Predicting Phosphorus Loss from Surface Applied Poultry Manure. (S11-schroeder091748-Oral)

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Abstract:

Poultry litter (PL) is commonly applied to hay and pasture in the Southeast. Phosphorus loss from surface applied PL was studied under simulated rainfall. Three PL rates (2, 7 and 13 Mg ha-1) and the three initial runoff scenarios, R1 (immediate runoff), R2 (30 days without rain then runoff), and R3 (several small rains before runoff) were applied to 1x2 m grassed plots. Total P (TP) and dissolved reactive P (DRP) were determined for runoff samples collected over a 6-month period. The greatest P loss was seen with R1. Phosphorus losses from the R2 and R3 scenarios were not different (p < 0.05). The highest PL application rate produced the greatest TP and DRP loss. Non-linear regression was used to develop equations relating P concentration in runoff to PL application and initial runoff timing. The resulting equations closely fit the observed data (R^2 from 0.68 to 0.91). However, when used to predict runoff P concentrations from larger (0.8 ha) plots accuracy of prediction was low. The fact that scaling up from small plots produced poor prediction indicates that the relationship between P application and P loss in runoff may be too complex to be described by a simple decay equation.

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