

# Stopping N Losses More Urgent Than Ever With Current Nitrogen Prices

*More and more growers are looking to urease inhibitors to curb N losses.*

**A** topic that is on many growers' minds these days is what nitrogen (N) source will I use and how much will I put down? Whatever the motivation, growers appear to have taken the next step by including or considering the use of enhanced fertilizer technologies into their fertility programs. One such product is a urease inhibitor manufactured by Agrotain International.

One compelling part of the grower's motivation to move toward

urease inhibitors is the steady upward march of N prices. Using an inhibitor is one very effective way to protect their N investment. Agrotain Plus is designed to do this by stopping N losses resulting from volatilization of ammonia from urea in UAN and reducing leaching of nitrate by inclusion of a nitrification inhibitor in the formulation.

## What is volatilization?

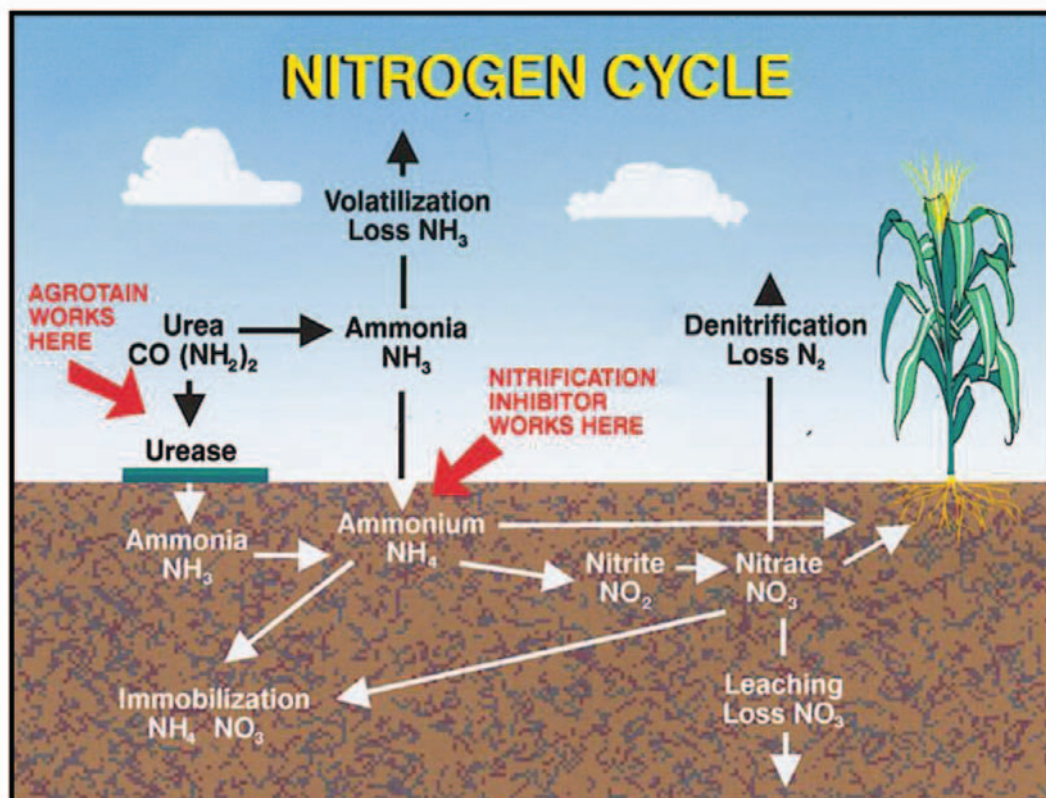
Volatilization occurs when urea in UAN rapidly undergoes hydrolysis particularly in surface applications. Urease enzyme converts urea into ammonia and carbon dioxide.

Volatilization is the loss of gaseous ammonia to the atmosphere. Under the right conditions, as much as 30 percent of ammonium nitrogen will be lost within a few days.

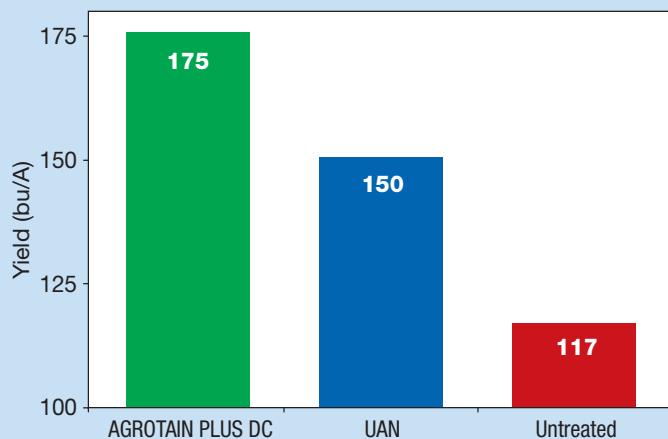
Volatilization can be prevented via our urease inhibitor. It blocks activity of the urease enzyme, minimizing N loss. This allows more time for rainfall and irrigation to move UAN into the soil.

