

## Introduction

- Fall nitrogen (N) application is an important fertilizer management strategy for Manitoba producers, though N application is often more efficient in spring.<sup>1</sup>
- Risk of N loss is associated with soil moisture conditions, which are difficult to predict in the long term.

Few studies in Western Canada have linked the relative efficiency of N management strategies with on-site soil moisture monitoring. This project aims to **assess the efficiency of various N sources and application timings under different soil moisture conditions.**

N sources	N Timings	N Rates
Urea	Early Fall	60%
SuperU	Mid Fall	100%
	Late Fall	ON
	Spring	

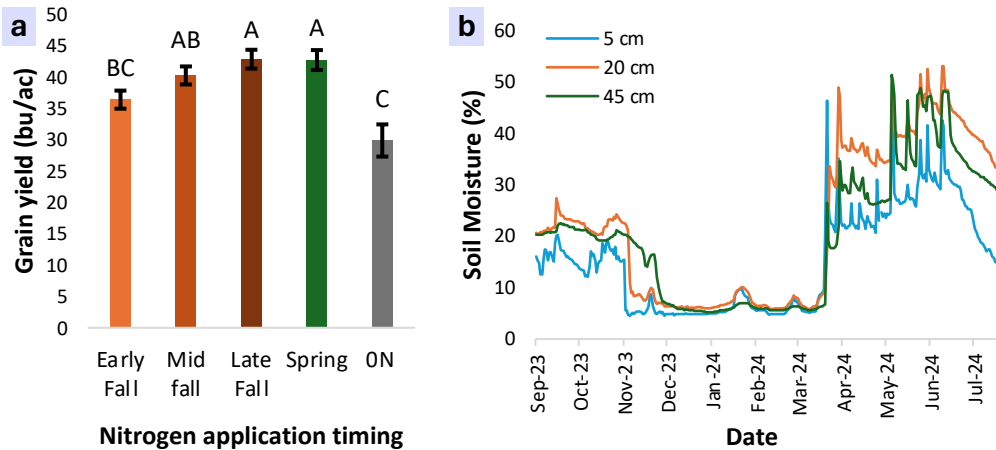


RCBD, four replicates  
 Brandon (2)  
 Arborg  
 Melfort  
 Swift Current  
 Lacombe

Continuous soil moisture and weather monitoring

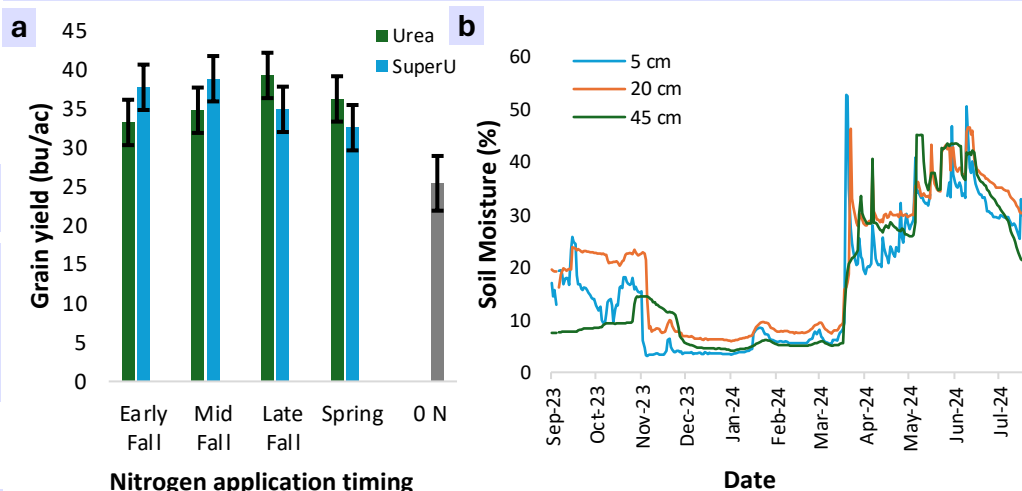
- Grain yield and quality
- Greenhouse gas emissions
- Nitrogen use efficiency

## Brandon: High Landscape Position



**Figure 1a.** Average yield of wheat where nitrogen fertilizer was applied at various timings near Brandon, MB. Bars marked with the same letter are not significantly ( $p < 0.05$ ) different by Tukey's HSD test. Error bars represent standard error. **b.** Soil moisture (%) at trial center.

## Brandon: Low Landscape Position



**Figure 2a.** Average yield of wheat where nitrogen fertilizer (urea or SuperU) was applied at various timings near Brandon, MB. Error bars represent standard error. **b.** Soil moisture (%) at trial center.

## Results

- Nitrogen application **timing** had a significant ( $p < 0.01$ ) effect on grain yield at Brandon (High).
- Grain yield was affected ( $p < 0.05$ ) by **N fertilizer source and application timing** at Brandon (Low). Means were not significantly different by Tukey's HSD mean separation method.

## Next Steps

- Trials will be repeated in 2025 and 2026.
- A lab study will be conducted to examine banded N fertilizer transformation and movement in soil at different moisture levels.
- Data generated from field and lab studies will be used to validate a decision support tool that aims to recommend N management strategies appropriate to local N loss risk estimates.

## Acknowledgements

Thank you to the technical staff at each site for their hard work on this trial, and to my advisory committee for their guidance and expert input.

## References

<sup>1</sup> Manitoba Agriculture. 2007. Manitoba Soil Fertility Guide. <https://www.gov.mb.ca/agriculture/crops/soil-fertility/soil-fertility-guide/>

## Connect with us!

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