

This project was intended to demonstrate different placement options for nitrogen (N) and phosphorus (P) fertilizer when growing oats, in combination with nitrogen rates. The demonstration was conducted at Melfort and Scott, SK in 2022. The site at Scott was in the brown soil zone while the site at Melfort was in the black soil zone. The treatments are listed in Table 1.

Table 1. Treatments used in 4R N and P Management in Oats at Melfort and Scott, SK in 2022.

Treatment #	Nitrogen Placement	Nitrogen Rate (kg/ha)	Phosphorus Placement ²
1	N/A	0	No P
2	N/A	0	Seed Row
3	N/A	0	Side-Band
4	Mid-Row	75	Seed Row
5	Mid-Row	100	Seed Row
6	Mid-Row	125	Seed Row
7	Side-Band	75	Seed Row
8	Side-Band	100	Seed Row
9	Side-Band	125	Seed Row
10	Side-Band	75	Side-Band
11	Side-Band	100	Side-Band
12	Side-Band	125	Side-Band

²phosphorus was applied at 45 kg/ha of P₂O₅

There were many significant treatment effects of nitrogen placement, nitrogen rate, and phosphorus placement on oat plant density, days to maturity, and grain yield at both locations in this demonstration; however, there were no significant treatment effects to oat test weights and thousand kernel weights. When N placement was significant, side-banded N decreased plant density, increased days to maturity, and increased grain yield as compared to midrow-banded N (Figure 1). When N rate was significant, increasing rates from 75 to 125 kg/ha decreased plant density and increased days to maturity. Additionally, when the N rate was increased in the side-band, plant densities were reduced as compared to the midrow. When treatment effects of P were significant, days to maturity was increased when P was seed-placed in combination with high rates (125 kg/ha) of applied N as compared to when P was side-banded. Additionally, P application significantly increased oat yield, but there was no significant effect of P placement (Figure 2). Due to dry and hot conditions at Scott and high residual soil nitrogen at Melfort, this demonstration results may vary from that of higher moisture and cooler temperature conditions as well as lower residual soil nitrogen at each of the

participating locations. Key takeaways from this one-year study were that midrow-banded N was best to maintain high plant stands, especially when applying high N rates, but side-banded N was best to maximize seed yields. Placement of P had minimal effects, but applying 45 kg/ha of P at seeding time helped to maximize yields.

Funding for this project was provided by Saskatchewan Agriculture through the Agriculture Demonstration of Practices and Technologies (ADOPT) program.

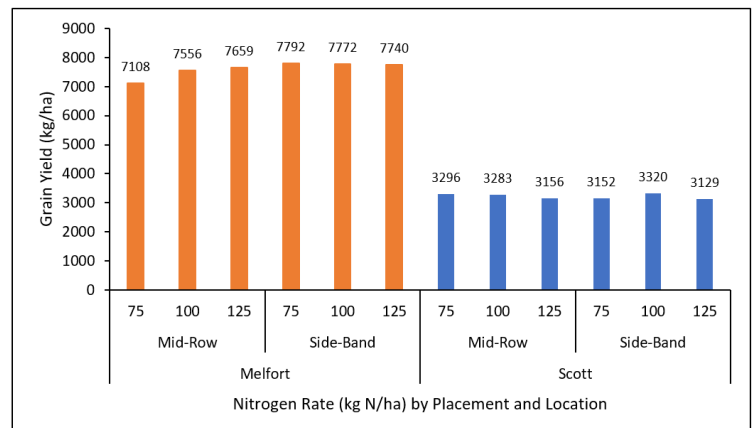


Figure 1. Treatment means for the effect of N placement and N rates on grain yield for 4R N and P Management in Oats at Scott and Melfort, SK in 2022.

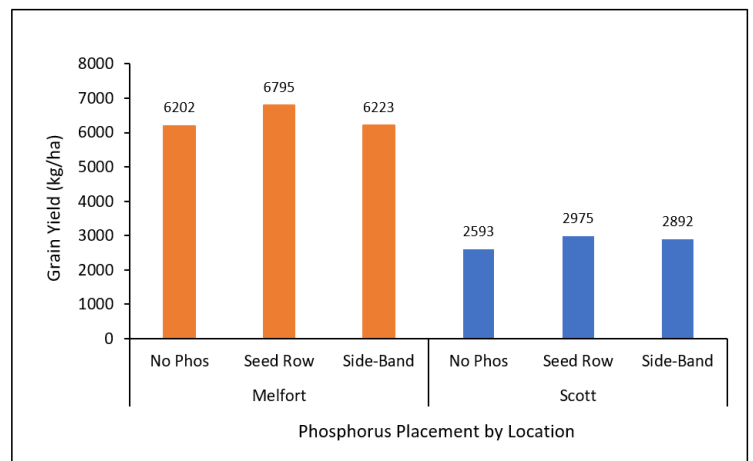


Figure 2. The effect of P placement on oat seed yield for 4R N and P Management in Oats at Scott and Melfort, SK in 2022.