



Study of the uniformity of emitters in drip irrigation using regenerated wastewater under different management practices

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The conventional water resources used in the intensive horticulture developed in the Southeast of Spain have suffered, throughout its more than 50 years of existence, a decrease, in terms of quality and quantity, of the groundwater reserves, the main source of supply of the productive system. For this reason, it has become necessary to incorporate new water sources such as reclaimed urban wastewater (RUW).

The RUW have, in general, a good chemical quality and a worse physical and biological quality compared to the groundwater usually used in this area. Consequently, the use of RUWs in drip irrigation presents greater risks of obturation of emitters. This problem is aggravated by the incorporation of nutrients in the irrigation water, fertigation, since they serve as food for the microorganisms present in the water, increasing the biomass that develops inside the emitters that plug them.

The test was developed in an experimental 1200 m² multitunnel greenhouse, located at the IFAPA La Mojonera Center in La Cañada (Almería, Spain). A factorial experimental design was established with two factors, irrigation management and type of emitter, in random blocks with three repetitions.

The basic experimental unit was an irrigation lateral. With respect to the irrigation management factor, three treatments were considered: 1. RUW; 2. RUW + fertigation; 3. RUW + fertigation + Maintenance. Continuous irrigation pulses of 30 minutes were performed in 5 weekly applications over a period of 37 weeks, equivalent to an irrigation season in an average cycle of greenhouse horticultural crops.

After 100 hours of irrigation, treatments with fertigation have shown a significantly greater flow rate reduction than the treatment without fertigation, regardless of the model of the emitter. The reduction of flow rate was 4.0 and 4.6% for the RUW + Fertigation and RUW + Fertigation + Maintenance treatments, respectively, however, the RUW treatment only showed a reduction of 1.3%, demonstrating the influence that fertigation has on the clogging of emitters. Consistent with the above, the uniformity coefficient was 95% in the first treatment, 92.7% in the second and 94.8% in the third.