

Evaluation of Performance of Gladiolus Varieties for Vegetative, Floral and Corm & Cormel Characters Under Tarai Conditions

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ABSTRACT: The present investigation was carried out during rabi season of 2012-13 to evaluate the performance of eight gladiolus varieties under Tarai conditions. The experiment was laid out in Randomized Block Design with three replications. Among eight varieties evaluated, Nathan Red had maximum number of tillers per plant (1.89). Variety Purple Flora and Red Majesty had maximum plant height at 30 and 60 days after planting whereas final plant height was recorded maximum in variety Yellow Golden (127.17 cm). Earliest spike emergence, opening of first floret and full blooming was recorded in Purple Flora followed by Nathan Red. Maximum number of florets per spike (14.77), spike length (110.63 cm) and rachis length (64.40 cm) was exhibited by Yellow Golden whereas largest floret size was recorded in White Friendship (11 cm). For corm yield variety Nathan Red (1.80) and Purple Flora (1.77) were found superior whereas for cormel yield Algarve (199.90) was superior. Maximum weight of corms per plant was recorded in Nathan Red (75.45 g) whereas variety Algarve exhibited maximum weight of cormels per plant (20.20 g).

Key words: Gladiolus, evaluation, Tarai conditions, corm & cormels

INTRODUCTION

Gladiolus is popularly known as “sword lily” and “queen of bulbous plants”. It is one of the most popular ornamental bulbous plants grown commercially for use in bouquets, floral arrangements, interior decoration and garden display purpose (Lepcha *et al.*, 2007). Gladiolus is originated in South Africa and belongs to the family Iridaceae. It is a tender, herbaceous perennial having irregular hermaphrodite flowers with six parted perianth, three stamens, single pistil and inferior ovary. The attractive spike of gladiolus bears a large number of florets, which varies in their sizes and colour. Gladiolus has a long vase life and its florets open in sequence on the spike. As demand for cut flowers is rising due to socio-economic status and change in life style of people, it is desirable to test varieties for their performance. Evaluation is basic tool for assessing the genetic variability present in any crop species, which could be exploited for its commercialization. The performance of any variety is not same in all the climatic conditions and regions because performance of variety

depends on genotypic and environmental interaction. Keeping this in view, the present experiment was carried out to evaluate performance of gladiolus varieties for vegetative, floral and corm & cormel characters under Tarai conditions.

MATERIAL AND METHODS

The present experiment was carried out at the Model Floriculture Centre (MFC), Department of Horticulture, G.B. Pant University of Agriculture & Technology, Pantnagar during 2012- 13. Pantnagar is situated in the Tarai region at 29° North altitude and 79.3° East longitude in the foot hills of Himalayas with an altitude of 243.83 m above the mean sea level. The experimental soil was sandy loam with good drainage and 6.9 pH. Eight gladiolus varieties *viz.* Yellow Golden, Nathan Red, White Friendship, Jester Gold, American Beauty, Red Majesty, Purple Flora and Algarve were selected for experiment. Corms of uniform size (4-4.5 cm) were selected and dipped for 30 minutes in Bavistin before planting. The experiment

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was laid out in Randomized Block Design with three replications. The row to row and plant to plant spacing were maintained at 30 cm × 25 cm, respectively. The observations were recorded on 19 characters, viz., days to sprouting, tillers per plant, plant height at 30 days, 60 days and final plant height (cm), number of leaves per plant, number of days taken for spike initiation, first floret opening, and full blooming, florets per spike, spike length (cm), rachis length (cm), floret diameter (cm), blooming period, number of corms per plant, weight of corms per plant (g), diameter of corms (mm), number of cormels and weight of cormels per plant (g). Observations were recorded on five selected plants from each genotype in each replication and mean values were statistically analyzed.

RESULTS AND DISCUSSION

Vegetative characters

Among all the varieties evaluated for their vegetative characters (Table 1), sprouting was earliest in Algarve

(9 days) and Purple Flora (9.33 days) and was late in Red Majesty (14 days) and Jester Gold (14.67 days). Maximum number of tiller was recorded in Nathan Red (1.89). The variety Purple Flora and Red Majesty exhibited maximum plant height at 30 and 60 days after planting whereas Yellow Golden had maximum final plant height (127.17 cm) followed by Red Majesty (121.35 cm). The more height in Purple Flora and Red Majesty at 30 and 60 days may be due to the reason that growth rate was faster in these two cultivars. The variation in final plant height among all the cultivars may be due to the hereditary traits or prevailing environmental conditions. Significant difference in number of leaves per plant was recorded. The maximum number of leaves per plant was recorded in Nathan Red (14.10) followed by Algarve (13.05). The variation in leaf number was also due to the variation in number of tillers. The wide variation in vegetative characters may be due to the distinguished genetic make up of cultivars.

