



Understanding the Benefits of Early-Planted Soybeans

Trial Objective

- Largely due to the widespread adoption of treated soybean seed, growers now plant soybeans increasingly earlier than ever before. For example, Illinois farmers had 31 percent of their soybean crop planted by May 3, 2020 compared to the previous 5-year average of 12 percent.¹
- This research was conducted with a goal of understanding not only the yield impact of planting soybeans at different dates, but also the agronomic characteristics which enable early planted beans to have higher yield potential.
- The main driver of yield potential increase in early planted beans is the ability for the plants to create more nodes before flowering.² We measured the number of nodes created and days to flowering to better understand this interaction.

Research Site Details

Location	Soil Type	Previous Crop	Tillage Type	Planting Date	Harvest Date	Potential Yield (bu/acre)	Seeding Rate (seeds/acre)
Roanoke, IL (Woodford County)	Silt loam	Corn	Conventional	4/25/18, 5/8/18, 5/23/18	9/24/18, 10/4/18	70	140k
Auburn, IL (Sanagamon County)	Silt loam	Corn	Conventional	5/2/18, 5/22/18	9/29/18	70	140k
Monticello, IL (Piatt County)	Silt loam	Corn	Conventional	5/1/18, 5/14/18, 6/1/18	10/23/18	70	140k
Roanoke, IL (Woodford County)	Silt loam	Corn	Conventional	4/9/19, 4/23/19, 5/7/19, 5/18/19, 6/3/19, 6/18/19	10/9/19, 10/23/19	70	140k
Roanoke, IL (Woodford County)	Silt loam	Corn	Conventional	3/7/20, 4/6/20, 4/20/20, 5/9/20, 6/1/20, 6/15/20	10/7/20, 10/15/20	70	140k
Monticello, IL (Piatt County)	Silt loam	Corn	Conventional	4/8/20, 4/23/20	10/6/20	70	140k
Newark, IL (Kendall County)	Silt loam	Corn	Conventional	4/8/20, 4/23/20, 5/8/20, 5/29/20	10/15/20	65	115k

- This research was conducted at Bayer® Crop Science FOCUS sites in four Illinois counties: Kendall, Piatt, Sangamon, and Woodford from 2018 through 2020.
- Four soybean products, ranging in maturity group (MG) 2.6 to 3.6 were evaluated, although not all products were planted at every location or in every year.
- All seed was treated with Acceleron® STANDARD and ILEVO® seed treatment.
- Standard fertility and weed management practices were followed, and plots were harvested as they matured.



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Understanding the Results

- To compare data across years, results are presented as a percentage of the maximum for the year, location, and variety. The highest average yields are attained from earlier planting, with a steady decline as the season goes on (Figure 1).
- Although it is possible for later planted soybeans to attain satisfactory yield, there is much greater yield variation than in fields which are planted earlier.
- Flowering date in soybeans is influenced by daylength and is often assumed to occur on a specific date regardless of planting date, but multiple factors combine to influence the actual date at which flowering occurs³. Figure 2 illustrates that the period between planting and flowering is greatly reduced when planting later.
- The earlier soybeans are planted, the more time they have to grow vegetatively and create nodes which are the foundation for yield potential (Figure 3).

