

# Canola Seed Safety and Yield Response to Novel Phosphorus Sources in Saskatchewan Soils: Factsheet



## Objective:

The objective of this project was to demonstrate canola response to increasing rates of seed-placed phosphorus (P) fertilizer for various formulations, with a focus on stand establishment and yield.

## Methodology:

Field trials were conducted near Swift Current, Scott, Indian Head, and Yorkton in 2020. Treatments consisted of four fertilizer forms; MicroEssentials S15 (S15; 13-33-0), monoammonium phosphate (MAP; 11-52-0), Crystal Green (CG; 5-28-0) and a blend of 50% MAP and 50% Crystal Green (MAP:CG) which were applied at three rates; 22, 40, and 57 lbs P<sub>2</sub>O<sub>5</sub>/ac. All P fertilizer was seed-placed.

## Key Findings:

- At Swift Current, plant densities were low regardless of treatments but were reduced to a greater extent with S15 and the MAP:CG blend ( $\approx 26$  plants/m<sup>2</sup>) compared to MAP or CG applied alone (32-33 plants/m<sup>2</sup>). Plant density response to rate was only significant for S15.
- At Scott, both MAP and S15 reduced plant stands compared to CG and the MAP:CG blend (47-48 plants/m<sup>2</sup> versus 56-59 plants/m<sup>2</sup>). Furthermore, at Scott, average plant densities with CG and MAP:CG were like those observed in the control. At Scott both MAP and S15 reduced spring plant counts with increasing application rates. Crystal Green® (CG) had relatively little effect on emergence regardless of the rate or whether it was applied alone versus in a blend.
- At Indian Head, average plant densities were lowest with S15 (62 plants/m<sup>2</sup>) and highest with CG (70 plants/m<sup>2</sup>) but these values were similar to or higher than the control (61 plants/m<sup>2</sup>). Negative impacts on emergence were only observed at the highest rate of S15. While CG observed a subtle increase in plant densities with increasing rates.
- At Yorkton, the lowest spring plant densities occurred with MAP (55 plants/m<sup>2</sup>) while stands with CG and the MAP:CG blend (67 plants/m<sup>2</sup>) were like the control (69 plants/m<sup>2</sup>).
- At Swift Current there were small yield responses to three out of four formulations. As rates increased yields increased for MAP and the MAP:CG blend; while for CG applied alone the highest yields were at the rates of 22-40 lbs/ac. When averaged across forms, the observed yield increase at 57 lbs P<sub>2</sub>O<sub>5</sub>/ac was 11% higher than the control.
- At Scott, yields tended to increase as P rate increased for each fertilizer formulation. When averaged across forms, the observed yield increase at 57 lbs P<sub>2</sub>O<sub>5</sub>/ac was 19% higher than the control. Yields with S15 and, to a lesser extent, MAP did trend lower for the highest rate at Scott, possibly due to lower plant populations.
- At Indian Head, only S15 had a significant yield increase over the control. When averaged across forms, the yield increase was only 5%.
- At Yorkton, yields increased with increasing rates for MAP and the MAP:CG blend, but was not significant for CG applied alone. The yield increase with P was 8% at the highest rate when averaged across forms.

The full report is available at: [www.warc.ca](http://www.warc.ca). This trial was funded by the Agricultural Demonstration of Practices and Technologies (ADOPT) initiative under the Canadian Agricultural Partnership bi-lateral agreement between the federal government and the Saskatchewan Ministry of Agriculture. Additional funding was provided by Fertilizer Canada.

**Table 1. Phosphorus fertilizer form (averaged across rates) effects on canola seed yield. Values within a column followed by the same letter do not significantly differ ( $P \leq 0.05$ ). Control (no P applied) values are provided as supplemental information.**

<b>P Form<sup>z</sup> / Contrast</b>	<b>Swift Current</b>	<b>Scott</b>	<b>Indian Head</b>	<b>Yorkton</b>
	----- Seed Yield (kg/ha) -----			
Control	1996	2973	3236	2951
MAP	2195 A	3421 A	3317 A	3144 AB
S15	2151 A	3369 A	3367 A	–
CG	2213 A	3450 A	3257 A	3063 B
MAP:CG	2163 A	3398 A	3305 A	3203 A
	----- Pr > F (p-values) -----			
MAP vs S15	0.448	0.511	0.398	–
MAP vs CG	0.751	0.722	0.300	0.093
MAP vs MAP:CG	0.581	0.772	0.828	0.217
S15 vs CG	0.285	0.313	0.065	–
S15 vs MAP:CG	0.836	0.712	0.290	–
CG vs MAP:CG	0.386	0.520	0.411	0.006

<sup>z</sup> MAP – monoammonium phosphate (11-52-0); S15 – MicroEssentials® S15 (13-33-0-15); CG – Crystal Green® (5-28-0 + 10 Mg); MAP:CG – 50:50 blend (by mass of product) of MAP:CG (8-40-0 + 5 Mg)

<sup>y</sup> Application rates were 22, 40, 57 lbs P<sub>2</sub>O<sub>5</sub>/ac

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