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Drainage, cover crops, and weather impact nitrate loss

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A tile drain flowing in Indiana. Photo by Jane Frankenberger.

Subsurface drainage is an essential water management practice for many poorly drained soils in the Midwestern United States and around the world, but this practice also contributes nitrate loads to surface waters. To sustain agricultural productivity in these regions, a systems approach needs to be implemented for designing drainage systems and managing drained lands, meeting both crop yield and water quality goals.

New *Journal of Environmental Quality* research reports on a long-term (31-year) study of subsurface drainage and cropping management practices in southeastern Indiana, summarizing results from Years 16 to 31 and comparing them to results from the first 15 years of the study. The study compared three drain spacings (5, 10, and 20 m) managed with a no-till corn–soybean rotation with cover crops in about half of the years.

Drain flow and nitrate losses per unit area were greatest for the 5-m spacing and lowest for the 20-m spacing. Cover crops reduced nitrate concentrations and losses in the drain flow. Even with lower concentrations, years with higher rainfall and drainage still produced large loads. The results underscore the interacting effects of drainage design, crop management, and weather in determining the magnitude of N loss from drained agricultural fields.

Dig Deeper

Kladivko, E.J., & Bowling, L.C. (2021). Long-term impacts of drain spacing, crop management, and weather on nitrate leaching to subsurface drains. *Journal of Environmental Quality*, *50*, 627–638. **https://doi.org/10.1002/jeq2.20215**

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