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Influence of growth regulators and spacing's on corms yield of gladiolus (*Gladiolus grandifloras* L.): A review

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Abstract

The results of the experiment showed use of Gibberellic acid and plant spacing's had been significantly. Highly influence on the most parameters such as number of corms per plant the not significant on higher amount of Gibberellic acid and wider spacing's.

Keywords: gladiolus, PGRs, corms & spacing's

Introduction

Gladiolus is a popular flowering plant grown all over the world, from South Africa to West Asia. The name gladiolus was derived from the Latin word gladioli, because of its sword-like leaves. It is popularly known as sword lily. It was introduced for the cultivation at the end of the 16th century, (Parthasarathy and Nagaraju, 1999) [15]. Flower quality (Length of cut flower, length of spike and number of florets) was poor in higher density plots. Planting of gladiolus at wider spacing resulted into maximum number of leaves, height of plant and diameter of corms/plant, the weight of daughter corms and corm-lets/plant also increased at wider spacing's. (Sujatha and Singh, 1991) [21].

Influence of corm production

Ogale *et al.*, 2000 [13] studied that flowering could induce the miniscule cat-8 corms of gladiolus var. Happy End with the help of PGRs.

Bijmol and Singh 2001 Response of gladiolus cv. Red beauty their resulted in maximum number of leaves per plant (12.30), length of longest leaf (51.21cm), width of scape (1.24cm), diameter of corm (5.59cm), and weight of corm (89.29 g/plant), However, spacing failed to exert any significant effect on days to sprouting, percentage of sprouting, width of longest leaf, number and weight of cormel per plant, average weight of corm and cormel yield per hectare.

Mishra and Singh 2001 [9] reported that, in general, wider spacing increased the production of corms, cormels and spikes per plant and improved the quality of blooms.

Sudhakar *et al.*, 2012 [19] result revealed that growth regulators application significantly influenced the growth and yield in gladiolus. The maximum number of floret/spike length (cm) and flower length (cm) were obtained with GA₃ @ 100ppm as compared to rest of the treatments. Whereas CCC @ 500ppm was found the best in terms of corm and cormels production.

Level of growth regulators and corm spacing

De *et al.*, 1996 carried out an experiment to study the effect of sucrose salts and organic acids on the post-harvest life and quality of pulsed (20% sucrose for 16 hrs.) gladiolus spikes cv. High Style. Sucrose (4%) + 8 HQC (250ppm) was found most beneficial for improving post-harvest life and quality of cut gladiolus spikes. Pal and Choudhury 1998 reported that gladiolus corms were soaked for 24 hrs. In 20ppm GA₃ gave the greatest spike length (91.0 cm) as compared to control. Prakash *et al.*, 1999 [16] investigated the effect of GA₃ on the floral parameters of gladiolus. Ten gladiolus cultivars were treated with 0, 100 and 150ppm GA₃ and effect on flower parameters, viz. time of flowering, inflorescence length, spike length, floret length and number of florets per spike were studied. GA₃ treatment at 150ppm GA₃ in cv. Friendship product the longest inflorescences and spike with the highest number of florets per spike.

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Singh and Singh 2000 ^[18] conducted experiment that the effect of spacing on length of the longest leaf and plant height proved to be significant; they observed that the height of the plant and leaf increased with the increasing spacing's. The spacing's significantly influenced corm and cormel production and the widest spacing (25x20cm) resulted in maximum weight and diameter of corm. The widest spacing also produced maximum number of cormels, and weight of cormles per plant, though there was no significant differences.

Dutta *et al.*, 2001 ^[6] study the determine the effect of gibberellic acid (GA₃) treatment on the corm germination of 10 gladiolus hybrids. Corms of each hybrid were de-husked and cleaned prior to soaking in GA₃ solution at 100, 150 and 200ppm and water for 24h. GA₃ @ 200ppm significantly increased the percentage of corm germination and reduced the number of days required for germination compared with other and control treatments. Corm germination values of 62.8 and 64.4% 66.5 were obtained with GA₃ at 100, 150 and 200ppm, respectively.

