INFLUENCE OF FOLIAR SULFUR, CHLORIDE AND NITROGEN ON WINTER WHEAT GRAIN YIELD AND QUALITY

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INTRODUCTION

Optimum use of nitrogen (N) is a key component in improving grain yield and quality in winter wheat (Triticum aestivum L.). The combined effect of other nutrients with N can have a positive impact on crop production. Use of sulfur (S) and chloride (Cl) with N is considered to be more effective in optimizing wheat grain yield and grain protein.

OBJECTIVE

To determine the benefits of foliar N application, before flowering, on winter wheat grain yields and to determine the synergistic effects of applying foliar N, S, and Cl on winter wheat grain yield.

MATERIALS AND METHODS

- Two sites: Lake Carl Blackwell (LCB) and Lahoma (LAH).
- RCBD with 4 replications and 16 treatments.
- Treatments received preplant Urea Ammonium Nitrate (UAN) 0, 40, 80 kg N ha^{-1} .
- UAN & NSURE were used as Foliar N source
- 10 kg N ha^{-1} and 20 kg N ha^{-1} was applied at pre-flowering growth stage.
- Gypsum was used as the S source and applied at 6 kg S ha^{-1}.
- Half of each plot in rep 4 & treatment 16 in each rep received foliar Cl as $CaCl_2$ at 10 kg Cl ha^{-1}.
- Grain yield and grain protein concentration (GPC) were determined for each treatment.
- Data was analyzed using non- orthogonal Contrasts

CO_2 Backpack Sprayer for foliar Application

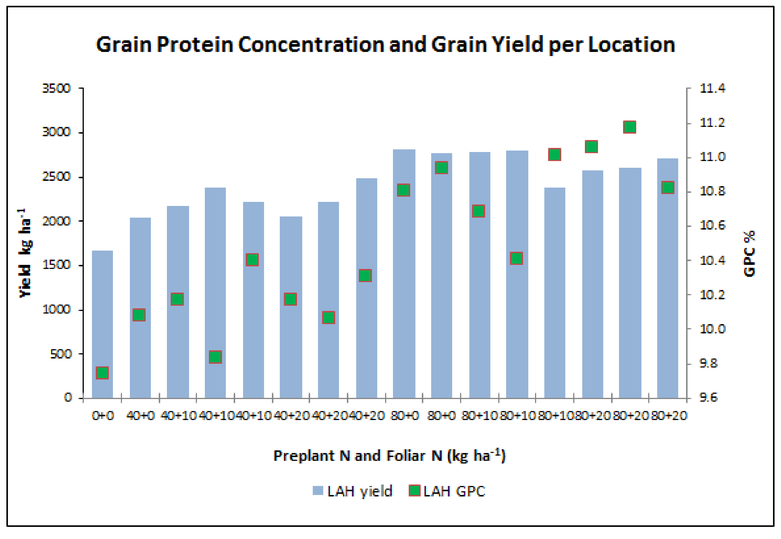
Feekes 4 Growth stage wheat, Lake Carl Blackwell, OK

RESULTS

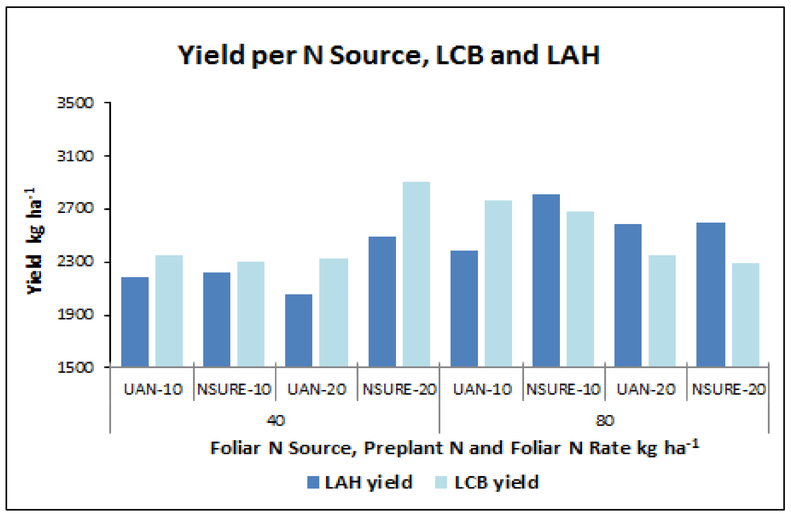
Table 1: Treatment means for grain yield and grain N, Lake Carl Blackwell , OK, 2012

Trt	Preplant N kg ha^{-1}	Foliar N Source	Foliar N kg ha^{-1}	Foliar S kg ha^{-1}	Yield kg ha^{-1}	Grain N mg kg^{-1}
1	0	Check	0		1700	144
2	40	Check	0		2797	154
3	40	UAN	10		2351	165
4	40	UAN	10	6	2815	166
5	40	NSURE	10		2304	171
6	40	UAN	20		2327	174
7	40	UAN	20	6	3192	175
8	40	NSURE	20		2903	166
9	80	Check	0		2044	182
10	80	UAN	0		2804	158
11	80	UAN	10	6	2641	174
12	80	NSURE	10		2684	174
13	80	UAN	10		2760	171
14	80	UAN	20	6	2345	186
15	80	NSURE	20		2288	169
16	80	NSURE	20	6	2945	177
				CV, %	15	6
				SED	131	4

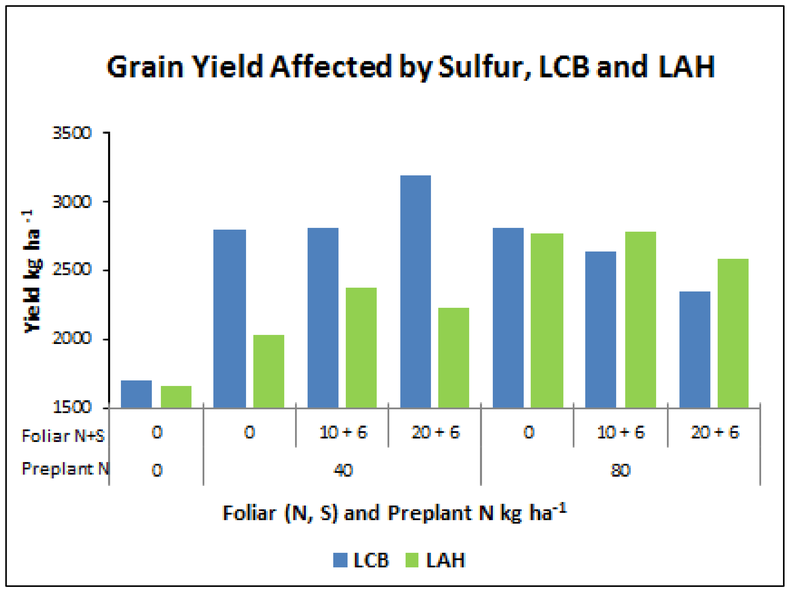
- Mean yield and grain protein increased with preplant linear N rate at both locations.



- Yield was higher at Lake Carl Blackwell and grain protein was higher at Lahoma
- Grain yield inversely correlated with grain protein
- Grain yield and grain protein increased with the application of preplant N and Foliar N



- Mean yields higher for NSURE at Lahoma, UAN higher for most treatments at LCB



- N (40 or 80) + 6 kg S/ha was effective at LCB and LAH

CONCLUSIONS

- Treatment vs. Control and preplant linear N contrasts were significantly different for both locations
- Chloride increased yield at Lahoma
- N+S increased yield at both locations