

## Evaluation of Dahlia Genotypes (*Dahlia variabilis* L.) for Growth, Yield and Quality Traits Under Hill Zone of Karnataka

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**Abstract** The evaluation of dahlia genotypes for various growth, flowering, yield and quality parameters were studied in twenty five genotypes of dahlia and noticed significant differences for all growth, flowering, yield and quality parameters. Genotype Sourav showed significant difference for plant height, number of branches per plant, internodal length at 30, 60, 90 and 120 DAT; also genotype Sourav showed significant difference with respect to leaf length and leaf width among all the genotypes.

Among all the genotypes, genotype Joyal Singh took least number of days to its first flowering (52.92 days) 50% flowering (69.80 days) , complete flowering (87.80 days) and also duration of flowering (67.10 days) was longest in Joyal Singh. Significant difference was noticed by genotype Sourav on number of flowers per plant (44.00) and number of tubers per plant (10.75) with respect to yield parameter. Finally, with respect to quality parameters genotype Kamala showed highest weight of flower (29.75g), whereas tuber weight, floeower diameter, number of petals per flower were highest in the genotypes Gargi (51.75 g), Pue Sona (17.16 cm), Bharati (150.50) and also significant result was noticed by the genotype Chittaranjan (15.73 cm) for stalk length, similar kind of result was obtained by chittarajan for vase life (6.60).

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**Keywords** Dahlia, Evaluation, Flower yield, Vase life.

### Introduction

Dahlia (*Dahlia variabilis* L.) belongs to the family Asteraceae, Occupies a place of pride in any garden at any place. Dahlia originated in Mexico, which received its name by Cavanilles in 1791, to commemorate the work of a Swedish Botanist Dr Andreas Dahl,

a pupil of Linneaus. It is easy to grow both in field and pots. It is extensively used for exhibition, garden display and home decoration. Tubers of this plant contain significant amount of insulin and fructose and small quantities of medicinally active compounds such as phytin and benzoic acid. The root exudate is nematotoxic and the mortality of the nematode is increasing with increase in the concentration of root exudates. Dahlia is an important crop grown under hilly regions particularly in heavy rainfall area, considering the importance of dahlia particularly under hill zone of Karnataka, there is a need to generate more information on yield performance. So, with respect to this, an investigation was conducted to study the performance, involving twenty five genotypes of dahlia with respect to growth, yield and quality parameters.

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### Materials and Methods

The experimental material comprised of twenty five genotypes of dahlia (*Dahlia variabilis* L.) collected from Indian nursery, Kolkata, West Bengal. Genotypes were grown in randomized complete block design during December 2014- April 2015. Thirty days old rooted cuttings were transplanted on the main field with a spacing of 60 cm between the rows and 40 cm between the plants. Observations were recorded on five randomly selected plants in each replication for all the growth, flower yield and quality traits such as plant height (120 DAT), number of branches (120 DAT), stem girth (120 DAT), internodal length (120 DAT), number of flowers per plant, tuber number, flower weight, stalk length, vase life.

### Results and Discussion

Performance in terms of growth, flower yield and quality of any flower crop influenced by various factors like variety, season, environment. Among these factors, cultivars themselves contribute much to this performance. The performance of cultivars of many crops differs from one region to another region. Hence, the attempt has been made to find out the

**Table 1.** Plant height (cm) number of branches, stem girth (cm) and internodal length at 120 days after transplanting (DAT) in dahlia genotypes.

Genotype	Plant height (cm) 120 DAT	Number of branches 120 DAT	Stem girth (cm) 120 DAT	Inter-nodal length (cm) 120 DAT
Suparna	109.75	10.75	1.35	16.15
Pue Sona	117.25	11.10	1.35	14.95
Baba borakhaekeari	105.75	10.60	1.31	15.30
Gargi	107.00	9.75	1.34	15.50
Mohini	100.25	11.10	1.43	15.15
Buddha	113.65	13.75	1.30	16.60
Babananda	104.00	11.80	1.31	15.75
Good day	106.66	11.10	1.29	15.60
Saraladevi	120.75	12.60	1.38	15.15
Devdas	97.75	11.40	1.34	15.40
Deviprasad	112.25	12.30	1.36	16.15
Bharati	113.4	11.90	1.44	17.10
Sourav	129.50	14.05	1.43	18.25
Sachin	112.10	11.85	1.43	16.80
Sugandha	103.75	10.15	1.35	16.05
Chittaranjan	109.75	11.15	1.36	15.75
Romia	114.33	12.15	1.38	15.70
SP-25	107.33	11.45	1.32	16.25
Bama Khefa	98.66	10.30	1.35	17.10
Sree Radha	102.75	10.75	1.30	15.90
Indira	111.75	11.80	1.30	17.15
Binayananda	101.65	10.15	1.28	15.35
Joyal Singh	98.15	9.30	1.33	15.05
Sahini	111.15	10.65	1.46	16.35
Kamala	114.75	11.35	1.45	17.25
Mean	108.96	11.33	1.36	16.07
SEm±	1.29	0.31	0.01	0.38
CD at 5%	3.79	0.93	0.03	1.11

superior performing cultivars among twenty five genotypes of dahlia for higher flower yield.

