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Effect of plant growth regulators on corm and cormels production of Gladiolus (Gladiolus grandiflorus L.) Cv. Saffron

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ABSTRACT : The present investigation was conducted to study the effect of plant growth regulators on growth and flowering of gladiolus Cv. Saffron during 2020-21 at Department of Floriculture and Landscape Architecture, IGKV Raipur, Chhattisgarh. Three growth regulators with three concentration viz., GA_3 (100 ppm, 200 ppm and 300 ppm), BAP (50 ppm, 100 ppm and 150 ppm) and MH (250 ppm, 500 ppm and 750 ppm) each at three concentration in addition to tap water spray as control. The experiment was laid out in Randomized block design (RBD) with ten treatments with three replication. The result revealed that the treatment T3 (GA_3 @ 200 ppm) followed by T9 (MH @ 500 ppm) attributed to superior results regarding the increase the number of corms per plant, weight of corms per plant, diameter of corms per plant, number of cormels per plant, weight of cormels per plantsover all other treatments.

Keywords: Gibberllic acid, Benzyl amino purine, Malic hydrazide

I. INTRODUCTION

Gladiolus is an important floral crop used world-wide as both a cut flower and planted in the garden. Gladiolus is known as the "Queen of Bulbus Flowers" and it is most important bulbous flower crops. Familyis Iridaceae, native to Europe, Africa, and the Mediterranean region. Several species are widely cultivated for cut flowers and as garden ornamentals.

The word “gladiolus” is derived from the Latin word “gladius” meaning a “sword” shape leaves of the plants. Gladiolus is grown as flower bed in gardens and used in floral arrangements for interior decoration as well as making high quality bouquets (Lepcha et al., 2007) Gladiolus is a monocotyledonous bulbous flowering plant. In the spike, the flowers open from the bottom to the top. It have multi coloured flowers and commonly used as a cut flower, rockeries, pot plants,herbaceous borders and bedding purpose. It is also used in bouquet and flower arrangements. Gladiolus is a winter crop, but it can also be grown in the summer in areas with low rainfall and a mild climatic condition. Gladiolus can be grown in a variety of soil types and requires a pH of 6.0-7.0 for optimal growth and spike production. Gladiolus is one of the four famous cut flower in the world. (Baiet al., 2009). It has 1st rank of bulbous flower in the world trade. (pragya et al., 2010).

II. MATERIAL AND METHODS

Present work was conducted at the Experimental area, Department of Floriculture and Landscape Architecture, IGKV Raipur, (Chhattisgarh), during the year of 2020-21. The experiment was set up in three replications using Randomized Block Design with 10 treatments. Soil of the experiment plot was medium black, uniform in texture and well drained. FYM was applied at the time of land prepration. The treatment comprised three plant growth regulators viz., GA_3 (100 ppm, 200 ppm and 300 ppm), BAP (50 ppm, 100 ppm and 150 ppm) and MH (250 ppm, 500 ppm and 750 ppm) each at three concentration in addition to tap water spray as control. Healthy,

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uniform-sized corms diameter ranging from 3 to 5 cm were planted with a row spacing of (30×20 cm) between the rows and plants, respectively One corm per hill about (5-6 cm) depth, corm were planted. All chemical applied the plants 30 day after planting through foliar spray. The growth and flowering parameters for each treatments were observed in five tagged plants selected by random sampling method. The data were statistically analysed and critical differences were work out at five percent level to draw statistical conclusions as suggested by Panse and Sukhatme (1985).

III. RESULT AND DISCUSSION:

The result presented in table 1, revealed that the corm and cormels yieldparameters of gladiolus plant were significantly altered due to the application of growth regulators. The maximum number of corms per plant, Weight of corms per plant, diameter ofcorms per plant, number of cormels per plant, weight of cormels per plants.

Number of corm per plant

The data reveals that the greatest number of corm per plant (1.66) has been noticed in treatment T_9 (MH @ 500 ppm). However, it was at par with treatments T_7 (BAP @ 150 ppm), T_8 (MH @ 250 ppm) and T_{10} (MH @ 750 ppm) and it was found significantly batter over remaining of the other treatments. The least number of corms per plant (1.12) was noted with treatment T_1 control with tap water.

The yield attribute related to corms per plant is significantly increased with application of growth retardants like, MH produced greater number of corms per plant, could be attributed to the effect of growth inhibitors on delaying floral initiation would have improved the source-sink ratio by lowering carbohydrate partitioning to the floral spike, as evidenced by the reduction in spike length. This finding is in consistent with the result reported by Patel et al. (2012) in gladiolus.

