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Effect of Early Planting on Soybean Yield: 2022 Growing Season

E. Adee, S. Dooley, and B. Pedriera

Summary

In an effort to increase soybean yield potential, early planting dates have been promoted as a management practice that can increase yield of soybeans. Early planting of soybeans can be a relative term, meaning late April/early May for some soybean producers in Kansas, but this definition of early planted soybeans is late March/early April. Theoretically, the earlier planting date could allow for more vegetative growth and interception of more light before blooming, increasing the yield potential. With the improvement of soybean seed treatments to protect seed when emergence is slowed due to cool and wet conditions, the early planting may be a viable option. The planting dates were late March, mid-late April, and May. At both irrigated locations, the highest yield was with the earlier planting date. At one location, the shorter season variety did not show a response to planting date.

Procedures

Early soybean planting studies were conducted at two Kansas State University Experiment Fields, Kansas River Valley (Topeka), and North Central (Scandia), and at the Southeast Research and Extension Center, Parson, KS, in 2022. The study location at Parsons received very little rainfall, resulting in extremely low yields, so no data were recorded from that location. The experiment at Topeka was irrigated, receiving 4.97 inches of water from July 12 to September 6. The experiment at Scandia was irrigated, receiving 8.55 inches from June 30 to September 14. Two varieties were planted at two seeding rates (100,000 and 150,000 seeds/a) at each of three planting dates in both studies. The varieties at Topeka were Golden Harvest GH3728X (Maturity Group 3.7) and GH3982X (MG 3.9), and at Scandia were Golden Harvest GH3442XF (MG 3.4) and GH4222XF (MG 4.4). The seed at both locations was treated with CruiserMaxx + Vibrance + Salstro. The planting dates at Topeka were April 4, April 21, and May 9, and at Scandia were April 6, April 27, and May 17. Soybeans were planted in four 30-inch row plots at 10 ft wide × 40 to 50 feet long. The experimental design utilized at Topeka and Scandia was a randomized complete block design with four replications. Yields were determined from the middle two rows of each plot to avoid influence from neighboring plots. Yields were corrected to 13% grain moisture. Weed control was managed to have no effect on yields.

Results

The first planting date at Topeka had emerged by April 25. In spite of taking three weeks to emerge there were no large gaps in the stand. The second planting date emerged 12-14 days after planting, and the third took 7 days. The first planting date

emerged 99 growing degree days (GDD) before the second planting date and 338 GDD before the third date.

Canopy closure with the April 4 planting date was 0.5 and 2.4 days earlier than closure dates for the April 21 and May 9 planting dates at Topeka. Maturity dates of the three planting dates at Topeka were less than 2 days apart with all treatments. Foliar symptoms of sudden death syndrome (SDS) were visible at a very low level (<5%) at R6 on September 6, and there were no differences between treatments.

The highest yields were just over 80 bu/a with both varieties planted April 4 at 150,000 seeds/a at Topeka, and the lowest yield was 76 bu/a planted May 9 (Figure 1). There was no significant difference between yields of any of the variety/seeding rate/planting date combination yielding between the high and low yielding treatments.

At Scandia, there was a significant yield response to planting date (Figure 2). The fuller season variety yields ranged from 84 bu/a with the first planting date to 64 bu/a in the third. (Figure 2). The shorter season variety showed no response to planting date with an average yield of 72.8 bu/a. (Figure 2).

This is the second year that this study has been conducted at Topeka and Scandia. The first years' data were reported in 2022 Kansas Field Research Report (Adee and Dooley, 2022). While caution should be used in making conclusions from this limited data set, it was shown that there can be a very positive yield response to planting soybeans in late March/early April for certain variety/seeding rate combinations. For most variety/seeding rate treatments, there was no major yield loss due to early planting. The last planting date in these studies is often before most producers historically start planting soybeans in the respective locations. Previous work reported in the Kansas Field Research publications had planting dates from early May to late June at Topeka, showing a yield increase with the earlier planting dates if steps were taken to reduce SDS. Further research is needed to determine if these trends for yield response are consistent. An additional research objective could be to identify varieties that respond with increased yield due to the early planting date more consistently than other varieties.

