

## Evaluation of gladiolus (*Gladiolus grandiflorus* L.) varieties under drip irrigation system

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**Abstract:** An experiment was conducted to evaluate *Gladiolus grandiflorus* L. varieties under Delhi conditions under drip irrigation system. The evaluation studies of various varieties of gladiolus under drip irrigation system revealed that the Amsterdam variety showed best performance with regard to plant height (113.11 cm), duration of flowering (19.27 days), spike length (91.57 cm) and rachis length (49.12 cm) whereas Peter Pears exhibited early bud initiation (83.11 days) and days to first floret opening (102.55 days). This variety also recorded maximum floret size (10.89 cm). Number of corms per plant and weight of corms per plant were found maximum in Spic and Span (1.44 and 39.56 g) respectively. Amsterdam exhibited maximum number of cormels per plant (29.33) and weight of cormels per plant (4.35g). Average corm diameter was recorded maximum in Peter Pears (4.41 cm) and minimum in Spic and Span (4.17 cm).

**Key words:** Floret, Spike, Rachis, Corm, Cormel, Drip irrigation

### INTRODUCTION

*Gladiolus grandiflorus* L. belongs to family iridaceae, is an important cut flower crop. The fascinating spikes bear a large number of florets, which exhibit varying sizes and forms, with smooth, ruffled, deeply crinkled or lacinated tepals which are blotched or possess distinct patches or markings of various colours and colour combinations. It is suitable for bedding, exhibition, flower arrangements, bouquets and for indoor decoration. On account of availability of market and rising demand for cut flowers due to rising socio-economic status, change in life style of people and want for new varieties, it is desirable to test new varieties for their performance. Also, evaluation is the first important step in any crop improvement programme and is the basic tool for assessing the genetic variability present in any crop species, which could be exploited for its commercialization. Trickle irrigation has been developed for the purpose of saving water and labour cost. Trickle irrigation applies small, controlled amount of water

near plants. Increasing demand of highly efficient irrigation system calls for the use of trickle irrigation, which has also been found suitable under adverse conditions of climate, soil and irrigation water (Singh *et al.*, 1989). It is, therefore, realized that under the changing scenario and advancement of floriculture sector, some important cultivars of gladiolus should be evaluated on different parameters and recommended to farmers in peri-urban areas of Delhi for exploitation of their potential. Hence the present study was undertaken to study three gladiolus varieties under Delhi conditions for vegetative, flowering and corm parameters.

### MATERIALS AND METHODS

The present investigation was carried out at the Research Farm, Centre for Protected Cultivation Technology, IARI, New Delhi during 2011-2012. The experiment was laid out in randomized block design (RBD) with three replications under drip irrigation system. The field was thoroughly ploughed and

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leveled to obtain fine tilth and then the beds were prepared. The flower grade corms of different cultivars were treated with Bavistin (0.2%) for 30 minutes as a protective measure against fungal diseases. Treated corms were dried in shade and dehusked before planting. The trial was laid out in the open field on 1<sup>st</sup> Nov. 2011. The corms were planted at a spacing of 30 x 20 cm at a depth of (approximately) 7-8 cm by keeping terminal buds upward and later covered with soil. The drip irrigation system was used to irrigate the field. Regular weeding and hoeing were done to keep the field free of weeds. Earthing up was done twice at 3 and 6 leaf stage. Dithane M - 45 (0.2%) and Bavistin (0.1%) were sprayed at regular interval to check fungal diseases. The spikes were harvested when the basal floret showed colour leaving four leaves on the plants. The spikes were harvested to take reading for different parameters. The digging of corms and cormels was done after the foliage turned yellow. The irrigation was stopped one month before harvesting. Observations were recorded on five randomly selected plants from each variety in each replication for different vegetative, floral and corm parameters. Observed data were subjected to statistical analysis and interpretations were made accordingly.

