

# Evaluation of Agrotain Urease Inhibitor with UAN Nitrogen Sidedress Applications in Field Corn

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## Objectives

To evaluate yield response of field corn to two different UAN nitrogen sidedress rates applied using a coulter/ injector toolbar with and without Agrotain urease inhibitor. The purpose of this study is to look at the effectiveness of Agrotain at preventing urea nitrogen loss in sidedress applications when the UAN is not knifed into the soil. The potential benefit to farmers is the possibility of reduced nitrogen rates to achieve the same yields.

## Background

Cooperator:	Marsh Foundation/ Farm Focus	Herbicide:	PRE (April 26): 2.1 qt/A Bicep II Magnum + 1.1 lb/A Princep + 0.8 oz/A Soil Python
County:	Van Wert	Insecticide:	6.7 oz per 1,000 row ft. Aztec 2.1G T-banded
Nearest Town:	Van Wert	Hybrid:	Corn Belt C-611
Soil Type:	Hoytville silty clay loam	Row Width:	30 inches
Drainage:	Tile- nonsystematic	Planting Rate:	29,120 seeds/A
Previous Crop:	Wheat	Planting Date:	April 26, 2002
Tillage:	Summer disk/ripper; Fall field cultivate (2x); Spring field cultivate (1x)	Harvest Date:	October 4, 2002
Soil Test (2002):	pH 6.5; P 39ppm; K 126ppm		
Fertilizer:	250 lb/A 8-24-24 in row at planting; UAN sidedress- See Methods.		

## Methods

This study is set up with four treatments replicated four times in a complete randomized block design. These treatments are:

1. 110 lb/A nitrogen sidedress applied as UAN
2. 110 lb/A nitrogen sidedress applied as UAN with Agrotain @ 0.25% v/v
3. 160 lb/A nitrogen sidedress applied as UAN
4. 160 lb/A nitrogen sidedress applied as UAN with Agrotain @ 0.25% v/v

Actual as applied weights were taken using portable weigh scales to weigh the applicator between treatments. All as applied rates were within +/- 8 percent of target rates.

All plots had 20 pounds actual nitrogen applied in the row starter fertilizer in addition to the above treatment rates. All sidedress applications were made on June 8 with corn at stage V4 using a 12-row coulter/ injector applicator rented from a local fertilizer dealer. No injector alignment adjustments were made prior to or during application.

Rainfall after application was recorded. Plot size was 30 feet (12 rows) wide by 1,030 feet long. Harvest populations (October 03) were estimated by counting the number of plants on each side of a 17.5 feet tape at three different locations in each plot. The average of the number of plants counted per 17.5 feet was converted to plants per acre. The plots were harvested using a John Deere 6620 combine equipped with a calibrated AgLeader PF3000 yield monitor. Yields were calculated based on yield monitor weights and moisture readings. All yields are adjusted to 15% standard moisture.

## Results

**Table 1. Corn Harvest Population, Moisture, and Yield.**

Treatment	Harvest Population (plants/A)	Harvest Moisture (%)	Grain Yield (bu/A)
110 lb./A nitrogen	24,800	16.9	98.1
110 lb./A nitrogen w/Agrotain	24,700	16.8	102.1
160 lb./A nitrogen	24,600	16.7	106.5
160 lb./A nitrogen w/Agrotain	24,600	16.9	96.5
LSD (0.05)	NS	NS	NS
F-test	<1	1.2	2.6

NS = not significant

## Summary

Agrotain is a urease inhibitor that according to the manufacturer is designed to prevent urea volatilization for a period of about 14 days when applied at the 0.25% volume-to-volume rate (1 qt. per 100 gal.) with 28% UAN liquid fertilizer. This delay allows more time to get the urea incorporated into the soil through rainfall. The first significant rainfalls after sidedress application occurred on June 18 and June 26, with 0.28 inches and 0.38 inches respectively.

The results from this one-year study indicate there was no statistical difference between the four different treatments with regards to harvest population, moisture, or yield. Variation in the yields between the replications of any particular treatment did not enable us to detect significant yield differences between treatments.

The reason for including the lower nitrogen rate treatments (110 lb./ A) was to be able to detect possible benefits of the Agrotain urease inhibitor even if yields were lower than normal. However, with corn yields for all the plots as low as they were this season due to weather, there should have been adequate nitrogen present in all four treatments at the rates applied to support the yields attained.

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