## Slowing N losses

In the presence of oxidizable organic matter,



### Nitrogen Management No-Till Corn: Side-Dressed

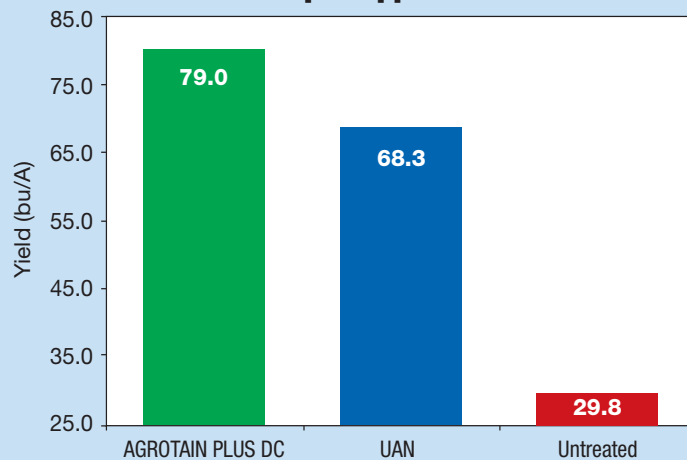


Treatment: All received 50 lbs N/A at planting. AGROTAIN PLUS and UAN received an additional 50 lbs N/A side-dressed.

Source: U. of Kentucky - G. Schwab, L. Murdock

Figure 1. Yield increase of side-dressed, no-till corn, Kentucky, Schwab, et al.

### Nitrogen Management Fall Seeded Wheat: Split-Application



Treatment: 40 lbs N/A at Feeke's 3, plus 60 lbs N/A at Feeke's 5

Source: Missouri - Wheat Tech - C. Bowley

Figure 2. Yield increase of fall-seeded wheat, Missouri, Bowley.

when oxygen is limiting (anaerobic conditions), soil bacteria use nitrate in place of oxygen. This process generates elemental  $N_2$  gas or  $N_2O$  (nitrous oxide) gas, both of which are lost to the atmosphere. Losses are greatest under conditions of high soil moisture and warm temperatures. Losses can be up to several pounds of N per day. Slowed bacterial conversion of ammonium to nitrate (nitrification) by a nitrification inhibitor present in Agrotain Plus limits further losses of N by both nitrate leaching and denitrification.

#### Education

One strategy we've developed has been to educate growers across all markets on how our urease inhibitor can help them get the most from their N sources. With this year's higher N costs, we've focused on the economics of the growers' N investment. Not surprisingly, dealers and growers have been receptive to this message. In educating growers, the goal is to show the "how, where,

when, and why" of using urease inhibitors.

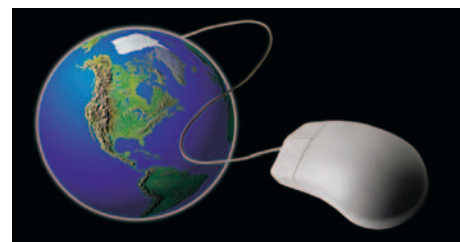
What exactly does our product do? In layman's terms it blocks an enzyme from being able to break down urea for a certain period of time. That time allowance provides opportunity for the surface-applied urea to be carried into the soil via rainfall or irrigation, as opposed to having to incorporate, and using costly fuel and time.

#### Bottom line argument

At harvest, we follow up with dealers and growers to make sure they see results from using our product. Our goal is to demonstrate that growers using urea or UAN can benefit from using one or more of our products. In a Kentucky study, for example, use of our product increased no-till, side-dressed corn yields by 25 bu/A (Figure 1). In another study, this time in Missouri on fall-seeded wheat, the use of our urease inhibitor increased wheat yield 12 bu/A, compared to UAN alone (Figure 2).

Such results in the field are the bottom line argument for using Agrotain to protect against N losses in a market of rising prices.

*John Hassell is research and agronomic development manager for Agrotain International in West Lafayette, Indiana.*



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