Cover Crop, Tillage, and Herbicide Effects on Weeds, Soil Properties, Soil Microbial Populations, and Yield of Soybean in the Mississippi Delta. (A08-reddy154322-Poster)

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Abstract:

A field study was conducted in 1997-2001 on a Dundee silt loam at Stoneville, MS to examine the interactions of cover crops, tillage, and herbicides on weeds, soybean yield, and soil properties. Experiment was conducted in a split split-plot design with tillage (conventional till and no-till) as main plot, cover crop (rye, crimson clover, and no cover crop) as subplot, and herbicide (preemergence, postemergence, both, and no herbicide) as sub-subplot. Rye and crimson clover were planted in October of each year and all plots were desiccated in April with paraquat. After desiccation, only conventional till plots received tillage before planting soybean. Total weed dry biomass was lower with conventional till vs no-till, rye vs crimson clover, and preemergence + postemergence vs either one alone. In 2000 and 2001, soil samples were collected from no herbicide plots 3 week after soybean planting. Crimson clover plots had higher nitrate-nitrogen, magnesium, and sulfur than rye, but both cover crops increased organic matter compared to no cover crop. Soils under crimson clover had highest populations of total fungi and bacteria and greatest enzyme activity. Soybean yields were similar between tillage, but higher in no cover crop vs crimson clover and preemergence + postemergence vs either one alone. Although crimson clover had beneficial effects on soil quality, it reduced weed control and soybean yield.

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