Effect of NPK on growth, yield and vase life of gladiolus (*Gladiolus grandiflorus* L.) cv. Big Time Supreme

SUMMARY
of
THESIS

Submitted To

Babasaheb Bhimrao Ambedkar University

(A Central University)

Lucknow

BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY
LUCKNOW
प्रज्ञा शील करूणा
ESTABLISHED 1996

FOR THE AWARD OF THE DEGREE OF

Doctor of Philosophy
In
HORTICULTURE

Co-Supervisor
Prof. R.B. Ram
Professor

Supervisor
Dr. R.S. Verma
Assistant Professor

Submitted By:

Harvindra Pal

Enrollment No. 871/17

DEPARTMENT OF APPLIED PLANT SCIENCE (HORTICULTURE)
SCHOOL FOR BIO-SCIENCES AND BIOTECHNOLOGY
BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY
(A CENTRAL UNIVERSITY)
VIDYA VIHAR, RAE BARELI ROAD, LUCKNOW-226025 (U.P.)
INDIA

2021

SUMMARY OF THESIS

The present investigation entitled **"Effect of NPK on growth, yield and vase life of gladiolus (*Gladiolus grandiflorus* L.) cv. Big Time Supreme"** was carried out at Horticulture Research Farm-I infront of Gautam Buddha Central library, Department of Applied Plant Science (Horticulture), School for Bio-sciences and Biotechnology, Babasaheb Bhimrao Ambedkar University (A central university), Vidya-Vihar, Rae Bareli Road, Lucknow, (U.P), India. was undertaken during the month of October - April in 2018-2019 and 2019-2020 respectively. The experiment was laid out in a randomized block design with 3 replications and total of sixty nine treatments. The corms of gladiolus cv. Big Time Supreme were planted with spacing of 25 × 25 cm. both ways (Row to Row and plant to plant). Different doses of NPK and their combination were viz. 200 kg N, 150 kg P_2O_5 & 150 kg K_2O per ha and 400 kg N, 300 kg P_2O_5 & 150 kg K_2O per ha, At the time of planting the corms, a full dose of phosphorus and potassium was applied, as well as a half dose of nitrogen. After 30 days of corms planting, the remaining half dose of nitrogen was applied in a split dose. Corms were treated before planting with Fungicide (carbendazim @ 0.2%). The corms harvested from the first year crop were replanted for the next crop in the same plot and were subjected to identical fertilizer treatments in the second year. Effect of different doses of NPK and their combinations on vegetative growth, floral characters, vase life, spikes, corms and cormels production were studied. The important findings of the present investigation are summarized as under:

1. The experimental findings advocated that the minimum days taken to plant emergence (9.14) was recorded with the application of N 20g + P 15g + K 15g, which was noted at par with N 20g + P 15g + K 30g (9.43), while the maximum days taken to plant emergence (13.84) was recorded in Control.

2. The maximum height of gladiolus plant (26.07, 48.99, 67.27 and 73.17 cm.) at 25, 50, 75 and 100 DAP were obtained under the treatment of N 20g + P 15g + K 15g, which was found at par with N 20g + P 15g + K 30g (25.67, 48.59, 66.91 and 72.72 cm.), while the minimum plant height (22.20, 43.90, 61.00 and 67.60 cm.) were recorded in Control.

3. The maximum number of leaves (4.10, 6.12, 7.55 and 8.55 cm.) at 25, 50, 75 and 100 DAP were obtained under the treatment of N 20g + P 15g + K 15g, which was observed

at par with N 20g + P 15g + K 30g (4.01, 5.98, 7.38 and 8.86 cm.), while the minimum number of leaves (3.17, 5.18, 6.43 and 7.90 cm.), respectively. were recorded in Control.

4. The maximum length of largest leaf (48.15 cm.) was recorded with the application of N 20g + P 15g + K 15g, followed by N 20g + P 15g + K 30g (47.73 cm.), while the minimum length of largest leaf (41.96 cm.) was recorded in Control.

5. The maximum width of longest leaf (5.78 cm.) was obtained under the treatment N 20g + P 15g + K 15g, followed by (5.50 cm.) under the treatment of N 20g + P 15g + K 30g, while the minimum width of longest leaf (3.90 cm.) was recorded in Control.

6. The minimum days taken to emergence of spike (101.63 days) was obtained with the application of N 20g + P 15g + K 15g followed by N 20g + P 15g + K 30g (102.20 days) and the maximum days taken to emergence of spike (106.67 days) was recorded in Control.

7. The maximum number of spikes per plant (1.28) was observed in N 20g + P 15g + K 15g followed by N 20g + P 15g + K 30g (1.27), while the minimum number of spikes per plant (1.06) was noticed in Control.

8. The minimum days taken to first floret opening (109.75 days) was obtained under the treatment of N 20g + P 15g + K 15g followed by (110.39 days) under the treatment of N 20g + P 15g + K 30g. However, the maximum days taken to first floret opening (114.59 days) was recorded in Control.

