

Factsheet: Seed-placed Phosphorus Products and Rate with Side-band vs. Mid-row Nitrogen



Objective:

This trial was conducted to evaluate the effects of different seed placed phosphorus products and rates with mid-row and side-band nitrogen placement on seed safety and yield.

Methodology:

The trial was established in Scott in 2020. Phosphorus (P) was applied in three different formulations including Microessentials S15[®] (MES15; 13-33-0-15), monoammonium phosphate (MAP; 11-52-0-0) and Crystal Green[®] (5-28-0), at two rates of 50 and 100 lbs/ac of actual total P. Nitrogen (N) was applied as urea (46-0-0) at a rate of 100 lbs of actual N/ac, as either side-band or mid-row placement.

Treatment	P Products	Rate lbs/ac	N Placement	Rate lbs/ac
1	MES15	25	Side-band	100
	MAP	25		
2	MES15	75	Side-band	100
	MAP	25		
3	MES15	50	Side-band	100
4	MES15	100	Side-band	100
5	Crystal Green	50	Side-band	100
6	Crystal Green	100	Side-band	100
7	MES15	25	Mid-row	100
	MAP	25		
8	MES15	75	Mid-row	100
	MAP	25		
9	MES15	50	Mid-row	100
10	MES15	100	Mid-row	100
11	Crystal Green	50	Mid-row	100
12	Crystal Green	100	Mid-row	100

Key Findings:

- Crystal Green treatments resulted in the highest plant densities, ranging from 53-84 plants/m². While the lowest plant densities at 26 plants/m² were observed with the blend of MES15: MAP at 100 lbs/ac with side-band N. As rates of P fertilizer increased from 50 lbs/ac to 100 lbs/ac, plant densities decreased for all treatments except Crystal Green with side-band N. In addition, plant densities were reduced when N was placed as a side-band rather than a mid-row for all treatments.

- Crystal Green treatments resulted in the lowest P concentration in the plant tissue at 0.26%, which may be attributed to the slow-release nature of the product. When the treatments were sampled at the rosette stage Crystal Green may not have been available for plant uptake to the same degree as MES15 and MAP. Higher rates of P (100 lbs/ac) resulted in 0.06% higher concentration of P in the plant compared to the lower rate (50 lbs/ac), suggesting higher rates were able to supply more P to the plant for uptake.
- The blend of MES15: MAP and MES15 alone resulted in the earliest maturing treatments (98 DTM) when applied at rates of 50 lbs/ac with mid-row N. However, these products also resulted in the latest maturing treatments (102 DTM) when applied at rates of 100 lbs/ac with side-band N. Thus, indicating the effect on maturity was in response to rates of P and placement of N rather than P products.
- The highest yield was observed by MES15: MAP at 100 lbs/ac with mid-row N at 67 bu/ac; while the lowest yield was observed by Crystal Green at 50 lbs/ac with mid-row N at 61 bu/ac (Figure 1). Higher rates of P with mid-row banded N resulted in higher yields when compared to side-banding N. Additionally, when N was side-banded, lower rates of P (50 lbs/ac) yielded higher compared to higher rates of P (100 lbs/ac), this is likely caused by higher rates in the seed-row in combination with side-band N increasing the risk of fertilizer toxicity and overall reducing yield potential.

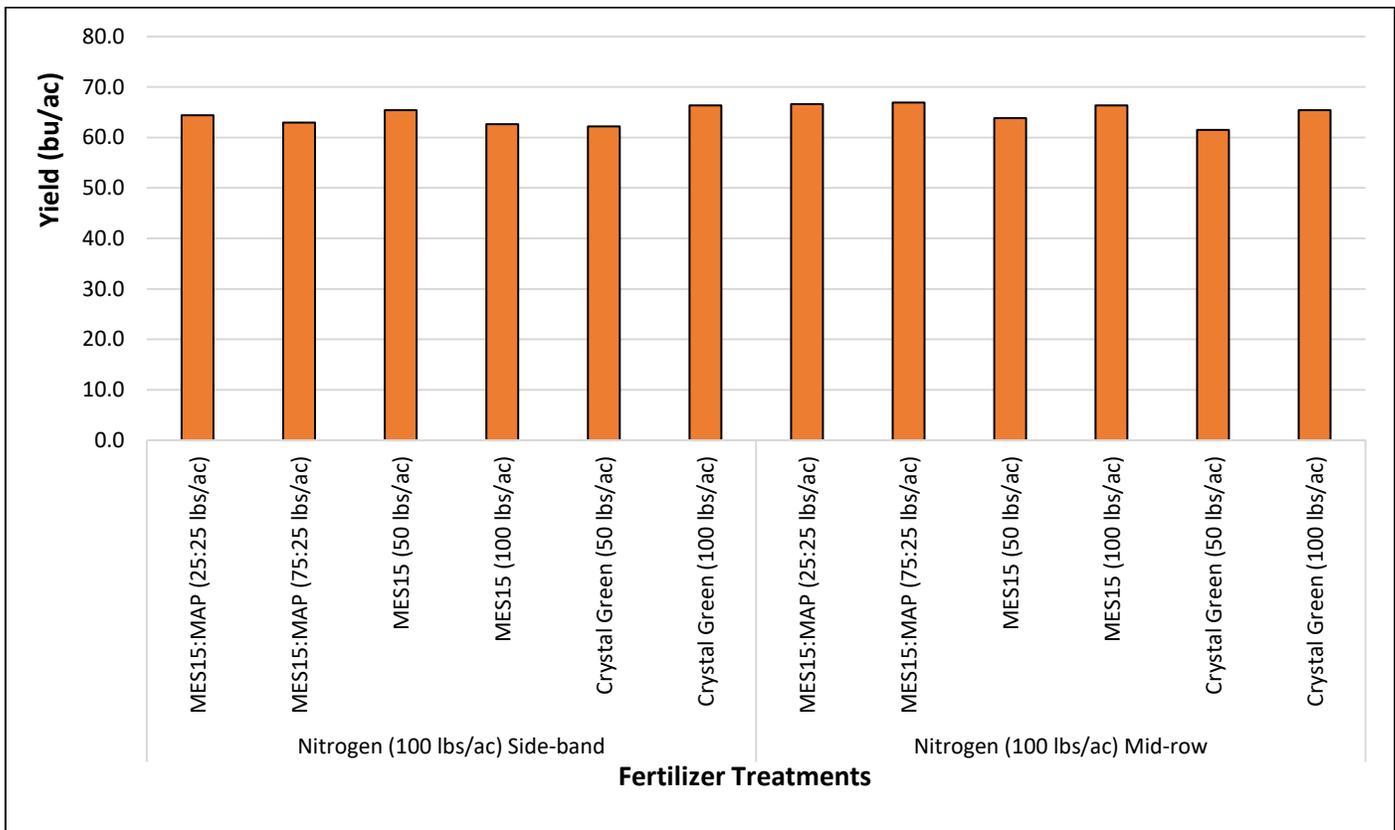


Figure 1. Yield (bu/ac) of canola in response to phosphorus fertilizer products and rates in combination with nitrogen placement at Scott SK, 2020.