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'COASTAL' BERMUDAGRASS YIELD RESPONSE TO DAIRY EFFLUENT AND POULTRY LITTER APPLICATIONS

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Background. Concern over improper waste disposal and concurrently increasing nitrogen (N) fertilizer costs continue to stimulate interest in greater utilization of animal manures as crop nutrient sources. Most forms of animal waste can supply all major plant growth requirements when applied in sufficient quantities. However, accurate forage yield responses to poultry litter and dairy effluent are lacking for sandy, East Texas soils. Since the over application of manure may result in contamination of groundwater and surface waters, it is important to have adequate guidelines for desired yield/rate interactions. The objectives of this study were to assess the yield response of 'Coastal' bermudagrass to varying rates of dairy effluent and poultry litter application.

Research Findings. An existing stand of Coastal bermudagrass was divided into 32 15x10 ft plots. These plots were organized into 4 replications with 8 treatments each. The treatments were assigned zero, 225 (L), 450 (M), or 895 (H) lbs/ac total-N from dairy effluent or poultry litter. Each waste treatment was split into four applications (May, July, October, March). Harvests were taken at approximately 30-day intervals starting on June 12, 1992. Bermudagrass yields represent response to manure applications in May and July 1992. Consequently, L, M, and H rates, as of August 1992, equaled 112, 223, and 446 lbs of total N/ac.

Bermudagrass yields (Tables 1 and 2) increased in response to dairy effluent and poultry litter applications. Increasing N rates for either source of livestock waste increased bermudagrass yields from 1.4 to 2.7 times the zero (control) rate. It is noteworthy, however, that no significant yield differences were observed between dairy effluent and poultry litter. Evaluation of yields take into account the unusually dry weather in late summer of 1992 which may have suppressed the overall total dry matter production.

Application. It is evident that both poultry litter and dairy effluent can make a significant contribution to forage production in East Texas. Use of animal manures, where readily available, can provide a potentially low-cost alternative to chemical fertilization and simultaneously convert a waste product liability into a forage-animal production asset.

While the highest forage production resulted from the highest rate of applied waste, it is important that application not exceed the nutrient use potential of the given crop. Use of soil test data and crop nutrient recommendations for animal waste applications, just as one would for chemical fertilization, will help to prevent nutrient loading and escape.

Table 1. Bermudagrass yield from dairy effluent applications.

Rate	Bermudagrass Dry Matter Yield ¹				Total
	Harvest 1 June 12	Harvest 2 July 15	Harvest 3 Aug 13	Harvest 4 Sept 19	
lbs N/ac	-----lbs/ac-----				
0 (Zero)	881 a	647 a	1065 a	804 a	3397 a
112 (Low)	1543 b	689 a	1649 ab	1040 ab	4921 b
223 (Med)	1985 b	817 a	2196 b	1114 ab	6112 c
446 (High)	2875 c	1039 a	3512 c	1398 b	8824 d

¹Means followed by the same letter within a column are not significantly different (p<.05).

Table 2. Bermudagrass yield from poultry litter applications.

Rate	Bermudagrass Dry Matter Yield ¹				Total
	Harvest 1 June 12	Harvest 2 July 15	Harvest 3 Aug 13	Harvest 4 Sept 19	
	-----lbs/ac-----				
0 (Zero)	-	929 a	1248 a	956 a	3133 a
112 (Low)	-	1248 a	2376 b	1612 b	5236 b
223 (Med)	-	1566 a	3503 c	2230 c	7299 c
446 (High)	-	1668 a	4179 d	2866 d	8713 d

¹Means followed by the same letter within a column are not significantly different (p<.05).