AGRONOMY RESEARCH UPDATE

Planting Date and Seeding Rate Effects on Soybean Lodging and Yield

2014

Background

- Soybean is planted in the MS delta using various row spacings and patterns. Typical seeding rates range from 110,000 seeds/acre to 160,000 seeds/acre.
- Planting dates range from late-March to June and the Early Soybean Production System is used extensively in this region.
- Much of the soybean production in this region has shifted to productive silt loam soils once reserved for cotton production. Soybeans grown on these soils are often prone to lodging, especially if soybean is planted in single wide rows and following a highly fertilized corn crop.
- It is important to employ strategies that reduce the likelihood of lodging when growing soybeans on these soil types. Such strategies might include early planting, variety selection, and reduced seeding rates.

Objectives

- Evaluate the impact of planting date and seeding rate on yield and lodging of two indeterminate Pioneer® brand soybean varieties grown on productive soils in the Mississippi Delta.

Study Description

- **Plot Layout:** 40 feet long x 4 – 38” rows
- **Experimental Design:** RCBD, 4 replications, factorial treatment structure
- **Plot Location:** Leland, MS
- **Row Spacing:** 38 inches
- **Factors:**
  - Planting Date: April 9, April 23, May 10, May 24
  - Seeding Rate (x1000): 60, 75, 90, 105, 120, 135, 150, 165
  - Variety/Brand[1]: P47T36R (Standability Score 8), P49T80R (Standability Score 6)
- **Data Collected:** Yield, Lodging

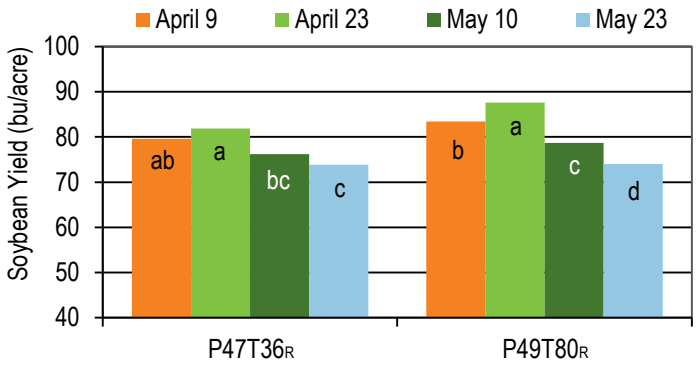

Figure 1. Planting date effect on soybean yield by variety.*

*Means with the same letter within a variety are not significantly different based on Tukey’s HSD test conducted at the alpha=0.05 level.

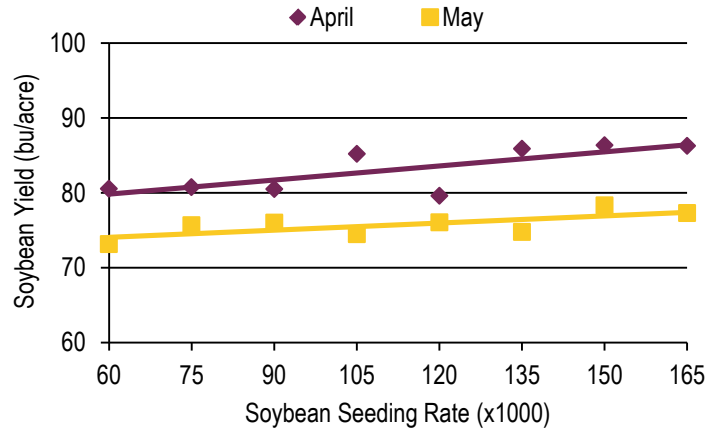

Figure 2. Seeding rate effect on soybean yield by planting date.

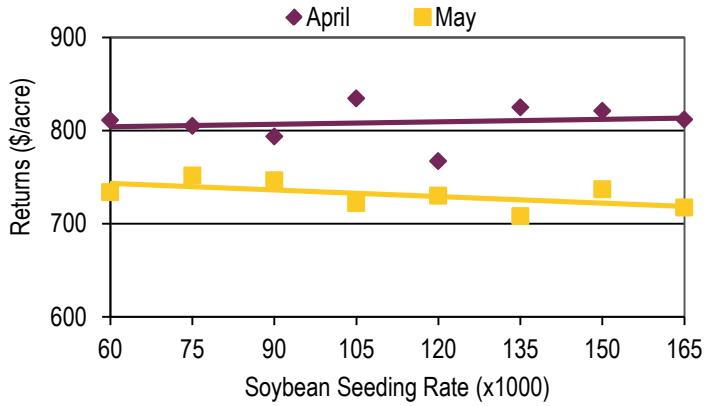

Figure 3. Seeding rate effect on gross returns above seed cost by planting date.

[1]All Pioneer products are varieties unless designated with LL, in which case some are brands.

2014 data are based on average of all comparisons made in one location through Nov. 15, 2014. Multi-year and multi-location is a better predictor of future performance. Do not use these or any other data from a limited number of trials as a significant factor in product selection. The foregoing is provided for informational use only. Please contact your Pioneer sales professional for information and suggestions specific to your operation. Product responses are variable and subject to a variety of environmental, disease, and pest pressures. Individual results may vary.

