



Carbon dynamics and aggregation in a *Vicia faba* crop: influence of management practice and cultivar

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In this study, we assessed the influence of a legume crop (*Vicia faba*) on the soil properties related to the carbon (C) cycle and soil aggregation, taking into account two cultivars (Muchamiel and Palencia) and two different management practices (conventional and organic). The study was randomly designed in blocks with four replications, in plots of 10 m². Faba bean crop spanned from 24 November 2014 to 2 March 2015. We took a soil sampling (0-30 cm) from each plot at the end of the cycle to measure soil organic C, recalcitrant C, labile C fractions, microbial biomass C (MBC), aggregate stability and the enzyme activities β -glucosidase, β -glucosaminidase, dehydrogenase, cellulose and arylesterase. Results showed that the cultivar and the management practice had no significant effect on any of the analyzed properties. Significant positive correlations were only observed between soil organic C and arylesterase activity, recalcitrant C and labile C fractions, and recalcitrant C with arylesterase and cellulase activities. So, it seems that the selected cultivars and management practices had similar effects on C dynamics and aggregation. Both management practices maintain the same levels of soil organic C, the different organic C pools, and aggregate stability. In addition, soil microorganisms are responding to the recalcitrant fraction of the organic carbon by release of cellulases and arylesterases.

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