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Effect of gibberellic acid on growth, flowering, yield and quality of gerbera under polyhouse conditions

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ABSTRACT

An experiment was conducted to study the effect of gibberellic acid on growth, flowering, flower yield and flower quality of gerbera under semi-control polyhouse in Complete Randomized Design at Floriculture Unit, Department of Horticulture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during January to June, 2006. Treatment comprises four levels of gibberellic acid (0, 50, 100 and 150 ppm). The result indicated that, maximum vegetative growth, flower yield and quality were observed with treatment ofGA_3 at 150 ppm. While, early flowering was noticed in 50 ppm GA_3 spray.

Key words : Gerbera, Gibberellic acid and polyhouse

INTRODUCTION

Gerbera (*Gerbera jamesonii* H. Bolus) commonly known as Transval Daisy or African Daisy belonging to the family Asteraceae. It is one of the important cut flower suitable for export and domestic requirements and according to the global trends in floriculture, it occupies the fourth place among the cut flowers. Growing gerbera on scientific footing under cover is of immense need for getting quality blooms with exportable standards.

Amongst the factors responsible for high flower quality and yield, hormonal balance plays a major role. Use of plant growth regulators is being increased to manipulate the growth, flowering and yield of many ornamental plants. Thus, keeping in view the potentialities of growth regulators like gibberellic acid, the present study was undertaken to find out the suitable concentration of GA3 for better growth, yield and quality production of gerbera under polyhouse.

MATERIALS AND METHODS

An experiment was carried out at Floriculture Unit, Department of Horticulture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola (M.S.) during January to June, 2006. The experiment was laid out in Complete Randomized Design (CRD) with five replications. In the present investigation three levels of gibberellic acid (50, 100 and 150 ppm) were tried along with control (water spray). An experiment was laid out in semi control modified Quonset type polyhouse, north light truss, dimension 16 m x 6 m with ridge height 4.5 m. An ultraviolet stabilized polyethylene film of 200 micron was used as cladding material for polyhouse. Three month old hardened tissue culture plantlets of variety 'Sangria' were planted in pot of 30 x 30 cm size filled with sterilized (0.2 % formalin) cocopeat. Solution of gibberellic acid was sprayed as per treatments along with control (water spray) at 30th and 60th days after transplanting. Nitrogen, phosphorous and potassium at the rate of 30, 12.5 and 15 g per sq. m, respectively were applied through, urea, single super phosphate and muriate of potash at 30 days interval. The observations on growth, flowering, flower yield and quality were recorded.

RESULTS AND DISCUSSION

Data in respect of growth, flowering, yield, flower, quality and vase life are presented in Table 1.

Growth:

Different concentration of GA_3 exhibited significant differences in respect of plant height and leaves per plant. Significantly maximum plant height (45.91 cm) and leaves per plant (29.71) were recorded in GA_3 at 150 ppm. However, significantly minimum plant height (43.43 cm) and leaves per plant (28.65) were recorded in control treatment. This might be due to gibberellic acid which has resulted in cell division and cell elongation resulting in enhanced vegetative growth. The results mentioned above are in conformity with the findings of El-Shafe and Hassan (1978) in gerbera.

Flowering:

Significant differences in respect of days required for bud initiation and days required for flowering from bud initiation were observed due to different treatments of gibberellic acid. Significantly early flower bud appearance (27.98 days) and flowering from bud initiation (14.13 days) were registered in the plants sprayed with GA3 at 50 ppm. However, these were observed late (32.41 and15.15 days, respectively) in the plants those were

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Table 1 : Effect of gibberellic acid on growth, flowering, flower yield and quality of gerbera

Treatments (GA_3 spray)	Ht. of plant (cm)	Leaves per plant	Days to bud initiation	Days to flowering from bud initiation	Flowers per plant	Flowers per sq. m	Length of flower stalk (cm)	Diameter of flower (cm)	Flower stalk thickness (cm)	Production of grade I flowers per plant	Vase life (days)
0 ppm	43.43	28.65	32.41	14.25	10.91	65.20	50.37	6.91	0.51	5.17	8.18
50 ppm	43.69	29.03	27.98	14.13	11.31	67.70	51.44	7.79	0.62	5.98	8.63
100 ppm	45.89	29.47	28.83	15.00	11.72	70.32	52.54	8.58	0.72	6.68	8.87
150 ppm	45.91	29.71	31.13	15.15	12.36	73.82	54.21	9.06	0.66	6.90	8.74
'F'test	Sig	Sig	Sig	Sig	Sig	Sig	Sig	Sig	Sig	Sig	Sig
S.E.$\pm$	0.04	0.13	0.15	0.10	0.14	0.83	0.16	0.08	0.003	0.05	0.05
C.D. (P=0.05)	0.14	0.38	0.43	0.29	0.39	2.40	0.47	0.23	0.01	0.14	0.15

sprayed with GA_3 at 150 ppm. Thus, it is evident that, the flower bud emergence and flowering were delayed by the higher concentration of GA_3. This might be due to that, the low level of GA_3 shortened the vegetative phase which leads to early flowering. The results are in agreement with the findings of El-Shafe and Hassan (1978) in gerbera.

Yield:

The data presented in Table 1 revealed that, highest flowers per plant (12.36) and per sqm (73.82) were harvested from the. plants sprayed with gibberellic acid at 150 ppm. However, significantly minimum flower yield per plant (10.91) and per sqm (65.20) were noticed in the control treatment. This increase in yield of flowers might be due fact that, gibberellic acid treated plants produced more number of leaves with maximum leaf as compared to control, which might have resulted in production and accumulation of more photosynthates that were diverted to the sink resulting in more number of flowers. These results are in close conformity with the results of Gowda (1980) in rose and Dutta *et al.* (1993) in chrysanthemum.

Flower quality:

In the present investigation, the flower quality was significantly influenced by different treatments of GA_3. Maximum length of flower stalk (54.21 cm), diameter of flower (9.06 cm) and production of grade I flowers (6.90) were registered in GA_3 150 ppm. However, flower stalk thickness (0.72cm) and vase life of flower (8.87 days) were noticed highest in GA_3 at 100 ppm. Minimum length of flower stalk (50.37 cm), diameter of flower (6.91 cm), flower stalk thickness (0.51), production of grade I flowers (5.17) and vase life of flower (8.18 days) were noticed lowest in control treatment. The gibberellins are well known for its promontory effects on cell division and cell elongation. therefore, an increase in quality aspect of flower with an application of GA_3 might be due to increase in auxin activity in the floral buds. Similar results were also reported by Gowda (1980) in rose.

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