

# Reminder About Fall Nitrogen Application

URBANA, ILL.

A lot of anhydrous is "fall applied" in our area. Exactly when that fall application should occur is a question that many often forget to ask during the busy months of autumn. When and how should that fall nitrogen be applied? The recommendations have changed and area producers need to know the "what and why" of those changes.

The University of Illinois and the Illinois Fertilizer and Chemical Association now recommend fall nitrogen applications only after four-inch soil temperatures have reached 50 degrees. Additionally, the University and IFCA no longer recommend fall applied anhydrous minus a nitrification inhibitor. This is a significant change over past nitrogen recommendations. In the past, the U of I recommended fall applications with an inhibitor at 60 degrees and fall applications minus an inhibitor at 50 degrees not before the third week of October.

Why should fall anhydrous only be applied with an inhibitor and why should it not be applied before temperatures have dropped to 50?

Following application anhydrous ammonia is rapidly transformed into  $\text{NH}_4$ , termed ammonium, which has a positive charge and is held tightly by the soil.

The upper seven inches of the soil contain two microorganisms that create nitrogen application concerns. The first is a bacteria termed nitrosomonas and the second is a bacteria referred to as nitrobacter. Nitrosomonas bacteria change ammonium into a chemical termed nitrite. Nitrobacter bacteria change nitrite into a material

termed nitrate.

Nitrate has two very severe problems associated with it. First, the material can be lost as percolating water leaches it from the soil because the chemical is not held by the soil very well. Secondly, the material can go through another process in which it is transformed into one of many gases that are lost to the atmosphere. Either way, the process of anhydrous being transformed into nitrate eventually means lost nitrogen for the following year's crop. Additionally, this loss of nitrogen has been popularly connected with environmental concerns, and this means that nitrogen applications may be strictly regulated someday.

Nitrification inhibitors kill nitrosomonas bacteria. As a result, nitrification inhibitors slow down the process by which anhydrous, the stable form of nitrogen, is changed to easily lost nitrogen. However, the bacteria responsible for the loss of applied nitrogen eventually recover. This means that if nitrogen is applied too early – a substantial portion will still be lost even when it is applied with an inhibitor because "nitrogen feeding" bacteria recover too soon.

The U of I and IFCA believe that these new guidelines provide the right parameters to "knock down" denitrifying bacteria long enough to reduce substantial nitrogen loss. By waiting until 50 degrees and using a nitrification inhibitor, farmers can save money and they may just also do their part to avoid future regulation.  $\Delta$