## Desalination and Water Treatment

www.deswater.com

 $1944\text{-}3994\,/\,1944\text{-}3986$  © 2010 Desalination Publications. All rights reserved. doi: 10.5004/dwt.2010.1088

## Effect of olive mill wastewater spreading on the physicochemical characteristics of soil

## A. Yaakoubia\*, A. Chahlaouia, M. Rahmanib, M. Elyachiouic, I. Nejdib

<sup>a</sup>Faculty of Science, Department of Biology, Laboratory of Biochemistry and Pharmacognosy, University Moulay Ismail UFR: Quality and Hydrobiologic Operation of the Watery Systems. BP 11201, Zitoune Meknès, Morocco Tel. +212 (5) 35 53 88 70; Fax +212 (5) 35 53 68 08; email: elyaakoubia@gmail.com, a\_chahlaoui@yahoo.fr <sup>b</sup>Department of Food and Nutritional Sciences, Agronomic and Veterinary Hassan II Institute, B.P. 6202, Rabat, Morocco <sup>c</sup>Faculty of Science of Kenitra, Laboratory of Biotechnology, Environment and Quality, B.P. 133.14000 Kenitra, Morocco

Received 21 May 2009; Accepted 13 December 2009

## ABSTRACT

Olive mill wastewater (OMW) is the liquid by-product obtained from olive processing to extract virgin olive oil. Due to its acidic pH and high amounts in organic matter and phenols, OMW is very difficult to further purify. A solution would be to spread it on the soil. Hence, the objective of this study was to explore the effects of different OMW amounts on chemical characteristics of the soil cultivated with vineyard (cv. Italia), at different depths (10–30 cm and 30–60 cm). Our results show that after 2 months of spreading follow up, during 2 consecutive years (2005/2006 and 2006/2007), the upper soil layer (10–30 cm) of land plots irrigated by OMW became fertile, with an average ratio NPK of, respectively, 1.54, 1.95 and 2. This study also showed the absence of risk of soil filling by the suspended matter and the residual oil brought by OMW. In the same way, the pH and the electric conductivity (EC) of the soil remain practically unchanged. The concentration of OMW in calcium as well as the high content of soil limestone favoured the precipitation of limestone (CaCO<sub>3</sub>), especially in the upper soil layer (10–30 cm). An increase in soil organic matter and phenols, due to spreading with OMW, was found as estimated by direct cell counting.

Keywords: Olive mill wastewater (OMW); Fertilizing; Spreading; Clay soil; Total phenols

<sup>\*</sup> Corresponding author.