Evaluating Earlier Planting Dates for Increased Soybean Yields
Progress Report to Maryland Soybean Board
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Project Objectives

To 1) plant full season soybeans at three different dates, 2) evaluate soybeans for nutrient deficiencies, disorders, or pest pressure, and 3) compare tissue and soil samples to yield after harvest.

Progress of Work

We had a successful 2021 growing season where we were able to successfully complete the project generally as proposed at the three locations: Wye, Clarksville, and Keedysville Research and Education Centers (RECs). We started planting at the Clarksville location first and did not yet have the seed for the MG 3 soybean, so we established the trial with early MG 4, late MG 4, and MG 5 soybean varieties only at this location. Both the Wye and Keedysville locations had all four varieties with three different planting dates (total of 12 treatments). Tissue and soil samples were collected as best as possible near R1-R2 growth stage for the late MG 4 variety only (paired project with UDel, PI Dr. Jarrod Miller), except at locations where rainfall limited our ability to properly collect a soil sample (i.e. soil too dry for collection). Table 1 shows which soil and tissue samples were collected in the 2021 growing season. All plots were evaluated for disease throughout the season and yield was collected from each plot as proposed for 2021.

Table 1. Soil and tissue samples collected from plots in 2021.

Location	Reps	Planting Date	Soil Samples	Tissue Samples
Clarksville	1-6	1	Collected	Collected
Clarksville	1-6	2	Collected	Collected
Clarksville	1-6	3	Collected	Collected
Keedysville	1-6	1	Collected	Collected
Keedysville	1-6	2	Collected	Collected
Keedysville	1-6	3	-	-
Wye	1-6	1	Collected	-
Wye	1-6	2	-	Collected
Wye	1-6	3	-	Collected

Results

While we have the results from soil and tissue analysis in 2021, we have not yet analyzed the data. With only one year of yield data, we cannot yet draw major conclusions. However in 2021, at Keedysville, there was a significant effect of maturity group on soybean yield (Figure 1) where the early MG 4 and the MG 5 varieties outyielded the late MG 4 and performed similarly to the MG 3. Planting date did not impact yield at Keedysville or Clarksville in 2021. At Wye, there was an interaction between maturity group and planting date (Figure 2), whereby early planting did not increase yield appreciably, regardless of maturity group. We hope to add another year of data to this dataset to draw more concrete conclusions about the impact of planting date and maturity of soybean on yield. Additionally, we anticipate providing

information on the nutrient status of plant tissue and soils under different planting dates with additional years of data collection.

Benefits to Soybean Farmers

After multiple years of this study, we plan to provide soybean farmers with updated recommendations on planting date for soybeans, namely across different maturity groups. As production systems shift with the increasingly unpredictable spring weather, farmers are looking for guidance on how they may change planting date to increase resiliency and productivity of their operations – by maintaining or increasing soybean yields.

Detailed Expenditures

Project PIs were unable to access detailed expenditures on this account at the time of report preparation. There are outstanding payments for sample analysis at University of Delaware Soil Testing Laboratory, however these payments will be made before the end of the project duration.

Figure 1. Soybean yield at Keedysville location in 2021 where maturity group significantly affected yield (P=0.0696).
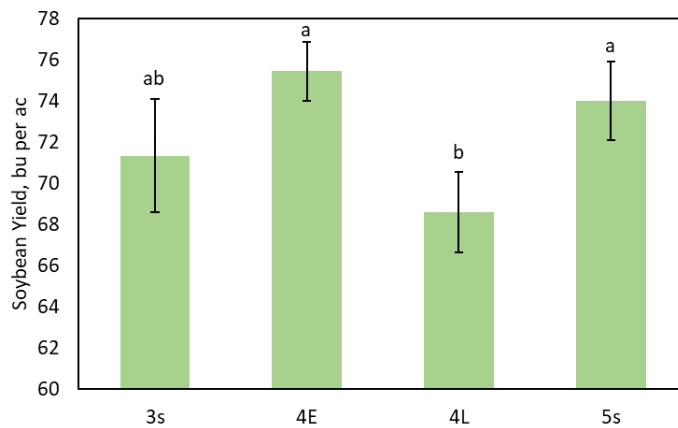

Figure 2. Soybean yield at Wye location in 2021 where there was an interaction between maturity group and planting date (legend entries) on yield. Bars with different letters are different at P=0.0544.