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Effect of quality of irrigation water and levels of N-fertigation on nitrogen use efficiency and water use efficiency of drip irrigated tomato

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■ **ABSTRACT :** Proper management of irrigation water and fertilizers is important for crop production. Drip irrigation method is known to have better water use as well as fertilizer use efficiency as compared to other methods of irrigation, particularly if poor quality water is to be used. This study was conducted to examine the effect of quality of irrigation water and level of fertigation on nitrogen use efficiency (NUE) and water use efficiency (WUE) on drip irrigated tomato crop. Experiments were conducted in micro plots (2 m x 2 m size) at Research farm of CCS Haryana Agricultural University, Hisar, Haryana (India). Irrigation for good quality (EC $\leq$ 0.5 dS m^{-1}) and marginal quality (EC = 2.5 dS m^{-1}) water was scheduled on alternate day with combination of three fertigation levels (N_1: 75 kg N/ha, N_2: 100 kg N/ha and N_3: 125 kg N/ha). The volume of irrigation water applied per plant during an irrigation event was calculated based on crop spacing, pan evaporation, crop co-efficient and per cent shaded area. A total of 948.4 litre of water was applied to each micro plot during the entire crop period.FYM @ 8 kg per plot, 1/3rd of nitrogen, 100% of P and K was applied before transplanting the tomato. Remaining dose of nitrogen was equally split in 11 doses at weekly interval. Maximum tomato yield (61.53 t/ha) and water use efficiency (26.0 kg /m^3) was obtained with good quality irrigation treatment receiving N-fertigation at the rate of 125 % of RDN. Maximum nitrogen use efficiency (594.9 kg /kg) was obtained with good quality irrigation treatment receiving N-fertigation at RDN. Minimum tomato yield (34.68 t/ha) and water use efficiency (14.3 kg/m^3) was obtained with marginal quality irrigation treatment receiving N-fertigation at the rate of 75 % of RDN. Maximum nitrogen use efficiency (594.9 kg/kg) was obtained with good quality irrigation treatment receiving N-fertigation at RDN. Minimum nitrogen use efficiency (404.3 kg/kg) was obtained with marginal quality irrigation treatment receiving N-fertigation at 125 % of RDN.

■ **KEY WORDS :** Drip irrigation, Tomato, Nitrogen use efficiency, Water use efficiency

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