

The 4R principles of 1) right formulation, 2) right rate, 3) right placement and 4) right timing are the focus of best management practices with fertilizer. In Saskatchewan, Phosphorus (P) is the second most common limiting nutrient, and a trend of residual P levels declining is becoming problematic due to continuous cropping, recent high yields, and inadequate P application rates. A common practice is seed placement of P; although, in-furrow P placement can burn the seed if rates are above the recommended safe values.

Trials were conducted on canola in 2017 at Prince Albert, Yorkton, Indian Head, Scott and Swift Current, Saskatchewan. The treatments consisted of P fertilizer rates of 0, 25, and 55 kg/ha in the form of MAP. Three different placements were used: pre-seed broadcast, seed-placed and side-banded.

At Scott, Indian Head, Yorkton, and Prince Albert there was no statistically significant effect on plant emergence or yield (Table 1). However, yields at Indian Head with side-banded P were approximately 5% higher than those achieved with broadcast P or in the control. Seed-placed P performed similarly to side-banded P in regard to both emergence and yield. At Yorkton, trends showed that broadcast applications were not better than the control while side-banded or seed-placed was 2-4 bushels higher than the control. The results at Prince Albert showed the highest rate of seed-placed P had the lowest emergence and, the yields were greatest for side banding 55 kg/ha P which was nearly 10 bu/ac more than the control.

At Swift Current under dry growing conditions, placing a high rate of P with the seed had severe consequences, resulting in crop injury and severe yield reductions compared to all other treatments (Figure 1). The surface applied P treatments in this trial performed significantly lower than the no P check. Side-banding 25 kg/ha of P resulted in the highest plant density and best yield, significantly higher than all the other treatments.

Table 1. Treatment effects on canola yield at 4 locations (2017).

Treatment* (kg P ₂ O ₅ /ha)	Prince Albert	Yorkton	Indian Head	Scott
	-----bu/ac-----			
Control	38	48	59	41
B 25 kg	40	48	59	39
B 55 kg	39	49	58	41
SP 25 kg	42	51	62	39
SP 55 kg	43	51	62	42
SB 25 kg	41	51	61	39
SB 55 kg	47	52	59	41

*B = spring broadcast, SP = seed placed, SB = side banded

In conclusion, seed-placed and side-banding are recommended over broadcasting. When broadcast, phosphorus is tied up by the soil and is less available for uptake by plants. Applied phosphorus is most effective when either seed-placed or side-banded.

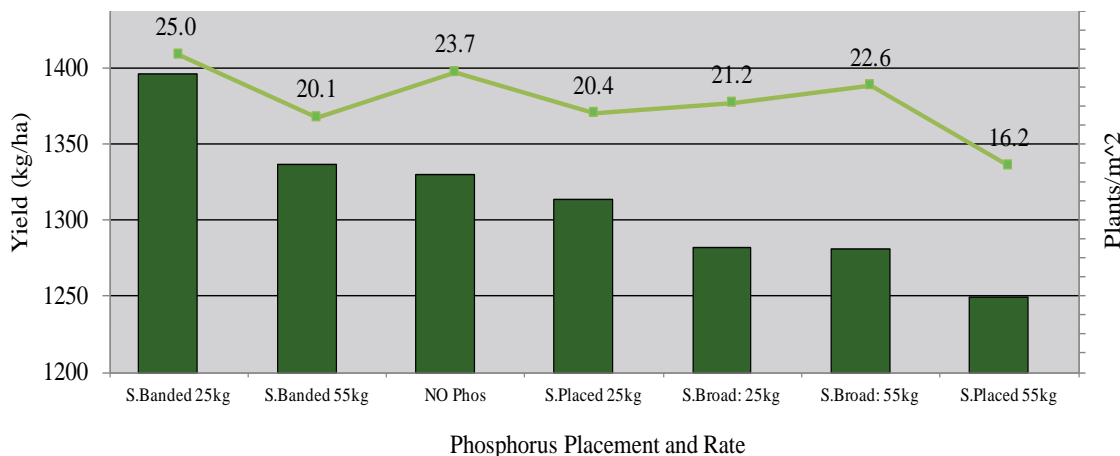


Figure 1. The effects of P placement and rate on canola emergence and yield Swift Current (2017).

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