Splitting nitrogen applications reduced nitrous oxide emissions

While many soils in the Upper Midwest of the U.S. are extensively tile drained, substantial cropland remains poorly drained, negatively affecting nitrogen (N) fertilizer use efficiency and possibly degrading the environment. Increasingly, farmers are using split N fertilizer applications, instead of a single early-season application, to enhance fertilizer efficiency and minimize environmental impacts. Despite an intuitive linkage between soil drainage, N fertilizers, and nitrous oxide ($N_2O$) emissions, evaluation of $N_2O$ emissions of single and split applications under different soil drainage conditions are lacking.

A recently published article in the *Journal of Environmental Quality* reports on a two-year study in south-central Minnesota where single and split N applications for corn production were evaluated under drained and undrained conditions in soils with natural poorly to somewhat-poorly drained characteristics.

Regardless of drainage condition, N fertilization increased $N_2O$ emissions, but undrained soil emitted 1.8 times more than the drained soil (2.11 vs. 1.15 lb N/ac). Further, the single application produced similar grain yield but emitted 35% more $N_2O$ than the split application, which also employed a urease inhibitor.

Given the need to reduce environmental impacts while enhancing crop productivity, split N application combined with a urease inhibitor may be a valuable approach, but further evaluation is needed in the context of previous studies suggesting that benefits of alternative N application timing on $N_2O$ emissions may be site and management specific.


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**Increasingly, farmers are using split N fertilizer applications over the course of the growing season.**

Source: YouTube/philip healey.