Table 1
Performance of galdiolus varieties for vegetative characters under Tarai conditions

Varieties	Days to sprouting	Tillers/ plant	Plant height (cm)			Leaves/ plant
			at 30 days	at 60 days	at full bloom	
Yellow Golden	13.33	1.21	28.25	44.28	127.17	9.72
Nathan Red	10.33	1.89	26.83	40.30	115.00	14.10
White Friendship	10.67	1.10	24.65	44.03	111.77	8.10
Jester Gold	14.67	1.55	28.88	48.50	116.40	11.02
American Beauty	11.33	1.26	29.90	50.78	118.10	10.31
Red Majesty	14.00	1.48	31.00	54.42	121.35	10.64
Purple Flora	9.33	1.55	31.57	55.17	105.27	11.16
Algarve	9.00	1.63	30.07	46.57	111.02	13.05
C.D. (p=0.05)	1.10	0.21	2.28	3.58	5.25	1.71

Table 2
Performance of galdiolus varieties for floral characters under Tarai conditions

Varieties	Spike initiation	Days taken for		Florets/ spike	Spike length (cm)	Rachis length (cm)	Floret diameter (cm)	Blooming period
		Opening of first floret	Full bloom					
Yellow Golden	90.53	105.00	118.43	14.77	110.63	64.40	10.53	19.54
Nathan Red	73.75	95.77	104.17	13.83	98.00	60.47	9.07	18.80
White Friendship	81.10	100.30	109.57	14.10	99.20	58.13	11.00	18.18
Jester Gold	93.50	109.20	113.50	13.98	99.17	55.67	9.82	17.25
American Beauty	81.67	103.17	113.83	13.20	101.35	55.26	10.21	20.37
Red Majesty	92.43	112.73	125.17	14.00	106.73	58.50	10.30	18.33
Purple Flora	75.45	94.33	103.00	13.77	87.60	49.83	9.44	17.65
Algarve	79.42	101.33	113.50	12.53	90.67	57.83	9.32	18.80
C.D. (p=0.05)	2.85	2.27	2.88	0.56	5.78	2.97	0.25	NS

Floral parameters

Varieties also exhibited pronounced variation for flowering characters. Among all the cultivars Purple Flora had earliest spike emergence (75.45 days),

opening of first floret (94.33 days) and full blooming (103 days) followed by Nathan Red (73.75, 95.77 and 104.17 days for spike emergence, first floret opening and full bloom, respectively). Maximum days for

opening of first floret (112.73 days) and full blooming (125.17 days) was taken by Red Majesty. The variation in number of days taken to spike emergence, first floret opening and full blooming in various cultivars of gladiolus was due to different genetic make up and prevailing environmental conditions. Maximum number of florets per spike was recorded in Yellow Golden (14.77) followed by White Friendship (14.10), Red Majesty (14) whereas maximum diameter of basal floret was recorded in White Friendship (11 cm) followed by Yellow Golden (10.53 cm) and minimum in Nathan Red (9.07). Significant variation in spike and rachis length was recorded among all the cultivars. Cultivar Yellow Golden exhibited maximum spike (110.63 cm) and rachis length (64.40 cm) whereas minimum spike (87.60 cm) and rachis length (49.83 cm) was recorded in Purple Flora. Variation for floral parameters was recorded by Chopde *et al.* (2012) in gladiolus. The difference for blooming period among all the varieties was not significant. Variation in these parameters might be attributed to differences in genetic constitution of genotypes. These results corroborate findings of Kumar and Yadav (2005) and Swaroop *et al.* (2005) who also recorded varietal variations for floral characters in gladiolus. Kem, *et al.* (2003) also recorded varietal differences in gladiolus and recommended Oscar and Melody for general cultivation

Corm & cormels

The data presented in Table 3 indicate that significant variations were recorded among the gladiolus cultivars for corm and cormel characters. For corm production Nathan Red variety (1.80 corms) was found superior followed by Purple Flora (1.77 corms). The weight of corms per plant (75.45 g) was recorded maximum in Nathan red and followed by Algarve (65.08 g). The variety Nathan Red had maximum corm diameter (54.23 mm) followed by Algarve (52.77 mm). For cormel production, variety Algarve was found superior than rest of the varieties. Number of cormels per plant was 199.90 in Algarve and weight of cormels per plant was 20.20 g. Variation in these characters in different varieties might be due to inherent genetic factors. Such variability in corm parameters might be attributed to influence of genetic makeup of varieties. These results are in close conformity with the findings of Sheikh and Khanday (2008) and Balaram and Janakiram (2009). Superiority of some varieties over the other for corm and cormel traits was also recorded by Kumar *et al.* (2009).

From the results it can be concluded that variety Yellow Golden, White Friendship and Red Majesty were superior for spike and floral characters whereas for corm yield Nathan Red and Purple Flora was superior than rest of the varieties. For cormel yield Algarve was found best under Tarai conditions.

Table 3
Performance of gladiolus varieties for corm and cormels characters under Tarai conditions

Varieties	Number of corms/plant	Weight of corms/plant (g)	Diameter of corm (mm)	Number of cormels/plant	Weight of cormels/plant (g)
Yellow Golden	1.50	35.93	50.03	31.33	10.83
Nathan Red	1.80	75.45	54.23	41.75	8.01
White Friendship	1.23	35.80	46.50	46.08	10.03
Jester Gold	1.27	44.79	52.27	20.50	5.69
American Beauty	1.37	38.66	51.50	15.18	5.11
Red Majesty	1.40	52.34	47.50	32.73	4.99
Purple Flora	1.77	57.42	47.37	77.73	8.76
Algarve	1.45	65.08	52.77	199.90	20.20
C.D. (p=0.05)	0.28	10.96	3.35	17.02	2.13

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