

Response of Different Chemicals on Vegetative Growth, Flowering, Corm and Cormels Production in *Gladiolus* cv. Phule Neelrekha

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ABSTRACT

The present investigation entitled, "Effect of different chemicals on vegetative growth, flowering and corm production in *gladiolus* cv. Phule Neelrekha was carried out at NARP Ganeshkhind Pune, during 2012-13. The experiment was laid out in randomized block design with three replication and seven treatments, viz., Thiourea 2%, Hydrogen cyanamide 1%, Potassium nitrate 1%, NAA 500 ppm, GA₃ 200 ppm, Water soaking and control. Uniform sized *gladiolus* corms were soaked in solutions of different concentration for 24 h before planting. Results revealed that the vegetative and floral characters were significant in the plants grown from the corms treated with hydrogen cyanamide 1% followed by potassium nitrate and GA₃. The corms treated with hydrogen cyanamide 1% produced the plants with most superior characters in respect of plant height (142.47 cm), number of leaves per plant (11.10), spike length (114.54 cm), rachis length (55.96 cm), diameter of flower (9.99 cm), number of florets per spike (20.04), corm size (8.63 cm), corm weight (111.81 cm), number of cormels per plant (25.74) and weight of cormels per plant (23.30 g) than all other treatments. All the chemical treatments along with water soaking were superior to control. To effect of different chemicals hydrogen cyanamide 1% was most promising in all vegetative and floral character in cv. Phule Neelrekha.

Key words *Gladiolus*, *Corm*, *Thiourea*, *Hydrogen Cyanamide*, *Potassium Nitrate*, *Naphthalene Acetic Acid*, *Gibberellic Acid*, *Water soaking*

Gladiolus is one of the important bulbous flower crop valued in commercial floriculture for its beautiful spikes. It is popularly known as "Queen of bulbous flowers" due to its attractive spikes. It belongs to family Iridaceae. It is an important cut flower in both domestic and international market. Its attractive spikes which are available in various colour and forms with prolonged vase life are the main attributes for increasing demand. The propagation of *gladiolus* is done by corms. At present many synthetic chemicals like used in different concentration for corms treatments for modify the growth and development of the plant including corm and cormel production. Some of the chemicals, viz., Thiourea, Hydrogen cyanamide, Potassium nitrate, Naphthalene Acetic Acid (NAA), GA₃, etc has ability to increasing vegetative growth, flowering and yield in certain crops. Several workers reported necessity of in vegetative growth, flowering and yield in *gladiolus* by pre-planting treatment. Hydrogen cyanamide and thiourea was

found useful in growth and flowering in *gladiolus* cultivars (Naveen Kumar et al., 2011). Potassium nitrate was also found effective in growth and corm yield (Padmalatha et al., 2013). The present investigation was undertaken with a view to effect of different chemicals on vegetative growth, flowering and corm production in *gladiolus* cv. Phule Neelrekha.

MATERIALS AND METHODS

The experiment was carried out at AICRP Pune during 2012-13. The uniform size corms of *gladiolus* cv. Phule Neelrekha' harvested in May were used for planting. There were seven treatments, viz., thiourea 2%, hydrogen cyanamide 1%, potassium nitrate 1%, NAA 500 ppm, GA₃ 200 ppm, Water soaking and control The corms soaked in respective solution for a period of 24 h before planting There were seven treatments replicated thrice in Randomized Block Design. The treated corms were planted at 60 X 10 cm spacing and a depth of 5 cm in a plot 6.5 x 4.5m. Observations on vegetative growth, flowering and corm production parameters were recorded time to time and data was analyzed for degree of variance (Panse and Sukhatme, 1985).

RESULTS AND DISCUSSION

There was significant effect on vegetative characters, i.e plant height and number of leaves per plant. The maximum plant height (142.47 cm) and number of leaves (11.10) (Table 1) was observed when the corms treated with hydrogen cyanamide 1% (T₂) and it was at par to T₁, T₃ and T₅. It also produced tallest plants (142.42 cm) and more number of leaves (11.10). This could be attributed to the fact that hydrogen cyanamide increased plant height due to the promoting DNA synthesis in cells and cell elongation and division. Similar results were reported by Suresh Kumar et al. (2008) and Barman and Rajni (2004).

The perusal of data presented in Table 2 showed that the corms treated with Hydrogen cyanamide 1% (T₂) produced maximum spike length (114.54 cm) and was found par with T₁, T₃, T₅ treatments. Longest spikes (114.54 cm) were produced by corms treated with hydrogen cyanamide 1% and shortest in control (T₇). This might have been increased cell division and cell enlargement (Naveen Kumar et al., 2011). The increase of spike length with hydrogen cyanamide might be due to better hormonal balance and ultimately promoted growth (Suresh Kumar et al., 2009).

The perusal of data presented in Table 2 showed that the corms treated with Hydrogen cyanamide 1% (T₂)

The corms treated with Hydrogen cyanamide 1% (T₂) produced maximum rachis length (55.96 cm) and was at

Table 1. Effect of Pre Planting Treatments of Corms With Chemicals On Vegetative Growth In Gladiolus

Treatments	Plant Height(cm)	Number of Leaves/Plant
T ₁ (Thiourea 2%)	137.27	9.88
T ₂ (Hydrogen cyanamide 1%)	142.47	11.10
T ₃ (Potassium nitrate 1%)	138.87	10.84
T ₄ (NAA 500ppm)	130.10	9.59
T ₅ (GA ₃ 200 ppm)	137.88	10.60
T ₆ (Water soaking)	133.08	8.98
T ₇ (Control)	127.12	8.30
SE(m) ±	0.84	0.26
CD at 5%	2.59	0.80

par with T₃, T₅ and T₁. The longest rachis (55.96 cm) was produced by corms treated with hydrogen cyanamide 1% and minimum in control (T₇). Increase in rachis length was due to chemical and growth regulators which acted as growth promoter. The effect of HC 1% was dominant, there was better length of rachis. (Suresh Kumar *et al.* 2008).

