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RESEARCH PAPER

Evaluation of gladiolus cultivars under subtropical conditions of Jammu

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Abstract : Fifty six gladiolus cultivars (32 exotic and 24 Indian) were evaluated for cut flower and corm production at the experimental farm of the Division of Vegetable Science and Floriculture, FOA, Chatha, SKUAST-J, Jammu. The cultivars were evaluated under Jammu conditions during 2007-2008. The analyzed data indicated that four cultivars *viz*., White Prosperity, Eurovision, Jyotsana and American Beauty proved superior over the others for various parameters of vegetative growth, flowering and corm and cormel production. Eurovision was found superior with respect to plants height (133.00 cm), number of leaves per plant (10.00) and number of florets per spike (19.00). Cultivar White Prosperity recorded maximum length of leaves (55.33 cm), longest spike (91.16 cm), maximum rachis length (76.16 cm), maximum floret diameter (11.36 cm), heavier corms (121.66 g) and size of corm (6.89 cm). Minimum number of days to slipping (66.00 days) and colour breaking (80.33 days) were recorded in cultivar Chandni. Maximum number of daughter corms (3.10 cm) and number of cormels (68.00) were recorded in cultivar Jyotsana.

Key Words : Gladiolus, Cultivars, Corm, Flowering

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INTRODUCTION

Gladiolus belonging to the family Iridaceae is an important bulbous crop both in domestic as well as international market. It is commercially grown in tropical, sub-tropical and hilly parts of the world. The exquisite and majestic beauty of gladiolus spikes, exhaustive range of colours, different shades, varying number of florets, size and better keeping quality has made gladiolus the most popular bulbous flower crop grown worldwide. The addition of new varieties every year necessitates varietal evaluation to find out suitable variety for specific region. The performance of any crop or cultivar largely depends on genotypic and environmental interaction. As a result, cultivars which perform well in one region may not perform the same in other regions of varying climatic conditions. Hence, the present investigation was, therefore, planned to evaluate 56 gladiolus cultivars suitable for cut flower and corm and cormel production in the subtropical conditions of Jammu.

MATERIALS AND METHODS

An experiment was carried out during the year 2007-2008 to evaluate 56 cultivars (32 exotic and 24 Indian) in a Randomized Block Design (RBD) with three replications at the experimental farm of the Division of Vegetable Science and Floriculture, SKUAST-J, Chatha, Jammu. Chatha is situated at 32°39'N latitude, 74°48'E longitude, 300 m amsl. Healthy and uniform size corms of 4-5 cm diameter were planted in the month of October, at the depth of 6-10 cm with a spacing of 40x20 cm. the soil of the experimental field was sandy loam, having 6-7 pH. The observations on growth, flowering and

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corm production parameters were recorded and presented in Table 1, 2 and 3.

RESULTS AND DISCUSSION

The analysis of variance revealed that all the vegetative growth parameters, flowering as well as corm and cormel production were found significant (Table 1, 2 and 3). A perusal of Table 1 revealed that variety Eurovision produced the tallest plant plants (133.00 cm) followed by White Prosperity (131.33 cm), American Beauty (125.01 cm) and Jyotsana (123.66 cm) whereas plants of variety Rang Mahal were smallest (63.05 cm) in height. In contrary, Arora *et al*. (2002) reported that cultivar Dhanvantri had produced maximum plant height under Delhi conditions.

The number of leaves/plant were highest in Eurovision (10.00) followed by White Prosperity (9.66) and Novalux (9.66) whereas number of leaves per plant were minimum (7.00) in Sanjeevni and Rang Mahal (7.00). The number of leaves per plant might be more due to the higher stored food reserves in mother corms of these cultivars (Sharma and Gupta, 2003).

The length of the leaves was recorded maximum (55.33 cm) in White Prosperity followed by Novalux (53.00 cm) and Candyman (52.26 cm) while minimum length of leaves (29.33 cm) was recorded in Rang Mahal. The maximum width of leaves (3.79 cm) was recorded by Candyman and minimum (2.13 cm) by Gulal. Differences in vegetative characters of different cultivars may be due to varied growth rate and their genetic make-up. As a result, variations in phenotypic expressions are expected to occur. Similar results on vegetative characters were also observed by Mishra (1997).

