



Study on evaluation of Gladiolus varieties for Cut Flower production under tropical conditions of Tirupati.

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ABSTRACT

A field study was conducted at the Citrus Research Station, Tirupati, for two winter seasons 2015- 17 to evaluate 12 germplasm of gladiolus for cut-flower and corm production. The various characters studied showed significant differences amongst the cultivars with the minimum number of days required to slipping (59.20 DAP) in A. Aarthi, the maximum spike length (96.47 cm) in A.Tilak and the highest number of florets per spike (18.47), cormels per plant (120.80), weight of cormels (21.29 g) per plant and vase life (9.88 days) in A.Amar. The maximum number of spikes (2.63) and corms (3.20) per plant was recorded in American Beauty. The maximum diameter of corm (4.74 cm), weight of corm (77.67 g) and size index of corm (19.84 cm) was superior in A.Kesar, while the highest number of florets remaining open at a time (5.33) was observed in A.Sanjeevini. On the basis of spike and corm yield and returns performance A.Aarthi was found to be the best under tropical conditions of Tirupati..

Key words : *Corm, cut-flower, gladiolus, vase-life*

Gladiolus (*Gladiolus x hybridus* Hort.) is the most important cut-flower amongst the bulbous flowers in trade. It is also popularly called as 'sword lily' due to its sword shaped leaves. It is also attributed as 'queen of bulbous flowers' due to its elegant flower spikes of etiquette beauty. Its cut-spikes are in great demand for bouquets and flower arrangements because of long spike length, variety of colors and forms of florets. Besides, it is also grown in beds for garden display and in pots for indoor gardening. Commercial cultivation of gladiolus is getting momentum day-by-day being a potential money-spinner for the aesthetic world with more returns per unit area than the other horticultural crops. Spread of gladiolus cultivation to newer areas has demanded study of available germplasm under the new agro climatic conditions for their performance and market acceptability, as well as making assured availability of quality planting material to the growers of the super performing germplasm. Considering these facts, the present study was undertaken to find out the suitable varieties of gladiolus for cultivation under the tropical conditions of Tirupati.

MATERIALS AND METHODS

The experiment was conducted at Citrus Research Station, Tirupati from November, 2015-16 and September, 2016-17 The soil of the experimental field is red loamy with pH 6.4. The region lies in Seshachalam hill ranges dominated by sedimentary rocky-hilly terrain .It receives an average rainfall of 900- 1000 mm with sub-humid conditions and remains almost free from frost. During summers the temperature touches the mark of 42-45 degrees centigrade, whereas during winters it falls to 18- 20° C. The source of planting material is from Indian Institute of Horticultural Research, and Lalbagh, Bangalore.

The cultivars included for study were Arka Gold, Arka Amar , Arka Ayush, Arka Kesar, Arka Naveen, American Beauty ,Summer Sunset, Arka Darshan, Arka Sanjeevini, Arka Kum Kum, Arka Tilak and Arka Aarthi . The corms of these 12 varieties were planted in randomized block design at a spacing of 30 x 30 cm in beds of 2x2 m size at a depth of 6-8 cm in three replications. All the fertilizer and protection measures was carried out as per the recommendations.

The plants were earthed-up after one month of planting by making ridges along the plant rows

and later upon emergence of spikes were staked with bamboo sticks. The observations were recorded on five randomly selected plants in each treatment plot and the mean values were statistically analyzed using analysis of variance technique. The parameters studied included days to sleeping, spike length, number of florets per spike, number of spikes per plant, number of corms per plant, diameter of corm, weight of corm, number of cormels, weight of cormels per plant, size index of corm, vase life of spikes, days to wilting of basal floret, number of florets open at a time.

RESULTS AND DISCUSSION

The varieties of gladiolus evaluated for flower and corm yield under tropical conditions of Tirupati showed significant variations in the studied parameters (Table 1).

Spike initiation was the earliest in A.Aarathi (59.20 days) followed by American Beauty (60.53 days), whereas it was late in A.Darshan (75.53 days). The variation in number of days required for spike initiation indicated that it might be primarily due to the different genetic constitution of the genotypes and secondary contribution of the prevailing environmental conditions. In similar studies, Patil (2002) and Pratap and Rao (2006) also recorded variation among varieties for spike initiation. The length of spike varied significantly amongst the varieties ranging from 69.93 to 96.47 cm. The longest spikes were measured in A.Tilak which were at par with those of A.Amar (90.93 cm), whereas the shortest in A.Aarathi (69.93 cm). The total number of florets per spike is also an important spike quality parameter which could determine the acceptability of cultivar for export purposes and was the maximum in A.Amar (18.47) and the least in A.Aarathi (13.33). Sindhu and Verma (1995), Patil (2002) and Kem et al. (2003) also reported significant differences in floret number amongst different gladiolus cultivars. The highest number of spikes per plant (2.73) was obtained in American Beauty followed by A.Aarathi (2.67), while the lowest in A.Kesar (1.13). The recorded differences could be attributed to genetic nature of different varieties as reported by Ram et al. (2005) in a similar study.

