

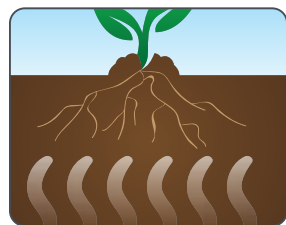
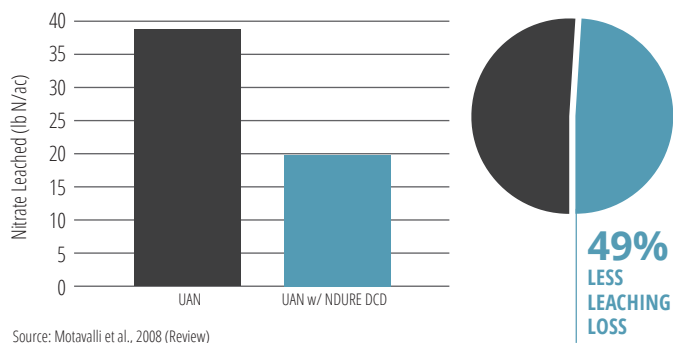
Protect Your Nitrogen Investment



Carl Bruice // National Nutrition Technical Manager

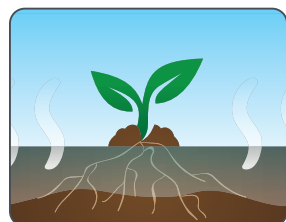
The Nitrogen Cycle in soils is a very leaky system, meaning nitrogen can be lost to the environment by several mechanisms, and losses can be significant (up to 40+%). These losses reduce Nitrogen Uptake Efficiency (NUE) and return on fertilizer investment, which is of serious concern when fertilizer costs are high. Nitrogen losses can also result in reduced production. Two of these loss mechanisms include leaching and denitrification.

EFFECT OF NDURE® DCD ON NITRATE LEACHING



NITRATE LEACHING

This form of nitrogen loss happens when negatively charged nitrate is moved below the plant's root zone by percolating water. Leaching tends to be more prevalent on sandy soils, but it can happen on all soil types.



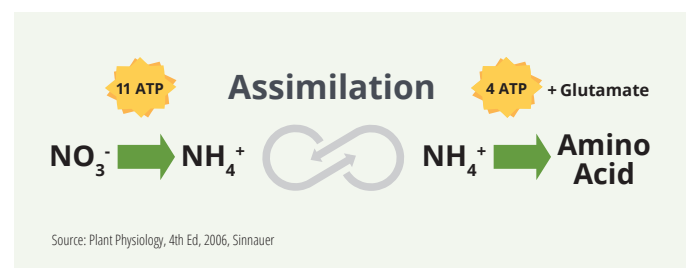
DENITRIFICATION

This is a nitrogen loss process where microbes convert nitrate into a gas that will escape into the atmosphere and be lost from the soil. Denitrification occurs when soil pores are filled with water instead of air, such as in poorly drained soil conditions.

Only nitrate-nitrogen can be lost to leaching and denitrification—ammonium cannot. In most soils, the conversion of ammonium to nitrate occurs rapidly. Losses can be minimized by including NDURE DCD nitrogen stabilizer in your nitrogen fertility program. NDURE DCD contains DCD (Dicyandiamide), a proven nitrification inhibitor that keeps nitrogen in the ammonium form longer, preventing losses of nitrate-nitrogen from either leaching and/or denitrification.

Not only does NDURE DCD improve NUE, but it also can lead to energy savings by the plant. When plants take up nitrate-nitrogen, they must expend a great deal of energy to convert it back to the ammonium form, as seen in the diagram below.

NITROGEN UPTAKE AND ENERGY BUDGET



ATP (Adenosine Triphosphate) is an energy-rich molecule used as fuel to power chemical reactions in all living cells. Keeping nitrogen in the ammonium form longer enhances ammonium uptake saving the crop from expending energy that should otherwise be used to fuel growth and increase yields.

Putting all three mechanisms together can lead to increases in crop production through:

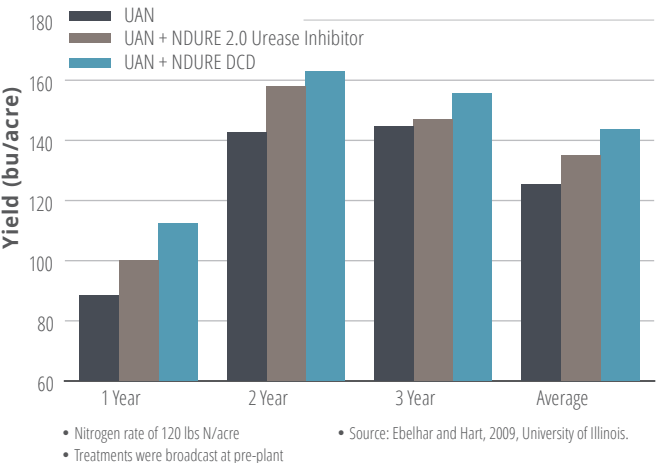
- Improved nitrogen uptake efficiency
- Reduced nitrogen losses
- Improved energy budget



