Deciding Whether to Plant Corn or Soybean Based on Field Conditions

Trial Objective

- Widespread adoption of soybean seed treatments has led to an increase in early soybean planting by growers across the midwestern United States. As an example, Illinois growers planted 41% of the soybean crop by May 2, 2021, compared to the five-year average of 14%.[1]
- Early in the planting season, growers are often faced with the decision of whether to plant corn or soybean first.
- This research was conducted with a goal of understanding the risks and benefits of planting corn and soybean at various timings throughout the spring.

Experiment/Trial Design

- Corn and soybean were planted on simultaneous dates across two growing seasons.
- In 2020, a 3.6 maturity group (MG) soybean product was planted. A 3.5 MG soybean product was planted in 2021 and 2022.
- In 2020, a 114-day relative maturity (RM) corn product was planted, while the 2021 data includes an average of 113- and 114-day RM corn products at each planting date.
- 2022 data includes an average of 111- and 114-day RM corn products.

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Location	Soil Type	Previous Crop	Tillage Type	Planting Date	Harvest Date	Potential Yield (bu/acre)	Seeding Rate (seeds/acre)
Roanoke, Illinois	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	75	140,000
Roanoke, Illinois	Silt loam	Soybean	Conventional	4/6/20 4/20/20 5/9/20 6/1/20 6/15/20	9/24/20 10/8/20 10/20/20	240	36,000
Roanoke, Illinois	Silt loam	Corn	Conventional	3/10/21 4/6/21 4/19/21 5/3/21 5/14/21 5/24/21 6/7/21 6/15/21	10/18/21	75	140,000
Roanoke, Illinois	Silt loam	Soybean	Conventional	4/6/21 4/19/21 5/3/21 5/14/21 5/24/21 6/7/21 6/15/21	9/15/21 9/16/21 9/30/21	240	36,000
Roanoke, Illinois	Silt loam	Corn	Conventional	3/17/22 3/29/22 4/12/22 4/27/22 5/12/22 5/24/22 6/4/22 6/13/22	10/7/22 10/10/22	75	140,000
Roanoke, Illinois	Silt loam	Soybean	Conventional	4/12/22 4/27/22 5/12/22 5/24/22 6/4/22 6/13/22	9/28/22 10/14/22	240	36,000

Understanding the Results

- In both 2020 and 2021, heavy frost reduced the soybean stands in the earliest planting dates.

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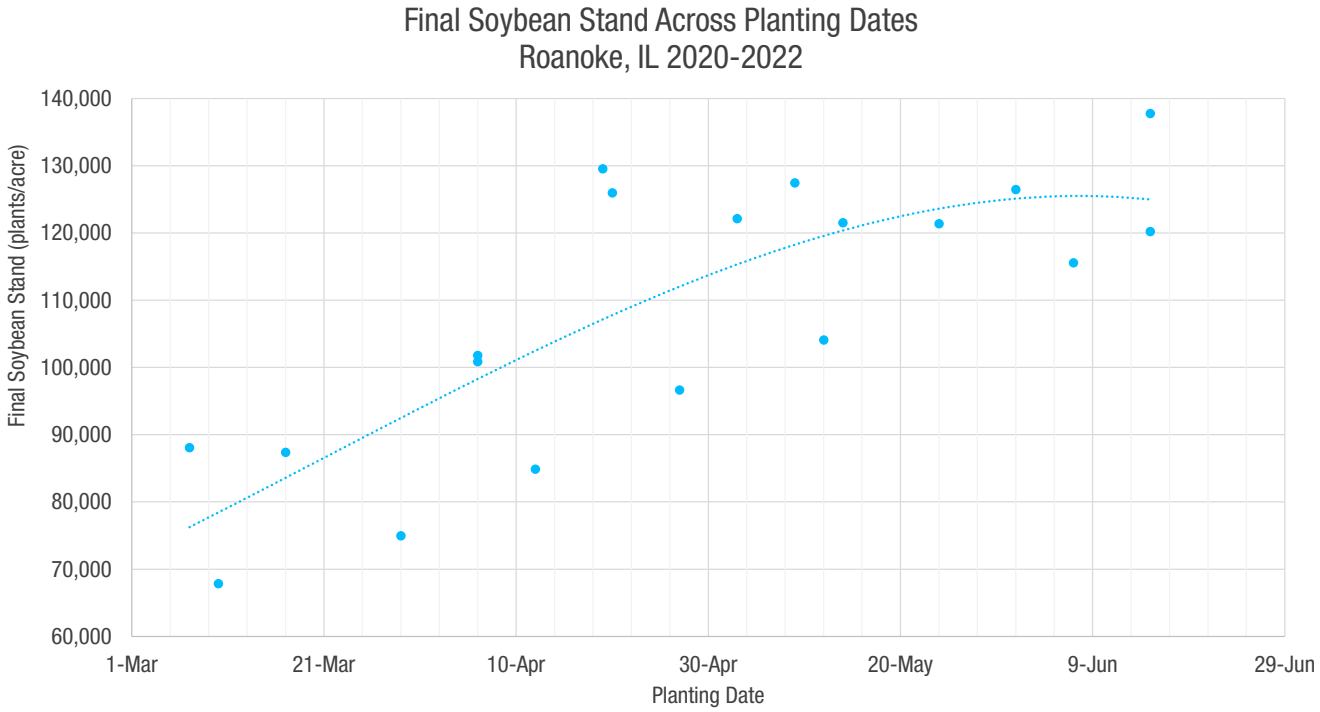

