



Science
Societies

Nitrogen Source Affects In-Season Availability More Than Nitrification Inhibitors

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Fertilizer nitrogen injection through anhydrous ammonia reduces potential nitrogen losses and keeps nitrogen in a more stabilized ammonium form during the early growing season. Photo courtesy of UNL CropWatch.

Nitrogen fertilizer management continues to be challenging due to potential nitrogen losses under variable weather conditions. Selecting the right fertilizer nitrogen source can minimize losses and improve nitrogen use efficiency and crop yield. Researchers have proposed nitrification inhibitors as a solution to stabilize nitrogen and reduce losses, but their effectiveness compared with conventional nitrogen sources needs to be better understood.

A team at the University of Nebraska–Lincoln conducted a two-year field study in maize to compare conventional nitrogen sources (anhydrous ammonia vs. urea) and nitrification inhibitors in fine-textured soil. Nitrogen source had a more significant effect on ammonium nitrogen retention (300–340% higher in anhydrous ammonia vs. urea) than nitrification inhibitor (14–50% higher with vs. without inhibitor) during the early growing season. Moreover, anhydrous ammonia improved maize grain yield and agronomic indicators, including partial factor productivity, crop nitrogen uptake, and nitrogen recovery efficiency. At the same time, nitrification inhibitors did not affect maize grain yield and agronomic indicators.

These findings suggest that using the right fertilizer source, followed by nitrification inhibitors, can be an effective strategy for reducing potential nitrogen losses and improving nitrogen use efficiency in maize.

Adapted from

Neels, W., Jhala, A., Maharjan, B., Patel, S., Slator, G., & Iqbal, J. (2024). Nitrogen source affects in-season nitrogen availability more than nitrification inhibitor and herbicide in a fine-textured soil. *Soil Science Society of America Journal*, 88,

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