Muraya *et al.*, 2002 conducted that foliar application of 100ppm GA₃ at 45 days after corms planting resulted in more number of spike per plant, increased number of florets spike⁻¹ (16.7) and size of second florets (10.8 cm).

Ram Raja *et al.*, 2002 ^[17] observed that treatment with 400 mg l⁻¹ethephon significantly reduced the dormancy period in gladiolus by 17.5 days as compared to control.

Bose *et al.*, 2003 ^[3] study the effect of GA₃ in flowering and quality characteristics of gladiolus cv. "Eurovision". Corms were soaked in solutions of 0 (control), 50ppm GA₃ for 1 hour and were planted 5 days later (late autumn) at 49 corms/m² on 24 November. GA₃ and 100ppm shortened the time from planting to harvest and increased flowering percentage, spike length, the number of flowers per spike and diameter of flower stems.

Gaur *et al.*, 2003 ^[7] an experiment that high GA₃ and low IAA concentrations improved plant height, number and size (width and Length) of leaves and thickness and width of shoots; promoted earliness in spikes, emergence, colour break in the first and flowering; increased the length of spikes, number of florets per spike, size of floret and longevity of spikes; and increased the vase life of cut flowers and the number, weight and diameter of corms and cormels. The highest values for all parameters were recorded with GA₃ at 200ppm.

Bhattacharjee *et al.*, 2010 ^[1] an experiment with gladiolus cv. Sylvia where corms kept in GA₃ solutions for 24 hours in an attempt to find out the effect in growth and flowering. It was revealed that the GA₃ treated and flowered earlier than the control corms.

Jinesh *et al.*, 2011 ^[8] results took minimum days for corm sprouting as compared to control and rest of the treatments. Significantly the maximum plant height, leaf length and number of leaves per plant width were registered with the same treatment GA₃ @ 50 mg/l as compared to control. Whereas CCC @ 250 mg/l gave maximum yield of corms and cormels by increasing the number and weight of corms and cormels per plant as compared to control.

Chopde *et al.*, 2011 ^[4] revealed that, the maximum leaves plant⁻¹ and spikes hectare⁻¹, minimum days required for opening of first pairs of florets and 50 percent flowering were due to the variety Phule Tejas. Whereas, the maximum total chlorophyll content of leaves before the flowering and the maximum length of spike, distance between two florets, longevity of flower on plant and length and width of florets

were observed under the variety Phule Ganesh. However, effect of PGR was non-significant as regards leaves plant⁻¹ and chlorophyll content of leaves. Treatment of GA₃ 150ppm. Sudhakar *et al.*, 2012 ^[19] study the effect of corm size and spacing on growth and flowering in gladiolus sp. cv. 'white friendship' in Tamil Nadu condition. Corms of different sizes, viz. 3.5-4.5 cm, 4.6-5.5 dia. Cm and above 5.5 cm were planted at the spacing, viz. 30 x 20 cm, 30 x 25 cm and 30 x 30 cm were planted and found that corm size of large 5.5 cm and spacing of 30 x 30 cm were found excellent in respect of vegetative, floral and corm yield compared to others.

Muhshid 2013 result of combined analysis showed that the treatment GA₃ at 100 mg/l and ethephon at 100 mg/l on Rose supreme variety at the first year had significant effect on the days to sprouting and weight of corm. Also the maximum number of flowers has been gained through the combination of gibberellic acid and ethephon at 100 mg/l on White prosperity variety at the second year. The combination of gibberellic acid and ethephon at 100 and 200 mg/l had significant effect on the number of cormels.

Nag *et al.*, 2018 ^[12] experiment compromised of three spacing's viz., 30x15cm, 30x20cm and 30x25cm had significantly. Increase on the most parameters such as height of plant, corms per plant and weight of corms per plant was the higher yield on wider spacing's 30x25cm.

Conclusion

From the present study, it can be concluded that the treatment combination of large bulb size (10cm in different diameter) along bulb treatment/treated with Ga₃@100ppm is best suited to grow gladiolus in open field condition and protected condition to achieve good growth, profuse flowering and bulb yield.

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