Pre-plant versus side-dress Nitrogen for corn in NW Minnesota

Nearest Town: Waubun (Mahnomen Co.) & Hendrum (Norman Co.)

Soil Type: Mahnomen County: Sverdrup sandy loam
Norman County: Fargo silty clay

Row Width: 30”

Experimental Design: Split plot within a randomized complete block design
Main plot pre-plant nitrogen rates: 0, 40, 80, 120, 160, and 200 lbs N per acre
Split plot side-dress N (pre-plant N + side-dress N): 0 + 120, 40 + 80, 80 + 40, 120 + 40, 160 + 40, and 200 + 40 lbs N/acre
Nitrogen source: urea (46-0-0)
Side-dress urea treated with Agrotain and applied between V4-V6
4 replications

Previous Crop: Mahnomen County: previous crop soybean
Norman County: previous crop spring wheat

Purpose of Study:
To determine if split application of nitrogen would result in greater corn yield in Northwest Minnesota

Results:
Corn grain yield was increased by pre-plant nitrogen at both locations. Economic optimum nitrogen rates (EONR) for both locations were near 100 lbs of N per acre.

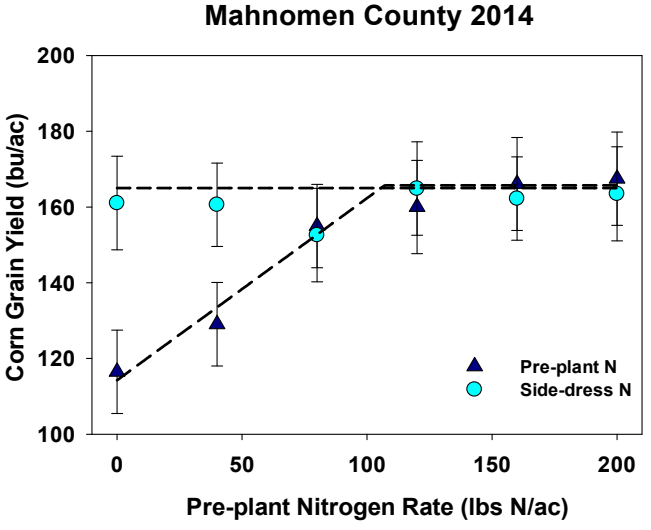
Side-dress application of nitrogen increased corn grain yield for the lowest two pre-plant application rates, 0 and 40 lbs of N per acre. There was no yield advantage of split application of nitrogen for pre-plant nitrogen rates 80 lbs of N or greater.

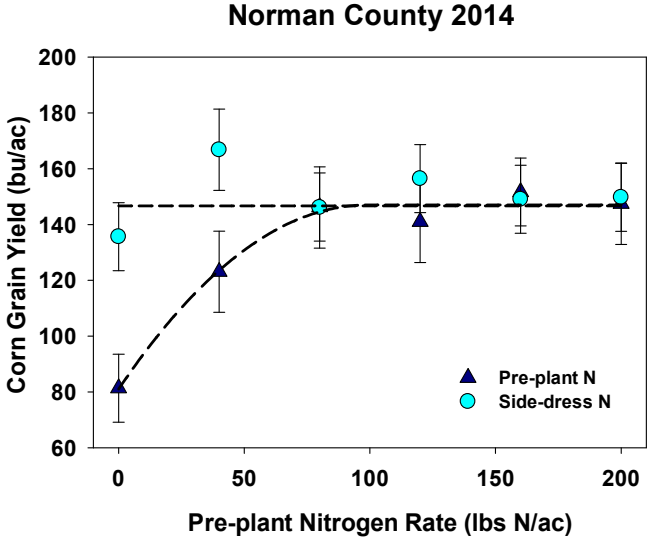
Side-dress application of nitrogen did not increase yield for applied N rates higher than the EONR. Application of 120 lbs of N resulted in similar yield when applied all as a pre-plant or a side-dress application.

The data provides evidence that a single pre-plant application of nitrogen alone may be enough to result in maximum corn grain yield even if early season rainfall may favor leaching losses

Table 1. Summary of economic optimum nitrogen rates using the maximum return to N model for two locations in Northwest Minnesota during 2014.

	Ratio of Price N:Price per bushel of corn					
Location	0.00	0.05	0.10	0.15	0.20	0.25
	----------lb N/acre----------					
Mahnomen	107	107	107	107	107	107
Norman	99	93	88	82	77	71





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