

## Lysimetric determination of Water Requirement and Crop Coefficient of Date Palm in Vegetative Growth Phase

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### Abstract

It is necessary to determinate of crop water requirement for optimum use of agricultural water resources. This research was carried out for determining water requirement and crop coefficient of *Barhee* date palm in the first to third year of vegetative growth. A drainage lysimeter was used to measure reference evapotranspiration ( $ET_r$ ) and three drainage lysimeters were used to measure evapotranspiration of date palm ( $ET_c$ ). The amounts of reference evapotranspiration and  $ET_c$  were calculated using soil water balance. The results showed that  $ET_r$  values in the first to third year were 2105, 1827, and 2021.8 mm, respectively, while seasonal  $ET_c$  in vegetative growth were 274.3, 402.7, and 597.2 mm, respectively.  $ET_c$  increased 46.8% and 48.3%, yearly. The crop coefficient of *Barhee* date palm was 0.08-0.18 in the first year. In this year, the minimum crop coefficient was recorded in May, while the maximum crop coefficient was in October and January. But, the date palm crop coefficient was 0.10-0.30 in the second year and 0.19-0.43 in the third year of vegetative growth. In second and third years of vegetative growth, the minimum crop coefficient was recorded in March. In the second year, the maximum crop coefficient was observed in August and January, while the maximum crop coefficient in the third year was obtained in November. The increasing plant age and vegetative growth could be the main reasons for the difference in the amounts of water requirement and crop coefficient of date palm in the first to third year.

**Keywords:** Irrigation, Irrigation scheduling, Soil water balance, Evapotranspiration, *Barhee* date palm.

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\*- Received :December 2016, and Accepted: September 2016