Optimizing Soybean Profitability in the Midwest

Trial Objective

- The optimum planting date for soybean in Iowa is believed to be the last week of April to the first week of May. Yet, questions remain regarding what soybean product maturity is the most profitable for early and later planting dates.
- Crop physiologists assert that planting later-maturing soybean products early is a good strategy to help increase soybean yields. Theoretically, this combination captures the most sunlight which can help produce a greater harvestable yield.
- The objective of this research was to better understand the optimum planting date (early or late) based on the relative maturity (RM) of the soybean product. An additional objective was to assess the effect of a fungicide application on soybean yield in both products and planting dates. This insight should help enable refined product placement and improve farm profitability.

Research Site Details

Location	Soil Type	Previous Crop	Tillage Type	Planting Date	Harvest Date	Potential Yield (bu/acre)	Seeding Rate (seeds/acre)
Huxley, IA	Clay loam	Corn	Strip tillage	5/13/19 6/2/19	10/23/19 10/17/19	60	140K

- The experimental factors were as follows:
- Two planting dates:
  - early for the geographical area
  - late for the geographical area.
- Fungicide application:
  - Delaro® 325 SC fungicide (applied at R3 growth stage at a rate of 8 fl oz/acre)
  - untreated check.
- Two soybean products:
  - a 2.0 RM product (early product for the research location)
  - a 2.9 RM product (full-season product for the research location)
- Row spacing was 30 inches, plots were 15 ft wide x 250 ft long, and there were 4 replications.
- All other management practices, including seeding rate, tillage, and weed management, were the same for the whole trial.
- All plots were harvested the same day.

Understanding the Results

Table 1. Final harvest population and grain moisture of two soybean products as affected by planting date and fungicide application in central Iowa.				
Fungicide Treatment	Planting Date	Product Relative Maturity	Harvest Population (000s plants/acre)	Harvest Grain Moisture Content (%)
Delaro® 325 SC Fungicide (8 fl oz/acre at R3 growth stage)	5/13/19 (Early)	Early	111.0	12.2
		Late	101.5	11.9
	6/2/19 (Late)	Early	101.0	12.0
		Late	100.8	12.0
No Fungicide	5/13/19 (Early)	Early	96.3	11.5
		Late	96.3	11.5
	6/2/19 (Late)	Early	82.0	11.3
		Late	82.5	11.4

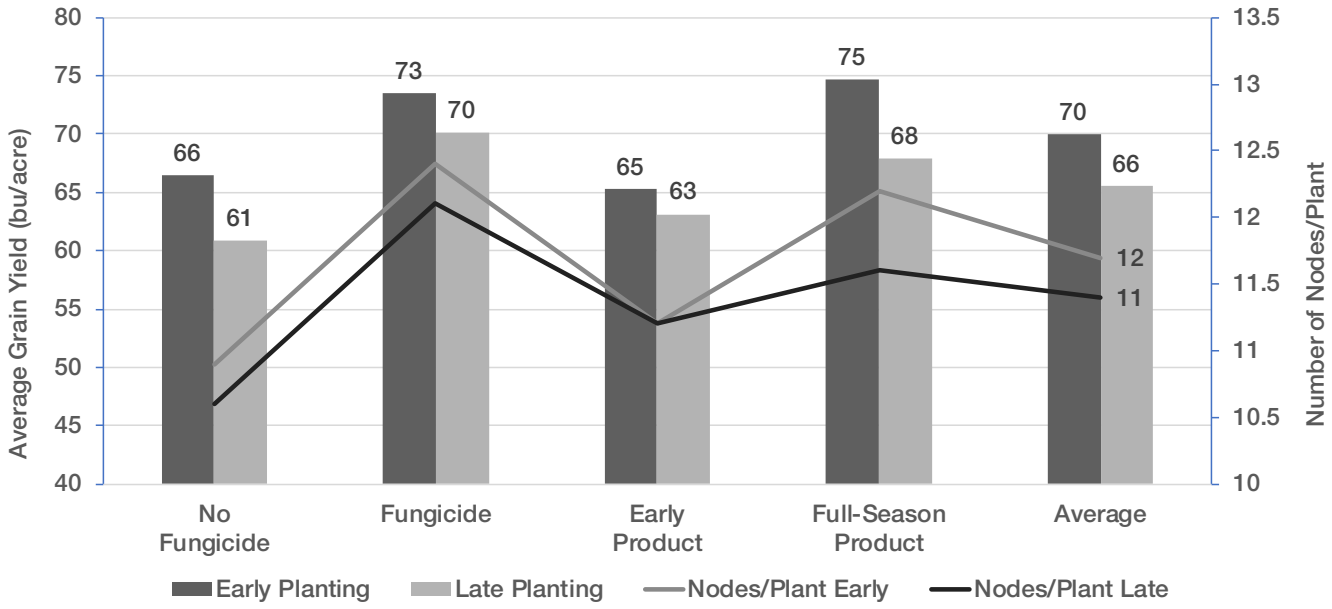

Figure 1. Effects of planting date on the number of nodes and yield of soybean products in central Iowa. Nodes were counted just before harvest. Planting dates were determined by environmental conditions. Average data represent planting date effect across both soybean product and fungicide treatments.

