Environment & Ecology 29 (3) : 1036—1038, 2011
 ISSN 0970-0420

Varietal Response of NAA on Growth and Yield of Brinjal (*Solanum melongena* L.)

ABHISHEK SINGH, B. K. SINGH, ANAND K. SINGH AND V. K. RAI

Department of Horticulture,Banaras Hindu University
Department of Extension Education, Institute of Agricultural Sciences
Varanasi 221005, India
E-mail : abhishek0875@gmail.com

Abstract

An experiment carried out during *rabi* season of 2008-2009 replicated thrice in a factorial randomized block design. The experiment included two factors i.e. , four levels of NAA (N_0 : Control, N_1 30 ppm, N_2 : 50 ppm and N_3 : 70 ppm) and two genotypes of brinjal (V_1 : Pant Rituraj and V_2 : K S-235). Nine parameters viz., plant height (cm), number of branches, number of fruits per plant, fruit length (cm), fruit diameter (cm), average fruit weight (g), number of seeds per fruit, fruit yield per plant (g) and fruit yield (q/ha) were studied for recording of observations. The fruit yield increased upto 30% with application of NAA (70 ppm) under field condition. The application of 70 ppm NAA and genotype K S-235 were found to be better for almost all yield attributes. In view of these findings, it is evident that NAA has beneficial role on growth and yield of brinjal.

Key words : Brinjal, NAA (naphthalene acetic acid), Growth, Yield.

Brinjal or eggplant (*Solanum melongena* L.) is a vegetable from Solanaceae family that has originated from warm India and China regions (1). It is the third most important vegetable crop after potato and onion and contributes a share of 9.4% of the total production of vegetables in the country. It is highly remunerative crop which gives heavy yield. However, sometimes the growers have to suffer on account of poor plant vigor, low fruit setting and small size fruit leading to recurring economic loss. Plant growth substances tend to modify the plant physiological and biochemical processes of the plant and increased growth and productivity. The application of PGR like NAA during flowering and fruiting period is known to enhance production and productivity. However, work on varietal response of growth regulator in brinjal is yet to be explored, hence the present study was initiated to study the effect of NAA on growth an yield of genotypes of brinjal.

Methods

An experiment was conducted during the *rabi* season of 2008-2009 at the Vegetable Research Farm, Department of Horticulture, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, (UP) with three replications in factorial randomized block design. The treatment consisted of four levels of NAA (N_0 : Control,N_1 : 30 ppm, N_2 : 50 ppm and N_3 : 70 ppm) and two varieties of brinjal (V_1 : Pant Rituraj and V_2 : K S-235). The observations were recorded on five randomly selected plants in each treatment. The data were recorded on nine parameters like height of plant (cm), number of branches, number of fruits per plant, fruit length (cm), fruit diameter (cm), average fruit weight (g), number of seeds per fruit, fruit yield per plant (g), fruit yield per hectare (q). The data were analyzed statistically following the standard procedure (2).

Results and Discussion

The effect of various treatments on plant height, number of branches, number of fruits per plant, fruit length (cm), fruit diameter (cm), average fruit weight (g), weight of seeds (g), number of seeds per fruit, fruit yield was found to be significant as revealed by the analysis of variance. The response of NAA exhibited maximum plant height (49.38 cm) with treatment combination of V_2N_3 which was at par with V_2N_2 (48.50) while it was registered minimum in V_1N_3 (35.69 cm). The increase in plant height was due to fact that NAA promotes vegetative growth by active cell division and cell elongation (3). The numbers of branches

Table 1. Effect of different treatment combinations of NAA on various characters of brinjal varieties.

Treatments	Plant height (cm)	Number of branches	Number of fruits per plant	Fruit length (cm)	Fruit diameter (cm)	Average fruit weight (g)	Number of seeds per fruit	Fruit yield per plant (kg)	Fruit yield per hectare (q/ha)
V_1N_0	37.33	8.53	5.56	10.49	7.25	99.28	1211.8	608.41	262.46
V_1N_1	37.22	9.60	6.33	11.32	7.39	107.88	1245.30	683.24	276.32
V_1N_2	36.92	9.80	7.23	12.35	7.02	106.96	1276.13	773.58	279.16
V_1N_3	35.79	9.90	7.20	11.57	7.35	105.95	1243.66	763.24	258.80
V_2N_0	47.48	10.24	5.64	13.92	4.24	90.22	625.00	587.78	242.48
V_2N_1	47.37	10.00	6.32	15.46	4.29	103.28	645.36	652.37	268.95
V_2N_2	48.50	10.33	7.24	16.46	4.38	102.23	632.03	740.12	246.89
V_2N_3	49.38	10.83	8.23	19.51	4.55	101.61	646.00	836.58	285.34
SE ±	0.46	0.28	0.51	0.35	0.22	0.48	0.01	76.19	3.80
CD at 5%	1.34	0.83	NS	1.02	0.64	1.38	NS	218.52	10.92

