

Sulfur Fertility

Objective: Measure effect of fertilizing with 100 lbs/acre AMS on wheat yield and protein.

Ammonium sulfate (AMS, 21-0-0-24) was applied preplant or top-dressed at 100 lbs/acre at 8 locations in MN in 2018. Trials included 3-4 replications of sulfur and no-sulfur strips applied with a fertilizer spreader along the full length of the field. Harvested strips were weighed in a weigh wagon and sampled to measure moisture, test weight, and protein content.

Results:

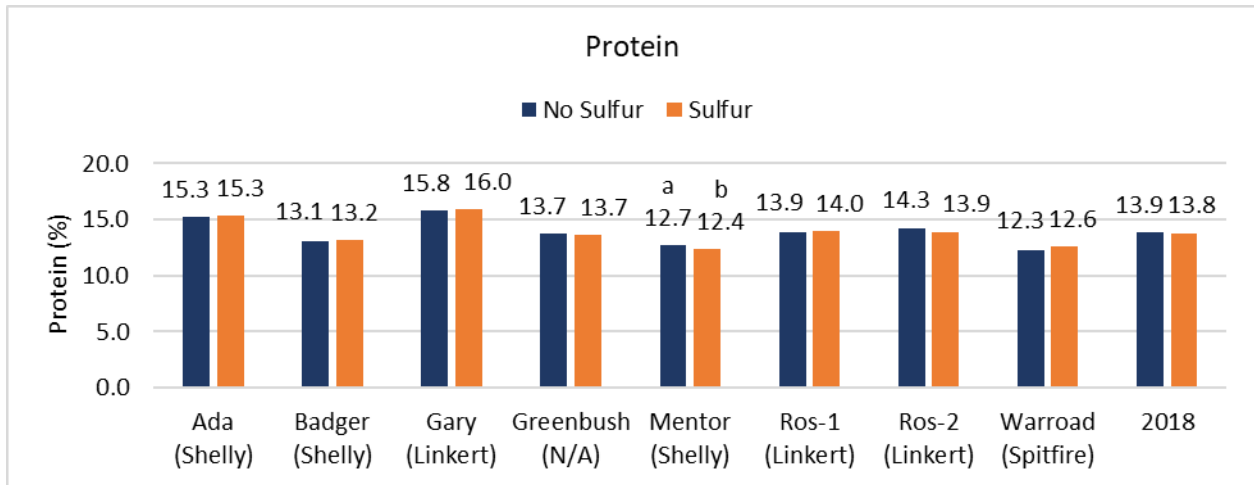


Figure 1. Protein content at 8 locations in NW MN in 2018. Differing lowercase letters indicate significant differences between treatments at the 90% confidence level.

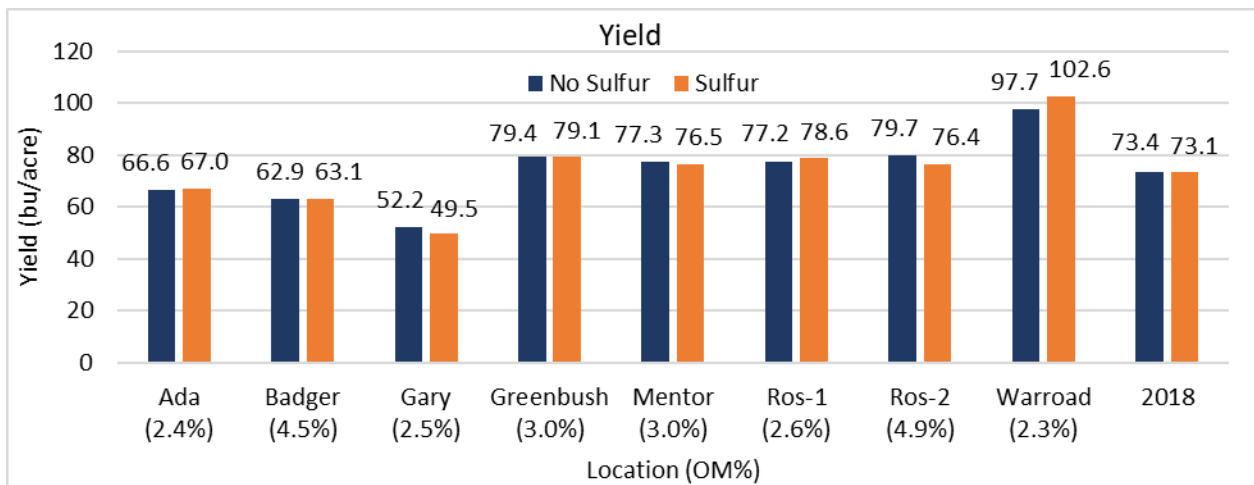


Figure 2. Wheat yield influenced by supplemental sulfur at the 2018 locations and combined years. Mean field organic matter (OM%) included for each location. Treatments were not significantly different at the 90% confidence level.