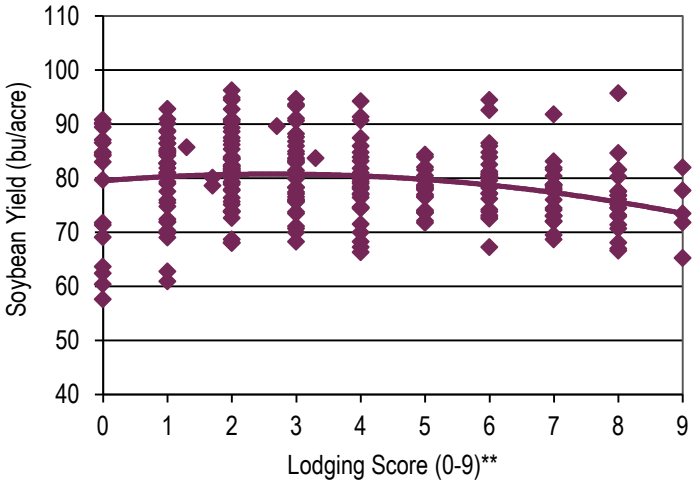

Figure 4. Lodging effect on soybean yield.

**Lodging rated using a 0-9 scale where 0=no lodging and 9=plants completely lodged.

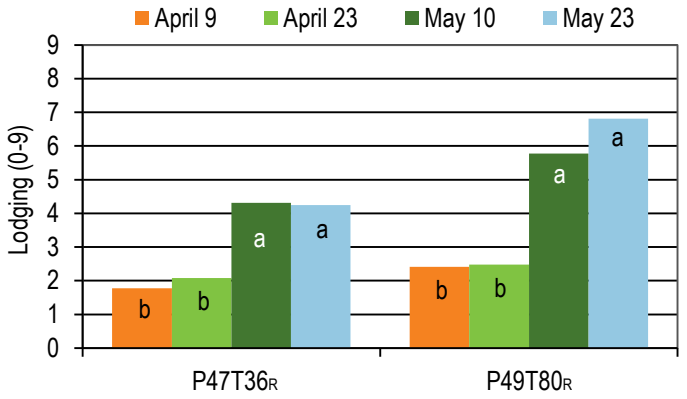

Figure 5. Planting date effect on lodging by variety.*

*Means with the same letter within a variety are not significantly different based on Tukey's HSD test conducted at the alpha=0.05 level. Lodging rated using a 0-9 scale where 0=no lodging and 9=plants completely lodged.

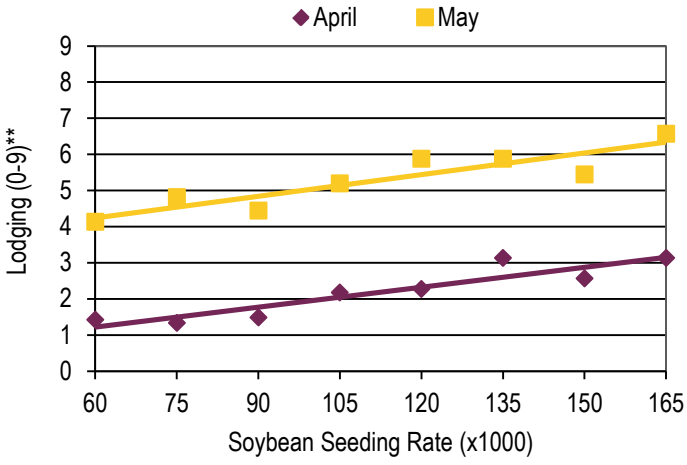

Figure 6. Seeding rate effect on lodging by planting date.

**Lodging rated using a 0-9 scale where 0=no lodging and 9=plants completely lodged.

Soybeans planted in 38-inch row pattern near Leland, MS in 2014. Narrow-row patterns planted to right and left of plot.

Results

- Soybean yield was highest with April planting dates (Figure 1).
- A slight linear increase in soybean yield occurred as seeding rate increased from 65,000 seeds/acre to 165,000 seeds/acre (Figure 2).
- However, the increase in yield associated with increased seeding rates did not result in an increase in gross returns above seed costs (Figure 3).
- Gross returns above seed cost were similar across all seeding rates for April plantings, and trended downward for May plantings as seeded rate increased (Figure 3).
- Soybean yield began to decrease slightly when lodging scores exceeded a score of 6 (Figure 4).
- Soybean lodging was significantly reduced for both varieties with April planting dates (Figure 5).
- The lodging score for Pioneer® variety P47T36R barely exceeded 4 on a 0-9 scale, regardless of planting date (Figure 5).
- In contrast, lodging scores of 5 to 6 were recorded for Pioneer® variety P49T80R with May plantings (Figure 5).
- Lodging score increased as seeding rate increased for April and May planting dates (Figure 6).
- Based on these findings, growers in this region should expect to maximize returns utilizing the Early Soybean Production System.
- P49T80R produced good yields regardless of planting date, but is more likely to lodge with May planting dates than P47T36R.
- With the 38-inch row spacing utilized in the study, growers should select a seeding rate that will ensure a final stand of about 100,000 plants/acre.
- Utilizing lower seeding rates may result in unacceptable final stands, causing a replant situation that would negate the yield advantage associated with early planting.
- In contrast, higher seeding rates with this 38-inch row spacing may increase the likelihood of yield loss from lodging, especially with May plantings.