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RESEARCH ARTICLE :

Effect of different plant growth regulators on growth of chilli (*Capsicum annum* L.) cv. PUSA JWALA

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SUMMARY : An experiment entitled, "Studies on effect of different plant growth regulators on growth, yield and quality of chilli" was carried out during 2015-16in the field of Research Farm, J.N.K.V.V., College of Agriculture, Tikamgarh (M.P.).The experiment was laid out in RBD with ten treatments and three replications. The plant growth regulators used wereT_1- NAA (20 ppm), T_2-NAA (40 ppm), T_3- NAA (60 ppm), T_4-GA_3 (25 ppm), T_5- GA_3 (50 ppm), T_6 - GA_3 (75 ppm), T_7- Ascorbic acid (100 ppm), T_8 - Ascorbic acid (200 ppm), T_9- Ascorbic acid (400 ppm) and T_{10}– Control. Results obtained in the present investigation revealed that, the highest plant height (34.73, 45.19 and 56.39 cm), number of leaves (50.71, 75.98 and 90.35 plant^{-1}), number of branches (9.73, 22.82 and 26.97 plant^{-1}) at 30, 60 and 90 DAT. Maximum fruit length (10.91 cm) and fruit girth (2.01 cm) NAA @ 40 ppm followed by NAA @ 60 ppm.

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KEY WORDS :
Chilli, Growth regulators, Plant height, Leaves, branches

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BACKGROUND AND OBJECTIVES

Chilli (*Capsicum annum* L.) belongs to the family solanaceae, is an important commercial spice cum vegetable crop of India. Chilli forms an essential ingredient of indian curry. There is no spice probably so popular as chilli and no other spice has become such an indispensable ingredient of the daily food of majority people of the world. Chilli is famous for its pleasant aromatic flavour, pungency and high colouring substance. The substances that responsible for pungency in chilli is Capsaicin (C_{18} H_{37} NO_3) and several related chemicals, collectively called Capsaicinoids. Green fruit of chilli and sweet peppers are one of the richest sources of anti-oxidant vitamins such as vitamin A, C and E.India is the world largest producer, consumer and exporter of chilli. Guntur in Andhra Pradesh is produces 30% of chilli particularly in India. In hot region, there is great problem of premature flower and fruit drop in chilli due to environment factors and cultivation practices. Hormonal imbalance due to sudden rise in atmospheric temperature. Poor fruit set is one of the major bottleneck in the production of chillies and it is directly affects the yield. It is by the adverse weather condition like increasing or decreasing

temperature and rainfall. Especially NAA has been reported to enhance fruit set and consequently yield. NAA in optimum concentration decrease flower shedding, promoting the vegetative growth and result maximum yield of chilli.

RESOURCES AND METHODS

This comprises the details about the materials used and the methods adopted during the course of present investigation entitled "Studies on effect of different plant growth regulators on growth, yield and quality of chilli" was carried out in *Kharif* season during the 2015-16.The present experiment was laid out in the field of Research Farm, J.N.K.V.V., College of Agriculture, Tikamgarh (M.P.). The manure and fertilizers were applied as per respective plot. Full dose of RDF (100: 60: 40 kg NPK ha^{-1}) and 1/3 nitrogen were given to the plot before sowing as basal dose. Remaining 2/3 quantity of nitrogen was applied in two split doses *i.e.*, 30 and 60 day after transplanting.Plant height (cm): Height of randomly selected plants in each plot was measured by scale from the ground level of plant to the tip of the main stem of plant at 30,60 and 90 DAT. The mean height was computed by dividing the summation with three.No. of branches $plant^{-1}$: The number of branches arising on the main stem in the five randomly selected and tagged plants were recorded at 30, 60 and 90 DAT. The mean number of branches $plant^{-1}$ was workout and expressed in number. No. of leaves $plant^{-1}$:The number of leaves in the five randomly selected and tagged plants were recorded at 30, 60 and 90 DAT. The number of leaves $plant^{-1}$ was worked out and expressed in number.

