Solid Earth
An interactive open-access journal of the European Geosciences Union

IF
IF 5-year
SNIP
2.204
2.200
IPP
SJR
0.814
h5-index
2.232
1.392

Definitions

Abstracted/indexed

- Science Citation Index Expanded
- Current Contents/PCE
- Scopus
- ADS
- CLOCKSS
- CNKI
- DOAJ
- EBSCO
- GBA
- Gale/Cengage
- GeoBase
- GeoRef
- Google Scholar
- J-Gate
- Portico
- ProQuest
- World Public Library

Solid Earth, 5, 299-311, 2014
www.solid-earth.net/5/299/2014/
doi:10.5194/se-5-299-2014

Research Article

15 May 2014

Conventional tillage versus organic farming in relation to soil organic carbon stock in olive groves in Mediterranean rangelands (southern Spain)

L. Parras-Alcántara and B. Lozano-García
Department of Agricultural Chemistry and Soil Science, Faculty of Science, Agrifood Campus of International Excellence – ceiA3, University of Cordoba, 14071 Cordoba, Spain

Received: 07 Dec 2013 – Published in Solid Earth Discuss.: 08 Jan 2014
Revised: 06 Mar 2014 – Accepted: 10 Mar 2014 – Published: 15 May 2014

Abstract. Soil organic carbon (SOC) concentration is a soil variable subject to changes. The management system is a key factor that influences these changes. To determine the long-term effects of the management system on SOC stocks (SOCS) in olive groves, 114 soil profiles were studied in the Los Pedroches Valley (Mediterranean rangelands – southern Spain) for 20 years. The management practices were conventional tillage (CT) and organic farming (OF) in four soil types: Cambisols (CMs), Regosols (RGs), Luvisols (LVs) and Leptosols (LPs). Soil properties were statistically analysed by management techniques, soil types and horizons. Significant differences ($p < 0.05$) were found between soil types and management practices. It was equally observed that the management system affected SOCS. In addition, the total SOCS during the 20-year experiment increased in OF with respect to CT by 72 and 66% in CMs and LVs respectively. SOC showed significant differences for horizons ($p < 0.05$) in relation to the management type. The stratification ratio (SR) was used as an indicator of soil quality based on the influence of surface SOC levels on erosion control, water infiltration and nutrient conservation with respect to deep layers. The SR of SOC from the surface to depth was greater in CT compared to OF with the exception of RGs. In all cases, the SR of SOC was >2. These results indicate high soil quality and that management practices affect SOC storage in the Los Pedroches Valley.

Citation: Parras-Alcántara, L. and Lozano-García, B.: Conventional tillage versus organic farming in relation to soil organic carbon stock in olive groves in Mediterranean rangelands (southern Spain), Solid Earth, 5, 299-311, doi:10.5194/se-5-299-2014, 2014.

Search SE

Full Text

Final Revised Paper

PDF

XML

Citation

- BibTeX
- EndNote

Discussion Paper

Published on 08 Jan 2014

Share