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EFFECT OF MICRONUTRIENTS ON GROWTH AND CORM YIELD OF GLADIOLUS

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Abstract

The present investigation was carried out at Main Experimental Station, Horticulture, N.D.U.A. & T., Kumarganj, Faizabad (U.P.) during the year 2012-13, to investigate the "Effect of different micronutrients on growth, flowering behavior and corm yield of gladiolus (*Gladiolus grandiflorus* L.)". The experiment was laid out in Randomized Block Design with three replications and ten treatments *i.e.* three levels of boron (100, 200 and 300 mg/l), three levels of zinc (100, 200 and 300 mg/l) three levels of manganese (100, 200 and 300 mg/l) and control. Foliar spraying of micronutrients was done after sowing at 3rd and 6th leaf stage. Number of leaves/plant, number of corm/plant, number of cormels/plant, weight of corm/plant (g), weight of cormels/plant (g), yield of corm/ha (q) and yield of cormels/ha (q) was significantly influenced with spraying of Zn @ 300 mg/l after sowing at 3rd and 6th leaf stage. Spraying of Mn @ 300 mg/l after sowing at 3rd and 6th leaf stage was proved to be most effective to increase plant height (cm) of gladiolus.

Key words *:* Micronutrients, gladiolus, boron, zinc, manganese and vase life.

Introduction

Gladiolus (*Gladiolus grandiflorus* L.) is a bulbous ornamental plant, which belongs to family Iridiaceae. Its ancestral chromosome number is 15 (Goldblatt *et al*., 1993). Gladiolus is popularly known as Queen of bulbous flower because of attractive spike, having florets of huge forms, dazzling colours and longer keeping quality and has been rated second popular flower in the world. It is grown both for cut flowers as well as for garden decoration purposes; gladiolus is an excellent for beds, pots, herbaceous borders and cut flowers. It is most popular has a very long vase life. It has great potential for export during winter months to European countries to earn foreign exchange.

Materials and Methods

The present investigation on "Effect of different micro nutrients on growth, flowering behavior and corm yield of gladiolus (*Gladiolus grandiflorus* L.)" was carried out in the year 2012-13 at Main Experimental Station, Horticulture, N.D.U.A. & T., Kumarganj, Faizabad (U.P.), India. The experiment was laid out in Randomized Block Design (RBD) with three replications and ten treatments. The treatments were comprised three different concentrations of boron (B), zinc (Zn) and manganese (Mn) @ 100, 200 and 300 mg/l respectively and control. Foliar spraying of micronutrients was done after sowing at 3rd and 6th leaf stage. The plot size was 1.6 m × 1.2 m with planting distance of 40 cm × 20 cm where each plot accommodates 24 plants. B, Zn and Mn given in the form of H_3BO_3, $ZnSO_4.7H_2O$ and $MnSO_4$, respectively. The data was recorded on various morphological characters.

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Results and Discussion

The statistical analysis of data revealed that effect of micronutrients on plant height recorded were significant (table 1). The Maximum plant height (95.60 cm) was recorded with the spraying of Mn @ 300 mg/l followed by spraying of Mn @ 200 mg/l (95.26 cm). The minimum plant height (88.27 cm) was recorded with water sprayed in control ($\mathbf{T_1}$). Increased in plant height with Mn spray might be due to Mn activate IAA oxides, which oxidize IAA in plants. The plant treated with Zn shows increase plant height due to its role in synthesis of tryptophan, which is a precursor of auxin (IAA) and is essential in nitrogen metabolism, which stimulates growth. The findings discussed above are in conformity with reports made by Barman and Pal (1993a) in

Table 1 : Effect of micronutrients on growth and corm yield of gladiolus.

