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Effect of Growth Regulators on Corms and Cormels Production of gladiolus *cv.'Picardy'*

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ABSTRACT: *An investigation was undertaken to study the effect of growth regulators on growth and flowering parameters in gladiolus* cv. Picardy *at Department of Horticulture, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Dist. Ratnagiri (MH) India, 415 712 during 2008-2009. The experiment was conducted in Randomised Block Design with ten treatments replicated three times. The treatments composed of growth regulators sprays at 2 and 4 leaf growth stages* viz., *T_1 – GA_3 100 ppm; T_2- GA_3 200 ppm; T_3 - GA_3 300 ppm; T_4 - Ethrel 150 ppm; T_5 - Ethrel 250 ppm; T_6 - Ethrel 350 ppm; T_7 - Cycocel 400 ppm; T_8 - Cycocel 800 ppm T_9 - Cycocel 1200 ppm T_{10} - Control (No Spray). All the plant growth regulators significantly influenced the corm and cormel production over the control. The treatment T_2 recorded the maximum number of corms per plant (1.46), highest weight of corms (32.16g), maximum number of cormels per corm (15.75) and highest total weight of cormels per corm (35.23g).*

Keywords: *Gladiolus, growth regulators, growth parameters, flowering parameters.*

INTRODUCTION

Gladiolus is an important flower crop which stands fourth in the international cut flower trade after carnation, rose and chrysanthemum. It belongs to family *Iridaceae* and was introduce to commercial cultivation towards the end of 16th century (Innes, 1985). It is grown commercially for interior decoration, social and religious functions and cut-flowers in vases. There is good scope for gladiolus cultivation in konkan region as the soil and climatic conditions are congenial for its commercial cultivation. It is grown on very small scale in thane districts to fulfill the requirement of Mumbai market, however it has demand in Pune, Kolhapure and Panjim market. Also it is the only flower crop which is accepted in European countries when grown in open condition. Thus, as a cut flower, gladiolus has great potential for domestic as well as foreign market and hence flower growers of konkan region have keen interest in advanced cultivation of gladiolus to earn more return.

The plant growth regulators generally modified the physiological processes of plants and ultimately affect the yield and quality of blooms. Several plant growth regulators have been widely used in many ornamental crops and their efficacy have been demonstrated for nursery production, ornamental foliage plant and/or several other flower crops (Sanap *et.al.* 2000). The uses of gibberellic acid, cycocel and maleic hydrazide have been reported to be remarkably successful in quality bloom production with several flowers and ornamental crops. Keeping all the above facts in view, this investigation was carried out to effect of growth regulators on corms and cormels production of gladiolus *cv. 'Picardy'*

MATERIAL AND METHODS

The experiment was conducted at Department of Horticulture, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Dist. Ratnagiri (MH) India, 415 712 during 2008-2009. Before sowing healthy corms (3-5cm) diameter were soaked in 0.2% bavistin solution for ten minutes and then one corm per hill was planted at 6-7 cm depth in the month of 2nd September 2008. The recommended dose of fertilizers was applied @ 400kg nitrogen, 200kg phosphorous and 200kg potassium in the form of urea, single super phosphate and murate of potash respectively. The

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experiment was conducted in Randomised Block Design with ten treatments replicated three times. The treatments composed of growth regulators sprays at 2 and 4 leaf growth stages *viz*., T_1 – GA_3 100 ppm; T_2- GA_3 200 ppm; T_3 - GA_3 300 ppm; T_4 - Ethrel 150 ppm; T_5 - Ethrel 250 ppm; T_6 - Ethrel 350 ppm; T_7 - Cycocel 400 ppm; T_8 - Cycocel 800 ppm T_9 - Cycocel 1200 ppm T_{10} - Control (No Spray).

The stock solution of GA_3, ethrel and Cycocel were prepared and from that, working solution of required concentration were prepared. The incidences of pest and diseases were negligible except leaf eating caterpillar and fussarium wilt which were controlled by spraying 0.05% endosulfan, 0.05% chloropyriphos and drenching of radomil. The data were recorded on number of corms per plant, average weight of corms per plant, average diameter of corms, number of cormels per plant total weight of cormels per corm and diameter of cormels. The recorded data were statistically analyzed by Panse and Sukhatme (1985). The critical difference was computed at 5% level of significance.

