

Soybean Planting Date × Maturity Group: Eastern Kansas Summary

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Summary

Optimum planting time for soybean depends on the interaction between genotype and environment ($G \times E$). Four field studies were conducted during the 2014 growing season across eastern Kansas (Manhattan, Topeka, Ottawa, and Parsons). This study explores the impact of planting date (early, mid, and late planting times) on yield for modern soybean cultivars from a range of maturity groups (early, medium, and late groups).

Introduction

Soybean yield is largely defined by the interaction between the genotype, maturity group, and environment. In the last 20 years, Kansas producers have shifted soybean planting dates earlier at a rate of about 0.5 day/year. Although the environment is the primary determinant of soybean yields, producer decisions are the one controllable factor that drives Kansas soybean production. Within those decisions, agronomic practices such as planting dates and maturity groups are important components that producers can manage.

New genetic interactions with environment and management practices require an updated version of optimum planting dates × maturity groups. The optimal planting times for these cultivars under the varying soils and environmental conditions across the state of Kansas are not well known. This project involves a coordinated regional effort to perform research trials. The outcomes of this project will provide excellent information for equipping key stakeholders in the decision-making process.

Procedures

Soybean cultivars from early, medium, and late maturity groups were planted at three times during the 2014 growing season. Maturity groups at Topeka and Manhattan locations were 2.0, 3.8, and 4.8, all planted at different times (April 22, May 15, and June 3 at Manhattan, and May 2, May 20, and June 18 at Topeka). Maturity groups at Ottawa were 3.7, 4.2, and 4.8 and were planted May 5, May 28, and June 26; at Parsons, groups 3.9, 4.8, and 5.6 were planted May 2, June 3, and June 26. At all field locations, total yield from each cultivar and planting date was determined by harvesting the center rows of each plot at maturity using a plot combine.

Results and Discussion

Under the dryland scenario at Manhattan, the mid-maturity group (3.8) was the highest-yielding group for the early or late planting date, with the latest maturity group (4.8) outyielding the rest groups evaluated for the mid planting date (May 15) (Figure 1). Under full irrigation at Topeka, medium- and late-maturity groups (3.8 and 4.8) maximized soybean yields for the earliest planting time (May 2), with yields above 70 bu/a (Figure 1). Lower yields were documented for the mid-May planting time compared with the early planting date, with the exception of the late-maturing group (4.8). For the late planting time (June 18), the maturity group 3.8 (medium group) (yields >60 bu/a) significantly outyielded the early (2.0) and late (4.8) soybean groups (yields below 45 bu/a).

Under the dryland scenario at Ottawa, soybean yields were similar across all maturity groups for the early (May 5) and mid planting dates (May 28), but yields were generally greater at the mid planting date (around 35 bu/a) (Figure 2). For the late planting time (June 26), soybean yield increased with the maturity group evaluated, and overall yields were the greatest among planting dates, with averages near 40 bu/a.

Under the dryland scenario at Parsons, the trend in soybean yield indicated that the earlier maturity group (3.9) yielded highest at the earliest planting date (May 3). Yield declined for this maturity group at later planting. Conversely, the longer-maturing cultivars yielded better at the later planting dates (Figure 2). Although a trend in the data supported timing of planting to capture fall rains to enhance yield, the results were not statistically significant between the later maturity groups.

