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Research Note

Effect of growth regulators on the growth, flowering, corm and cormel attributes of gladiolus

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Gladiolus is one of the leading cut flower in global industries of floriculture. It requires various nutrients and growth regulators for production of good quality of flowers. The work done with various growth regulators like GA_3, BA and SA with different levels on gladiolus is almost nil which allured our attention to study the effect of growth regulators on gladiolus; hence the present investing was carried out.

A field trial was conducted at Floriculture Research Scheme, ASPEE College of Horticulture and Forestry, Navsari Agricultural University, Navsari during winter 2008-09. The soil of experimental field had a pH of 7.7, with available nitrogen 160 kg/ha, available phosphorus 40.12 kg/ha and available potash 381.05 kg/ha. The experiment was laid out in Randomized Block Design with various growth regulators treatment *i.e.* T_1-GA_3 20mg/l, T_2 GA_3-30 mg/l, T_3-GA_3 40 mg/l, T_4-BA 25 mg/l, T_5-BA 50 mg/l, T_6-BA 75 mg/l, T_7-SA 50 mg/l, T_8-SA 100 mg/l, T_9-SA 150 mg/l and T_{10}-Control. The data on growth parameters, flowering parameters and yield parameters were recorded and presented in Table 1 after statistical analysis.

The data recorded during the course of investigation were tabulated, statistically analysed and results are intepreted here under appropriate heads:

Growth attributes:

Plant height:

Highest plant height (45.6 cm) was recorded under treatment T_3 (GA_3 40 mg/l) which was at par with T_1, T_2 and T_9. This may be due to GA_3 which are known to promote the elongation of stem by cell elongation and cell multiplication. Also may due to osmotic up taken of water and nutrients under the influence of GA_3. Which maintain a swelling force against the softening of cell wall and thereby increase in plant height (Umrao *et al.,* 2007).

Length of leaves:

GA_3 (40 mg/l) recorded significantly highest length of fully open leaf (36.2 cm) while minimum leaf length was recorded in control being 25.5 cm. It might be due to enhanced cell elongation and cell multiplication by promoting DNA synthesis in cell. The increase in leaf length as a result of GA_3 application is in close confermity of finding with Sharma *et al.* (2004).

Number of leaves per plant:

Maximum number of leaves per plant crop was recorded in T_3 (GA_3 4 mg/l) being 7.2 while least number of leaves was noted in control being 5.2. It might be due to increase in vegetative growth which accelerates the photosynthesis metabolic activity more transportation and utilization of the photosynthetic production (Rana *et al.,* 2005).

Leaf area:

Maximum leaf area (35.5 cm^2) was recorded by the application of GA_3 40 mg/l, which was statistically at par with other growth regulator treatment except T_4. Minimum leaf area (25.1 cm^2) was recorded in control. It may be due to action of gibberellins occurring through the enhancement in auxin by proliferating the site of auxin action. Emergence, exploitation of leaves pivotal of overall growth and development in plant. Also foliar application

of growth regulator shows the effect on vegetative parameters, (Kirad *et al.,* 2001).

Flowering attributes:

Days required for spike emergence:

Treatment T_4 (GA_3 40 mg/l) being 78 days was significantly superior for earliness of flowering as compared to other treatments. It might be due to higher concentrations of GA_3 associated with anthocyanin and developed florigen, which induce early flowering, also increase in endogenous level of GA_3 and increased photosynthetic area and respiration which enhanced CO_2 fixation in plant and associated with the early flowering, Ramachandrudu and Thangam (2007).

Spike length:

Maximum length of spike 53.6 cm was obtained in T_3 (GA_3 40 mg/l), where as a minimum length of spike 37.7 cm was recorded in T_{10} control. It may be due to synergetic action of GA_3 which faster the cell division and enlargement of cells of stalk. Also it increases the auxin content in tissue. So increase in metabolic activities takes place (Baskaram and Mishra, 2007).

Number of florets per spike:

Maximum number of florets per spike (11.3) as recorded through the application of GA_3 40 mg/l, while minimum number of florets per spike was noted with control. This might be due to the more length of spike and more no. of florets per spike could be due to the change in bud initiation and increase in photosynthesis and respiration, enhanced carbohydrate fixation in plant treated with GA_3 change vegetative bud into floral buds.

Vase life:

Maximum vase life (14.8 days) was recorded with GA_3 40 mg/l, which was at par with T_2, T_9 and T_1 as compared to control. This may be due to the increase in GA_3 in flowering spike which decreased the ethylene content resulted decreased respiration rate (Dhatonde, 2008).