Figure 1. Soybean stands can be thin in early planting dates.

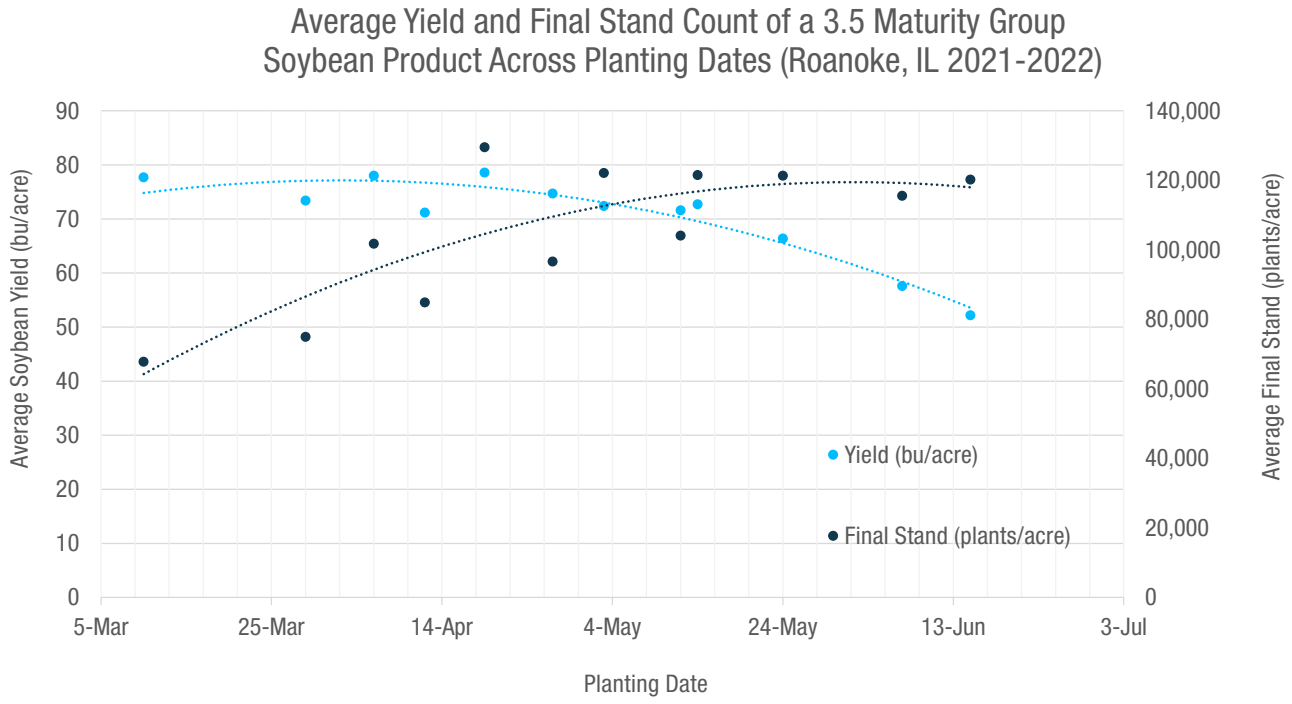

Figure 2. Average soybean yields and final stands. Surviving soybean plants have additional time to grow compared to later plantings and can still attain high yields.

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Figure 3. Frosted soybean cotyledons after freezing nighttime temperatures. In 2021, 25.9% of emerged soybean seedlings were killed after two consecutive nights of freezing temperatures. Final stand was 67,846 plants/acre, with a yield of 77.7 bu/acre (98.9% of maximum).

