

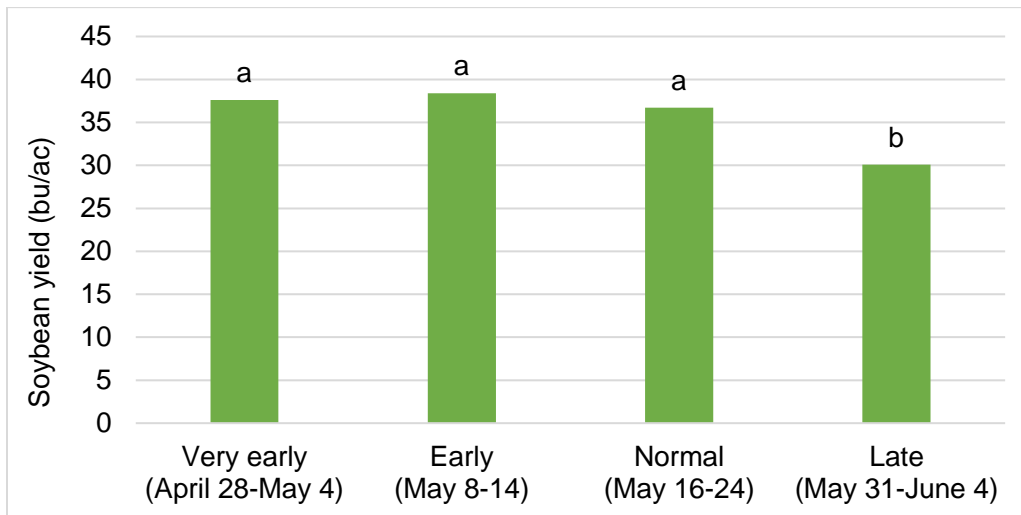
# Determining the Optimum Seeding Window for Soybeans in Manitoba

**Project Duration:** 2017 -2019

**Objectives:** The objective of this study is to determine the optimum seeding window for soybeans across Manitoba growing regions. Traditional recommendations are to plant soybeans when soil temperature has warmed to at least 10°C, which is typically May 15-25 in Manitoba (Manitoba Agriculture and Resource Development). However, farmers have started to seed soybeans earlier and recent work by Dr. Yvonne Lawley and Cassandra Tkachuk (2017) supports this trend. They evaluated seeding dates across a range of soil temperatures from 6 to 14°C in 2014 and 2015; the earliest seeding dates maximized yield regardless of soil temperature and it was concluded that calendar date is a superior indicator. To update seeding date recommendations across a wider range of environments and using defined calendar dates, this study was initiated at Arborg, Carman, Dauphin and Melita in 2017 and 2019 was the last year of testing.