OBSERVATIONS AND ANALYSIS

The experimental results pertaining "Studies on effect of different plant growth regulators on growth, yield and quality of chilli" conducted during *Kharif* season 2015-16 are being presented. The data on growth, yield attributes, yield and quality parameters of chilli variety Pusa Jwala were subjected to statistical calculation and wherever necessary these are being presented with suitable illustration.

The result shows that plant height at 30, 60 and 90 DAT was influenced significantly due to different growth regulators. The plant height in general increased by multifold between 30 DAT and upto the harvest stage.

Table 1 : Effect of different plant growth regulators on number of leaves $plant^{-1}$ of chilli

Treatments	Number of leaves $plant^{-1}$		
	30 DAT	60 DAT	90 DAT
	Mean	Mean	Mean
T_1	42.27	60.32	75.61
T_2	50.71	75.98	90.35
T_3	47.02	72.95	87.59
T_4	40.05	56.99	78.15
T_5	44.65	67.34	84.01
T_6	43.91	62.33	80.29
T_7	36.11	53.68	74.06
T_8	38.78	58.57	76.69
T_9	44.73	63.81	79.30
T_{10}	28.16	48.06	73.81
S.E. ±	2.21	0.80	1.71
C.D. (P=0.05)	6.62	2.42	5.12

Table 2 : Effect of different plant growth regulators on number of branches $plant^{-1}$ of chilli

Treatments	Number of branches $plant^{-1}$		
	30 DAT	60 DAT	90 DAT
	Mean	Mean	Mean
T_1	6.38	14.42	17.66
T_2	9.73	22.82	26.97
T_3	7.95	19.21	23.20
T_4	6.03	12.89	15.80
T_5	7.11	16.20	19.72
T_6	6.94	13.38	16.74
T_7	4.99	10.05	13.06
T_8	5.78	12.45	14.97
T_9	6.54	13.62	16.05
T_{10}	4.35	9.32	11.97
S.E. ±	0.64	0.73	0.69
C.D. (P=0.05)	1.91	2.20	2.08

Table 3 : Effect of different plant growth regulators on plant height (cm) of chilli

Treatments	Plant height (cm)		
	30 DAT	60 DAT	90 DAT
	Mean	Mean	Mean
T_1	30.28	41.26	47.77
T_2	34.73	45.19	56.39
T_3	32.36	43.90	52.73
T_4	29.45	38.90	48.78
T_5	31.52	41.54	51.94
T_6	30.12	39.79	49.12
T_7	24.83	34.18	41.47
T_8	25.64	35.90	44.50
T_9	27.18	37.79	46.77
T_{10}	18.52	29.54	39.64
S.E. ±	0.98	1.11	0.95
C.D. (P=0.05)	2.94	3.31	2.86

At 30 DAT stage, it ranged from 18.52 to 34.73 cm, at 60 DAT it ranged 29.54 to 45.19 cm and at 90 DAT it ranged 39.64 to 56.39 cm.

At 90 DAT, significantly higher no. of branches (26.97 plant^{-1}) was recorded in T_2 (NAA @ 40 ppm) followed by (23.20 and 19.72 plant^{-1}) T_3 (NAA @ 60 ppm) and T_5 (GA_3 @ 50 ppm), whereas, lowest no. of branches (11.97 plant^{-1}) was recorded in T_{10} (Control).

The no. of leaves plant^{-1} differed significantly due to different growth regulators treatments. The no. of leaves plant^{-1} increased continuously from 30 to 90 DAT in all the treatments of Pusa Jwala.

At 90 DAT, the maximum no. of leaves (90.35 plant^{-1}) was recorded in treatment T_2 (NAA @ 40 ppm) and it was found significantly superior over other treatments followed by (87.59 and 84.01 plant^{-1}) in T_3 (NAA @ 60 ppm) and T_5 (GA_3 @ 50 ppm), Whereas, minimum no. of leaves (73.81 plant^{-1}) was recorded in treatment T_{10} (Control).Growth regulators (NAA, GA_3 and Ascorbic acid) at different concentrations significantly affected the growth parameters *viz.*, plant height, number of branches plant^{-1}, number of leaves plant^{-1} in chilli. These parameters among all the growth regulators recorded maximum with NAA @ 40 ppm concentration (Athaneriya *et al.*, 2011).

