



E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(4): 751-754
Received: 04-05-2018
Accepted: 08-06-2018

Dhananjay Kumar
Department of Horticulture,
Institute of Agricultural Sciences
Banaras Hindu University,
Varanasi, Uttar Pradesh, India

Anil K Singh
Department of Horticulture,
Institute of Agricultural Sciences
Banaras Hindu University,
Varanasi, Uttar Pradesh, India

Anjana Sisodia
Department of Horticulture,
Institute of Agricultural Sciences
Banaras Hindu University,
Varanasi, Uttar Pradesh, India

Performance of gladiolus varieties for growth and corm yield under eastern Uttar Pradesh condition

Dhananjay Kumar, Anil K Singh and Anjana Sisodia

Abstract

An experiment was conducted to study the “Performance of gladiolus varieties for growth and corm yield under Eastern Uttar Pradesh condition”. Healthy and uniform corms of 31 gladiolus varieties were planted during October 2017 and experiment was carried out in Randomized Block Design with three replications. Corms of healthy and disease-free varieties of Indian and exotic origin were planted during month of October, 2017. Among varieties, cv. Punjab Dawn found to be early in days to sprouting and cv. Purple Flora was most late. Cultivar Nova Lux found to have maximum width of scape at 20 DAP and cv. American Beauty at 35 and 50 DAP and found minimum in cultivar Flevo Leguna, Punjab Morning and Purple Flora at 20, 35, and 50 DAP, respectively. Cv. Dhanvantari found superior amongst the cultivars for plant height at 20, 35 and 50 DAP, whereas minimum was observed in cultivars BTS at 20 DAP and Flevo Leguna at 35 and 50 DAP. Cultivar Punjab Morning exhibited best performance for number of corms per plant and minimum in cultivar Pink Friendship. Germplasm BTS was found superior with respect to the weight of corm, number of cormels per plant and weight of cormels per plant whereas cultivar American Beauty had bigger corm size.

Keywords: gladiolus, cultivars, growth, corm, cormels

Introduction

Flowers form an integral part of our rich heritage and culture as India has long tradition in floriculture. Gladiolus is one of the most popular bulbous flowers grown in many parts of the world and it has a long and noble history (Singh, 2006)^[10]. The Latin word ‘Gladius’ means sword and hence it is often called as ‘sword lily’ because of the shape of its leaves. India has suitable agro-climatic conditions for gladiolus cultivation; it is commercially cultivated in West Bengal, Himachal Pradesh, Sikkim, Karnataka, Uttar Pradesh, Tamil Nadu, Punjab and Delhi. In the eastern states like Tripura, Assam, Manipur, Meghalaya and Nagaland, this flower has established itself as a commercial proposition (Singh *et al.*, 2013)^[9]. Gladiolus is extremely rich in its varietal wealth. The choice of cultivar is an important factor in commercial floriculture. It is essential to recommend a set of equally well performing gladiolus cultivars only for this region because the agro-climatic conditions are unique in nature. Though many genotypes of gladioli can be grown in particular agro-climatic region all are not suited for commercial cultivation. Therefore, there is a need for evaluation of hybrids for particular agro-climatic region. So that suitable hybrids could be recommended for commercial cultivation under eastern region of Uttar Pradesh. In view of the above, research work has been carried out with the title “Performance of gladiolus varieties for growth and corm yield under Eastern Uttar Pradesh condition”.

Materials and Methods

The experiment was conducted during winter season of 2017-18 at Horticulture Research Farm of the Department of Horticulture, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, which is situated at 25° 02' North latitude, 83° 03' East longitudes and at an elevation of 128.93 meters above sea level. Healthy and disease-free corms of 31 varieties (Pink Friendship, Jyotsana, Sunanya, Green, Yellow Star, Anjali, Pusa Subham, Arti, BTS, Trader Horn, Flevo Leguna, Surya Kiran, Punjab Morning, IIHR, American Beauty, Nova Lux, Punjab Dawn, Priscilla, Aldebaran, Dhanvantari, Princess Margaret Rose, Pusa Srijan, Subhangini, Jester Gold, Purple Flora, Chemistry, Darshan, Shabanam, Chandini, Pusa Kiran and Tiger Flame) were planted with spacing of 30 cm between the rows and 20 cm between the plants. The experiment was laid out in Randomized Block Design and replicated thrice. All cultural operations were uniformly done for all the varieties. Observations were recorded on various growth, corm and cormels characters and data were analyzed statistically.

