

Soybean Yield Under Nitrogen and Sulfur Fertilization

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Objective.

Determine the effects of nitrogen and sulfur fertilization on soybean yield to define best management practices.

Materials and Methods

Site-Year 1 | Crop Year–2021

Soil type	Nicollet, Clarion
Previous crop	Corn
Cultivar	P28T14E
Planting date	May 6, 2021
Rowspacing	30 in.
Seeding rate	140,000 seeds/acre
Tillage	Field cultivator in the spring
Fertilizer	Optimum-to-high soil test
Nitrogen	Per treatment scheme
Harvest date	October 13, 2021
Experimental design	Randomized complete block design
Replications	4
Treatments	Untreated (0 lb. N and S per acre at both planting); AMS (26.3 lb. N and 30 lb. S per acre at both planting); Gypsum (0 lb. N and 30 lb. S per acre at both planting); Urea (26.3 lb. N and 0 lb. S per acre at both planting); and Full (150 lb. N and 15 lb. S per acre at both planting and R3 stage)

Site-Year 2 | Crop Year–2021

Soil type	Galva, Primghar
Previous crop	Corn
Cultivar	P23A15X
Planting date	May 11, 2021
Rowspacing	30 in.
Seeding rate	140,000 seeds/acre
Tillage	Soil finisher–April 2, 2021
Fertilizer	24-60-80 VRT application–November 3, 2020
Nitrogen	Per treatment scheme
Harvest date	October 6, 2021
Experimental design	Randomized complete block design
Replications	4
Treatments	Untreated (0 lb. N and S per acre at both planting); AMS (26.3 lb. N and 30 lb. S per acre at both planting); Gypsum (0 lb. N and 30 lb. S per acre at both planting); Urea (26.3 lb. N and 0 lb. S per acre at both planting); and Full (150 lb. N and 15 lb. S per acre at both planting and R3 stage)

Site-Year 3 | Crop Year–2022

Soil type	Primghar, Galva
Previous crop	Corn
Cultivar	P22T18E
Planting date	May 13, 2021
Row spacing	30 in.
Seeding rate	140,000 seeds/acre
Tillage	Chisel plow–November 30, 2021; disc–April 15, 2022, field cultivator–May 12, 2022
Fertilizer	19-48-55 VRT applied November 17, 2021; 1.5 ton lime VRT applied November 23, 2021
Nitrogen	Per treatment scheme
Harvest date	September 27, 2022
Experimental design	Randomized complete block design
Replications	4
Treatments	Untreated (0 lb. N and S per acre at both planting); AMS (26.3 lb. N and 30 lb. S per acre at both planting); Gypsum (0 lb. N and 30 lb. S per acre at both planting); Urea (26.3 lb. N and 0 lb. S per acre at both planting); and Full (150 lb. N and 15 lb. S per acre at both planting and R3 stage)

Results

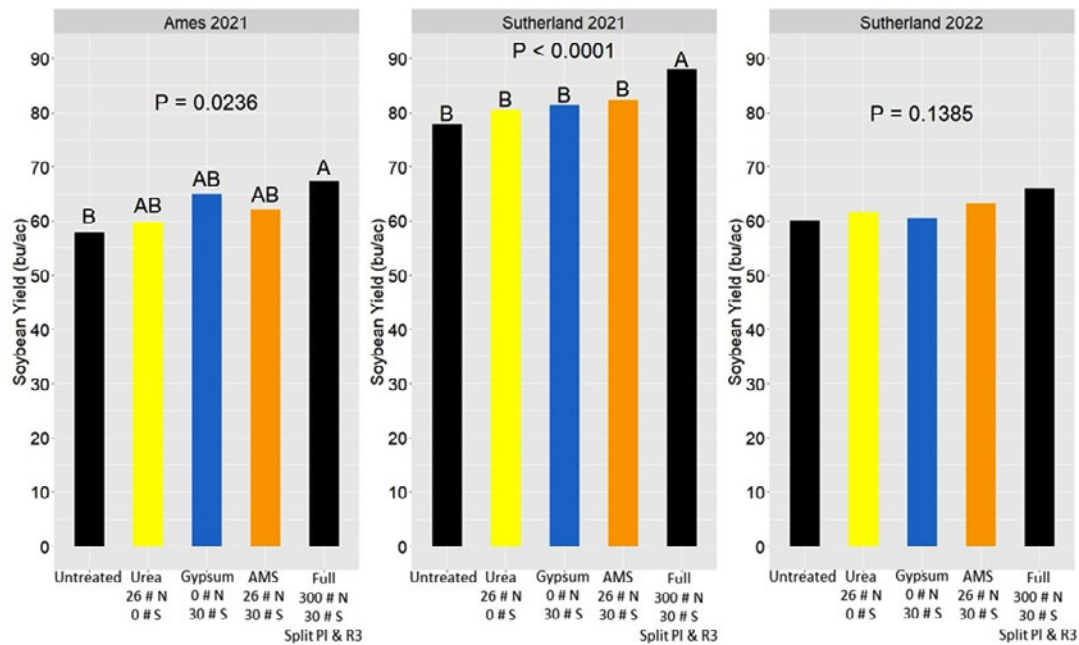


Figure 1. Soybean grain yield at 13% moisture in 2021 and 2022. Yields that are significantly different at $P < 0.05$ have different letters.

Key Takeaways

- The full treatment (150 lb. N and 15 lb. S per acre at both planting and R3 stage) had significantly higher soybean yields compared with the untreated control in 2021.
- In 2022, the yield trend was the same as the two 2021 site-years, however, was not statistically different.
- Yield benefits from the addition of N and/or S was not found to be economically beneficial.

Acknowledgements

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