SHORT COMMUNICATION

EFFECT OF PLANT GROWTH REGULATORS ON GROWTH AND FLOWER YIELD OF PETUNIA (*PETUNIA HYBRIDA* L.)

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Abstract: Effect of Plant Growth Regulators on Growth and Flower Yield of Petunia (*Petunia hybrida*) was carried out at research field of Department of Horticulture, Allahabad School of Agriculture, SHIATS Allahabad. The experiment included 10 treatments and three replications. It was concluded that application of GA_3 -200 ppm in treatment T_2 was found to be superior on plant height, plant spread, number of branches, number of leaves, number of flowers per plant, and higher yield and the application of CCC - 500 ppm in treatment T_5 was found superior on size of flower, fresh weight of flower and dry weight of flower and the application of NAA - 30 ppm in treatment T_7 was found superior on early bud flower bud emergence was observed as compared with control.

Keywords: Plant Growth Regulators, GA3, CCC, NAA, Petunia

INTRODUCTION

Petunia is a popular, easy to grow and versatile annual with showy flowers and has the longest season of bloom of all garden annuals. A wide range of colours and forms has been developed over the years, which are classified on the basis of the characteristics of flowers. Petunia plants are perennials but are generally grown as half-hardy annuals in open gardens. Petunia belongs to the family Solanaceae and Genus *Petunia*, has its origin in South America. Petunia has 25 species including synthetic garden species *Petunia hybrida* (Vilm), which has arisen in historical times from two wild sps. Viz; *Petunia axillaries and P. Violacea.* The petunia flower is funnel shaped, but hybridizers have created many variation including singles and doubles with petals that have wavy or fringed margins. Many patterns are available in strips, mauve, speckles and borders is an extensive colour palette that includes purple, mauve, lavender, pink, red, white, yellow and some cultivars are bicoloured. Leaves and stems are sticky to the touch and have a distinctive odour. The height may vary between 20-30 cm and 30-45 cm, depending upon the type. Petunia is a free flowering plant. In an experiment with five ornamentals found that the seeds which germinated poorly at 25^0C responded positively with gibberellic acid treatment in solution varying in concentration from 1 ppm to 1,000 ppm. Growth regulators like ethrel, B-Nine and Cycocel not only caused dwarfness but also extended the self-life some flowering annuals by several days. Cycocel (CCC) was very effective in inhibiting growth in many malvaceous plants. The leaves of the treated plants were thick in texture, small in size and dark green in colour.

MATERIAL AND METHOD

The experiment was conducted with 10 treatments viz; GA_3- 100ppm, GA_3- 200ppm, GA_3- 300ppm, CCC- 250ppm, CCC- 500ppm, CCC-750ppm, NAA- 30ppm, NAA- 45ppm and NAA- 60ppm. Petunia var. Picourty was sown randomized block design with 3 replications during winter season in the year of 2011 at Floriculture research form of the Department of Horticulture, Sam Higginbottom Institute of Agriculture, Technology and Sciences. Row to Row and Plant to Plant spacing were maintained at 50 cm and 55 cm, respectively. All the recommended agronomic package of practices was followed to grow a healthy crops. Observations were recorded on 10 characters viz. Plant height (cm), number of leaves, number of branches, plant spread (cm), days of the first bud ignition, number of flower per plant, flower diameter (cm), weight of flower (g), flower yield per plant (g), flower yield per plot (g) and per ha (t ha^{-1}). Data was statistically analyzed for the study of preference of variety.

Table 1. Performance of different treatment for various character of Petunia.

Treatments	Treatments & Combination	Plant height (cm)	Plant spread (cm)	Number of leaves / plant	Number of branches / plant	Days of the first flower bud initiation	Number of flowers / plant	Diameter of flower (cm)	Fresh weight of flower (gm)	Flower Yield/ ha (t)
T_0	Control	25.93	55.53	434.60	10.60	62.60	26.73	5.91	0.73	1.530
T_1	GA_3 @100ppm	27.80	66.80	575.00	14.13	58.87	45.60	7.82	0.86	2.835

