Geophysical Research Abstracts
Vol. 14, EGU2012-3772, 2012
EGU General Assembly 2012

Aggregate stability in citrus plantations. The impact of drip irrigation

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Soil aggregate stability is a key property for soil and water conservation, and a synthetic parameter to quantify the soil degradation. Aggregation is relevant in soils where vegetation cover is scarce (Cerdà, 1996). Most of the research carried out to determine the soil aggregate stability was done in forest soils (Mataix-Solera et al., 2011) and little is done on farms (Cerdà, 2000). The research have show the effect of vegetation cover on soil aggregate stability (Cerdà, 1998) but little is known when vegetation is scarce, rare or not found such it can be seeing in agriculture soils. Then, aggregation is the main factor to control the soil losses and to improve the water availability. Moreover, agriculture management can improve the soil aggregate characteristics and the first step in this direction should be to quantify the aggregate stability. There is no information about the aggregate stability of soils under citrus production, although the research did show that the soil losses in the farms with citrus plantations is very high (Cerdà et al., 2009), and that aggregation should play a key role as the soils are bare due to the widespread use of herbicides.
From 2009 to 2011, samples were collected in summer and winter in a chemically managed farm in Montesa, Eastern Iberian Peninsula. Ten irrigated patches and ten non-irrigated patches were selected to compare the effect of the drip irrigation on the soil aggregate stability. The Ten Drop Impacts (TDI) and the Counting the number of drops (CND) tests were applied at 200 aggregates (10 samples x 10 aggregates x 2 sites) in winter and summer in 2009, 2010 and 2011.
The results show that the irrigated patches had TDI values that ranged from 43 to 56 % and that the non-irrigated reached values of 41 to 54 %. The CND samples ranged from 29 to 38 drops in the non-irrigated patches to 32 to 42 drop-impacts in the irrigated soil patches. No trends were found from winter to summer during the three years time period measured.
This research study is being supported by the the research project CGL2008-02879/BTE

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