

PERFORMANCE OF GLADIOLUS CULTIVARS UNDER OPEN FIELD CONDITIONS FOR VEGETATIVE AND CORM PARAMETERS IN SOUTHERN ZONE OF ANDHRA PRADESH

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KEYWORDS

Gladiolus,
Cultivars and Corms

Received on :
03.09.2018

Accepted on :
07.12.2018

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ABSTRACT

A field experiment was carried out among fourteen cultivars of gladiolus to find out the suitable cultivar under Southern zone of Andhra Pradesh for Vegetative and corm parameters. There was significant differences among varieties with respect to vegetative and corm parameters. Among different cultivars Bindya recorded maximum plant height at spike emergence (80.27 cm) and at spike harvest (110.33 cm), maximum number of leaves plant⁻¹ (9.46), leaf length (58.33 cm) and leaf width (3.79 cm), maximum weight of corms plant⁻¹ (126.13 g) and diameter of corm (7.71 cm). Cultivar American Beauty (2.60) and Arka Amar (2.47) recorded maximum number of corms plant⁻¹. Cultivar Arka Amar produced more number of cormels plant⁻¹ (34.33). The weight of cormels was highest in cultivar Sylvia (40.69 g) and Arka Amar (38.45 g). From the present investigation it was concluded that the gladiolus cultivars Bindya, American Beauty and Arka Amar were found promising for corm and cormel yield.

INTRODUCTION

Gladiolus is an important florist crop, most popular as cut flower in the domestic and International market. Its magnificent inflorescence with a variety of colours has made it attractive for use in herbaceous borders, beddings, pots and for cut flowers. It is one of the major cut flowers in national and international markets and it is grown commercially to an extent of 1500 ha in India. In Netherlands, it ranks next only to tulip in commercial importance. It is mainly cultivated in Karnataka, West Bengal, Maharashtra, Punjab, Haryana, Uttar Pradesh, Tamil Nadu, Jammu & Kashmir, Uttaranchal, Delhi, Sikkim and Himachal Pradesh. Gladiolus is commercially propagated through corms and cormels. Parameters like Size of corm influence the production of gladiolus. Large corms (4.6-5.0 cm in diameter) produced spikes with more number of florets and higher spike length (Mukhopadhyay and Yadav, 1984). Poon *et al.* (2010) evaluated twenty-one genotypes for corm and cormel production and found that Genotype 'Hybrid selection 87-1-1' recorded the maximum corm diameter (8.00 cm). *Gladiolus grandiflorus* L. genotypes were evaluated for growth and floral parameters by Sankari *et al.* (2012) and found that among 42 genotypes evaluated, 'Candyman' (7.0 cm) was found to be superior in corm diameter. Bhujbal *et al.* (2013) also studied the performance of gladiolus cultivars and noticed that cultivar Arka Kesar (67.00) produced maximum number of cormels per plant followed by IHR-77-59-32 (64.00). Chourasia *et al.*, (2015) conducted an experiment and concluded that variety 'Candiman' was found best for cultivation under Saurashtra region of Gujarat in terms of growth, flowering, spike yield and corm yield characters.

Gladiolus is rich in varietal wealth and the performance of these varieties depends on climatic conditions of particular region. The varieties which perform better in one region may not perform well in other region because of varying environmental conditions. Keeping all the above facts in view, the present investigation was carried out to study the performance of gladiolus cultivars for vegetative and corm parameters in southern zone of Andhra Pradesh.

MATERIALS AND METHODS

The present investigation "Performance of gladiolus cultivars under open field conditions for Vegetative and Corm Parameters in southern zone of Andhra Pradesh" was carried out at Horticultural College and Research Institute (H.C&R.I), Dr.Y.S.R Horticultural University, Anantharajupet, Y.S.R. District. The experiment was laid out in Randomized Block Design with three replications. The experimental material consists of 14 treatments representing the cultivars of gladiolus (Ac No. 7, American Beauty, Arun, Arka Amar, Arka Gold, Arka Naveen, Bindya, Darshan, Dhiraj, Sadabahar, Suchitra, Swarnima, Sylvia, Tilak). The soil type of experimental site is sandy clay loam with p^H 7.35 and EC of 120 micro simens.

