Title: Linking Optimal Nitrogen Management Practices to Soil Moisture Conditions

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Abstract

Though research in the prairies has demonstrated that spring nitrogen (N) application is often more efficient than fall N application, the relative efficiency of N fertilizer application timings varies greatly with seasonal soil moisture conditions. Additionally, fall N application is an important management tool for prairie producers, as this strategy offers operational and cost efficiency benefits to many. While previous research projects in Canada have examined the relative efficiencies of N management strategies, few have included in-trial continuous soil moisture monitoring. A field trial was established at six sites throughout western Canada to relate the efficiency of N fertilizer sources (urea or SuperU) and application timings (early fall, mid fall, late fall or spring) with soil moisture conditions at each site. After one year, N application timing had a significant ($p < 0.01$) effect on wheat yield at the high landscape position site in Brandon. Additionally, N fertilizer source and application timing were shown to affect wheat yield at the low landscape position site in Brandon ($p < 0.05$). Trials will be replicated at each site in 2025 and 2026, with the aim of aiding producers and agronomists when making N fertilizer management decisions in the prairies.