

## **AGR1509: Developing Phosphorus Management Recommendations for Soybean Production in Saskatchewan**

A project was initiated in 2015 to investigate soybean response to phosphorus (P) fertilizer rates and placement options under field conditions in Saskatchewan. The second year of field trials has been completed with locations at Indian Head, Outlook, Melfort, and Scott. The treatments are a combination of three P fertilizer rates (22, 45, and 90 kg P<sub>2</sub>O<sub>5</sub> ha<sup>-1</sup>) and three placement options (seed-placed, side-banded, and pre-seed broadcast) along with a control. The specific field protocols being followed were originally developed at the University of Manitoba and have also been implemented at various locations throughout that province. Preliminary results showed evidence of reduced plant populations with 45-90 kg ha<sup>-1</sup> of seed-placed P at 3/8 site-years (Melfort 2015 and 2016, and Scott 2016) while at Outlook in 2015, effects on emergence were not significant but yields were reduced with 90 kg P<sub>2</sub>O<sub>5</sub> ha<sup>-1</sup> of seed-placed P. While negative impacts on emergence were not always detected and were frequently subtle, these results support the recommendation that rates of seed-placed P exceeding 22 kg P<sub>2</sub>O<sub>5</sub>/ha should be avoided to minimize the potential for seedling injury. While whole plant tissue P concentrations were increased with fertilization to some extent at the majority of sites, seed yield increases with P were only evident at 2/8 sites with the strongest response at Indian Head 2016 and smaller but significant linear yield increases with P fertilizer at Outlook in 2016. The magnitudes of the responses were approximately 18% and 13% at Indian Head (2016) and Outlook (2016), respectively. In contrast, at Outlook in 2015 the only significant P fertilizer effects on yield were negative and specific to the highest rate of seed placed P. Data for seed P concentrations and P exports are not yet available for all sites; however, increased seed P concentrations with fertilizer were observed at Indian Head in both years. This work is continuing at all four locations in 2017 with funding provided by the Saskatchewan Pulse Crop Development Board.