CORN YIELD BENEFIT | ILLINOIS

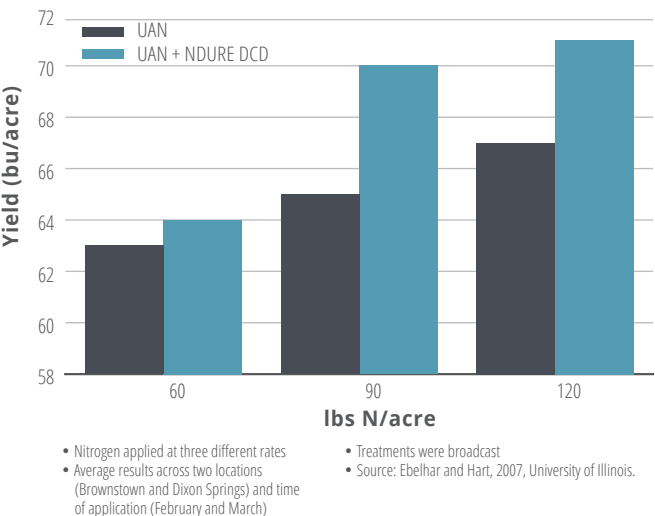
On average, NDURE 2.0-treated UAN resulted in a higher yield compared to untreated UAN, indicating the value of a urease inhibitor to protect the nitrogen from ammonia volatilization leading to optimized yield potential.

NDURE DCD-treated UAN resulted in a higher yield compared to untreated UAN and NDURE 2.0-treated UAN. The study indicates a nitrification inhibitor to protect against nitrate leaching and denitrification was needed to gain the highest yield.



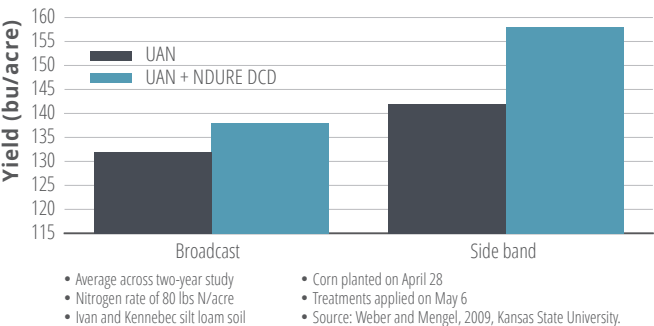
SOFT RED WINTER WHEAT YIELD BENEFIT ILLINOIS

Across all three nitrogen rates, UAN treated with NDURE DCD stabilizer resulted in higher yields compared to untreated UAN.



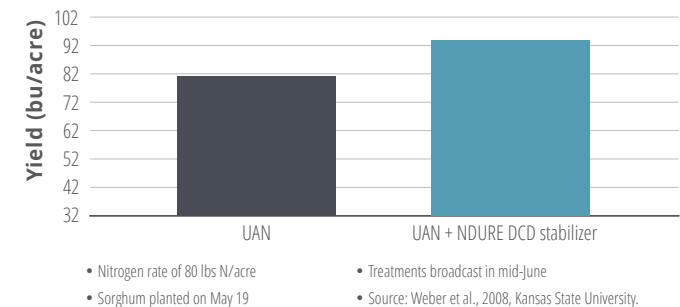
CORN YIELD BENEFIT | KANSAS

In both broadcast and side-band applications, UAN treated with NDURE DCD stabilizer resulted in higher yields compared to untreated UAN.



SORGHUM YIELD BENEFIT | KANSAS

NDURE DCD-treated UAN resulted in a 13 bu/acre yield advantage compared to untreated UAN.

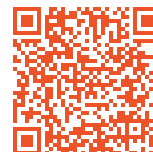


Introducing TILL-IT® FLUID CARBON® and TILL-IT FLUID CARB®-S Containing the Proven Nitrification Inhibitor in NDURE DCD

Enjoy the convenience of NDURE DCD pre-mixed with UAN for ready-to-use simplicity.



TILL-IT FLUID CARBON is a 27-0-0 liquid fertilizer derived from UAN containing DCD as a pre-mix and 0.24% humic acid for the added benefit of enhanced nutrient uptake.



TILL-IT FLUID CARB-S 26-0-0-3S is designed for soil applications to prevent or correct nitrogen and sulfur deficiencies in a wide range of crops. It contains a DCD nitrification inhibitor to maintain nitrogen in the ammonium form for reduced leaching loss potential. This product also contains humic acids and may enhance nutrient uptake efficiency.



NDURE DCD AND TILL-IT FLUID CARBON FOR



Improved nitrogen uptake efficiency



Reduced nitrogen losses



Improved energy budget



Higher yields

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