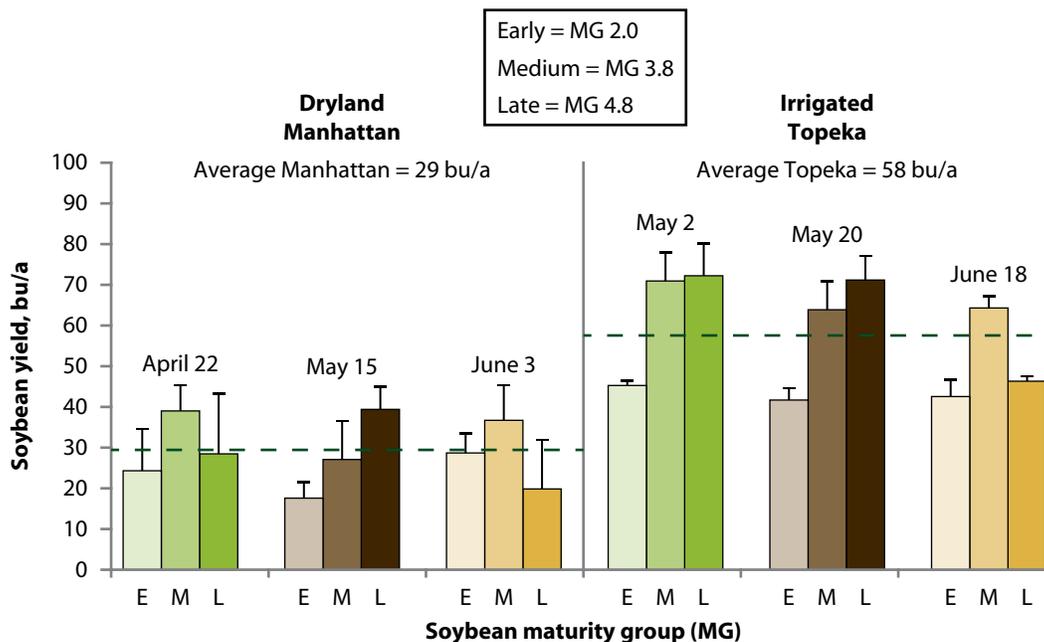


Figure 1. Soybean yields under varying planting dates (early, mid, and late) and maturity groups (E = early, M = medium, L = late maturing groups) for Manhattan and Topeka.

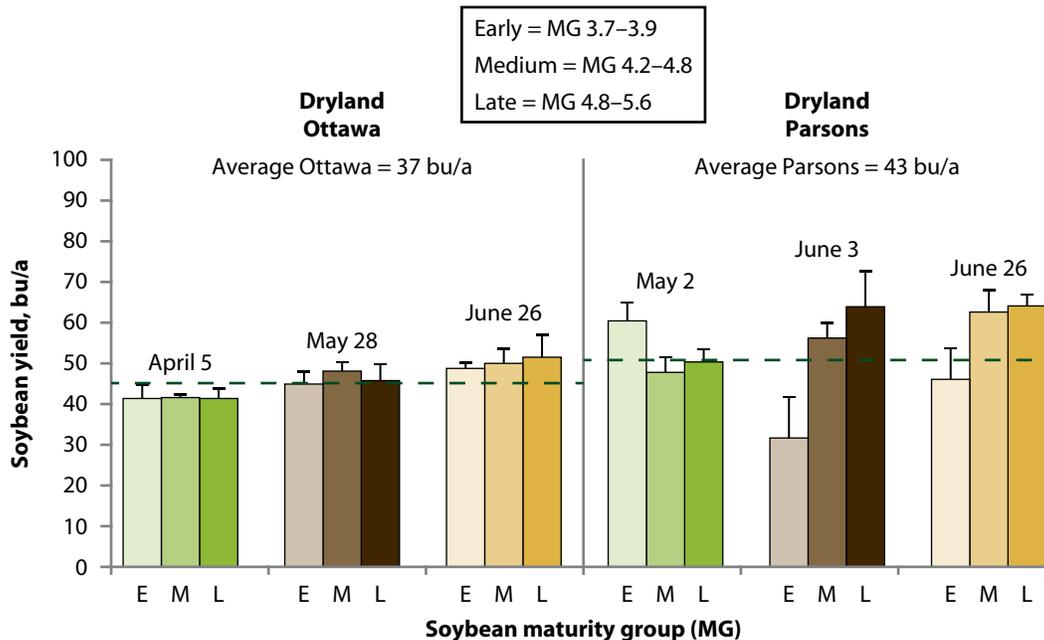


Figure 2. Soybean yields under varying planting dates (early, mid, and late planting times) and maturity groups (E = early, M = medium, L = late maturing groups) for Ottawa and Parsons.