

**THE IMPACT OF TILLAGE AND COVER CROPS ON COTTON YIELD, WATER USE EFFICIENCY,  
AND RUNOFF****Carson Roberts****Drew Gholson****Mississippi State University****Stoneville, MS****Martin Locke****USDA-ARS****Oxford, MS****Dave Spencer****Mississippi State University****Starkville, MS****Abstract**

Reducing trips across the field, using less irrigation water, and decreasing topsoil and nutrient runoff are all ways that cotton (*Glossypium hirsutum* L.) producers can save money, time, and resources. A study is being conducted in Stoneville, MS, from 2021 to 2023 to determine how cotton yield, water use efficiency (WUE), and nutrient and soil in water runoff are influenced by conservation tillage and cover cropping systems. Study treatments included reduced tillage (RT), Strip tillage (ST), ST-cover crops (CC), ST-CC-subsoil (SS), no seedbed tillage (NT), NT-CC, and NT-CC-SS. In the first year of full study implementation (2021), lint yield was decreased in no-till (NT) treatments by up to 16% (1382 kg ha<sup>-1</sup>) compared to conventional reduced tillage (RT; 1647 kg ha<sup>-1</sup>). Strip-till treatments with cover crops (CC) did not have an impact on yield compared to RT. Tailwater runoff from a rainfall event in late August did not differ between treatments. Preliminary observations indicate that glyphosate concentration in runoff water is greater following a burndown application of glyphosate in NT-CC treatments (907 µg L<sup>-1</sup>) than in RT treatments (482 µg L<sup>-1</sup>). Few conclusions can be made regarding irrigation WUE since irrigation only occurred in a single RT plot due to irregular rainfall. Since this is the first complete year of treatment implementation, treatment effects are expected to become more apparent as this long-term study continues.