

Effect of Relative Maturity on Soybean Yield

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Objective

To evaluate the effect of relative maturity on soybean yield.

Background

Crop Year: 2022	Tillage: None
Location: ACRE Farm	Soil Test(M3): OM 2.1%, P 290ppm, K 130ppm
County/Town: Defiance/Defiance Ohio	Planting Date: 5/20/2022
Soil Type: Ottokee loamy sand/Mermill loam	Seeding Rate: 180,000 seeds/acre
Drainage: Random	Harvest Date: 10/11/2022
Previous Crop: Soybean	Varieties: Wellman (see Table 1)

Methods

This study was designed as a randomized complete block with four treatments with three replications each. Treatments consisted of four soybean varieties with a range of relative maturity (RM) sourced from the same seed company, Wellman Seeds. Each plot was 30 feet wide with varying lengths. Equal rates of fertilizer and herbicides were applied to all plots. Soybean treatments were all no-till drilled on the same date with a row spacing of 7.5 inches. Target seeding rate was 180,000 seeds per acre with a seed depth adjusted to reach adequate soil moisture, resulting in a depth of approximately 1.25 inch. Plant population data was collected on June 30 during soybean growth stage V2-V3 by randomly placing a hoop ring, calibrated to 1/10,000 of an acre, at three locations within each plot and counting the number of plants within the hoop. The three plant population data points were averaged for each plot. The entirety of each plot was harvested with a 30-foot grain head for the length of the plot. Grain samples from each plot were collected and combined by treatment then tested for moisture and test weight at the local grain elevator. Harvested grain was weighted with a calibrated weigh wagon and weights adjusted to 13% moisture to determine final plot yield.

Results

	Plants/acre
RM 2.4 - Wellman 6224 E	141,111 A
RM 2.7 - Wellman 6227 E	153,333 A
RM 3.1 - Wellman 6131 E	152,222 A
RM 3.8 - Wellman 6138 E	161,111 A
Note: results with different letters are statistically significant.	LSD (0.10) 54,580 not significant



	Yield (bushels/acre)
RM 2.4	57.3 A
RM 2.7	62.3 A
RM 3.1	55.0 A
RM 3.8	53.7 A
Note: results with different letters are statistically significant.	f-test (p-value = 0.23) not significant

Summary

Plots were scouted regularly from planting to harvest with no significant incidence of insect or disease pressure. All plant populations were lower than the target seeding rate due to cool, wet soil conditions following the planting date. In this study, soybean yields were not significantly different among the four RM varieties, all planted on 5/5/2022. The RM 2.7 variety had the highest measured yield while the RM 3.8 had the lowest measured yield. At harvest soybean price was \$13.88 per bushel. The gross revenue per acre in this study for each relative maturity was RM 2.4 \$795.32, RM 2.7 \$864.72, RM 3.1 \$763.40, and RM 3.8 \$745.36.

Relative maturity (RM) has little effect on yield for plantings made during the first three weeks of May, but the effect can be large for late plantings (Lindsey, et al, 2017). However, shorter RM soybean varieties are planted to obtain an optimum fall planting period for subsequent soft red winter wheat (SRWW) or fall cover crops. In this study, varieties with RM 2.4 and RM 2.7 were harvest ready (physiological maturity and 13% grain moisture or less) during the preferred SRWW planting period; a 10-day period starting the day after the fly-safe date (Sept 23) of the study location (Sept 24 – Oct 3). Fall seeded cover crops can also benefit from timely planting in September/October. In this study, the varieties with RM 3.1 and RM 3.8 were harvest ready on October 5 and October 10, respectively. All varieties were harvested on the same day.

Acknowledgements

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Reference:

Lindsey, L, Tilmon, K., Michel, A., Dorrance, A. (2017). Ohio Agronomy Guide 15th Edition, Chapter 5. Soybean Production. Ohio State University, 2120 Fyffe Road, Columbus, OH, United States.



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