DETERMINATION OF THE CROP COEFFICIENT (KC) FOR AVOCADO CV. HASS IN CHILE

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The continuous increase in the surface of cultivated avocados registered during the last decade in Chile, forces the producers to optimize the management designed to increase the production and improve the quality of the harvested fruit. For that, the determination of the water requirements of the avocado tree is very important. For this reason, an assay was conducted during 2 years on a commercial Hass avocado orchard, to estimate the cultivation coefficient values (Kc) and the annual volume of water required per hectare. Moreover, the effect of different irrigation volumes over the vegetative and reproductive development of the trees was evaluated.

Water volumes corresponding to 90, 100, 110 and 130% of the evapotranspiration (ETc), determined by a modified Penman-Monteith method, in base of the measurements of an automatic meteorological station installed on the orchard, were applied. The irrigation frequency was determined by the partial drain off of the water in the soil, using tensiometer measurements at different soil depths.

When the determined Kc values for the area of application of the treatments watered with 90 and 100% ETc were used, a severe water stress was observed in the trees, expressed in the reduction of the trunk and short branches perimeter growth, compared to the treatments watered with 110 and 130% ETc. Under the agro-climate conditions where the assay was carried out, the avocado Kc value is closer to the treatments watered with 110 and 130% ETc. In all the treatments, the water tension measurements in the soil in fall and winter revealed values higher than the appropriate range, inferring that the Kc of those seasons can be similar to the months with a highest water demand.

Considering a Kc of 110 to 130% ETc and discounting the effective annual precipitation, the water requirements for an established avocado orchard will reach 7000-9000 m^3/ha/year.

The analysis of the yields obtained with each treatment indicates that the treatment of 90% ETc results in a 21% fruit decrease compared to the control (100% ETc). The treatment watered with 110% ETc results in a 5% fruit increase compared to the control. When the percentage of fruit size is analyzed and related to kilograms and the projected prices, the results show that the treatment of 90% ETc results in a 35% decrease in profits to the producer compared to the treatments of 100 and 130 ETc, while the treatment of 110% ETc results in a 13% increase in profits to the producer. From these results the Kc value proposed for avocado for each month along the year is 0.72.