Seed Treatment Effect on Yield in Soybeans Across Planting Dates

Trial Objective

- Earlier planting of soybeans allows growers to capture maximum yield potential. University of Illinois data from 2008-2016 indicates that maximum yield potential is achieved at a planting date of April 17, with about a ¼ bu/day decrease after May 1.[1]
- In order for growers to harness the advantages of early planting, universities recommend utilizing fungicidal and insecticidal seed treatments to protect the seeds under unfavorable early spring soil conditions.[2,3]
- This 2019 research study was conducted to evaluate the effect of seed treatments on soybean yield and final stands at multiple planting dates.

Research Site Details

Location	Soil Type	Previous Crop	Tillage Type	Planting Date	Harvest Date	Potential Yield (bu/acre)	Seeding Rate (seeds/acre)
Roanoke, IL	Silt loam	Corn	Conventional	4/9/19	10/9/19	75	140K
Roanoke, IL	Silt loam	Corn	Conventional	4/23/19	10/9/19	75	140K
Roanoke, IL	Silt loam	Corn	Conventional	5/7/19	10/9/19	75	140K
Roanoke, IL	Silt loam	Corn	Conventional	5/18/19	10/9/19	75	140K
Roanoke, IL	Silt loam	Corn	Conventional	6/3/19	10/23/19	75	140K
Roanoke, IL	Silt loam	Corn	Conventional	6/18/19	10/23/19	75	140K
Auburn, IL	Silt loam	Corn	Conventional	5/18/19	10/7/19	75	140K
Auburn, IL	Silt loam	Corn	Conventional	6/2/19	10/7/19	75	140K

- This trial was conducted at Bayer Crop Science FOCUS sites in Woodford and Sangamon Counties, Illinois.
- A single 3.6 RM soybean variety was planted at six different planting dates (see table above) with the following treatments:
  - Untreated seed
  - Seed treated with Acceleron® Seed Applied Solutions Basic
  - Seed treated with Acceleron® Seed Applied Solutions Standard
- All planting dates were planted at 140,000 seeds/acre in 30-inch rows and harvested when mature.
- The 2019 growing season was very cool and wet through early June, leading to delayed planting for many growers. Hot and dry conditions were prevalent in July and August.
- Plots planted in April and May were planted into sub-optimal soil conditions. These early plantings had reduced stands and substantial insect damage, but foliar insecticide was not applied in order to maintain equality between the treatments and limit variability.
- Final stand counts were conducted at the Roanoke location.

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Understanding the Results

- In this study, there was a larger yield response to seed treatment in the April planting dates (Figure 1).
- Final stand counts were substantially higher with treated seed compared to untreated in the April plantings (Figure 2), with reduced effect as the planting date approached mid-June.
- Final stand (plants/acre) was only loosely correlated with yield (Figure 3). This is consistent with university research indicating that soybeans compensate for lower populations by adding branches.[4] This also supports a conclusion that most of the yield increase in the plots treated with seed treatment was a result of increased plant health rather than plant survival.
- Yields in the April plantings were lower than expected, which can be at least partially explained by the insect damage which was not controlled with a foliar insecticide.

