

## Sulfur Fertility Strategies in Wheat

Mike Ostlie

Two trials were established over the course of the 2012 and 2013 growing seasons to evaluate different sulfur products and application timings for wheat yield and protein enhancement. At each location the treatment structure was largely the same. The exceptions were that the Wishek location did not receive any copper sulfate (CuS, 0-0-0-13s-25cu) and the Carrington location did not receive any MES10 (12-40-0-10s). Other included products at each location were MESZ (12-40-0-10s-1zn) and AMS (21-0-0-24). Each study consisted of 10 by 25 ft plots and four replicates arranged within an RCBD. All products were applied as granules to the soil except the anthesis treatments which were applied as liquid. It should be noted that the trial site had fairly high levels of nutrients including a base of 120 lbs N and 14 ppm P, as well as 15 lbs sulfur.

During both growing seasons, we experienced very dry conditions, which appear to have favored high protein development. In 2012 MES10 applied at 30 lbs sulfur/ac was the clear top performer for wheat yield with a 50 percent yield increase over almost every other treatment (Table 1). This is not easily explained as the only difference between MES10 and MESZ is the addition of zinc in the latter formulation. There were few differences in protein in Wishek as well. The two top yielding treatments were joined by the nontreated check and the nitrogen + phosphorous treatments as the lowest protein values, although these values were still quite high. In 2013 there was no difference in protein level among the treatments. Only the application of CuS at 10 lbs sulfur/ac at the four-leaf stage improved the wheat yield more than the nontreated check.

**Table 1. Evaluation of sulfur and copper applications to wheat at various growth stages in Carrington and Wishek.**

Treatment	Sulfur Rate lb/a	Timing	Carrington 2013				Wishek 2012			
			Moisture %	Weight lb/bu	Yield bu/a	Protein %	Moisture %	Weight lb/bu	Yield bu/a	Protein %
Check			15.8	61.19	55.4	17.56	9.4	58.71	26.0	15.76
N + P only			15.9	61.48	56.8	17.88	9.4	56.24	25.5	16.72
MES10	10	PRE					9.3	55.00	22.3	17.44
MES10	30	PRE					9.6	59.50	38.8	16.32
MESZ	10	PRE	16.1	61.72	60.1	17.34	9.4	56.10	20.3	16.89
MESZ	30	PRE	16.2	61.46	57.2	17.41	9.5	56.23	25.4	17.17
AMS	10	PRE	16.2	61.23	56.5	17.45	9.3	55.71	23.3	17.11
AMS	30	PRE	15.6	61.34	54.0	18.16	9.5	56.15	22.4	17.19
AMS	10	4 leaf	16.0	61.19	58.5	17.38	9.4	57.11	24.4	17.06
AMS	30	4 leaf	16.1	61.24	60.8	17.57	9.4	55.56	23.6	17.44
AMS	10	Anthesis	15.7	61.88	61.0	17.39	9.5	56.17	24.3	17.54
AMS	30	Anthesis	15.9	61.30	60.3	17.31	9.6	58.65	28.5	15.59
CuS	10	Anthesis	16.6	61.23	57.0	17.08				
CuS	30	Anthesis	16.1	61.49	59.3	17.36				
CuS	10	4 leaf	15.8	62.13	63.5	17.17				
CuS	30	4 leaf	15.7	62.10	59.3	17.51				
C.V.			3.3	1.1	9.2	3.0	1.1	6.7	12.3	2.5
LSD (0.05)			0.7	0.90	7.3	0.69	0.1	1.73	9.1	0.52

\*planted 5/24; harvested 8/30

\*planted 4/24; harvested 8/2