



A project to study SOC evolution after land use change combining chronosequence and gradient methods

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In the last decades the interest in the global C budget has increased enormously and soils have a great importance in this issue since they contain about twice as much carbon as the atmosphere. Land use change (LUC) can cause a change in land cover and an associated change in carbon stocks in soils, so it has a major impact in the balance between inputs and outputs of soil organic carbon (SOC). Improved understanding of land-use impacts on the world's terrestrial carbon balance is thus a necessary part of the global effort to mitigate climate change. The aim of this project is to predict the effects of land use and land management change on (SOC) stocks, characterizing the soil organic carbon cycle and its relationship to the vegetal cover in croplands abandoned different years ago and under different Mediterranean climatic conditions in South of Spain.

The study area is located in the Cordillera Bética Litoral, in South of Spain. In this area, a climatic gradient can be observed from West to East: from >1,500 mm year-1 in the Strait of Gibraltar to <250 mm year-1 in the Cabo de Gata. More specifically, the study is focussed on three different areas from the climatic conditions point of view: Gaucín (1010 mm year-1), Almogía, (576 mm year-1) and Gérgal (240 mm year-1).

By means of the analyses of aerial photographs (1956, 1977, 1984, 1998 and 2009) all the experimental plots will be selected. After this procedure, the three study areas will be composed by experimental plots of these classes:

- a) Lands with natural vegetation since 1956.
- b) Abandoned lands between 1956 and 1977.
- c) Abandoned lands between 1977 and 1984.
- d) Abandoned lands between 1984 and 1998.
- e) Abandoned lands between 1998 and 2005.
- f) Cultivated lands since 1956.

The main expected outcomes of the research project are the characterization of the temporal evolution of SOC in soils, the compilation of experimental areas under different Mediterranean climatic conditions, and the characterization of vegetation cover and soil profiles from different and representative Mediterranean land uses.