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EVALUATION OF CHRYSANTHEMUM GENOTYPES FOR POT CULTURE

G. H. Mahale[*], S. K. Marbhal[**], T. N. Saha[2*] and A.B. Bhosale[**]
[*]Post Graduate Student, College of Agriculture, Pune.
[**]Assistant Professor, Department of Horticulture, College of Agriculture, Pune.
[2*]Senior Research Scientist, ICAR- Directorate of Floriculture Research, Pune.

ABSTRACT: The Twelve chrysanthemum genotypes were evaluated with observations taken on fifteen qualitative and quantitative traits at Pune condition. The experiment was laid in Completely Randomized Design with three replications and twelve treatments. The genotype Fire Ball found to be superior in respect to plant spread in North-South direction (38.66 cm), number of primary branch (1.20), number of secondary branches (5.07), days to bud initiation (75.40), days to colour break (87.40), days to full bloom (98.73), flower duration (32.33 days) and number of flowers per plant (117.00). 2.The genotype Pusa Sona found to superior in following characters viz., early to bud initiation (75.53), days to colour break (88.47), days to full bloom (103.73) and flower duration (34.00 days). The genotype DFR C-4 found superior in character which were plant spread in North – South direction (39.19 cm), number of secondary branches (4.93), flower duration (32.07 days) and number of flowers per plants (123.07). 4.The genotype Little Pink found to be superior in respect to leaf length (4.83 cm), plant spread in North-South direction (40.57 cm), number of secondary branches (5.00) and flower duration (34.00 days). On the basis of above research findings, the genotypes Fire Ball, Pusa Sona, DFR C-4 and Little Pink found the most suitable for pot culture under Pune conditions.

Keywords: Chrysanthemum, Pot culture, Plant height, Bud initiation and Colour.

The trade in floriculture on a global scale has grown significantly in recent years. Crops used in floriculture are grown in about 140 nations worldwide. Among all the ornamental crops, chrysanthemum occupies a prominent position in popularity and trade. Chrysanthemum is well-known in India for both commercial and exhibition flowers. Cultivars with a small and compact growth habit are appropriate for front row plantations or pot culture.

The advantage of growing chrysanthemum in pots is the ability to cultivate it just about anywhere. If one has space constraints, this method allows one to grow chrysanthemum in small spaces. Pots are easily portable Pot culture necessitates less effort for weeding and other cultural practices, and it allows for the cultivation of different chrysanthemum varieties with varying soil requirements, which is generally not possible in the field.

Pot mums are generally used for aesthetical value such as in interior home decoration, beautifying balconies, and terrace gardening. Lightweight pot mums are used in hanging gardens and are typically hung with rope or chain. A specific size pot mum can be used to enhance the beauty of a home entrance, doorsteps and also one can be put on a compound wall as well as a parapet wall. Now a days it is a new trend that some people offer decorative pot mums instead of simple bouquets. A small pot mum could also be kept on a tabletop, which gives a feel vase.

In view of urbanization, there is a great demand for potted ornamentals, both foliage and flowers. Chrysanthemum is an excellent choice for potted flowering ornamentals due to its varied color, shape, and size, as well as its ability to stay in a pot for an extended period. Several chrysanthemum genotypes are available in our country which can be successfully grown in pots. A systematic evaluation is required to give a recommendation. The aim of investigation was to study the growth and yield characteristics of chrysanthemum genotypes to determine which were best suited to growing in pots.

MATERIALS AND METHOD

The present investigation entitled "evaluation of chrysanthemum genotype for pot culture' was conducted during 2021–2022, in Modibaug, Horticulture section, College of Agriculture, Pune. The experiment was carried out with 12 genotypes namely genotype Pusa Sona, Pusa Guldasta, Himani, Lilliput, Little Pink, Bidhan Mum, Mini Jessie, Fire Ball, DFR C-3, DFR C-4, Mother Teresa and Little Orange Chrysanthemum. The genotypes were obtained from the research farm of ICAR-Directorate of Floricultural Research, Keshavnagar, Pune.

