



Water use efficiency and agronomic response of greenhouse-grown pepper irrigated by buried diffuser

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Greenhouse-grown pepper (*capsicum annum*) was used to investigate the effect of the buried diffuser (BD) (a newly irrigation technology on irrigation water efficiency), water distribution and yield. The treatments consisted of reducing irrigation amount to the half during four growing stages. Four irrigation strategies were applied; drip irrigation with 50% of full water requirement (DI50), drip irrigation with 100% of full water requirement (DI100), buried diffuser with 50% of full water requirement (BD50) and buried diffuser with 100% of full water requirement (BD100). The full irrigation water amount was calculated according to the plant needs in each season during all growing stages. The results obtained demonstrate that the buried diffuser overcomes the drip irrigation technique in all aspects. In fact, on the performance scale, we observed that the distribution efficiency of the buried diffuser is good with a percentage of 76.77%, whereas it was acceptable for drip irrigation (64.37%), the buried diffuser showed also a higher application efficiency (91.37%) especially in plants irrigated by 50% of full water requirement. In addition, the buried diffuser revealed a remarkable yield improvement of the two irrigation treatments with 23 T.ha⁻¹ for the treatment 50% and 23.9 T.ha⁻¹ for the 100% irrigation treatment. In fact, the irrigation water use efficiency (IWUE) with BD50 (36.8 kg.m⁻³) was almost similar with that of DI100 (37.5 kg.m⁻³). We can conclude that with only 50% of full water requirement with the buried diffuser we can conserve more irrigation water while improving both IWUE and yield in these particular arid and semi-arid regions where saline water is the main source of irrigation due to the degradation of water quality.