



## **Changes in Topsoil Organic Carbon of China's Cropland evidenced from the National Soil Fertility Monitoring Network**

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Cropland soil organic carbon (SOC) is a key parameters not only for soil fertility but for C sequestration in mitigation of climate change in agrioculture also. Understanding changes in SOC dynamics will be critical for assessing the C sequestration potential of China's croplands. In this study, we collected the data of topsoil SOC content retrieved from the national monitoring network to since 1985 and quantify the SOC dynamics in China' croplands by defining a relative change rate at g/kg/yr with the initial and final SOC values for the duration of monitored observations.. The data set comprises 299 observation sites across mainland China. Topsoil SOC of China's croplands was in a general trend of accumulation with a frequency of 63.2 %, which were mainly distributed in North, East and Southwest China. The caculated topsoil SOC accumulation for the overall sites was  $0.14 \pm 0.47$  g/kg/yr on weighted average, with  $0.07 \pm 0.38$  g/kg/yr for dry croplands, and  $0.18 \pm 0.46$  g/kg/yr for rice paddies. Rice paddies have shown a significantly higher mean SOC contents and higher frequency of accumulation compared to dry croplands. Furthermore, topsoil SOC was greatly increased under intensified cropping systems with double rice, rice-wheat and wheat-corn rotations with the double rice and plus green manure being the highest. Therefore, topsoil SOC storage in China's croplands had been increasing possibly due to increased residue input due to enhanced crop productivity for the last 2 decades in China's croplands. However, the overall sequestration capacity would be greatly masked under small scale farm tenure system . Also, a quantitative assessment would be necessary of net C balance in crop production systems of China when addressing the potential mitigation of climate change in China' agriculture.