924 yielded higher during both the 1982-83 and the 1983-84 seasons than in this year.

In late December 1983, extreme cold temperatures were recorded (three consecutive nights below 10°F). Performance of both the reseeded sub clover and the newly established annual clover test was diminished by

these adverse conditions. However, even with these conditions, no clover lines in these tests were rated as winter-killed.