

Water Distribution Patterns of Drip Irrigation in Sandy Calcareous Soil As Affected by Discharge Rate and Amount of Irrigation Water

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Abstract: Even though high field-scale uniformity of water distribution is obtained by a good designed drip irrigation system, the uniform distribution of water around the lateral lines is quite questionable. Water distribution pattern underneath the drippers is affected by many factors, of which discharge rate and amount of irrigation water applied in each irrigation event are most important. Using small drainage lysimetres, this work aimed at studying the effects of discharge rates (1, 2 and 4 l/h) and amount of irrigation water (80 and 120% of ET_c) on water distribution pattern in soil and its impact on growth and yield of wheat crop. The size and shape of the wetting zones are very dependent on both rate of discharge and amount of irrigation water applied in each irrigation event. With application of the same amount of irrigation water to loamy sand soil, increasing the discharge rate allows more water to move in horizontal direction and vertical direction, while decreasing

the discharge rate allows more water to move in vertical direction only. The highest discharge rate (4 L/h) develops a wide wetting zone that reached more than 30 cm in horizontal direction and more than 50 cm in depth. This means that using high discharge emitters in drip irrigation system well resulted in overlapping the wetted zone in horizontal direction, and in the same time may result to push the water deeply below the root zone. Therefore, it is advisable to use a low discharge rate emitters and increasing the operating time to save more water.