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Nitrogen vs Clover on Pensacola Bahiagrass

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SUMMARY

Pensacola bahiagrass production did not increase significantly above 225 lb N/ac. Total production of Pensacola bahiagrass overseeded with clovers was similar to bahiagrass receiving 150 to 200 lb N/ac. Mt. Barker subterranean and Yuchi arrowleaf clovers produced 2000 and 500 lb/ac respectively by Mar. 29. Summer nitrogen fertilization of clover-bahiagrass plots reduced Mt. Barker and Yuchi growth the following winter and early spring by 33 and 64%, respectively. Overseeded clovers provided as effective spring weed control as Princep.

Introduction

Clovers are overseeded on warm season perennial grasses in an effort to substitute symbiotically fixed nitrogen for expensive nitrogen fertilizer. The addition of clovers also extends the grazing season which reduces the winter feeding period. The extent of these clover benefits will depend on the forage species and the management, climatic and edaphic conditions under which they are grown. The effects of nitrogen rates, overseeding clovers and applying Princep for weed control was investigated on the production and distribution of Pensacola bahiagrass.

Methods and Materials

Pensacola bahiagrass was seeded on a Crowley very fine sandy loam at Eagle Lake in the spring of 1977. In 1978 and 1979 treatments were 0, 75, 150, 225 and 300 lb N/ac and 0, 75 and 150 lb N/ac plus 1 lb/ac of Princep applied in late February for weed control. Nitrogen treatments were divided in three equal applications on Apr. 1, June 1 and Aug. 1. Additional treatments were bahiagrass overseeded in the fall of 1978 with Yuchi arrowleaf and Mt. Barker subterranean clovers with no nitrogen or 50 lb N/ac on June 1 and Aug. 1.

Ninety pounds of phosphorus and 60 lb potassium per acre were applied each fall. Plots were 6 x 15 ft in a randomized block design with four replications. Plots were harvested about once a month with a flail mower at a 1 inch height. Botanical composition was estimated visually.

Results and Discussion

Forage production increased as nitrogen rate increased but with no significant gain above the 225 N rate for the nitrogen only treatments (Table 1). Approximately half of the total forage production occurred

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Table 1. Forage production of Pensacola bahiagrass overseeded with clover or receiving nitrogen fertilizer 1979.

	Harvest dates								Total
	Dec. 19	Mar. 29	May 7	June 11	July 9	Aug. 16	Sept. 11	Oct. 16	
0 N			635 f	1141 f	775 ef	882 de	369 bc	113 cd	3915 h
75 N			1026 ef	1587 de	1014 de	1212 bcd	360 bc	177 cd	5376 fg
150 N			1417 de	2065 bc	1351 bc	1421 b	382 bc	245 abc	6881 de
225 N			2474 a	2809 a	1499 ab	1425 b	494 bc	317 ab	9018 ab
300 N			2041 abc	2905 a	1498 ab	1953 a	536 bc	361 a	9294 a
0 N + Princep			1048 ef	1392 ef	655 f	619 e	328 c	108 d	4160 gh
75 N + Princep			1557 cde	1800 cd	1032 de	1112 b-e	367 bc	147 cd	6015 ef
150 N + Princep			1841 bcd	2371 b	1350 bc	1330 bc	551 bc	212 bcd	7655 bcd
Yuchi			548 b	1819 cd	1580 ab	617 e	347 c	146 cd	7320 cde
Yuchi + 100 N			197 c	2113 bc	1347 bc	763 de	651 b	240 a-d	7722 bcd
Mt. Barker	727 a*	1360 a	2341 ab	1490 def	1148 cd	669 e	602 bc	158 cd	8495 abc
Mt. Barker + 100 N	338 b	1058 a	2601 a	1529 def	1725 a	673 e	961 a	231 bcd	9116 ab

*Yields within a column followed by the same letter are not significantly different at .05 level, Duncan's Multiple Range Test.

by the second harvest on June 11. The low production in summer and early fall is due to the low water holding capacity of the shallow soil. A clay pan 10 to 14 inches below the soil surface restricts water and root penetration. Rainfall in excess of $\frac{1}{2}$ to $\frac{3}{4}$ inch is lost through evaporation or run off. Therefore rain or irrigation is required every 10 to 14 days to maintain grass growth.

Princep improved forage production at the first harvest at all three nitrogen rates but only the 75 N rate was significantly higher. In contrast to Coastal bermudagrass and dallisgrass, bahiagrass forms a thick tight sod which is very competitive to emerging weed seedlings.

Mt. Barker subterranean and Yuchi arrowleaf clovers produced 2000 and 500 lb/ac, respectively by Mar. 29. Total production of Pensacola bahiagrass overseeded with clovers was similar to bahiagrass receiving 150 to 200 lb N/ac. Applying 50 lb N/ac on June 1 and Aug. 1 to clover-bahia mixtures the previous growing season reduced forage production of Mt. Barker and Yuchi by 33 and 64%, respectively. Summer fertilization increased grass growth and vigor so that it was more competitive to the fall emerging clover seedlings.

There was little difference in weed production in the nitrogen only treatments at the May 7 harvest (Table 2). Applying Princep significantly reduced weed yields at each of the three low nitrogen treatments. Weed production on bahiagrass overseeded with clovers was not significantly different from the Princep treatments.

Table 2. Weed production on Pensacola bahiagrass at May 7 harvest.

	lb/ac		lb/ac
0 N	360 b*	0 N + Princep	7 d
75 N	640 a	75 N + Princep	158 bcd
150 N	385 b	150 N + Princep	45 d
225 N	363 b	arrowleaf	101 cd
300 N	313 bc	subclover	37 d

*Yields followed by the same letter are not significantly different at .05 level, Duncan's Multiple Range Test.