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Precipitation controls fertilizer source effects on nitrate leaching

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Dr. Athyna Cambouris's research team member installing a suction lysimeter during a field experiment in Quebec, Canada. Photo by Athyna Cambouris.

In Québec, where potatoes are typically grown on sandy soils, soluble nitrogen fertilizers are commonly split-applied to reduce nitrate leaching. Despite reduced nitrate leaching compared with a single application at planting, split-application of soluble nitrogen fertilizers still results in high nitrate losses, which is of great economic and environmental concern.

In a recent article published in *Agronomy Journal*, researchers evaluate the performance of one-time application of polymer-coated urea—an environmentally smart nitrogen—to reduce growing-season nitrate leaching compared with split-application of two conventional soluble fertilizers (ammonium nitrate and ammonium sulfate) widely used by local farmers.

The results indicated that nitrate leaching is primarily driven by precipitation regardless of the fertilizer N source. Polymer-coated urea reduced the risk of early-season nitrate leaching by reducing soil nitrate concentrations between planting and hilling. However, reduction of growing-season nitrate leaching only occurred when rainfall during this period was high.

This study suggests that the effectiveness of polymer-coated urea to reduce nitrate leaching is sensitive to seasonal precipitation patterns and that polymer-coated urea is a better option than conventional soluble fertilizers in reducing growing-season nitrate leaching in years with high early-season water supply.

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Clément, C.-C., Cambouris, A.N., Ziadi, N., Zebarth, B.J., & Karam, A. (2020). Growing season nitrate leaching as affected by nitrogen management in irrigated potato production. *Agronomy Journal*, *112*. **https://doi.org/10.1002/agj2.20387**

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