9. A perusal of data for the maximum duration of flowering (15.70 days) was recorded under the treatment of N 20g + P 15g + K 15g, which was obtained at par with N 20g + P 15g + K 30g (14.93 days), while the minimum duration of flowering (11.45 days) was noted in control.

10. The maximum length of spike (87.70 cm) was obtained with the application of N 20g + P 15g + K 15g followed by N 20g + P 15g + K 30g (87.17 cm), while the lowest spike length (81.69 cm) was observed in Control.

11. The maximum number of florets per spike (15.63) was obtained under the treatment of N 20g + P 15g + K 15g followed by (15.40) under the treatment of N 20g + P 15g + K 30g, while the minimum number of florets per spike (12.60) was noted in Control.

12. The maximum diameter of floret (9.34 cm.) was obtained under the treatment of N 20g + P 15g + K 15g followed by (8.97 cm.) under the treatment of N 20g + P 15g + K 30g, while the minimum diameter of floret (7.20 cm.) was recorded in Control.

13. The maximum length of floret (9.89 cm.) was recorded with the application of N 20g + P 15g + K 15g, which was noted at par with N 20g + P 15g + K 30g (9.61 cm.), while the lowest length of floret (7.87 cm.) was obtained in Control.

14. The vase life of cut spike (15.70, 15.94 and 16.73 days) were recorded at 2% sucrose + 100ppm, 200ppm and 300ppm of Silver Nitrate ($AgNO_3$) was obtained under the treatment of N 20g + P 15g + K 15g, which was obtained at par with N 20g + P 15g + K 30g (15.21, 15.82 and 16.40 days), while the minimum vase life of cut spike (12.09, 12.70 and 12.87 days) respectively. were recorded in Control.

15. The highest number of spikes per hectare (204000) was observed in N 20g + P 15g + K 15g followed by N 20g + P 15g + K 30g (202400), while the lowest number of spikes per hectare (168800) was noticed in Control.

16. The highest number of corms per plant (3.16) was obtained in N 20g + P 30g + K 30g followed by N 20g + P 15g + K 30g (3.13), while the lowest number of corms per plant (2.23) was observed in Control.

17. The maximum corm weight (32.10 g.) was recorded with the application of N 20g + P 30g + K 30g followed by N 20g + P 15g + K 30g (32.03 g.). However, the minimum weight of corm (28.20 g.) was recorded in Control.

18. The maximum diameter of corm (6.71 cm.) was noted under the treatment N 20g + P 30g + K 30g followed by (6.30 cm.) under the treatment of N 20g + P 15g + K 30g, while the minimum diameter of corm (4.77 cm.) was recorded in Control.

19. The highest number of cormels per plant (35.61) was obtained under the treatment of N 20g + P 30g + K 30g followed by N 20g + P 15g + K 30g (34.50), while the lowest number of cormels per plant (28.80) was noticed in Control.

20. The highest weight of cormels per plant (16.86 g) was recorded with the application of N 20g + P 30g + K 30g followed by N 20g + P 15g + K 30g (16.25 g), while the lowest weight of cormels per plant (12.43 g) was recorded in Control.

21. The maximum corm production per hectare (162.30 q) was recorded with the application of N 20g + P 30g + K 30g, which was observed at par with N 20g + P 15g + K 30g (160.40 q) However, the minimum corm production (100.37 q) was recorded in Control.

22. The maximum cormels production (26.97 q/ha.) was recorded with the application of N 20g + P 30g + K 30g, which was noted at par with N 20g + P 15g + K 30g (26.00 q/ha.), while the minimum cormels production (19.89 q/ha.) was recorded in Control.

23. The maximum gross returns, net returns and benefit : cost ratio (Rs. 1314400 / ha., Rs. 908442 / ha. & 2.23:1) were recorded with the application of N 20g + P 15g + K 15g followed by N 20g + P 15g + K 30g (Rs. 1309600 / ha., Rs. 899642 / ha. & 2.19:1), while the minimum gross returns, net returns and benefit : cost ratio (Rs. 1031200 / ha., Rs. 638590 / ha. & 1.62:1) respectively. were recorded in Control. However, as per Gross returns, Net returns and B:C ratio N 20g + P 15g + K 15g is the best as per income of Gladiolus spikes & corms per hectare.

Conclusion:

On the basis of the findings the present investigation, it can be concluded that the application of T_{16}- N 20 g + P 15 g + K 15 g when applied as full doses of phosphorus, potassium and half dose of nitrogen at the time of field preparation and remaining the half dose of nitrogen was applied one month after planting, found to be most effective with respect to vegetative growth, flowering characters, vase life, number of spikes per hectare and also gave higher gross return, net return and benefit cost ratio. The application of T_{21}- N 20 g + P 30 g + K 30 g, was found most effective with yield attributes traits (corms and cormels production). Thus, the use of nutrients in balanced way may be suggested for higher crop production and can be recommended to farmers for commercial cultivation of Gladiolus (*Gladiolus grandiflorus* L.) under Lucknow conditions.