

High Yield Soybean Management in Eastern Canada

Increasing Yields in Soybeans

- Improvements in genetics and management have driven substantial gains in soybean yields in Eastern Canada (Ontario and Quebec) over the past 50 years, at a rate of 0.33 bu/acre/year (Figure 1).
- Ontario's average soybean yields topped 50 bu/acre for the first time in 2018 and again in 2020. In 2020 Quebec's average soybean yields reach an all time high of 48.4 bu/acre.

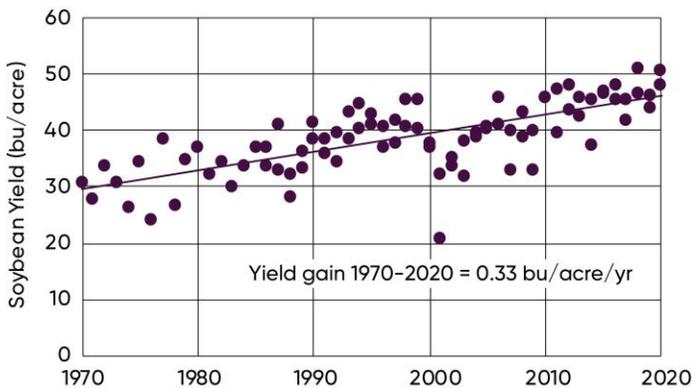


Figure 1. Ontario and Quebec average soybean yields 1970-2020. (Statistics Canada, Table 32-10-0359-01 Estimated areas, yield, production, average farm price and total farm value of principal field crops, in metric and imperial units).

- 75 bu/acre has often served as a target yield level for farmers seeking high yields with optimized management and the newest genetics.
- Across all of the on-farm genetic and agronomic trials Pioneer conducts each year in Eastern Canada, it has not been unusual for a few entries each year to top 75 bu/acre.
- Beginning in 2018, the number of plots exceeding 75 bu/acre increased dramatically. This number declined in 2019 due to weather challenges but increased again in 2020 (Figure 2).

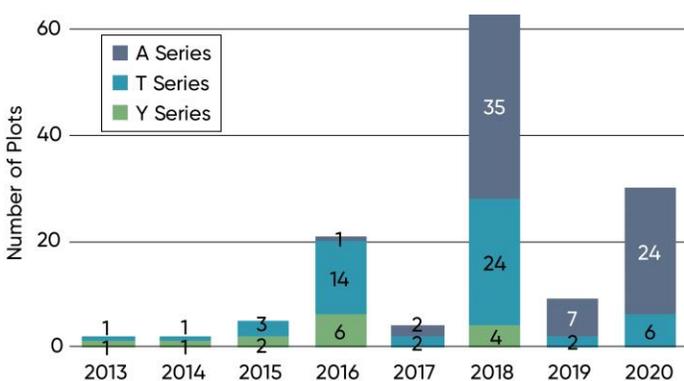


Figure 2. Series of Pioneer brand soybean varieties used in Eastern Canada Pioneer on-farm trial entries exceeding 75 bu/acre, 2013-2020.

Pioneer On-Farm Trial Results

- A total of 67 on-farm soybean trials between 2018 and 2020 exceeded 75 bu/acre plot average, 66 of which contained A-Series soybean varieties (Figure 2).
- 75 bu/acre was achieved with 49 different Pioneer brand varieties from maturity group 0.3 to 3.1 across those plots from 2018 to 2020 (Table 1).

Table 1. Pioneer brand soybean varieties used from 2018 to 2020 in Eastern Canada Pioneer on-farm trials entries exceeding 75 bu/acre.

