# Effect of Deficit Irrigation on Growth Parameters of Eggplant (*Solanum melongena* L.)

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Due to several unprincipled human activities, available water is being depleted immensely, as a result of such reduction, now the agriculture sector is under perilous condition. In order to rectify the water scarcity issues, reduction in water usage will be the best option. Considering about water usage, larger fraction of water is being withdrawn for irrigation purposes and most part of such applied water is drained off to the groundwater, certain part is evaporated and a minor part is utilized by plant. Reducing water quantity during irrigation is a substantial way to ensure the sustainability of water. This study was targeted to compare the effect of plant growth under deficit irrigation at a level of 70 % of the total water requirement of plants with the standard irrigation. Eggplants (*Solanum melongena* L.*)* seedlings raised from a selection called "plastic" were planted in three different plots during the *yala* season of the year 2017. First plot was irrigated with the recommended quantity of water by the Department of Agriculture Farm, Thirunelvely as 2 l/plant/day (30 minutes of irrigation via the 4 l/h) using pressure compensated emitters and root lengths of plants were measured. Second plot was irrigated up to the 70 % of water requirement of plants via the drip by using arduino based semi-automated Yl- 69 soil moisture sensors, inserted up to the top half part of measured root lengths and maintained up to the field capacity. The third plot was irrigated with excess water same like farmer practices, which is approximately 604.8 l up to 108 days after planting. Then the growth parameters such as plant height, leaf number and canopy diameters were measured in pre-determined time period as 18 days, 38 days, 58 days, and 78 days 108 days after planting. All growth parameters were comparatively high in over irrigation conditions and the parameters were analyzed via the independent sample t-test. Significant variation was observed from 58 days after planting. Growth per liter at the end was high for the deficit irrigation at 70 % level. Therefore in terms of growth per liter, to ensure water sustainability, the deficit irrigation through drip system will be the better one, than what the farmers are practicing (over irrigation).

**Key words**: Arduino, Crop water requirement, Eggplant, Irrigation, Root analysis