



RESEARCH PAPER

Impact of wastewater irrigation on chemical properties of soil and flower quality of marigold (*Tagetes patula* L. cv. Pusa deep)

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Abstract : A field experiment was conducted to find out the impact of wastewater irrigation on physical and microbiological soil health in marigold (*Tagetes patula* L. cv. Pusa deep) based on FDR sensor at Water Technology Centre farm of ICAR-Indian Agricultural Research Institute, New Delhi during period of 2020-2021. Eight treatments T-1: Groundwater irrigation scheduled at 25% MAD ($\theta_v=27\%$); T-2: Groundwater irrigation scheduled at 50% MAD ($\theta_v=22.5\%$); T-3: Groundwater irrigation scheduled at 75% MAD ($\theta_v=18\%$); T-4: Groundwater irrigation scheduled as per farmers practice/recommended POP; T-5: Wastewater irrigation scheduled at 25% MAD ($\theta_v=27\%$); T-6: Wastewater irrigation scheduled at 50% MAD ($\theta_v=22.5\%$); T-7: Wastewater irrigation scheduled at 50% MAD ($\theta_v=18\%$); T-8: Wastewater irrigation scheduled as per farmers practice/recommended POP were laid out in a Randomized Block Design (RBD) with three replications. Results indicated that soil chemical properties such as pH, organic carbon, EC, NPK and heavy metal at depth of 0-15 cm in marigold. As soil pH (7.80), EC (0.24 to 0.31 dS/m), OC (0.38), NPK and the concentration of heavy metals (Ni, Cd, Cr, Pb) were significantly higher in the treatment T6 where wastewater irrigations were scheduled at 50% MAD as compared to groundwater irrigations. Moreover, the quality and grade of marigold came to be high in wastewater irrigated plots compared to groundwater. Thus, short-term application of wastewater has less impact over soil and gives better results in crop growth and quality but, the long-term application of wastewater may affect the chemical properties of the soil which can be analysed with different ranges of MAD (maximum allowable deficit) need to be studied.

Key Words : Wastewater, Marigold, Allowable deficit, FDR, Irrigation scheduling

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