The perusal of data presented in Table 2 on performance of different gladiolus cultivars for various flowering parameters revealed that variety Chandni took minimum number of days (66.00 days) to slipping followed by Mohini (69.33 days) whereas Candiman took the maximum number of days (101.00 days) to slipping. Arora and Khanna (1985) also reported that time taken for spike emergence varied significantly among various cultivars of gladiolus. Further, Neeraj *et al*. (2000) suggested that gladiolus can be grouped as early, mid and late flowering and may be cultivated for longer duration of flowering and garden display. Chandni cultivar also took minimum number of days for colour breaking (80.33 days) followed by Green Pasture (83.33 days), Mohini (83.33 days) and Anjali (83.66 days) whereas maximum (117.66 days) was recorded with Candiman. The difference in various parameters among cultivars may be due to the different genetic make-up of the cultivars.

Minimum number of days taken for first floret opening was recorded with the variety Gunjan (81.00 days) followed by Chandni (85.33 days), Mohini (88.66 days) whereas variety Candiman took the maximum (124.66 days). Similar variation in early and late cultivars of gladiolus has been reported by

Table 1 : Performance of different gladiolus cultivars for various growth parameters under sub - tropical conditions of Jammu

Cultivars	Plant height (cm)	No of leaves	Leaf length (cm)	Leaf width (cm)
1. American Beauty	125.01	9.33	41.60	2.96
2. Dhanvantri	111.55	8.33	47.00	3.12
3. Anjali	86.22	7.66	41.66	2.76
4. Mohini	90.44	7.66	41.66	2.94
5. Sanjeevni	99.88	7.00	43.53	2.71
6. Shagun	118.66	8.66	48.00	3.07
7. Australian Fair	115.11	8.66	47.66	2.83
8. High Style	100.10	8.66	43.66	2.67
9. Bis Bis	122.88	7.66	40.00	3.03
10. Sunanya	112.33	7.33	46.33	3.03
11. Suchitra	102.88	7.33	38.00	2.80
12. Jyotsana	123.66	8.33	49.00	3.26
13. Eurovision	133.00	10.0	48.00	3.29
14. White Prosperity	131.33	9.66	55.33	3.58
15. Gunjan	106.22	8.33	51.00	3.20
16. Novalux	116.22	9.66	53.00	3.46
17. Tilak	76.61	7.66	40.66	2.94
18. Urmil	95.77	9.00	41.33	2.55
19. Srinagar	100.00	8.33	38.66	2.77
20. Sukanya	108.44	8.66	45.00	2.61
21. Sweeta	93.88	8.33	39.00	2.47
22. Jester Gold	108.77	8.66	39.00	2.70
23. Green Pasture	111.77	8.00	50.00	3.13
24. Shweta	65.00	8.00	32.00	2.63
25. Charm Glow	108.00	8.33	43.66	3.26
26. George Major	92.22	7.66	38.33	2.62
27. Yellow In Jane	112.44	7.67	48.66	3.20
28. Rang Mahal	63.05	7.00	29.33	2.43
29. Chantiler	90.33	8.00	35.33	2.60
30. Palm Tart	105.77	7.33	51.00	3.66
31. Her Majesty	81.10	6.66	42.00	2.70
32. Urmil	101.77	8.00	40.00	2.60
33. Sagarika	97.66	7.33	44.50	2.70
34. Superstar	88.55	7.33	46.00	3.51
35. Archana	104.11	8.00	41.00	3.60
36. Bonier	115.77	8.33	47.33	3.46
37. Pricilla	105.55	9.00	46.66	3.70
38. Urvashi	73.33	7.66	44.66	3.06
39. Eighth Wonder	107.66	8.66	41.66	3.01
40. Summer Pearl	104.94	8.33	48.33	3.02
41. Pascal	106.11	8.00	47.33	3.07
42. White Butterfly	88.05	8.00	43.00	2.66
43. Punjab Dawn	94.33	8.00	49.50	3.13
44. Sagar	115.66	8.00	45.33	2.97
45. Summer Rose	93.50	8.33	44.70	2.81
46. Gulal	94.99	7.66	37.10	2.13
47. Swarn Kiran	97.44	8.00	48.66	3.11
48. Interpad	96.33	8.33	47.03	2.63
49. Snow Princess	98.22	8.33	48.00	2.59
50. Mascogni	96.44	8.33	47.50	2.82
51. Chirag	91.83	7.33	45.60	2.72
52. Applause	96.33	8.00	38.26	2.44
53. Friendship	92.33	8.33	44.10	2.77
54. Chandni	106.83	8.33	46.76	2.98
55. Darshan	93.72	8.33	41.30	2.84
56. Candiman	109.77	8.66	52.26	3.79
C.D. (P=0.05)	14.59	1.30	4.05	0.39

