



Nutrient uptake and fruit quality in a nectarine orchard irrigated with treated municipal wastewaters

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ABSTRACT

Nowadays, treated municipal wastewater is considered as an alternative water source for irrigation, crucial mainly under dry environments; however, if not well managed, it could negatively affect crops and environment. Four irrigation water sources were tested in order to evaluate their impact in a nectarine orchard: three unconventional wastewaters – including a secondary-treated municipal wastewater (SW), a wastewater made by a simplified lagoon treatment pilot plant (LW), and a tertiary-treated wastewater (TW) – and one conventional freshwater source (FW). Fruit and water chemical composition and fruit quality were evaluated also using a multivariate analysis. The effect on soil chemical fertility was also investigated. As a consequence of various water sources with different nutrient loads, soil nutrient availability, plant uptake and fruit quality were significantly affected by the water source supplied. Plots irrigated with unconventional waters (LW, TW and SW) showed positive impacts on fruit quality (e.g., soluble solids and acidity) and negative nutritional aspects. These results could be attributed to higher soil pH (with lower micronutrients availability) and high concentration of N and K in unconventional wastewater sources. The results obtained with principal component analysis suggested us that water, enriched with mineral nutrients, may affect fruit quality; in our study, a lower fruit firmness while higher h° value and total soluble solids of fruits were observed, indicating an earlier ripening. Further studies are needed in order to understand better the long-term effect of municipal wastewater on nectarine orchard.

Keywords: *Prunus persica* (L.) Batsch; Plant nutritional status; Water–soil–crop interactions; Water recycling; Principal component analysis

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