The bigger flower with more diameter were obtained in corms treated with Hydrogen cyanamide 1% (T₂) and was (9.99 cm) and was at par with T₃, T₅ and T₁ treatment (Table 2). The size of flower was a result of better growth and vegetative characters due to Hydrogen cyanamide treatment (Baskaran and Misra, 2010). The mobilization of food material from leaves to flower enhanced growth and quality of flowers. (Sindhu and Verma 1998).

The maximum number of florets per spike (20.04) were obtained in corms treated with Hydrogen cyanamide 1% (T₂) and were followed by T₃, T₅, and T₁ treatments (Table 2). The minimum number of florets (16.67) was recorded in control (T₇). The number of florets is the genetic character and is also affected by growth promoting chemical and environment. Hydrogen cyanamide acted as a growth promoting chemical it was due to good vegetative growth. (Suman Kumari *et al.*, 2008).

The results in Table 3 showed that the corms treated with Hydrogen cyanamide 1% (T₂) produced maximum number of spikes (1.08) and minimum in control but were non significant. The results pertaining to number of spikes

were found to be non significant. It was due to the fact that single spike was emerged from each mother corm (Dhua *et al.*, 1987) and Havale *et al.* (2008).

The treatment Hydrogen cyanamide 1% (T₂) produced maximum number of corms per plant (1.08) where as it was least in control (1.00) but results were non significant. It was known fact in gladiolus mother corms degenerates during growth after planting and produces only one big size corm capable to produce spike in next generation (Padmalatha *et al.*, 2013).

The treatment with Hydrogen cyanamide 1% (T₂) produced largest corm (8.63 cm) and maximum corm weight (111.81 g) it was at par to T₃, T₅. Where as the corms in control have minimum size (5.24 cm) and lowest weight (60.51 g). It was fact that soaking of corms in hydrogen cyanamide, potassium nitrate and GA₃ results of mobilization of metabolites from leaves to harvesting of flower. Better the plant growth bigger was the size of corms (Naveen Kumar *et al.*, 2011).

Similar trend was observed in production of cormels, the number of comels produced and weight of cormel was significantly higher in hydrogen cyanamide 1% (T₂), and it was (25.74) and (23.30 g) respectively. Which were found at par with T₃ and T₅. This increase in cormel number and weight was due to fact the number of cormels depends upon the growth of active buds in corms (Suresh Kumar *et al.*, 2009). The early sprouting of corms resulted into longer

Table 2. Effect of Pre Planting Treatments of Corms With Chemicals On Flowering Characters In Gladiolus.

Treatments	Spike length(cm)	Rachis length (cm)	Diameter of flower (cm)	Number of florets/spike
T ₁ (Thiourea 2%)	112.50	52.14	8.85	17.82
T ₂ (Hydrogen cyanamide 1%)	114.54	55.96	9.99	20.04
T ₃ (Potassium nitrate 1%)	113.85	54.88	9.02	18.52
T ₄ (NAA 500ppm)	107.00	47.47	8.73	17.63
T ₅ (GA ₃ 200 ppm)	113.51	54.09	8.91	18.07
T ₆ (Water soaking)	107.66	48.15	8.69	17.59
T ₇ (Control)	97.10	43.34	8.14	16.67
SE(m) +	2.07	1.37	0.19	0.43
CD at 5%	6.39	4.23	0.61	1.34

Table 3. Effect of Pre Planting Chemical Treatments of Corms on Quantitative Parameters in Gladiolus

Treatments	No. of spikes/plant	No. of corms/plant	Corm size(cm)	Corm weight(g)	No. of cormels/plant	Wt Of cormels/plant
T ₁ (Thiourea 2%)	1.00	1.00	6.60	79.81	20.08	18.24
T ₂ (Hydrogen cyanamide 1%)	1.08	1.08	8.63	111.81	25.74	23.30
T ₃ (Potassium nitrate 1%)	1.03	1.07	7.10	102.46	23.36	21.19
T ₄ (NAA 500ppm)	1.00	1.00	6.28	75.00	18.94	17.16
T ₅ (GA ₃ 200 ppm)	1.00	1.04	6.92	101.30	22.10	19.41
T ₆ (Water soaking)	1.00	1.00	6.54	72.00	19.09	17.26
T ₇ (Control)	1.00	1.00	5.24	60.51	17.03	14.20
SE(m) +	0.034	0.037	0.30	7.92	0.92	1.01
CD at 5%	NS	NS	0.92	24.41	2.71	2.99

period of growth phase and untimely production of favourable conditions to produce more number of cormels (Padmalatha et al., 2013).

It is concluded that there was positive role of different chemical treatments in vegetative growth, flowering and corm production in gladiolus. The effect of individual treatment differed in vegetative and floral characters of gladiolus. The most effective treatment was hydrogen cyanamide 1%. The corms treated with HC gave best results in vegetative and floral and quantitative parameters. The results indicated that soaking of corms with Hydrogen cyanamide 1%, Potassium nitrate 1% and GA₃ 200 ppm have promising effect in growth, flowering and corm production in gladiolus.

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