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Nitrogen vs Clover on Coastal Bermudagrass

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SUMMARY

Coastal bermudagrass overseeded with Yuchi arrowleaf or Mt. Barker subterranean clovers produced as much forage as Coastal alone with about 100 lb N/ac. Mt. Barker and Yuchi produced 2400 and 500 lb/ac respectively by March 29. Applying 50 lb/ac on June 1 and Aug. 1 the previous growing season restricted clover growth by 60 percent. There was no significant difference in weed production on plots seeded with clover or sprayed with Princep.

Introduction

Major advantages of adding clovers to warm season perennial grasses are to extend the grazing season and use atmospheric nitrogen instead of expensive nitrogen fertilizer. The degree of improvement is dependent on adaptability and growth rate of the clover and grass and how they are managed and utilized. Performance of specific clover-grass mixtures needs to be characterized for the contrasting climatic regions of the state. Forage production and distribution of Coastal bermudagrass receiving various nitrogen fertilizer rates with and without Princep or overseeded with Yuchi arrowleaf for Mt. Barker subterranean clovers was determined on a fine sandy loam rice soil in Southeast Texas.

Methods and Materials

Coastal bermudagrass was sprigged 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 April 1, June 1 and August 1. Additional treatments were Coastal 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 August 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 compostion was estimated visually.

Results and Discussion

Forage production increased as the nitrogen rate increased on the treatments that received nitrogen only (Table 1). However, there was not a significant forage increase from the 225 to 300 N treatment. Coastal is more responsive to high N rates on deep soils. On this soil, root growth is restricted by a clay pan 10 to 14 inches below the soil surface. This frequently causes moisture to be the most limiting factor during summer and early fall. One third of the total yield was produced

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Table 1. Forage production of Coastal bermudagrass overseeded with clover or receiving nitrogen fertilizer 1979.

	Harvest dates								
	Dec. 19	Mar. 29	May 9	June 5	July 16	Aug. 22	Sept. 17	Oct. 18	Total
	lb/ac								
0 N			1576 d	805 f	792 c	345 def	248 e	228 d	3994 i
75 N			2198 cd	1088 ef	1545 b	390 c-f	532 cde	483 cd	6236 gh
150 N			3192 b	1792 cd	2143 a	454 b-e	624 b-e	807 ab	9012 de
225 N			4902 a	2379 b	2191 a	554 b	601 b-e	896 ab	11523 ab
300 N			4598 a	3373 a	2128 a	721 a	900 abc	985 a	12705 a
0 N + Princep			2263 cd	895 f	712 c	283 f	243 e	243 d	4639 i
75 N + Princep			3458 b	1498 de	1535 b	459 b-e	542 cde	420 cd	7912 ef
150 N + Princep			4537 a	2208 bc	2107 a	502 bcd	677 a-d	751 ab	10782 bc
Yuchi		483 bc	2911 bc	1492 de	2173 a	388 c-f	505 cde	271 d	8223 e
Yuchi + 100 N		190 c	2160 cd	1119 ef	1075 bc	405 bf	1036 a	667 bc	6652 fg
Mt. Barker	883 a*	1487 a	2912 bc	861 f	1027 bc	303 ef	300 de	347 d	8120 e
Mt. Barker + 100 N	405 b	562 b	2772 bc	1144 ef	2443 a	539 bc	948 ab	739 ab	9552 cd

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

by May 9 and over half by June 5. Applying Princep for weed control allowed a significant forage increase at the 75 and 150 N rate at the first harvest and for total yield.

Overseeding with clover did provide earlier forage production. Mt. Barker subterranean clover produced over a ton of dry matter by March 29. Summer nitrogen application the previous growing season restricted Yuchi and Mt. Barker growth by 60 percent. Nitrogen fertilization of clover-Coastal mixtures stimulated grass growth which made the grass sod more competitive to the fall emerging clover seedlings. Coastal overseeded with clovers produced as much forage as Coastal alone with about 100 lb of nitrogen.

Weed production in the nitrogen only treatments decreased as nitrogen rate increased (Table 2). The higher nitrogen rates caused a more competitive sod which restricted weed growth. Princep significantly reduced weed production at all three nitrogen rates. Weed yields on plots overseeded with clovers were not significantly different from the Princep treated plots.

Table 2. Weed production at May 9 harvest.

	lb/ac		lb/ac
0 N	1355 a*	0 N + Princep	122 de
75 N	1213 a	75 N + Princep	154 cde
150 N	990 ab	150 N + Princep	81 de
225 N	695 bc	arrowleaf	206 cde
300 N	590 bcd	subclover	330 cde

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