RegenPGC Graduate Education Community


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# Evaluating the Efficacy of Commercially Available Nitrification Inhibitors


***Abstract.*** Nitrogen is essential for crop productivity, yet its inefficient use in agriculture leads to significant environmental losses through nitrate leaching, nitrous oxide emissions, and ammonia volatilization. Nitrification inhibitors (NIs) are a key strategy to improve nitrogen use efficiency (NUE) by delaying the microbial conversion of ammonium to nitrate. This research evaluates the efficacy, mechanisms, and agronomic implications of commercially available NIs, focusing on active ingredients, including nitrapyrin, dicyandiamide (DCD), and pronitridine. Meta-analyses and field studies show variable results, with product performance influenced by factors such as soil temperature and moisture, organic matter content, and application rates. While products like nitrapyrin and DCD have demonstrated consistent effectiveness under optimal conditions, newer compounds like pronitridine and calcium-polysaccharide show potential yet require further independent validation. These findings underscore the importance of tailoring NI use to specific site conditions and integrating them within broader nitrogen management strategies for sustainable agriculture.



Ludolph, Alex, **Diop, Alioune**, Yakubu, Adam, Dorissant, Larousse, & **Roth, Richard**. (2025, November 10). *Evaluating the efficacy of commercially available nitrification inhibitors* [Abstract]. CANVAS 2025, Salt Lake City, UT, United States. https://scisoc.confex.com/scisoc/2025am/meetingapp.cgi/Paper/170608