

Original Research Article

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## Study on Naphthalene Acetic Acid and Gibberellic Acid on Growth and Quality of Capsicum (*Capsicum annum* L.) cv. Indra under Shade Net Conditions

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### ABSTRACT

#### Keywords

Capsicum, NAA, GA3, Growth, Quality, Shade net condition.

#### Article Info

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The present investigation entitled “Study on naphthalene acetic acid and gibberellic acid on growth and yield of capsicum (*Capsicum annum* L.) cv. Indra under Shade net condition” was carried out at the vegetable research farm of the Department of Horticulture, Sam Higginbottom Institute of Agriculture, Technology and Sciences (Deemed to-be University), Allahabad during the Rabi season of 2014 – 2015, the experiment was laid out in Randomized Block Design having 9 treatments 3 replications. The experiment revealed that NAA @ 60 ppm increased plant height, early flowering, number of branches, plant spread, number of flower per plant, shelf life, TSS, With the above result it can be concluded that NAA @ 60 ppm is very much beneficial for the growth and quality of capsicum.

### Introduction

Vegetables are an important crop in horticulture sector, occupying an area of 9.20 million ha during 2012-13 with a total production of 162.2 million tones and having average productivity of 17.6 tones /ha. In fact vegetables constitute about 61% of horticulture production. Bell pepper (*Capsicum annum* L.) belongs to the family Solanaceae under the genus *Capsicum* (Shoemaker *et al.*, 1995).

The crop is a native of Tropical South America especially Brazil which is thought to be the original home of peppers (Islam *et al.*, 2010). It is also used in salad and soup preparation. It is very rich in vitamins A (180

IU) and vitamin C than that of tomatoes. From every 100 gram of edible portion of capsicum 24 k cal of energy, 1.3 gram of protein, 4.3 gram of carbohydrate and 0.3 gram of fat is provided.

It has attained a status of high value crop in India in the recent years and occupies a pride place among vegetables in Indian cuisine, because of its delicate taste and pleasant flavor coupled with rich content of ascorbic acid and other vitamins and minerals. The mature-fruits (green,-red and-yellow) of sweet pepper are eaten raw or widely used in stuffing's, baking's, pizza and burger preparations.

## Materials and Methods

The present investigation entitled “Study on Naphthalene Acetic Acid and Gibberellic Acid on Growth, Yield and Quality of Capsicum (*Capsicum annum* L.) cv. Indra under shade net Condition” was conducted from October 2014 -May 2015. The experiment was laid out in a Randomized Block Design with 9 treatments and 3 replications at the experimental field of the Department of Horticulture, Sam Higginbottom Institute of Agriculture, Technology and Sciences, Allahabad.

The experimental site is located at a latitude of 20° and 15° North and longitude of 60° East and at an altitude of 98 meters above mean sea level (MSL) and variety selected for research was INDRA (I.A.R.I., New Delhi). Maintaining a spacing of 60x40 cm for transplanting, for spraying the growth regulator (promoters) solutions were prepared as per the requirement *i.e.* 1ml of growth regulator (promoters) in 10 liters of water gives 100ppm, meanwhile solution prepared as per the requirement sprayed at pre bloom and fruit development stage. Five plants recording observations. The recommended package of practices was followed for raising the successful crop. Data on plant growth and quality characters were recorded seven months after transplanting when the plants were fully grown. Treatment (T<sub>0</sub> – control, T<sub>2</sub> – GA<sub>3</sub> 60ppm, T<sub>3</sub> - GA<sub>3</sub> 80ppm, T<sub>4</sub> - GA<sub>3</sub> 100ppm, T<sub>5</sub> - NAA 30ppm, T<sub>6</sub> –NAA 40ppm, T<sub>7</sub> – NAA60ppm, T<sub>8</sub> –NAA100ppm, T<sub>1</sub> –GA<sub>3</sub> 30ppm).

