

Determination of crop coefficient for bean (*Phaseolus vulgaris* L.) plants under drip irrigation system

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Abstract: Field experiments were carried out during two consecutive seasons (2012 and 2013). The experiments were conducted at the Shalakan Experimental Farm of the Faculty of Agriculture, Ain Shams University, Kalubia Governorate (30.13° N, 31.4° E and 14 m above of sea). The experimental site represents the old alluvial soil of the Nile Delta. The soil was clay loam in texture. The main objective of this study was to determine the values of crop coefficient (KC) for bean (*Phaseolus vulgaris* L.) varieties Contender and Bronco under Egyptian conditions in case of using surface drip irrigation (SDI) and subsurface drip irrigation (SSDI).

The crop coefficient was calculated during the growing season for each treatment and reaching to the length of the different stages of bean in each treatment. Crop coefficient ranged between (0.63- 0.64) for initial, (0.87 - 0.82) for development, (0.99 - 1.09) for midseason and (0.80-0.95) for harvesting stage in case of Bronco variety at three levels of water application (80%, 60% and 40%) of available water with both irrigation system. While ranged between (0.59- 0.61) for initial, (0.78 - 0.98) for development, (1.07 - 1.19) for midseason and (0.73-0.88) for harvesting stage in case of Contender variety with both irrigation system and the same three levels of water application.

Keywords: *Phaseolus vulgaris*, irrigation treatments, available water, surface and subsurface drip irrigation, crop coefficient and evapotranspiration.