

Effects of Sulfur Fertilizers on Canola Yield and Nutrient Uptake

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Introduction

- Canola (*Brassica napus L.*) is a significant crop in Canada. Canadian-grown canola contributes to around \$30 billion to the Canadian economy each year^[1].
- Canola is often affected by diseases and pests, but its yield depends primarily on the availability of nutrients like nitrogen (N) and sulfur (S), which are critical limiting factors.



Figure 1. Canola field



Figure 2. Sulfur Deficiency in Canola



Figure 3. Flea Beetle Damage



Figure 4. Banding fertilizer



Figure 5. Broadcasting fertilizer

Objectives

- Determine how UreaMST (micronized sulfur treatment), with and without Nitrain, affects canola yield and the efficacy of S compared to the traditional one (eg., ammonium sulfate (AMS))
- Evaluate the role of fertilizer management practices in microbial activities that contribute to canola yield and nutrient uptake

Hypothesis

In addition to N fertilizers, the application of micronized S fertilizers, whether banded or broadcasted, will result in higher canola yield and nutrient uptake through enhanced soil fertility

Materials & Methods

Fertilizers



Figure 6. UreaMST



Figure 7. AMS

Plot Layout



Figure 8. Beaumont research site layout in 2024

- Treatments are conducted in randomized complete block design, replicating 4 times, the experimental unit size is 10 x 2 m²
- Soil and tissue samples are collected from early June to September (seeding to harvest)

Sampling and Analysis

- Spring soil samples are collected for background information and monthly samples are collected throughout the growing season (Nutrient availability/S oxidation)
- Tissue analysis at vegetative and reproductive stages (Nutrient use efficiency)
- Crop Biomass and yield sampling during harvest (Nutrient uptake/Crop yield)



Figure 10. Collecting soil samples using a soil sampler

- In each plot, 5 random positions spread across the entire plot are selected as soil cores from a depth of 0-15 cm are taken.
- Five soil cores are combined to create a composite sample representing each plot for soil analysis

Treatments

- Control, no S
- UreaMST (Banding)
- UreaMST (Broadcast)
- UreaMST+Nitrain (Broadcast)
- AMS (Banding)

