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Research Paper

Effect of Gibberellic Acid Spraying on yield and Flowers of Gerbera (Gerbera jamesonii) c.v Dennis

Horticulture

KEYWORDS : Gibberellic Acid, spray, gerbera, flowers

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ABSTRACT

The Effect of Gibberellic Acid Spray on Flowers of Gerbera (Gerbera jamesonii) c.v Dennis was studied GA3 (0, 50, 100, 150, nd 200 ppm). This study was arranged in complete randomized block design (R.B.D.) with three replicates at the farm and the laboratory of Horticulture department, Allahabad School of Agriculture, SHIATS, Allahabad during October to June 2013. The result indicated that, maximum yield and quality parameters (number of flowers per plant, stalk length, flower bud diameter and stalk diameter) and Days to flower bud emergence and Days to first flowering were observed with treatment of BA at 150 ppm (T4).

INTRODUCTION

Gerbera (*Gerbera jamesonii*) came into dictionary of floriculture after it was discovered by pre-Linnean botanist, Gronovious but it received its fortunate name in honour of German naturalist, 'Traugott Gerber' who travelled in Russia in 1743.

It is considered as one of the natures beautiful creations because of having excellent flowers with exquisite shape, size and bewitching colors. It finds utility in garden beds, borders, rock gardens and pot culture. It is also used extensively in flower arrangements and also as cut flowers.

Panwar *ET. al.,* (2006) on tuberose found that foliar application of GA_3 at 0, 25, 50, 75 and 100 ppm was done on plants at 4-5 leaf stage. Among all treatments, application of GA_3 at 100 ppm was found best resulting in more number of leaves / plant.

Devadanam *ET. al.,* (2007) on tuberose make a trial on the effects of GA_3 Gibberellic acid (50, 100 or 150 ppm on growth and Yield of *polianthes tuberose*. GA_3 was sprayed to plants at 30, 60 and 90 days after planting. Significantly enhanced the growth. GA_3 at 150ppm resulted in the greatest plant height (59.13cm).

Ismaeil and Yossef (2008) on *Hemerocallis aurantica* indicate that all GA_3 concentrations (50, 100 and 200ppm) significantly increased the number of leaves and fresh and dry weights of leaves when compared with untreated plants "control" in both seasons.

Devadanam *ET. al.,* (2007) on tuberose demonstrated that the effects of gibberellic acid (50, 100 or 150 ppm) on flowering of *polianthes tuberosa.* GA_3 was sprayed to plants at 30, 60 and 90 day after planting. Significantly enhanced flower spike. GA_3 at 150 ppm resulted in the greatest number of florets per spike (30.49), flower yield/ha (6.25), and number of spikes/ha (2.48 lakhs) [1.0 lakh= 100.000].

Tyagi and Singh (2008) indicated that the effect of gibberellic acid (GA_3) and IBA on flowering of tuberose (polianthes *tuberosa.* cv. Double.) There were 17 treatments of soaking at 24h before planting and spraying at 30 days after planting of GA_3 at (40, 80, 120 and 160 ppm) and IBA at (20, 40, 60 and 80 ppm). Spraying of GA_3 at 160 ppm at 30 days after planting was the most effective for day's emergence of spikes (80.33), florets per spike (38.85), spike diameter (0.97), spikes per plant (2.43), spike length (78.33 cm) and rachis length (34.48 cm).

Ismaeil and Youssef (2008) on reported that all GA_3 (50, 100 and 200ppm) treatments statistically increased the number of flowers/ clump, Length and diameter of flower stalk , fresh and dry weights of flower as compared with control in both seasons.

MATERIALS AND METHODS

The present work was carried out at the farm and the laboratory of Horticulture department, Allahabad School of Agriculture, SHIATS, Allahabad. This work was aimed to study the effects of some pretreatments as growth regulators (GA3) as well as their interaction treatments on growth and yield of gerbera c.v Dennis.

T1: Control treatment (distilled water).
T2 : gibberellic acid (GA3) at 50 ppm
T3 : gibberellic acid (GA3) at 100 ppm
T4 : gibberellic acid (GA3) at 150 ppm
T5 : gibberellic acid (GA3) at 200 ppm

The treatments of the present work was arranged in complete randomized block design (R.B.D.) with three replicates.