Table 2 : Performance of different gladiolus cultivars for various flowering parameters under sub - tropical conditions of Jammu

Cultivars	Days to slipping	Days to colour break	Days to first floret open	Days to last floret open	Spike length (cm)	Rachis length (cm)	No. of florets /spike	Dia. of first floret (cm)
1. American Beauty	94.33	111.0	118.66	130.00	86.66	57.33	16.33	9.73
2. Dhanvantri	91.66	104.33	114.66	126.66	50.00	44.00	13.00	9.33
3. Anjali	71.00	83.66	89.66	103.33	60.00	38.33	12.66	9.36
4. Mohini	69.33	83.33	88.66	101.66	57.66	45.00	14.33	9.33
5. Sanjeevni	77.33	94.66	101.66	115.00	63.00	44.33	13.00	9.83
6. Shagun	91.00	106.6	113.00	124.66	63.00	48.66	15.00	8.44
7. Australian Fair	94.33	110.33	117.66	130.33	61.33	45.66	11.66	9.10
8. High Style	88.00	105.66	113.00	125.33	57.33	44.00	10.66	8.83
9. Bis Bis	76.33	89.00	96.33	110.66	71.00	55.00	10.33	8.50
10. Sunanya	71.00	85.66	95.66	106.00	74.33	59.00	13.66	10.00
11. Suchitra	72.33	90.33	97.33	110.33	62.00	47.66	12.00	10.00
12. Jyotsana	72.66	88.00	94.00	108.00	78.66	60.66	15.00	11.06
13. Eurovision	82.33	95.66	101.33	112.00	88.33	70.66	19.00	9.66
14. White Prosperity	74.66	93.33	101.66	109.66	91.16	76.16	18.30	11.36
15. Gunjan	70.00	85.00	81.00	90.00	54.00	39.00	13.00	10.00
16. Novalux	72.33	89.66	9.33	111.00	62.00	46.66	13.33	10.23
17. Tilak	84.00	105.33	112.00	121.66	46.33	30.33	10.33	9.00
18. Urmil	84.33	99.00	106.00	118.33	51.66	34.66	12.33	9.83
19. Srinagar	73.33	88.33	96.00	106.66	79.66	57.66	15.00	10.20
20. Sukanya	96.66	114.33	121.00	132.33	67.00	44.33	11.33	8.00
21. Sweeta	89.00	105.33	113.66	124.66	65.66	45.33	14.00	9.00
22. Jester Gold	92.00	109.00	117.33	128.00	61.66	42.66	13.00	9.93
23. Green Pasture	71.00	83.33	91.33	102.66	71.00	49.00	12.00	9.83
24. Shweta	78.66	99.33	106.66	118.00	44.33	29.33	11.66	8.83
25. Charm Glow	81.66	97.66	104.66	115.66	65.00	45.66	14.66	10.46
26. George Major	77.00	96.00	107.66	118.66	52.00	35.66	11.33	10.43
27. Yellow In Jane	90.00	104.66	117.00	127.33	59.66	35.00	11.66	9.66
