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**Long-term evaluation of a forward osmosis-nanofiltration demonstration plant for
wastewater reuse in agriculture**

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Abstract

Hybrid forward osmosis (FO) processes such as forward osmosis with membrane bioreactors (FO-MBR), electrodialysis (FO-ED), nanofiltration (FO-NF) or reverse osmosis (FO-RO) present promising technologies for wastewater reuse in agriculture as they meet high effluent quality requirements, especially regarding boron and/or salt content. An FO-NF demonstration plant for this application was built and operated treating $3 \text{ m}^3 \text{ h}^{-1}$ of real wastewater with a salinity of $3\text{-}5 \text{ mS cm}^{-1}$ and 1.5 mg L^{-1} of boron in continuous mode for 480 days. Three draw solutions (DS) were evaluated in different periods of experimentation. Sodium polyacrylate led to reversible fouling on the FO and NF membranes and the permeate was not suitable for irrigation. Magnesium sulphate, used as DS in a second phase, generated severe irreversible fouling on NF membranes and therefore it was discarded. Finally, magnesium chloride showed the

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