

CLOVER-BERMUDAGRASS PRODUCTION WHEN FERTILIZED WITH BROILER LITTER AND COMMERCIAL NITROGEN FERTILIZER

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Background. Broiler litter is a good plant nutrient source for pastures and may be more economical than commercial fertilizer. Broiler litter contains other nutrients besides nitrogen (N), phosphorus (P), and potassium (K) and adds organic matter to the soil. Broiler litter usually contains as much or more P than N. Because warm-season perennial grasses like Coastal bermudagrass take up only 1 lb of P for every 4 lb N, only about 25% of the P in broiler litter is taken up. The P remaining in the soil builds up over time with continued annual broiler litter applications and could move in to rivers and lakes and cause environmental problems. Other research at Overton has shown that applying commercial N fertilizer in combination with annual broiler litter applications increased P uptake by an annual ryegrass-Coastal bermudagrass pasture. A similar study was carried out substituting crimson clover for annual ryegrass with the theory that the clover would fix enough N from the air and eliminate the need for commercial N fertilizer. Broiler litter was applied at 4 tons/acre in late April after the last clover harvest in 1999 and 2000. Fifty pounds of N/acre were applied from 1 to 3 times a year in April, June, and/or July to the Coastal bermudagrass.

Research Findings. The clover-bermudagrass response to the various N treatments was different for the 2 years so each year is presented separately. The greatest bermudagrass yields in 1999 occurred in the control treatment with no N and when N was applied in April and July (Table 1). The preceding clover crop provided sufficient N that the bermudagrass did not respond to the N fertilizer treatments. Yield of the following crimson clover crop in spring of 2000 was not influenced by N treatment. When combining the 1999 bermudagrass and spring 2000 clover yields, the no N treatment was the most productive. The second year included bermudagrass from 2000 and the spring clover yield from 2001. There was no response to N fertilizer by the bermudagrass, crimson clover, or combined total yield (Table 2). Total yields of the no N treatment for both years were 11,000 lb/acre which was similar to the maximum yields of the ryegrass-bermudagrass study with 150 lb N/acre/year.

Application. Broiler litter is a good fertilizer for hybrid bermudagrass like Coastal but only about 25% of the P is taken up. When the bermudagrass is overseeded with annual ryegrass and N fertilizer applied, yields and P uptake increased. Substituting clover for the annual ryegrass

produced the same yields with out N fertilizer produced the same yields. Eliminating the N fertilizer makes the clover-bermudagrass system more economical.

Table 1. Bermudagrass, clover and total yield by nitrogen treatment for 1999-2000 growing season.

	1999 Bermudagrass	2000 Clover	Total
	lb dry matter/acre		
50 lb N/month			
None	9563 a [†]	1979 a	11542 a
April	7918 b-d	1833 a	9751 bc
June	7462 cd	1829 a	9291 bc
July	7751 b-d	2127 a	9878 bc
April, June	8187 bc	1504 a	9691 bc
April, July	8577 ab	1620 a	10197 b
June, July	7104 d	1808 a	8912 c
April, June, July	7853 b-d	1849 a	9702 bc

[†]Values within a column followed by the same letter are not significantly different at 0.05 level.

Table 2. Bermudagrass, clover and total yield by nitrogen treatment for 2000-2001 growing season.

	2000 Bermudagrass	2001 Clover	Total
	lb dry matter/acre		
50 lb N/month			
None	8916	2053	10969
April	7905	1621	9526
June	9305	1605	10909
July	9072	1594	10666
April, June	9996	1519	11515
April, July	9063	1769	10832
June, July	9346	1289	10635
April, June, July	9817	1715	11532