

iSQAPER Master Student Research Information

Research Title

Prime effects and dynamic changes of soil organic carbon in upland red soil under repeatedly receiving organic materials

Abstract

Soil organic carbon (SOC) is not only closely related to soil fertility and crop yield, but also represents a potential carbon sink or source of atmospheric CO₂. Understanding the effects of different exogenous organic materials on accumulation and mineralization of native soil organic carbon is of great significance for improving soil fertility, mitigating greenhouse gas emission to the atmosphere, and increasing carbon sequestration potential. In this study, the stalk and root of corn and wheat, respectively, were selected as exogenous organic materials repetitiously added to soils. The soils were packed in glass bottles, moistened to 70% WHC and kept in a dark incubation room at 25°C. The technique of natural ¹³C abundance was used to investigate the decay characteristics of exogenous organic carbon and native soil organic carbon, as well as the impact of different type and quantity of exogenous organic materials on the dynamic changes of native soil organic carbon.

Objectives of the research

The incubation experiment of repeated addition of organic materials was conducted in order to explore the impact of full and half of amount of straw application in the field on the dynamic change of native soil organic carbon. The objective of this study was: (1) to investigate effects of different parts and amount of stalk on dynamic change of native soil organic carbon; (2) to assess source and turnover characteristics of soil organic carbon after organic material repeated addition; and (3) to determine accumulation and mineralization amount of soil organic carbon in different part and amount of stalk.

iSQAPER Study Site / Work Package

Hengyang Red Soil Experimental Station of CAAS.

Partners in this research

Professor Minggang Xu, Associate Professor Wenju Zhang

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