

A Comparative Study on Capsicum (*Capsicum annuum* L.) Grown in Polyhouse and Open Field Condition Under Climatic Situation of Tripura

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ABSTRACT

The present investigation was conducted in instructional farm of KVK, West Tripura with an objective to find the actual result under climatic condition of Tripura, during 2014. The investigation revealed that highest no. of fruits/ plant (38) along with maximum fruit diameter (5.7 cm), individual fruit weight (58.8 g), crop duration (195 days), yield (8.55 kg/m²) and BC 3.5 and lowest pest and disease % was recorded in Capsicum grown under polyhouse conditions in comparison with the open field condition. It can be concluded that protected condition considerably enhance production of capsicum as compared to open fields.

Key words Capsicum, Poly house, Tripura

Capsicum (*Capsicum annuum* L. var. Grossum Sendt) commonly known as sweet Pepper / Bell Pepper or Shimla Mirch, is a member of the family Solanaceae and considered as luxury vegetable being used in Pizza making throughout the globe. Tropical South America, especially Brazil is thought to be the original home of Peppers (Shoemaker and Teskey, 1955). The fruits are harvested either at green mature stage or at colouring stage and is a very good source of vitamin A & C and other nutrients having great demand in big cities and other urban areas of the country and fetch very high price. It's gaining popularity among farmers due to its quick and high returns. Under open conditions, quality and productivity of the produce is poor, which reduces profit margins of Capsicum growers. Because of its economic importance as a high value vegetable crop both in domestic and overseas markets due to more consumer preferences and use in various culinary products, quality production of capsicum is the need of the day. This has led to production of

Capsicum under protected conditions to meet the standards of different markets prompting popularity of this crop as an enterprise in urban and semi urban areas. Total weight of Capsicum inside polyhouse is more than double compared to outside. To make its cultivation successful, protected cultivation is most suitable solutions (Chandra *et al.*, 2000 and Singh *et al.*, 2004 and 2010). The advantages of protected cultivation are- Higher productivity resulting in increased yield; Provides better growing environment to plants; Protects from rain, wind, high temperatures; Protected structures act as physical barrier and play a key role in IPM by preventing spreading of insects, pests and viruses causing severe damage to the crop (Singh *et al.*, 2003) and thereby improving the quality and yield; Facilitates year round production coupled with yield enhancement by 2-3 times compared to open cultivation. In addition these structures facilitate the utilization of nutrients from soil for longer duration (Singh *et al.*, 2005a, 2005b, Singh, 2003).

MATERIAL AND METHODS

Though it is well-known that Capsicum is suitable for green house cultivation, still the technology was assessed to find the actual result under climatic condition of Tripura. With this objective the experiment was laid to study a comparative result with Capsicum grown under protected and open field condition.

Site of Experiment:

The experiment was conducted during 2014, at the instructional farm of KVK, West Tripura under naturally ventilated polyhouse and open field condition. KVK, West Tripura is located in Khowai district of Tripura at an altitude of 23 m mean sea level, latitude 23.84N, longitude 91.27E. Soil of the

experimental site was sandy loam, acidic with P^H 5.8, 0.52% organic carbon, low in available nitrogen (217.65 kg/ha), medium in available phosphorus (22.82 kg/ha) and available potash (177.68 kg/ha).

Crop:

Capsicum var. Bharat was selected for the experiment. This is F_1 hybrid Capsicum released by Indo-American Hybrid Seeds, Bangalore. Plants are vigorous and productive. It yields bell shaped, thick walled and mostly 4 lobbed fruits (Bose *et al.*, 1993).

Package of Practice:

Seedlings of 30-35 days old are used for transplanting. Care should be taken to see that no damage is occurred to roots and transplanted at a spacing of 45cm x 30cm during September 3rd week. A fertilizer dose of 75:75:75 NPK is required per ha and is applied to the beds uniformly before transplanting along with 100 q. of FYM. Whole quantity of FYM, P, K and half of N is applied at the time of field preparation. Remaining half quantity is applied as top dressing in two equal splits at one month interval after transplanting. Stacking is done with Bamboo stick. This is practiced after four weeks of transplanting. The tip of the plant splits into two at 5th or 6th node and are left to grow. These two branches again split in to two giving rise to four branches. At every node of the tip splits into two giving rise to one strong branch and one week branch. The pruning is done after 30 days of transplanting at an interval of 8 to 10 days, resulting in bigger fruits with better quality and high productivity.

Plant protection – Need based.

RESULT AND DISCUSSION

Data on different crop parameter and economics are shown below in Table 1.

The data presented in Table 1 exhibited that highest no. of fruits/ plant (38) was recorded in Capsicum grown under polyhouse conditions along with maximum fruit diameter (5.7 cm), individual fruit weight (58.8 g), crop duration (195 days), yield (8.55 kg/m²) and BC 3.5. The above observations were recorded lowest under open field condition. Plants grown in polyhouse experienced minimum incidence of pest and disease % whereas it was maximum in open field condition i.e., 44.2 and 12.4 respectively. The higher fruit yield, better economics and minimum disease & mortality was recorded under polyhouse condition due to its protective ability against major a biotic stresses, which reduces the effect of the excess rainfall, water logging and provides controlled environment (3–4°C higher temperature than open field condition) to the crop (Singh *et al.*, 2003 and Singh *et al.*, 2010). The open field condition also promotes disease in plant and fruits (Singh *et al.*, 2003, 2005b). The higher yield in polyhouse might also be due to improved climate in these conditions. In polyhouse the temperature was found to be 3–4°C higher than open condition

It is concluded from the study that in case of green house condition crop duration increases up to 195 days; whereas under open field condition it is only for 96 days. The quality of fruit in terms of size, shape, colour intensity was better in polyhouse condition with maximum yield. It can be summarized that protected conditions considerably enhance production of Capsicum as compared to open fields.

Table 1. Crop parameter and Economics of Capsicum grown in polyhouse and open field condition under climatic situation of Tripura

S.N.	Cropping situation	Nos. of fruit/plant	Individual fruit weight (g)	Fruit Diameter (cm)	Pest & disease (%)	Crop Duration (days)	Yield/m ² (kg)	B:C
1.	Polyhouse condition	38	58.8	5.7	12.4	195	8.55	3.5
2.	Open Field condition	25	33.9	3.5	44.2	96	3.12	1.5

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