Soil Organic Carbon Dynamics in Black Soils of China under Different Agricultural Management Systems. (S05-liu111433-Poster)

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Abstract:

Cultivation can reduce soil organic carbon (SOC) content and lead to soil deterioration, but some agricultural management systems may increase SOC content and soil productivity. This research examined the SOC dynamics during a 50-year cultivation and how long-term agricultural management practices influenced SOC content in a typical black soil (Mollisol) region of P.R. China. The experiments selected four areas with different cultivation periods: uncultivated, five years, fourteen years, and fifty years. In addition, four long-term agricultural managements were initiated in 1992: conventional wheat-soybean rotation, wheat-sweet clover rotation, wheat-soybean rotation with addition of pig manure, and wheat-soybean rotation with addition of wheat straw. The SOC content declined rapidly at early years of cultivation and gradually afterwards. Wheat-soybean rotation with addition wheat straw or pig manure resulted in a substantial increase in SOC content in 9 years. Thus, proper soil management can improve soil quality and health by increasing SOM content, and mitigate the greenhouse effect by sequestrating carbon dioxide from the atmosphere as indicated by the significant increase of organic carbon content in soil.

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