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FORAGE PRODUCTION OF COASTAL BERMUDAGRASS AND ANNUAL RYEGRASS-COASTAL BERMUDAGRASS MIXTURE FERTILIZED WITH FOUR RATES OF BROILER LITTER

G. W. Evers, D. S. Doctorian, and A. D. Davidson

Background. Broiler litter is a byproduct of the poultry industry and is disposed of on pastures. Broiler litter contains all essential plant nutrients; contains organic matter which improves the water and nutrient holding capacity of the soil; N from organic matter is released slowly over time which reduces potential nitrate leaching into groundwater; and the cost of nutrients may be less than commercial fertilizer. Information is needed on the response of forages to broiler litter to help producers decide if, and how much, broiler litter they want to use. Results are reported for the second year of a 3-year study where broiler litter was applied to Coastal bermudagrass and an annual ryegrass-Coastal bermudagrass mixture. Broiler litter rates of 0, 3, 6, and 12 tons/acre were split into four equal applications applied in October 1994, January, April, and July 1995. Nitrogen, phosphorus (P_2O_5) and potassium (K_2O) content of the broiler litter was 53, 60, and 48 lb/ton. Plots were harvested seven times from January through September 1995.

Research Findings. In the Coastal bermudagrass only system, bermudagrass production increased up to 11,000 lb/acre as broiler litter rate increased (Table 1). Although no ryegrass was planted, some did volunteer and is reported. When Coastal bermudagrass was overseeded with ryegrass, bermudagrass yields reached only 6,900 lb/acre because of the ryegrass competition during the spring. Ryegrass was very responsive to the broiler litter because of the mild, moist winter and spring with maximum yields of over 8,000 lb/acre. Total forage production for the year was from 2,000 to 4,000 lb/acre greater when ryegrass was added to the bermudagrass than bermudagrass alone. Forage production per ton broiler litter applied was 716 lb/acre for bermudagrass only and 833 lb/acre for ryegrass-bermudagrass mixture. Cool-season weed yields also increased as broiler litter rate increased but they were always lower on the ryegrass-bermudagrass system because of the ryegrass competition. Overseeding annual ryegrass on bermudagrass extended the forage production season by four months (Figure 1).

Application. When a bermudagrass pasture is fertilized with broiler litter, it should be overseeded with annual ryegrass. The grazing season is extended, forage production per ton broiler litter applied is slightly higher and cool-season weeds are reduced. Forage production increased as broiler litter rate increased but in this study the broiler litter was split in four applications and applied every three months.

Table 1. Production of Coastal bermudagrass and annual ryegrass-Coastal bermudagrass mixture fertilized with four rates of broiler litter from October 1994 to September 1995.

Broiler Litter	Bermuda	Ryegrass	Total Forage	Weeds	Total
tons/acre	-----lb DM/acre-----				
Coastal Bermudagrass					
0	2782 d†	0 a	2782 d	386 c	2989 d
3	4937 c	57 a	4994 c	896 bc	5889 c
6	6836 b	51 a	6887 b	1841 ab	8728 b
12	11064 a	509 a	11573 a	2113 a	13686 a
Mean	6405 A	154 B	6559 B	1309 A	7867 A
Ryegrass-Coastal Bermudagrass					
0	3288 b	1515 d	4803 d	80 c	4883 d
3	3488 b	3952 c	7440 c	330 bc	7770 c
6	4166 b	5964 b	10130 b	484 ab	10614 b
12	6909 a	8460 a	15369 a	746 a	16114 a
Mean	4462 B	4973 A	9435 A	410 B	9845 A

†Yields within forage systems (lowercase) in the same column followed by a different letter are significantly different 0.05 level, Waller-Duncan Multiple Range Test.

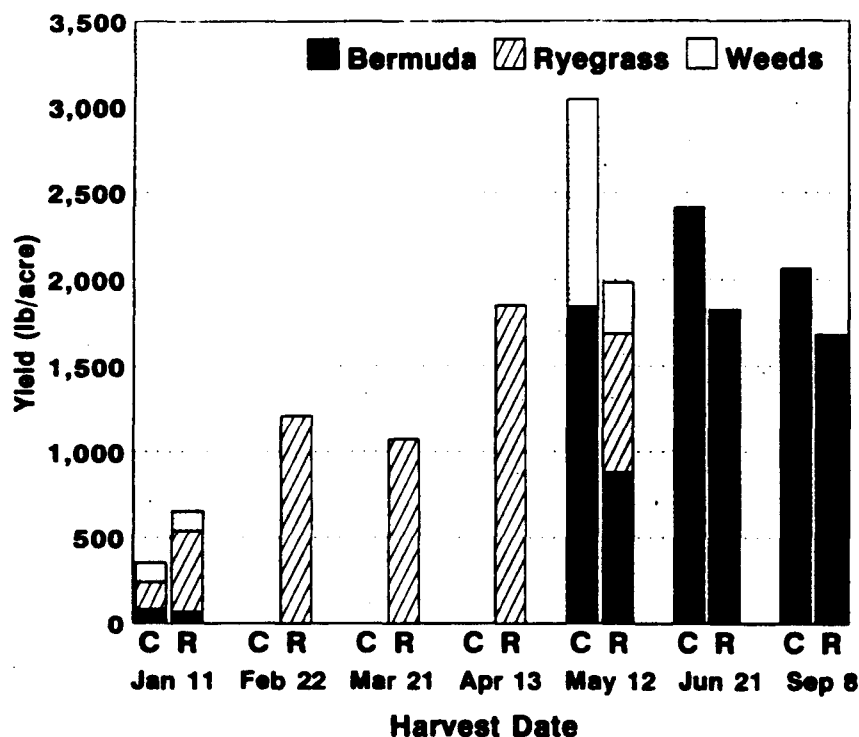


Figure 1. Yield distribution of Coastal bermudagrass (C) and ryegrass + Coastal bermudagrass (R) forage systems averaged across four broiler litter rates in 1995.