

有機碳於生物炭改良土壤團粒間之分布

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摘要 添加生物炭可改良土壤構造、減少土壤沖蝕與增加作物產量。本研究主要添加稻殼炭(4%)與禽畜堆肥(60 t/ha)至土壤，評估施用初期與 60 天後，土壤中易分解有機碳(含易氧化碳(readily oxidizable C, ROC)與微生物生質碳(microbial biomass C, MBC)於各土壤團粒間之分布與變化。實驗結果顯示，各處理之粗團粒(macro-aggregates)中的易分解有機碳隨培育時間而減少，但粒徑介於 0.5 mm - 0.25 mm 之粗團粒中 ROC 卻顯著增加，顯示該粒徑團粒比例隨培育時間而增加，且嵌入更多易分解之有機物質。MBC 測定結果更證實，於 60 天期間，被包埋於 0.5 mm - 0.25 mm 的團粒中之 ROC 因受團粒形成過程中的物理性保護而免於被微生物分解。

關鍵詞：生物炭、土壤團粒、易氧化碳、微生物生質碳。

Distribution of Soil Organic Carbon in Aggregates with Different Sizes after Biochar-amended Soil

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ABSTRACT Biochar incorporation could affect soil structure, reduce soil erosion and increase crop production. This study incorporated biochar (4%) and cow manure compost (60 t/ha) into a sandy soil, and evaluated the changes and distribution of readily oxidizable C (ROC) and microbial biomass C (MBC) among aggregates with different sizes after 60 days incubation. The results indicated that ROC decreased in most of macro-aggregates with incubation duration, but it increased with time in aggregates with diameter in 0.5-0.25 mm. This implicated that formation of new macro-aggregates (0.5-0.25 mm) with incubation duration and some ROC was incorporated in these aggregates. MBC results further indicated that the incorporated ROC might be protected by new macro-aggregates from decomposition by microbes.

Key Words : biochar, aggregates, readily oxidizable C, microbial biomass C

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