

Effect of NAA, GA₃ and CCC on yield and quality attributes of cabbage cv. PRIDE OF INDIA

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ABSTRACT

An experiment was carried out during *Rabi* (Winter) Season 2005-06 on Cabbage cv. PRIDE OF INDIA at Department of Horticulture, College of Agriculture, Marathwada Agricultural University, Parbhani (M.S.) Four week old cabbage seedlings were transplanted and sprayed with GA₃ and NAA (25, 50 and 75 ppm) and CCC (500, 750 and 1000 ppm) two times at 15 and 30 days after transplanting. GA₃ 50 ppm produced highest weight of head, yield per hectare and staying capacity of head while NAA 50 ppm gave best results for total soluble solid and ascorbic acid content of the head.

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Key words : Cabbage, NAA, GA₃, CCC, Yield, Quality

INTRODUCTION

Cabbage is a hardy cool season annual crop and the edible portion which gives economic yield is called "Head". In the recent years a great deal of research work has been reported on the use of plant growth regulator in vegetable crops. However, most of the studies have been carried out in the field of growth and little information is available on yield and quality improvement of vegetable crops. A trial was, therefore conducted at Department of Horticulture College of Agriculture, Marathwada Agriculture University, Parbhani during *Rabi* season 2005-2006 to evaluate the response of GA, NAA and CCC to improve yield and quality of cabbage.

MATERIALS AND METHODS

The trial was conducted at Department of Horticulture, College of Agriculture, Marathwada Agriculture University, Parbhani on Cabbage Cv. Pride of India during *Rabi* (winter) season 2005-06. The experimental site was fairly uniform, medium black cotton soil with good drainage. The trial was laid out in R.B.D. with ten (10) treatments with three (3) replications. The treatments consisted of two sprays of GA₃, NAA (25, 50, and 75 ppm) and CCC (500, 750 and 1000 ppm). The spraying was done at 15 and 30 days after transplanting. Uniform cultural practices were adopted and observations

on yield, staying capacity, total soluble solids ascorbic acid content and keeping quality were recorded.

RESULTS AND DISCUSSION

The findings of the present study have been discussed under following heads :

Yield:

Weight of head:

Data pertaining to weight of head is presented in table 1 indicates that all the growth regulator treatments increased the weight of head significantly over the control treatment. The highest weight of head was produced by the treatment GA₃ 50 pm (1.193 kg.). This might be due to apportioning efficiency *viz.* increased allocation of photosynthesis towards the economic part and hormonal balance in the plant system. The results are in agreement with Hossain *et.al.* (1990) in Cucumber, Muthoo *et.al.* (1987) showed increase in the mean fruit weight in cauliflower by spraying of GA₃.

Yield per hectare:

Table 1 revealed that plant growth regulators significantly increased the yield per hectare. The higher head yield per hectare. (362.25q/h) was observed in the treatment GA₃ 50ppm which was significantly superior

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Table 1 : Effect of plant growth regulators on yield on certain quality attributes of cabbage

Tr. No.	Treatments	Weight of head (kg)	Yield per hectare (q/ha)	Total soluble solid (^o B)	Ascorbic acid (mg/100g)	Keeping quality (days)	Staying capacity of head (days)
T ₁	GA 25 ppm	1.136	324.52	5.21	42.24	11.34	8.40
T ₂	GA 50 ppm	1.193	362.25	5.48	47.24	11.81	9.93
T ₃	GA 75 ppm	1.152	340.57	5.34	44.58	12.86	9.18
T ₄	NAA 25 ppm	1.129	308.58	5.73	46.65	11.26	9.00
T ₅	NAA 50 ppm	1.164	342.13	6.17	54.82	11.52	9.66
T ₆	NAA 75 ppm	1.115	330.29	5.42	44.23	11.46	8.70
T ₇	CCC 500 ppm	1.067	316.96	5.18	47.64	11.20	7.53
T ₈	CCC 750 ppm	1.093	313.84	5.77	51.47	10.20	7.83
T ₉	CCC 1000 ppm	1.045	2.94.45	5.11	48.44	9.73	7.28
T ₁₀	Control	0.814	240.40	4.36	98.28	8.06	6.24
S.E. ±		0.0478	12.21	0.097	0.577	0.454	0.290
C.D. (P=0.05)		0.141	36.22	0.289	1.71	1.34	0.862

over all other treatments except. T₃, T₅ and T₆. The increase in yield might be due to accumulation of carbohydrates owing to greater photosynthesis and ultimately increased head size and yield. Similar results were obtained by Muthoo *et al.* (1987) in cauliflower. Patil *et al.* (1987) in cabbage.

Quality parameters :

Total solubal solids (TSS)^oB:

Data on total soluble solids indicated significant effects. The treatment receiving NAA 50 ppm recorded significantly more TSS (6-17^oB) than all other treatments under study. The increased in TSS may be accounted to the hydrolysis of polysaccharids, conversion of organic acid into soluble sugars and enhanced solubalization of insoluble starch and pectin in the cell wall and middle lamelle. The results are in consequence with findings of Akhtar *et al.* (1996), Desai *et al.* (1994) in winter melon.

Ascorbic acid:

Data with regards to ascorbic acid content in cabbage head indicated that application of different growth regulators increased the ascorbic acid content. The maximum ascorbic acid content in cabbage (54.82 mg/100g) was recorded in NAA 50 ppm. This might be due to physiological influence of NAA on activity of number of enzymes and due to more energy of food material available to the head due to strong vegetative growth. Mohanty and Nema (1970) also reported similar results in cabbage.

Keeping quality:

Significant difference were noted between the

treatment in their influence on keeping quality of cabbage heads under ambient conditions. Application of GA 75 ppm was found to be more effective than all other treatments under study. The next best treatments are NAA 50 ppm and GA 50 ppm, respectively. Similar results were obtained by Dhengle (2002) in Cabbage.

Staying capacity of head:

Staying capacity of cabbage head was significantly influence by various treatments, maximum staying capacity was observed in treatment GA₃ 50 ppm (9.93 days). The staying capacity of head was closely associated with compactness of head. In the present investigation weight of the head was significantly increased due to application of growth regulators which resulted in better compact head. Due to this reason there was increase in the staying capacity of head as compared to control. These result are online with the findings reported by Dhengale (2002) in cabbage.

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