Treatments	Plant height (cm)	No. of leaves / plant	No of corm/ plant	No of cormels/ plant	Weight of corm/ plant (g)	Weight of cormels/ plant (g)	Yield of corm/ ha (q)	Yield of cormels/ ha (q)
T_1 (Control)	88.27	6.50	1.33	25.83	73.09	4.81	91.36	6.01
T_2 (B 100 mg/l)	88.57	7.05	1.53	29.40	81.16	5.64	101.44	7.05
T_3 (B 200 mg/l)	91.02	7.45	1.67	31.27	84.95	6.80	106.19	8.16
T_4 (B 300 mg/l)	92.50	7.83	1.73	36.80	86.67	7.94	108.34	9.92
T_5 (Zn 100 mg/l)	90.43	7.15	1.57	30.00	82.78	6.25	103.47	7.81
T_6 (Zn 200 mg/l)	93.10	7.39	1.87	32.47	86.06	6.97	107.57	8.71
T_7 (Zn 300 mg/l)	94.23	7.89	2.03	38.17	92.64	8.48	115.80	10.60
T_8 (Mn 100 mg/l)	93.52	7.10	1.60	26.33	78.94	5.46	98.67	6.82
T_9 (Mn 200 mg/l)	95.26	7.28	1.70	29.93	81.50	6.40	101.88	7.99
T_{10} (Mn 300 mg/l)	95.60	7.57	1.83	31.50	85.53	7.44	106.91	9.30
S. Em±	0.58	0.23	0.07	0.65	0.43	0.41	2.06	0.51
CD at 5%	1.74	0.70	0.21	1.95	1.27	1.22	6.13	1.53

chrysanthemum, Jauhari *et al.* (2005) and Singh and Singh (2004) in gladiolus.

Significantly, the maximum number of leaves per plant (7.89) was recorded with the spraying of Zn @ 300 mg/ l followed by spraying of B @ 300 mg/l (7.83). The minimum number of leaves per plant (6.50) was recorded with water sprayed in control (T_1). Increased in number of leaves per plant may be due to cell division in plants. Similar findings are reported by Khan (2000), Kumar and Arora (2000) in gladiolus, Halder *et al.* (2007), Ganga *et al*. (2009), Khosa *et al*. (2011) and Lahijie (2012) in gladiolus.

Significantly, the maximum number of corm (2.03) and cormels per plant (38.17) was recorded with the spraying of Zn @ 300 mg/l followed by spraying of Zn @ 200 mg/l (1.87) and B @ 300 mg/l (36.80), respectively. The minimum number of corm (1.33) and cormels (25.83) per plant was recorded with water sprayed in control (T_1), respectively. The increased in corm and cormels might be due to role of zinc in translocation of constituents from one part to other part. This findings recorded by Kumar and Arora (2000) and Pratap *et al.* (2005) in gladiolus.

Significantly, the maximum weight of corm (92.64 g) and cormels (8.48 g) per plant was recorded with the spraying of Zn @ 300 mg/l followed by spraying of B @ 300 mg/l (86.67 g) and (7.94 g) respectively. However, minimum weight of corm (73.09 g) and of cormels (4.81 g) per plant was recorded with water sprayed under control (T_1), respectively. The result might be due to micronutrients helps in nitrogen assimilation and synthesis of protein and also because of catalytic role in the activation of enzymes (Chaturvedi *et al.*, 1986). Similar results have been noted by Pratap *et al.* (2005) in gladiolus. This result was in agreement with findings Roy and Sarker (1995), Jhon *et al.* (1997) and Mukherjee *et al*. (1998).

Significantly, the Maximum yield of corm (115.80 q) and cormels (10.60 q) per hectare was recorded with the spraying of Zn @ 300 mg/l followed by spraying of B @ 300 mg/l (108.34 q) and (9.92 q) respectively. However, minimum yield of corm (91.36 q) and cormels (6.01 q) per hectare was recorded with water sprayed under control (T_1), respectively. The result might be due to micronutrients helps in nitrogen assimilation and synthesis of protein and also because of catalytic role in the activation of enzymes (Chaturvedi *et al.*, 1986).

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