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Winter cover crop promotes nutrient retention

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Dr. Sheila Christopher and her team taking soil and cover crop samples in northern Indiana. Photo by Kemal Gökkaya.

The U.S. Midwest is among the most highly productive and intensively farmed areas in the world, but a fallow period in winter/spring, high rates of fertilization, and artificial drainage cause excess nitrogen and phosphorus losses to waterways. The planting of winter cover crops is one management tool that can improve soil health while reducing nutrient loss from farm fields during the fallow period.

In a new *Journal of Environmental Quality* study, researchers examined the effect of cover crops on soil nutrients by comparing fields with and without cover crops at two locations in northern Indiana.

They found cover crop use decreased soil nitrate by more than 50% the magnitude of reduction was related to cover crop biomass. Cover crops had variable effects on soil phosphorus. Mineralization experiments showed that nitrogen in decaying cover crops became available for cash crop uptake the following year.

Over the five-year study, researchers did not detect changes in soil organic matter content, suggesting nitrogen-cycling responses to cover crops happen rapidly and independently of changes in soil organic matter. Overall, this study showed that widespread implementation of winter cover crops holds considerable promise for reducing nutrient loss and improving soil health.

Dig Deeper

Christopher, S.F., Tank, J.L., Mahl, U.H., Hanrahan, B.R., & Royer, T.V. (2021). Effect of winter cover crops on soil nutrients in two row-cropped watersheds in Indiana.

Journal of Environmental Quality, 50, 667–679. https://doi.org/10.1002/jeq2.20217

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