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Short-term effects of organic amendment on soil quality properties in a semi-arid Mediterranean area.

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Soil degradation is one of the most important environmental problems in the Mediterranean area intensified by the semiarid conditions, including low and irregular precipitation and frequent drought period. These soils are also submitted to unsustainable agricultural management with clearing of natural vegetation and loss of organic matter content; under these conditions the risk of soil fertility and quality loss is very high.

The aim of this research is to assess the effects of the addition of one organic amendment (compost) on different soil microbial properties and on other properties related with soil quality. This kind of agricultural management is increasingly being used in organic agriculture. The study of evolution of different soil quality properties has a remarkable importance as long as these have a key role as soil quality indicators. Two different treatments have been applied in the study area, “El Clot de Galvany”, located at Elche in the south-east of Spain: high amendment dose (A) with 420kgN/ha per year and low amendment dose (B) with 210kgN/ha per year, and one control (C) that was established without organic amendment, near to the a and b plots. Two plots per treatment were established for this field study. Soil samples were collected on 31th October of 2013, taking three samples per plot that were analyzed to evaluate the effects of the amendment on soil properties: soil organic carbon (SOC), water holding capacity(WHC), electrical conductivity (EC), pH, available phosphorus (P), Kjeldhal nitrogen (N), carbonates, basal soil respiration (BSR), aggregate stability (AS) and soil microbial biomass carbon (Cmic).

The results showed a clear increase on organic matter content of soils treated with compost, and as a consequence there has been an increase of microbial biomass and soil respiration in these soils. Also the rest of the properties studied were improved after the addition of organic amendment. The application of this type of amendment can be considered as an effective soil management in sustainable agriculture, because it produced an important improvement of soil properties related with soil quality.