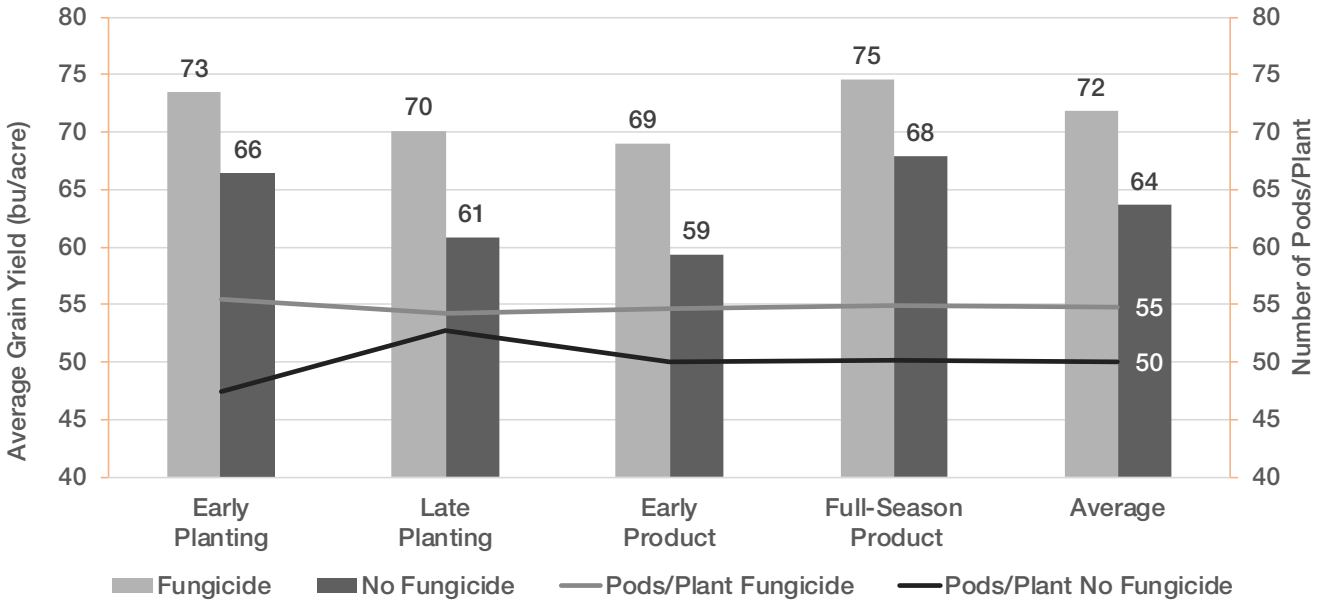

Figure 2. Effects of fungicide application on pod development and yield of soybean products in central Iowa. Pod number was counted just before harvest. Planting dates were determined by environmental conditions. Average data represent fungicide effect across both soybean product and planting date.

- Minor disease incidences observed across the entire research field included frogeye leaf spot (*Cercospora sojina*), Sudden Death Syndrome (SDS) (*Fusarium virgulifome*), and Cercospora leaf blight (*Cercospora kukuchii*).
- Across soybean products and fungicide treatments, early planting resulted in an average of 101,250 plants/acre at harvest compared to 91,565 plants/acre for late planting. Across products and planting dates, fungicide application resulted in a harvest population of 103,563 plants/acre versus 89,250 plants/acre in the unsprayed check (Table 1).
- Early planting resulted in higher average yields in both products (Figure 1).
- A fungicide application appears to improve node and pod counts, as well as average yield regardless of planting date and soybean product (Figure 2).
- A full-season product planted early and with a fungicide application produced the highest average yield (Figures 1 and 2).

Key Learnings

- In this trial, average grain yields were increased by a fungicide application and an early planting date. Farmers generally hope to get fields planted as early as the weather permits and these data confirm this to be a good practice.
- This trial suggests a full-season product planted early (whenever possible) should be the preferred practice to optimize soybean profitability.
- Fungicide application is an added cost; however, it may improve profit margins. With the current soybean grain price of $8.43/bu, about 3 bu/acre is required to pay for the fungicide used in this trial.
- Crop yield response to production inputs can be highly variable, often impacted by the environmental conditions during the growing season. Farmers are therefore advised to consult their trusted crop advisors when making input and planting decisions.

Legal Statements

The information discussed in this report is from a single 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.