Variety/Brand ¹	Plots	Variety/Brand ¹	Plots
P03A26x (RR2X)	1	P18A98x (RR2X)	10
P04A60R (RR2X)	1	P19A14x (RR2X)	15
P05A35x (RR2X)	1	P19T39R2 (RR2Y)	5
P06A13R (R)	6	P20T95E (E3)	1
P06A51x (RR2X)	3	P21A20	1
P06T28R (R)	1	P21A28x (RR2X)	17
P07A18x (RR2X)	2	P23A15x (RR2X)	6
P08T96R (R)	10	P23A32x (RR2X)	9
P09A53x (RR2X)	19	P24A80x (RR2X)	12
P09A62x (RR2X)	16	P24T05R (R)	2
P09T74R2 (RR2Y)	6	P24T76E (E3)	2
P10T48R (R)	10	P25A54x (RR2X)	3
P11A10	2	P25A65R (R)	3
P11A44x (RR2X)	1	P26T57E (E3)	2
P11A67	1	P27A17x (RR2X)	11
P13T06L (LL)	1	P28A42x (RR2X)	8
P14A23L (LL)	1	P28A94x (RR2X)	7
P15A09x (RR2X)	4	P28T08R (R)	3
P15A63x (RR2X)	5	P28T14E (E3)	1
P15A88x (RR2X)	4	P28T62R (R)	2
P15T46R2 (RR2Y)	3	P29A25x (RR2X)	7
P15T83R (R)	1	93Y05 (R)	1
P16A13x (RR2X)	13	P31A22x (RR2X)	4
P16A84x (RR2X)	6	P31A95Bx (BOLT, RR2X)	2
P16T71E (E3)	2		

¹ All Pioneer products are varieties unless designated with LL, in which case some are brands.

Agronomic Practices

- 75+ bu/acre yields were achieved in a range of different environments and with a range of different agronomic practices.
- Analyses of management practices used in yield contest winners in other crops have produced similar findings (Jeschke, 2019), indicating that there is no single one-size-fits-all formula for achieving high yield potential.

Previous Crop

- The vast majority of 75+ bu/acre plots from 2013-2020 were planted to corn the prior season – 71 of 88 (80.7%) – while 8 (9.1%) were planted to soybeans, and 9 (10.2%) to another crop (data not shown).

Tillage

- The most common tillage system used at locations with 75+ bu/acre plots was conventional tillage, followed by conservation/min-till, followed by no-till. (Figure 3).

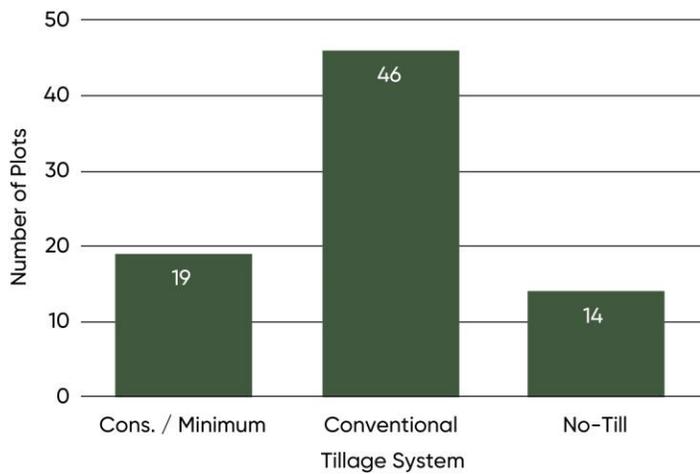


Figure 3. Tillage practices used in Eastern Canada Pioneer on-farm trials with entries exceeding 75 bu/acre, 2013-2020.

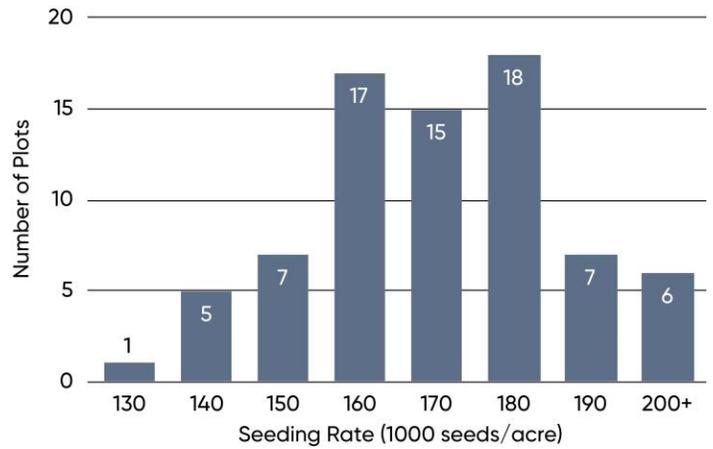


Figure 4. Seeding rate used in Eastern Canada Pioneer on-farm trials with entries exceeding 75 bu/acre, 2013-2020.

