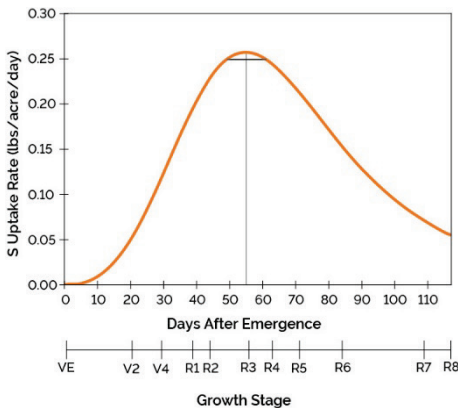


## In-Season Sulfur Application in Soybeans

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).

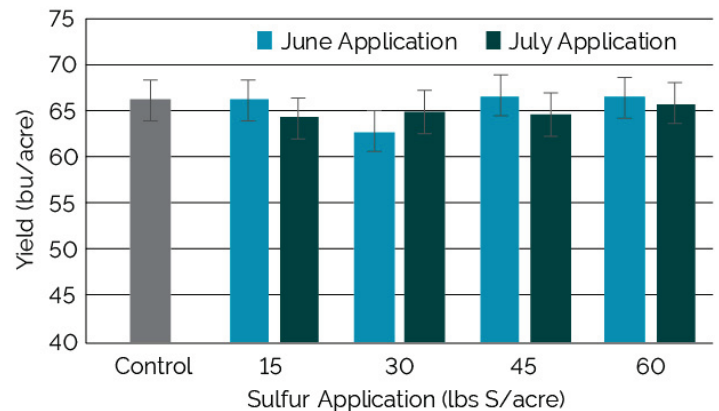


**Figure 1.** Sulfur uptake rate through the growing season for a 66 bu/acre soybean crop. Duration of peak uptake is represented by the horizontal black line (Gaspar and Conley, 2016).

- 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

<b>Location</b>	Johnston, IA	
<b>Planting Date</b>	May 12	
<b>Design</b>	Randomized complete block, 4 replications	
<b>Soybean Variety<sup>1</sup></b>	Pioneer® brand P31T11R	
<b>Treatments</b>		
<b>Rates</b>	0 lbs S/acre	45 lbs S/acre
	30 lbs S/acre	60 lbs S/acre
<b>Timings</b>	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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