

# On-farm Sulfur Fertilization of Soybean Trials

## RFR-A1318

Sulfur (S) fertilizer applications can offer yield increases where S deficiencies are present. The objective of these trials was to evaluate potential for S deficiency and grain yield response in soybeans to S applications.

### Methods

In 2012, S was applied to six cornfields with no manure history to test the response of corn in 2012 to S application and the response of soybeans in 2013 to residual S (the prior-year S application). In addition, S was applied to one soybean field in 2013 when soybeans were at V5 growth stage to test the response to S in the year of application. Calcium sulfate (gypsum) was the source of S in all trials, with the exception of Trial 5, where elemental S was the source. The rate of applied S ranged from 15 to 17 pounds S/acre. The S was applied in strip plots with three or more replications per treatment in each trial. All trials were conducted in western Iowa. See Table 1 for details on the seven trials.

### Results

#### First-year trial

There was no effect of S fertilization on the soybean grain yield in Trial 1 where S was applied in 2013 (Table 2).

#### Second-year residual

There was a statistically significant increase in soybean yield with the S application in two of the trials (Table 2). There was no yield increase due to S application in the other four trials. These trials indicate that S application can increase soybean yields in some fields and the yield increase can occur at least one year after the application is made. Across the two years of all ISU FARM trials with S application (first-year or residual-year in corn and soybean), there was a 29 percent positive yield response rate to S application.

For further information on these trials and other research on S fertilization, contact John Sawyer, professor, Department of Agronomy, Iowa State University Extension and Outreach ([jsawyer@iastate.edu](mailto:jsawyer@iastate.edu)).

**Table 1. Variety, row spacing, planting date, planting population, and previous crop, and tillage practices in sulfur trials on soybeans.**

Exp. No.	Trial	County	Variety	Row spacing (in.)	Planting date	Planting population (seeds/A)	Previous crop	Tillage
130619	1	Taylor	Stine 37LA82	15	5/16/13	152,500	Corn	No-till
130101	2	Lyon	Pioneer 91Y90	15	6/3/13	133,000	Corn	No-till
130132	3	Sioux	Pioneer 92Y31	30	5/13/13	132,000	Corn	No-till
130142	4	Lyon	Stine 17LDOZ	20	6/13/13	140,000	Corn	No-till
130206	5	Clay	Pioneer 92M22	30	6/20/13	139,000	Corn	Fall disk, spring field finish
130304	6	Crawford	NK S28-U7RR2	30	6/10/13	150,000	Corn	No-till
130306	7	Monona	LG 3114LL	30	6/3/13	140,000	Corn	Fall disk, spring mulch finish

**Table 2. Yield from soybean sulfur trials.**

Exp. No.	Trial	Sulfur rate (lb/A)	Application timing	Yield (bu/A)				Year
				Sulfur	Control	Response	P-value	
130619	1	17	6/19 (V5)	44.1	45.3	-1.2	0.23	1
130101	2	15	2012	53.6	55.5	-1.9	0.35	2
130132	3	15	2012	44.3	40.5	3.8	<0.01	2
130142	4	15	2012	42.7	43.7	-1.0	0.76	2
130206	5	15	2012	55.2	54.8	0.4	0.16	2
130304	6	16	2012	49.1	45.0	4.1	0.01	2
130306	7	16	2012	69.5	69.3	0.2	0.68	2