

Response of Soybean to Planting Date and Relative Maturity

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Introduction

Planting date and variety selection are two very inexpensive management practices farmers can utilize to increase their profitability. Yet very little research is conducted on this topic. To address these questions, the North Central Soybean Research Program has initiated a multi-state project. The purposes of this project are 1) what are the risks vs. benefits of planting soybean in the same planting window as corn, and 2) under early planting, will a farmer realize higher yield and profit in selecting slightly later relative maturities.

The overall hypothesis being tested is later soybean planted early will yield more than normal soybean maturities planted under normal planting dates.

Materials and Methods

Results in this report are for two years of a three-year project. Each year soybean was planted during the normal corn planting window (early planting) and compared with soybean planted 3-4 weeks later (Table 1). Within each planting window, two soybean varieties were planted—a Group 2.3 to reflect the common maturity used for the area and a 2.8 reflecting an improved practice under early planting.

Plot design was a split plot arrangement with planting date as the whole plot and soybean maturity as the sub-plots. Each trial was replicated four times for both years. Statistical analysis of the plots included common mixed model methodology using the lmer function in R where replicates were considered as random effects and variety and planting date being fixed effects.

Results and Discussion

Results from the analysis of variance indicated soybean differed in response to planting date and variety ($p > F = 0.001$, ANOVA not shown). The main comparison in this trial is a later relative maturity (RM) variety planted early vs. a normal RM variety planted later. In both years, there was a statistically significant advantage for planting a later RM variety during the normal corn planting window (Table 2). This advantage was nearly 4 bushels/acre. Given a soybean price of \$10/bushel, this equates to a \$40/acre economic advantage to planting a slightly later RM variety in the normal corn planting window.

Interestingly, when averaging across varieties by planting date, the yield advantage for early planting was not large, around 1 bushel/acre. This provides evidence that variety selection under early planting should be different compared with normal planting, with the later RM variety providing an advantage. This experiment will be conducted again in 2021 and a full report across all locations will be made available at that time.

Table 1. Planting dates and varieties used in this experiment in Sutherland, Iowa.

Treatment ¹	Variety RM	2019 planting date	2020 planting date
NRM, EP	2.3	May 7	Apr 24
NRM, LP	2.3	May 7	Apr 24
LRM, EP	2.8	June 3	May 22
LRM, LP	2.8	June 3	May 22

¹Treatment abbreviations: NRM, EP = normal RM, early planting date; NRM, LP = normal RM, late planting date; LRM, EP = later maturity variety, early planting date; LRM, LP = later maturity variety, late planting date.

Table 2. Yield results by year for the planting date by relative maturity study, Sutherland, Iowa.

Treatment ¹	Variety RM	2019	2020
NRM, EP	2.3	64.8	71.1
NRM, LP	2.3	63.2	66.2
LRM, EP	2.8	67.3	69.9
LRM, LP	2.8	65.6	67.7
LSD (0.05)		2.0	3.4

¹Treatment abbreviations: NRM, EP = normal RM, early planting date; NRM, LP = normal RM, late planting date; LRM, EP = later maturity variety, early planting date; LRM, LP = later maturity variety, late planting date.