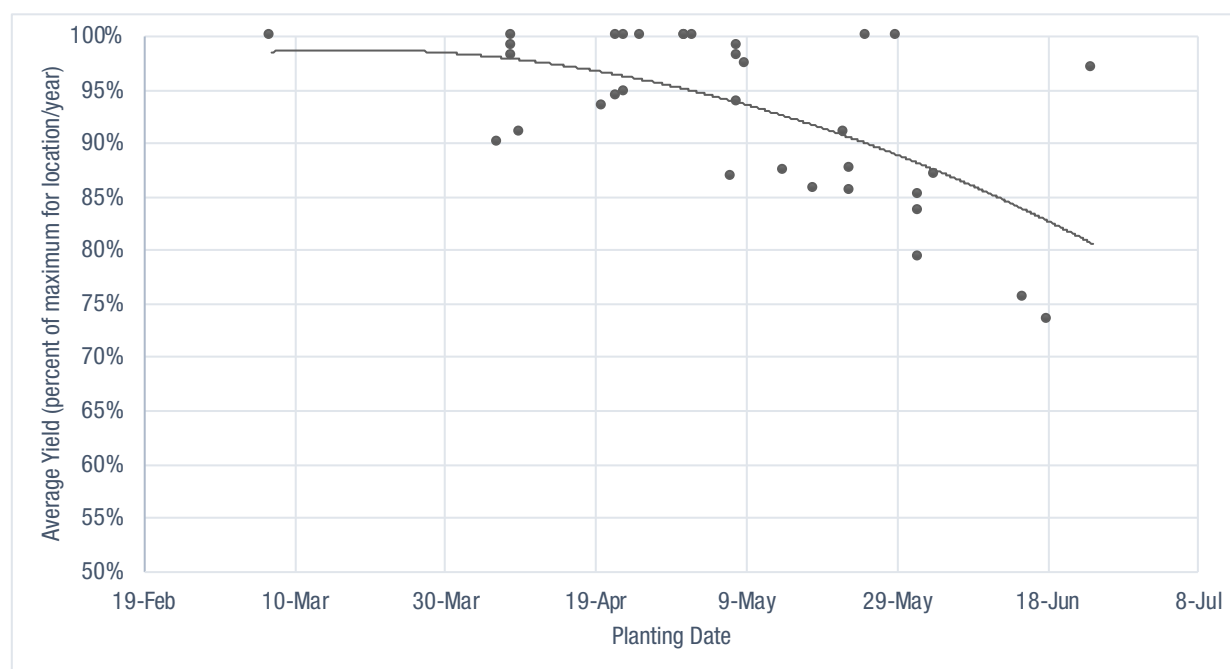


Figure 1. Average soybean yield response to planting date over three years, 2018 to 2020.

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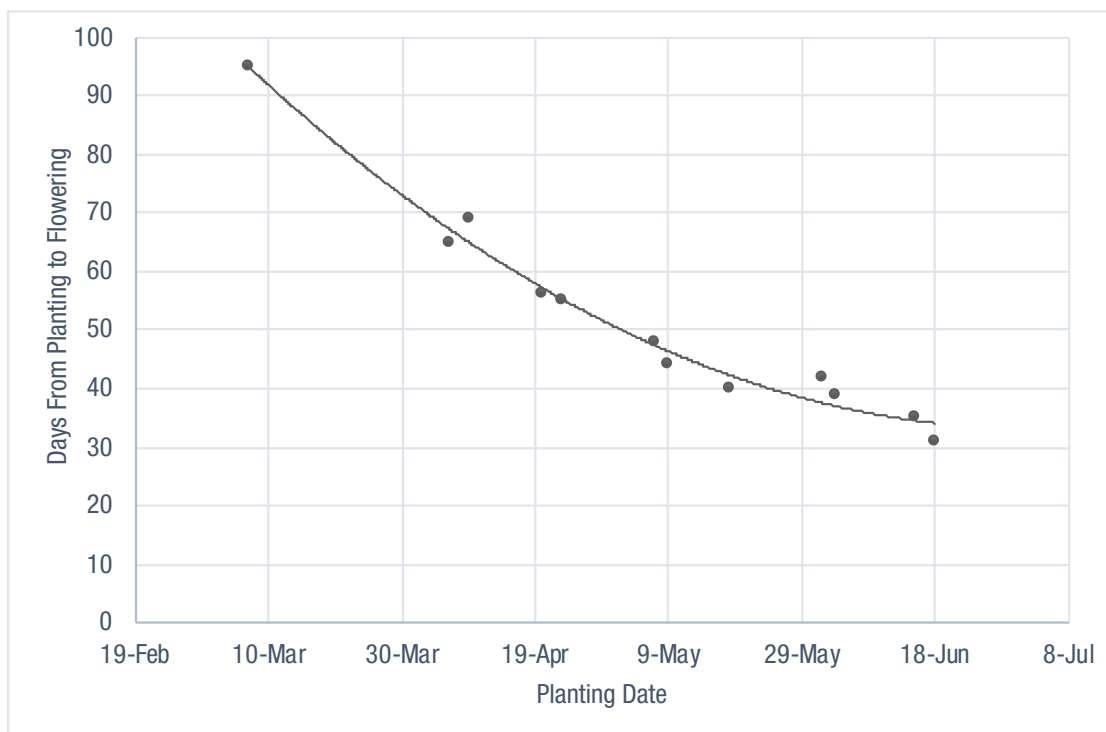


Figure 2. Average number of days from planting to flowering for a MG 3.6 soybean product based on planting date over two years, 2019 and 2020.

