

In-Season Sulfur Application in Soybeans

2017

Background and Objectives

- Sulfur fertility has historically not been a major concern for growers on most soils; however, several factors have made sulfur deficiencies in crop production more common:
 - Increased removal due to higher crop yields
 - Increasing use of high analysis fertilizers without sulfur
 - Decreased manure applications in many areas
 - Reduced atmospheric deposition from industrial emissions
- A research trial was conducted at the DuPont Pioneer research farm in Johnston, IA in 2017 to evaluate the effect of in-season sulfur applications on soybean yield.
 - Soil tests indicated low to medium sulfate levels in the trial field (9-14 ppm) and soil organic matter of 3.6%.
 - In-season applications were used to supply sulfur prior to and at the timing of peak plant uptake (Figure 1).

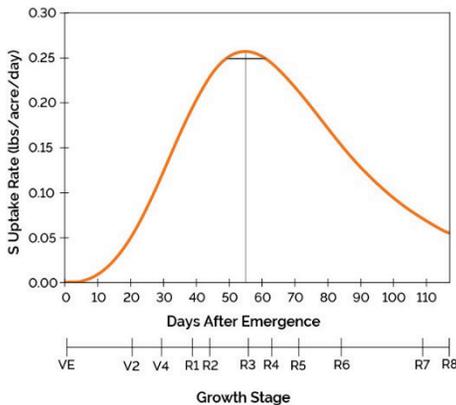


Figure 1. Sulfur uptake rate through the growing season for a 66 bu/acre soybean crop. Duration of peak uptake is represented by the horizontal black line (Gaspar and Conley, 2016).

- Sulfur was hand-applied as calcium sulfate (gypsum) 0-0-0-17
- Flowers and pods were counted five times throughout the growing season.
- Tissue tests were taken 2 weeks after each S application.
- Plots were machine-harvested for yield.

Results

- Sulfur treatments showed no effect on soybean growth and yield in this study.
- Yield did not significantly differ among sulfur application rates and timings (Figure 2).
- Tissue test results showed no effects of sulfur treatment on leaf sulfur levels and were generally indicative of adequate sulfur fertility.
- There were no differences in flower number, pod number, or leaf greenness among treatments.

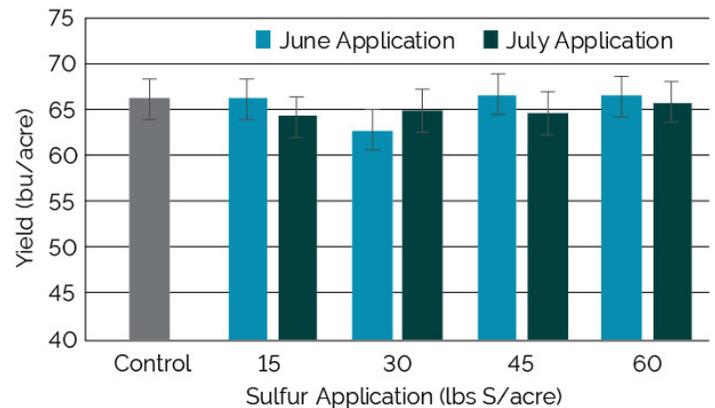


Figure 2. Effect of sulfur application timing and rate on soybean yields.

Study Description

Location	Johnston, IA	
Planting Date	May 12	
Design	Randomized complete block, 4 replications	
Soybean Variety¹	Pioneer® brand P31T11R	
Treatments		
Rates	0 lbs S/acre	45 lbs S/acre
	30 lbs S/acre	60 lbs S/acre
Timings	June 14 (~27 days after emergence)	
	July 12 (~55 days after emergence)	

Conclusions

- There are several factors that have led to sulfur deficiencies in crop production being more common today than in the past.
- However, results of this study are generally consistent with previous research conducted in Iowa, which has shown a relatively low likelihood of a yield response to applied sulfur in soybeans.

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Gaspar, A. and S. Conley. 2017. Soybean Nitrogen and Sulfur Uptake, Partitioning, and Removal. DuPont Pioneer Research Update

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