## RESULTS AND DISCUSSION

The observations were recorded for different vegetative, floral and corm parameters in three varieties. Analysis of variance revealed significant variation among the varieties for most of the characters, thereby indicating tremendous potential for improvement through selection. The data presented in Table 1 revealed that variety Amsterdam recorded maximum plant height (113.11 cm) followed by Spic and Span (98.16 cm), whereas minimum plant height was recorded in Peter Pears (86.52 cm). However, early bud initiation (83.11 days) was recorded in variety Peter Pears. Maximum pair of leaves (3.73) were recorded in variety Spic and Span. Variation in these characters in different varieties might be due to inherent genetic factors. These genetic factors control the expression of genotypes in terms of variation these characters. The present findings are in conformity with the findings of Kumari and Misra (2009) and Kumar *et*

*al.* (2011) in snapdragon; Horo *et al.* (2009) in gladiolus.

Varieties also exhibited pronounced variation for flowering characters. Days to first floret to opening (102.55 days) were found minimum in variety Peter Pears. Amsterdam exhibited maximum duration of flowering (19.27 days) and minimum duration of flowering (16.87 days) was found in Spic and Span. Number of florets per spike was observed maximum (16.20) in variety Spic and Span and minimum (13.89) in Peter Pears. Peter Pears also recorded maximum floret size (10.89 cm). Maximum spike and rachis length was found in Amsterdam (91.57 cm and 49.12 cm) followed by Spic and Span (87.00 and 48.71 cm) and minimum in Peter Pears (79.07 and 46.86 cm), respectively. Variation in these parameters might be attributed to differences in genetic constitution of genotypes. Results obtained by Kem *et al.* (2003), Kumar and Yadav (2005) and Swaroop *et al.* (2005) in gladiolus; Kumari and Misra (2009) and Kumar *et al.* (2011) in snapdragon also confirms the authenticity of the present investigation.

The study of data presented in Table 2 depicted significant variation among the varieties for different traits related to corm production *viz.*, number of corms per plant, number of cormels per plant, weight of corms per plant, weight of cormels per plant and average corm diameter. Number of corms per plant was recorded maximum in Spic and Span (1.44) and minimum in Peter Pears and Amsterdam (1.22), whereas maximum number of cormels per plant were exhibited by variety Amsterdam (29.33) followed by Spic and Span (21.78) and minimum in Peter Pears (20.22). Maximum weight of corms per plant (39.56g) was recorded in Spic and Span. However, Amsterdam recorded maximum weight of cormels per plant (4.35 g). Peter Pears recorded maximum average diameter (4.41 cm) followed by Spic and Span (4.37 cm) and minimum in Amsterdam (4.22 cm). Such variability in corm parameters might be attributed to influence of genetic makeup of varieties. Results are in line with the findings of Aswath and Parthasarthy (1996), Sheikh and Khanday (2008) and Balaram and Janakiram (2009).

**Table 1**  
Vegetative and flowering characters in gladiolus (*Gladiolus grandiflorus* L.) varieties

Sr.No.	Variety	Plant height (cm)	Days to bud initiation	Pair of leaves	Days to first floret opening	Duration of flowering (days)	Number of florets per spike	Floret size (cm)	Spike length (cm)	Rachis length (cm)
1.	Peter Pears	86.52	83.11	3.67	102.55	17.60	13.89	10.89	79.07	46.86
2.	Amsterdam	113.11	95.00	3.60	104.00	19.27	15.22	10.38	91.57	49.12
3.	Spic and Span	98.16	96.33	3.73	104.00	16.87	16.20	10.65	87.00	48.71
	C.D. at 5%	10.51	4.73	0.49	1.91	3.04	1.74	0.68	3.18	4.71

**Table 2**  
Corm characters in gladiolus (*Gladiolus grandiflorus* L.) varieties

Sr.No.	Variety	Number of corms per plant	Number of cormels per plant	Weight of corms per plant (g)	Weight of cormels per plant (g)	Average corm diameter (cm)
1.	Peter Pears	1.22	20.22	31.14	2.86	4.41
2.	Amsterdam	1.22	29.33	39.16	4.35	4.22
3.	Spic and Span	1.44	21.78	39.56	3.88	4.37
	C.D. at 5%	0.50	23.76	17.09	4.47	0.41

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