



Microbial biomass and activity after the abandonment of agriculture in some semiarid Mediterranean areas of Spain

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In the some regions of the Mediterranean Basin of Spain, almond trees have been cultivated in terraced orchards for centuries. These crops are immersed in the Mediterranean forest scenery, configuring a mosaic landscape where orchards are integrated between the forest. Cultivated soils represent a type of land use with important effects on physical, chemical and microbial soil characteristics. In the last decades, many almond orchards from Eastern Spain were abandoned due to the low productivity of these crops, society industrialization, and the development of tourism. This abandonment has lead to an increase in vegetation cover, since abandoned fields were naturally colonized by the surrounded natural vegetation. In this study, we selected four locations from SE Spain, with similar vegetation mosaic, constituted by forest, almond trees orchards, and orchards abandoned between 10 and 15 years previously to sampling. The main objective was to investigate the effects of changes in land use from forest to agricultural and posterior land abandonment on soil microbial biomass and activity. In all locations, all properties showed higher values in forest soils than in agricultural and abandoned agricultural soils. Abandoned agricultural soils seemed to show a recovery in most properties compared with agricultural soils, presenting higher values in microbial biomass carbon, basal respiration, and enzyme activities. These results indicate that after agricultural abandonment soil microorganisms are more active as a consequence of the increment in the vegetation cover, with higher inputs as litter and root exudates. Moreover, the cessation of tillage may have also favoured the

increments in the microbial biomass and activity. Nonetheless, these values are still low comparing to forest soils, reflecting that 10-15 years of abandonment is not long enough to achieve a total recovery of soil microbial properties.

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