28. Rang Mahal	85.66	101.66	110.33	121.00	41.00	26.33	8.00	10.00
29. Chantiler	72.66	90.33	96.66	106.66	55.33	33.00	12.33	8.66
30. Palm Tart	71.00	86.33	92.00	103.00	67.66	52.66	15.66	8.96
31. Her Majesty	89.33	104.00	111.33	121.66	54.33	36.33	10.00	8.60
32. Urmil	72.66	89.66	95.33	104.66	72.66	53.66	13.66	9.50
33. Sagarika	84.66	100.00	108.33	118.33	70.00	42.00	12.66	10.00
34. Superstar	71.00	89.66	97.33	107.33	46.00	33.66	12.00	8.000
35. Archana	95.00	109.66	116.33	126.33	70.66	51.33	15.33	10.16
36. Bonier	87.00	100.66	111.00	120.33	71.00	51.00	15.66	10.23
37. Pricilla	93.33	106.33	111.33	121.33	57.33	45.33	10.33	10.30
38. Urvashi	92.33	104.66	110.66	120.33	45.00	31.66	11.00	10.36
39. Eighth Wonder	88.00	104.33	112.33	121.66	73.00	53.33	14.66	10.63
40. Summer Pearl	94.00	111.66	118.33	127.66	55.33	36.00	12.00	10.23
41. Pascal	94.66	110.66	117.00	127.00	66.66	51.66	15.33	8.66
42. White Butterfly	92.00	109.66	116.33	126.33	56.33	42.00	10.66	9.00
43. Punjab Dawn	91.00	104.00	110.66	119.33	82.66	61.00	12.33	10.00
44. Sagar	90.33	110.33	118.33	128.33	78.66	64.66	14.00	9.66
45. Summer Rose	74.33	91.33	98.33	107.33	59.33	41.33	12.33	10.16
46. Gulal	87.66	105.66	111.33	121.66	46.66	32.00	12.66	10.93
47. Swarn Kiran	72.33	91.66	99.00	108.66	59.66	44.00	13.66	10.00
48. Interpad	78.00	96.00	104.33	113.66	56.00	39.00	12.66	9.83
49. Snow Princess	81.00	98.00	107.66	124.00	57.33	40.00	14.66	10.16
50. Mascogni	95.00	116.33	123.00	133.00	57.00	41.00	11.66	10.00
51. Chirag	76.66	94.00	101.00	110.66	52.66	34.33	11.00	9.83
52. Applause	76.00	93.00	102.33	112.33	52.33	36.33	12.33	10.20
53. Friendship	74.00	91.00	97.33	107.00	50.00	33.66	14.00	10.00
54. Chandni	66.00	80.33	85.33	95.33	58.66	39.00	11.00	9.00
55. Darshan	95.66	116.66	123.00	133.00	52.33	35.66	12.66	8.66
56. Candiman	101.0	117.66	124.66	134.33	60.33	44.00	13.33	10.36
C.D. (P=0.05)	0.54	0.25	0.00	0.43	1.59	0.93	0.51	0.79

Table 3 : Performance of different gladiolus cultivars for various corm and cormel production parameters under sub - tropical conditions of Jammu

