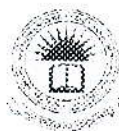


**EFFECT OF DIFFERENT IRRIGATION INTERVALS
ON THE GROWTH AND YIELD OF CHILLI IN SANDY
SOIL**



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ABSTRACT

The damaging effect of climate change on global food security has assumed a frightening dimension leading to food shortages due to water scarcity in developing nations. The need for efficient irrigation scheduling for improving crop productivity especially chilli therefore became imperative. Chilli is one of the important vegetable crop cultivated in the dry zone of Sri Lanka. Temporal and spatial water scarcity has been a major problem in the Dry Zone areas from ancient times during the dry weather conditions. To alleviate the problem, deficit irrigation was proposed for some vegetables including chilli. This practice may be more applicable than full irrigation when water supplies are limited or irrigation costs are high. Therefore, water demand for irrigation can be reduced, and the water saved can be used for other sectors or be diverted to irrigate additional land, meanwhile maintaining relatively high water use efficiency (WUE) and supporting the sustainability of irrigated agriculture through irrigation scheduling.

A study was carried out to evaluate the effect of different irrigation intervals on growth and yield of chilli at the crop farm of Eastern University, Sri Lanka, Vantharumoolai, Batticaloa district. The experimental setup was a Randomized Complete Block Design of four treatments and five replicates. The treatments applied were; T1 (irrigated daily as control), T2 (at 3 days irrigation interval), T3 (at 5 days interval for first 12 weeks and then with 6 days interval) and T4 (at 7 days irrigation interval). The crop coefficient for this treatment for initial, development and mid-season stage was found to be 1.05, 1.05 and 0.9 respectively. The purpose of this research was to examine the suitable irrigation interval for chilli grown on a sandy soil in dry weather conditions.

In order to study the effects of irrigation intervals on crop growth and yield, measurements on plant growth characteristics (plant height, leaf area, number of leaves, branches) and yield attributes (Number of flowers, pods) were carried out. Simultaneously fresh and dry weight of plant shoots, roots, and fruits were recorded periodically. High irrigation had higher growth rate on crop characteristics, such as plant height (64.3cm), leaf area (28.48cm²), shoot fresh weight (112.09g), shoot dry weight (28.01g), root fresh weight (12.58g), root dry weight (3.85g) etc. Daily irrigation produced the highest yield of 11623.9kg/ha. And statistical analysis confirmed that there were significant differences between the daily irrigation plots with other treatments at 0.05 probability level. The daily irrigation significantly increased the yield attributes of chilli, whereas irrigation at 3 days and 5 days did not influence significantly.

The growth, yield and WUE were significantly lower for treatment with 7 days irrigation interval. The yield reduction was by 45.4% for 7 days irrigation interval from daily irrigated plots which was significantly higher.

In most of the parameters studied, daily irrigation shows highest desirable output, 7 days irrigation interval shows the lowest, while 3 days irrigation interval and 5 days irrigation interval were in between. Only a slight deviation was noticed in case of the results from 3 days irrigation interval and 5 days irrigation interval treatment. Statistical analysis among the agronomic parameters showed significant difference ($p < 0.05$) in all the treatments. The WUE was also highest for control (7.71kg/ha-mm); though the amount of water applied was high but it is compensated by the yield obtained. The tremendous effect of water use pattern on the yield and agronomic parameters of the crop was evident from the study.

According to the results it could be concluded that, though the irrigation at the crop requirement serves water with high water use efficiency, daily irrigation is produced high yield and most suitable at dry conditions. The reason is due to the change in climatic factors the water requirement of the crop fluctuates frequently which results in the reduction in yield. Therefore, irrigation scheduling at 5 days intervals i.e. at the actual crop requirement is not suitable for chilli cultivation in dry zone in sandy soil.

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