



Long-term zero-tillage effects on soybean growth and soil properties.

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This research sought to study the influence of two tillage systems (Conventional (CN) and no-till (NT)) on (1) the performance and yield of soybean (*Glycine max* (L.) Merrill) (var. Forrest), (2) on soil pH and soil organic matter (OM), and (3) on the dynamics of soil nutrients, and plant uptake of these nutrients.

The research was conducted on a Byler silt loam soil (Typic fragiudalf). Five potassium (K) rates (0, 45, 90, 135, and 180 kg K₂O/ha) were superimposed on the “main” tillage (CN and NT) plots during the last 4 years of the study in a splitplot statistical design. Conventional tillage consisted of plow/disc and plant; the NT comprised of either glyphosate or paraquat application.

Soybean yields were determined. Soil pH, OM, and soil N, P, K, Ca, and Mg were monitored, and seed and leaf nutrient uptake by soybeans was measured.

Data indicated that soybean general plot population, and growth (vigor, height) in NT compared favorably with CN. Grain yields in NT were equal or better than those in CN. Soil pH tended to be lower in NT as expected after 5 years of no-tillage. Soil organic matter levels were generally higher in NT. Available P, K, Ca, and Mg contents of the soil were not significantly different. With the exception of seed N, plant nutrient uptake remained uninfluenced by tillage. Seed nitrogen tended to be higher in NT.