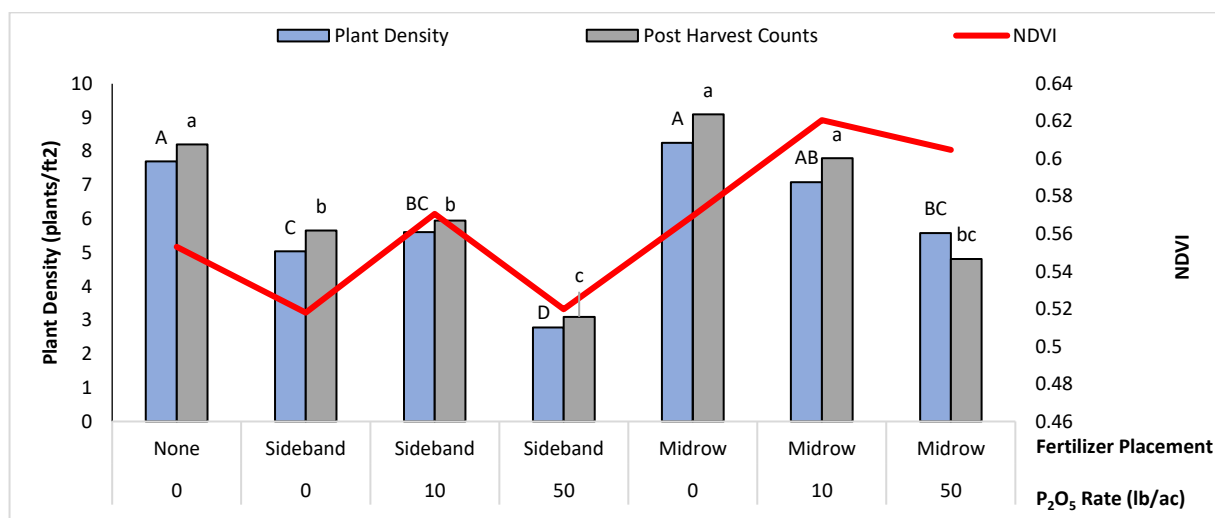


# Demonstrating the effects of N and S as side-banding vs. mid row banding with high rates of P seed placed

Farming practices today focus largely on pushing fertilizer rate above and beyond the current standard to achieve their highest yields, however, the implications of these high rates are often over looked. Proper fertilizer rates and placement are critical to improve crop safety, particularly in sensitive crops such as canola, and necessary to ensure maximized growth and development and ultimately yield. The objective of this study was to determine if extremely high rates of nitrogen (N) and sulphur (S) would influence canola yield if placed in either the side-band or midrow. The second objective focused on seed-placed phosphorus (P) at a high and low rate to determine if seed safety was affected when N and S is side-banded or midrowed.

The demonstration was arranged as a RCBD with four replicates and seven treatments at Scott, SK 2019. Nitrogen (in the form of urea) and sulphur (in the form of ammonium sulphate) were applied at a target rate of 120 lb N /ac and 45 lb S /ac to result in a 49-0-0-51 blend applied at 367 lb/ac applied either in the midrow or side-band. Phosphorus (in the form of monoammonium sulphate) was applied in the seed row at three rates 0, 10 and 50 lb of P<sub>2</sub>O<sub>5</sub>/ac. The canola was a Liberty Link variety with a target seeding rate of 11 seeds/ft<sup>2</sup>.

