Determination of Plant-Pan Coefficients for Field-Grown Eggplant (*Solanum melongena* L.) Using Class A Pan Evaporation Values

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Abstract

This study was conducted to determine the most suitable plant-pan coefficient for eggplant, using pan evaporation values, in field conditions. Application of irrigation water was based on cumulative class A pan evaporation within the irrigation intervals. Irrigation treatments consisted of one irrigation interval ($I1$: 7 day) and five plant-pan coefficients ($K_{cp}1$: based on percent crop canopy closure; $K_{cp}2$: 0.50; $K_{cp}3$: 0.70; $K_{cp}4$: 0.90; $K_{cp}5$: 1.10). Average irrigation values for each treatment varied from 372 to 689 mm, average evapotranspiration values ranged from 420 to 689 mm and eggplant fruit yield ranged from 10.11 to 21.14 tonnes ha^{-1}. The highest total and early fruit yield was obtained from the $K_{cp}4$ and $K_{cp}3$ treatments, respectively. Seasonal yield response factor (K_y) was 0.60. E_t/E_{pan} ratios for each treatment varied from 0.18 to 1.32. In addition, irrigation levels substantially affected yield ($P < 0.001$) and fruit number ($P < 0.01$). A significant correlation between irrigation water volume and plant vegetative growth traits, and between plant water consumption and fruit yield, were found. Thus, in irrigation programming, the $K_{cp}4$ plant-pan coefficient is recommended for field-grown eggplant.

Keywords: Water use efficiency; Eggplant; Evapotranspiration; Plant-pan coefficient