

Improving In-Season Corn Nitrogen Dressing Using Canopy Sensing In Manitoba

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Predicting corn grain yield using optical sensors is perhaps a way to improve in-season nitrogen (N) dressing addition. However, there are currently no N rate recommendations for Manitoba corn growers to use canopy spectral reflectance. This research was intended to provide a basis to use optical spectral reflectance to predict corn grain yield and estimate in-season N side dress addition to achieve a maximum economic return to nitrogen in Manitoba. Using three optical sensors to sense three corn growth stages (V4, V8 and V12) in 2018-2021, N rate trails were conducted in western Manitoba. The four site years were combined to capture N response under different meteorological conditions with the hope to make general assumptions. The combined site years had a significant response to N fertilizer applied. The N rate followed a quadratic response model for the maximum return to nitrogen (MRTN) that included the spring soil nitrate yielding 7,986 kg of corn grain ha⁻¹ requiring 0.0222 kg N kg⁻¹ corn. A fertilizer grain use efficiency of 0.3 was calculated using our grain data. Optical sensing at V4, V8 and V12 can be done with V12 showing the strongest relationship to corn grain yield.