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RESEARCH PAPER

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Effect of nitrogen levels and gibberellic acid on quality and vase life of gerbera under polyhouse condition

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ABSTRACT

In gerbera under polyhouse condition, the quality parameter like flower stalk length, flower stalk thickness, flower diameter, flowers of grade I were mostly influenced by the application of higher level of nitrogen *i.e.*N_3 (30g/m^2/month) and flowers of grade II was found superior in the treatment N_1 (10g/m^2/month). Application of G_2 (100ppm at monthly interval) resulted in maximum flower stalk thickness and in respect of flower stalk length and flower diameter G_3 (150ppm at monthly interval) was found superior.

KEY WORDS : Gerbera, Polyhouse, Nitrogen, GA_3, Vase life

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INTRODUCTION

Gerbera (*Gerbera jamesonii* H.Bolus) is one of the natures beautiful creation having excellent flowers of exquisite shape, size and attractive colour. It is grown for various purposes such as beds, borders, rock gardens, pot cultures and cut flowers. There is a great demand for gerbera throughout the year in big cities and also have export value. Therefore, gerbera growing under polyhouse could be helpful to meet city requirements adequately. Gerbera being a perennial plant, require plenty of organic matter and adequate nutrient *i.e.* nitrogen, phosphorus, and potassium for profuse growth and good flower quality. The number of marketable flowers of gerbera increased as both N and K rates increased up to 110kg/ha (Dufault *et al*.1990). Use of PGR are being increased to manipulated the growth, flowering and yield of ornamental plants (Saini and Arora, 1974).

Thus, keeping in view the potentialities of nutrition and gibberellic acid in gerbera flower production, the experiment was carried out with the objective, to study the effect of different levels of nitrogen and gibberellic acid on flower quality and vase life of gerbera under polyhouse condition.

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MATERIALS AND METHODS

A pot experiment was carried out at Floriculture unit, University Department of Horticulture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola (M.S.) during June to November 2005. Experiment was laid out in semicontrol modified quonset type polyhouse. Green shade net (50%) was provided inside polyhouse. Sterilized cocopeat media was filled in the pot of equal sized. Three months hardened tissue culture plants of variety Sangria were planted in pot of 30cm x 30cm size. The experiment which was embedded in a FRBD with three replications and sixteen treatment combinations comprising of four levels of nitrogen (0, 10, 20, and 30g /m^2 /month) and gibberellic acid (0, 50, 100, 150ppm at monthly interval).

Nitrogen was applied as per the treatments however, phosphorus, and potassium were applied @ 12.5g and 15g /m2/ month, respectively at 15 days interval. Straight fertilizers *viz.,* Urea, SSP, and MOP were applied. Proper

irrigation was done throughout the experiment as and when required. Whenever inside temperature of polyhouse was increased, fan and pad system as well as foggers were operated to maintain the optimum temperature and humidity. The incidence of aphids, white flies were controlled by spraying with diamethoate @1.5ml/l. Similarly collar rot were controlled by alternate drenching of redomil @ 2g/l. The observations on flower quality and vase life of flowers were recorded from five flowers selected from each treatment.

The data collected and recorded during course of investigation were subjected to statistical analysis as per the method of analysis of variance (Panse and Sukhatme, 1979) for FRBD. The results have been interpreted on the basis of F test and C.D.at 5%

● RESULTS AND DISCUSSION ●

The results obtained from the present investigation as well as well as relevant discussion have been presented under following heads :

Effect of nitrogen:

Different levels of nitrogen significantly influenced the qualitative parameters (Table 1). The flowers with longest stalk (56.50cm) were harvested from the plant supplied with 30g nitrogen per sq.m. (N_3) and shortest flower stalk was noticed under control (45.20cm). Data indicated that, 30g nitrogen per sq.m.per month of nitrogen produced flowers with maximum diameter (10.03cm), and it was minimum (6.48cm) in control. This may be due to nitrogen which enhances translocation of metabolites required for growth of flower due to which flower diameter increased. Similar results were also obtained by Gurav *et al*. (2002). Flowers with thickest stalk (0.78cm) were harvested from the plants fertilized with 30g nitrogen per sq.m. per month (N_3) and it was thinnest (0.48cm) in control.Significantly highest number of cut flowers of grade I (8.67) were harvested from plants under 30g nitrogen per sq.m. per month (N_3) treatment and lowest (3.06) under N_0 treatment of nitrogen. Flowers of grade II were maximum (3.27) under 10g nitrogen per sq.m.per month, followed by the treatment 30g nitrogen per sq.m. per month (2.97). The flowers harvested from the treatment N_1 recorded maximum vase life (9.35 days) which was significantly superior than rest of the treatments. However, minimum vase life (7.36 days) was recorded in the flower harvested from N_0 treatment.

