

Objective

- Evaluate the yield response to nitrogen (N) rates applied with and without sulfur (S) for continuous corn on corn fields with medium to high organic matter levels and corn grown after soybean on fields with <3.0% soil organic matter (SOM).

Study Description

Locations: 3 in Minnesota (see table)

Replicates: 4 per location

Factors:

- Spring applied urea: 0, 50, 100, 150 and 250 lbs N/acre as a single application pre-plant
 - Urea was split applied at Melrose (50% at planting and 50% at V4)
- Spring applied sulfur: 0 or 25 lbs S/acre as potassium sulfate – KCl applied to 0 lb S to balance applied potassium
- Soils were tested for nitrate-nitrogen and sulfate-sulfur (in lb N or S/acre) based on a samples taken to a depth of 2 ft prior to fertilizer application (see table).



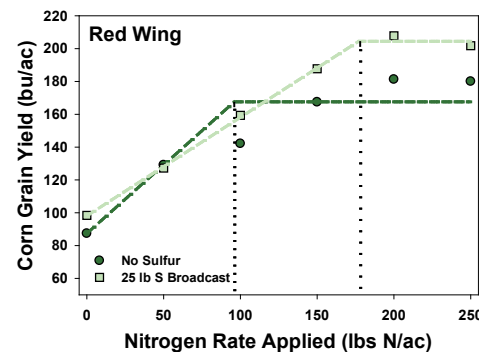
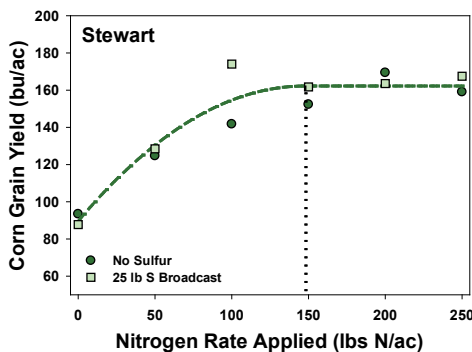
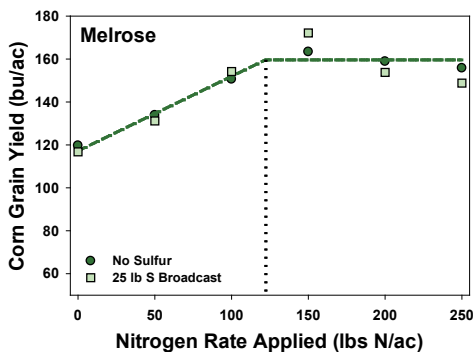
Sulfur deficiency symptoms in corn.

Location	Prev. Crop	SOM %	N -----lb/acre-----	S
Melrose	Corn	1.9	54	19
Red Wing	Soybean	2.1	25	18
Stewart	Corn	6.4	23	20

Research conducted by Dan Kaiser, University of Minnesota, as a part of the DuPont Pioneer Crop Management Research Awards (CMRA) Program. This program provides funds for agronomic and precision farming studies by university and USDA cooperators throughout North America. The awards extend for up to four years and address crop management information needs of DuPont Pioneer agronomists, Pioneer sales professionals and customers.

Results

- A significant corn yield response to S application was observed at 1 of 3 locations in 2013 and only 1 of 8 research trials conducted in Minnesota from 2011 to 2013.
- The average response to S at Red Wing was greatest at the highest N rates, where yields were 20 bu/acre greater with 25 lbs/acre of S.
- A sulfur response at Red Wing was expected due to low SOM concentration. The lack of response at Melrose was unexpected since the soil at Melrose was sandy and SOM was in the same range as the Red Wing site.
- All sites showed a significant grain yield response to N.
- Yield was maximized by 122 lbs/acre N at Melrose and 147 lbs/acre N at Stewart.
- Grain yield response to N varied with S use at Red Wing.
 - The difference was likely a result of inefficient use of N when S was not applied rather than an additional N requirement of corn due to S application.
 - The greater N requirement (compared to current suggestions) at Red Wing when S was applied (177 lb N/acre) was likely a result of leaching of N early in the growing season. There is no evidence of a greater N requirement for corn when S is applied.



2013 data are based on average of all comparisons made in 3 locations through October 31, 2013. Multi-year and multi-location is a better predictor of future performance. Do not use these or any other data from a limited number of trials as a significant factor in product selection. Product responses are variable and subject to a variety of environmental, disease, and pest pressures. Individual results may vary.