

Refining Soybean Seeding Window Recommendations

The window to seed soybeans in Manitoba is flexible throughout the month of May. Soybean yields did not differ among May 1–24 seeding dates, but yields were reduced by 15%, on average, when seeding was delayed until May 31–June 4.

THE TRADITIONAL RECOMMENDATION has been to plant soybeans when soil temperatures have warmed to at least 10°C, or from May 15–25 in Manitoba. However, previous Manitoba-based research found that late April to early May planting dates corresponding with soil temperatures of 6.0–10.6°C produced similar and, in one case, greater soybean yields than those seeded at the traditionally recommended time.

The purpose of the current study aimed to update soybean seeding date recommendations across a wider range of environments, using defined calendar dates. Over three years (2017–2019), experiments were established at Arborg, Carman, Dauphin and Melita. Four seeding windows were tested: *very early* (April 28–May 6), *early* (May 8–14), *normal* (May 16–24) and *late* (May 31–June 4), using the short-season variety, S007-Y4 (MG 00.5), and mid-season variety, NSC Richer (MG 00.7). Soybeans were seeded into soil temperatures as low as 0°C.

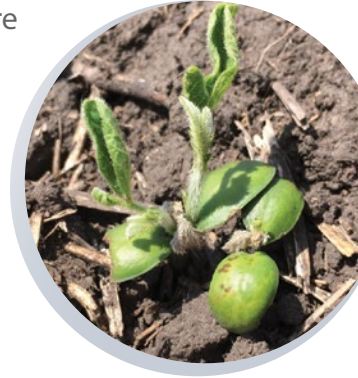
There were no differences in soybean yield when planted throughout May 1 to 24 (Figure 1). Yield was reduced by 15%, on

average, when seeding was delayed until May 31 to June 4. These results indicate that the soybean seeding window is flexible during the first three weeks of May in Manitoba.

At four of 11 site-years, yield was maximized by seeding very early (April 28–May 6), but yield was significantly reduced by this very early seeding at one site-year. At five of 11 site-years, yield was maximized during the early seeding window (May 8–14).

These results highlight the risks related to seeding soybeans too early in Manitoba. Cold soil temperatures within the first 48 hours of seeding can result in chilling injury, reduced or delayed emergence and increased susceptibility to soil-borne pathogens. There is also the risk of exposure to spring frost, which can kill or injure emerged seedlings. The coldest soil temperatures occurred during the very early seeding window at Melita in 2019 (0°C), at Melita in 2017 (1.1°C) and at Arborg in 2018 (5.8°C). At those site-years, yield was reduced by 13–19% during the very early seeding window (April 28–May 6). Late killing spring frosts occurred

Emerged soybean seedlings from the very early seeding window (April 28–May 6) exposed to a late spring frost.



on May 19, 2017 and June 2, 2019, that may have negatively impacted emerged seedlings and yield from the very early seeding window.

In these experiments, soybean seed protein averaged 31.9%, 13% moisture basis (range: 26.5–35.1%). The effect of seeding window on seed protein was significant overall, but this depended on the environment. At eight out of 11 site-years, protein was the same among seeding dates. Late seeding produced greater protein than during the very early or early seeding windows at two out of 11 site-years. We need to gain a greater understanding of how genetic, management and environmental factors interact and affect soybean protein and other quality factors in Manitoba before altering our farming practices to manage protein.

Based on the results of this study, seeding soybeans during the second week of May generally maximized soybean yield in Manitoba while reducing the risks associated with cold soil and late spring frost. However, the optimal time to seed soybeans can vary by region and from year to year. Each planting season, avoid seeding into soil temperatures below 8°C, ensure there is no cold rain or snow in the forecast for the first 24–48 hours after planting and aim to seed within two weeks of the last expected spring frost to establish a strong plant stand, maximize yield and minimize risk. ▶

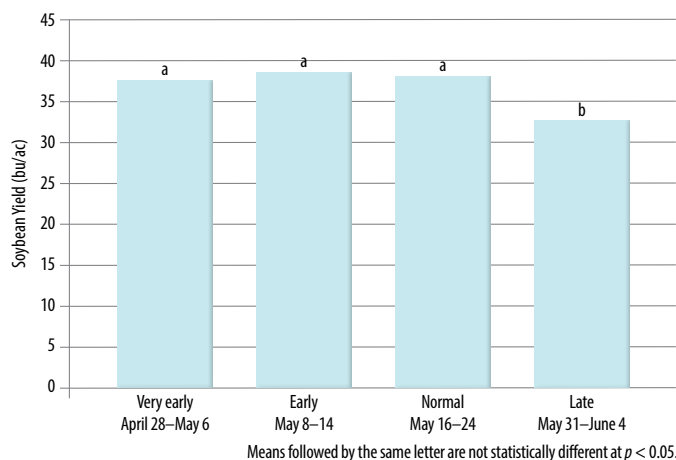


Figure 1. Soybean yield by seeding window among Arborg, Carman, Dauphin and Melita environments from 2017–2019.