## Results and Discussion

### Growth and quality parameters

The outcome of the investigations for plant height (cm), plant spread (cm), no of branches, days to first flowering, no of flower

per plant, total soluble solids (°Brix), shelf life (Days) have been presented in table 1. It was revealed that Maximum plant height (120.59cm), Maximum plant spread (92.57cm), Maximum no of branches (16.05), Minimum number of days to first flowering (32.51), Maximum no of flower per plant (11.83), Maximum total soluble solids (7.83°Brix), Maximum shelf life (5.71Days) was found to be in treatment T<sub>7</sub> (NAA 60ppm).

This treatment was followed by T<sub>5</sub> (NAA 30ppm) in case of plant height (109.38cm), plant spread (87.10cm), no of branches (13.56), no of flower per plant (10.10), total soluble solids (7.67°Brix), shelf life (4.25Days) was observed for the treatment T<sub>5</sub> (NAA 30ppm) while the number of days to flowering was found for the treatment T<sub>1</sub> (GA<sub>3</sub> 30ppm). The Minimum reading was recorded for plant spread (72.60cm), no of flower per plant (6.36), total soluble solids (7.34°Brix) for the treatment T<sub>8</sub> (NAA 100ppm) while Minimum plant height and Minimum number of branches per plant was recorded for the treatment T<sub>0</sub> (Control) and Maximum no of days to first flowering was found to be for T<sub>8</sub> (NAA 100ppm) and the shelf life was found to be minimum for the T<sub>4</sub> (GA<sub>3</sub> 100ppm).

Good quality and growth parameters were attributed to the cultivation of capsicum in naturally ventilated net house and the effect of plant growth promoters. These results are similar to findings of Rana and Singh (2012) for plant height in capsicum.

Singh *et al.*, (2012) for no of branches in capsicum. Kannan *et al.*, (2009) for first flowering in paprika. Shetty and Manohar (2008) for number of flower per plant in capsicum. Pundir *et al.*, (2001) for TSS in tomato.

**Table.1** Effect of different growth regulators on growth and quality parameter of capsicum

Treat ment	Treatment combination	Growth Parameters					Quality Parameters	
		Plant height (cm) 120 DAT	Plant spread (cm) 120 DAT	Number of branches 120 DAT	Days to first flower	Number of flower/plant	Shelf life (days)	TSS (Brix <sup>0</sup> )
T <sub>0</sub>	Control	82.28	78.02	9.85	38.43	7.09	2.88	7.51
T <sub>1</sub>	GA <sub>3</sub> 30 ppm	103.49	85.64	11.99	33.14	8.87	3.98	7.63
T <sub>2</sub>	GA <sub>3</sub> 60 ppm	99.85	83.41	11.14	37.11	7.93	3.73	7.59
T <sub>3</sub>	GA <sub>3</sub> 80 ppm	88.07	76.36	11.72	37.72	7.73	3.25	7.46
T <sub>4</sub>	GA <sub>3</sub> 100 ppm	85.62	74.85	10.08	39.54	6.71	2.85	7.41
T <sub>5</sub>	NAA 30 ppm	109.38	87.10	13.56	34.88	10.10	4.25	7.67
T <sub>6</sub>	NAA 40 ppm	94.04	81.34	10.99	35.81	8.16	3.54	7.56
T <sub>7</sub>	NAA 60 ppm	120.59	92.57	16.05	32.51	11.83	5.71	7.83
T <sub>8</sub>	NAA 100 ppm	90.83	72.60	10.70	40.10	6.36	3.04	7.34
F Test		<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>
CD at 5%		1.13	3.25	0.26	0.46	0.27	0.05	0.72

Based on the results obtained in this experiment, it is concluded that the treatment concentration T<sub>7</sub> (NAA 60 ppm) was found to be superior over all other treatments in relation to growth and quality parameters in capsicum under the agro-climatic conditions of Allahabad. However, since these results are based on one year experiment, further trials may be needed to substantiate the results.

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