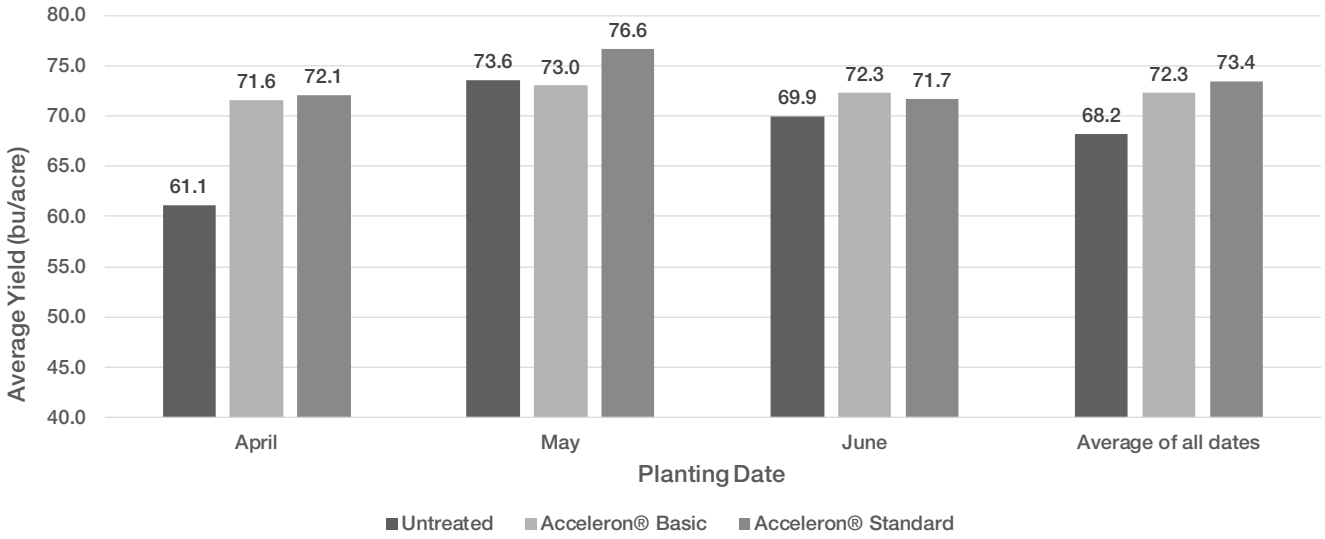

Figure 1. Seed treatment effect on yield in the 3.6 RM soybean variety by relative planting date.

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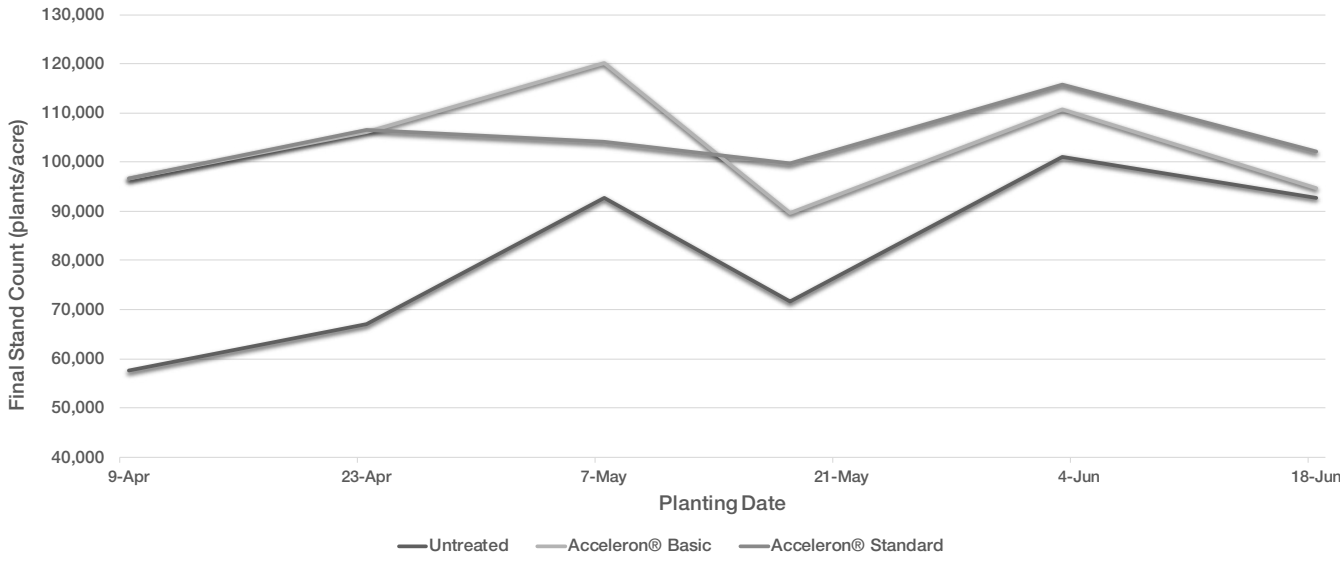

Figure 2. Effect of Acceleron® Seed Applied Solutions seed treatments on final stand across six planting dates at Roanoke, IL in 2019.