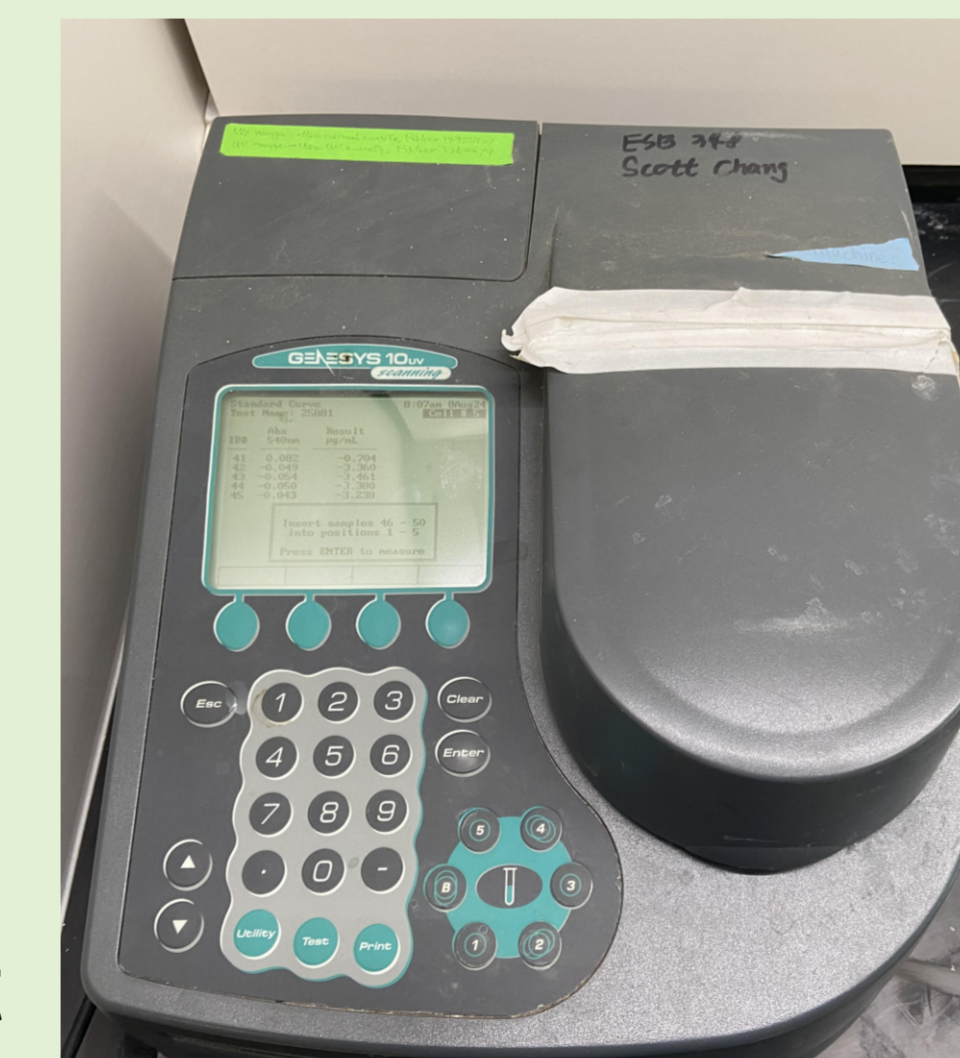


Figure 9. Determining soil sulfate by colorimetric method

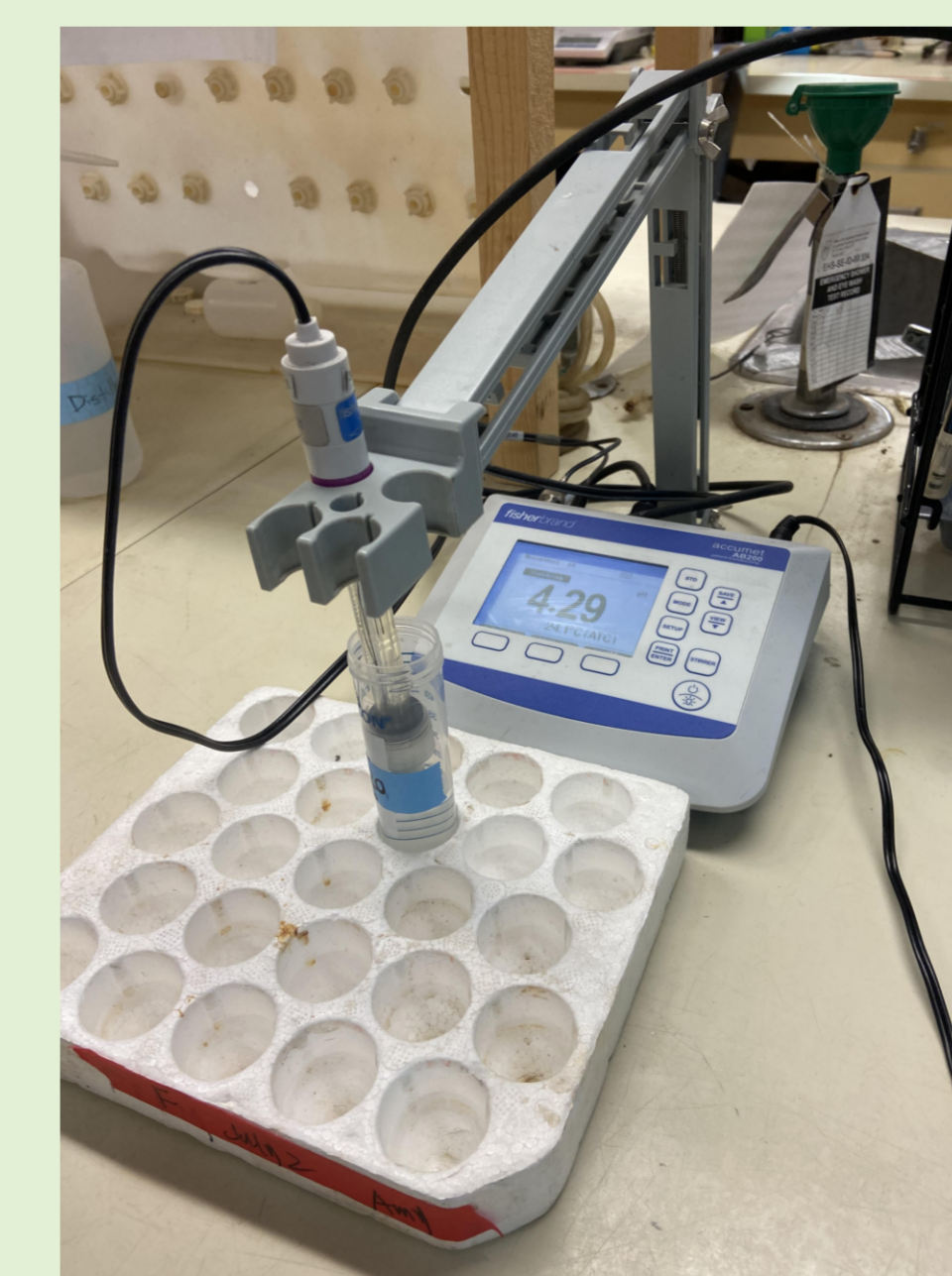


Figure 11. Measuring pH of soil samples

Results

- UreaMST did not increase canola yield from one year trial
- Applying UreaMST, compared to AMS, could increase soil available S during canola growing stage (e.g. 50% flowering stage)

