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

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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 could assist in optimizing wheat grain yield and grain protein.

OBJECTIVE

Determine the synergistic effects of foliar N, S, and Cl and the benefits of applying foliar N before flowering on winter wheat grain yields.

MATERIALS AND METHODS

- Treatment structure: RCBD with 4 replications and 16 treatments.
- Preplant N: Urea Ammonium Nitrate (UAN) 0, 40, 80 kg N ha⁻¹.
- Foliar N: UAN & NSURE (10 & 20 kg N ha⁻¹).
- S source: Gypsum (6 kg S ha⁻¹).
- Cl source: CaCl₂ (10 kg Cl ha⁻¹).
- All foliar fertilizers were dissolved in water and applied at flag leaf growth stage using CO₂ backpack sprayer.
- Soil level of Nitrate N, Ammonium N, Chloride and Sulfur were analyzed.
- Grain yield (GY) and total N (TN) determined in each plot.
- Data analyzed using non-orthogonal contrasts and Paired T-tests to determine effects of N, S, and Cl.

RESULTS

Table 1. Treatment means for grain yield and Grain N, LCB (2011), LAH (2011 & 2012), OK.

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Table 1. Treatment means for grain yield and Grain N, LCB (2011), LAH (2011 & 2012), OK.

- LCB (2011) had highest GY but lowest TN and LAH (2012) had lowest GY with highest TN (Table 1).
- Results for LAH (2011 & 2012) showed significant yield response to foliar Cl.
- Yield at LAH 2012 (Table 1) was lower due to a dry fall, poor plant stands and late spring freezes in February and March.
- Grain yield was significant with preplant N at LAH only (Table 2).
- Significant differences in total N as a function of preplant N and Foliar N were found at LAH (2012) (Table 2).
- Interactions between preplant N, foliar N, foliar S were not significant (Table 2).

CONCLUSIONS

- When grain yields were higher total N levels were lower.
- Response of preplant N observed at both locations.
- No response to Foliar S at both locations.
- Yield response to foliar Cl found at LAH only.
- Interactions were not significant.