

SOYBEAN RESPONSE TO TILLAGE, ROW SPACING AND NUTRIENT MANAGEMENT PRACTICES IN SOUTHERN ILLINOIS

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ABSTRACT

Conservation tillage improves long-term soil health and water quality but may reduce early soybean (*Glycine max* L.) growth due to cooler, wetter soils and limited nutrient availability. This study evaluated integrated management strategies, including tillage, row spacing, and starter nitrogen (N) and sulfur (S) fertilization, to optimize soybean performance under Illinois conditions. Field trials were established in 2024 in southern Illinois. Two split-plot experiments were conducted: (i) three tillage systems (conventional, strip-till, no-till) \times three fertility treatments control, UAN (15 lb N ac⁻¹), and UAN + ATS (15 lb N ac⁻¹ + 10 lb S ac⁻¹) and (ii) two row spacings (15 vs. 30 inches) \times the same fertility treatments. Soil sensors monitored moisture and temperature, and plant samples were collected at V4, R2, and R8 for analysis of nutrient uptake, growth, and yield components. Preliminary findings indicate that tillage and starter fertility had limited effects on soybean establishment or yield, while row spacing significantly influenced plant population and harvest index. Soybean yields were highest when received N+S fertilization in narrow row spacing. Wider row spacing decreased soybean yield confirming growers' preference for planting soybean in 15-inch row spacings. Future research should evaluate the response of soybeans to different landscape positions under N+S fertilization and row spacings.