Planting Speed Impact on Soybean Yield

Trial Objective

Can altering planting speed affect soybean yield? There are claims that reduced planting speed can result in noticeable soybean yield increases. A 2020 Bayer study showed that a planting speed reduction from 4.5 mph to 3.0 mph resulted in a higher average yield.[1]

- Objective - Conduct a second-year study to evaluate the effect of planting speed on soybean yield.

Research Site Details

Location	Soil Type	Previous Crop	Tillage Type	Planting Date	Harvest Date	Potential Yield (bu/acre)	Seeding Rate (seeds/acre)
Gothenburg, NE	Hord silt loam	Corn	Strip tillage	5/12/2021	10/6/2021	95	100,000 & 160,000

- Treatments consisted of three planting speeds and two seeding rates for a total of six treatments.
  - » Planting speed – Planter passes were mapped using the Climate FieldView™ (Figure 1).
    - » 1.5 miles per hour (mph)
    - » 3.0 mph
    - » 4.5 mph
  - » Seeding rates
    - » 100,000 seeds/acre
    - » 160,000 seeds/acre

Figure 1. Speed of planter passes as reported in Climate FieldView™. The plot area is highlighted in red.

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- The study was setup as a randomized complete block with four replications of each of the six treatments. All planting speed by seeding rate combinations were evaluated.
- A soybean product with a relative maturity of 2.5 was planted in all treatment combinations.
- The planter utilized was a fully mounted four row 30" planter row units utilizing Precision Planting® DeltaForce® for downforce control and Precision Planting® vDrive® for seeding rate control.
- A base fertilizer application of 60 lb/acre of phosphorus, 25 lb/acre sulfur, 0.25 lb/acre zinc was strip-tilled across all treatments on April 5, 2021.
- The plots were sprinkler irrigated to meet the evapotranspiration needs of the crop.
- Weeds were controlled and no fungicides or insecticides were applied.
- Plots were combine-harvested. Grain moisture content, test weight, and total weight were determined. Statistical analysis for Fisher's LSD was performed.

Understanding the Results

Figure 2. 2021 average soybean yield response to planting speed and seeding rate at Bayer Learning Center in Gothenburg, NE.

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- Neither planting speed or seeding rate affected soybean test weight or grain moisture (data not shown).
- There was a significant interaction between planting speed and seeding rate (Figure 2) which is different than the results from 20201.
  - » The 3.0 mph speed had consistently higher yields which aligns with the results from the 2020 study.
  - » The difference between 2021 and 2020 study can be observed in the results from the 4.5 mph speed. The highest yield in 2021 of an average of 92 bu/acre, was obtained when planting at the 4.5 mph speed with 160,000 seeds/acre rate. The lowest yield of an average of 88 bu/acre was obtained planting at the same speed but with a seeding rate of 100,000 seeds/acre.
  - » One possible explanation for the difference in yield when planting speed changes could relate to the uniformity of seed spacing. With the lower seeding rate and higher planting speed, plant to plant spacing may have had a significant impact on yield.

Key Learnings

- Planting speed and seeding rate impacted soybean yield in the second year of this single-site study.
- Consistently higher yields were obtained in both 2020 and 2021 when the planting speed was 3.0 mph regardless of seeding rate.

Sources

[1] Planting Speed Effect on Soybean Yield. 2020. https://www.dekalbasgrowdeltapine.com/en-us/agronomy/planting-speed-effect-on-soybean-yield.html

Legal Statements