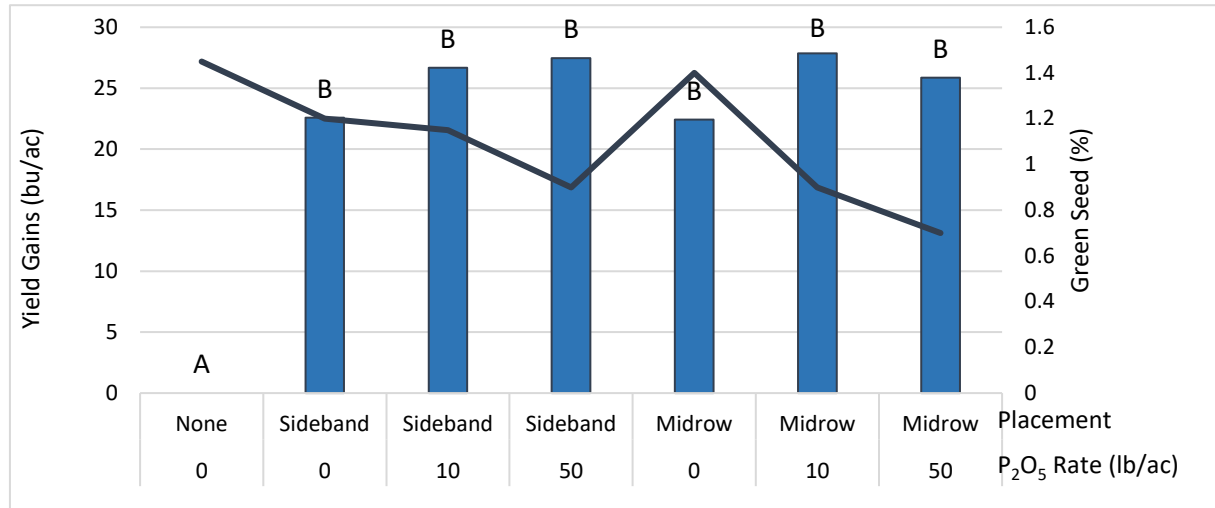
Plant densities dropped from 7 to 5 plants/ft<sup>2</sup> (25% reduction) when seed placed phosphorus exceeded 10 lb of P<sub>2</sub>O<sub>5</sub>/ac. The greatest stand reductions (less than 4 plants/ft<sup>2</sup>) occurred when N and S were side banded with 50 lb of P<sub>2</sub>O<sub>5</sub> /ac seed placed. NDVI (an indication of the most vegetation produced) was highest when N and S were midrow banded (10 > 0 > 50 P<sub>2</sub>O<sub>5</sub>). NDVI was lowest when 50 P<sub>2</sub>O<sub>5</sub> was seed placed combined with N and S side banded (Figure 1).



**Figure 1.** Canola plant density (3 WAE and post-harvest) and vegetative growth (NDVI) response to seed placed P at three rates (0,10, 50 lb of P<sub>2</sub>O<sub>5</sub> /ac) combined with N and S side-banded or midrowed.

