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Short communication

Effect of bio-regulators on growth and flowering of gloxinia

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Gloxinia (*Sinningia speciosa* Hierm.), a member of family Gesneriaceae is native to Brazil. It makes a flamboyant flowering bulbous pot plant with its large velvety, dark green leaves and huge trumpet shaped blooms of bewitching colours. Bio-regulators are helpful in modifying the plants to desired shape, regulate flowering and maintain the presentability of potted plants for a longer duration. No scientific literature is available on the use of bio-regulators in gloxinia.

The investigations were carried out at the Experimental Farm of the Department of Floriculture and Landscaping, Dr Y.S. Parmar University of Horticulture and Forestry, Nauni. The experiment was laid out in a completely randomized design, consisting of eight treatments (GA_3- 25, 50, 100 ppm; BA- 25, 50, 100, 150 ppm and control), replicated thrice. The *in vitro* raised and hardened plants of gloxinia were planted in 10 cm earthen pots during May containing standardized growing mixture (Kashyap *et al.*, 2) containing cocopeat + leaf mould + municipal solid waste (1:1:1). The plants were placed under protected conditions where the light intensity was lowered to about 2.5 k lux with a shading net. Plants were sprayed with 200 ppm N P K at weekly intervals until flowering commenced. After 35 days of planting, the plants were sprayed with GA_3 and BA. Routine cultural operations like hoeing, weeding, watering and control of insect-pest and diseases were followed as per the requirement. Observations on various vegetative and floral parameters were recorded at the time of flowering (August to mid October) and data was subjected to analysis of variance.

Table 1 elucidates the promotive effects of GA_3 and BA application on various vegetative and floral attributes of gloxinia. Maximum plant height was obtained with 100 ppm GA_3 and minimum in the untreated control. Plant spread and leaf area were significantly increased by all bio-regulator treatments and maximum plant spread and leaf area were recorded in GA_3 100 ppm treated plants. Enhancement of results with increasing concentrations of GA_3 may be due to its general effect on cell division and elongation and ultimately enhanced vegetative growth of the plants. Results on increased plant height are in congruence with that of Singh (5) and that of plant spread and leaf area are in close conformity with Thakur *et al.* (9) in statice, and Kumar and Dubey (3) in gladiolus.

Significantly more number of leaves and side shoots were observed in BA treated plants and were maximum with BA 150 ppm. This may be attributed to the source and sink hypothesis of cytokinins in diverting nutrients. Our findings lent credence to the observations made by Sreekala *et al.* (7), who found increased number of branches in crossandra due to BA sprays, whereas increase in number of leaves with kinetin spray as observed by Singh (5) in tuberose. There was a marked effect of GA_3 sprays on flowering of gloxinia. Bud formation and flowering was almost 10.88 and 19.44 days, respectively, earlier as compared to control with 100 ppm GA_3 sprays. Earlier flowering may be due to the promotive effect of GA_3 in production and accumulation of more photosynthates and then diverting them to the ultimate sink, *i.e*. flower. Such findings have experimentally been substantiated by Song *et al.* (6) in cyclamen.

Number of flowers/plant, maximum number of flowers open at a time and flower diameter increased with GA_3 sprays and was maximum with 100 ppm GA_3. Increase in number of flowers with GA_3 is in close line with Corr and Widmer (1) in *Zantedeschia.* Whereas, increase in flower diameter with GA_3 is in accordance with the findings of Talukdar and Paswan (8) in chrysanthemum. Duration of flowering increased with both GA_3 and BA sprays as compared to control and application of BA was more effective. Maximum duration of flowering (75.50 days) was observed in plants treated with BA 150 ppm. In comparison to this the unsprayed plants remained in flowering only for 55.67 days. It may be credited to the anti-senescence activity of cytokinins, which might have helped in increasing display life of flowering plants.

The overall quality of a pot plant is assessed by its presentability. Presentability increased with ascending levels of BA and GA_3 application and was maximum with GA_3 100 ppm. The increase in pot presentability with GA_3 may be due to the better vegetative growth, increased flower diameter and number of flowers open at a time, which increased the overall display of the plants. Similar results on increase in presentability with GA_3 were noticed by Sharma and Pathak (4) in *Begonia* x *tuberhybrida*.

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Table 1. Effect of GA_3 and BA on growth and flowering attributes of gloxinia.

Growth regulator conc. (ppm)	Plant height (cm)	Plant spread (cm^2)	Leaf area (cm^2)	No. of leaves/ plant	No. of side shoots	No. of days to bud formation	No. of days to flowering	Number of flowers/ plant	Maximum No. of flowers/ plant opened at a time	Flower dia (cm)	Duration of flowering (days)	Pot presentability (score out of 100)
GA_3												
25	11.55	477.3	540.0	6.76	0.00 (1.00)	47.67	75.67	12.12	4.81	8.27	61.30	82.55
50	13.04	732.8	576.0	7.35	0.00 (1.00)	39.40	66.07	16.19	7.05	8.39	60.93	83.00
100	13.97	1165.0	624.3	8.16	0.00 (1.00)	35.50	58.93	17.18	7.45	8.92	66.47	85.30
BA												
25	9.62	317.0	468.3	8.88	1.36 (1.54)	59.47	80.80	9.67	2.81	7.73	72.33	76.10
50	9.70	356.2	488.3	9.50	2.76 (1.94)	51.60	78.57	11.44	3.03	7.74	73.33	77.97
100	9.89	376.7	512.3	9.89	3.07 (2.02)	49.85	78.67	10.74	2.97	7.78	72.57	79.97
150	10.48	427.0	529.0	14.12	4.23 (2.29)	42.58	73.17	11.81	3.07	7.80	75.50	80.60
Control (distilled water)	9.59	315.3	441.7	6.74	0.00 (1.00)	46.38	78.37	8.68	2.68	7.72	55.67	74.66
$CD_{0.05}$	0.77	29.7	14.8	2.41	0.11	4.59	4.65	2.86	1.13	0.14	2.96	2.11

Figures in the parentheses are arcsine transformation.

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