



Timing of Nitrogen Application

Trial Objective

- Nitrogen is a significant and required investment in corn production. There is considerable interest in applying nitrogen later in the growing season; therefore, knowing when corn plants are most responsive to a later-season application can help farmers determine the application timing for the best return on their investment.
- The objective of this study was to compare the yield impact of different nitrogen side-dress application timings during the growing season.

Research Site Details

Location	Soil Type	Previous Crop	Tillage Type	Planting Date	Harvest Date	Potential Yield (bu/acre)	Seeding Rate (seeds/acre)
Monmouth, IL	Silt loam	Corn	Conventional	4/27/2018	9/24/2018	250	36K

- A 114 RM SmartStax® RIB Complete® corn blend product was planted on April 27th using 32% urea and ammonium nitrate (UAN) (32-0-0) as the nitrogen source.
- Prior to planting, 80 lb/acre of nitrogen was applied and incorporated into the soil for all treatments.
- The additional nitrogen treatments of 32% UAN were applied with a urease inhibitor using 360 Y-DROP® applicators at the rate of 100 lb/acre of actual nitrogen at three different growth stages: V4 (4 leaf collars), V8 (8 leaf collars), and VT (Tassel).
- Three replications of each treatment were used.

Understanding the Results

- There was a statistically significant difference between all nitrogen application timings with the application at V4 providing the highest yield response (Figure 1).
 - This is the third year that this study has been conducted. The results are inconsistent when compared to the previous years where the average differences for the combination of 2016 and 2017 results were minimal. The 2018 results may have been impacted by cold temperatures in the spring resulting in delayed residue decomposition, and leading to reduced nitrogen availability during the early growing season.
- Differences in nitrogen stress between treatments were visually apparent throughout the season (Figure 2-4).
- The ideal timing of a later-season nitrogen application could change yearly because of weather and environmental challenges. Additionally, the cost to potentially obtain greater yields based on the timing of an application of nitrogen may not always be economically feasible when all costs are considered.



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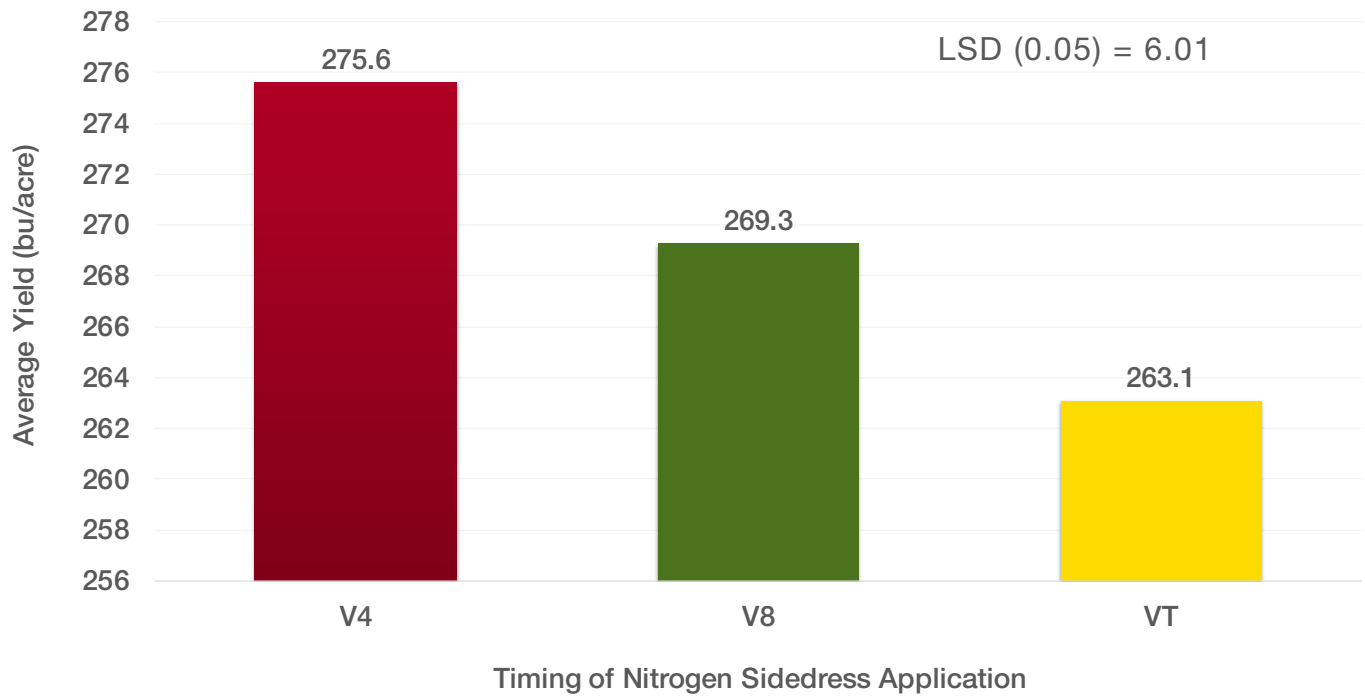


Figure 1. Average yield response to the timing of nitrogen application at Monmouth, IL in 2018.



Figure 2. Nitrogen applied at growth stage V4 (image taken on August 16, 2018).



Figure 3. Nitrogen applied at growth stage V8 (image taken on August 16, 2018).



Figure 4. Nitrogen applied at growth stage VT (image taken on August 16, 2018).

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What Does This Mean For Your Farm?

- Nitrogen applications later in the growing season have the potential to improve yields and reduce potential nitrogen loss through leaching and nitrification.
- Environmental conditions and the costs associated with nitrogen applications should be considered when making fertility plans for each field.
- Use of 360 Y-DROP® applicators for later-season nitrogen applications can allow for greater flexibility in the timing of the application, allowing nitrogen applications in taller corn.

Legal Statements

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Performance may vary, from location to location and from year to year, as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on the grower's fields.

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