



## **Preliminary study to determine the crop coefficient for chufa crop using a lysimetric station**

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Chufa (*Cyperus esculentus* L. var. *sativus* Boeck.), also called tigernut, tiger nut or yellow nutsedge, is a traditional crop in Valencia (Spain). It is globally considered as a minority crop, however, it is of great importance at local level, since it is one of the few horticultural crops that are, nowadays, economically profitable for the growers. Chufa is cultivated for its tubers, which are mainly used to produce “horchata”, a popular and refreshing drink. It is traditionally furrow irrigated, with significant water consumption (up to  $10,000 \text{ m}^3 \text{ ha}^{-1} \text{ year}^{-1}$ ) and low application efficiencies (down to 30%). The research team that presents this study has undertaken several experiments during the last years, with the aim of minimizing the water applied and improving the irrigation water use efficiency in chufa, both in furrow and drip irrigation. Although the improvements obtained are considerable, they are not definitive, as the water requirements of the crop are still unknown. In order to know these needs, both the crop evapotranspiration (ET<sub>c</sub>), and the crop coefficient should be determined, being their determination the objective of the present study. The experiment has been carried out during the 2018 season, on an experimental plot in the Universitat Politècnica de València, within the traditional cultivation area. A lysimetric station (Smart Field Lysimeter) was installed in the plot, allowing to determine the daily ET<sub>c</sub>. Furthermore, the plot contains a meteorological station, which provides the parameters required for the determination of the daily reference crop evapotranspiration (ET<sub>o</sub>) through the FAO-56 Penman-Monteith method. The crop coefficient (K<sub>c</sub>) values can be obtained by relating the values of ET<sub>c</sub> and ET<sub>o</sub> corresponding to the different growth stages during the crop cycle. Considering the crop development, the length of the four growth stages were established for the initial, development, mid-season and late season stages. The single K<sub>c</sub> values for the initial, mean and end of the late season stages are being established. These K<sub>c</sub> values will allow to adjust irrigation water doses to water needs, thus reducing the water applied and improving the irrigation application efficiencies in chufa crop.