Correspondence
Dhananjay Kumar
Department of Horticulture,
Institute of Agricultural Sciences
Banaras Hindu University,
Varanasi, Uttar Pradesh, India

Results and Discussion

Growth characters

Significant difference due to varieties was observed on various growth characters (Table 1 and 2). The perusal of data reveals that days to 10%, 20%, 50% and >50% sprouting was observed earliest in cultivar Punjab Dawn. For days to 30% sprouting cv. Anjali found to be earliest and for days to 40% sprouting cultivars Anjali, Punjab Dawn, Priscilla and Jester Gold was taken minimum time. The maximum days to sprouting was found in cultivar Chemistry (10% and 30%), and Purple Flora (20%, 40%, 50% and >50%). The maximum width of scape was recorded in cultivar Nova Lux at 20 DAP which was at par with the cultivars American Beauty (1.79 cm), Pusa Kiran (1.69 cm) and BTS (1.67 cm). During the course of growth at 35 DAP and 50 DAP the maximum width of scape was recorded in cultivar American Beauty which was statistically at par with cultivar Princess Margaret Rose (2.57 cm), Chemistry (2.51 cm), and Nova Lux (2.49 cm) at 35 DAP and found significantly superior to rest of the other cultivars at 50 DAP. The maximum leaf width was recorded with cv. Pusa Kiran at 20 DAP which was at par with cvs.

Anjali, Pink Friendship and Shubhangini. At 35 DAP the maximum leaf width was recorded in cultivar Sunanya which was at par with cultivar BTS and Jester Gold and it was found superior over other cultivars at 35 DAP and in case of 50 DAP the maximum leaf width was recorded in cultivar Shubhangini which was at par with cultivars Sunanya and BTS (Fig. 1). Maximum plant height at 20 DAP was found with cultivar Dhanvantari and at par with cultivar Pusa Kiran (37.69 cm) and Tiger Flame (43.89 cm) and found significantly superior to rest of the other cultivars at 35 and 50 DAP, whereas, minimum was observed in cultivar BTS at 20 DAP and Flevo Leguna at 35 and 50 DAP (Table 1). It is clearly noticed from the data that there is a wide variation in different growth characters which is probably due to genetic nature of the varieties. Morphological variation on days to sprouting and size of leaf due to gladiolus varieties was observed by Singh *et al.* (2013a) [9], Kadam *et al.* (2014) [3], Sisodia and Singh (2015) [9], Swaroop *et al.* (2017), Mushtaq *et al.* (2018) [4], and difference on growth characters also observed in snapdragon by Singh *et al.* (2013b) [10].

