

Evaluation of Agrotain[®] Urease Inhibitor and UAN Nitrogen Sidedress Application Rates in Field Corn

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Objectives

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

Background

Cooperator:	Farm Focus	Herbicide:	2.5 qt/A Lumax + 1.4 lb/A
County:	Van Wert	PRE (April 17):	Atrazine 90DF
Soil Type:	Hoytville silty clay loam, Haskins loam,	Insecticide:	None applied
Drainage:	Tile- nonsystematic	Hybrid:	Walton Hybrids WX 1665
Previous Crop:	Wheat	Row Width:	30 inches
Tillage:	Fall disk/ripper; Spring field cultivate(2x)	Planting Rate:	29,680 seeds/A
Soil Test(2002):	pH 6.1, P 83 ppm, K 155 ppm	Planting Date:	April 16, 2004
Fertilizer:	195 lb/A 8-24-24 2X2 banded at planting, UAN sidedress- see methods	Harvest Date:	October 8, 2004

Methods

This study was set up with four treatments replicated six times in a complete randomized block design. These treatments were:

- 1) 115 lb/A nitrogen sidedress applied as UAN
- 2) 115 lb/A nitrogen sidedress applied as UAN with Agrotain @ 0.25% v/v
- 3) 165 lb/A nitrogen sidedress applied as UAN
- 4) 165 lb/A nitrogen sidedress applied as UAN with Agrotain @ 0.25% v/v

All plots had 15.5 pounds actual nitrogen applied in the row starter fertilizer in addition to the above treatment rates. All sidedress applications were applied on May 29 with corn at stage V3-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, as would be the case for most farmers using a rental unit from a fertilizer dealer (Misaligned injectors may increase the amount of UAN left on the surface subject to volatilization).

Plot size was 30 feet (12 rows) wide by 1030 feet long. Harvest populations (September 30) 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 6 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 yield monitor wet weight and moisture readings for each plot. All yields are adjusted to 15% moisture.

Results

Table 1. Corn harvest population, moisture, and yield means¹.

Treatment	Harvest Population (plants/A)	Moisture (%)	Yield (bu/A)
165 lb/A nitrogen w/ Agrotain	27,600 b	15.4 a	204.0 a
165 lb/A nitrogen	28,400 a	15.4 a	202.8 ab
115 lb/A nitrogen	27,700 ab	15.3 a	192.6 bc
115 lb/A nitrogen w/ Agrotain	27,100 b	15.1 b	190.4 c
LSD (0.05)	700	0.1	10.4
F-test	5.2	5.2	4.1
CV (%)	2.0	<1	4.3

¹Means followed by the same letter in same column are not significantly different

Summary

The results from this year's study indicate there were some statistical differences between some of the treatments for yield, moisture, and harvest populations. In looking at the yield data, we can conclude that the addition of Agrotain at both nitrogen rates had no effect on yield. The yield results for this year do show a significant difference between the higher and lower nitrogen rates with Agrotain added, but not a significant difference between the nitrogen only treatments at different rates. Thus it is hard to say with a high degree of confidence that a yield difference can be expected between the two nitrogen rates tested.

Similar studies conducted in 2002 and 2003 (reference these reports on the Farm Focus website: www.farmfocusshow.com/research.htm) showed no significant differences in yield could be attributed to the higher nitrogen rates. These studies also indicated no yield benefit from adding Agrotain[®] to sidedressed UAN under the field conditions which it was tested (conventional tillage following wheat stubble), and with the amounts of rainfall received after UAN applications.

Agrotain[®] 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 rainfall after sidedress application (May 29) occurred on May 30 in the amount of 2.4 inches. This amount of rainfall within a day of application of the UAN sidedress would have resulted in thorough incorporation into the soil and prevented any significant volatilization of the urea even without the addition of Agrotain[®].

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