



Forage Research in Texas

1983

Seasonal Forage Production of Annual Clovers

G. R. Smith¹

SUMMARY

Thirty-seven annual clovers were evaluated for seasonal forage production during 1981-82 at Overton, Texas. Seventeen subterranean (Trifolium subterraneum L.), six arrowleaf (Trifolium vesiculosum Savi.), five crimson (Trifolium incarnatum L.), three rose (Trifolium hirtum All.), two Trifolium dasyurum L., two Trifolium diffusum Ehrh., one ball (Trifolium nigrescens Viv.), and one berseem (Trifolium alexandrinum L.) clover varieties were included in two experiments. The clovers were broadcast seeded on a prepared seedbed in a Bowie fine sandy loam soil. Yields ranged from 5194 to 1016 pounds of dry matter per acre for Rose Exp. I and Nungarin sub clover, respectively.

Introduction

Annual clovers are cool-season forage crops that have the potential of producing high quality grazing during the late winter and spring with no nitrogen fertilizer inputs. Varieties, experimental lines, and plant introductions were evaluated for seasonal forage production in support of the annual clover breeding program at Overton during 1981-82.

Procedure

Thirty-seven annual clovers were broadcast seeded in 12 x 20 foot plots on a prepared seedbed September 17, 1981. Soil test ratings of phosphorus and potassium were very low and soil pH (0-6 inches) was 6.0. One-half ton of agricultural lime and 450 lbs per acre of 0-20-20 fertilizer were applied and incorporated prior to planting. The soil was a Bowie fine sandy loam (Plinthic Paleudult, fine-loamy, siliceous, thermic). Seeding rates and Rhizobium inoculants are outlined in Table 1. Peat inoculant was supplied by the Nitragin Co. and 0.15 grams of inoculant was applied per gram of seed with Pelgel solution used as an adhesive.

Due to differences in growth habit (prostrate vs. upright) two separate experiments were conducted. Twenty-one annual clovers including crimson (T. incarnatum), arrowleaf (T. vesiculosum), rose (T. hirtum), berseem (T. alexandrinum), ball (T. nigrescens), T. diffusum, T. dasyurum, and one variety of subterranean (T. subterraneum) were planted in a randomized complete block design with four replications. Sixteen varieties or plant introductions of subterranean clover (sub) were planted in a separate experiment, also in a randomized complete

¹ Assistant professor, Texas A&M University Agricultural Research and Extension Center at Overton, Overton, TX 75684.

block design with four replications. The same experimental and cultural procedures were used for both experiments except a 24-inch border was left between plots of sub clover to prevent plot mixing after reseeding. Also, the sub clover plots were harvested at 1½ inches and the annual clover harvested at 2½ inches, both with a rotary mower. Plot green weights were recorded in the field. Subsamples were weighed, dried at 70°C for 48 hours and weighed again. Dry matter (DM) percentage was calculated and plot yields were expressed as lbs DM/acre. Analysis of variance was calculated and means separated using Duncan's New Multiple Range Test.

Results and Discussion

Rose Exp. I was the highest yielding annual clover in 1981-82 (Table 2). Most of the production of this selection was concentrated in the latter part of the growing season. Only the crimson clovers and Winter Hardy Berseem made harvestable growth by December and the same produced the highest yields at the second harvest in February. Tibbee crimson clover was high producer at the February harvest but due to unseasonable warm weather in early March was in full bloom at the third harvest and subsequently did not regrow.

Drought conditions after seedling emergence caused some stand reductions on all plots but affected the smaller seeded clovers (arrowleaf and ball) most drastically. By the third harvest these plots appeared normal but the yields reported here for arrowleaf and ball clover are not representative of their full potential at Overton. Dry matter yield per acre of 21 annual clovers is presented in Table 2.

Nangeela and Tallarook were the highest yielding sub clover varieties in 1981-82 (Table 3). No significant differences ($P>0.05$) were found between these varieties and Woogenellup and Mississippi Ecotype. Two plant introduction lines were also comparatively high yielding and had good seasonal distribution of yield. P.I. line 209927 produced a late harvest yielding more than Tallarook or Mississippi Ecotype. The forage distribution of P.I. line 209924 was very similar to Woogenellup. Nungarin flowered in early March and did not regrow after the March harvest. Dry matter yield per acre of sixteen sub clovers is reported in Table 3.

Table 1. Seeding rates and Rhizobium inoculant used in evaluation of annual clovers.

Species	Seeding Rate	Inoculant Type ¹
	--lbs/acre--	
Arrowleaf	14.2	O
Crimson	19.6	R
Rose	19.6	WR
Ball	3.5	B
Berseem	19.6	R
Sub	19.6	WR
<u>T. diffusum</u>	10.6	Spec. 11
<u>T. dasyurum</u>	10.6	Spec. 11

¹Supplied by the Nitragin Co.

Table 2. Dry matter production of annual clovers at Overton, TX. 1981-82.

Variety	Harvest Date				Total
	12-9	2-22	3-17	5-4	
	-----lbs DM/acre-----				
Rose Exp. I		239	1450	3505	5194 a ¹
Wood Co. (C) ²	37	274	1380	2928	4619 ab
Wilton Rose		127	1151	3327	4605 a-c
W. H. Berseem	92	456	1196	2796	4540 a-d
Autauga (C)	91	495	1881	1984	4451 b-d
<u>T. diffusum</u> Exp. I		125	937	3283	4345 b-e
BF-1 (A) ³		119	892	3263	4274 b-e
Yuchi (A)		115	819	3255	4189 b-e
Chief (C)	103	453	1652	1753	4161 b-e
<u>T. diffusum</u> Exp. II			856	3236	4092 b-e
Dixie (C)	88	428	1701	1834	4051 b-e
Amclo (A)		121	985	2926	4032 b-e
Overton Syn 2 (A)		77	810	3024	3911 b-e
Meechee (A)		61	753	3081	3895 b-e
Kondinin Rose		258	1347	2237	3842 c-e
RRPS-5 (A)			811	2988	3799 de
<u>T. dasyurum</u> Exp. I			763	3011	3774 de
<u>T. diffusum</u> Exp. III		141	665	2854	3660 e
Common Ball		63	763	2760	3586 ef
Tibbee (C)	212	911	1835		2958 f
Mt. Barker Sub		58	1084	1802	2944 f

C.V. = 11.1%

¹Yields followed by the same letter are not significantly different at the 0.05 level using Duncan's Multiple Range Test.

²Crimson clover

³Arrowleaf clover

Table 3. Dry matter production of subterranean clover at Overton, TX. 1981-82.

Variety	Harvest Date				TOTAL
	2-23	3-18	4-28	5-26	
	-----lbs DM/acre-----				
Nangeela	1276	1321	989		3586 a ¹
Tallarook	530	1108	1497	229	3364 ab
209927	363	898	1572	524	3357 ab
209924	1015	1126	1013		3175 ab
Woogenellup	1052	1050	1024		3126 ab
Miss. Ecotype	512	992	1336	271	3111 ab
184962	767	1032	1218		3017 bc
168638	728	900	1324		2952 bcd
239907	639	1071	1241		2951 bcd
Mt. Barker	784	1027	1109		2920 bcd
219917	541	1053	1303		2897 bcde
319145	576	911	1064		2551 cde
311499	542	772	1216		2530 cde
311498	546	911	1022		2479 de
319146	586	716	1096		2398 e
Nungarin	544	472			1016 f
C.V. = 11.2%					

¹ Yields followed by the same letter are not significantly different at the 0.05 level using Duncan's Multiple Range Test.