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## Evaluation of gladiolus cultivars for plant growth and corm production

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### Abstract

The present investigation, entitled "Evaluation of gladiolus cultivars for plant growth and corm production," was conducted at the Pt. K. L. S. College of Horticulture and Research Station Pendri Farm Rajnandgaon (C.G.) during *Rabi* season, October–April (2018–19). The experiment was laid out in a randomised block design (RBD) with eight treatments (cultivars) and three replications. The cultivar Saffron had the minimum number of days (9.33) required for 50% sprouting, and the maximum plant height (89.80 cm) was recorded in the cultivar Summer Sunshine. The highest number of leaves (8.70) was recorded in cultivar Chipper White; the maximum length of leaf (68.13 cm) and the maximum width of leaf (2.79cm) were recorded in cultivar Summer Sunshine. In the case of corms and cormels yield, the maximum number of corms (2.66) per plant was observed in the cultivar American Beauty; the cultivar Chipper White recorded the maximum (44.73) number of cormels per plant; the maximum diameter of corm (5.52cm) and maximum (55.00g) weight of corms per plant were observed in the cultivar Chipper White; and the cultivar Saffron observed the maximum (29.26 g) weight of cormels per plant.

**Keywords:** Gladiolus, cultivars, growth, corm, cormels

### Introduction

Gladiolus is a member of the family *Iridaceae* and subfamily *Ixioidae*, is one of the best-known ornamental bulbous plants grown commercially for its fascinating flowers in numerous parts of the world. The current number of species in the genus is 255 (Pragya *et al.*, 2010) [5]. The vast majority of these species are native to the Mediterranean region and tropical parts of South Africa, especially the region of the 'Cape of Good Hope'. It was introduced into development towards the end of the sixteenth century. However, in India, its cultivation dates back to the nineteenth century, as the *Firmingers Manual of Gardening*' in India, published in 1863, specifies that Charles Gray of Coonoor developed a few gladiolus from corms and seeds in his garden.

Gladiolus flowers have a good self-life and resist Transport very well. They are widely used in flower arrangements, bouquets, and interior decorations (Arora *et al.* 2002) [2]. Gladiolus is additionally useful for flower bedding in gardens, pot crops, rockeries, etc. (Abbasi *et al.* 2005) [1]. Gladiolus is a flower of stunning beauty, with a wide range of colours, sizes, and shapes. Its attractive inflorescence has won it a place of pride in gardens and commercial value as a cut flower. Except true blue and green, basically all colours are available in gladiolus.

The performance of any crop depends on the genotype and the interaction with the environment. Therefore, cultivars which perform well in one region may not perform as well in another region with changing climatic conditions. In view of the above facts, the present investigation was conducted to "Evaluation of Gladiolus cultivars for plant growth and corm production.

### Materials and Methods

The experiment was carried out at the Pt. K. L. S. College of Horticulture and Research Station, Pendri Farm, Rajnandgaon, Chhattisgarh. Geographically Rajnandgaon is situated on the bank of Shivnath and falls between 21°06'N latitude and 81°02' E longitude at a height of 307 metres above the mean sea level. Healthy corms of 8 cultivars (Har Majesty, Red Majesty, Chipper White, Souvik, American Beauty, Summer Sunshine, Saffron, and a local cultivar) were planted at 30×20 cm spacing in October 2018. The experiment was laid out in a randomized block design (RBD) with three replications. All cultural operations were uniformly done for all the cultivars. Observations were recorded on various growth, corm, and cormel attributes, and the data were analysed statistically.

## Results and Discussion

### Growth parameters

Various growth parameters were significantly influenced by variety response (Tables 1&2). The cultivar Saffron was observed as having the minimum number of days (9.33) required for 50% sprout, followed by Chipper White (9.66) and Summer Sunshine (9.83), and the cultivar Souvik was recorded as having the maximum number of days (12.50) required for 50% sprout.