Seeding Rate

- Seeding rates used in plots yielding above 75 bu/acre ranged from 130,000 seeds/acre to 225,000 seeds/acre, with an average of 173,000 seeds/acre (Figure 4).
- Average seeding rate was higher among no-till locations (180,000 seeds/acre) than conventional till locations (169,900 seeds/acre).
- Average seeding rates differed between Ontario and Quebec where all of the 75+ bu/acre plots were located:
 - The average seeding rate across Ontario locations was 174,000 seeds/acre.
 - The average seeding rate across Quebec locations was 161,600 seeds/acre.

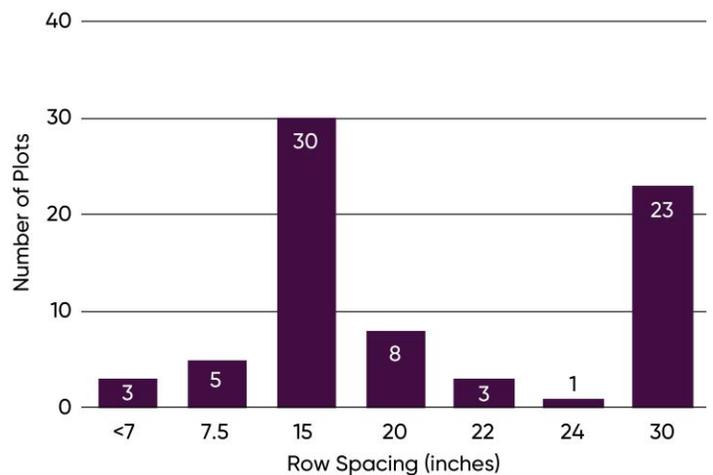


Figure 5. Row spacing used in Eastern Canada Pioneer on-farm trials with entries exceeding 75 bu/acre, 2013-2020.

Row Spacing

- Where row spacing was recorded there was an almost even split between locations with row spacing in 15-inch configurations or less, and 20-30-inch configurations (Figure 5).

- Geographic distribution of row spacing practices showed that all but one of Quebec's 75+ bu/acre locations was planted to a wide (20+ inch) row spacing with the majority of those rows being in a 30-inch configuration. Ontario locations showed a wider variety of row spacing configurations with 15-inch rows being the most common (data not shown).

Planting Date

- Some recent research has shown the importance of early planting for maximizing soybean yields (Van Roekel, 2019). However most trial locations with 75 bu/acre plots in Eastern Canada were planted in the mid to latter half of May (Figure 6) highlighting the importance of soil fitness at planting.

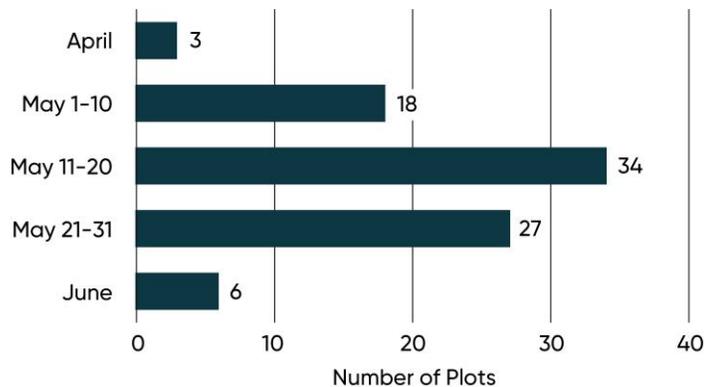


Figure 6. Planting date of Eastern Canada Pioneer on-farm trials with entries exceeding 75 bu/acre, 2013-2020.

Other Practices

- Other management practices employed at locations with 75+ bu/acre plots included foliar fungicides (especially those aimed at white mould control), and foliar insecticides.



References

- Jeschke, M. 2019. Managing Corn for Greater Yield. Pioneer Crop Insights Vol. 29 No. 2.
- Van Roekel, R. 2019. The Importance of Early Planting for Soybeans in the Midwest. Pioneer Crop Focus Vol. 11 No. 1.

Glyphosate
Tolerant

ROUNDUP READY 2
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SOYBEANS

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Enlist E3
SOYBEANS

BOLT

Roundup Ready 2
Yield
SOYBEANS

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