

A NOVEL APPROACH FOR GROWING CAPSICUM: A HYDROPONIC SYSTEM TREATED WITH RICE HULL LEACHATE FOR ENHANCED PERFORMANCE OF *CAPSICUM ANNUUM* L.

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Capsicum (*Capsicum annuum* L) is a vegetable which fetches a high demand both in local and export market. Growing capsicum in the field involves extensive labor and a high cost of agrochemicals to assure good yield and quality. Hydroponics is a suitable system of growing crops in which space, fertilizer and labor are efficiently used. Silicon has long been known as a beneficial element particularly in hydroponic systems, which increases plant growth and yield and also reduces fungal diseases. Rice hull is a byproduct, which is not utilized properly and is readily available. It has been reported that rice hull leaches have a high amount of soluble Si and a very low amount of other ions. The objective of this research was to investigate the effect of rice hull leachate on the performance of *Capsicum annuum* L.

Rice hull leachate having 5 ppm Si was prepared by soaking 2 kg of rice hull in 50 L of tap water for two days and analysed for molybdo reactive silica. Two treatments were imposed; nutrient solution with rice hull leachate (T-leachate) and nutrient solution without rice hull leachate (T-control) each with three replicates consisting four plants per replicate. *Capsicum annuum* L. cv. "Muria F1", which has early blooming and fruit setting was used in the study. Healthy, 6-week old plants were transferred to noncirculating hydroponic system supplemented with nutrient solutions– NFG (for growth stage) and NFB (for bloom and fruiting stage). The nutrient solution was renewed once a week and leachate (5 ppm Si) was also introduced to T-leachate medium. The growth, yield and fruit quality parameters were measured. Resistance against anthracnose disease was assessed by artificial inoculation of *Colletotrichum gloeosporioides* on fruits and measuring the lesion area for 10 days. Data were analyzed using one way ANOVA in Minitab 14 statistical software.

Capsicum plants treated with rice hull leachate showed a significant increase in weight of fruits/plant (51 %), fruit weight (37 %), fruit length (32 %), shoot length (60 %), root length (100 %), no of leaves (55 %) and leaf area (44 %) compared to T-control. A 51 % reduction of anthracnose disease was observed in T-leachate compared to T-control. However, there was no significant difference in fruit quality parameters (total soluble solids, pH and fruit firmness) observed in treated fruits compared to control fruits. Therefore, it can be concluded that, rice hull leachate could be used as a low cost silicon source for hydroponic system to enhance performance of Capsicum cv. 'Muria F1'.

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