

## 黄土台塬不同土地利用方式下土壤碳组分的差异

刘梦云, 常庆瑞, 杨香云

西北农林科技大学资源环境学院, 农业部黄土高原农业资源与环境修复重点开放实验室, 陕西杨凌712100

## Soil carbon fractions under different land use types in the tablelands of the Loess Plateau

LIU Meng-yun, CHANG Qing-rui, YANG Xiang-yun\*

*Key Opening Laboratory of Agriculture Resource and Environment Renovation in the Loess Plateau, Ministry of Agriculture/College of Resources and Environment, Northwest Agriculture and Forestry University, Yangling, Shaanxi 712100, China*[摘要](#)[参考文献](#)[相关文章](#)Download: [PDF \(1060KB\)](#) [HTML 1KB](#) Export: [BibTeX](#) or [EndNote \(RIS\)](#) [Supporting Info](#)

**摘要** 为探讨土地利用方式对土壤碳固定的影响,以乔木、灌木、草和农田等不同植被类型,纯林和混交两种栽培模式的黄土台塬为对象,进行了土壤碳组分研究。结果表明,不同利用方式下林地和天然草地在0—100 cm土层总碳、轻组、重组、可溶性有机碳以及轻组有机碳分配比例(LFOC/SOC)均不同程度高于耕地,而其有机无机复合度(HFOC/SOC)则低于耕地,灌木林地和天然草地这种趋势尤为突出;各种土地利用方式间,土壤总碳和HFOC/SOC在0—20 cm差异显著,总碳在60—100 cm也差异明显,轻组、重组及可溶性有机碳在0—40 cm,而无机碳则在40—100 cm差异明显;LFOC/SOC和DOC/SOC在各土层均存在一定差异。土壤总碳、有机碳以及各组分有机碳之间呈极显著正相关,而无机碳则与其呈负相关。轻组和可溶性有机碳均与粗颗粒、易氧化有机碳以及2—0.25 mm团聚体有机碳的相关性高于与细颗粒、稳态有机碳和>2 mm团聚体有机碳;而重组有机碳则与之相反。轻组有机碳较有机碳、总碳、重组以及可溶性有机碳能更敏感地反映利用方式之间的差异,可作为土壤质量变化的评价指标。

**关键词:** 黄土台塬 土地利用方式 总碳 无机碳 有机碳组分

**Abstract:** Effects of land use types on soil organic carbon(SOC) sequestration in the tablelands of the Loess Plateau were studied in this paper. There were four vegetation types cultivated in pure and mixed planting models, namely arbor, shrub, grass and farmland. Soil total carbon(STC), soil inorganic carbon(SIC), density of organic carbon and dissolved organic carbon were analyzed. The results showed that concentrations of soil total carbon in 0-20cm and 60-100cm were significantly different, and the light fraction(LFC), heavy fraction(HFOC) and dissolved organic carbon(DOC) were in 0-40cm, while the soil inorganic carbon was in 40-100cm, LFOC/SOC and DOC/SOC were different in each layer, and HFOC/SOC was significantly different in 0-20 cm. Soil total carbon, light fraction, heavy fraction, dissolved organic carbon and LFOC/SOC of forest land and natural grass land were higher than those of farmland, while their HFOC/SOC were lower than those of farmland, and that of shrub forestland and natural grass land showed this tendency much more. Under different land uses there were significant positive correlations between soil total carbon, organic carbon, light fraction, heavy fraction, dissolved organic carbon and coarse particulate, fine particulate, easily oxidizable organic carbon, stable organic carbon and aggregate organic carbon, while there were negative correlations between inorganic carbon and organic carbon fractions. The correlation coefficients between light fraction organic carbon, dissolved organic carbon and coarse particulate organic carbon, easily oxidizable organic carbon, organic carbon in aggregates with the sizes of 2-0.25 mm were bigger than those of between fine particulate organic carbon, stable organic carbon and organic carbon in aggregates with the sizes of >2mm, while heavy fraction organic carbon was contrary. Light fraction organic carbon was more sensitive to the land use types than others, the sensitivities of organic carbon and heavy fraction organic carbon were almost same and rank the second, and the sensitivities of total carbon and dissolved organic carbon were the lowest. Therefore, light fraction organic carbon could be used as one of the effectiveness indicators of soil fertility change assessment.

**Keywords:** tablelands of the Loess Plateau land use type soil total carbon inorganic carbon organic carbon fractions

Received 2009-12-30;

Fund:

国家自然科学基金项目(30872073);陕西省自然科学基金项目(SJ08D08)资助。

## Service

- ▶ [把本文推荐给朋友](#)
- ▶ [加入我的书架](#)
- ▶ [加入引用管理器](#)
- ▶ [Email Alert](#)
- ▶ [RSS](#)

## 作者相关文章

- ▶ [刘梦云](#)
- ▶ [常庆瑞](#)
- ▶ [杨香云](#)

