



# NEWSLETTER

## SPRING 2020



Agriculture and  
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# Soybean Seed Rates, Plant Population and Yield

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The Atlantic Grains Council (AGC) between 2015 and 2019 has conducted over 40 trials across the Maritime Provinces concerning soybean seeding rates. A review of the data generated from these trials provides helpful information concerning seeding rate and plant population that should be considered as plans for planting the 2020 crop are finalized.

## What is difference between seeding rate and plant population?

**Seeding rate:** number of seeds per acre planted to achieve a desired or target plant population, achieved by calibrating equipment for the seed-lot or seed-lots being used.

**Plant Population:** the actual number of plants established per acre in the field.

In the Maritime trials over the last four years soybeans were planted at 90, 110, 130, 160 and 190,000 seeds per acre.

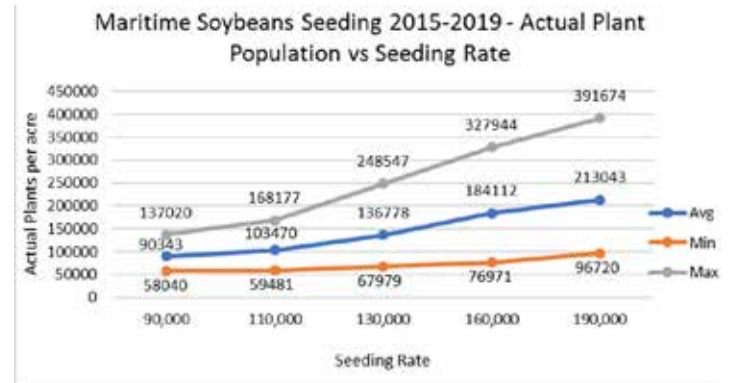
Figure 1. summarizes the seeding rate compared to the actual plant populations achieved.

- 1) The bottom or x-axis of the graph indicates the planned or target seeding rate.
- 2) The left or y-axis indicates the actual plant population in plants/acre achieved.
- 3) The bottom or brown line indicates the minimum population achieved for each intended seeding rate. For example, when the target population was 90,000 plants/acre, the minimum actual plant population achieved was 58,040 plants/acre.
- 4) The middle or blue line indicates the average actual plants/acre achieved at a given target seed rate.
- 5) The upper or grey line is the maximum population achieved at each intended seed rate. For example, when the target population was 90,000 plants/acre, the maximum actual plant population achieved was 137,020 plants/acre.

Figure 1. is interesting as it shows on average seeding rates can achieve a desired plant population, but the average hides the fact that there are a number of trials

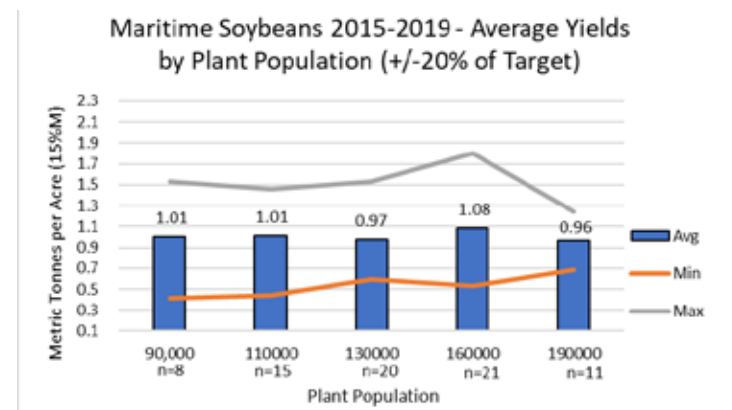
where the seed rate significantly missed the desired plant population either being too low or too high. As the seeding rate increased the accuracy decreased with a much larger difference between the minimum and maximum actual plants per acre.

Figure 1. Actual Plant Population vs. Seeding Rate



How can we compare yields of the seeding rates when the actual plant populations have such a wide range? In order to determine what might be the best seeding rates for Maritime soybean producers to use, only those trials where the resulting plant population were within plus or minus 20% of the intended seeding rate were compared. This still left a meaningful number of trials to consider as shown in Figure 2.

Figure 2. Average Yield by Plant population



- 1) The blue bars represent the average for all trials where the plant population was within plus or minus 20% of the target population. Essentially showing no difference in yield with increasing plant populations.
- 2) The brown line represents the minimum yields for each population. As plant population

increases there is a trend for yield to increase but it is difficult to achieve a good yield with a low plant population.

- 3) The gray line represents the maximum yields for each plant population. The yield potential is the same from the plant population of 90,000 up to 130,000. Plant population of 160,000 has the highest potential yield. 190,000 plants per acres has the lowest yield potential.

Figure 3. Soybean Yield Economics

		90,000	110000	130000	160000	190000
<b>Yields MT/acre</b>	Avg	1.01	1.01	0.97	1.08	0.96
	Min	0.42	0.45	0.59	0.53	0.68
	Max	1.53	1.46	1.53	1.80	1.24
<b>Target Cost seed/acre</b>		51.43	62.86	74.29	91.43	108.57
<b>Net \$/acre</b>	Avg	\$351	\$343	\$315	\$341	\$277
	Min	\$116	\$115	\$163	\$121	\$165
	Max	\$561	\$519	\$538	\$630	\$388

Figure 3<sup>1</sup>, presents the yield information along with the target seed costs per acre and the projected net dollars per acre (value of yield minus seed cost). While it is possible to achieve a good yield with a low plant population it may be better when growing soybeans in the Maritimes to target a plant population in the range of 130,000 to 160,000 plants per acre in order to minimize risk and maximize yield potential.

### Summary

- Higher plant population does not equal a higher yield.
- There is a need to improve accuracy in achieving target plant populations to reduce unnecessary seed costs and improve profit.
- Trials indicate that targetting a plant population of 130,000 to 160,000 plants per acre will maximum yield potential and minimize risk.
- When in doubt, plant at a lower rate as there is no difference in average yields between plant populations.