Varieties of longer vase-life of cut spikes are considered desirable for interior decoration and making bouquets. Perusal of the results presented in Table 1 indicates that the longest vase life of spikes was recorded in A. Amar (9.88 days),

whereas spikes of A.Aarathi had the shortest vase-life (6.89 days). Differential performance of varieties for vase-life of spikes could be attributed to the differential accumulation of carbohydrates by them due to varied leaf numbers and area as well as varied sensitivity of cultivars to ethylene. Findings of Kumar and Yadav (2005), Pratap and Rao (2006) and Horo et al. (2009) confirm the results of present investigation on variation in durability of flower spikes. The maximum number of days taken to wilting of basal floret was recorded in A. Sanjeevini (4.55 days) which was at par with American Beauty (4.11) while the minimum in A. Darshan (2.66 days). The maximum number of florets (5.33) opening at a time was observed in A. Sanjeevini which was at par with A.Ayush (4.97), whereas the minimum was observed in A.Aarathi and A.Naveen (3.33). These observations are in agreement with the findings of Kumble et al. (2004) and Pratap and Rao (2006).

In gladiolus, the ability of a genotype to produce corms and cormels per plant determines its multiplication rate and ultimately the acreage under the genotype which is otherwise in demand in the trade. Therefore, multiplication rate of a genotype is important character in crop improvement programme in gladiolus. In the present study, the maximum number of corms per plant (3.20) was recorded in American Beauty, while the minimum (1.53) in A.Kesar (Table 2). Sharma and Gupta (2003) reported that availability of more food material stored in bigger size mother corms leading to enhanced plant growth might be associated with the beneficial effect on cormels production. Corms of the largest diameter (4.74 cm) were produced by A.Kesar followed by A.Amar (4.45 cm) and the smallest corm (3.85 cm) in A.Gold. The results on diameter of corm indicated main role of genotype on corm size coupled with environmental condition prevailed during the experimentation. The results are in tune with the reports of Saini et al. (1991), Neeraj et al. (2001) and Ram et al. (2005).

The weight of single corm was recorded the maximum in A.Kesar (77.67 g), while the minimum in A.Gold (34.16 g). Similarly, A.Gold also had the lowest weight of cormels (5.58 g) and the least number of cormels (18.83) produced per plant, whereas the highest weight of cormels (21.29 g) and the highest number of cormels (120.80) produced per plant was in A.Amar. The size index of corms was the largest (19.84 cm²) in A.Kesar, whereas corms of the smallest size index (14.13

Table 1. Comparative performance of gladiolus varieties for floral parameters

Name of variety	Days to slipping	spike length (cm)	No. of florets/spike	No. of spikes/plant	Vase life of spike (days)	Days to wilting of basal floret	No. of flowers remaining open at a time
Arka Sanjeevini	59.27	80.20	15.13	2.53	8.00	4.55	5.33
American Beauty	60.53	72.07	14.33	2.73	8.44	4.11	4.15
Arka Tilak	65.07	96.47	15.13	2.13	7.77	3.44	3.41
Arka Amar	64.27	90.93	18.47	1.60	9.88	3.88	5.00
Summer Sunset	62.40	76.73	14.67	1.20	7.00	3.55	4.07
Arka Kesar	61.93	77.33	13.93	1.13	7.72	4.00	4.24
Arka Ayush	64.53	82.00	13.67	2.00	7.11	3.33	4.97
Arka Aarthi	59.20	69.93	13.33	2.67	6.89	3.33	3.33
Arka Darshan	75.53	73.13	14.40	1.47	8.00	2.66	4.36
Arka Naveen	65.87	83.63	14.33	2.00	7.22	3.44	3.33
Arka Gold	65.40	84.43	14.47	2.40	7.66	2.77	4.55
Arka KumKum	71.80	77.50	14.27	1.40	7.00	3.44	4.83
Mean	64.65	80.36	14.68	1.94	7.72	3.54	4.30
S. Em \pm	1.969	2.384	0.461	0.104	0.179	0.157	0.121
C.D.(P=0.05)	5.776	6.991	1.351	0.306	0.525	0.460	0.356

Table 2. Comparative performance of gladiolus varieties for corm parameters

Name of variety	No. of corms/plant	Diameter of corm (cm)	weight of corm (g)	No. of cormels/plant	weight of cormels/plant (g)	Size index of corm (cm ²)
Arka Sanjeevini	3.07	4.39	58.02	104.73	18.07	16.80
American Beauty	3.20	4.14	45.02	37.00	13.50	15.10
Arka Tilak	2.60	4.12	48.39	35.47	9.23	14.92
Arka Amar	2.00	4.45	66.68	120.80	21.29	17.46
Summer Sunset	1.80	4.40	55.55	31.40	8.88	15.51
Arka Kesar	1.53	4.74	77.67	54.53	9.60	19.84
Arka Ayush	2.67	4.25	52.02	26.60	11.73	15.96
Arka Aarthi	3.00	4.19	41.52	83.80	11.51	17.15
Arka Darshan	1.60	4.37	55.76	24.40	9.41	17.45
Arka Naveen	2.27	3.93	46.87	23.47	10.18	15.90
Arka Gold	2.93	3.85	34.16	18.83	5.58	14.13
Arka KumKum	2.07	4.17	41.63	20.23	9.81	15.69
Mean	2.39	4.25	51.94	48.44	11.57	16.33
S. Em \pm	0.130	0.128	2.300	1.757	0.582	0.506
C.D.(P=0.05)	0.382	0.374	6.745	5.152	1.707	1.485

cm²) were recorded in A.Gold. The genotypic variation in size index of corms was also reported by Sindhu and Verma (1995).

On the basis of spikes yield and corms A.Aarthi performed the best as compared to other varieties.

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