

COVER CROP MANAGEMENT IS KEY TO REDUCE RUNOFF AND PHOSPHORUS LOSSES

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Cover crop can provide important ecosystem services in agricultural systems by reducing the risks of nutrient losses to the environment. Reducing nutrient losses from farmland should also help improve agricultural viability by reducing the amount of nutrients that need to be imported back to the farm. A study was established to determine the impact of cereal rye (*Secale cereale* L.) and dairy liquid manure application method (surface, low-disturbance and deep injection) on phosphorus losses from soil under corn silage production. Manure was applied in the fall at 8,000 gal/acre rate to a cover crop that was drill seeded three weeks prior. A rainfall simulator was used to compare water runoff volume and phosphorus losses between management schemes. Rainfall simulations were conducted 2 weeks after manure application in the fall, in the spring, and early summer (corn at V3 stage). There were significant differences in phosphorus losses between the different simulation timings, with more phosphorus lost in the fall. Cover crop had a less important role relative to method of manure application for phosphorus losses, especially in the fall. This can be attributed to low biomass present at the time of the fall simulation. Runoff losses were lower with the cover crop in the spring. This study's results underline the importance of establishing a cover crop early to maximize fall biomass production and that the method of manure application plays an important role. Future work includes comparing other rye cover crop and manure application combinations, and investigating nitrogen availability to the following corn crop.

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