Plant height, number of branches, stem girth and internodal length were significantly influenced by different genotypes throughout the experimental period (Table 1). The genotype Sourav was vigorous in growth in terms of plant height. The genotype Joyal Singh recorded minimum plant height. Plant height being a genetically controlled factor, it varied among the genotypes as well as influence of the growing environmental conditions, production technology and cultural practices. similar variation in plant height due to cultivars was also observed in dahlia by [1]

Vikas et al. and Chourasia et al. [2] in gladiolus. Number of branches were maximum in genotype Sourav while the genotype Joyal Singh recorded minimum branches. The difference in number of branches could be attributed to the genetic makeup of the cultivars. Increased number of branches leads to production of more number of leaves in turn it will enhance the yield of flowers and tubers by increasing source and sink relationship. Similar trend was noticed by Ajeetkumar et al. [3] in dahlia and Munikrishnappa [4] in china aster genotypes. Stem girth should be more to have sturdiness of the plant. Otherwise the weak, thin stem may lead to lodging of plants in windy situations. Genotype Sourav, Bharati, Kamala, Sahini recorded higher stem girth at all the growth stages, whereas Buddha and Good day, Indira, Binayananda recorded the lowest stem the girth. Similar trend was observed by Vikas et al. [1] in dahlia. The internodal length was maximum in the genotype Sourav and hence the plants were more height. The genotype Joyal Singh recorded least internodal length. The variation in internodal length among the cultivars may be due to genetic makeup of the cultivars and higher the internodal length more will be the plant height. Similar result was observed in china aster by Zosiamliana et al. [5].

Yield parameters decide the significance of suitability of the particular genotypes for commercial cultivation and significant difference was noticed for all the yield parameters (Table 2). Maximum number of flowers per plant and tubers per plant was observed in Sourav, while the genotype Joyal Singh produced the least number of flowers per plant and Baba Borakhnakeari produced the least number of tubers per plant. The number of flowers and tubers produced per plant may be directly related to increase in plant height, more number of branches and number of leaves and accumulation of maximum photosynthates results in production of good number of flowers with bigger size. The similar results were observed in china aster by Munikrishnappa [4] and Zosiamliana et al. [5].

Flower quality parameters decide the significance of suitability of the particular genotypes for commercial cultivation. Significant differences were observed among the cultivars for these flower qual-

**Table 2.** Yield and quality parameters in dahlia genotypes.

Genotype	Number of flowers /plant	Tuber number (g)	Flower weight (g)	stalk length (cm)	Vase life (days)
Suparna	22.30	6.05	21.00	11.10	5.45
Pue Sona	26.50	8.45	15.50	14.79	5.55
Baba Borakhnakeari	23.85	4.65	19.00	11.21	6.10
Gargi	25.85	5.50	24.50	11.88	5.15
Mohini	30.65	6.85	27.50	13.25	5.45
Buddha	34.00	7.15	22.00	14.18	4.25
Babananda	32.10	6.15	25.00	13.06	6.50
Good Day	26.30	6.95	22.00	12.24	4.90
Saraladevi	39.85	7.65	24.00	14.35	5.35
Devdas	30.50	7.35	22.50	13.47	4.90
Deviprasad	28.60	6.40	24.50	15.17	5.95
Bharati	27.15	6.75	29.00	12.95	4.75
Sourav	44.00	10.75	21.00	11.88	5.55
Sachin	26.65	7.55	25.00	11.93	4.90
Sugandha	24.85	6.85	21.50	11.15	4.85
Chittaranjan	33.30	7.35	22.50	15.73	6.60
Romia	24.60	6.45	26.50	12.63	6.15
SP-25	23.90	7.25	25.00	11.53	5.15
Bama Khefa	20.50	6.25	20.50	12.02	4.40
Sree radha	25.90	8.75	25.50	12.33	6.00
Indira	24.85	9.80	24.00	12.84	5.10
Binayananda	22.85	5.65	8.50	10.75	5.80
Joyal Singh	19.60	5.20	14.50	10.10	4.455
Sahini	25.95	7.40	27.50	12.29	3.25
Kamala	23.80	7.45	29.75	12.35	4.60
Mean	27.53	7.06	23.13	12.60	5.24
SEm±	0.91	0.38	1.43	0.31	0.014
CD at 5%	2.66	1.13	4.19	0.91	0.409

ity parameters in Table 2. weight of fresh flowers was maximum in the genotype Kamala, whereas, it was minimum in Binayananda. This variation in flower among genotypes might be attributed to the higher water and carbohydrate levels in the flower. Water plays a very important role in maintaining flower turgidity, freshness and petal orientation. These results are in conformity with the results reported earlier in dahlia by Vikas et al. [1] and Ajeetkumar et al. [3].

Significant difference with respect to stalk length was noticed among the genotypes (Table 2). Stalk length of the flower determines the suitability as a cut flower or loose flower and it is a very important trait which decides the quality of cut flowers, it also plays an important role in the vase life by extending their post harvest life. In the present in-

investigation genotype Chittaranjan produced highest stalk length indicating that it is most suitable for cut flower purpose and Joyal singh recorded least stalk length. Same outcome was seen in gerbera by Shruthi et al. [6] and Srinivasulu et al. [7] in China aster.

Vase life of flowers significantly differed among different cultivars. Maximum vase life was observed in Chittaranjan. Vase life of flower seems to be an inherent capacity of the cultivar and variation in vase life among the genotypes might be attributed to the increased accumulation of carbohydrates. These are in accordance with study conducted by Vikas et al. [1] in dahlia and also in Kumari et al. [8].

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