Influence of Integrated Nutrient Management on Floral Characteristics and Corm Yield inGladiolus cv. Nova Lux

ABSTRACT

A field experiment was conducted at the Department of Horticulture, Janta College Bakewar, Etawah, India, during 2021-22. The experiment was conducted in a randomized block design with 10 treatments in three replications. Different combinations of Vermi-compost, F.Y.M., and NPK were used as treatments. The results revealed that, amongst all the treatments, the application of N.P.K. 120:80:80 kg + V.C. 10 t/ha in treatment (T_8) produced significant results. Average height of plant in (90 DAS)73.16cm, Average number of leaves per plant (60 DAS) 5.78, Average width of longest leaf in 5.77cm (final stage), Average length of florets in 9.88 cm (full blooming stage),Average Number of cormels 32.04 per plant, Average weight of corms 150.51 (g).

Keywords: Gladiolus, FYM, Vermi-compost, Organic manures and Inorganic fertilizers.

Introduction-

The word gladiolus is derived from the Latin word “Gladius” meaning sword. It is also named as “Sword Lily”. Corn flag is another name in Europe because *Gladiolus illyricus* is found as wild weed in corm field.Gladiolus is cultivated all over the world. The major countries producing gladiolus cut flowers are the USA, Italy, France, Holland, Bulgaria, Brazil, Australia and also Israel. It was introduced that into cultivation towards the end of the 16th century. In India its cultivation dates back to 19th century**(Singh, 2006).** It stands fourth in the international cut flower trade after carnation, rose and chrysanthemum.The major gladiolus growing states in India are West Bengal, Madhya Pradesh, Maharashtra, Uttar Pradesh, Punjab, Haryana and Andhra Pradesh. **(Anonymous, 2007).**In Maharashtra it is mostly cultivated on large scale in Pune, Nashik, Kolhapur and Nagpur districts. The total area of gladiolus in India is 1270 hectare and 127 million cut spikes was produced **(Singh, 2006).** Flower crops are very much responsive to fertilizer. It is highly capable of exhausting huge nutrients from native soil. So, it requires a higher amount of chemical fertilizer in a balanced proportion for ensuring maximum flower production. Fertilizer requirements of gladiolus like other crops have a vital role in growth, quality, corn, and cormel production. There are some reports on the requirement of Nitrogen (N), Phosphorus (P), Potassium (K),

and other fertilization in many countries. Major nutrients like nitrogen, phosphorus, potassium along with zinc noticeably increase the number of flowers, florets/spike, length of the spike, and flowering stem of gladiolus **(Halder *et al,* 2007).**

Gladiolus being a highly nutrient responsive crop, fertilizer requirement plays a vital role in growth, quality, corm and cormel production of gladiolus. The proper application of fertilizer has optimum plant population and perquisites for higher returns. (**Bohra, M. and Nautiyal, B.P. 2019).**

Materials and Methods-

The present study on the Influence of Integrated Nutrient Management on Floral Characteristics and Corm Yield in Gladiolus cv. Nova Luxby Organic Manures and Inorganic Fertilizerswas carried out in the experimental field at the Department of Horticulture, Janta College, Bakewar,Etawah (U.P.) during the session 2021–2022. The variety of gladiolus used for investigation was Nova Lux. Healthy, uniform-sized cormswere treated with Bavistin (0.2%) and planted in the month of October.The experiment was laid out in a randomized block design with ten treatments and three replications. The distance between rows was 25 cm and the distance between plants was 25 cm. Different treatments that were used in the experiment are as follows: T_1 - Control, T_2 - N.P.K.120:80:80 kg/ha, T_3 - N.P.K. 90:60:60 kg/ha, T_4 - N.P.K. 60:40:40 kg/ha, T_5 - N.P.K. 120:80:80 kg + F.Y.M.10t/ha, T_6-N.P.K. 90:60:60 kg + F.Y.M, T_7 -N.P.K. 60:40:40 kg + F.Y.M.10t/ha, T_8 -N.P.K.120:80:80 kg + V.C.10t/ha, T_9 -N.P.K. 90:60:60 kg + V.C. 10t/ha and T_{10}- N.P.K. 60:40:40 kg+V.C.10t/ha. The observations were recorded on different growth,flowering & yield parameters like: Height of plant in cm (90 DAS), Number of leaves per plant (90DAS),Width of longest leaves in cm (final stage), Length of florets in cm (at full blooming stage),Number of cormels per plant,Average weight of corms (g)The experiment was laid out in a randomized block design with 10 treatments and three replications. Barring the treatments, the crop was maintained under uniform cultural practices and conditions. The data collection on various parameters of crop was statistically analyzed as per method given by **Panse and Sukhatme (1985)** and the results were evaluated at 5% level of significance.