RESULT AND DISCUSSION

It is noticed from the data presented in Table 1 that, plant growth regulators under study significantly affect the number of corms per plant, weight of corms and diameter of corms in gladiolus *cv. picarady.* The plants sprayed with 200 ppm GA_3 solution recorded the maximum number of corms per plant (1.46) which was closely followed by 100 ppm GA_3 solution treatment (1.40). The minimum number of corms per plant (1.03) was recorded in control. The GA_3 at all concentrations under study influenced the corm production over control. However lower concentration of GA_3 were more effective than higher concentration. The findings are in line with results reported by Gaur *et. al.* (2002) with 200 ppm GA_3 in gladiolus. The treatment ethrel 350 ppm registered maximum corm weight (36.87g) which was significantly superior over rest of the treatments. It was followed by the 200 and 100 ppm GA_3 solution (32.16g and 31.62g resp.). The minimum corm weight with 23.79g was reported in control. In general the effect was prominent with ethrel 350 ppm, which was the most effective treatment. The overall performance of GA_3 and ethrel was better as compared to cycocel treatments. The results obtained are in accordance with the results findings of Raja-Ram *et. al.* (2002) in gladiolus. The treatment GA_3 300 ppm registered significantly maximum diameter of corm (5.09 cm) and was at par with ethrel 350 ppm, cycocel 400 ppm and cycocel 1200 ppm. The treatment ethrel 250 ppm produced significantly small size corm (4.09 cm). it was noticed from the table 1 that the higher concentration of GA_3 and lower concentration of ethrel and cycocel produced bigger sized corms as compared to control. The results confirm well with those reported by Mahesh and Misra (1993) with 100 ppm GA_3, Ravidas *et. al*. (1992) with 250 ppm cycocel and Raja-ram *et. al.* (2002) with 400 ppm ethrel which increased corm size in gladiolus.

It is observed from the table 2 that the treatment GA_3 200 ppm produced maximum number of cormels (15.75) per plant. It was followed by GA_3 100 ppm. Controlled plants registered least value (12.02) for number of cormels produced per plant. Thus results indicate that various growth regulators under study markedly improved the cormel production per plant. The effect was more prominent in GA_3 200 ppm. The overall performance of GA_3 and higher concentration of cycocel were better compared to ethrel treatments. The results are in line with the findings of Raja-Ram *et. al.* (2000) with 100 ppm GA_3, Maurya and Nagda with 100 ppm GA_3 and 100 ppm cycocel as a foliar spray. It is apparent from the data treatment GA_3 200 ppm registered maximum weight of cormels (35.23g) and was significantly superior over all the treatments. It was followed by GA_3 100 ppm. The control recorded the minimum value (22.87g) for weight of cormel. The GA_3 at moderate concentration recorded maximum weight of cormels. The ethrel and cycocel treatments produced cormels of higher weight than control. The present results are confirmed with the findings of Ravidas *et. al.* (1992) with GA_3 (50-200 ppm). Misra *et. al.* (1993) with GA_3 (50-400 ppm) and shiramagond (1997) with GA_3 spray 100 ppm in gladiolus. The GA_3 200 ppm registered largest size cormels (1.66 cm). It was followed by treatment GA_3 100 ppm (1.63 cm). The control recorded the least value (1.21 cm) for diameter of cormels. The results are in accordance with the findings of Shiramagond (1997) with 100 ppm GA_3, Datta-Ram *et. al*. (2001) with 250 ppm cycocel and Raja-Ram *et. al.* (2002) with 400 ppm ethrel as foliar sprays in gladiolus.

CONCLUSION

Thus, the experimental results concluded that growth regulators significantly improved the corms and cormels production in gladiolus *cv. Picardy*. Among all the growth regulators the GA_3 @ 200 ppm was found to be the best which resulted in highest number of corms per plant (1.46), maximum weight of corms (32.16g), highest number of cormels per corm (15.75)

and maximum total weight of cormels per corms (35.23g).

Table 1
Effect of Plant Growth Regulators on corms of gladiolus *cv* Picardy

Sr. No.	*Treatments (Variety)*	*Number of corms per plant*	*Average weight of corms (g)*	*Average diameter of corms (cm)*
1	GA_3 100 ppm	1.40	31.62	4.48
2	GA_3 200 ppm	1.46	32.16	4.62
3	GA_3 300 ppm	1.13	28.51	5.09
4	Ethrel 150 ppm	1.27	28.22	4.59
5	Ethrel 250 ppm	1.10	29.55	4.09
6	Ethrel 350 ppm	1.07	36.87	4.95
7	Cycocel 400 ppm	1.13	29.53	4.76
8	Cycocel 800 ppm	1.13	26.40	4.44
9	Cycocel 1200 ppm	1.13	25.28	5.05
10	Control	1.03	23.79	4.41
	S.Em. ±	0.09	1.54	0.17
	C.D. at 5%	0.26	4.57	0.51

Table 2
Effect of Plant Growth Regulators on Cormels of gladiolus *cv* Picardy

Sr. No.	*Treatments (Variety)*	*Number of cormels per corm*	*Total weight of cormels per corms (g)*	*Diameter of cormels (cm)*
1	GA_3 100 ppm	14.77	30.15	1.63
2	GA_3 200 ppm	15.75	35.23	1.52
3	GA_3 300 ppm	13.13	27.20	1.66
4	Ethrel 150 ppm	13.58	24.77	1.59
5	Ethrel 250 ppm	13.05	28.10	1.57
6	Ethrel 350 ppm	13.00	27.07	1.61
7	Cycocel 400 ppm	13.10	28.60	1.60
8	Cycocel 800 ppm	13.83	25.20	1.59
9	Cycocel 1200 ppm	14.07	26.20	1.58
10	Control	12.02	22.87	1.21
	S.Em. ±	0.57	1.49	0.05
	C.D. at 5%	1.68	4.42	0.16

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