Cultivars	No of daughter corms	No of cormels	Corm weight (g)	Corm Diameter (cm)
1. American Beauty	1.55	24.00	112.66	6.33
2. Dhanvantri	1.66	22.00	53.33	4.50
3. Anjali	1.33	21.66	85.00	5.16
4. Mohini	1.66	27.33	81.66	5.73
5. Sanjeevni	1.33	18.66	55.00	4.76
6. Shagun	1.66	14.66	83.33	6.43
7. Australian Fair	1.00	10.33	61.00	5.20
8. High Style	1.33	14.33	44.66	4.66
9. Bis Bis	1.66	36.00	50.00	4.56
10. Sunanya	1.00	13.00	50.00	4.70
11. Suchitra	2.33	15.00	76.00	5.66
12. Jyotsana	3.10	68.00	107.66	5.98
13. Eurovision	2.00	55.00	108.66	6.76
14. White Prosperity	3.00	63.00	121.66	6.89
15. Gunjan	2.00	41.23	91.66	6.10
16. Novalux	2.33	59.33	70.00	5.56
17. Tilak	1.66	10.00	71.66	4.43
18. Urmil	1.33	15.00	103.33	5.90
19. Srinagar	1.00	22.00	101.00	5.86
20. Sukanya	1.66	32.33	96.50	5.30
21. Sweeta	1.33	20.66	103.33	5.30
22. Jester Gold	1.66	16.33	51.33	5.06
23. Green Pasture	1.66	10.00	91.66	5.23
24. Shweta	1.33	16.33	85.00	4.53
25. Charm Glow	1.66	40.33	89.66	6.16
26. George Major	1.33	17.33	55.00	4.43
27. Yellow In Jane	1.00	42.33	100.00	6.06
28. Rang Mahal	2.00	15.00	62.66	4.60
29. Chantiler	1.66	37.33	87.66	5.33
30. Palm Tart	2.33	16.66	53.33	4.63
31. Her Majesty	1.66	21.66	94.66	5.20
32. Urmil	1.66	11.00	76.00	5.70
33. Sagarika	1.66	13.33	65.00	4.90
34. Superstar	1.00	10.00	45.66	5.06
35. Archana	1.33	17.66	101.00	5.43
36. Bonier	1.33	24.33	62.66	5.66
37. Pricilla	2.00	11.66	98.66	6.33
38. Urvashi	1.33	10.33	90.00	5.43
39. Eighth Wonder	1.33	15.00	101.66	5.90
40. Summer Pearl	2.33	15.00	63.33	5.73
41. Pascal	1.66	15.00	76.6	5.10
42. White Butterfly	1.33	14.66	71.33	4.66
43. Punjab Dawn	1.33	17.66	65.00	5.33
44. Sagar	1.11	11.66	50.33	4.63
45. Summer Rose	1.66	10.33	73.33	5.30
46. Gulal	1.66	21.33	107.66	6.03
47. Swarn Kiran	1.66	36.00	80.00	5.83
48. Interpad	2.00	58.33	78.33	5.76
49. Snow Princess	1.66	25.00	72.33	5.43
50. Mascogni	2.67	23.66	46.66	4.30
51. Chirag	1.66	11.00	51.66	5.36
52. Applause	2.33	10.33	96.66	5.50
53. Friendship	2.00	30.00	73.33	5.66
54. Chandni	2.00	16.66	67.00	5.56
55. Darshan	2.67	19.66	38.33	4.20
56. Candiman	1.55	16.33	85.00	6.16
C.D. (P=0.05)	0.75	8.62	19.66	0.76

Awasthi and Parthsarthy (1996) and Kumar and Yadav (2005).

The perusal of data in Table 2 also revealed that maximum number of days to last floret opening was recorded with the cultivar Candiman (134.33 days) followed by Darshan (133.00 days), Mascogni (133.00 days) whereas, minimum number of days to floret opening was recorded with cultivar Gunjan (90.00 days).

White Prosperity produced significantly longer spike (91.16 cm) followed by Eurovision (88.33 cm) and American Beauty (86.66 cm) whereas cultivar Frienship recorded the shortest spike length (50.00 cm). The maximum length of rachis (76.16 cm) was recorded in White Prosperity while minimum (26.33 cm) in Rang Mahal.

The number of florets per spike was maximum (19.00) in Eurovision, followed by White Prosperity (18.30) and American Beauty (16.33) whereas minimum (8.00) in Rang Mahal. Uppal and Arora (1994) and Dimri (2002) also noticed significant differences in floret number from different cultivars. White Prosperity produced the maximum floret diameter (11.36 cm) followed by Jyotsana (11.06 cm) while minimum diameter (8.00 cm) was recorded in Sukanya.

