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RESPONSE OF GLADIOLUS TO NITROGEN AND PHOSPHORUS UNDER MID HILL CONDITIONS OF HP HIMALAYAS

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ABSTRACT

An experiment was carried out during 1995-96 and 1996-97 to study the pesponse of gladioli to nitrogen and phosphorus under mid hill conditions of Himachal Prasesh. The results indicated that increasing levels of nitrogen application significantly inproved the growth and flowering in gladiolus up to 150 kg N/ha. Thereafter, non-significant effects were noticed. Although, phosphorus could not influence the germination and numbers of shoot per plant, but 60 kg P_2O_5/ha was found to be the best recording highest values of growth and flowring attributes. The interactions were significant only for plant height and spike length recording highest values at 150 kg N/ha in the presence of 60kg P_2O_5 /ha application.

INTRODUCTION

Gladiolus is an important cut flower of the world. Its cultivation, of late, is gainning impotance in Himachal Pradesh as off-season cut flower. Its attractive spikes, which are available in various colours and prolong vase life, are the main reasons for its increasing popularity. The number of floret which has more market value, can be increased with the increase in plant height and spike length through judicious management of nutriesnts. Among the essential nutrients, nitrogen and phosphorus appear to be resposible for growth and flowering in gladiolus (Singh and Sujatha, 1990). Because of meagre information on nutirent management, the present investigation was carried out to study the response of gladiolus to nitrogen and phosphorus for prodection of quality spike under mid hill conditions of Himachal Pradesh.

MATREIALS AND METHODS

The experiment was carried out at Horticultural Research Station, UHF, Kandaghate (HP), during 1995-96 and 1996-97 at fixed site. The treatments comprising of five nitrogen levels (0, 50, 100, 150 and 200 kg/ha) and four levels of phosphorus (0, 30, 60 and 90 kg/ha) were laidout in randomized block desigh with three replications. The soil of experiments site was sandy loam in texture, low on nitrogen (210kg/ha), medium in phosphorus and high in potassium (18.5 and 230kg/ha). Gladiolus variety Happyend was sown on 10th and 15th March, 1995 and 1996, respectively. Treatment

wise half dose of nitrogen and full dose of phosphorus was applies at the time of planting of corms. The fertilizers were placed in furrow just 5 cm bellow the corm. The remaining half nitrogen was top- dressed in two equal split i.e at 2 or 3 leaf stage and at just appearance of spike. Observations on growth and folwering were recorded at the time of harvesting of spikes.

RESULTS AND DISCUSSION

Response to nitrogen

Application of nitrogen although, did not improve the germination during 1995-96, but during 1996-97 all nitrogen doses being at per with each others significantly improved germination over control. Application of nitrogen at increased level significantlyincreased plant height upto150 kg N/ha during 1995-96 while during 1996-97 maximum plant height recorded at150 kg N/ha which at was par with 100 and 200 kg N/ha. This is ascribed to the favorable effect of nitrogen on growth of the plant (Borrelet, 1984). Similar results in galdiolus have also been reported by Bawaja et al., (2001) spike length and numbers of floret per spike were significanty increased due to incressed levels of nitrogen application up to 150 kg N/ha but the maximum values of these attributes were recorded at 200 and 150 kg N/ha was 5.69, 20.29 and 43.49% higher than 100., 50 and 0 kg N ha, respectively. this may be due to the fact that proper plant growth and devolopment contributed to heigher spike length and number of floret per spike (Mishra and Saini, 1990) as the deficiencey of nitrogen at critical stages of gladioli caused shortening of spike and less number of floret (Singh and Sujatha, 1990).

