

## GROWTH AND FLOWERING PERFORMANCE OF GLADIOLUS VARIETIES

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### ABSTRACT

Field study was conducted at Horticulture Section, College of Agriculture, Nagpur during the year 2014-15 with nine varieties of gladiolus viz., Snow Princess, Yellow Stone, Chandani, Nova Lux, Flaro Sovenier, Princess Morgerate Rose, Pricilla, Forta Rosa and Jester Gold to identify a suitable variety of gladiolus for commercial cultivation in Nagpur region. Results showed that, number of shoots plant<sup>-1</sup>(2.73), plant height (84.80 cm), number of leaves plant<sup>-1</sup> (19.80) and leaf area (198.17 cm<sup>2</sup>) recorded maximum in variety Yellow stone. Variety Chandani recorded minimum days to first spike emergence (63.47 days), days to opening of first florets (73.73 days), and 50 % flowering, while maximum flowering duration was recorded in variety Yellow Stone. Number of corms plant<sup>-1</sup> (2.63) and hectare<sup>-1</sup>(2.63 lakh) were recorded maximum in variety Yellow Stone. However, maximum weight of corm (48.17 g) and diameter of corm (7.09 cm) were recorded in variety Forta Rose.

(Key words: Growth, flowering, gladiolus, variety, corm)

### INTRODUCTION

In cut flower industry, the most important aspects are suitability of the varieties to a particular type of climate in order to maximize the production of better quality cut flower in order to fetch more market prices. Gladiolus (*Gladiolus grandiflora* L.) is one of the most cultivated, economically important cut flower in India and in many other countries because of its elegant spike, rich varied colours and longer keeping quality. Gladiolus is known as the queen of the bulbous plants. Commercial cultivation of gladiolus has been increasing day by day and large scale production is practiced mainly in winter season. Gladiolus has a great importance in floral arrangement and bouquets because of its long vase life. Selection of suitable cultivar is an important factor that determines successful cultivation of gladiolus under different agro-climatic conditions, as the performance of varieties with respect to various parameters like growth and quality and corm yield and quality differs greatly in different regions. The performance of a cultivar in respect of growth and yield is known to be greatly influenced by the environmental conditions in which it is grown and the genetic makeup of the cultivar. Keeping this view the present investigation on 'Performance of gladiolus varieties on growth and flowering parameters in Nagpur conditions' was undertaken at Horticulture Section, College of Agriculture Nagpur.

### MATERIALS AND METHODS

A field experiment was carried out at farm of Horticulture Section, College of Agriculture, Nagpur during

rabi season of the year 2014-2015. The experiment was laid out in a Randomized Block Design with three replications. The experiment comprised with nine gladiolus varieties viz., Snow Princess, Yellow Stone, Chandani, Nova Lux, Flaro Sovenier, Princess Morgerate Rose, Pricilla, Forta Rosa and Jester Gold.

The experimental plot was ploughed and subsequent harrowing was done and soil was brought to fine tilth. At the time of land preparation, well rotted FYM @ 20 t ha<sup>-1</sup> was mixed uniformly in the soil before last harrowing. Layout of ridges and furrow of a dimension of 2.25 m x 1.20 m was made.

Corms were dipped in copper fungicide (0.1%) solution for 20 minutes as preventive measure for *Fusarium wilt* disease before planting. These corms were planted at a spacing of 45 cm x 15 cm in each row along the sides of the ridges at a depth of 5-6 cm on 24<sup>th</sup> November 2014. Light irrigation was given immediately after planting.

Recommended dose of NPK (400:200:200 kg/ha) was applied in the form of urea, single super phosphate and muriate of potash respectively. At the time of planting half the dose of N, full dose of P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O were applied. The crop was top dressed with remaining half dose of N at 30 days after planting.

Observations like shoot plant<sup>-1</sup> was recorded thirty days after planting, height of plant and number of leaves were recorded at 60 days after planting, leaf area was taken at 50 per cent flowering stage, flowering parameters were recorded at flowering time and corm parameters were recorded at time of harvesting. Recorded data was statistically analyzed as per method suggested by Gomez and Gomez, (1984).

