

## Cluster 2 – Non-confidential Summary

### 1. CLUSTER PROJECT DETAILS

Project number: **AIP-CL03: Activity 6.v10 (A9)**  
Name of Project: **Adaptation and Establishment of Soybean (Glycine max)**  
Project research period: **April 1 2014 – March 31 2018**  
Period covered by this report: **April 1 2014 – March 31, 2018**  
Principal investigator and research collaborators: **Chris Holzapfel and Bryan Nybo**

### NON-CONFIDENTIAL ABSTRACT/SUMMARY (For use in publications and pulse grower websites)

- Overall project objectives, methodology, research design & findings from project start to March 31, 2017.
- **500 words** in lay language.
- To be used “as is” with no additional permissions sought prior to use.

In 2014, three experiments were initiated in contrasting locations (Indian Head – thin Black soil and Swift Current – Brown soil) to evaluate soybean adaptation and improve regional recommendations for this crop. In the first trial, soybeans were planted alongside canola, field peas, and faba beans at three seeding dates ranging from early/mid-May through early June. Soybean yields varied widely with environmental conditions, ranging from <500 kg/ha under severe drought to >2,500 kg/ha under favourable conditions. While late maturity was occasionally a concern, low yields were more frequently attributable to a lack of moisture. As expected, soybeans were better adapted to the Black soil zone, however excellent yields were achieved in the Brown soil zone with above-average precipitation. Focussing on seeding dates, mid- to late- May proved optimal, however seeding earlier in May was preferable to June seeding. While yields were usually similar between the first two dates, soybeans seeded early in May took longer to emerge and there had virtually no maturity advantage. While late seeded soybeans consistently matured in fewer days, yields suffered (14-20% reduction) from a shorter vegetative period and, occasionally, fall frost. The second experiment evaluated soybean response to seven seeding rates (15-85 seeds/m<sup>2</sup>) and two seeding depths (17-20 mm versus 33-38 mm). Although responses varied, when emergence, pod height, maturity, and yield were considered across all sites, the results favoured shallow seeding. Across sites and seeding rates, deeper seed placement led to 5% fewer plants, slightly reduced pod height, slightly later maturity, and 7% lower yields. The only site where the results differed was Indian Head 2017 where, under dry conditions, there was an establishment and maturity advantage to deeper placement but no effect on yield. Focussing on seeding rate, the overall mean mortality was 15% ranging from 0-43% amongst individual sites. The seeding rate response was stronger than expected and optimal plant populations tended to be higher under low yielding conditions. Across sites, yields at 70 seeds/m<sup>2</sup> were significantly higher than at any of the lower rates, however, at individual trials, yields frequently leveled off at 50-60 seeds/m<sup>2</sup>. Overall, a target of 55-60 seeds/m<sup>2</sup> is recommended to ensure optimum yields across a wide range of environmental conditions. Slightly lower seeding rates may suffice under favorable growing conditions and, potentially, with later maturing soybean varieties. Focussing on row spacing, the response varied from year-to-year but, on average, there was a slight linear yield increase with increasing spacing (7% yield advantage at 61 cm versus 25 cm row spacing) despite higher seedling mortality. This was, however, primarily due to the response under stressful conditions and was likely due, in part, to better nodulation at wider row spacing. Under higher yielding conditions, there was either no row spacing effect or yields were slightly higher at the narrower, 25-31 cm, row spacing. Overall, this project provided information on the overall adaption and yield variability that might be expected with soybeans along with improved seeding date, depth, rate and row spacing recommendations.

Completed report to be sent to [stoms@saskpulse.com](mailto:stoms@saskpulse.com) by April 30, 2017