Effect of gibberellic acid:

The results from Table 1 indicate that the flowers with longest stalk length (54.21cm) were harvested from G_3 treatment (150ppm), whereas it was shortest (50.37cm) in control. This might be due to fact that gibberellic acid promotes cell division and cell elongation resulting in longer stalks. The spraying of gibberellic acid at 150ppm concentration produced flowers with maximum diameter (9.06cm), while it was minimum (6.91cm) under contol. Gibberellic acid is growth promoter and might possibly influence the auxin activity in terminal buds of plants. These results are in close agreement with the findings of Sujatha *et al*(2002a), Sujatha *et al*.(2002b) in gerbera and Gowda *et al*.(1988) in gladiolus. Maximum flower stalk thickness (0.72cm), was recorded with spraying 100ppm level of gibberellic acid, followed by 150ppm gibberellic acid (0.66cm). However it was minimum in control (0.51cm). More number of grade I flowers (6.90) were produced by spraying 150 ppm GA_3 level of gibberellic acid, while 50 ppm GA_3 level had produced maximum flowers (3.32) of grade II. The vase life of flowers was observed more (8.87 days) in treatment G_2 and was at par with the treatment G_3 (8.74 days). But these treatments were significantly superior over G_1 and G_0. However, the vase life of flower was observed less (8.18 days) in treatment G_0.

Interaction effect of Nitrogen and level of Gibberellic acid:

The interaction between nitrogen and gibberellic acid (N x GA_3) improved the various characters of gerbera

Table 1 : Effect of nitrogen levels and gibberellic acid on quality and vase life of gerbera under polyhouse condition

Characters	Nitrogen level(g/m^2/month)					Gibberellic acid (monthly spray)				
	N_0 (0g)	N_1 (10g)	N_2 (20g)	N_3 (30g)	C.D. (P=0.05)	G_0 (0ppm)	G_1 (10ppm)	G_2 (100ppm)	G_3 (150ppm)	C.D. (P=0.05)
Flower stalk length (cm)	45.20	52.43	54.43	56.50	0.47	50.37	51.44	52.54	54.21	0.47
Flower diameter (cm)	6.48	6.68	9.15	10.03	0.23	6.91	7.79	8.58	9.06	0.23
Flower stalk thickness (cm)	0.48	0.56	0.70	0.78	0.01	0.51	0.62	0.72	0.66	0.01
Flower Grade I	3.06	5.22	7.78	8.67	0.14	5.17	5.98	6.68	6.90	0.14
Flower Grade II	2.63	3.27	2.88	2.97	0.06	2.85	3.32	2.75	2.83	0.06
Vase life studies (Days)	7.36	9.35	8.91	8.79	0.15	8.18	8.63	8.87	8.74	0.15

crop better than their effects in isolation(Table 2). The quality parameters *viz.,* flower stalk length, flower diameter, flower stalk thickness, number of grade I flowers were significantly superior under the higher level of nitrogen and moderate level of gibberellic acid (30g nitrogen per square meter per month + 150ppm gibberellic acid at monthly interval) whereas maximum number of grade II flowers were observed under low level of nitrogen and of gibberellic acid (10g nitrogen per square meter + 50ppm gibberellic acid at monthly interval). Table 2 showed that the maximum vase life were recorded under low level of nitrogen and moderate level of gibberellic acid(10g nitrogen per square meter + 100ppm gibberellic acid at monthly interval).This might be due to more carbohydrates reserves in the stem. Similarly the xylem and phloem are equally responsible for translocation of sugar might increase the somatic concentration and improve the ability to absorb more water and thus increased the longevity of flowers under vase. Similar results was also reported by Moulinier and Montarone (1978) in gerbera.

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