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Performance of different gladiolus (*Gladiolus grandiflora* L.) cultivars under chhattisgarh plains agroclimatic zone conditions

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Abstract

An experiment entitled “Performance of different gladiolus cultivars under Chhattisgarh plains agroclimatic zone conditions” was carried out in Horticulture Research Farm at the Department of Floriculture and Landscape Architecture, IGKV, Raipur, Chhattisgarh during 2016-17. The experiment was laid out in randomized block design (RBD) with 14 treatments (cultivars) and three replications. With respect to flowering yield and quality parameter, the cultivar Nova Lux was taken minimum number of day (60.49) to spike emergence, the cultivar American Beauty (67.09) was taken minimum number of days to first floret colour show, the minimum days to full bloom of first floret open was taken by cultivar American Beauty (68.25), the spike length was significantly higher in cultivar Saffron (78.13 cm), the length of rachis was recorded maximum in cultivar White Prosperity (69.81 cm), maximum inter nodal length was pointed in cultivar White Prosperity (3.02 cm), the maximum number of florets spike⁻¹ was recorded in cultivar Candyman (15.03), the maximum diameter of florets was significantly higher in the cultivar Fancy Pink (10.73 cm), the cultivar Gunjan has recorded highest flowering duration (32.22 days). The maximum day to vase life (8.26) in tap water of gladiolus was observed in the cultivar Candyman.

Keywords: Gladiolus, cultivars, flower characters, vase life

Introduction

Gladiolus (*Gladiolus grandiflora* L.) belongs to family Iridaceae. It is one of the most popular flowers with magnificent inflorescence, referred as “Queen of bulbous flowers”. It is native of South Africa and Tropical Africa. The name gladiolus was originally coined by Pliny the Elder (A.D.23-79), from the Latin word gladius, meaning a sword, also known as ‘Sword lily’ on account of the sword-like shape of the foliage. ‘Corn flag’ is another common name in Europe because it is found wild as weed in the corn-fields. It is herbaceous plant which develops from axillary buds on the corm, usually unbranched leafy, leaves basal and cauline and sword shaped (Goldblatt *et al.*, 1998) [6]. It is one of the most important among the bulbous ornamentals for cut flower trade in India. It is also ideal both for garden display and floral arrangements for table and interior decoration as well as making high quality bouquet. Gladiolus is additionally useful for flower beddings in gardens, pot crops, rockeries etc (Abbasi *et al.* 2005) [1]. The state of Chhattisgarh is one of the potential areas for commercial cultivation of Gladiolus. There is a heavy demand for flowers during marriage, festivals and other social functions. Gladiolus is one of the dominant flowers in the flower market of Chhattisgarh is blessed with many natural advantages such as abundant sunshine and favourable temperatures for its growth. There is much scope for increase Gladiolus cultivation in Chhattisgarh. The performance of any crop or cultivar largely depends on genotypic constituent and effect of environmental condition. As a result, cultivars which perform well in one region may not perform the same in other regions of varying climatic conditions (Pandey, 2012) [10]. Hence, the present experiment was conducted to Performance of different gladiolus cultivars under Chhattisgarh plains agroclimatic zone conditions.

Materials and Methods

An experiment entitled “Performance of different gladiolus cultivars under Chhattisgarh plains agroclimatic zone conditions” was carried out in Horticultural Research cum Instruction Farm at the Department of Floriculture and Landscape Architecture, College of Agriculture, Indira

Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, during 2016-17. The experiment was laid out in Randomized Block Design (RBD) and three replication. Healthy corms of fourteen cultivars (Candyman, Nova Lux, Gunjan, Advantage, Punjab Dawn, Summer Sunshine, Her Majesty, Dull Queen, Saffron, GS-2, American Beauty, White Prosperity, Red Majesty, Fancy Pink) were planted at 30×20 cm spacing. Standard cultivation and recommended cultural practices were followed. Observations were recorded on flowering attributes and vase life in tap water under ambient condition and data were analyzed statistically.