The plastic pot of size 20 cm in diameter with a 20 cm depth was used for growing chrysanthemum genotypes. As recommended by ICAR, a 2:1:1 (v/v) media mixture of soil, sand, and FYM was put into each pot. The pot was washed with water before being filled. The experimental design was completely randomized with three replications and twelve treatments. The pots were placed out in an open field. Before planting, the filled pots were irrigated and sprayed with fungicide (Dithane M-45, @ 2.5 g/l). The transplanting of rooted cuttings was undertaken on 27 August 2021 and they were watered immediately after transplanting. Irrigation was done every three to four days. On the fifteen characters viz. Plant height (cm), Plant spread (cm), Number of primary branches, number of secondary branches, Leaf length (cm), Leaf breadth (cm), Days to bud initiation, Days to colour break, Days to full bloom, Duration of flower (days), Number of flowers per plants, Flower colour (as per RHS colour chart), Flower diameter (cm), Fresh weight of flower (g) and type of flower observations were taken on all of the plants from each treatment in each replication.

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The data was analysed statistically by the method of "Analysis of Variance" as suggested by Fisher (1967). The effects of different treatments on various qualitative and quantitative characters have been reported under an experimental finding. The 'F' test was applied for judging the significance of various treatments effects by comparison of mean values was made by using critical difference at 5 per cent level of significance.

RESULTS AND DISCUSSION

The present study was undertaken to examine the growth and yield performance of twelve chrysanthemum genotypes during 2021–2022**.**

The minimum plant height was observed in the genotype Mother Teresa (20.03 cm), while the maximum plant height was observed in the genotype Little Orange (40.34 cm). Similar results were recorded in chrysanthemum by [Gaikwad and Dumbre-Patil (2001)]. The maximum plant spread in N-S (North-South) direction was seen in the genotype Little Pink (40.57 cm), which was statistically at par with the genotypes DFR C-4 (39.19 cm) and Fire Ball (38.66 cm), while the minimum plant spread in N–S (North-South) direction was noticed in the genotype Mother Teresa (27.11 cm).). The maximum plant spread in E-W (East-West) direction was observed in the genotype Himani (40.38 cm), which was statistically superior over rest of the genotypes. Whereas minimum plant spread in East-West direction was observed in the genotype Mother Teresa (23.83 cm). Similar findings were reported by Suvija et al. (2016). The genotype Fire Ball (1.20) recorded the maximum number of primary branches and the maximum number of secondary branches per plant was found in the genotype Fire Ball (5.07), which was on par with the Lilliput (5.00), Little Pink (5.00), DFR C-4 (4.93) and Bidhan Mum (4.80), while the minimum number of secondary branches was observed in the genotype Pusa Sona (3.00). Similar results were recorded by Gaikwad et al. (2002).

The maximum leaf length was perceived in the genotype DFR C-3 (5.01 cm), while the minimum leaf length was noticed in the genotype Pusa Sona (3.21 cm). Maximum leaf breadth was also found in the genotypes DFR C-3 (4.05 cm) and Mini Jessie (4.05 cm), while the minimum leaf breadth was recorded for the lilliput (2.37 cm). These results coincide with the findings of Gimhavnekar et al. (2021).

The earlier bud initiation was found in the genotype Fire Ball (75.40 days), which was statistically at par with the genotype Pusa Sona (75.53 days). On the contrary, the genotype Pusa Guldasta was found to be late in bud initiation (95.07 days), most delayed in bud colour change was recognized in the genotype Fire Ball (87.40 days) followed by Pusa Sona (88.47 days) and Mini Jessie (93.40 days). The earliest blooming was observed in the genotype Fire Ball (98.73 days), which is statistically at par with the genotype Pusa Sona (103.73 days). Similar result were observed by Singh et al. (2017).

The maximum longevity of flower was seen in the genotypes Pusa Sona (34 days) and Little Pink (34 days), which was statistically at par with the genotypes Himani (32.67 days), Mini Jessie (32.47 days), Fire Ball (32.33 days) and DFR C-4 (32.07 days). Whereas the genotype DFR C-3 had the shortest flower longevity (27.27 days). The maximum diameter of the flower was noticed in the genotype DFR C-3 (6.51 cm) whereas the minimum diameter of the flower was noticed in the genotype lilliput (1.96 cm). The results were in line with the results of Bala (2015).

