Science Societies

No-Till Improves Soil Water Storage in Mississippi Delta

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Top: conventionally tilled plot with stagnant water on the furrows during the rainy winter. Bottor

Top: conventionally tilled plot with stagnant water on the furrows during the rainy winter. Bottom: no-till furrows with water mostly absorbed by surface residue. Photos by Madhav Dhakal.

Tillage can alter soil–plant–water relations and impact water movement into the soil and on the surface, which can influence the benefits of cover crops in row crop systems. It is important to understand whether no‐tillage and cover crops are the drivers of sustainable water management and crop production in the Mississippi Delta.

Researchers from Mississippi State University and USDA‐ARS evaluated the effect of two tillage systems (no‐tillage and conventional tillage) and two cover crop management methods (Austrian winter pea cover cropping and winter fallow) on soil water balance during the 2019–2020 and 2020–2021 seasons in cotton and sorghum cropping systems. They measured daily soil water content for 0‐to 1.2‐m soil depths

using capacitance probes, and computed soil water balance by simulating evapotranspiration, deep drainage, and runoff using a process‐based model.

No‐tillage improved soil water storage and significantly reduced the surface runoff over its conventional counterpart, resulting in improved crop water utilization. Cover crops had no impact on soil water storage and consumptive use of water. The results confirmed that conventional tillage and winter fallow can be detrimental to the environment and agricultural sustainability in humid regions.

Adapted from

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