

Developing Best Management Practices (BMPs) for nutrient applications has long been focused on the 4R principles which refer to using the: 1) right source, 2) right rate, 3) right time, and 4) right placement. These factors are not necessarily independent of each other. For example, depending on the source, application timings or placement options that normally might be considered high risk can become more viable. The objective of this project was to demonstrate canola response to varying rates of nitrogen (N) fertilizer along with different combinations of formulations, timing, and placement options relative to side-banded, untreated urea as a benchmark.

A field trial with canola was initiated at Indian Head in the fall of 2017 to promote 4R N stewardship and to demonstrate the overall canola response to N fertilization rates. The demonstration included four forms (untreated urea, Agrotain, SuperUrea, and ESN) and three timing/placement options (fall surface-broadcast, fall in-soil band, and side-band). Treatments of 0x, 0.5x, 1.0x, and 1.5x of a baseline rate of 145 kg N/ha (soil residual plus fertilizer) was supplied as side-banded urea.

Despite the dry weather in 2018 growing season, this project demonstrated strong canola responses to N fertilization along with the relative responses associated with several contrasting N management strategies. The yield increase with N was 133% over the control, with similar yields between the 1-1.5x rates (Figure 1). Focusing on timing/placement, all the options resulted in a strong N response and significant differences amongst individual treatments were relatively rare. Averaged across forms, yields with fall surface-broadcast applications were 9% lower than with either fall in-soil or side-banded N. Yields were similar for fall banded versus side-banded N. Regarding forms, all performed similarly under the conditions encountered when averaged across timing and placement methods. Specifically with fall surface-broadcast placement, canola yields with

SuperUrea tended to be higher than with either fall broadcast urea or Agrotain and did not differ from most individual treatments where N was banded beneath the soil surface.

Nitrogen fertilizer management is sensitive to weather and environmental conditions; therefore, the actual results that producers might experience with these strategies can vary greatly. Thus, soil testing is advised to account for the inherent fertility of the soil and better determine appropriate fertilizer rates. Side-banding continues to be recommended as a safe and effective practice that will provide consistent results over a broad range of environmental conditions. In this study, fall in-soil banding was also highly effective and, although the benefits can vary depending on the specific conditions encountered, enhanced efficiency fertilizer products can improve performance particularly with potentially risky practices such as fall-surface broadcasting.

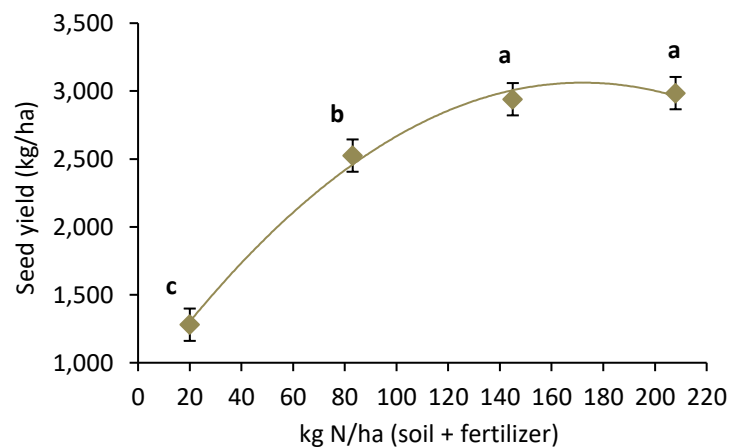


Figure 1. Side-banded urea rate effects on canola seed yield at Indian Head (2018).

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