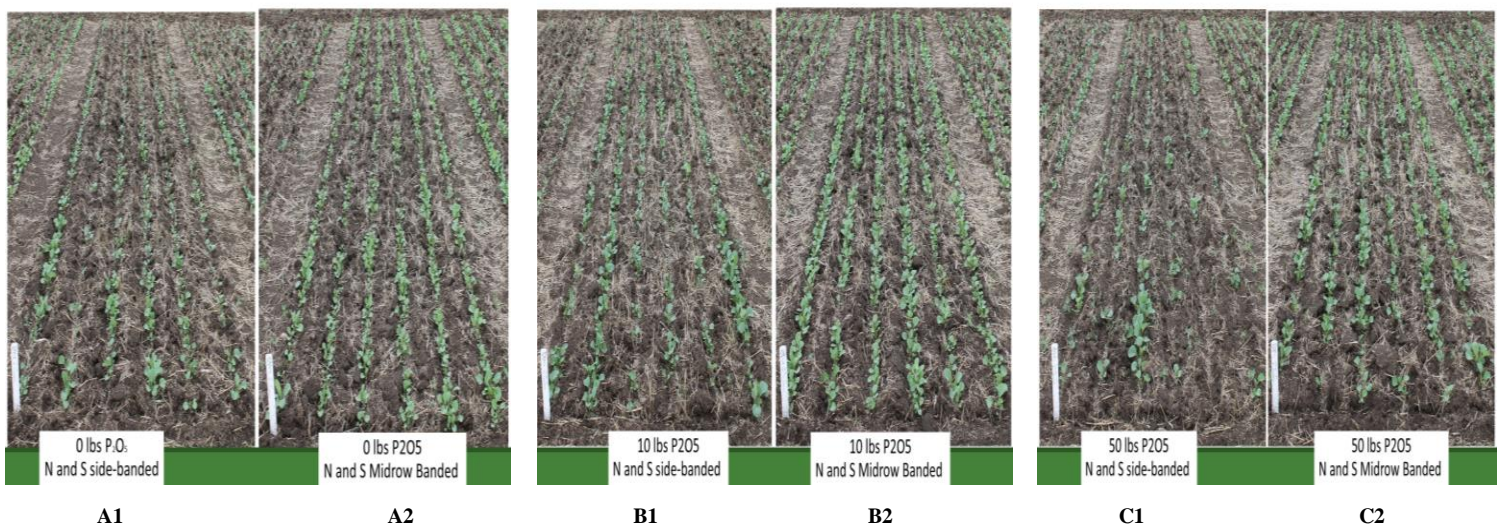
Days to maturity ranged from 111 to 107 days, with shorter days in maturity resulting from higher rates of phosphorus and N/ S midrow banded. When no phosphorus and N/S were side-banded, it resulted in the highest number of days to maturity. Yield was significantly influenced by both rate (P=0.0037) and placement (<0.0001). The application of P<sub>2</sub>O<sub>5</sub>, regardless of rate, resulted in a 12 bu/ac gain compared to the unfertilized check (no P, N, S). Side-banded and midrow banded fertilizer resulted in similar yields and resulted in a 25.5 bu/ac yield gain compared to the unfertilized check. Although fertilizer placement (side-band vs. midrow) was similar, the greatest gains were achieved when 10 P<sub>2</sub>O<sub>5</sub> was seed placed and N/S was mid rowed. Side-banded and midrowed treatments where P was applied resulted in a 4.5 bu/ac yield gain compared to when P was not applied (Figure 2). Green seed was marginally influenced by fertilizer rate and placement. When P was applied, % green seed increased slightly. Unfertilized check resulted in highest green seed (1.45%) compared to side banded and mid rowed treatments.

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**Figure 2.** Canola yield (bu/ac) and green seed (%) response to seed placed P at three rates (0,10, 50 lb of P<sub>2</sub>O<sub>5</sub> /ac) combined with N and S side-banded or midrowed.

Overall, yield was significantly influenced by both fertilizer rate and placement. The application of P<sub>2</sub>O<sub>5</sub> at 10 and 50 lb/ ac resulted in a 12 bu/ac gain compared to the untreated check. The placement of fertilizer overall resulted in a 25.5 bu/ac compared to the untreated check. There were no significant differences between side-banded and midrowed overall. However, the general trend indicated that the greatest gains were achieved when 10 P<sub>2</sub>O<sub>5</sub> was seed placed and N/S was midrow banded (Fig. 3 B2). Yield differences between side-banded and midrow banded treatments were expected, as plant densities dropped below recommended minimum of 5 plants/ft<sup>2</sup>, particularly under 50 lb/ac P<sub>2</sub>O<sub>5</sub> with side-banded N/S (Fig.3 C1). The NDVI indexes indicated that midrow banded treatments typically resulted in greater early season vigor compared to the side-banded treatments (Fig. 3 A2, B2 and C2). However, this did not correlate into a yield gain. Based on these results, side-banding high rates (50 lb P<sub>2</sub>O<sub>5</sub>/ac) with high N and S is not recommended as plant densities were severely reduced and there is a high probability that yield loss would occur under these conditions.



**Figure 3.** Early season vigour response between N and S side-banded or midrowed with same P rates (0, 10, 50 lb of P<sub>2</sub>O<sub>5</sub>/ac).

The full report will be available at: [www.warc.ca](http://www.warc.ca). This project was supported by three local producers Blaine Davey, Tony Kun and Dan Holman. We would like to acknowledge them for their contribution to this study.