

Supplemental Nitrogen on Soybeans

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Objective

Evaluate the yield response of soybeans to supplemental N at the R2 reproductive stage.

Background

Cooperator:	Marsh Foundation/ Farm Focus	Soil Test:	pH 6.1, P 72 ppm, K 155 ppm
County:	Van Wert	Herbicides:	PRE: Roundup Ultra (1.5 pt/A) Squadron (3 pt/A)
Nearest Town:	Van Wert		POST: Roundup Ultra (1.0 pt/A)
Soil type:	Hoytville silty clay loam	Variety:	Callahan 8297 RR (treated)
Drainage:	Tile	Planting Date:	May 11, 1999
Tillage:	Fall deep till and land leveled	Planting Rate:	200,000 seeds/A
Previous Crop:	Corn	Harvest Date:	September 16, 1999

Methods

The experimental design was a randomized complete block with four replications of three treatments. Treatments included: (1) 83 lb/A N from urea plus Agrotain® (5 qt/ton of urea), (2) one pass of application equipment without fertilizer, and (3) no fertilizer or equipment traffic.

Nitrogen was applied during the R2 growth stage using a broadcast spreader on a tractor in 15-foot swaths. Two passes were made for each treatment to produce a 30-foot wide treatment area.

Plot length was 464.5 feet. The center 14 feet of each plot was harvested and weighed by a weigh wagon to determine grain yield at 13% moisture. Harvest populations were estimated by counting the number of plants in three-foot sections from two adjacent rows. Counts were made at three different locations in each plot.

Results

Table 1. Harvest Population and Yield.

Treatment	Harvest Population (plants/A)	Yield (bu/A)
N (83 lb/A)	207,152	48.2
Equipment traffic without N	199,408	47.8
No N or Equipment traffic	198,440	51.7
LSD (P = 0.05)	NS	NS
CV	6.26%	5.28%

NS = not significant

Summary and Notes

Supplemental nitrogen applied to soybeans at the R2 reproductive stage did not significantly increase yields. Lack of rainfall may have diminished the potential benefit of additional N. Urea requires at least 0.5 inch of rainfall for incorporation, otherwise N may be lost from volatilization. Agrotain®, an urease inhibitor, can delay these losses 10-14 days after application. In this study, 0.25 inch of rain occurred within one day after N application. Total rainfall accumulation after 14 days was 0.92 inches. Yields were not significantly better on plots that received no fertilizer or equipment traffic.

In conclusion, this one-year study suggested no benefit from applying supplemental N to soybeans at the R2 reproductive stage. Driving across plots at flowering at the R2 stage did not significantly lower yields. Results may be different in a year with normal rainfall.

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