

Partnership Perk



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Fall applications of Nitrogen and Soil Temperatures

Fall application of nitrogen fertilizer to cropland going to corn is about to begin. Ideally, nitrogen fertilizer applications should be made in the spring or sidedressed after corn planting. However, fall nitrogen applications are sometimes necessary to cover the acreage planted to corn in Iowa with available application equipment, and with limited time for spring fieldwork and labor.

The only nitrogen fertilizer suggested for fall application in Iowa is anhydrous ammonia, because the ammonium ion attaches to soil exchange sites, limiting movement in soil. However, with warm soil temperatures, microbial activity converts ammonium to nitrate, which is mobile in soil, can be leached, and can be denitrified. Losses represent decreased economic return from the nitrogen investment and leaching increases nitrate in water systems.

Application of anhydrous ammonia should not be done until soil temperatures are 50°F or colder, with continued soil cooling forecast. The colder the soil the better for slowing nitrification and allowing a fall ammonia application to behave like a spring preplant application does. Nitrification inhibitors can further slow the ammonia to nitrate conversion, thus increasing the fraction still in the ammonium form the next spring.

Long Story Short: Delay fall nitrogen applications until soil temperatures are 50°F and cooling.

ISU's county soil temperature and forecast model is available at:

<http://extension.agron.iastate.edu/NPKnowledge>

In the past 5 years, soil temperatures have cooled to below 50°F statewide ranging from October 22 to November 21. Soil temperatures will cool earlier in northern Iowa.

Sources:

John Sawyer and Elwynn Taylor, ISU Department of Agronomy

Steve Brinkman, Nutrient Management Specialist, Natural Resource Conservation Service