The maximum (48.86 cm) height of the plant was recorded in cultivar Chipper White at 20 DAP, which was at par with cultivar Red Majesty (44.63 cm) and Summer Sunshine (42.90 cm), and the minimum plant height was recorded in the local cultivar (33.86cm).

At 40 DAP, the maximum height of the plant (76.73 cm) was noticed in cultivar Summer Sunshine, which was at par with cultivar Chipper White (76.66cm) and Saffron (66.20 cm), and the minimum plant height was recorded in American Beauty (45.43 cm).

Maximum plant height (89.80 cm) at 60 DAP was found in the cultivar Summer Sunshine, Which was significantly superior to the rest of the other cultivars. The minimum plant height was observed in cultivar American Beauty (67.93 cm) and was significantly shorter than the rest of the cultivars.

The highest (3.00) number of leaves was recorded in cultivar Chipper at 20 DAP White, which was at par with cultivars Summer Sunshine (2.33), Har Majesty (2.43), and American Beauty (2.36), and the lowest number of leaves was observed in the local cultivar (1.70).

At 40 DAP, the maximum number of leaves (6.80) was observed in cultivar Chipper White, which was at par with cultivars American Beauty (5.80), Summer Sunshine (4.73), and Saffron (4.66), and the minimum number of leaves was observed in Local cultivar (3.77).

At 60 DAP, the highest number of leaves (8.70) was recorded in cultivar Chipper White, followed by American Beauty (7.66), Summer Sunshine (7.66), and significantly higher than the rest of the other cultivars. The lowest number of leaves (6.40) was observed in the cultivar Har Majesty.

The maximum (33.93 cm) length of leaf was observed in cultivar Chipper White, which was at par with cultivars Red Majesty (32.30 cm), Saffron (29.26 cm), and American Beauty (26.63 cm), and the lowest length of leaf was observed in cultivar Souvik (24.26 cm).

At 40 DAP, the leaf length was measured. Significantly, the maximum length of leaf (55.40 cm) was recorded in cultivar Summer Sunshine, followed by cultivar Chipper White (49.06 cm), Saffron (47.73 cm), and Red Majesty, and the minimum length of leaf was recorded in cultivar American Beauty (33.0

cm).

At 60 DAP, the maximum (68.13 cm) length of leaf was observed in cultivar Summer Sunshine, which was at par with cultivars Saffron (58.46cm), Chipper White (57.80 cm), and Red Majesty (54.66 cm), and the minimum length of leaf was observed in cultivar American Beauty (42.60 cm).

Significantly, the higher width of leaf (1.91cm) was recorded in the cultivar Red Majesty, which was at par with cultivars Saffron (1.79cm), Summer Sunshine (1.76 cm), and Chipper White (1.71 cm), and the lower width of leaf (1.35cm) was recorded in cultivar American Beauty at 20 DAP.

At 40 DAP, the maximum width of leaf (2.39cm) was noted under the cultivar Red Majesty, which was at par with cultivar Summer Sunshine (2.30cm), Local cultivar (2.10 cm), and Souvik (1.99 cm), and the minimum width of leaf (1.67cm) was observed in cultivar American Beauty.

The maximum width of leaf (2.79cm) at 60 DAP was observed in the cultivar Summer Sunshine, which was at par with cultivars Red Majesty (2.62cm), Souvik (2.51 cm), and Saffron (2.46 cm), and the minimum width of leaf (1.98cm) was observed in cultivar American Beauty.

### Corms and cormels yield

The highest number of corms (2.66) per plant was noticed in the cultivar American Beauty, followed by Summer Sunshine (2.46), Saffron (2.40), and Red Majesty (2.33), and the lowest number of corms per plant was noted in the cultivar Souvik (1.46).

The cultivar Chipper White recorded the maximum (44.73) number of cormels per plant, which was on par with cultivars Saffron (36.53), Summer Sunshine (33.66), and Har Majesty (31.26), and the lowest number of corms was noted in the cultivar Souvik (24.46).