Field was prepared by ploughing and harrowing. Recommended dose of FYM 10 t ha⁻¹ and NPK (200:75:75 kg ha⁻¹) fertilizers was applied in the form of Urea, Single super phosphate (SSP) and Muriate of potash (MOP). At the time of field preparation required amounts of FYM and half the dose of Urea, full dose of SSP, MOP was applied as basal and the remaining half dose of Urea was applied in two split doses at 30 and 60 days after planting (DAP). Plots of 1.8 m² size were

prepared and 30 corms per plot were maintained for each replication in a treatment at spacing of 30 x 20 cm and a light irrigation was given immediately after planting. Five plants were selected at random and tagged in each replication in all treatments for the purpose of recording vegetative and corm yield parameters. The data were analyzed using the procedure outlined by Panse and Sukhatme (1967). Statistical significance was tested by 'F' value at 5 per cent level of significance. Critical difference at 0.05 level was worked out for the effects which were significant.

RESULTS AND DISCUSSIONS

Cultivar Binda recorded maximum plant height at spike emergence (80.27 cm) and at spike harvest (110.33 cm) which was statistically on par with cv. Swarnima (75.20, 106.20 cm). Similar findings for plant height were also recorded by Pratap and Rao (2006) and Rani *et al.*, (2007).

The differences in plant height among the cultivars may be attributed to differences in genetic constituents as well as environmental effects, as also reported by Nagaraju and Parthasarthy (2001). Production of more than one shoot per mother corm also resulted in reduced plant height. Similar variations in plant height were observed by Swain *et al.*, (2008) and Pandey *et al.*, (2012).

The cultivar Binda produced more number of leaves plant⁻¹ (9.47), maximum leaf length (58.33 cm) and leaf width (3.79 cm). Plant produces food material through the process of photosynthesis. With the increasing number of leaves, photosynthesis generally increases, and plant can produce more food that influences the growth and development of plant. So, genotypes that produce more leaves have more plant growth leading to higher yield. The variation in number of leaves plant⁻¹ might be due to the genetic variation and difference in adaptation to the agro-climatic conditions, Saleem *et al.*, (2013). Mushtaq *et al.*, (2013) also recorded maximum leaf length in Madriver (52.92 cm) which was statistically at par with Pietmohlen and Fado. Singh *et al.*, (2013) also observed similar variations for leaf width.

With regard to corm parameters, number of corms plant⁻¹ was highest in cultivar American Beauty (2.60) and minimum number of corms plant⁻¹ was recorded in Ac.No 7 (1.00). In gladiolus corm production is directly depend on number of shoots produced per mother corm as reported by Ramachandrudu and Thangam (2008). The cultivar American Beauty, Arka Amar and Arka Naveen produces more number of shoots mother corm⁻¹. Kishan Swaroop (2010) also reported that American Beauty recorded maximum number of tillers plant⁻¹ and corms plant⁻¹ (3.44 and 3.33 respectively).

The maximum weight of corms plant⁻¹ (126.13 g) and diameter of corm (7.71 cm) was recorded in cv. Binda. The Production of daughter corms of more weight may be attributed to the good vegetative growth of plants in the initial stages, which supplies higher amounts of photosynthates for storage in the corms which are also the storage organs. This is clearly evident from the results obtained as cv. Binda recorded maximum plant height and more number of leaves. Number of corms produced per corm may also influence the weight of corms per plant. It may also due to highest corm weight and corm size at the time of planting. Rahul *et al.*, (2011) also reported similar variations in weight of corms. Corm diameter and corm weight are important parameters for producing quality spikes with more number of florets of larger size. Sharma and Gupta (2003) reported that availability of more food materials stored in bigger sized mother corms that helped in better plant growth might be associated with the beneficial effect and cormels production depends on the size of corms. Superiority of the cultivar Binda in respect of diameter and weight of corms plant⁻¹ over the others might be due to utilization of available food material for the development of corms.

