

# 2010 Demonstration Report



## THE LEARNING CENTER

at Monmouth, Illinois

### Nitrogen Management in Soybean

It is generally accepted that in most situations, preplant nitrogen (N) applications often result in reduced root nodulation and insignificant increases in soybean yield potential. Soybean plants work with rhizobium bacteria in the soil to nodulate and fix most of their required N. However, available N often becomes depleted in the later R growth stages due to increased demand from the plant when nodule efficiency tends to decrease. It is thought that supplying N in these later stages may help boost production, especially in high-yield environments.

#### Study Guidelines

A replicated trial was conducted at the Monsanto Learning Center near Monmouth, Illinois in 2010 to evaluate the effects of various rates of soil applied N on the nodulation and yield potential of soybeans compared to an untreated check. A maturity group 3.0 Genuity® Roundup Ready 2 Yield® soybean was planted in 30-inch rows. The trial was planted on May 5 at 150,000 seeds/acre. The herbicide program was Valor® XLT herbicide at 3 oz./acre pre-emergence, followed by Roundup PowerMAX® herbicide at 22 oz./acre postemergence on 4-inch weeds. It was harvested on October 5, with an average yield of 86.2 bu./acre. In 2009, the field was planted to corn and chisel plowed in the fall. To level the seed bed, a soil finisher was used in the spring of 2010.

The N treatments were applied using 32% urea ammonium-nitrate (UAN). Two application timings evaluated were preplant incorporated (PPI) and R1. The treatments at R1 were applied with a hand boom using drop nozzles. Agrotain®, a urease inhibitor,

was added to the treatments at R1 to help stabilize and prevent loss of the N. At each timing, N rates of 0, 25, 75, 100, and 200 lbs./acre were evaluated.

#### Results

While the N treatments visually resulted in greener, taller soybean plants they also reduced root nodulation compared to the untreated check. (Figure 1). Higher yields were obtained with N applications at both timings. However, yield increases seen in the N applied plots were not economically feasible (Figure 2). The increased yields were not high enough to cover the cost of the added N, which ranged from \$12.50 to \$20 for each additional bushel produced, not including application costs.

#### Conclusions

- PPI applications of N resulted in taller greener plants, with fewer nodules.
- The yield increases from any of the treatments was not sufficient to cover the cost of the N and application.
- Adding soil-applied N was not economically feasible in either timing at any rate.

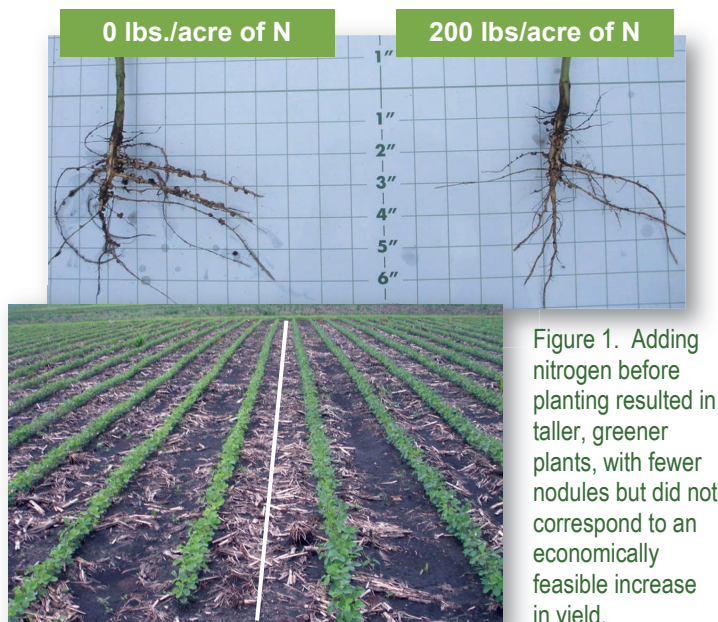


Figure 1. Adding nitrogen before planting resulted in taller, greener plants, with fewer nodules but did not correspond to an economically feasible increase in yield.

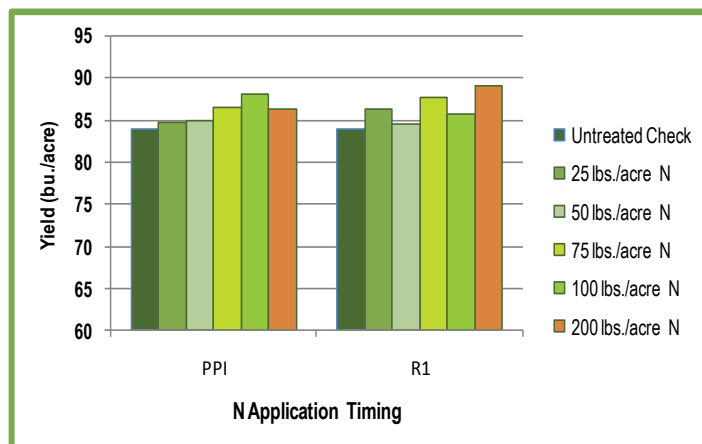


Figure 2. Yield increases from various rates of N (lbs./acre) at two timings, as compared to the untreated check.

The information discussed in this report is from a single site, non-replicated, one-year demonstration. This informational piece is designed to report the results of this demonstration and is not intended to infer any confirmed trends. Please use this information accordingly.

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