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EFFECT OF POULTRY LITTER RATE OF APPLICATION ON RESIDUAL SOIL NO₃-N

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Background. Application rates of poultry litter that contains approximately 4% N on a dry weight basis is often excessive. This N is the major component for determining application rates. Excessive rates cause accumulation of nutrients in soil. This increases the potential for movement of nutrients into surface and ground water.

To develop management plans, rates of application were evaluated beginning in spring 1992 and ending in fall 1993. Soil samples were obtained at the beginning of each planting season to determine the recommended litter rate based on N needs of the individual crop. Sweet corn ('Merit') was used as the spring crop and broccoli ('Green Valiant') was the fall crop.

The 1X litter rates used in 1992 were: spring, 4.8 tons/ac and fall, 3.9 tons/ac. In 1993, the rates were: spring, 2.3 tons/ac and fall, 4.1 tons/ac. The fertilizer blends used in 1992 were: spring, 23.8N-4.3P-4.1K and fall, 68.0N-26.0P-24.9K. In 1993, the blends were: spring, 33.6N-12.5P-46.6K and fall, 28.0N-7.3P-51.1K.

The results reported are from soil samples obtained at the end of the fall 1993 study. This reflects the accumulation and leaching of litter and fertilizer supplied NO₃-N over time.

Research Findings. Little difference in accumulation in the surface 1 ft. of soil from any of the treatments was noted (Fig. 1). Accumulation was greatest at lower depths from the two highest rates and blend. There was almost a two-fold increase in concentration at 4 ft. as rate increased from 1X to 4X.

Application. This study indicates that poultry litter can be applied seasonally without causing environmental problems when rates are applied according to soil test results. Also litter applied at recommended rates results in less leaching and accumulation of NO₃-N than from fertilizer blend.

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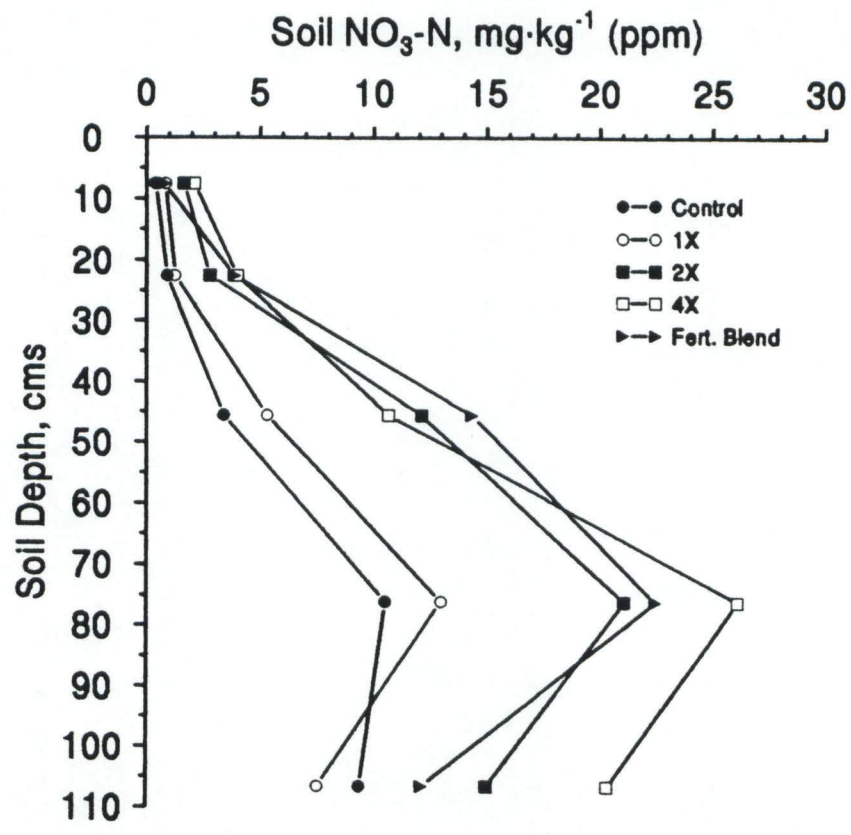


Fig. 1. Soil concentration of residual N from poultry litter and blended fertilizer applied each spring and fall over a 2 year period (1992-93). 1X=15.1 tons/ac; 2X=30.2 tons/ac; 4X=60.4 tons/ac; fert. blend=153.4N.