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Variation in phenology and its relationship to seed yield in late-planted soybean

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In the US, most of the research on late planted soybeans has been focused in the southeastern region. However, increased interest in double and intercropping soybean with winter annual crops has led to questions related to optimizing soybean production under late planting conditions. Double cropping soybean following harvest of a winter cash crop would provide agroecosystem services to the landscape, in addition to possibly diversifying farm income. In order to fit into these cropping systems in the Upper Midwest, the late-planted soybeans need to mature by early October to allow for planting of the winter annual crop, while maintaining sufficient yield and quality. Our objective was to characterize the phenology of soybean under normal (mid-May) and late-planting (late June, early July) conditions to assist in the design of future experiments to determine the relationship between phenology and yield of late-planted soybeans. A study was performed to examine the difference in phenology of vegetative and reproductive stages of soybean production between normal and late planting dates. This study included 25 soybean breeding lines ranging from maturity group (MG) 00 to II. All genotypes were tested for seed yield, protein content, and oil content. In 2016, it was found that a MG 0.8 or less was required for maturity to occur on time. A large amount of variation in yield was observed, and oil and protein content were both lower on average under late planted conditions.