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The impact of land use on biological activity of agriculture soils. An State-of-the-Art

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Biological activity is a crucial soil property affecting soil sustainability and crop production. The unsuitable land management can lead to a loss in soil fertility and a reduction in the abundance and diversity of soil microorganisms. This can be as a consequence of high erosion rates due to the mismanagement of farmers (Cerdà et al., 2009a). However ecological practices and some organic amendments can promote the activities of soil microbial communities, and increase its biodiversity (García-Orenes et al., 2010; 2013). The impact of land use in microbiological properties of agriculture soil are presented and discussed in this review. Biological activity is quantified by microbial soil communities and soil enzyme activities to interpret the effects of soil management practices (Morugán-Coronado et al., 2013). The aim of biological activity tests is to give a reliable description of the state of agricultural soils under the effect of different land uses.

Numerous methods have been used to determine the impact of land uses on microbiological properties. The current used methods for detecting microbial diversity are based on molecular techniques centered on the 16S and 18S rRNA encoding sequences such as CLPP: community-level physiological profiles; T-RFLP: terminal restriction fragment length polymorphism; DGGE: denaturing gradient gel electrophoresis; OFRG: oligonucleotide fingerprinting of rRNA genes, ARISA: Automated Ribosomal intergenic spacer analysis, SSCP: single-strand conformation polymorphism. And techniques based on the cellular composition of the microbes such as PLFA: phospholipid fatty acid analysis. Other methods are based on the activity of microbes, for example, Cmic: microbial biomass carbon; SIR: substrate induced respiration; BSR: Basal soil respiration; qCO_2 metabolic quotient; enzymatic activities (Urease, ß-glucosidase and phosphatase) (Deng, 2012).

Agricultural land management can contribute to increased rates of erosion due to desiccation, mechanical destruction, soil compaction, reduce pore volume, and disruption of access to food resources (Cerdà et al., 2009b). Furthermore, it can lead to a loss in soil fertility and reduction in the abundance and diversity of soil microorganism (Caravaca et al., 2002). Nevertheless, some organic fertilizers, such as manure, waste water and sewage sludge, promote the activities of soil microbial communities (Morugán-Coronado et al., 2011; Balota et al., 2013; Macci et al., 2013). On the other hand, land use influences soil microbial processes by changing the quantity and quality of plant residues entering the soil and their spatial distribution, thorough changes in nutrients and inputs (García-Orenes et al., 2009; 2012). The abuse of pesticides can drastically modify the function and structure of microbial communities, altering the terrestrial ecosystems, which has important implication for soil quality (Pampulha et al., 2006). Soil quality is important for the sustainable development of terrestrial ecosystem (Paz-Ferreiro & Fu, 2013; Vasconcellos et al., 2013).

This paper will review the State-of-the-Art of the scientific knowledge on the impact of land use on the biological activity in agriculture soils

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