



## Changes in soil aggregate stability under different irrigation doses of waste water

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Freshwater availability and soil degradation are two of the most important environmental problems in the Mediterranean area exacerbated by incorrect agricultural use of irrigation in which organic matter is not correctly managed, the use of low quality water for irrigation, and the inefficiency of dose irrigation. For these reasons strategies for saving water and for the restoration of the mean properties of soil are necessary. The use of treated waste water for the irrigation of agricultural land could be a good solution to these problems, as it reduces the utilization of fresh water and could potentially improve key soil properties.

In this work we have been studying, for more than three years, the effects on soil properties of different doses of irrigation with waste water. Here we show the results on aggregate stability. The study is located in an agricultural area at Biar (Alicante, SE of Spain), with a crop of grape (*Vitis labrusca*). Three types of waters are being used in the irrigation of the soil: fresh water (control) (TC), and treated waste water from secondary (T2) and tertiary treatment (T3). Three different doses of irrigation have been applied to fit the efficiency of the irrigation to the crop and soil type: D10 (10 L m<sup>-2</sup> every week during 17 months), D50 (50 L m<sup>-2</sup> every fifteen days during 14 months) and D30 (30 L m<sup>-2</sup> every week during 6 months up to present day).

The results showed a clear decrease of aggregate stability during the period we used the second dose (D50) independent of the type of water used. That dose of irrigation and frequency produced strong wetting and drying cycles (WD) in the soil, and this is suspected to be the main factor responsible for the results. When we changed the dose of irrigation to D30, reducing the quantity per event and increasing the frequency, the soil aggregate stability started to improve. This dose avoids strong drying periods between irrigation events and the aggregate stability is confirmed to be slowly increasing. A study in the medium or long-term is necessary to continue to ascertain the impact on soil of the irrigation and to assess the feasibility of using these waters in this type of soil.

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