Results and Discussion

Flowering yield and quality parameters

Various flowering yield and quality parameters were influenced significantly due to response of varieties (Table 1&2). The cultivar Nova Lux was taken minimum number of days to spike emergence (60.49) which was showed at par with cultivar American Beauty (60.83), Fancy Pink (60.86), Punjab Dawn (61.63), White Prosperity (61.73), Dull Queen (61.82), Her Majesty (62.71) and GS-2 (63.12). However, it was significantly earlier than other cultivars. Candyman (72.26) took maximum number of days to spike emergence. Similar results on varietal differences for spike emergence have reported by Nagaraju and Parthasarthy (2001)^[9] and Kumar and Yadav (2005)^[8].

The cultivar American Beauty (67.09) was taken minimum number of days to first floret colour show which was at par with cultivar GS-2 (69.01), Punjab Dawn (69.12), White Prosperity (69.92), Dull Queen (70.38) and Fancy Pink (70.71). However, it was significantly earlier than other cultivars. The cultivar Candyman (83.50) took maximum number of days to first floret colour show. These results are in line with the result of Arora and Khanna (1985)^[3] and Rani *et al.*, (2007)^[13] who reported superiority of some genotypes over other genotypes arisen due to variation of genotypes used.

The data reveals that the minimum days to full bloom of first floret open was taken by cultivar American Beauty (68.25) which was at par with cultivar White Prosperity (69.90) and Punjab Dawn (71.15). However, it was found significantly differ with rest of the other cultivars. The maximum number of days to first floret open (86.20) was recorded in cultivar Candyman. The Variation in days to first floret open might be attributed to differences in genetic makeup of the cultivars and might also be influenced by their growing environmental conditions. Similar results were obtained by Arora and Sandhu (1987)^[4], Kem *et al.*, (2003)^[7] and Swaroop *et al.* (2011)^[17].

The length of spike was significantly higher in cultivar Saffron (78.13 cm) which was at par with cultivar Candyman (76.16 cm), White Prosperity (75.33 cm) and Fancy Pink (75.30 cm). However, it was showed significant difference with other cultivars. The minimum length of spike was recorded under cultivar Gunjan (51.11 cm). The variation in length of spike might be due to differences in genetic constitution of genotypes which show their character in one generation to next generation. Similar results were also reported by Arora *et al.* (2002)^[2], Rani *et al.* (2007)^[13] and Sindhu *et al.*, (2014)^[15].

The length of rachis was recorded maximum in cultivar White Prosperity (69.81 cm) which was at par with cultivar Candyman (68.22 cm) and it was significantly variation with other cultivars. The minimum length of rachis was noted in cultivar Dull Queen (45.46 cm). Similar results were reported by Baweja and Brahma (2003)^[5], Kumar and Yadav (2005)^[8] and Swain *et al.* (2008)^[16].

The significantly maximum inter nodal length was pointed in cultivar White Prosperity (3.02 cm) which was significantly greater than rest of other cultivars. The lower inter nodal length founds in cultivar GS-2 (1.06).

The data reveals that the maximum number of florets per spike was recorded in cultivar Candyman (15.03) which was at par with cultivar White Prosperity (14.80), Red Majesty (14.37), Punjab Dawn (14.33) and Nova Lux (14.27) whereas it was exhibited significant differences with other cultivars. The minimum number of florets per spike recorded in cultivar Dull Queen (11.33). The number of florets differs as different cultivar to cultivars might be due to hereditary traits of the cultivar of the gladiolus, which is governed by genetic makeup of the plants. Similar results on number of florets per spike have been reported by Rani and Singh (2005) and Ram *et al.* (2005)^[11].

The diameter of florets was significantly higher in the cultivar Fancy Pink (10.73 cm) and lower diameter of florets was found in the cultivar Punjab Dawn (8.33 cm). The variation in diameter of florets might be due to hereditary traits of the varieties. Similar results on number of florets per spike have been reported by Rani and Singh (2005)^[12] and Ram *et al.* (2005)^[11].

