OPTIMIZATION OF SOYBEAN CARBOHYDRATE PROFILES AND PROFIT POTENTIAL USING VARIABLE PLANTING DATES AND GENETIC BACKGROUNDS

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ABSTRACT

Information on management practices that can increase crop value can be useful for producers in maximizing farm profits. Differing planting dates alter the environment in which a crop is grown, and have been shown to affect seed yield, composition, and quality. Providing soybean meal high in sucrose and low in the raffinose family of oligosaccharides (RFOs) is desirable for improving digestibility and increased feed efficiency in poultry and swine, and for increasing profitability for farmers by providing soybean varieties with value-added traits. In this study, the effects of planting date on soybean [Glycine max (L.) Merr.] seed composition and several agronomic traits were investigated using ten specialty genotypes with modified carbohydrate profiles due to known gene mutations, and with ten check varieties. The environment had a significant effect on all traits measured, except protein. Planting date had a significant effect on all agronomic traits except lodging and seed weight, and all seed composition traits measured except RFOs. RFO concentrations were shown to be more stable when compared to sucrose concentrations. Early plantings showed increased yield and oil and late plantings showed increased sucrose and higher seed quality. Higher temperatures were shown to be associated with higher oil and RFO concentrations, while cooler temperatures were associated with higher sucrose concentrations. This research shows that a late planting or double cropping production system will provide the most optimum concentrations of high sucrose, low RFO soybeans compared to earlier planting dates.