RESULTS AND DISCUSSION

The data were recorded in various vegetative growth, flowering and corm yield traits. The data were recorded and analyzed depicted in Table-1.

Influence of Organic Manures and Integrated Nutrient Management on Vegetative Characters of Gladiolus:

The maximum plant height 73.16cm at 90 DAS was recorded in treatment T_8 (N.P.K. 120:80:80 kg + V.C. 10t/ha) followed by 72.72cm with T_6 (N.P.K.90:60:60 kg+F.Y.M.10t/ha). The minimum plant height 70.41cm was recorded with T_1 control.The results are in conformity with the findings of **Shivam *et al.* (2023)** reported that maximum plant height treated with the combination of F.Y.M. at 10t/ha + 70% recommended vermi compost rate compared to other combination.

The number of leaves per plant after 60 DAS range between 5.17and 5.78. The maximum number of leaves 5.78 was recorded under T_8 (N.P.K. 120:80:80 kg + V.C. 10t/ha). While minimum number of leaves per plant 5.17 was recorded under control. These findings nearly corroborate with the result of **Dalvi *etal.* (2008)**they reported organic manures and inorganic fertilizers increased growth, yield and quality attributes of gladiolus viz. plant height, number of leaves per plant

The maximum width of longest leaves in cm 5.77 cm was recorded under T_8 (N.P.K. 120:80:80 kg + V.C. 10t/ha). While minimum width of longest leaves in 3.90cm was recorded under control. The results are in conformity with the findings of **Kejkar and Polara (2017)** also noticed that the plants applied with 20:20:15 NPK g/m^2. As a result, the 20:20:15 NPK g/m^2 treatment could be beneficial for Gladiolus cv. Nova Lux, vegetative and reproductive characteristics.

Table 1: Influence of Organic Manures and Integrated Nutrient Managementon Vegetative Growth of Gladiolus cv. Nova Lux.

Treatments Combinations	Vegetative Characters		
	Height of plant in cm (90 DAS)	Number of leaves per plant (60 DAS)	width of longest leaves in cm (final stage)
T_1-Control	70.41	5.17	3.90
T_2- N.P.K. 120: 80:80 kg/ha	71.08	5.38	4.28
T_3-N.P.K. 90:60:60 kg/ha	71.47	5.49	4.20
T_4-N.P.K. 60:40:40 kg/ha	72.17	5.54	4.65
T_5-N.P.K. 120:80:80 kg + F.Y.M.10t/ha	70.45	5.53	4.85
T_6- N.P.K. 90:60:60 kg + F.Y.M.10t/ha	72.72	5.28	4.44
T_7-N.P.K. 60:40:40 kg + F.Y.M.10t/ha	71.70	5.76	4.69
T_8-N.P.K. 120:80:80 kg + V.C. 10t/ha	73.16	5.78	5.77
T_9-N.P.K. 90:60:60 kg + V.C. 10t/ha	71.83	5.67	4.06
T_{10}- N.P.K. 60:40:40 kg + V.C. 10t/ha	71.80	5.53	4.85

S.E.(m)	**0.163**	**0.077**	**0.036**
CD at 5%	**0.489**	**0.232**	**0.106**

Influence of Organic Manures and Integrated Nutrient Managementon Flowering Characters and Corm Characters of Gladiolus:

That maximum length of florets in (9.88 cm) was recorded in T_8 (N.P.K. 120:80:80 kg + V.C. 10t/ha) followed by (8.88) with T_6 (N.P.K. 90:60:60 kg + F.Y.M.10t/ha). The difference between two treatments is significant. The minimum length of florets (8.17) was recorded with T_1 control.These findings nearly corroborate with the result of **Rajesh *et al,* (2016)** who concluded that the application of NPK in gladiolus, in terms of the longest duration of blooming, the highest length of spike and the highest length of florets, the application of N.P.K. (4.5:2.7:1.8 g/plant) was shown to be the best.The maximum Number of cormels per plant (32.04) was recorded under T_8 (N.P.K. 120:80:80 kg + V.C. 10t/ha) followed by (30.97) number of cormels under T_5 (N.P.K. 120:80:80 kg + F.Y.M.10t/ha) the difference between two treatments is significant where as minimum number of cormels (28.80) was recorded with T_1 control. These findings nearly corroborate with the result of **Sharma *et al,* (2007)**.They observed that in a field experiment, the fertilizer combination of N at 50 g/m2, P at 30 g/m^2, and K at 30 g/m^2 resulted in the highest number of cormels per plant, good size of cormels for gladiolus.That maximum average weight of corms in (150.51 g.) was recorded in T_8 (N.P.K. 120:80:80 kg + V.C. 10t/ha) followed by (145.47 g.) with T_9 (N.P.K. 90:60:60 kg + V.C. 10t/ha). The minimum weight of corms in (120.25g.) was recorded with T_1 control.The results are in conformity with the findings of **Qazi Altaf *et al,* (2005)** they are reported weight of corms per plant treated with the combination of F.Y.M. at 10t/ha + 70% recommended vermi compost rate compared to other combination.

