Evaluation of evapotranspiration coefficient and daily crop reference evapotranspiration in a semi-arid region based on field water balance and FAO method

ABSTRACT

Precise estimation of daily crop reference evapotranspiration and crop coefficients (K c) is required for determining crop water use in order to practice proper irrigation management. Crop coefficients, which have been presented for most crops by FAO based on four crop stages (initial, development, middle, and late) are affected by many factors including soil moisture, growing degree days (GDD) and leaf area index (LAI). Therefore, the above-mentioned factors have to be considered in estimating these values. The purpose of this study was evolution of crop coefficients for sugar beet crop based on field water balance and FAO method through measuring soil moisture variation, and evaluating reference ET by FAO-penman-monteith equation in a semi-arid region. Crop coefficient curves and various mathematical relationships were developed for growth period to estimate the crop coefficient for this crop. The K c values during the growing season was 0.59, 1.19 and 0.85 for initial, mid and end stage respectively. The K c ini that was estimated with field water balance method was greater than FAO method but K c mid, K c end were lesser than FAO method over the growth season.

Keyword: Crop coefficients; FAO method; Field water balance; Sugar beet