Weight of corm per plant (g)

"The greatest corm weight per plant (49.50 g) has been noted in treatment T_3(GA_3 at 200 ppm) and it was observed similar with treatments T_2 (GA_3 at 100 ppm), T_4 (GA_3 at 300 ppm), T_5 (BAP at 50 ppm), T_6 (BAP at 100 ppm) and T_7 (BAP at 150 ppm). Moreover, it was observed substantial better over remaining of the other treatments. The least weight of corm per plant (40.80 g) was found with treatment T_1 (control with tap water).

"The higher weight of corm per plant was noted with application of treatment T_4 (GA_3 @ 300 ppm) concerning the weight of corm per plant, the GA_3 application can be attributed to the capacity to increase the photosynthetic assimilates, in photosynthetic assimilation process whereby CO_2 and water are transformed into a number of organic molecules in plant cells that may be increase to weight of corm per plants. These findings are closed conformity in gladiolus with findings of Ram et al., (2001) and padmalatha et al., (2013)."

Diameter of corm (g)

The observation from data reveals that the treatment T_4 (GA_3 at 300 ppm) produced the largest corm diameter (6.37cm), which was statistically equivalent to treatments T_2 (GA_3 at 100 ppm), T_3 (GA_3 at 200 ppm), T_9 (MH at 500 ppm) and T_{10} (MH at 500 ppm). Whereas, it was shows significant difference with rest of the other treatments. However, the treatment T_5 (BAP at 50 ppm) had the smallest corm diameter (5.51 cm).

The increase in corm diameter per plant in treatment T_4 could be due to the incorporation of protein and carbohydrate in GA_3 treated plants that resulted in improved vegetative growth of the plant. This almost certainly aided corm tuberization and increased their size (diameter) and weight in gladiolus corm. The result is consistent with the finding of Singh et al. (2002) and Kumar et al. (2005).

Number of cormels per plant

The data revealed that the greatest number of cormels per plant (46.89) were recorded by the treatment T_3 (GA_3 @ 200 ppm) which was statically at par with T_9 (MH @ 500 ppm) and significantly batter to remaining of the other treatments. However, minimum number of cormels

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per plant (28.43) was noticed in treatment T_5 (BAP @ 50 ppm).

Number of cormels per plant enhance with treatment T_3 (GA_3 @ 200 ppm) might be due to accessibility of higher level of GA_3 to the plant for longer period of time with foliar spray method resulted in batter growth of plant and ultimately increased the cormels per plant. This is consistent with the finding of chowdhury (1989).

Weight of cormels per plant (g)

It revealed that the maximum weight of cormels per plant (29.20 g) were registered by the treatment T_3 (GA_3 @ 200 ppm) and it was statically similar with T_9 (MH @ 500 ppm) and exibited significantly better over remaining of the other treatments. However, lowest weight of cormels per plant (16.26 g) has been noted in treatment T_1 control with tap water.

The application of GA_3 to Gladiolus significantly increases cormel weight per plant may be due to the GA_3 treated plant remaining physiologically active more in order to build up sufficient food stocks, which in turn caused the batter plant growth and development to eventually increase, weight of cormels per plant. These findings are in consonance with the reports of Baskaran et al. (2009) Gaur et al. (2003) and Padmalatha et al. (2013).

IV. CONCLUSION:

Based on the present research work, it is concluded that Gibberellic acid GA_3 @ 200 ppm foliar spray followed by MH T_9 @ 500 ppmimprove thecorm and cormels yields, increase the number of corms per plant, weight of corms per plant, diameter of corms per plant, number of cormels per plant, weight of cormels per plants.

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Table 1: Effect of plant growth regulators on corm and cormels production of gladiolus.

Treatments	Number of corm/plant	Weight of corms/plant (g)	Diameter of corms/plant	Number of cormels/ plant	Weight of cormels/plants
T1-Control	1.12	40.80	5.51	32.34	16.26
T2-GA3@100 ppm	1.18	49.03	6.31	37.05	19.73
T3-GA3@200 ppm	1.25	48.00	6.37	46.89	29.20
T4-GA3@300 ppm	1.32	49.50	6.27	45.27	18.87
T5- BAP@ 50 ppm	1.20	47.40	5.50	28.43	17.13
T6-BAP@100 ppm	1.39	48.10	5.60	32.14	18.81
T7-BAP@150 ppm	1.52	47.90	5.84	30.13	17.89
T8-MH@ 250 ppm	1.58	42.30	5.76	40.06	23.40
T9-MH@ 500 ppm	1.66	43.40	5.92	45.52	29.06
T10-MH@750ppm	1.64	41.20	5.94	41.59	19.98
S.Em±	0.06	0.96	0.15	0.49	0.25
C.D. at 5%	0.18	2.87	0.45	1.46	0.74

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