

Dry beans are a high value pulse option for irrigation farmers looking to diversify their crop rotations. This project aimed to identify the best management practices for phosphorus (P) fertilizer in irrigated dry bean production.

The study was carried out over three years at the Canada-Saskatchewan Irrigation Diversification Center in Outlook. The study included two dry bean market classes: black beans and pinto beans. Treatments included seed placed and side-banded applications of 0, 15, 30 and 45 kg/ha P₂O₅. An additional 60 kg/ha side-band treatment was also included. Soil tests revealed that the plot areas were very low in P (7 ppm) in both 2023 and 2024, while the 2025 plot area had moderate P levels (16 ppm). Other nutrients were applied based on soil test results.

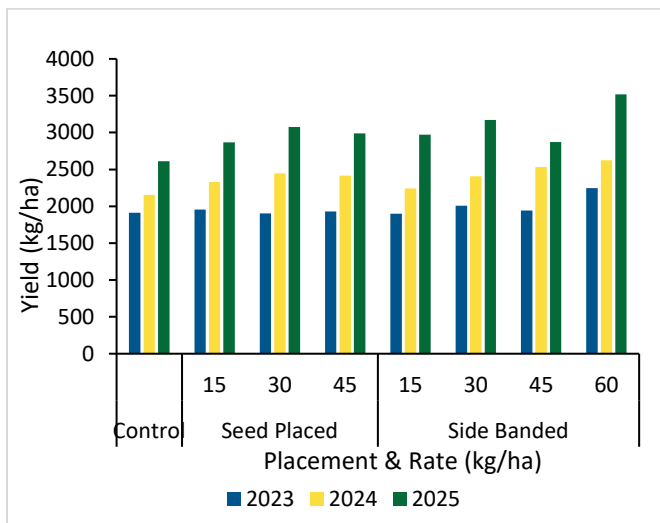


Figure 1: Yield response of black beans to varying rates and placement of P₂O₅ over three years.

In general, both market classes showed increased yields with P₂O₅ applications. Results varied over the course of the study; however, black beans were found to have maximum yield at 60 kg/ha of P₂O₅ side banded, while pinto beans consistently had the highest yield at 45 kg/ha of P₂O₅ side banded.

Side-banding consistently outperformed seed-placed applications for both market classes. Providing phosphorus beside the seed row ensured early access to nutrients without risking seed injury, which supported better emergence and stronger crop growth. While seed-placed phosphorus worked well at lower rates, suggesting that applying too much fertilizer directly with the seed can hinder early development.

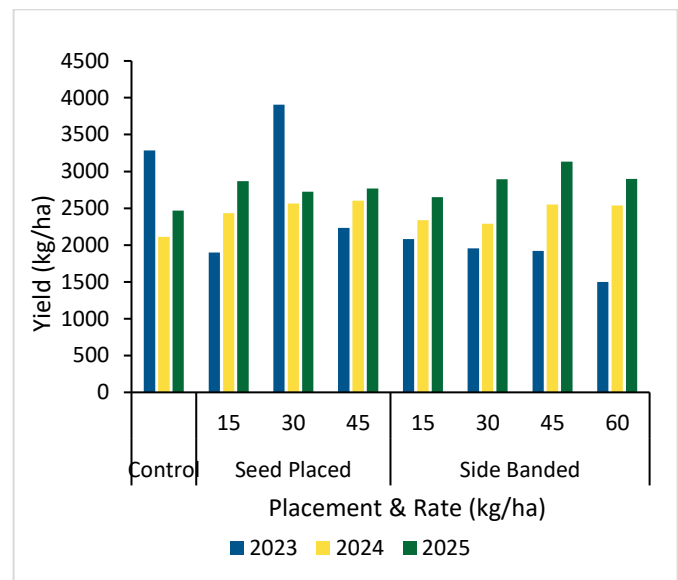


Figure 2: Yield response of pinto beans to varying rates and placement of P₂O₅ over three years.

Overall, the project shows that side-banded P is the most reliable and safest placement method under irrigation, allowing higher P rates with a lower risk of seed-row injury. Producers are therefore encouraged to use side-banded P at 45 kg/ ha P₂O₅ in soils testing low in P and apply seed-placed P only at conservative rates (15-30 kg/ ha P₂O₅) if higher P rates aren't required.

The full report of this project can be found in Irrigation Saskatchewan's 2025 Research and Demonstration report. This project was funded through the Strategic Field Program (SFP).