A close look at Table 3 on the performance of different gladiolus cultivars for various corm and cormel production parameter revealed that cultivar Jyotsana produced maximum number of daughter corm (3.10) followed by White Prosperity (3.00) and minimum (1.00) by Australian Fair, Sunayana, Srinagar, Yellow In Jane and Super Star. In gladiolus, the ability to produce corms and cormels per plant determines its rate of multiplication and these characters would be very effective in improvement programmes.

Numbers of cormels were recorded maximum by the cultivar Jyotsana (68.00) followedeby White Prosperity (63.00) and Novalux (59.33) and minimum by Tilak (18.00), Green Pasture (10.00) and Superstar (10.00). Sharma and Gupta (2003) reported that availability of more food material stored in bigger sized mother corms helped in better plant growth and might be associated with the beneficial effect on cormel production.

Corm diameter and corm weight are the important parameters for producing quality spikes with more flowers of larger size. Polar and equilatorial diameter of corms indicated thickness of the corms, used for selecting quality corms, which will produce sturdy and long spikes. Variety White Prosperity produced heavier corms (121.66 g) followed by American Beauty (112.66 g) whereas Bis Bis and Sunanya exhibited lightest corm per plant (50.00 g). The size of the corm was significantly wider in White Prosperity (6.89 cm) followed by Eurovision (6.76 cm) whereas least (4.20 cm) was recorded in Darshan. Kamble *et al.* (2004) also reported wide variation in corm and cormel production while working on different cultivars of gladiolus. Dimri (2002) also reported similar results on variation in weight of corms in different cultivars.

Considerable morphological variations was observed in vegetative, flowering, corm and cormel production parameters

among various cultivars of gladiolus. These characters could be considered as useful criteria for determining the suitability of various cultivars in the particular region. It may be concluded from the present experiment that 25 cultivars may be grouped as early, 13 number as mid season and 18 as late season flowering cultivars. It is also evident from the experiment that cultivars White Prosperity, Eurovision and American Beauty produced quality spikes and cultivar Jyotsana, White Prosperity and Mascogni produced quality corms and cormels.

REFERENCES

Arora, J.S. and Khanna, K. (1985). Evaluation of gladiolus cultivars. *J.Res. Punjab Agric. Univ.,* **22**(4): 635-662.

Arora, J.S., Misra, R.L., Singh, K., Singh, P.J. and Bhattacharjee, S.K. (2002). In: *Gladiolus*. Technical Bulletein No. 14, published by All India Co-ordinated Research Project on Floriculture, Division of Floriculture and Landscaping, Indian Agricultural Research Institute, NEW DELHI, India pp.66-67.

Awasthi, C. and Parthasarthy (1996). Evaluation of gladiolus cultivars. *J. Hill Res.,* **9**(1):147-149.

Dimri, D.C. (2002). Performance of some promising gladioli cultivars under low hills of Uttaranchal. *Prog. Hort.*, **34**(2):265-267.

Kamble, B.S., Reddy, B.S., Gangadharappa and Kulkarani, B.S. (2004). Evaluation of gladiolus varieties for quality parameters, flower and corm yield. *Haryana J.Hort. Sci.,* **33**(1-2): 74-75.

Kumar, R. and Yadav, D.S. (2005). Evaluation of Gladiolus cultivars under sub-tropical hills of Meghalaya. *J. Ornam. Hort.,* **8**(2):86-90.

Mishra, H.P. (1997). Performance of gladiolus genotypes under calcareous soil for North Bihar. *Indian J. Hort.*, **14**(1): 77-92.

Neeraj, Mishra, H.P. and Jha, P.B. (2000). Evaluation of gladiolus germplasm under North Bihar conditions. *Indian J. Hort.,* **57**(2):178-181.

Sharma, T.R. and Gupta, R.B. (2003). Effect of corm size and spacing on growth, flowering and corm production in gladiolus. *J. Ornam. Hort.*, **6**(4):352-356.

Uppal, S. and Arora, J.S. (1994). Evaluation of different cultivars of gladiolus under varying dates of planting. *Punjab Hort. J.,* **34**(3-4):129-134.

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