Response to phosphorus

All the parameters of gladiolus under study except germination and number of shoots per plant found to increase with the application of phosphorus during both the years of experimentaion. plant height significantly increased only up to 60 kg P_2O_5 /ha during 1995-96 while during 1996-97 maximum plant height (49.22cm) was recorded with 90 kg/ P_2O_5/ha application, closely followed by 30 and 60 kg P_2O_5/ha. Spike length being at par with 30 and 90 kg P_2O_5/ha, was maximum with 60 kg P_2O_5/ ha, which was 4.78 and 15.72 per cent higher over 30 and 0 kg P_2O_5/ha during 1995-96 and 1996-97, respectively. Similarly, highest numbers of floret/spike were recorded at 60 kg P_2O_5/ha. The findings are in conformity with those reported by Bawaja *et al.* (2001)

Interaction effect of nitrogen and phosphorus were significant only for plant height and spike length (Table 2). Maximum plant height was recorded due to 200 and 150 kg N/ha in the prsence of 90 kg P_2O_5/ha during 1995-96 and 1996-97, respectively. But the difference between 150 and 200 kg N/ha as well as 60 and 90 kg P_2O_5/ha was not significant. Like wise the spike length was recorded at 200 and 150 kg N/ha at 60 kg P_2O_5/ha in the order of the year. It can, therefore, be inferred that Happyend cv of galdiolus produced maximum spike length with sufficient number of floret with the application of 150 kg N/ha and 60 kg P_2O_5/ha under mid hill conditions of Himachal Pradesh.

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Table 1. Effect of nitrogen and phsophorus on growth and flowering in gladiolus

Treat ments	Germination		Plant height (cm)		No of shoots per plant		Spike length (cm)		No of floret per spile	
	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2
Nitrogen levels (kg/ha)										
N_0	85.24	85.31	41.12	35.56	1.50	1.75	40.48	35.61	8.17	7.88
N_{50}	86.57	87.24	49.47	40.37	2.40	1.85	49.28	41.50	10.36	9.23
N_{100}	87.27	88.40	56.65	48.47	2.85	2.41	52.89	50.42	11.43	11.38
N_{150}	86.67	88.53	60.00	52.32	2.87	2.68	55.10	54.10	11.68	11.89
N_{200}	85.72	86.48	60.78	52.54	2.85	2.75	55.65	53.56	11.29	12.04
CD	NS	0.92	2.01	4.17	0.34	0.58	5.29	4.17	1.53	2.48
Phosphorus levels (kg/ha)										
P_0	85.21	85.41	48.54	41.45	2.46	2.10	46.24	42.45	9.45	9.04
P_{30}	886.28	86.85	52.83	45.68	2.58	2.28	50.99	46.96	10.65	10.48
P_{60}	86.45	88.03	55.86	47.69	2.67	2.37	53.22	49.42	11.12	11.25
P_{90}	87.20	88.47	57.18	49.22	2.70	2.39	52.21	49.28	11.07	11.17
CD	NS	NS	1.78	3.72	NS	NS	4.73	3.72	1.41	2.22

Y1 = 1995-96; Y2 = 1996-97

Table 2. Interaction effect of nitrogen and phosphorus on plant height and spike length

Treatments	1995-96					1996-97				
	N_0	N_{50}	N_{100}	N_{150}	N_{200}	N_0	N_{50}	N_{100}	N_{150}	N_{200}
Plant height (cm)										
P_0	37.54	42.51	51.05	55.25	56.32	32.75	34.41	43.75	48.75	47.82
P_{30}	40.70	48.73	55.15	59.42	60.14	35.49	39.37	48.85	52.15	52.54
P_{60}	42.75	52.50	59.65	62.12	62.32	36.52	43.73	49.23	54.65	54.39
P_{90}	43.50	54.14	60.75	63.20	64.35	37.49	43.95	51.49	57.75	55.42
CD (P=0.05)			4.05						8.37	
Spike length (cm)										
P_0	31.42	43.80	50.12	52.72	53.15	30.75	36.32	44.36	49.51	51.32
P_{30}	40.75	49.75	5.15	55.19	56.39	35.42	41.54	51.32	54.32	52.24
P_{60}	45.32	52.75	54.35	55.80	57.90	37.85	44.62	53.15	56.75	54.75
P_{90}	44.42	50.81	53.95	56.72	55.15	38.42	43.51	52.85	55.82	55.80
CD (P=0, 05)			10.57						8.33	