

Effect of soil moisture stress at various growth periods on the yield of chilli (*Capsicum annum* L.) crop.

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ABSTRACT

The field experiment was conducted in summer season on clay soil having depth more than 60 cm at Central Campus, Mahatma Phule Krishi Vidyapeeth, Rahuri to study the effect of soil moisture stress at various growth period of Chilli crop (*Capsicum annum* L.) cultivar Jwala. The maximum yield of green chilli (55.22 q/ha) was observed in control treatment, which was not stressed at any growth period. The minimum reduction in yield was observed in T₂ (7.24 %) where in the stress was exposed during critical growth period (pre flowering) and maximum yield reduction was observed in T₅ (97.49 %) where in the stress was applied in flowering and fruiting stage.

Key words : Yield of Chilli, Soil moisture stress, Soil moisture.

INTRODUCTION

Among the various production components water is the most important. However the water resources are scarce. Hence the efforts are required to the efficient use of water, so as to increase the crop production within the limits of available water resources of the country. There are several ways to use water resources efficiently. Optimum use of water through proper scheduling is one such option. The potential yield of crop can be obtained if there are no constraints inputs required for crop production. However, when the inputs such as waters are scarce, the crop is subjected to stress reducing the yield. The reduction in depends on the degree of stress offered during different crop growth stages. To enable to predict the crop yield due to moisture stress at various growth stages, it is essential to find out the relation of water use and crop yield when the crop is stressed at various growth periods. Several studies are reported on scheduling of irrigation for Chilli (*Capsicum annum* L.). These studies indicated that the use of CW/CPE ratio of 0.6, 0.8 for chilli and irrigation to be applied at 40 % depletion of available soil moisture. However, moisture stress to chilli crop in particular growth stage was not observed. Chilli (*Capsicum annum* L.) is one of the major spices crop. It is used as green chillies or red chillies. The green chillies are rich in vitamin A and C. Therefore considering the importance of crop and its appropriate irrigation scheduling when water is scarce, the field experiment was undertaken to evaluate the effect of soil moisture stress at various growth periods on the yield of chilli crop.

MATERIALS AND METHODS

The experiment was conducted on clay soil having

depth up to 60 cm. The experiment was laid out in randomized block design with seven treatments and four replications. The treatments were as given in Table 1.

The ridges and furrows were prepared at the spacing of 60 cm in each block. The size of the block was 3 x 5 m. The buffer space of 2 m was kept between the treatments and 4 m between the replications. The seedling were prepared on raised bed and transplanted in the first week of February. Standard agronomical practices were followed for the cultivation.

Irrigation Scheduling

Before transplanting of crop, irrigation was applied to bring the soil moisture to field capacity. The second irrigation was applied at the transplanting of crop. The next common irrigation to all the treatments was given two days after transplanting for establishment of crop. The subsequent irrigations were scheduled on the basis of soil moisture depletion and stress period of underlying treatments. In control treatment no stress was given during crop growth period. It was considered in this study that the chilli crop was not subjected to stress if irrigated at 40 % depletion of available soil moisture. Therefore, control treatment was irrigated when 40 % of available soil moisture was depleted from the root zone of the crop throughout the crop period. In remaining treatments irrigation was applied at 40 % depletion of available soil moisture except during no irrigation period (stress period). Thus, during this period irrigations were missed (for the period 25 days) When the stress period was over, the irrigation was applied to bring the moisture content to the field capacity and subsequent irrigations were given at 40 % available soil moisture depletion.

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