

Effects of Laterals and Emitters Spacing on Winter Wheat Yield and Water Use Efficiency in Drip-Tape Irrigation System

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Abstract

Proper design of the factors effective in hydraulic performance of drip-tape irrigation systems appropriate to the field and crop conditions is the key for their success. For this purpose, two important and sensitive parameters are lateral spacing and emitter spacing. Lack of correct selection of these two parameters affects the drip-tape irrigation system performance and it has a significant impact on the cost of implementing such irrigation systems. To investigate the effect of the lateral and emitter spacing on winter wheat yield, its components, and water use efficiency, a factorial arrangement experiment with two factors based on randomized complete block design was conducted at the Soil and Water Research Institute Station, Karaj, Iran. The investigated factors included lateral spacing (at 30, 45, and 60 cm) and emitter spacing (at 10, 20, and 30 cm). Results showed that in most of the studied indices, the 20 cm emitter spacing in different lateral spacing was the superior treatment. The results showed that, although the 30 cm lateral spacing led to the highest yield, but based on the results of economic analysis, the highest economic performance for a wheat field could be achieved at 45 cm lateral spacing, which could be adopted by farmers.

Keywords: Trickle irrigation, Water use efficiency, Hydraulic performance, Drip-tape economics

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