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Effects of different agricultural managements in soil microbial community structure in a semi-arid Mediterranean region.

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Agriculture has been practiced in semi-arid Mediterranean regions for 10.000 years and in many cases these practices have been unsuitable causing land degradation for millennium and an important loss of soil quality. The land management can provide solutions to find the best agricultural practices in order to maintain the soil quality and get a sustainable agriculture model.
Microbiological properties are the most sensitive and rapid indicators of soil perturbations and land use managements. The study of microbial community and diversity has an important interest as indicators of changes in soil quality. The main objective of this work was to asses the effect of different agricultural management practices in soil microbial community (evaluated as abundance of phospholipid fatty acids, PLFA). Four different treatments were selected, based on the most commonly practices applied by farmers in the study area, "El Teularet Experimental Station", located at the Enguera Range in the southern part of the Valencia province (eastern Spain). These treatments were: a) ploughing, b) herbicides c) mulch, using the types applied by organic farmers to develop a sustainable agriculture, such as oat straw and d) control that was established as plot where the treatment was abandonment after farming. An adjacent area with the same type of soil, but with natural vegetation was used as a standard or reference high quality soil. Soil samples were taken to evaluate the changes in microbial soil structure, analysing the abundance of PLFA. The results showed a major content of total PLFA in soils treated with oats straw, being these results similar to the content of PLFA in the soil with natural vegetation, also these soils were similar in the distribution of abundance of different PLFA studied. However, the herbicide and tillage treatments showed great differences regarding the soil used as reference (soil under natural vegetation).