



## **Dynamic changes in hydraulic properties of soils irrigated with treated wastewater**

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With increasing water scarcity, treated wastewater (TW) appears as an attractive alternative source of water for irrigation, especially in arid and semi-arid regions where freshwater is naturally scarce. However, it seems that long-term use of TW for irrigation cause to soil degradation and crop yield reduction.

This study aims to describe and quantify the dynamic changes in the soil hydraulic properties resulting from the use of TW for irrigation.

Combining between analysis of data from a set of complementary laboratory experiments involving infiltration, evaporation, swelling and saturated hydraulic conductivity measurements, and numerical simulations provide quantitative estimates of the negative impact of TW for irrigation on the soil properties. It appears that the soil degradation is a dynamic process that depends on the duration of the exposure to the low-quality irrigation water. The intensity of the changes distributes with depth and results from the irrigation management applied and the efficiency of the leaching process induced by rainfall. The negative impact is the result between increase of soil sodicity and changes in soil wettability. Such negative impact may affect the hydrological balance components at the field and at the regional scale.