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## RESULTS AND DISCUSSION

### Growth parameters

Data from table 1 showed significant differences in respect to shoots plant<sup>-1</sup> among gladiolus varieties. The variety Yellow Stone had produced significantly maximum shoots plant<sup>-1</sup> (2.73) which was statistically found to be at par with the variety Chandani (2.53). However, minimum shoots plant<sup>-1</sup> (1.87) were produced in variety Nova Lux.

The variation in production of shoots plant<sup>-1</sup> of gladiolus might be attributed due to the genetic differences of varieties. Similar results are obtained by the workers viz., Shaukat *et al.* (2012). They quoted that Fidelio and Priscilla varieties of gladiolus recorded maximum sprouts plant<sup>-1</sup>. Gawali *et al.* (2012). They reported that gladiolus varieties Phule Ganesh and Pisttacinus Hybrid recorded maximum sprouts plant<sup>-1</sup>.

The data in table 1 revealed that, significantly maximum plant height (84.80cm) was recorded in variety Yellow Stone which was at par with Forta Rosa (76.00 cm), followed by Snow princes (73.93cm) and Chadani (70.20 cm). However, variety Pricilla had recorded significantly minimum plant height (59.33 cm) at 60 days after planting.

Number of leaves plant<sup>-1</sup> (19.80) was recorded significantly maximum in variety Yellow Stone which was at par with Chandani (18.20) followed by the varieties Snow princes (16.20) and Forta Rosa (16.07). However, significantly minimum number of leaves plant<sup>-1</sup> was recorded in variety Flaro Sovenier (11.40) at 60 days after planting.

Leaf area at 50 per cent flowering stage was recorded maximum (198.17 cm<sup>2</sup>) in variety Snow princes which was at par with Yellow Stone (196.33 cm<sup>2</sup>) and Morgerate Rose (191.13 cm<sup>2</sup>). However, significantly minimum leaf area at 50 per cent flowering stage was recorded in variety Chandani (105.87 cm<sup>2</sup>).

The variation in height of plant, number of leaves and leaf area of the different varieties of gladiolus might be due to the differential genetic makeup and varied growth rate among the varieties of gladiolus. The results are in close conformity with the findings of Choudhary *et al.* (2011). They reported that highest plant height recorded in 'Sabnam' while cultivar 'Dhanvantari' produced longest length of leaf in gladiolus. Ashvini *et al.* (2016) reported that, plant height, number of leaves clump<sup>-1</sup> and leaf area were recorded maximum in tuberosa genotype Prajwal. Rao and Sushma (2015) reported that IIHR G 12 genotypes of gladiolus recorded maximum vegetative growth.

### Flowering parameters

The data in table 1 revealed that, gladiolus variety Chandani had observed significantly minimum days for first flower spike initiation (63.47 days), opening of first pair of floret (73.73 days) and 50 % flowering (84.20 days) followed by varieties Forta Rosa and Princes Morgerate Rose. Significantly maximum days for first flower spike initiation

(73.47 days), opening of first pair of floret (83.07 days) and 50 % flowering (92.73 days) were observed in variety Jester Gold.

Flowering span (21.33 days) and longevity of intact flower on plant (16.13 days) was recorded significantly maximum in variety Yellow Stone which was at par with variety Snow Princes and Fort Rosa. The variety Princes Morgerate Rose observed the minimum flowering span (17.33 days) and longevity of intact flower on plant (14.17 days).

Variation in flowering parameters viz., days to initiation of spike, days to opening of first pair of floret, days to 50% flowering, days to first harvesting showed by different genotypes of gladiolus might be due to variation in their genetic factor. Results, obtained in the present investigation are in consonance with the findings of Negi *et al.* (2014). They found that gladiolus cultivars Hb-1-8 and Hb-1-28 took minimum days to spike emergence and cultivars Hb-2-52, Hb-9-16 and Hb-1-8 took minimum days to flowering. Sarkar and Chakraborty (2014) quoted that gladiolus variety Swarnima was showed highest longevity (field life) of spike.

### Corm study

The data in table 1 revealed that significantly gladiolus variety Yellow Stone had produced significantly maximum corms plant<sup>-1</sup> (2.63 plant<sup>-1</sup>) and ha<sup>-1</sup> (2.43 lakhs) which was statistically found to be at par with the variety Chandani (2.33 plant<sup>-1</sup> and 2.12 lakhs ha<sup>-1</sup>), whereas significantly minimum corms plant<sup>-1</sup> (1.47) and hectare<sup>-1</sup> (1.22 lakhs) were recorded with the variety Jester Gold.