per plant showed incremental effect with application of NAA, however, the 70 ppm dose had detrimental effect on this character. The final stage sampling revealed maximum number of branches per plant (10.83) was recorded with V_2N_3 combination followed by V_2N_2 (10.33) whereas the minimum number of branches per plant was recorded with V_1N_0 (8.53) combination. It was highly significant when it was compared among themselves and with the control. Since in brinjal fruit bearing takes place in the axil of the leaves on the nodes, so the more number of branches, the more is the number of nodes leading to better probability of fruit yield. The results are in conformity with Dod et al (4).

Table 1 reveals that there was significant increase in number of fruits per plant, fruit length (cm), fruit diameter (cm), average fruit weight (g), weight of seed (g), number of seeds per fruit and total yield of marketable fruits with the 70 ppm NAA concentration as compared to control. The maximum number of fruits per plant was recorded with treatment combination V_2N_3 (8.23) and maximum fruit length was also registered in the same treatment combination V_2N_3 (19.51 cm) with 70 ppm NAA concentration, while minimum fruit length and number of fruits per plant were recorded with control V_1N_0. The maximum fruit diameter was recorded in treatment combination V_1N_1 (7.39 cm) followed by V_1N_3 (7.35 cm) and minimum was in control V_2N_0 (4.24 cm). The average fruit weight (107.88 g) was exhibited highest with treatment combination V_1N_1 followed by V_1N_2 (106.96 g) while minimum value was noted in control V_2N_0 (90.22 g). The various treatments of NAA significantly increased the number of seeds per fruit. Maximum number of seeds per fruit (1276.13) were recorded in treatment combination V_1N_3, while it was minimum (625.03) under control V_2N_0. Observations recorded in respect of fruit yield were significantly affected by different treatments of NAA. Maximum fruit yield per plant (836.58 g) was recorded with treatment combination V_2N_3 while it was lowest (587.78 g) with V_2N_0 (control). The yield was increased considerably by application of different treatments of NAA. The combination V_2N_3 gave the highest yield (285.34 q/ha) and lowest yield was obtained with the combination of V_2N_0 (242.48 q/ha). From the result it is obvious that the number of fruits per plant had greater influence on the yield attributing traits and was due to improvement in the level of carbohydrates owing to greater photosynthesis and ultimate increased fruit size, weight and yield (5). The results of Chauhan et al. (6) and Meena and Dhaka (7) are in accordance with these findings.

Conclusion

Thus it is evident that irrespective of varieties the NAA application increased the vegetative growth, flowering and yield attributes of brinjal crop. The application of 70 ppm of NAA enhanced the fruit yield about 30% under field conditions. Similarly, the 70 ppm of NAA concentration and genotype KS-235 were found to perform better, hence, it can be sug-

gested that NAA has beneficial role in increasing the growth and yield of brinjal.

References

1. Lawande K. E and J. K. Chavan. 1998. Eggplant (Brinjal) *in Handbook of vegetable science and technology.*
2. Panse V. G. and P. V. Sukhatme. 1987. *Statistical method for agricultural work.* ICAR, New Delhi, India.
3. Katwale T. R. and R. K. Saraf. 1990. A study on hormone vapour treatment of vegetables. *Agric. and Hort*. 49 : 805—806.
4. Dod V. N., P. B. Kale and R. S. Rantakar. 1989. Effect of foliar application of auxin and micro-nutrients on growth and yield of chilli. *PKV Res*. 13 : 29—33.
5. El-Zawily A. H., E.A. Zayed and M. Hasson. 1985. Studies on growth productivity and some physiological aspect of egg plants. I. Comparison of some growth regulating substances. *J. Agric. Sci.* 10 : 166—174.
6. Chauhan K. S., S. K. S. Bhadoria and K. N. Nagaich. 2007. Effect of different levels of nitrogen and phosphorus with NAA concentration on quality characters of summer brinjal. *Bhartiya Krishi Anushandhan Patrika.* 22 : 167—170.
7. Meena S. S. and R. S. Dhaka. 2003. Effect of plant growth regulators on growth and yield of brinjal under semi-arid conditions of Rajasthan. *Ann. Agric. Res*. 24 : 516—521.