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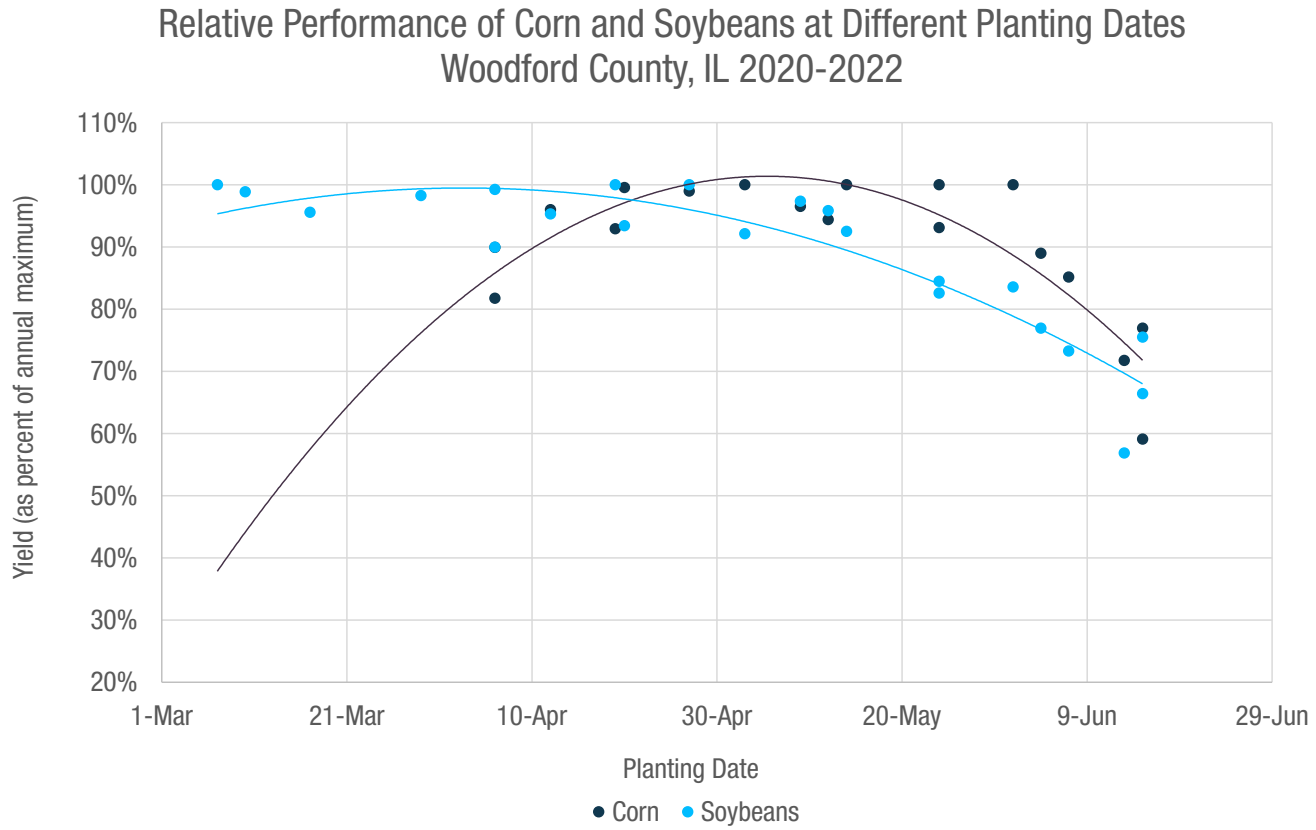

Figure 4. To compare corn and soybean data across years, results are presented as a percentage of the maximum yield for the year for the crop.

- Highest soybean yields were consistently found with early planting dates. Soybean yield steadily declined in progressively later plantings.
- Conversely, corn yield was negatively affected by too early and too late planting dates.

Key Learnings

- These data support the increasingly accepted practice of planting soybean early in the growing season while waiting until conditions are more favorable for planting corn.
- As a general rule, soybean seed can be planted when soil moisture conditions are satisfactory, regardless of soil temperature and weather forecast.
- However, corn planting should wait until favorable weather is forecasted and proper soil conditions (temperature and moisture) prevail.

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Sources:

[1]Illinois Crop Progress and Condition. May 3, 2021. United States Department of Agriculture Statistic Service. https://www.nass.usda.gov/Statistics_by_State/Illinois/Publications/Crop_Progress_&_Condition/2021/20210503-IL-Crop-Progress.pdf

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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