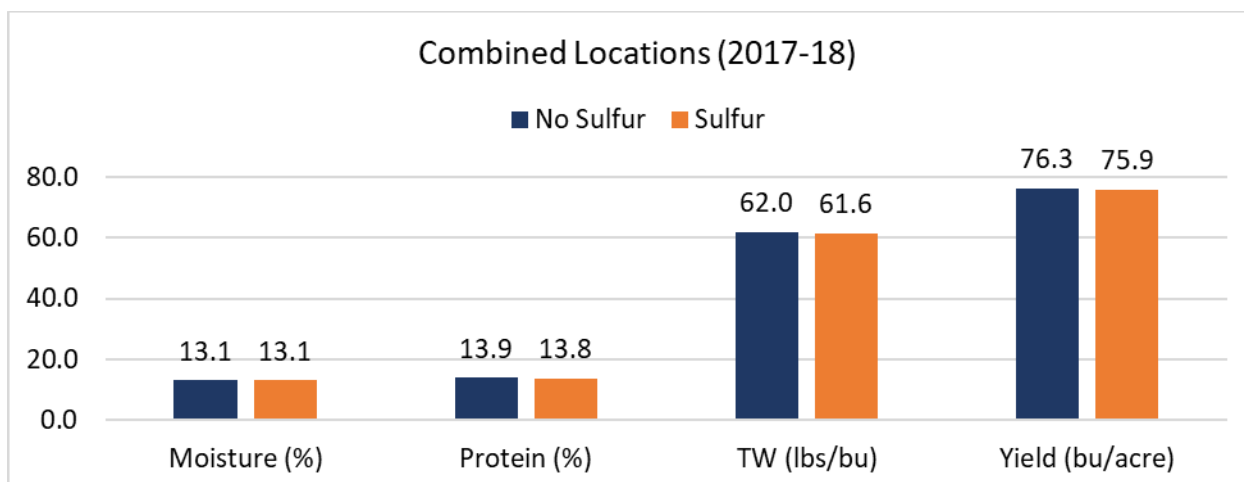


Figure 3. Moisture, protein, test weight (TW) and yield combined across locations in 2017-18. There were no significant differences among treatments.

Table 1. Economic analysis of sulfur application in 2018.

	No Sulfur	Sulfur	Yield gain	Yield gain ¹	\$ AMS cost ²	Net gain
	-----	bu/acre	-----	-----	\$/acre	-----
Ada	66.6	67.0	0.4	\$ 2.28	\$ 7.15	\$ (4.87)
Badger	62.9	63.1	0.2	\$ 1.14	\$ 7.15	\$ (6.01)
Gary	52.2	49.5	-2.7	\$ (15.51)	\$ 7.15	\$ (22.66)
Greenbush	79.4	79.1	-0.3	\$ (1.71)	\$ 7.15	\$ (8.86)
Mentor	77.3	76.5	-0.8	\$ (4.55)	\$ 7.15	\$ (11.70)
Ros-1	77.2	78.6	1.4	\$ 8.11	\$ 7.15	\$ 0.96
Ros-2	79.7	76.4	-3.3	\$ (18.89)	\$ 7.15	\$ (26.04)
Warroad	97.7	102.6	4.9	\$ 27.93	\$ 7.15	\$ 20.78
2018	73.4	73.1	-0.3	\$ (1.85)	\$ 7.15	\$ (9.00)
All years	76.3	75.9	-0.4	\$ (2.28)	\$ 7.15	\$ (9.43)

1 Calculated at \$5.69/bu

2 100 lbs/acre AMS (\$305/ton) = \$15.25/ acre AMS.

45.65 lbs/acre urea-N (21 units @ \$355/ton) not needed due to AMS-N = \$8.10/acre.

Total sulfur cost = \$15.25/acre AMS - \$8.10/acre additional urea = \$7.15/acre.

Conclusions:

- The No Sulfur treatment had a significantly higher protein content at Mentor in 2018 (Figure 1), a trend that was also present at two of the locations in 2017.
- Test weight was significantly greater in the No Sulfur treatment at Gary and Warroad (data not shown).
- There were no differences in yield at the individual locations in 2018, or when combined across all locations and years (Figures 2 and 3).
- Weather data from 2018 indicate the month of May was the second warmest on record (NOAA). Due to the warm temperatures in the spring and summer of 2018 sulfur was likely released at adequate levels from the soil, minimizing the potential benefit of added sulfur.