The cultivar Gunjan has recorded highest flowering duration (32.22 days) which was at par with cultivar GS-2 (30.76 days) and White Prosperity (30.68) and it was showed significantly greater than other cultivars of the gladiolus. The lowest was in cultivar Candyman (21.14 days). Flowering duration differ might be due to genetic makeup of the cultivars as well as environmental factors, which is governed by the genotypic constituent of the plant.

Table 1: Performance of gladiolus cultivars for flowering yield and quality parameters

Treatments	Days taken to spike emergence	Days taken to first floret color show	Days taken to first floret open	Length of spike (cm)	Rachis length (cm)
Candyman	72.26	83.50	86.20	76.16	68.22
Nova Lux	60.49	71.06	74.37	74.78	66.41
Gunjan	65.38	74.07	78.07	51.11	46.49
Advantage	67.53	76.14	79.43	69.98	57.77
Punjab Dawn	61.63	69.12	71.15	69.19	65.26
Summer Sunshine	65.51	73.16	75.07	72.68	55.07
Her Majesty	62.71	71.78	74.47	71.01	58.03
Dull Queen	61.82	70.38	72.27	58.91	45.46
Saffron	67.17	77.80	79.08	78.13	54.73
GS-2	63.12	69.01	71.33	68.58	48.69
American Beauty	60.83	67.09	68.25	63.06	48.92
White Prosperity	61.73	69.92	69.90	75.33	69.81

Red Majesty	66.93	76.29	79.98	71.73	64.30
Fancy Pink	60.86	70.71	74.12	75.30	60.76
S. Em \pm	1.01	1.26	1.01	0.98	0.73
C.D at 5%	2.94	3.67	2.95	2.85	2.12

Table 2: Performance of gladiolus cultivars for flowering yield and quality parameters and vase life

Treatments	Inter nodal length (cm)	Number of florets per spike	Diameter of florets (cm)	Duration of flowering (Days)	Vase life of gladiolus in ambient condition
Candyman	2.74	15.03	9.74	21.14	8.26
Nova Lux	2.08	14.27	9.51	24.69	7.30
Gunjan	1.89	11.63	8.55	32.22	6.57
Advantage	2.73	13.13	9.69	21.53	7.29
Punjab Dawn	1.74	14.33	8.33	25.58	6.15
Summer Sunshine	2.70	12.03	9.64	25.20	6.86
Her Majesty	1.69	13.33	8.45	22.65	6.53
Dull Queen	1.67	11.33	8.41	25.27	5.95
Saffron	1.83	13.43	9.54	23.41	6.64
GS-2	1.60	12.23	9.19	30.76	7.16
American Beauty	1.77	12.47	9.71	28.25	5.94
White Prosperity	3.02	14.80	9.49	30.68	7.56
Red Majesty	1.70	14.37	9.62	22.48	6.94
Fancy Pink	2.06	13.33	10.73	26.52	7.45
S. Em \pm	0.06	0.33	0.14	0.54	0.31
C.D at 5%	0.17	0.97	0.41	1.57	0.89

Vase life of cut flower (day)

The experimental flowers were held in the laboratory at about $22 \pm 2^\circ\text{C}$ ambient room temperature. The maximum days to vase life of gladiolus in ambient condition was recorded in the cultivar Candyman (8.26) which was at par with cultivar White Prosperity (7.56) and Fancy Pink (7.45). The minimum days to vase life was noted in the cultivar American Beauty (5.94). Variation in vase-life may be attributed to differential accumulation of carbohydrates from varied leaf production, sensitivity of cultivars to ethylene and genetically framework of the plant. It may also be differ due to hereditary character of the cultivars. Vase life of the spike in water under ambient conditions was found to be best in cultivars 'Priscilla' and 'Legend' (14 days) followed by cultivar Tropic Sea was reported by Sankari *et al.*, (2012)^[14]. Rupa Rani *et al.*, (2007)^[13].

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