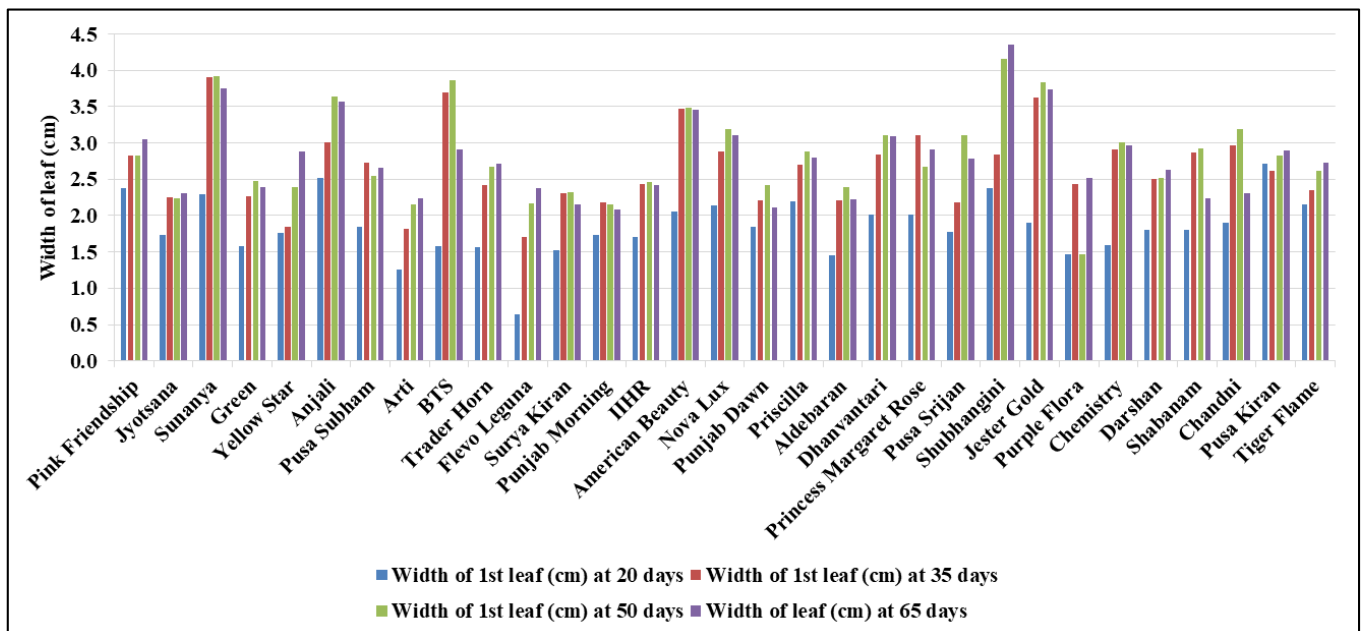


Fig 1: Performance of gladiolus varieties for width of leaf at 20, 35, 50 and 65 DAP

Table 1: Performance of gladiolus varieties for days to sprouting (10%, 20%, 30%, 40%, 50% and >50%).

Treatment	Days to 10% sprouting	Days to 20% sprouting	Days to 30% sprouting	Days to 40% sprouting	Days to 50% sprouting	Days to >50% sprouting
Pink Friendship	8.00	9.33	10.67	11.67	11.67	12.33
Jyotsana	8.67	9.67	10.00	10.33	11.33	11.67
Sunanya	8.33	8.67	10.00	10.67	11.33	11.67
Green	10.67	11.00	11.00	12.00	13.67	14.33
Yellow Star	7.67	8.33	10.33	10.67	10.67	11.33
Anjali	8.00	8.33	8.33	9.00	10.33	11.33
Pusa Subham	8.00	8.67	9.00	9.33	10.00	11.67
Arti	8.33	10.33	10.33	11.00	11.67	12.00
BTS	8.67	9.67	10.33	10.33	11.33	11.67
Trader Horn	9.33	10.00	10.33	10.67	11.00	11.67
FlevoLeguna	10.67	11.33	11.33	12.00	13.67	12.67
Surya Kiran	9.67	10.33	10.67	11.67	12.00	13.00
Punjab Morning	8.33	9.00	9.33	10.00	10.00	10.33
IIHR	8.33	10.33	11.00	11.33	11.67	12.67
American Beauty	10.33	11.33	11.67	12.33	12.33	12.67
Nova Lux	9.00	9.67	10.33	10.67	10.33	11.00
Punjab Dawn	7.00	8.00	8.67	9.00	9.00	9.33
Priscilla	7.33	8.00	9.33	9.00	10.00	10.33

Aldebaran	9.33	9.00	10.67	11.33	12.00	12.33
Dhanvantari	8.67	9.00	9.00	9.67	10.33	11.00
Princess Margaret Rose	9.67	10.67	11.67	12.33	12.00	12.67
Pusa Srijan	9.33	10.67	10.67	11.00	11.67	12.00
Shubhangini	10.67	11.33	12.00	12.33	13.33	13.67
Jester Gold	8.67	9.00	9.00	9.00	9.00	10.33
Purple Flora	10.67	12.00	12.00	14.00	14.00	14.00
Chemistry	11.00	11.33	12.67	13.00	13.67	13.67
Darshan	10.67	11.00	12.00	12.33	12.33	13.00
Shabnam	10.00	10.00	11.33	11.67	12.67	13.00
Chandni	10.33	11.00	11.67	12.00	12.33	12.67
Pusa Kiran	10.67	10.67	10.00	11.67	12.67	14.00
Tiger Flame	7.33	9.33	10.67	11.33	11.33	12.33
C.D. 5%	1.16	1.23	1.34	1.38	1.19	1.14

Table 2: Performance of gladiolus varieties for width of scape at 20, 35 and 50 DAP and plant height at 20, 35 and 50 DAP.