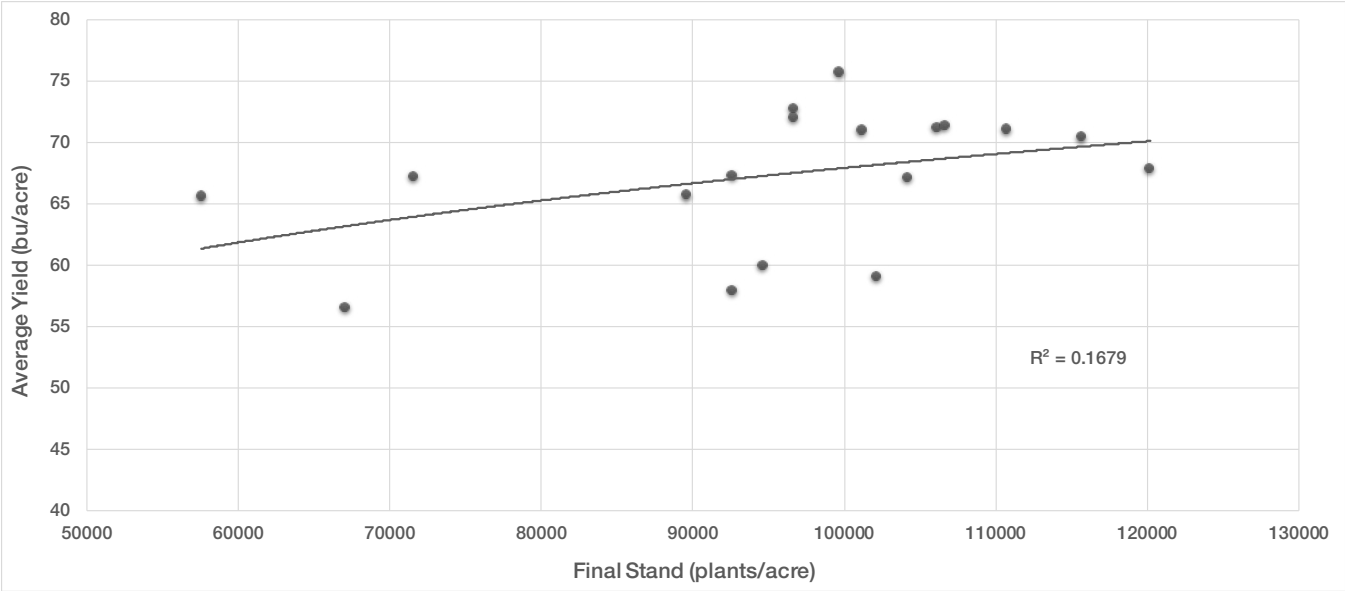

Figure 3. Effect of final stand on yield across seed treatments.

Key Learnings

- These data suggest seed treatments help protect yield potential, especially in earlier plantings.
- For the earlier plantings, plant survival was notably higher in the plots treated with seed treatments as compared to untreated plots, whereas in the later plantings this was not as dramatic.
- Even in the late plantings, the plots treated with Acceleron® Seed Applied Solutions seed treatments had higher yields over the untreated plots.

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Sources

[1]Nafziger, E. 2016. Planting date: Corn or soybean first? The bulletin: Pest management and crop development information for Illinois. http://bulletin.ipm.illinois.edu/?p=3564

[2]Elmore, R., Specht, J., Rees, J., Grassini, P., & Glewen, K. 2014. Why planting soybean early improves yield potential. https://cropwatch.unl.edu/why-planting-soybean-early-improves-yield-potential

[3]Staton, M. 2018. Things to consider when planting soybeans early. https://www.canr.msu.edu/news/things_to_consider_when_planting_soybeans_early

[4]De Bruin, J.L., & Pedersen, P. 2008. Soybean seed yield response to planting date and seeding rate in the upper Midwest.

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.

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