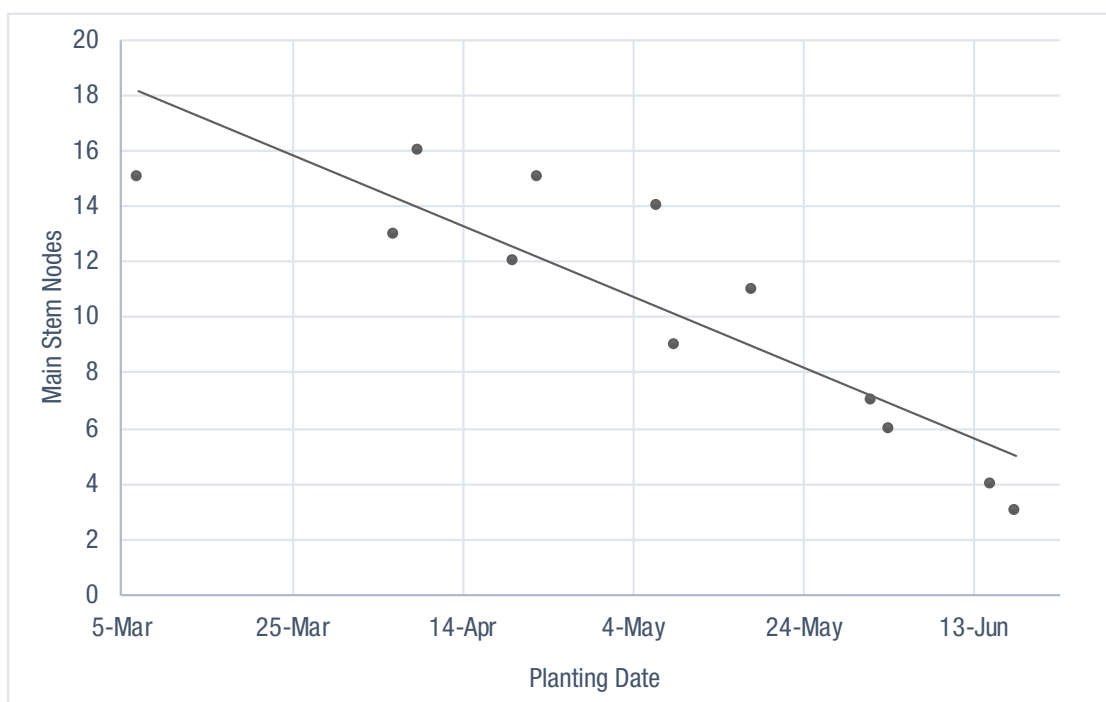


Figure 3. Effect of planting date on number of developed main stem nodes for a MG 3.6 soybean product by July, 10 over two years, 2019 to 2020.

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Key Learnings

- Although later-planted soybeans can have satisfactory yield potential, there is more yield variation than in fields planted earlier.
- Although there is not always a large yield advantage to planting earlier, there is rarely a yield penalty. To reach maximum yield potential, it is critical that seeds are properly protected with a quality seed treatment.⁴
- Early-planted soybeans have a longer period between planting and flowering, providing higher yield potential from the development of additional nodes. Conversely, later-planted soybeans have a shorter time between planting and flowering, which can negatively impact yield potential.

Sources

¹ U.S. Department of Agriculture National Agricultural Statistical Service. https://www.nass.usda.gov/Statistics_by_State/Illinois/Publications/Crop_Progress_&_Condition/.

² Bastidas, A.M., Setiyono, T.D., Dobermann, A., Cassman, K.G., Elmore, R.W., Graef, G.L. and Specht, J.E. 2008. Soybean sowing date: The vegetative, reproductive, and agronomic impacts. *Crop Science*. Volume 48.

³ Hu, M. and Wiatrak, P. 2012. Effect of planting date on soybean growth, yield, and grain quality: review. *Agronomy Journal*. Volume 104.

⁴ Rees J. and Specht, J. 2020. Understanding the soybean germination process for early planted soybean decisions. <https://cropwatch.unl.edu/2020/understanding-soybean-germination-process-early-planted-soybean-decisions>.

Legal Statements

The information discussed in this report is from a multiple site, replicated demonstration. This informational piece is designed to report the results of this demonstration and is not intended to infer any confirmed trends. Please use this information accordingly.

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. Performance may vary, from location to location and from year to year, as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on the grower's fields.

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