**RRES Press Release 12th March 2025 Conservation agriculture boosts soil organic carbon storage in Malawi**

***Agroecological approach raised soil organic carbon by up to 20% and could play a crucial role in supporting sustainable farming in sub-Saharan Africa***

A new study in Malawi’s Mzimba district has found that conservation agriculture (CA) can significantly improve soil organic carbon (SOC) levels by up to one fifth compared to conventional farming methods. The findings add to growing evidence that CA—an agroecological approach focused on minimal soil disturbance, crop rotation, and mulching—could play a crucial role in sustainable farming and climate resilience in sub-Saharan Africa.

Researchers analysed soil samples from 30 paired farms practicing either CA or conventional tillage, measuring key soil properties and organic carbon fractions. The study found that SOC levels in CA plots ranged from 0.4% to 1.8%, compared to 0.4% to 1.5% in conventionally tilled fields. The largest improvements were seen in the topsoil (0-10 cm depth), where SOC and other soil nutrients were most concentrated.

“These results highlight CA’s potential to enhance soil health and carbon sequestration, which is critical for sustainable agriculture and climate adaptation,” said Rothamsted Research’s Dr Grace Kangara, who led the study along with local partners at Lilongwe University of Agriculture and Natural Resources. “However, widespread adoption faces challenges, including the competing use of crop residues for livestock feed, fuel, and mulch.”

The study suggests that long-term research and alternative mulching strategies are needed to maximize CA’s benefits. As African nations and global policymakers push for climate-smart farming solutions, these findings could help shape soil conservation strategies across the region

Publication

Manzeke-Kangara MG, Ligowe IS, Tibu A, Gondwe TN, Greathead HMR and Galdos MV (2025) Soil organic carbon and related properties under conservation agriculture and contrasting conventional fields in Northern Malawi. *Frontiers in Soil Science* 4:1481275. doi: 10.3389/fsoil.2024.1481275