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Effect of treated wastewater application on soil water repellency of sandy soil with olive trees and grass cover

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Soil water repellency has received significant attention due to water scarcity and increasing demand of irrigation water worldwide. The objective of this study was to examine the effects of treated wastewater application on soil water repellency of a repellent sandy soil with olive trees and grass cover. Secondary effluent from a municipal wastewater treatment plant was applied directly on the field on a 4×2 m plot. Freshwater and a mixture of freshwater:wastewater (1:1) were used in subsequent plots for comparison. A total of 62 water applications were performed between March 2006 and July 2008. The soil receiving the mixture of freshwater:wastewater exhibited the highest wettability. The soil water repellency after the first year of wastewater application decreased in the respective plot compared with the soil under natural conditions. The higher values of the WDPT were determined on the freshwater irrigated plot. The field-moist samples on all plots revealed high wettability because the moisture content of the soil was maintained above the critical soil water content. The results of this study reveal that short-term application of treated municipal wastewater does not induce soil water repellency.