

# SOIL/WATER RESEARCH

## *South Dakota State University*

### 2008 Progress Report

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#### Influence of zinc application on corn yield at Brookings SD in 2008. (41608)

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#### Introduction

Corn yield responses to zinc application are somewhat rare and hard to quantify. However, when zinc supply is deficient the corn response to zinc can be surprisingly large. There are many sources for zinc. Therefore, it is continually important to evaluate and build the database of zinc evaluations for corn.

#### Materials and Method

Item:	Description:
Location	Crop Improvement farm, Aurora
Corn Hybrid and seeding rate	DKC 46-60 (30,100 seeds/a)
Planting date	May 15
Soil Samples (zinc and other nutrients)	0-6 and 6-24 inch
Zinc sources and rates (applied with starter)	Origin and Trafix (both at 1 qt/a)
Starter Fertilizer with seed	5 gpa 10-34-0
Growth promoters (applied with starter)	Ascend (4 and 6 oz/a), AGM 6023 (2 qts/a)
Parameters measured	V6, V10 and VT plant zinc concentration grain yield
Harvest Date	Sept. 26 - Brookings, Sept. 28- Aurora
Statistics (4 replications)	RCBD

#### Results and Discussion

The zinc soil test (0-6 inch) was 0.61 ppm which is in the range that a yield response to zinc application on corn would be expected. Corn yield was significantly influenced by treatment (Table 1.) All treatment applications yields were significantly greater when compared with the control plot. Plant dry weights and zinc concentrations were not significantly different from the

control (Table 1). However, the treatment plots with zinc were always greater than the control. Grain yields at this site were somewhat below optimum due to below normal precipitation during July, August and September.

Table 1. Influence of zinc application on whole plant zinc uptake and corn yield at Brookings SD in 2008. (41608)

Treatment <sup>A</sup>	Plant dry weight and (Zn concentration)			Grain Yield <sup>B</sup>
	V6	V10	VT	
	----- dry wt. g/plant (ppm Zn) -----			
Control	19.5 (28.0)	44.4 (26.5)	88.4 (24.3)	127.7 c
Origin <sup>C</sup> Zinc (10%) 1 qt/a	20.9 (31.5)	44.5 (28.8)	91.6 (25.0)	133.8 b
Trafix <sup>D</sup> Zinc (10%) 1 qt/a	----- not sampled -----			133.7 b
Origin Zinc 1 qt/a + Ascend 4 oz/a	----- not sampled -----			136.2 ab
Origin Zinc 1 qt/a + Ascend 6 oz/a	----- not sampled -----			139.4 a
AGM 6023 at 2 qts/a	----- not sampled -----			136.9 ab
LSD <sub>(.10)</sub>	NS (NS)	NS (NS)	NS (NS)	4.8
Pr>F	0.15 (0.14)	0.82 (0.37)	0.24 (0.68)	0.01
CV (%)	5.2 (8.3)	1.8 (10.9)	3.4 (9.5)	2.9

<sup>A</sup> all treatments applied in 5 gpa 10-34-0

<sup>B</sup> adjusted to 15% moisture

Zinc soil test (0-6 inch = 0.61 ppm)

<sup>C</sup> Zinc sources (ZnCl, ZnO, EDTA, citric acid, NH4OH)

<sup>D</sup> Zinc sulfate (citric acid chelate)