



## Evaluation of CaCO<sub>3</sub> clogging in emitters with magnetized saline waters

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### ABSTRACT

High water application uniformity is essential for an effective irrigation. Clogging of emitters in drip irrigation systems is one of the most important factors decreasing uniformity. In this study, the possible effect of magnetization of water on chemical clogging of dripline emitters was investigated. Separate experiments were conducted with three different saline waters (W-1: 0.314 dS m<sup>-1</sup>, W-2: 0.665 dS m<sup>-1</sup>, W-3: 0.937 dS m<sup>-1</sup>) having a high pH and a positive Langelier saturation index (LSI). Discharge rates, electrical conductivity (EC) and pH's of discharge water from emitters in driplines were measured. Uniformity of driplines was evaluated by using the statistical uniformity coefficient ( $U_c$ ) and the emission uniformity coefficient ( $E_u$ ). The pH and EC values of discharge water from emitters in driplines were found to be slightly lower when operated with magnetized water. However, discharge rates under non-magnetized water were lower than those of magnetized water. Magnetic effect was observed to be decreased as the water salinity increased. The  $U_c$  and the  $E_u$  values indicated that when the medium saline water was magnetized before its release into the system, a better uniformity due to a lower emitter clogging rate can be achieved. When higher saline water was magnetized, lower  $U_c$  and the  $E_u$  values were observed.

*Keywords:* Calcium carbonate precipitation; Emitter; Magnetic water treatment; Uniformity

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