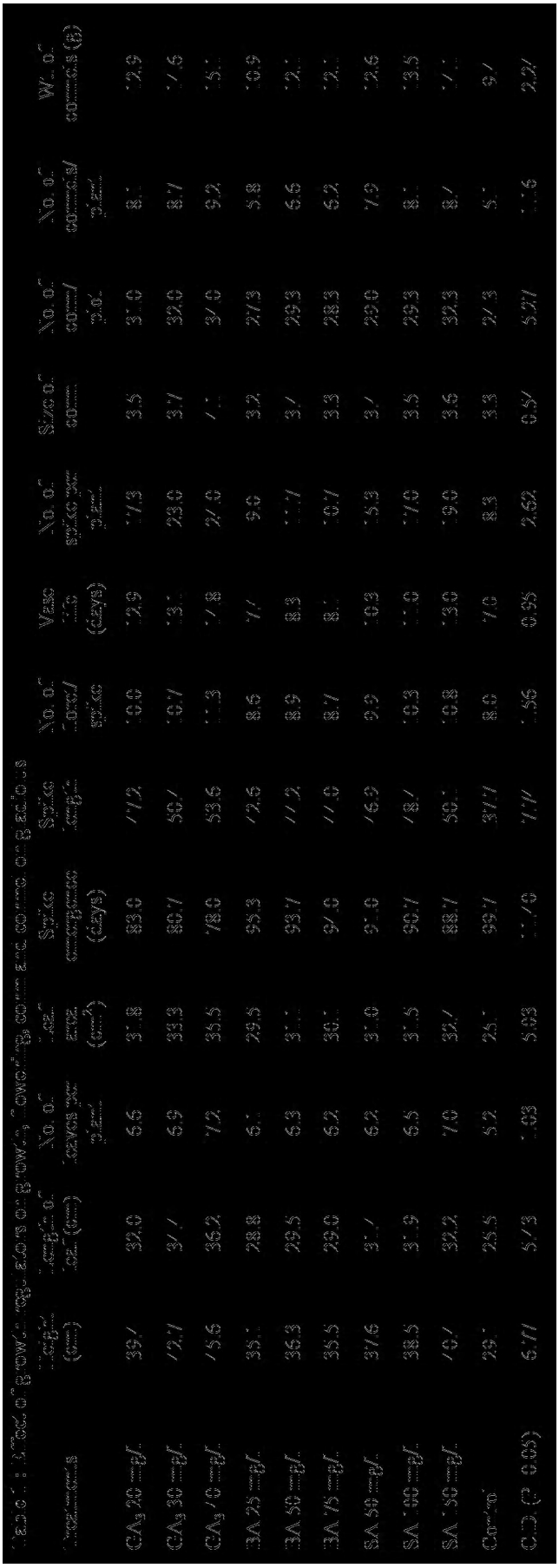
Number of spike per plant:

Maximum number of spikes was obtained from GA_3 40 mg/l being 24 spikes which may be due to gibberellins promote the number of sprouting per plant which increases number of spike per plant (Umarao *et al.,* 2007).

Corm/ Cormel production:

Size of corm:

The maximum corm size (diameter) was recorded



under T_3 (GA_3 40 mg/l) being 4.1 cm that was at par with T_2 and T_9 being 3.7 cm and 3.6, respectively. While minimum size of corm was found under control. It may be due promotion of vegetative growth by active cell division and elongation and also by increasing the rate of photosynthesis and respiration which enhanced carbohydrate fixation in plant (Umarao *et al.,* 2007).

Number of corms per plot (1.5 m^2):

Maximum number of corms production per plot was under T_3 (34.0) which was at par with T_1, T_2 and T_9, while least number of corm production was registered under control. This might be due to enhanced physiological activities by GA_3 treatment in development of more number of corms per plant as compared to control (Baskarma and Misra, 2007).

Number of cormels per plant:

Higher cormel production was observed under T_3 (9.2), while least number of cormel productions was noted in control. Due to more production of food material in leaves and enhanced physiological activities by GA_3 also by unique ability to promote extensive growth of intact plants which was reason for increased number of cormels per plant (Ramchandrudu and Thangam, 2007).

Weight of cormels per plant (g):

Maximum weight of cormels (15.1 g) was recorded with treatment of GA_3 40 mg/l, which was on same bar with SA 150 mg/l, GA_3 30 mg/l, SA 100 mg/l and GA_3 20 mg/l. Due to foliar application of GA_3 at 40 mg/l produced more food material in leaves resulted in heaviest cormels (Ramchandrudu and Thangam, 2007).

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