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## Growth and fruit yield of coloured capsicum hybrids (*Capsicum annum* L.) influenced by plant spacing under polyhouse condition

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**ABSTRACT :** The plant height, number of branches/plant, leaf area/plant, and fruit yield quintal/hectare was highest in case of capsicum hybrid Orbelle. Whereas, the parameters *viz.*, plant height, number of branches/plant, leaf area/plant, dry matter/plant was more in case of plant spacing 60 cm x 60 cm. However, the fruit yield (q/ ha) was highest in case of plant spacing 45 cm x 45 cm. The interaction between capsicum hybrid and spacing was found to be non significant.

**KEY WORDS :** Orbelle, Bomby, Hybrid, Capsicum, Spacing

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**C**apsicum (*Capsicum annum* L.) is also called as sweet pepper or bell pepper; it is one of the most popular and highly valued vegetable crop grown in India. It is grown in several parts of the world and believed to be native of tropical South America (Shoemaker and Teskey, 1995). In sweet pepper the gene is recessive, so the fruit do not contain capsaicin. The fruits are commonly eaten as green, cooked, raw, sliced, stuffed with sautéed, pizza, meat loaf, dehydrated processed meat and pork and used for dressing of foods.

Polyhouse production technology of vegetables emphasizes the need for having approximate plant densities in order to boost up the production per unit area and time. However, work on planting geometry under polyhouse condition for sweet pepper is very meagre in general in India and particularly in Maharashtra state. The present study was, therefore, undertaken to study the effect of plant spacing on coloured capsicum hybrids under polyhouse condition.

### RESEARCH METHODS

The present investigation was carried out at Hi-Tech Horticulture and vegetable Project, College of Agriculture, Pune during 2007–08. The experiment was laid out in Factorial Randomized Block Design in the naturally ventilated polyhouse on raised beds of red soils having a pH of 7.5. There were six treatment combinations comprising of two coloured capsicum hybrids (Bomby and Orbelle) and three spacings (45 cm x 45 cm, 60 cm x 45 cm and 60 cm x 60 cm). The solution of water soluble fertilizers (nitrogen, phosphorus, potash and calcium) were prepared and applied through drip irrigation system. It was applied in the ratio of 2:05:1:05 (N:P:K:Ca) upto three months from transplanting (during the period of vegetative growth) and 1:05:2:05 (N:P:K:Ca) three months onward (during the period of fruit harvesting). Electric conductivity was kept constant between 1.6 to 1.8 mmhos/mole of solution prepared. During irrigation neutral pH (6.5) was maintained.

**Table 1: Effect on growth and fruit yield of different coloured capsicum hybrids due to different spacings**

Treatments	Plant height (cm)	No. of branches plant <sup>-1</sup>	Leaf area plant <sup>-1</sup> (dm <sup>2</sup> )	Dry matter plant <sup>-1</sup>	No. of fruits plant <sup>-1</sup>	Length of fruits (cm)	Diameter of fruits (cm)	Fruit yield (q ha <sup>-1</sup> )
<b>Hybrid</b>								
Bomby(H <sub>1</sub> )	212.70	66.37	20.01	0.18	18.14	5.22	5.98	931.33
Orbelle(H <sub>2</sub> )	215.00	69.05	21.33	0.19	18.05	5.11	5.63	957.36
S.E. ±	0.63	0.71	0.40	0.002	0.28	0.13	0.11	8.56
C.D. (P=0.05)	1.96	2.21	1.24	0.009	NS	NS	NS	23.97
<b>Spacing</b>								
45 cm x 45 cm (S <sub>1</sub> )	206.67	62.30	17.40	0.16	17.91	5.08	5.77	1082.48
60 cm x 45 cm (S <sub>2</sub> )	213.93	69.01	19.95	0.19	18.12	5.15	5.79	976.56
60 cm x 60 cm (S <sub>3</sub> )	220.95	71.82	24.66	0.19	18.22	5.26	5.86	774.00
S.E. ±	0.77	0.87	0.49	0.003	0.34	0.16	0.14	10.48
C.D. (P=0.05)	2.40	2.71	1.52	0.01	NS	NS	NS	29.36
<b>Interaction</b>								
S.E. ±	1.09	1.23	0.69	0.005	0.49	0.23	0.19	14.82
C.D. (P=0.05)	NS	NS	NS	NS	NS	NS	NS	NS

NS=Non-significant

## RESEARCH FINDINGS AND DISCUSSION

The findings of the present study as well as relevant discussion have been presented under following heads :

### Effect of hybrids:

The growth components *viz.*, plant height, number of branches/plant, leaf area/plant and dry matter production/plant differed significantly due to different capsicum hybrids. Significantly higher values of plant height (215.00 cm), number of branches/plant (69.05) leaf area/plant (21.33 dm<sup>2</sup>) and dry matter/plant (0.19 kg) were observed in Orbelle. Whereas, the yield components *viz.*, number of fruits/plant, length of fruit and diameter of fruit were not differed significantly due to different capsicum hybrids. However, the fruit yield was significantly more (957.36 q/ ha) in case of Orbelle (Table 1). This might be due to its genetic makeup, morphological characters, inherent genetic yield potential ability and more responsive to polyhouse condition.

### Effect of spacings :

The growth characters *viz.*, plant height, number of branches/plant, leaf area/plant and dry matter production/plant also differed significantly due to different planting geometry. Except, the equal dry matter production/plant with spacing 60 cm x 45 cm the wider spacing 60 cm x 60 cm showed significantly superior values of plant height (220.95 cm), number of branches/

plant (71.82), leaf area/plant (24.66dm<sup>2</sup>) and dry matter production/plant (0.19 kg) than 45cm x 45 cm and 60 cm x 45 cm. This might be due to availability of more space, nutrients, moisture, light etc. to each and every plant which contributed in phasic growth and development of plant. Similar increase in the growth parameters at wider spacing were noticed and reported by Decoteau and Graham (1994); Motsenbocker (1996); Ekwu and Okporie (2006); Faiza-Aman *et al.*(2002); Nyambi *et al.* (2003) and Choudhary and Singh (2006) in sweet pepper.

Similarly, the yield attributes *viz.*, number of fruits/plant, length of fruit and diameter of fruit were found to be non-significant in all spacing geometry. However, the fruit yield (1082.48 q/ha) was significantly highest in case of closer spacing (45 cm x 45 cm) (Table 1) and it was 9.78 and 28.50 per cent more than intermediate (60 cm x 45 cm) and wider spacing (60 cm x 60 cm), respectively. The maximum fruit yield in closer spacing (45 cm x 45 cm) might be due to higher plant density per unit land area. Increase in desired plant density have been reported to increase in the total fruit yield of capsicum by Thomas *et al.* (1982); Lopez and Silvasrios (1986); Nyambi *et al.* (2003); Al-Gharibi and Abu-Awwad (2005); Choudhary and Singh (2006) and Agarwal *et al.* (2007) in pepper. The interaction between capsicum hybrid and spacing combination was found to be non-significant in all growth and yield characters and fruit yield.

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