Treatment	Width of scape (cm) at 20 days	Width of scape (cm) at 35 days	Width of scape (cm) at 50 days	Height of plant (cm) at 20 days	Height of plant (cm) at 35 days	Height of plant (cm) at 50 days
Pink Friendship	1.77	2.35	2.59	27.96	46.29	55.99
Jyotsana	1.30	1.61	1.98	30.42	46.87	59.36
Sunanya	1.57	2.03	2.44	26.95	43.17	53.55
Green	1.40	1.75	2.12	21.93	40.59	50.47
Yellow Star	1.41	1.89	2.21	33.37	44.50	63.25
Anjali	1.55	2.20	2.50	32.17	46.82	56.84
Pusa Subham	1.46	2.21	2.33	26.80	46.97	59.49
Arti	1.09	1.71	2.08	26.86	45.65	56.34
BTS	1.67	2.33	2.06	13.49	34.11	43.47
Trader Horn	1.38	1.60	2.73	17.78	33.53	51.30
FlevoLeguna	1.00	1.68	1.97	14.02	29.55	41.00
Surya Kiran	1.26	1.70	1.91	21.53	41.66	53.91
Punjab Morning	1.04	1.53	1.85	26.67	49.77	62.48
IIHR	1.41	1.89	2.13	25.29	47.02	57.62
American Beauty	1.79	2.79	3.23	26.85	50.25	61.61
Nova Lux	1.90	2.49	2.71	31.14	47.85	63.75
Punjab Dawn	1.23	1.77	2.01	33.38	53.23	63.73
Priscilla	1.64	2.28	2.60	31.95	51.65	59.94
Aldebaran	1.35	1.73	1.93	25.65	47.67	58.07
Dhanvantari	1.42	2.01	2.41	38.23	61.13	78.37
Princess Margaret Rose	1.51	2.58	2.47	28.61	45.34	55.13
Pusa Srijan	1.57	2.18	2.51	19.01	37.53	49.15
Shubhangini	1.37	2.06	2.56	27.37	45.38	55.87
Jester Gold	1.42	2.10	2.48	27.65	46.63	60.54
Purple Flora	1.22	1.64	1.79	19.46	45.39	58.80
Chemistry	1.61	2.51	2.80	17.98	41.53	51.63
Darshan	1.20	1.90	2.23	20.17	40.49	46.79
Shabanam	1.37	2.05	2.41	24.09	42.13	51.40
Chandni	1.29	2.20	2.45	25.95	44.07	55.43
Pusa Kiran	1.69	2.23	2.44	37.69	54.43	68.15
Tiger Flame	1.49	2.04	2.51	33.89	47.97	58.89
C.D. 5%	0.25	0.32	0.36	4.79	6.35	6.36

Corm and cormel parameters

Significant differences were observed among the cultivars for various corm and cormel characters (Table 3). Cultivar Punjab Morning produced maximum number of corms per plant which was at par with cvs. Pusa subham, Pusa Kiran, Chandini, Pusa Srijan, Jyotsana, Surya Kiran, IIHR, Dhanvantari, Punjab Dawn, whereas, minimum number of corms per plant was recorded with cultivar Pink Friendship. Variation in number of corms was also reported by Singh *et al.* (2013) [9] and Kadam *et al.* (2014) [3]. The maximum weight of corms per plant was recorded in variety BTS (157.71 g) which was at par with the cultivar American Beauty (146.07 g) and Dhanvantari (142.51 g), followed by cvs. Anjali (138.50 g) and Sunanya (135.99). The cultivar Tiger Flame (34.73 g) found to be lightest with respect to the weight of corm. The maximum diameter of corm (86.48 mm)

was observed with cultivar American Beauty and it is significantly greater than all other cultivars. The minimum diameter of corm (19.44 mm) was observed in cv. Flevo Leguna. Maximum number of cormels per hill (174.17) was recorded with variety BTS which was statistically significant to all other cultivars. The weight of cormels was highest in germplasm BTS (33.31 g) followed by cv. Arti (26.07 g) and lowest cormel weight per plant was recorded with cv. Punjab Morning (0.94 g). Present findings are experimentally substantiated by Poon *et al.* (2010) [6], Shaukat *et al.* (2012) [8], Jana *et al.* (2013), Singh *et al.* (2013a) [9], and Rao *et al.* (2015) [7]. Corm and cormel production influenced by different varieties was also noticed by Sisodia and Singh (2015) in gladiolus and significant difference on production of tuberos bulb was observed by Singh *et al.* (2013c) [11].

Table 3: Performance of gladiolus varieties for corm and cormel parameters.