Conclusion :

The growth parameters are observed periodically have exhibited many architectural variations due to different plant growth regulators in chilli cv. PUSA JWALA. The growth parameters plant height, no. of leaves plant^{-1} and no. of branches plant^{-1} were found significant at 30, 60 and 90 DAT.

Thus, upto the maturity stage different plant height in different treatments ranged from 39.64 to 56.39. The tremendous variations in no. of branches plant^{-1} and no. of leaves plant^{-1} also occurred.

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REFERENCES

Abear, S.I., Shafeek, M.R., Ahmed, H.I. and Faten, S.A. (2015). Improving growth, fruit setting, total yield and fruit quality of sweet pepper plants (*Capsicum annum* L.) by using antioxidant and seaweed extracts. *Middle East J. Agric.*, **4**(02):154-161.

Akand, M.H., Mazed, H.E.M., Pulok, A.I., Chowdhury, S.N. and Moonmoom, J.F. (2015). Growth and yield of tomato (*Lycopersicon esculentum* Mill.) as influenced by different. *Appl. Res.*, **1**(3):71-74.

Arora, I., Singh, J.P. and Singh, R.K. (2014). Effect of concentration and methods of application of 2,4-D and NAA on plant growth, flowering, yield and quality in summer season chilli (*Capsicum annum* L.) cv. Pant C-1. *Adv. Res. J. Crop Improve.*, **5**(2) : 176-180.

Arora, S.K., Brar, J.S., Kumar, J., Batra, B.R. and Mangal, J.L. (2000). Effect of gibberellic acid (GA3) treatment on the shelf-life of chilli (*Capsicum annuum* L.) cv. Pusa Jwala. *Haryana Agric. Univ. J. Res.*, **30**(1/2):37-39.

Athaneriya, M.K., Sengar, N. and Pandey, B.R. (2011). Influence of biofertilizer on growth and yield of chilli. *Veg. Sci.*, 38(1):101-103.

Balraj, R., Kurdikeri, M.B. and Revanappa (2002). Effect of growth regulators on growth and yield of chilli (*Capsicum annum* L.) at different pickings. Indian J. Hort., **59**(1):84-88.

Belakbir, A., Ruiz, J.M. and Romero, L. (1998). Yield and fruit quality of pepper (*Capsicum annum* L.) in response to bioregulators. *Hort. Sci.*, **33**(1):85-87.

Choudhury, S., Islam, N., Sarkar, M.D. and Ali, M.A. (2013). Growth and yield of summer tomato as influenced by plant growth regulators. *Internat. J. Sustainable Agric.*, **5**(1):25-28.

Deshmukh, D.A., Telang, S.M. and Patil, S.S. (2010). Influence of foliar application of growth hormones and fertilizers on the field and ascorbic content in chilli cv Parbhani Tajas. *Asian J. Soil Sci.*, **5**(1):114-115.

Joshi, N.C. and Singh, D.K. (2001). Effect of plant bioregulators on chilli. *Veg. Sci.*, **28**(1)74-75.

Kalshyam, M.K., Kumar, J., Mohan, B., Singh, J.P., Ram, N. and Rajbeer (2011). Effect of plant growth hormone and fertilizer on growth and yield parameters in chilli (*Capsicum annum* L.) cv. Pusa Jwala. *Asian J. Fertilizer*, **6**(2):316-318.

Kumar, K.P., Reddy, D.J., Reddy, K.N., Babu, T.R. and Narendranath, V.V. (2000). Dissipation of cypermethrin residues in chilli. *Pesticide Res. J.*, **12**(1):130-132.

Moniruzzaman, M., Khatoon, R., Hossain, M.FB.,. Jamil, M.K. and Isssslam, M.N. (2014). Effect of GA_3 and NAA on the effects of various plant growth regulators on growth,quality and physiology of *Capsicum annum* L. *Asian & Australasian J. Plant Sci. & Biotechnol.*, **4**(1):24-29.