The cultivar Arka Amar (34.33) was significantly superior over all cultivars under study regarding cormels plant⁻¹ where as cv. Tilak recorded lowest number of cormels plant⁻¹ (15.07). In gladiolus, the ability to produce corms and cormels plant⁻¹ determines its rate of multiplication. There should be sufficient production of cormels to have the large quantity of planting material for next generations. Production of number of cormels plant⁻¹ may be attributed to the genetic makeup of a cultivar.

Table 1: Vegetative Parameters in different cultivars of gladiolus

Cultivars	Plant height at spike emergence (cm)	Plant height at spike harvest (cm)	Number of leaves plant ⁻¹	Leaf length (cm)	Leaf width (cm)
Acc.no 7	71.67	101.33	8.20	54.20	3.67
American Beauty	62.40	88.00	7.60	35.07	3.07
Arun	65.20	86.73	7.00	34.60	2.57
Arka amar	66.20	90.20	9.00	42.20	2.93
Arka gold	73.00	102.47	8.67	57.47	3.41
Arka naveen	70.87	97.73	7.80	50.67	3.35
Bindya	80.27	110.33	9.47	58.33	3.79
Darshan	63.13	88.80	7.40	39.00	3.13
Dhiraj	57.93	80.20	7.57	31.27	2.91
Sadabahar	59.13	80.00	8.00	30.07	2.93
Suchitra	61.40	82.73	7.27	32.20	2.98
Swarnima	75.20	106.20	8.60	56.40	3.52
Sylvia	67.00	90.47	6.93	45.47	2.77
Tilak	60.07	78.93	7.50	30.13	3.51
Mean	66.67	91.72	7.92	42.64	3.18
S.Em ±	2.07	2.44	0.28	1.40	0.08
C.D (P= 0.05)	6.04	7.12	0.82	4.09	0.23

Table 2: Corm and cormel attributes of different gladiolus cultivars

Cultivars	Number of corms plant ⁻¹	Weight of corms plant ⁻¹ (g)	Diameter of corm (cm)	Number of cormels plant ⁻¹	Weight of cormels plant ⁻¹ (g)
Acc.no 7	1.00	103.03	7.66	22.93	20.10
American Beauty	2.60	106.85	5.81	28.20	26.19
Arun	1.27	68.15	5.79	21.33	33.11
Arka amar	2.47	123.21	7.01	34.33	38.45
Arka gold	2.00	115.24	5.89	19.07	20.61
Arka naveen	2.40	104.14	5.59	20.73	18.33
Bindya	1.13	126.13	7.71	23.13	29.43
Darshan	2.27	100.64	5.45	17.73	28.20
Dhiraj	2.20	81.50	5.31	15.73	27.69
Sadabahar	1.80	106.81	5.94	19.87	25.47
Suchitra	1.87	73.31	5.27	16.53	29.69
Swarnima	1.27	114.00	6.96	26.20	25.21
Sylvia	1.60	58.95	5.18	16.80	40.69
Tilak	1.67	99.91	5.81	15.07	23.13
Mean	1.82	98.71	6.09	21.26	27.59
S.Em ±	0.11	1.2	0.18	0.85	0.77
C.D (P= 0.05)	0.32	3.5	0.53	2.50	2.26

The results for number of cormels plant⁻¹ confirm the findings Hossain et al., (2011) in gladiolus. The weight of cormels was highest in cultivar Sylvia (40.69 g) which was statistically on par with Arka Amar (38.45 g) and lowest in cultivar Arka Naveen (18.33 g).

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