Treatment	Number of corms per hill	Number of cormels per hill	Weight of corm (g)	Weight of cormels (g)	Diameter of corm (mm)
Pink Friendship	1.00	28.17	69.15	6.05	65.69
Jyotsana	2.56	12.44	107.42	4.99	56.38
Sunanya	2.00	29.67	136.00	16.52	62.30
Green	1.33	25.39	50.24	2.78	47.10
Yellow Star	1.44	42.28	74.22	5.73	57.36
Anjali	2.33	64.00	138.50	12.55	64.46
Pusa Subham	2.89	41.83	107.80	9.62	48.46
Arti	2.00	22.22	81.48	26.07	46.26
BTS	2.28	174.17	157.71	33.31	58.07
Trader Horn	2.33	24.50	77.50	7.36	52.12
FlevoLeguna	2.17	11.06	35.31	1.71	19.44
Surya Kiran	2.50	30.50	99.30	8.06	49.67
Punjab Morning	3.00	3.00	127.73	0.94	54.82
IIHR	2.44	29.56	89.25	11.71	50.55
American Beauty	1.33	17.22	146.08	5.02	86.48
Nova Lux	1.39	31.00	130.16	10.87	66.57
Punjab Dawn	2.44	6.11	111.45	2.48	55.19
Priscilla	1.78	26.78	111.12	6.37	62.16
Aldebaran	2.00	26.33	86.25	7.42	56.53
Dhanvantari	2.44	19.11	142.52	4.78	63.85
Princess Margaret Rose	1.22	10.44	83.97	2.59	67.06
Pusa Srijan	2.67	27.89	96.03	8.72	50.02
Shubhangini	2.00	56.22	90.15	8.55	57.25
Jester Gold	2.17	11.50	130.13	1.47	60.69
Purple Flora	2.33	64.17	81.12	7.92	50.10
Chemistry	2.00	11.50	101.68	1.65	57.08
Darshan	2.17	9.28	52.43	2.95	44.77
Shabanam	1.11	11.33	66.21	3.89	57.19
Chandni	2.83	46.83	84.50	8.13	42.39
Pusa Kiran	2.83	32.17	78.97	6.25	45.16
Tiger Flame	2.28	26.67	34.73	4.16	36.15
C.D. 5%	0.57	5.90	15.93	1.65	5.74

References

- Chourasia A, Viradia RR, Ansar H, Madle SN. Evaluation of different gladiolus cultivars for growth, flowering, spike yield and corm yield under Saurashtra region of Gujarat. *The Bioscan*. 2015; 10(1):131-134.
- Jana BR, Das B. Evaluation of tropical gladiolus under eastern plateau and hill region of India. *International Journal of Science and Research*. 2013; 4(7):1301-1302.
- Kadam GB, Kumar G, Saha TN, Tiwari AK, Kumar R. Varietal evaluation and genetic variability studies on gladiolus. *Indian Journal of Horticulture*. 2014; 71(3):379-384.
- Mushtaq S, Hafiz IA, Arif M, Anwar A. Performance evaluation of elite gladiolus cultivars under agro climatic conditions of Rawalpindi. *Asian Journal of Advances in Agricultural Research*. 2018; 5(3):1-6.
- Pandey RK, Bhat DJI, Dogra S, Singh A, Laishram N, Jamwal S. Evaluation of gladiolus cultivars under subtropical conditions of Jammu. *International Journal of Agriculture Sciences*. 2012; 8(2):518-522.
- Poon TB, Rao TM, Kumar DP, Dhananjaya MV. Evaluation of different genotypes of gladiolus for corm and cormel production. *Nepal Agriculture Research Journal*. 2010; 10:50-54.
- Rao KD, Sushma K. Performance of different new genotypes of gladiolus. *Agricultural Science Digest-A Research Journal*. 2015; 35(2):134-137.
- Shaukat SA, Shah SZA, Shaukat SK, Shaukat SW. Evaluation of different gladiolus cultivars under Union Council Bangoin Poonch J&K Conditions. *Journal of Agricultural Science and Applications*. 2012; 14(2):138-141.
- Singh AK, Anuj K, Ghimire NR. Studies of gladiolus cultivars for post-harvest characters. *Environment and Ecology*. 2013a; 31(2):418-421.
- Singh AK. *Flower Crops: Cultivation and Management*. New India Publishing Agency, New Delhi. 2006, 147.
- Singh AK, Jauhari S, Sisodia A. Development of snapdragon hybrids and their evaluation for vegetative, flowering and seed attributes. *Progressive Horticulture*, 2013b; 46(1):133-142.
- Singh AK, Kumar Amresh, Sisodia A. Growth, flowering and bulb yield in tuberose as influenced by cultivars. *Environment and Ecology*. 2013c; 31(4A):1823-1825.
- Sisodia A, Singh AK. Plant morphology, growth and corm parameters as influenced by gamma doses in gladiolus cultivars. *Environment and Ecology*. 2015; 33(2A):888-892.
- Swaroop K. Morphological variation and evaluation of gladiolus germplasm. *Indian Journal of Agricultural Sciences*. 2010; 80(8):742-745.