



Long term agronomic and environmental effects of irrigation with reclaimed wastewater

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Fresh water in the Mediterranean region is generally scarce and only low quality reclaimed wastewater (RWW) is available for irrigation. The aim of the present study was to evaluate the effect of irrigation with RWW on tree growth and productivity and to quantify nitrate and chloride (Cl) losses in an olive orchard. Three treatments were tested on two cultivars (Barnea and Leccino); fresh water with standard fertigation (Fr), recycled water with standard fertigation (Re) and recycled water with reduced fertigation (in accordance to the K and N available in the recycled water) (Re-). The total amount of nutrients arriving with the RWW was substantial; 100, 30, 150 kg ha⁻¹ N, P, K, respectively, ca. half of the recommended fertilization dosages. Throughout the 6 experimental years, fertigation treatments did not influence nutrient status in leaves and did not affect fruit or oil production. While similar amounts of water were applied, the Re and Re- treatments loaded the soil profile with 1.75 times more Cl than the Fr treatment. Additionally, significantly more nitrates were transported out of the root zone in the Re treatment compared to Fr and Re- for both cultivars. The results indicate that recycled water can be used for olive oil irrigation with no negative effects on oil yield or quality. Irrigation with RWW increased salt loads into and beyond the root zone. The nutritional constituents in the RWW used to irrigate olives should be accounted for in order to increase fertilizer application efficiency and minimize the transport of salts and nutrients into groundwater.