Acknowledgments

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References

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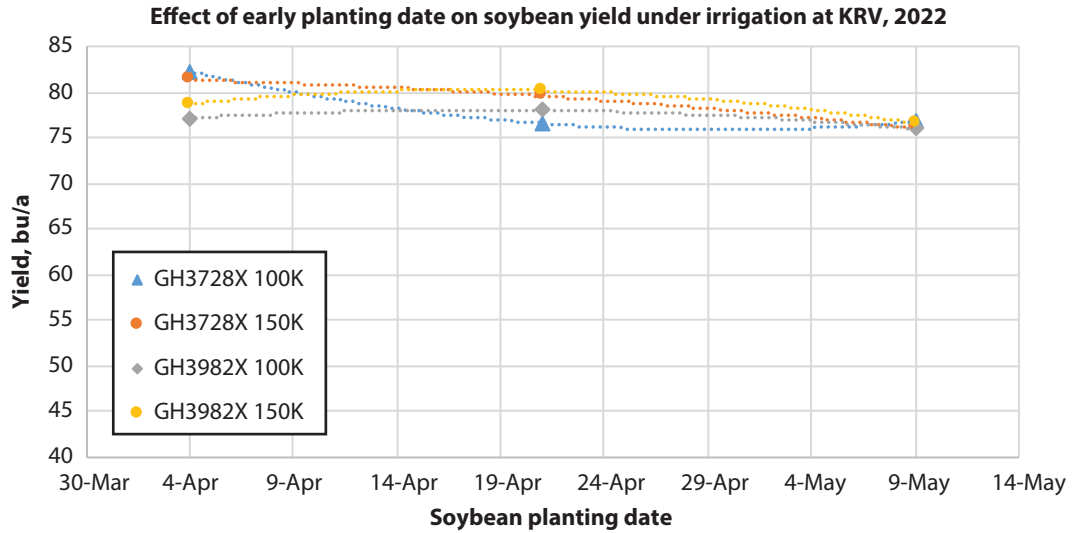


Figure 1. Effect of soybean planting date with soybean varieties of different maturity groups, planted at two seeding rates on yield at Kansas River Valley Experiment Field, Topeka, 2022.

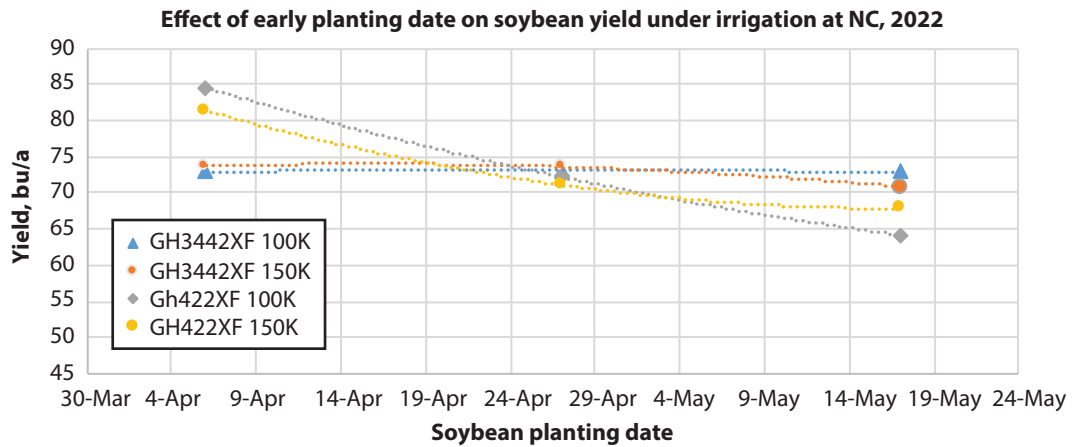


Figure 2. Effect of soybean planting date with soybean varieties of different maturity groups, planted at two seeding rates on yield at North Central Experiment Field, Scandia, 2022.