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SEASONAL PRODUCTION OF ANNUAL FORAGE LEGUMES AT OVERTON, TEXAS - 1988-89

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SUMMARY

Forty-five annual forage legumes, including arrowleaf, crimson, berseem, ball, rose clover, and vetch were evaluated for forage production and adaptation at Overton in 1988-89. An experimental rose clover line, R-12, was the most productive annual clover with 4242 lbs DM/ac, while Kondinin rose produced 1181 lbs DM/ac. Vetch production ranged from 4776 to 59 lbs DM/ac for Woodford 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 cost 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.

PROCEDURES

Twenty-nine annual clovers and six vetches were drilled into a Coastal bermudagrass sod on October 27, 1988. 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 5x7 foot plots. Soil pH was 5.9. All plots were fertilized according to soil test prior to planting. Fertilizer applied was 80 lbs P_2O_5, 80 lbs K_2O, and 1 lb B/ac. The clovers were harvested at 2.25 inches and the vetch at 1.75 inches with a rotary mower.

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. At each harvest, subsamples were weighed, dried at 60°C for 48 hours and weighed again to calculate dry matter yield per acre.

RESULTS

Woodford vetch was the most productive forage legume in 1988-89 (Table 2). Vetch production ranged from 4776 lbs DM/ac for Woodford to 59 lbs DM/ac for Nova II. The common vetches, Cahaba White, Vantage, Vanguard, and Nova II, are not well adapted to East Texas growing conditions. Common vetch forage production is generally well below that of Woodford and Hairy vetch.

Annual clover forage production ranged from 3101 lbs DM/ac to 1181 lbs DM/ac for OLS-1 experimental arrowleaf and MS Exp. 4 berseem, respectively (Table 3). Berseem clover is not well adapted to acid soils and therefore, forage production of this clover is often depressed in East Texas. The ball clover production was about average for Overton, while the arrowleaf and crimson forage yield was below that of previous years.

Rose clover forage production ranged from 4242 lbs DM/ac for R-12 to 433 lbs DM/ac for Kondinin during the 1988-89 season (Table 4). R-12 and OWS-81 were more productive than in previous years at Overton. Hykon and Kondinin are poorly adapted to East Texas due to low relative cold tolerance and early maturity.

In early February 1989, both Kondinin and Hykon were severely damaged by cold temperatures (15°F). Forage production of the experimental rose clovers was not affected by these temperatures. In previous years, Kondinin and Hykon have shown good early season production but produced low forage yields in mid to late season harvests compared to experimentals such as F-20 and H-18. Experimental late-maturing, cold-tolerant rose clovers have generally produced 50 to 75% more total season forage than Kondinin or Hykon.

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

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

[1]Supplied by the Nitragin Co., Milwaukee, WI. Applied at 1.6 oz. per pound of seed with Pelgel solution as an adhesive.

TABLE 2. SEASONAL FORAGE PRODUCTION OF SOD-SEEDED VETCH AT OVERTON, TEXAS - 1988-89

Variety	Harvest Date			Total
	3-14-89	4-4-89	5-23-89	
	lbs DM/ac			
Woodford[1]	727	603	3446	4776
Hairy[2]	686	597	2314	3597
Cahaba White[3]	672	403		1075
Vantage[3]	654	374		1028
Vanguard[3]	482	210		692
Nova II[3]	59			59
C.V. = 15.5%				LSD (0.05) = 430

[1]Bigflower
[2]Hairy
[3]Common

TABLE 3. SEASONAL FORAGE PRODUCTION OF SOD-SEEDED ANNUAL CLOVERS AT OVERTON, TEXAS - 1988-89

Variety	Harvest Date 3-14-89	4-4-89	5-9-89	Total
	----------lbs DM/ac----------			
OLS-1[1,6]	394	613	2094	3101
Yuchi[1]	408	597	1970	2975
Meechee[1]	306	551	2099	2956
Dixie Yuchi[2]	583	763	1565	2911
Chief[3]	600	792	1514	2906
RRPS-5[1]	332	611	1948	2891
RRPS-6[1]	340	628	1809	2777
Common Ball[4]	129	450	2143	2722
Segrest[4]	108	416	2190	2714
Amclo[1]	368	552	1669	2589
Dixie[3]	670	762	1128	2560
Tibbee[3]	739	731	726	2196
Bigbee[5]	344	444	1236	2024
OVB-2[5,6]	233	368	1182	1783
MS Exp. 4[5]	66	107	1008	1181
C.V. = 19.7%				LSD (0.05) = 715

[1]Arrowleaf
[2]Mix of Dixie crimson and Yuchi arrowleaf each at 50% seeding rates.
[3]Crimson
[4]Ball
[5]Berseem
[6]Experimental clover lines from TAES clover breeding program.

TABLE 4. SEASONAL FORAGE PRODUCTION OF SOD-SEEDED ROSE CLOVER AT OVERTON, TEXAS - 1988-89

Variety	Harvest Date 3-14-89	4-5-89	5-12-89	Total
	lbs DM/ac			
R-12[1]	337	965	2940	4242
OWS-81[1]	387	965	2833	4185
H-7[1]	297	912	2099	3308
D-3[1]	351	990	1874	3215
J-3[1]	410	1095	1614	3119
H-18[1]	373	1014	1697	3084
M-16[1]	343	1026	1673	3042
D-17[1]	373	1153	1468	2994
M-13[1]	379	1357	1208	2944
Cal. Common	302	916	1608	2826
O-15[1]	358	862	1467	2687
F-20[1]	405	1061	1218	2684
Hykon	205	364	0	569
Kondinin	132	301	0	433
C.V. = 15.5%				LSD (0.05) = 620

[1]Experimental rose clovers from TAES clover breeding program.