

# SOIL/WATER RESEARCH

## *South Dakota State University*

### 2008 Progress Report

Agricultural Experiment Station  
Plant Science Department  
South Dakota State University, Brookings, SD 57007

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**Influence of starter fertilizer materials on corn grain yield and foliarly applied fertilizer materials on soybean grain yield near Brookings SD in 2008. (41508 and 42308)**

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#### **Objectives:**

1. Compare the effectiveness of starter fertilizer materials on corn grain yield.
2. Compare the effectiveness of foliar fertilizer materials on soybean grain yield.

#### **Materials and Methods**

<b>Item:</b>	<b>Description:</b>
Location	Crop Improvement Farm, Aurora SD
Corn Hybrid	Dekalb DKC 46-60
Soybean Variety	Asgrow 1401 RR
Planting Date / Seeding rate	Corn = May 10, (30,100 seeds/a) Soybeans = May 23, (180,000 seeds/a)
Fertilizer Materials	KTS (potassium thio-sulfate) ATS (ammonium thio-sulfate) MgTS (magnesium thio-sulfate) Trisert K+ and Trisert CB
Fertilizer rates	see tables 1 and 2
Fertilizer placements	2 X 2 and foliar
Soil samples	0-6 and 6-24 inch
Tillage method	Corn = No-till, Soybeans = conventional
Corn Broadcast N rate (all plots)	urea, 130 lbs N/a after planting
Harvest date	Soybeans = Sept. 26, Corn = Nov. 11
Statistics	RCBD, 4 replications

#### **Results and Discussion**

Soil test results for the corn site showed 3.9% organic matter, 48 lbs N/a (0-2ft), 4 ppm Olsen P, 216 ppm K, 6.0 pH,

0.61 ppm Zn, and 34 lbs S/a (0-2ft).  
Soil test results for the soybean site showed 3.4 % organic matter, 42 lbs N/a (0-2ft), 5 ppm Olsen P, 195 ppm K, 6.4 pH, 0.69 ppm Zn, and 36 lbs S/a (0-

2ft). Seven and twelve treatments were used to make the comparisons for the corn and soybeans, respectively (Tables 1 and 2). Treatment did not statistically influence corn or soybean grain yield (Tables 1 and 2). No visual treatment effects on the corn or leaf burn on the soybeans was noticed.

### Acknowledgements

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Table 1. Influence of fertilizer materials on corn grain yield near Brookings SD in 2008.

Treatment #	Fertilizer Material <sup>A</sup>	Rate <sup>B</sup> gpa	Grain Yield <sup>C</sup> bu/a
1	check	--	128.7
2	KTS	3	127.5
3	KTS	4	127.6
4	ATS	1	127.7
5	ATS	3	128.7
6	MgTS	1	127.1
7	MgTS	2	128.2
Pr>F			0.997
LSD <sub>(.10)</sub>			NS

<sup>A</sup> KTS = potassium thio-sulfate, ATS = ammonium thio-sulfate, MgTS = magnesium thio-sulfate

<sup>B</sup> applied 2x2 at planting.

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

gpa = gallons per acre, LSD = least significant difference

Pr>F statistic = probability of a greater F value.

Table 2. Influence of fertilizer materials on soybean grain yield near Brookings SD in 2008.

Treatment #	Fertilizer Material <sup>A</sup>	Rate <sup>B</sup>	Growth Stage <sup>C</sup>	Grain Yield <sup>D</sup>
		gpa		bu/a
1	check	--	--	36.4
2	Trisert K+	2.5	V5	34.3
3	Trisert K+	5	V5	34.7
4	MgTS	1	V5	35.9
5	MgTS	1.5	V5	35.1
6	MgTS	2	V5	37.4
7	Trisert CB	1	R2	35.7
8	Trisert CB	1.5	R2	36.6
9	CaTS	1	R2	36.7
10	CaTS	3	R2	35.6
11	CaTS	5	R2	34.9
12	KTS	3	2x2	34.9
	Pr>F			0.19
	LSD <sub>(.10)</sub>			NS

<sup>A</sup> MgTS = magnesium thio-sulfate, CaTS = calcium thio-sulfate, KTS = potassium thiosulfate, Trisert K+ and Trisert CB are proprietary products of Tessenderlo Kerley Inc.

<sup>B</sup> Each rate of fertilizer was diluted with water and foliar applied with flat fan nozzles at 10 gpa total volume at specified growth stages.

<sup>C</sup> Soybean growth stages and 2x2 applied at planting.

<sup>D</sup> adjusted to 13% moisture

LSD = least significant difference

Pr>F statistic = probability of a greater F value