

Partnership Perk



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Fall Applications of Nitrogen and Soil Temperatures

Fall application of nitrogen fertilizer to cropland going to corn in 2008 is about to begin. Ideally nitrogen fertilizer applications should be made in the spring or sidedressed after corn emergence. However, fall nitrogen applications are sometimes necessary to cover the acreage planted to corn in Iowa with available application equipment, especially when time and labor are limited in the spring.

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 is, the better for limiting 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 remaining as ammonium next spring.

Soil temperatures statewide are expected to reach and remain below the 50°F guideline around *the first weekend of November* in 2007.

Ammonium ions attach to exchange sites in the soil, thereby limiting its movement. Also, anhydrous ammonia initially limits its own conversion to nitrate and therefore is the only nitrogen fertilizer suggested for fall application in Iowa. However, warm soil temperatures increase microbial activity that converts ammonium to nitrate, which is mobile in soil so it can both leach, and also be lost through denitrification. Nitrogen losses represent decreased economic return from the fertilizer investment and leaching increases nitrate reaching water systems.

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 recent years, soil temperatures have cooled to below 50°F statewide ranging from October 22 to November 21. Soil temperatures typically cool earlier in northern Iowa.

Sources:

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Steve Brinkman, Nutrient Management Specialist, Natural Resource Conservation Service