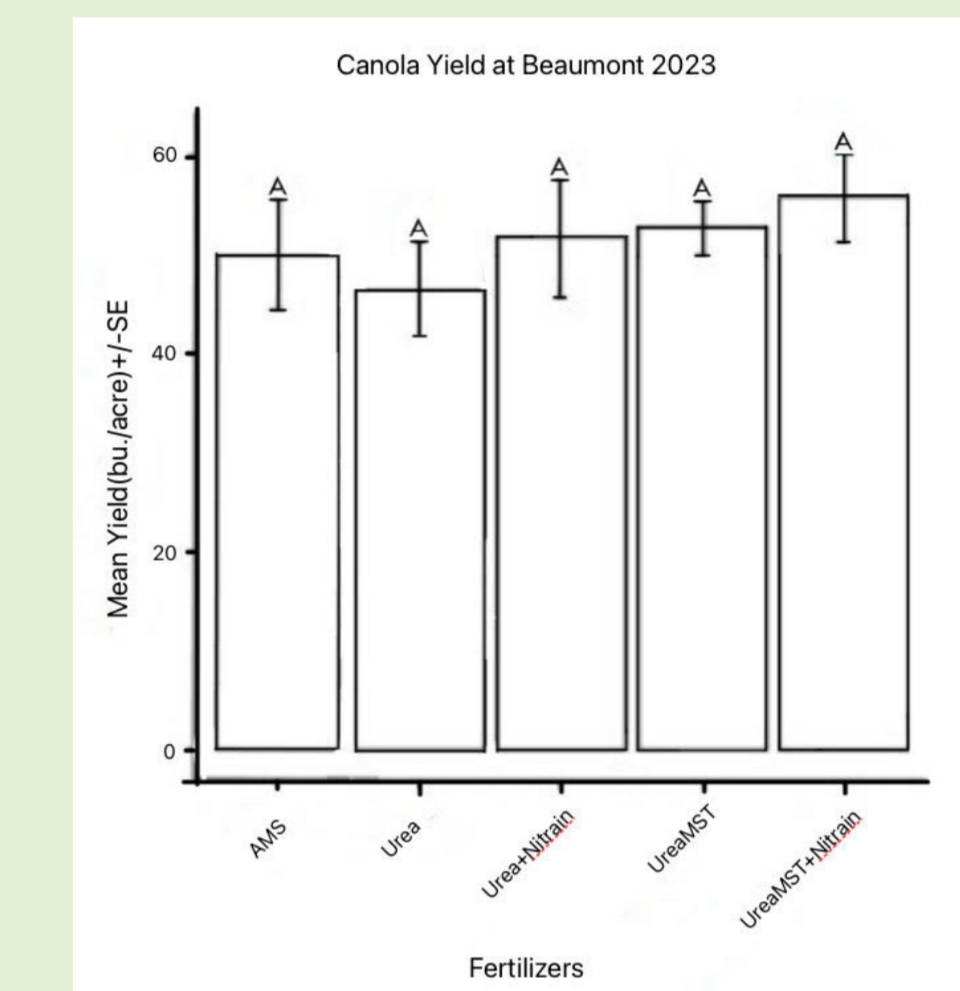


Figure 12. Crop Yield in 2023

Discussion & Conclusion

- The efficacy of applying UreaMST, compared to AMS, in providing canola S nutrition in one season of application is not significantly greater.
- Although canola yield failed to increase in a one year trial, soil nutrient availability improved.

Citations

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