Science Societies

Conservation Practices Targeting Phosphorus Have Trade-Offs

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Phosphorus researchers examine a vegetated riparian buffer in Nor- way. Riparian buffers are very effective at trapping sediment-bound phosphorus but can become sources of dissolved phosphorus if legacy sources are not dealt with. Photo by Pete Kleinman.

Nutrient runoff from agricultural lands can pollute downstream water bodies, promoting eutrophication—the biological enrichment of surface water and the most widespread water quality problem worldwide. Billions of dollars are spent on conservation practices to mitigate this runoff. However, this can come with trade-offs,

as practices curtailing the loss of one form of a nutrient can exacerbate other forms.

An international team of researchers reviewed trade-offs associated with conservation practices for controlling phosphorus (P) loss from agricultural lands. Phosphorus is one of the major nutrients involved in eutrophication, and agricultural P has been implicated in eutrophication of water bodies around the world. The team found that conservation practices aimed at controlling and trapping P often did well in controlling P tied to sediment. However, they did little to control dissolved forms of P and often increased dissolved P pollution. Some of the most common conservation practices, including no-till, cover crops, and vegetated buffers, regularly exhibited these trade-offs.

Anticipating these trade-offs is essential to the success and sustainability of conservation systems.

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