Table 2: Influnce of Organic Manures and Integrated Nutrient Managementon Flowering Charactersand Corm Characters of Gladiolus cv. Nova Lux.

Treatments Combinations	Flowering Characters and Corm Characters		
	Length of florets in cm (full blooming stage)	Number of cormels per plant	Weight of corms (g.)
T_1 -Control	8.17	28.80	120.25
T_2- N.P.K. 120:80:80 kg/ha	8.19	29.66	125.35
T_3 -N.P.K. 90:60:60 kg/ha	8.30	29.85	130.61
T_4 -N.P.K. 60:40:40 kg/ha	8.38	29.96	120.50
T_5 -N.P.K. 120:80:80 kg + F.Y.M.10t/ha	8.43	30.97	130.38

T_6 - N.P.K. 90:60:60 kg + F.Y.M.10t/ha	8.88	30.80	135.46
T_7 -N.P.K. 60:40:40 kg + F.Y.M.10t/ha	8.72	30.85	140.41
T_8 -N.P.K. 120:80:80 kg + V.C. 10t/ha	9.88	32.04	150.51
T_9 -N.P.K. 90:60:60 kg + V.C. 10t/ha	8.60	29.77	145.47
T_{10} - N.P.K. 60:40:40 kg + V.C. 10t/ha	8.50	30.70	130.65
S.E.(m)	**0.032**	**0.212**	**0.118**
CD at 5%	**0.095**	**0.634**	**0.354**

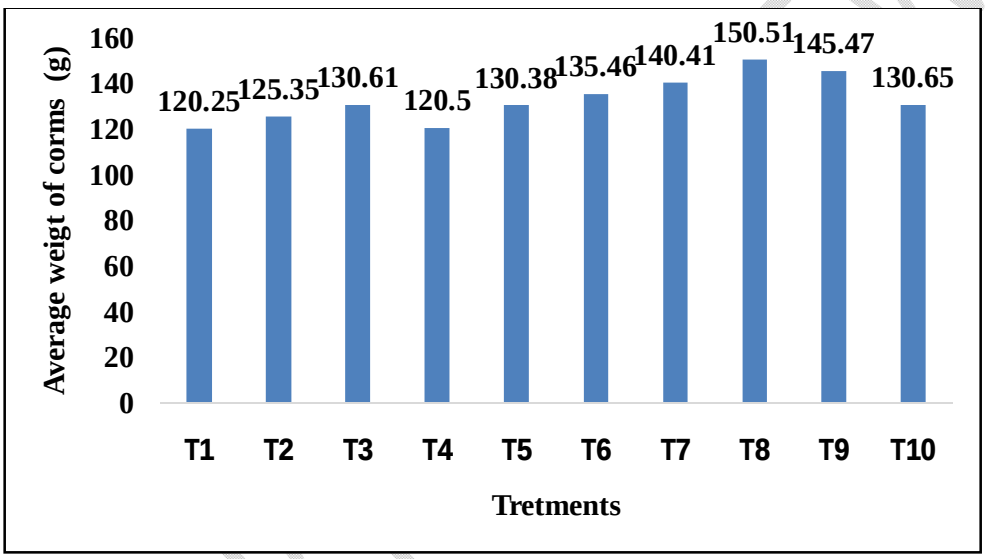

Figure-1:Effectofvarioustreatmentsoforganicmanuresand inorganic fertilizersonaverageweightof corms(g)of gladiolus cv. Nova Lux

Conclusion

Based on the findings of the present investigation, it may be concluded that the application of N.P.K. 120:80:80 kg + VC 10 t/ha is beneficial for the commercial traits of gladiolus cv. Nova Lux.

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