

SOIL/WATER RESEARCH

South Dakota State University

2008 Progress Report

Agricultural Experiment Station
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Influence of N rate, NSN (Nutrisphere) additive, and Agrotain on corn grain yield and ear leaf N concentration near Aurora SD in 2008. (40908)

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Nitrogen prices have increased steadily in the past few years. This situation has warranted better use of fertilizer

nitrogen. Surface applied N fertilizers are subject to volatilization losses. Nitrification inhibitors can reduce volatilization losses. A newer product (NSN, Nutrisphere) that slows urease enzyme activity is available. Therefore, a no-till corn study was initiated to evaluate the effectiveness of this new product (NSN) along with Agrotain (older urease reducer).

Materials and Methods

Item:	Description:
Location	Crop Improvement Farm, Aurora SD
Tillage	No-till
Previous crop	Soybeans
N Fertilizer source	Urea
N rates	0, 50, 100 and 150
NSN additive and Agrotain (50 lbs N/a)	with or without
Corn hybrid and seeding rate	Dekalb DKC 46-60 (30,100 seeds/a)
Planting date	May 15
Soil Samples (nitrate-N)	Pre-plant (0-6 and 6-24 inch)
Plant samples	Ear Leaf analyzed for total nitrogen (TKN)
Harvest date	Nov. 3
Statistics	RCBD, 4 replications

Results and Discussion

Corn grain yield was significantly influenced by N application rate (Table 1). Soil test nitrate (0-24 inch) was 48 lbs N/a. NSN additive and Agrotain did not significantly influence grain yield when compared to the 50 lbs N/a rate

without urease inhibitors (note 50 lbs N/a rate with similar lower case letter). However, there was a trend for higher yield with NSN and Agrotain. Rainfall (0.29 inches) was received the day after N application. Corn ear leaf N was significantly influenced by N rate (Table 1).

Table 1. Influence of urea N rate, Agrotain, and Nutrisphere-N (NSN) on corn ear leaf N concentration and grain yield near Brookings SD in 2008 (40908).

Treatment	N rate lbs/a	N additive ^A	Ear Leaf N %	Grain Yield ^B bu/a
1	0		1.78 c	106.8 d
2	50		2.26 b	129.5 c
3	50	Agrotain	2.20 b	133.1 bc
4	50	NSN	2.29 b	138.3 bc
5	100		2.52 a	145.1 ab
6	150		2.62 a	154.4 a
Pr>F			0.001	0.002
LSD _(.10)			0.20	12.3

^A Agrotain (5 qts/ton urea), NSN (2 qts/ton urea)
^B adjusted to 15 % grain moisture.
 Soil test NO3-N (0-2ft) = 48 lbs/a

NSN additive and Agrotain did not significantly influence ear leaf total N (note 50 lbs N/a rate with similar lower case letter). Extremely dry climatic conditions occurred in July, August and September which reduced grain yields.

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