



Rotating fertilizers a sustainable alternative to P-based poultry litter management

February 21, 2021

Application of poultry litter with a small-plot manure spreader in a study that investigated meth

Application of poultry litter with a small-plot manure spreader in a study that investigated methods of managing nutrient buildup due to repeated poultry litter applications. Photo by H. Tewolde.

When poultry litter is applied to the same field continuously for several years, some litter-derived elements such as phosphorus (P) accumulate in the soil and become a concern for eutrophication and other environmental issues. The most recommended management practice to prevent excess nutrient buildup in the soil is to apply just enough poultry litter to meet the P need of the crop. However, this does not supply enough other nutrients to meet the crop's need, making it necessary to supply nutrients from other sources, increasing production costs.

A recent article in the *Soil Science Society of America Journal* looks at whether a new management strategy that involves rotating poultry litter with synthetic fertilizers in combination with rotation of cotton, corn, and soybean would minimize nutrient accumulation from repeated poultry litter applications. The results showed that applying poultry litter for a few years at a high rate to satisfy all nutrient needs of cotton, followed by suspending the application for two or three years during which synthetic nitrogen fertilizer is applied, was as effective as the commonly recommended P-based management in maintaining initial soil nutrient levels. This new strategy also increased cotton, corn, and soybean yields. Rotating crops was not effective, but rotating poultry litter with nitrogen fertilizers proved to be an effective, safe, and sustainable option.

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Tewolde, H., Buehring, N., Feng, G., & Way, T.R. (2021). Managing soil nutrient buildup by rotating crops and fertilizers following repeated poultry litter applications. *Soil Science Society of America Journal*. <https://doi.org/10.1002/saj2.20184> (in press)

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