

## Fall Nitrification Inhibition of Anhydrous Ammonia in Manitoba

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Fall-applied anhydrous ammonia (AA) is prone to nitrification losses in the soil by the time of next growing season. Farmers often apply higher fall nitrogen (N) rates than spring to compensate N losses. In 2020, a preliminary trial was set up on a commercial field at the Silverwinds Farms to determine whether nitrification inhibitors (NIs) with fall-applied AA can slow down the conversion of ammonium ( $\text{NH}_4^+$ ) to nitrate ( $\text{NO}_3^-$ ). Stabilizing fall-applied AA in  $\text{NH}_4^+$  form may prevent N losses and cut short the higher fall N rates requirements. Nitrogen (82-0-0) was applied on September 30, at  $110 \text{ lb N ac}^{-1}$  with Centuro<sup>®</sup>, N-Serve<sup>®</sup>, and without any nitrification inhibitor ( $\text{NH}_3$  110N), while treatments without N addition as control and with full N rate at  $140 \text{ lb N ac}^{-1}$  ( $\text{NH}_3$  140N) were also included. Extractable  $\text{NH}_4^+$  and  $\text{NO}_3^-$  concentrations ( $\text{mg N kg}^{-1}$  dry soil) were obtained for the soil sampled (0-12" on band rows) in late fall, early, and late spring. We found that the use of NIs allowed more inorganic N and  $\text{NH}_4^+$  persistence, and Centuro tended to show better inhibition than N-Serve. We continued following a similar setup at two different sites this fall to get more detailed patterns.