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T_2	GA_3 @200ppm	**27.97**	**69.15**	**1559.93**	**18.07**	58.07	**54.47**	8.06	0.89	**3.524**
T_3	GA_3 @300ppm	27.35	63.87	529.73	13.27	60.40	43.00	7.64	0.86	2.657
T_4	CCC@250ppm	23.49	50.53	381.53	12.60	65.67	35.13	8.33	0.93	2.533
T_5	CCC@500ppm	24.81	54.13	408.87	12.80	63.87	36.27	**8.75**	**1.02**	2.579
T_6	CCC@750ppm	20.27	40.87	241.33	12.47	68.13	31.80	8.13	0.91	2.375
T_7	NAA @30ppm	26.90	61.80	494.13	12.00	52.87	41.47	7.31	0.81	2.150
T_8	NAA @45ppm	26.97	62.33	523.47	12.13	**49.87**	42.53	7.53	0.85	2.230
T_9	NAA @60ppm	26.54	58.00	462.40	11.40	56.60	38.27	6.92	0.80	2.015
	S.Ed(±)	0.76	0.92	25.82	0.21	1.06	1.19	0.09	0.02	71.35
	CD (P=0.05)	2.25	2.75	76.71	0.62	3.15	3.53	0.26	0.07	211.99

RESULT AND DISCUSSION

All the genotypes showed significant differences for all the 12 parameters of growth and yield of petunia. The maximum height of plant (27.97 cm) was recorded in treatments T_2 (GA_3- 200ppm). The next better treatment was T_1 (GA_3-100ppm) (27.80 cm). (Kadam *et al*. 2002.). The maximum spread of plant (69.15 cm) was recorded in treatments T_2 (GA_3 - 200ppm). The next better treatment was T_1 (GA_3-100ppm) spread of plant (66.80 cm). (Gautam *et al*. 2006).The maximum number of leaves per plant (1559.93) was recorded in treatments T_2 (GA_3 - 200ppm). The next better treatment was T_1 (GA_3-100ppm) (575.00). The maximum number of branches per plant (18.07 cm) was recorded in treatments T_2 (GA_3-200ppm). The next better treatment was T_1 (GA_3-100ppm) (14.13 cm) (Dabas *et al.* 2001).The number of days required for first flower bud emergence from transplanting (49.87 days) was recorded in treatment T_8 (NAA-45ppm) followed by treatment T_7 (NAA-30ppm) (52.87 days). The fresh and dry weight of flower (1.02 g and 0.87 g) was significantly increased in treatment T_5 (CCC-500ppm) respectively followed by treatment T_4 (CCC-250ppm) (0.93 g and 0.82 g) respectively. (Abadi 2010). The flower diameter (8.75 cm) was significantly increase in treatment T_5 (CCC-500ppm) followed by treatment T_4 (CCC-250ppm) (8.33 cm). Significantly increase in number of flowers per plant (54.47) was recorded in treatment T_2 (GA_3-200ppm) followed by treatment T_1 (GA_3-100ppm) (45.60). The maximum yield of flower per plant (105.73g) was recorded in treatment T_2(GA_3-200ppm) followed by treatment T_1 (GA_3-100ppm) (85.07g). Significantly increase in yield of flowers per plot (951.60g) and per hectare (3524.09t) were recorded in treatment T_2 (GA_3-200ppm) followed by treatment T_1 (GA_3-100ppm) (765.60t) per plot and (2835.27t) per hectare. Maximum gross return (Rs.88102.3/ha) was recorded in treatment T_2 (GA_3-200ppm) followed by treatment T_1 (GA_3-100ppm) (Rs.70881.8/ha) and the minimum (Rs.38273.95/ha) was recorded in treatment T_0 Control. Maximum net return (Rs.50925.3/ha) was recorded in treatment T_2 (GA_3-200ppm) followed by treatment T_1 (GA_3-100ppm) (Rs.37731.8/ha) and the minimum (Rs.9323.95/ha) was recorded in treatment T_0 Control. Maximum cost: benefit ratio (1:2.37) was recorded in treatment T_2 (GA_3-200ppm) followed by treatment T_1 (GA_3-100ppm) (1: 2.13).

On the basis of present investigation it is concluded that the application of T_2 (GA3@200ppm) was best in term of growth and yield of flower. The above findings are based on one year trial more scientific research is needed to confirm the above result.

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