LIFE CARBONFARM: TECHNOLOGIES TO STABILIZE SOIL ORGANIC CARBON AND FARM PRODUCTIVITY, PROMOTE WASTE VALUE AND CLIMATE CHANGE MITIGATION (LIFE12 ENV IT 000719)

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ABSTRACT

The LIFE+ CarbOnFarm project (http//agricoltura.regione.campania.it/CARBONFARM/index.html) represents an application of both demonstrative and innovative practices aimed to promote the sustainable Soil Organic Matter (SOM) managements in the agro-ecosystems. The project strategies approach the environmental problems related to the decrease of SOC content and to soil degradation, in agricultural areas of Mediterranean countries, which are among the chiefly target objectives advised by EU Soil Thematic Strategy. The objective is the restoration of SOM functions in agricultural soils, attained through the valorization of local recycled agricultural biomasses and with soil application of green chemistry products; these practices will be applied at farm scale in four project sites, reproducing the local farming systems, located in Piemonte and in Campania regions in Italy. The improvement of SOC, the enhancement of the economic and environmental role of soil resources in the agro-ecosystems and the valorization of agricultural biomasses recycling are the main area of concern. The proposal is tailored on the non-livestock farms of agricultural areas of Southern Europe characterized by limited access to renewable OM sources, the progressive decline of SOM content and soil fertility, with a potential increase of soil erosion and a steady requirement of high energy inputs.

An important target of the project is to promote the productive and economical valorization of residual biomasses from the local agricultural activities to reach a high quality compost. In farm sites of Campania, which territory is characterized by the scarcity of suitable organic sources, the compost will be obtained by on-farm composting facilities. In farm sites of Piemonte the compost will be produced in external composting plan by using the available organic biomasses represented by solid fraction from anaerobic digestion of cattle slurry. The innovative activities based on soil addition with eco-friendly biomimetic catalyst, will strengthen the in situ stabilization of SOM. These activities will meet the main goal of the project which is to promote the SOC sequestration and the restoration of SOM functions thereby involving a decrease of GHG emissions and combining the maintenance of crop productivity with lower energetic inputs. The adoption of specific monitoring actions has been conceived to make available the application of suitable approaches for the acquisition of a useful array of data concerning the SOC quantity and quality, GHG emission from cultivated soils, soil stability, crop productivity as well as the environmental, energetic and economical sustainability of the applied methodologies.

Keywords: LIFE project, SOM management, SOC sequestration, on farm composting, biomimetic catalyst.

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