The maximum diameter of corm (5.52cm) was observed in cultivar Chipper White, followed by Summer Sunshine (5.08 cm), Red Majesty (4.24 cm), and Saffron (4.09cm). It was significantly higher than the other cultivars. The minimum diameter of the corm was recorded in the cultivar Souvik (2.92cm).

The maximum (55.00 g) weight of corms per plant was recorded in the cultivar Chipper White, followed by Saffron (54.73 g) and Summer Sunshine (49.13), and the minimum weight of corms was noted in the cultivar Souvik (22.00 g).

The cultivar Saffron had the maximum (29.26 g) weight of cormels per plant, followed by the local cultivar (25.33 g), Summer Sunshine (22.03 g), and Chipper White (21.40 g), and the minimum weight of cormels was observed in the cultivar Souvik (16.46 g).

**Table 1:** Performance of gladiolus cultivars for growth characters

Treatment	Number of days required for 50% sprout	Plant height (cm)			Number of leaves per plant		
		20 DAP	40 DAP	60 DAP	20 DAP	40 DAP	60 DAP
Har Majesty	10.16	39.28	51.73	69.26	2.43	4.20	6.46
Red Majesty	10.50	44.63	65.63	77.63	2.13	4.13	7.20
Chipper White	9.66	48.86	76.66	88.43	3.00	6.80	8.70
Souvik	12.50	36.76	56.43	71.73	1.83	4.60	6.60
American Beauty	12.16	34.16	45.43	67.93	2.36	5.80	7.66
Summer Sunshine	9.82	42.90	76.73	89.80	2.33	4.73	7.66
Saffron	9.33	41.63	66.23	81.40	1.73	4.66	7.20
Local cultivar	11.50	33.86	58.60	74.06	1.70	3.73	6.60
S.Em±	0.28	2.802	2.639	2.179	0.238	0.456	0.383
C.D at 5%	0.87	8.581	8.081	6.675	0.729	1.397	1.174

**Table 2:** Performance of gladiolus cultivars for growth characters

Treatment	Length of leaf (cm)			Width of leaf (cm)		
	20 DAP	40 DAP	60 DAP	20 DAP	40 DAP	60 DAP
Har Majesty	24.50	36.20	42.66	1.50	1.87	2.38
Red Majesty	32.30	47.66	54.66	1.91	2.39	2.62
Chipper White	33.93	49.06	57.80	1.71	1.98	2.40
Souvik	24.26	42.36	51.20	1.50	1.99	2.51
American Beauty	26.63	33.00	42.60	1.35	1.67	1.98
Summer Sunshine	26.06	55.40	68.13	1.76	2.30	2.79
Saffron	29.26	47.733	58.46	1.79	1.96	2.46
Local cultivar	25.36	36.86	46.26	1.64	2.01	2.45
S.Em±	1.88	2.18	2.43	0.08	0.09	0.10
C.D at 5%	5.76	6.68	7.47	0.24	0.28	0.32

**Table 3:** Performance of gladiolus cultivars for corms and cormels production

Treatment	Number of corms per plant	Number of cormels per plant	Diameter of corms (cm)	Weight of corms per plant (g)	Weight of cormels per plant (g)
Har Majesty	1.733	31.26	3.06	26.73	17.86
Red Majesty	2.33	28.6	4.24	36.73	16.13
Chipper White	1.8	44.73	5.52	55.00	21.40
Souvik	1.46	24.46	2.92	22.00	16.46
American Beauty	2.66	30.4	3.04	26.00	18.86
Summer Sunshine	2.4	33.66	5.08	49.13	22.06
Saffron	2.46	36.53	4.09	54.73	29.26
Local cultivar	1.93	26.36	3.76	38.06	25.33
S.Em±	0.09	0.8	0.10	1.33	0.95
C.D at 5%	0.28	2.47	0.30	4.09	2.93

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