The initial application for all treatments was begun at 30 days after planting and repeated two times at 3 weeks intervals .Bio new film was used as a surfactant chemical at 0.1 %. Control treatment was sprayed with tap water plus surfactant chemical dissolved in water at the rate of 0.1%.Thus all gerbera plants will be received three application of pervious growth regulators as spray at early morning, the vegetative buds and leaves were sprayed till run off. Plants was sprayed with fungicides (Topsin and Robigan) at doses 1g/L and2g/L respectively for two times at weekly intervals. Also all plants was received calcium chelate (100ppm) As spray at the beginning of flowering stage for two times at weekly intervals. Plants was received normal agriculture practices whenever they was needed with care beginning taken to cover all plants parts.

Data collection: Data were collected on days to flower bud emergence, days to first flowering, number of flower, flower bud diameter, peduncle length, peduncle diameter and flower head diameter from each pot within the period.

Results and Discussion

Days to flower bud emergence: Days to flower bud emergence varied significantly among the GA3 treatments. Early flower bud emergence occurred in T4 (150 ppm) (71.66)

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days while T1 (0 ppm) (86.00) days showed the late flower bud emergence (Table 1) . Inflorescences were emerged earlier than control, when those plants were treated with GA3 (Matsumoto 2006).

Days to first flowering : Among the treatments studied (T4, T5) taken (84.33) days to first flower and found to be statistically on par with T3 (85.67) days where as (T1) has taken maximum (99.33) number of day for first flowering (Table 1) . From the current study it was observed that application of GA3 influenced significantly for early flowering but not significantly affected d by their concentration. Jamal Uddin et al. (2012) and found that GA3 application caused early flowering in strawberry. Application of GA3 induced early flowering (Hernandez 1997 and Awan et al. 1999). GA3seemed to decrease ABA concentration and to boot t-ZR (trans-Zeatin Riboside) up in leaf that might be related to flower buds initiation and early flowering (Phengphachanh et al. 2012).

Number of flowers per plant: The perusal data presented in table 1 revealed that, the significantly highest (24.67) number of flowers recorded in (T5) whereas (T1) registered minimum number of flowers per plant (18.00). Foliar application of GA3 increases number of flower in strawberry (Jamal Uddin et al. 2012). Flower abscissions are usually due to high level of ethylene in the flower (Malik et al. 2003, Beno-Moualem et al. 2004) and the lower concentration of auxin and gibberellin (Aneja and Gianfagna 1999, Malik and Singh 2006).

Table (1) effect of gibberellic acid treatments on flowering parameters

GA3 Concentrations	Days to first flower bud emergence	Days to first flowering	Number of flowers / plant
T1	86.00d	99.33c	18.30a
T2	77.33c	89.66b	20.00b
T3	74.33b	85.67a	20.67b
T4	71.66a	84.33a	22.00c
T5	73.66b	84.33a	24.67d
L.S.D 0.05	1.570	2.104	1.104

In a column means having similar letter(s) are statistically identical and those having dissimilar letter(s) differ significantly at 0.05 level of significance

Flower bud diameter : The perusal data presented in table 2 revealed that, the significantly highest (3.20 cm) recorded in (T4) and was statistically on par with T5 (3.16 cm) while minimum registered by T1, T2 (2.80 cm) .

Stalk length: Significant differences were observed among the different treatments. Length of flower stalk was more in T4 (48.33 cm), which was significantly superior over other treatments followed by T5 (47.56 cm) and T3 (46.86 cm). While the shorter stalk length was recorded in T1 (43.10 cm) (Table 2).

Stalk diameter: Stalk diameter varied significantly among the treatments and it was maximum (1.76 cm) in T4, followed by T3 and T5 (1.63. cm). While minimum stalk diameter was recorded in T1 (1.40 cm) (Table 2).

Flower head diameter: The perusal of data presented in table 2 depicted that the flower head diameter not significantly superior between the treatments. There are no significant differences between the treatments.

Table (2) effect of gibberellic acid treatments on Yield and quality parameters

GA3 Concentrations	Flower bud diameter (cm)	Stalk length (cm)	Stalk diameter (cm)	Flower head diameter (cm)
T1	2.80a	43.10a	1.40a	7.93
T2	2.80a	44.06b	1.50a	8.00
T3	3.03b	46.86c	1.63b	8.06
T4	3.20c	48.33f	1.76c	8.10
T5	3.16c	47.56d	1.63b	8.00
L.S.D 0.05	0.093	1.860	0.126	N.S

In a column means having similar letter(s) are statistically identical and those having dissimilar letter(s) differ significantly at 0.05 level of significance

Conclusion

It was revealed from the study that (T4) 150 ppm Gibberellic acid increases the number of flower in addition with stalk length diameter and flower bud diameter.

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