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Adopting cover crops and reducing tillage show no early benefits

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Thomas “Beau” Badon, a Mississippi State University graduate research assistant and first author on the study, prepares the sampling station to collect data from a study site in northwest Mississippi. Photo by Mark Hill.

In the U.S. Mid-South, some farmers voluntarily adopt practices to prevent runoff-driven nutrient and sediment pollution to surface waterbodies. One such practice is fallow-season cover crops, often done while also reducing tillage. However, field-scale research has not focused on quantifying the water conservation benefits from these practices in the row crop systems prevalent in the region.

Researchers in Mississippi subdivided six farm fields, managed in a corn–soybean rotation, into hydrologically separate treatment and control watersheds. Farmers maintained the control half, continuing their tillage practices and leaving soil exposed through the rainy winter months. In the treatment half, researchers integrated cover crops and minimized tillage, removing multiple post-harvest operations that disturb soil. After collecting and analyzing surface runoff from fields for two years, the team found that concentrations of nutrients were reduced. However, cover crops and minimum tillage did not reduce discharge from fields, and so neither nutrient loads nor sediment losses were reduced.

The study suggests it is unlikely that adding these conservation practices will immediately reduce pollution in conventional production systems and highlights the need for more research to help farmers transition to these practices.

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Badon, T., Czarnecki, J. M. P., Baker, B. H., Spencer, D., Hill, M. J., Lucore, A. E., & Krutz, L. J. (2022). Transitioning from conventional to cover crop systems with minimum tillage does not alter nutrient loading. *Journal of Environmental Quality*, *51*,

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