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Corn Response to Sulfur Application Rate

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Abstract

Historically, sulfur (S) application has not been recommended on Iowa soils for corn and soybean production. Soils supply, or a combination from sources such as soil organic matter, profile sulfate, manure, and precipitation have met crop S needs. However, over the past few years, S deficiencies in alfalfa and corn have been documented. Large crop yield responses have been measured in some fields containing soils with low organic matter, side-slope landscape position, or coarse soil texture, especially in northeastern Iowa. The objective of this study was to determine S response in corn and soybean in north-central Iowa.

Keywords

RFR A1190, Agronomy

Disciplines

Agricultural Science | Agriculture | Agronomy and Crop Sciences

Corn Response to Sulfur Application Rate

RFR-A1190

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Introduction

Historically, sulfur (S) application has not been recommended on Iowa soils for corn and soybean production. Soils supply, or a combination from sources such as soil organic matter, profile sulfate, manure, and precipitation have met crop S needs. However, over the past few years, S deficiencies in alfalfa and corn have been documented. Large crop yield responses have been measured in some fields containing soils with low organic matter, side-slope landscape position, or coarse soil texture, especially in northeastern Iowa. The objective of this study was to determine S response in corn and soybean in north-central Iowa.

Materials and Methods

This study was conducted on two sites, one (lower organic matter) on a Clarion loam with 2 to 5 percent slope and 3.8 to 4.7 percent soil organic matter, the other (higher organic matter) on a Webster clay loam with 0 to 2 percent slope and 5.4 to 6.1 percent soil organic matter. Calcium sulfate was broadcast

applied at rates of 0, 5, 10, 20, and 40 lb S/acre in the spring and incorporated before corn planting. Plots were 20 ft × 50 ft. Treatments were replicated four times. The middle three rows were harvested the length of the plots with a plot combine. Grain yields were corrected to standard moisture. Soil samples were collected prior to sulfur application at depths of 0–6 in. and analyzed for soil organic matter.

Results and Discussion

On June 10 corn ear leaf greenness was visibly increased in plots receiving sulfur compared with the check and surrounding bulk areas at both sites. By June 24, there was still a height increase due to sulfur, but the color differences were less. Despite the visual plant response, S fertilizer application at any rate had no statistically significant effect on corn grain yield at either site in 2011 (Table 1).

This study will be continued in 2012 to determine if there is a response in soybean to residual S supply from the 2011 applications.

Acknowledgements

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Table 1. Effect of sulfur rate on corn grain yield.

Sulfur rate	Higher o.m. site	Lower o.m. site
Lb S/acre	- - - Yield, bu/acre - - -	
0	192	187
5	184	188
10	190	187
20	191	191
40	187	183
FLSD _(0.10)	NS	NS

O.M. = organic matter.