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Preliminary estimation of Arracacha's water requirement using lysimeter field data

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Arracacha (*Arracacia xanthorrhiza*) is not only a potential income-generating crops for medium and small farmers in Cajamarca, Tolima, Colombia with a total cultivated area of about 4000 ha, but also a high agro-alimentary and socioeconomic value in the region. Unfortunately, despite the importance of Arracacha there is not enough information available on Arracacha's water requirements and crop coefficients (Kc) in Colombia. Arracacha is a quite tolerant crop to the droughts, nevertheless, in cases of climatic adversity, the risk of loss of productivity is high. Therefore, the adequate administration of water and irrigation is fundamental to maintain high productivity. The aim of this research was to estimate the daily actual evapotranspiration (ETc) to present preliminary irrigation water requirement of Arracacha. Two volumetric lysimeters of 1 m3 capacity were installed to establish the crop water consumption according to water balance. A common procedure for estimating ETc from a well-watered crop is to first estimate reference evapotranspiration (ETO) based on evaporation pan. The average weekly ETc varied from <1 mm.day-1 to 5.73 mm.day-1 for lysimeter 1, in the early growing period (week 1 to 37) and from <1 mm.day-1 to 5.66 mm.day-1 for lysimeter 2. The peaks ETc were 7.2 mm.day-1 and 9.7 mm.day-1 for lysimeter 1 and 2, respectively, both occurred in week 39 of the growing stage. The highest demand was due to the formation and filling of the turnip. The results indicated that future research shall address to more precise information about Kc and ETc using meteorological station data associated with the experiment. The generated ETc and Kc data will be used as input for FAO-AquaCrop model to estimate crop water requirements and crop yield. AquaCrop will be then calibrated for Arracacha crop parameters.

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