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REUSE OF TREATED MUNICIPAL WASTEWATER FOR IRRIGATION IN APULIA REGION: THE “IN.TE.R.R.A.” PROJECT

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Abstract

The use of non-conventional water resources including treated municipal wastewater has been increasing in the Mediterranean regions over the last decades to cope with water shortages and uneven rainfalls due to climate change.

The aim of this paper is to present the first results from two years of experimental field activities carried out in two different demo-places in Southern Italy: the municipal wastewater treatment plants of Noci and Castellana Grotte (Apulia region). In these sites different vegetable crops (cucumber, lettuce, melon, endive in Noci and fennel, lettuce, fennel in Castellana Grotte) were grown in succession and irrigated in parallel with treated wastewater and conventional water pumped from wells, for comparing the effects of the different water sources on soil and vegetables. Reclaimed water quality was monitored for chemical and microbial parameters and compared with conventional water. At harvesting time, microbial indicators were measured on edible part of crops and in soil.

Results show that the effluents produced by a full scale membrane bioreactor (MBR) treatment plant (Noci) comply with the stringent Italian standards for reuse in agriculture, and its microbiological quality is higher than the conventional well water. In Castellana Grotte the effluent quality of the two pilot plants was different according to the adopted technologies (MBR and tertiary cloth filtration), and sometimes depended on the quality of incoming wastewater.

As for the agronomic results, in both sites crop yields were higher in the plots irrigated with treated wastewater, and the microbial indicators *Escherichia coli* and *Salmonella* were never found, at harvesting time, on edible parts of crops and in the soil.

Key words: agricultural reuse, drip irrigation, treated wastewater, vegetable crops

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