

THE IMPORTANCE OF CROP RESIDUE MANAGEMENT FOR CARBON SEQUESTRATION UNDER NO-TILL

BASCH, G.*; CARVALHO, M.†;
BARROS, J.F.C.†; CALADO, J.M.G.†

† INSTITUTE OF MEDITERRANEAN
AGRICULTURAL AND
ENVIRONMENTAL SCIENCES,
UNIVERSITY OF ÉVORA, CROP
SCIENCE DEPARTMENT., P-7002-
554 ÉVORA

*CORRESPONDING AUTHOR: GB@
UEVORA.PT, TEL +351266760818;
FAX = 351266760828

SUMMARY

The practice of no-till is known to contribute to the sequestration of organic carbon in the soil, as it decreases the mineralization of soil organic matter (SOM). However, huge differences regarding the soil carbon storage under no-till can be found in literature. This study evaluates the effect of different residues management practices under no-till on the evolution of SOM. Two different crop residues (wheat and chickpea) and four wheat straw management systems were used in a field trial over 3 years and the soil organic carbon determined in different soil layers at the beginning and the end of the experiment. The increase of SOM was higher the more wheat straw was left on the soil surface. *In situ* grazing of the wheat straw conducted to a lower SOM increase than its maintenance on the surface. The chickpea crop, with a low C/N ratio of its residues showed no positive effect in terms of SOM improvement. The results suggest that the return of cereal residues instead of its removal or grazing in combination with no-till for crop establishment can contribute considerably to improve the low soil organic matter levels found in Mediterranean environments.

Keywords: carbon sequestration, no-tillage, residue management

INTRODUCTION

Soils under Mediterranean climate are known to present low levels of organic carbon (Zdruli et al. 2004). Climatic effects