**Collaborators:** Kristen P. MacMillan, University of Manitoba  
Scott Chalmers, WADO Melita

## Project Findings

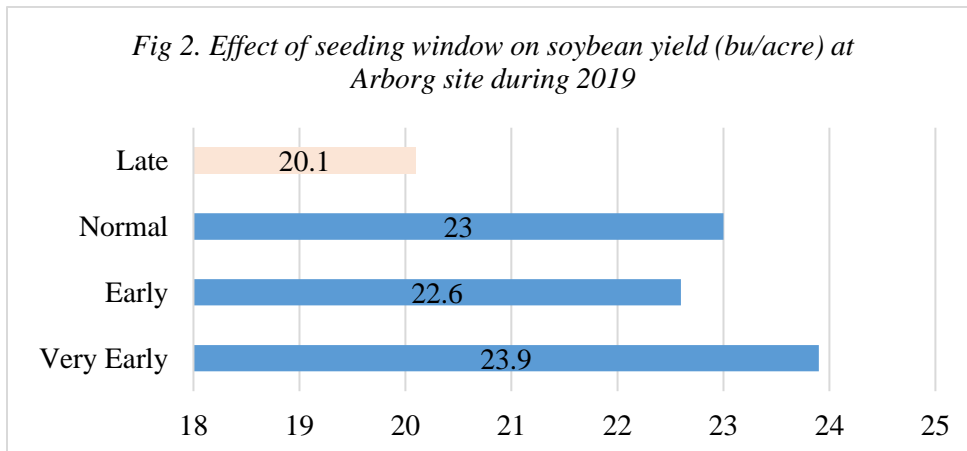


**Figure 1.** Soybean yield by seeding window among 7 site-years in Manitoba from 2017-2018. Means followed by the same letter are not statistically different at  $P < 0.05$ .

The preliminary combined analysis from 2017 to 2018 indicates that soybean yield was affected by the main effects of environment (E) and seeding date (SD), and their interaction (E x SD).

Overall, soybean yields were below average to average in these dry growing environments, ranging from 21-40 bu/ac, with the exception of Dauphin18 which yielded 64 bu/ac. Looking at individual environments (data not shown), yield maximization occurred in the

first seeding window for 3 out of 7 environments, out yielding the second and third dates by 2-12%. In the other 4 out of 7 environments, yield maximization occurred in the second seeding window (early) by 1-14% compared to the first and third dates. In 2 out of those 4 environments (Carman17 and Melita17), soybeans in the first seeding date were beginning to emerge and were exposed to spring frost which is an important consideration for very early seeding. Yield differences among the first three seeding windows were statistically similar in 5 out of 7 environments and reduced yield with late seeding was consistent across all environments contributing to a meaningful overall effect of seeding date (Figure 1). Overall, soybean yield was statistically similar when seeded between April 28 and May 24, seeding beyond which reduced soybean yield by 20% on average. At Arborg18, soybean yield was statistically higher at the second seeding date compared to the first and last date. Due to this occurrence and associated frost risk observed at two other environments, farmers may want to consider waiting until the 2<sup>nd</sup> week of May to seed soybeans in Manitoba. Other measurements being collected include emergence, crop phenology, maturity and seed quality. This data continues to be analyzed to help refine overall seeding date recommendations.



During 2019, soybean yield was below average at all the seeding dates because of drier weather at Arborg site. However, yield trend was similar to overall conclusions based on 2017-2018 data. Late seeded plots had significantly less yield than all other three dates (Figure 2:  $p = 0.031$ ,  $CV = 11.0\%$ ). Variety-seeding date interactions were not significant.

### **Background/References/Additional Resources**

Traditional recommendations are to plant soybeans when soil temperature has warmed to at least 10°C, which is typically May 15-25 in Manitoba (Manitoba Agriculture & Resource Development). However, farmers are starting to plant soybeans earlier and recent work by Tkachuk (2017) supports this trend. Tkachuk investigated soybean seeding dates across a range of soil temperatures from 6 to 14°C at Carman, Morden and Melita in 2014 and 2015. At three site-years, soybean yield was optimized with the earliest planting date.

## **Materials & Methods**

The experimental design is a split plot RCBD, with seeding window as the main plot and variety as the split plot. The four seeding windows tested were “very early” (April 28 to May 4), “early” (May 8 to 14), “normal” (May 16 to 24) and “late” (May 31 to June 4). The short season variety S007Y4 and mid season variety NSC Richer were seeded within each seeding window.

*Data collected*- plant height, lodging, days to maturity, yield

***Agronomic Info*** (PESAI Arborg)

*Stubble, soil type* - Wheat, heavy clay

*Soil Fertility* - N= 29 lb/Ac, P= 17 lb/Ac, K= 620 lb/Ac

*Fertilizer Applied* – No application

*Pesticides Applied (doses and dates)* –

Glyphosate @ 0.67 L/acre on June 13

Silencer @34ml/acre on June 13 for the control of cutworms

Glyphosate @ 0.67 L/acre on July 2

*Seeding Dates* - May 6, May 13, May 22, June 4

*Harvest Date*- October 8