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USE OF BROILER LITTER AS FERTILIZER FOR SWEET CORN PRODUCTION

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Background. In the East Texas area, as well as other regions of the South, broiler production has been on the increase. With an increase in production, a problem of litter disposal has become an environmental concern. This problem could be converted into a valuable asset by incorporating a high value crop such as vegetables into sustainable production schemes that utilized broiler litter as a fertilizer. The objective of this study was to evaluate the effect of broiler litter rates and frequency of application on sweet corn growth and production.

Research Findings. Litter rate was based on total N content of the litter and the subsequent crops' N requirement for maximum production as determined by soil test results from the Texas A&M Soil Testing Lab. The litter rates used in this study were 0, 4.8 (recommended rate), 9.6 (2 X recommended), and 19.2 (4 X recommended) tons/ac. One-half of the plots received the total litter rate prior to planting and the other half received one-half prior to planting and the rest at lay-by. A fertilizer blend containing 23.8N-4.3P-4.1K was applied at a total rate of 500 lb/ac with the N split into two applications. All treatments were incorporated. The sweet corn variety 'Merit' was seeded on 21 April.

Growth, as measured by leaf area, was not affected by rate or frequency of application (Table 1). Frequency of application had no significant effect on any parameters examined. Yield was increased as rate was increased. Applications of 4 times the recommended rate decreased yield. Average ear weight, even though not significant, was increased as the recommended rate was doubled but decreased when it was quadrupled. Commercial blend fertilizer produced the smallest ears but was equal in yield to those produced by the addition of 4.8 tons/ac of litter. Both contained equal amounts of N.

Application. Results show that excessive rates can have detrimental effects on sweet corn yield. The total amount of litter for maximum yield can be applied, in total, pre-plant without any yield reduction. Broiler litter can be substituted for commercial fertilizer without any significant reduction in yield or ear size.

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Table 1. Influence of poultry litter rate, frequency of application, and commercial fertilizer on growth and yield of sweet corn.

Treatment	Leaf area (cm^2)	Yield (lb/ac)	Avg. ear wt. (oz/ear)
Rate (tons/ac)			
0	4793	3909	6.5
4.8	5042	4686	6.5
9.6	5506	7521	7.6
19.2	5804	5994	6.8
Commercial blend[z]	5547	4868	6.1
Frequency			
Total	5453	4897	6.6
Split	5120	4968	7.1
Significance			
Rate			
Linear	NS[y]	**	NS
Quadratic	NS	*	NS
Frequency	NS	NS	NS
Rate x Frequency	NS	NS	NS

[z]Commercial blend not used in statistical analysis; presented for comparison only.
[y]NS, *, ** - nonsignificant or significant at P = .10, P = .05, respectively.