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Field Corn Response to Sulfur Fertilization

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Abstract

The objective of this trial was to investigate response of field corn to sulfur fertilization when grown on irrigated coarse sand soil with low organic matter.

Keywords

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Disciplines

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Field Corn Response to Sulfur Fertilization

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Vince Lawson, farm superintendent

Introduction

The objective of this trial was to investigate response of field corn to sulfur fertilization when grown on irrigated coarse sand soil with low organic matter.

Materials and Methods

Trial location was Field H, which has a Fruitfield coarse sand soil with 1 percent organic matter and soil pH of 7.4. A spring soil test reported 326 lb/acre phosphorus (very high), 208 lb/acre potassium (medium), and 20 lb/acre of sulfur (low) in the topsoil. Spring tillage included chisel plowing and disking. Pioneer P1395AM1 hybrid corn seed was planted on May 5. Plant emergence was uniform and final stand counts averaged 32,500 plants/acre. Weed control was achieved by applying Lumax herbicide crop pre-emergence and row cultivation on June 10 just before canopy closure. Potash (0-0-60) fertilizer was broadcast at a rate of 200 lb/acre on April 26. Nitrogen (N) fertilizer was applied in split applications in the form of dry urea (May 12 and June 10) and liquid UAN (through irrigation July 2 and 11) and totaled 200 lb N for the season. Plots were arranged in a randomized complete block design with

four replications. A treatment plot consisted of six corn rows 50 ft long with data taken from the center two rows. Calcium sulfate (21% Ca, 17% S) was used as the sulfur source and banded between plot rows at rates equal to 10, 20, and 40 lb/acre sulfur on May 18. Plant tissue sampling occurred on July 17 when corn was at the R1 growth stage by collecting leaves that were opposite and below the primary ear. Plant samples were sent to A&L Analytical Laboratories, Memphis, TN, for nutrient concentration determinations. The center two rows of each plot were harvested on October 11 for grain yield determinations.

Results and Discussion

Good growing conditions for corn resulted in treatment yields that ranged from 206.6 to 214.0 bushels/acre in Table 1. Sidedressing calcium sulfate on May 18 at 10, 20 or 40 lb/acre had no effect on yield. Plant tissue analysis on July 17 revealed that all treatments, including the control, were in the reported sufficiency range for corn of 0.15–0.59 percent. Although this research was conducted on irrigated coarse sand soil with low sulfur content it found no evidence (under conditions of this trial) that corn plants were lacking sulfur from their growing environment to limit yield.

Table 1. Sulfur fertilizer treatments, percent sulfur of plant tissue on July 17, and treatment yields.

Treatment	Description	Plant tissue % sulfur	Yield bushels/acre ^a
Control	No sulfur fertilizer	0.21	211.1
Sulfur 10 lb/acre	59 lb/acre CaSO ₄ applied May 18	0.22	206.6
Sulfur 20 lb/acre	118 lb/acre CaSO ₄ applied May 18	0.23	214.0
Sulfur 40 lb/acre	236 lb/acre CaSO ₄ applied May 18	0.20	210.4

^aTreatment yields not significantly different at the 5 percent level.