AGRONOMY

# Agronomic Management of Soybeans in Manitoba: Row Spacing and Seeding Rate

The optimal plant population for soybeans in Manitoba is 160,000 plants/ac and narrow-row spacing consistently produced yields equivalent to, or greater than, wide rows.

**SOYBEANS IN MANITOBA** are often seeded in narrow rows (<15 inches) using an air seeder because row-cropping equipment is unavailable or uncommon in some regions. Questions have begun to arise regarding the relative benefits and disadvantages of narrow- vs. wide-row spacing on soybean establishment and yield. Studies conducted in North Dakota reported narrow-row spacing increased yield and weed competition due to earlier canopy closure. Conversely, wider rows may increase air movement among plants, reducing disease and allowing the use of inter-row cultivation for weed control.

Current Manitoba seeding recommendations are to target 180,000 to 210,000 plants/ac (40 plants/m$^2$). In North Dakota, previous studies of contrasting seeding rates found higher plant density increased yield in some cases.

The objective of this experiment was to evaluate the effects of seeding rate and row spacing on soybean growth, yield and seed quality in Manitoba.

Eight sites were chosen for this study: Morden, Portage, Melita, Carberry (2011–2013) and Brandon, Roblin, Arborg, Beausejour (2012–2013). Four seeding rates (80,000, 120,000, 160,000 and 200,000 seeds/ac) and two row spacings (narrow 8–12 inches vs. wide 16–30 inches) were established under weed-free conditions. Standard management practices appropriate for each region were applied. Soybeans were typically seeded between mid-May and mid-June, and harvested in September or October, depending upon location.

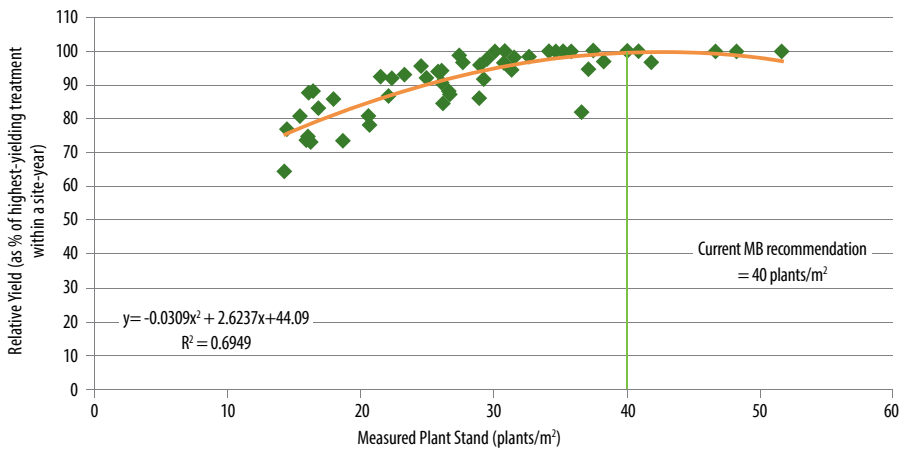
Results showed seeding rate and row spacing were largely independent of each other. Narrow rows produced yields that were equivalent to or greater than wide rows in all site-years. Where narrow rows of 9–10 inches were compared against wide rows ranging from 27–30 inches, narrow rows had a yield advantage in almost all cases (six of seven site-years). In site-years where wide rows ranged from 16–24 inches, yield differences between narrow and wide rows were less frequent (two of 13 site-years).

Increasing seeding rate consistently increased plant stand, but the actual plant stand established frequently ranged from 60 to 100% of that targeted by the seeding rate. This shows the influence of environmental conditions on final crop establishment. These findings demonstrate the importance of stand counts to verify the actual plant stand achieved in a given field.

Increasing seeding rate increased yield in 17 of 20 site-years. Considering relative yield (i.e. yield of a seeding rate as percentage of the highest-yielding seeding rate in each site-year), the results showed yield increased with increasing plant stand then levelled off (Figure 1). Actual plant stands of 120,000, 140,000 and 160,000 plants/ac in the field produced an estimated 95, 98% and 100% of optimum relative yield. This study established seeding recommendations for Manitoba. The *seeding rate calculator* in the MPSG *Bean App* has built in the results of this study, allowing farmers to determine the economic optimum seeding rate with customizable cost of soybean seed, target yield and soybean price.

Information regarding lodging score, plant height and days to maturity was collected; however, no strong nor consistent effects of row spacing and seeding rate were observed. Additionally, both row spacing and seeding rate influenced seed quality in some site-years. However, observed effects were generally not consistent among all site-years, and differences among treatments were often small.

*Figure 1. Relationship between actual plant stand and relative yield of soybeans (yield as percent of the highest-yielding treatment within each site-year) based on 13 site-years of data in Manitoba (2011–13). Data presented is averaged across narrow- and wide-row spacing treatments.*

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