Measurement of Crop Water Requirement for Eggplant with the Assistance of Low Cost Arduino Soil Moisture Investigator

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Even though there are some techniques to find crop water requirements, till now most of the farmers irrigate their field with excess of water due to several difficulties in applying such techniques. This kind of continuous unscrupulous activity may increase the severity of the water scarcity. Therefore it is essential to calculate the crop water requirement directly at the corresponding fields and giving this information to the famers will guide them towards precision irrigation and ultimately supports the water sustainability. Through the present study we vindicated the crop water requirement for eggplant with the assistance of Arduino soil moisture investigator. In order to do so a device was established in the Arduino platform according to the guidelines. Then the egg plants were planted in two drip fixed fields at two different times each field was allowed to have 6 columns and 13 rows. Such time variation in planting was maintained to facilitate the root study in one field before the irrigation of the other field. One field was planted 31 days prior to other field and from this field, plants were uprooted according to monolith method randomly on the basis of 4 plants in each column and they were investigated for horizontal and vertical root length in predetermined durations such as 18, 38, 58, 78 and 108 days after planting. In the late planted field, according to the investigated root lengths the soil moisture sensors were placed and the field was irrigated up to the field capacity level and it was re-irrigated from 50% depletion level. During the irrigation, the needed time to irrigate the plants was measured along with the emitter flow rate. From the above mentioned parameters, the total needed water for a single plant was calculated for first 18 days after planting, then four times with the 20 days interval and finally having one time with 30 days interval and he quantities of water needed were 0.58, 0.88, 1.24, 1.21 and 0.92 L/day, respectively. Hence, the total water requirement of an eggplant up to 108 days after planting is around 104.6 L. The cost for an Arduino soil moisture investigation in one field is around Rs. 536 and it is bearable by farmers when compared to the over irrigation costs.

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