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Prof. Nicola Senesi

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EFFECTS OF OLIVE GROVE MANAGEMENT ON CARBON SEQUESTRATION AND CHEMICAL AND MICROBIOLOGICAL SOIL PARAMETERS IN SOUTH OF ITALY

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Agricultural practices can play an important role in carbon (C) sequestration. The C stock can be viewed as measure of the relative contribution to biomass to the C cycle. The capacity to store organic carbon depends to a great extent upon climate and soil properties, although in agricultural soils the cultivation system also plays a considerable part. Olives are one of the most important and extensive crops in the Mediterranean region where soil erosion and loss of fertility are frequent phenomena. The objective of this paper is to discuss some of the agricultural management practices that can be used to reduce atmospheric CO₂ via increased C sequestration in soils and modify the chemical and microbiological soil parameters. We restrict our discussion to arable land. Further, we only discuss C sequestration, although we recognize that management may have a positive effect on CO₂ emissions while this is counterbalanced by negative effects on other greenhouse gases. The process of the recovery of soil quality parameters in the abandoned olive grove, triggered by the absence of soil and plant management, was evident. The activities of some enzymes involved in the carbon cycle were found to be significantly different in the two systems. The study of the carbon substrate utilization profiles using Biolog® method, revealed significant differences between the two systems for some metabolic indices of the soil microbiota. In general, the abandoned system showed a higher microbial diversity and complexity.