

The advantages of NF desalination of brackish water for sustainable irrigation: The case of the Arava Valley in Israel

Andrea Ghermandi*, Rami Messalem

*Ben-Gurion University of the Negev, Zuckerberg Institute for Water Research, Desalination and Water Treatment,
Beer Sheva, Israel*

Tel. +972 (8) 646 1942; Fax +972 (8) 647 2984; email: ghermand@bgu.ac.il

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ABSTRACT

Irrigation with brackish water is a widespread practice in freshwater-poor regions with ample brackish water resources, but it has severe limitations. Desalination is a water saving alternative to brackish water irrigation, but its diffusion as a viable method of water treatment has been limited by high costs and concern about the lack of plant nutrients in desalinated water. In this paper, we discuss the advantages of nanofiltration (NF) membranes for the production of irrigation water based on the simulation of the performance of a solar-assisted pilot plant in the Arava Valley in Israel. It is argued that the proposed system would consume up to 40% less energy than conventional reverse osmosis desalination, reduce by 34% the currently abstracted groundwater volumes, and increase by 18% the total biomass production of the irrigated crops.

Keywords: Brackish water; Irrigation; Nanofiltration; Reverse osmosis; Solar desalination

* Corresponding author.

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