The variation in the number of corms produced plant<sup>-1</sup> might be due to its genetic character of individual variety. Baweja and Brahma (2003) reported that gladiolus cultivars Sunset and Summer Pearl recorded the highest number of corms plant<sup>-1</sup>. Patil (2003) reported that corm production was highest in gladiolus varieties Yellow Stone and Sancerre. Gawali *et al.* (2012) found that, corm yield of gladiolus in respect of numbers was noticed maximum in variety Pisttacinus Hybrid. Whereas, the maximum diameter of corm and weight of corm plant<sup>-1</sup> were found superior with the variety Nova Lux and corms produced plant<sup>-1</sup> and their weight were noted maximum with the variety Phule Ganesh.

The variety Forta Rosa (48.17 g) had produced significantly maximum weight of corm which was statistically found to be at par with the variety Nova Lux (46.83 g), whereas significantly minimum weight of corm was recorded with the variety Snow Princess (30.33 g). The variety Forta Rosa (7.09 cm) had recorded significantly maximum diameter of corm which was statistically found to be at par with the variety Pricilla (6.33 cm), whereas significantly minimum diameter of corm (5.24 cm) was recorded with the variety Nova Lux.

The variety Forta Rosa had produced the maximum weight of corm which might have been happened due to the

Table 1. Growth, flowering and corm yield of gladiolus as influenced by varieties

Genotypes	Shoots plant <sup>-1</sup>	Plant Height (cm)	No. of leaves clump <sup>-1</sup>	Leaf area at (cm <sup>2</sup> )	Days to first spike emergence	Days to opening of first florets	Days to 50 % flowering	Flowering span (days)	Number of bulb clump <sup>-1</sup>	Number of bulb plot <sup>-1</sup>	Number of bulb ha <sup>-1</sup>	Corm weight (g)	Diameter of corm (cm)
Snow Princess	2.27	73.93	16.20	198.17	66.80	77.07	86.40	20.67	1.93	46.13	1.70	30.33	6.14
Yellow Stone	2.73	84.80	19.80	196.33	71.93	81.47	90.80	21.33	2.63	65.73	2.43	41.17	5.48
Chandani	2.53	70.20	18.20	105.87	63.47	73.73	84.20	16.67	2.33	57.33	2.12	32.33	5.86
Nova Lux	1.87	62.00	13.40	111.87	67.80	76.07	85.73	18.00	1.70	39.60	1.46	46.83	5.24
Flaro Sovenier	2.00	67.87	11.40	187.40	70.27	79.93	89.60	17.67	1.53	37.93	1.40	36.50	5.77
Princess Morgerate Rose	2.00	61.13	14.80	191.13	65.87	75.13	84.33	17.33	1.67	38.53	1.42	39.83	5.96
Pricilla	2.27	59.53	15.00	118.27	66.93	76.33	85.67	18.33	1.87	44.27	1.64	43.17	6.33
Forta Rosa	2.33	76.00	16.07	136.53	65.27	76.00	85.67	19.67	2.13	51.73	1.91	48.17	7.09
Jester Gold	2.00	69.13	14.87	134.73	73.47	83.07	92.73	19.33	1.47	33.07	1.22	33.33	6.05
SE (m) ±	0.10	2.05	1.04	3.59	1.08	0.73	0.88	0.42	0.14	3.68	0.13	0.85	0.32
CD at 5 %	0.31	6.10	3.11	10.65	3.20	2.19	2.64	1.26	0.41	11.03	0.40	2.54	0.95

utilization of available food material for development of corm plant<sup>-1</sup> and this weight of corm might have been increased. The results are in close conformity with the findings of Safiullah and Ahmed (2001). They reported that gladiolus cultivars, Deciso and Trader Horn were superior for corm weight, cormel weight, whereas corm and cormel diameter were recorded maximum with gladiolus variety Mary Housley. Gawali *et al.* (2012) found that, the maximum diameter of corm and weight of corm plant<sup>-1</sup> were found superior with the variety Nova Lux and cormels produced plant<sup>-1</sup> and their weight were noted maximum with the variety Phule Ganesh.

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