

Effect of Nitrification Inhibitors on Nitrogen Transformations in Soils with Different Textures –  
An Incubation Study

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Nitrification inhibitors (NIs) are considered a viable option for delaying nitrification and increasing nitrogen use efficiency. However, their efficacy can be impacted by different soil types. To address this, a soil incubation experiment including three soils (clay, loam, and sand) was conducted at 20°C and 65% WFPS. The treatments were UAN, UAN+DCD/DMPP/Centuro/and eNtrench. Extractable N ( $\text{NH}_4^+/\text{NO}_3^-$ ) was destructively sampled and analyzed at specific intervals from the start of the experiment during a 28-day trial. Overall, we observed rapid nitrification in loam compared to sandy and clayey soils. Among the inhibitors, eNtrench was effective in sand and clay, retaining more ammonium and significantly reducing nitrate accumulation for the first two weeks, with DCD having a slight reduction in nitrification. However, DMPP and Centuro were not effective. In field experiments, it was found DCD and DMPP effectively reduce nitrification. Observing the products not working in the laboratory study indicates injection of small amounts of the inhibitors with UAN by syringe does not reproduce the effect of subsurface banding of the products in the field. Further laboratory studies are planned to examine the partitioning of the inhibitors from UAN upon syringe injection to soil.