

# Evaluation of Agrotain<sup>®</sup> Urease Inhibitor and UAN Nitrogen Sidedress Application Rates in Field Corn

## Objectives

To evaluate yield response of field corn to different nitrogen rates and the addition of Agrotain<sup>®</sup> urease inhibitor with 28% UAN nitrogen sidedress applied using a coulter/injector toolbar.

## Background

---

Soil Type:	Hoytville silty clay loam, Haskins loam, Millgrove silt loam	Herbicide:	PRE (April 23): 2.6 qt./A Keystone + 2.4 oz./A Hornet(85.6%DG)
Drainage:	Tile- nonsystematic	Insecticide:	6.7 oz. per 1000 row ft. Aztec 2.1G T-banded
Previous Crop:	Wheat	Hybrid:	U.S.A. Seed 565
Tillage:	Summer disk/ripper; Fall field cultivate(2x); Spring field cultivate(2x)	Row Width:	30 inches
Soil Test(2002):	pH 6.5, P 85 ppm, K 249 ppm	Planting Rate:	29,120 seeds/A
Fertilizer:	95 lb./A 46-0-0 banded (2X2) at planting, UAN sidedress- see methods	Planting Date:	April 23, 2003
		Harvest Date:	October 18, 2003

---

## Methods

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

- 1) 95 lb./A nitrogen sidedress applied as UAN
- 2) 95 lb./A nitrogen sidedress applied as UAN with Agrotain @ 0.25% v/v
- 3) 135 lb./A nitrogen sidedress applied as UAN
- 4) 135 lb./A nitrogen sidedress applied as UAN with Agrotain @ 0.25% v/v
- 5) 175 lb./A nitrogen sidedress applied as UAN

Actual as applied weights were taken using portable weigh scales to weigh the applicator between treatments. All as applied rates were within +/- 7 percent of target rates. All plots had 44 pounds actual nitrogen applied in the row starter fertilizer in addition to the above treatment rates. All sidedress applications were applied on June 11 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. Misaligned injectors can increase the amount of UAN left on the surface subject to volatilization.

Rainfall after application was recorded. Plot size was 60 feet (24 rows) wide by 335 feet long. Harvest populations (October 02) 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 center 12 rows of each plot were harvested using a John Deere 6620 combine equipped with a calibrated AgLeader PF3000 yield monitor. Yields were calculated based on weigh wagon weights(yield monitor weights were not

used due to the short length of the plots) and moisture readings from the yield monitor. All yields are adjusted to a 15% standard moisture.

## Results

**Table 1.** Corn harvest population, moisture, and yield.

Treatment	Harvest Population (plants/A)	Moisture (%)	Yield (bu/A)
95 lb./A nitrogen	27,800	19.1	205.0
95 lb./A nitrogen w/ Agrotain	27,700	19.1	201.8
135 lb./A nitrogen	28,200	19.3	206.5
135 lb./A nitrogen w/ Agrotain	27,400	19.2	204.5
175 lb./A nitrogen	27,900	19.5	208.3
LSD (0.05)	NS	NS	NS
F-test	<1	<1	2.0
CV (%)	2.7	2.4	1.5

NS= not significant

## Summary

The results from this year's study indicate there was no statistical difference between the five different treatments with regards to harvest population, moisture, or yield. Even with an 80 lb./A variation in the nitrogen rate, yields did not indicate a statistically significant difference. This is the second year this trial has been conducted at Farm Focus (reference 2002 trial at: [http://www.ag.ohio-state.edu/~farmfocus/Agrotain\\_corn-02.pdf](http://www.ag.ohio-state.edu/~farmfocus/Agrotain_corn-02.pdf)). Results from both years are similar in that there was no significant yield response to the different nitrogen rates, or the addition of Agrotain<sup>®</sup> inhibitor.

Agrotain<sup>®</sup> is a urease inhibitor that according to the manufacturer is designed to delay 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 (June 11) occurred on June 12, 13, and 17, with 0.46 inches, 0.68 inches, and 0.68 inches respectively. These amounts of rainfall within this short time of application of the UAN sidedress would have prevented any significant volatilization of the urea even without the addition of Agrotain<sup>®</sup>.

## Acknowledgement

The authors express appreciation to Agrotain International representative, Steve Parrish, for his cooperation with this study.

---

**All educational programs conducted by Ohio State University Extension are available to clientele on a nondiscriminatory basis without regard to race, color, creed, religion, sexual orientation, national origin, gender, age, disability, or Vietnam-era veteran status.**

**Keith L. Smith, Associate Vice President for Ag. Administration and Director, OSU Extension.  
TDD No. 800-589-8292 (Ohio only) or 614-292-1868**

---