The genotype Himani (1.83 g) recorded the maximum fresh weight of flower, which was statistically superior to the rest of the genotype, whereas the minimum fresh weight of flower was noticed in the genotype Lilliput (0.42 g). Significant variation was reported for the number of flowers per plant. The maximum number of flowers was recorded by the genotype DFR C-4 (123.07), which was found statistically at par with the genotype Fire Ball (117.00), while the minimum number of flowers per plant was recorded in the genotype Mini Jessie (36.20). . Analogous results were obtained by Siddiqua et al. (2018).

A notable difference in colour variation was observed in flowers of all the genotypes. The yellow orange colour was observed in the genotypes Pusa Guladasta, Bidhan Mum, Mini Jessie and Little Pink. Yellow colour was observed in the genotypes Pusa Sona, Lilliput, DFR C-3 and DFR C-4. White coloration was observed in the genotypes Himani and Mother Teresa. A red purple colour was observed in the genotype Little Pink. In the genotype Fire Ball, a greyed purple colour as observed.

The flower type of all twelve genotypes according to the National Chrysanthemum Society of America, the genotypes Pusa Sona and DFR C-4 had the Single type of flower, the genotypes Pusa Guladasta and DFR C-4 had the Semi-double type of flower; the genotype Fire Ball had Single Korean type of flower; and the genotype Himani had Double Korean type of flower. The genotypes Little Pink, Bidhan Mum and Mini Jessie showed Pompon type of flower whereas the genotype Lilliput showed Button type of flower and the genotype Mother Teresa had Single Anemone type of flower.

The genotype Fire Ball found to be superior in respect to plant spread in North-South direction (38.66 cm), number of primary branches (1.20), number of secondary branches (5.07), days to bud initiation (75.40), days to colour break (87.40), days to full bloom (98.73), flower duration (32.33 days) and number of flowers per plant (117.00). The genotype Pusa Sona found to be superior for days to bud initiation (75.53), days to colour break (88.47), days to full bloom (103.73) and flower duration (34.00 days). The genotype DFR C-4 found superior for the characters plant spread in North–South direction (39.19 cm), number of secondary branches (4.93), flower duration (32.07 days) and number of flowers per plant (123.07). The genotype Little Pink found to be superior in respect to leaf length

(4.83 cm), plant spread in North-South direction (40.57 cm), number of secondary branches (5.00) and flower duration (34.00 days).

Based on above research findings, the genotypes Fire Ball, Pusa Sona, DFR C-4 and Little Pink found the most suitable for pot culture under Pune condition.

Table-1: Mean performance of chrysanthemum genotypes for growth characters

Treatments/ Genotypes		Height of plant (cm)	Plant spread (cm)		No. of primary branches	No of secondary branches	Leaf breadth (cm)	Leaf Length (cm)
			North-South	East-West				
T_1	Pusa Sona	27.09	33.82	26.95	1.00	3.00	2.57	3.21
T_2	Pusa Guldasta	37.46	33.73	28.37	1.00	4.00	3.49	4.61
T_3	Himani	30.49	37.89	40.38	1.00	4.20	2.80	3.93
T_4	Liliput	22.80	32.15	25.79	1.00	5.00	2.37	3.82
T_5	Little Pink	39.18	40.57	37.53	1.00	5.00	3.26	4.83
T_6	Bidhan Mum	30.28	28.44	28.23	1.00	4.80	3.59	4.51
T_7	Mini Jessie	24.24	27.63	27.10	1.00	4.07	4.05	4.11
T_8	Fire Ball	27.45	38.66	36.54	1.20	5.07	2.75	4.56
T_9	DFR C-3	26.31	37.87	30.34	1.00	4.40	4.05	5.01
T_{10}	DFR C-4	34.24	39.19	32.53	1.13	4.93	3.45	4.03
T_{11}	Mother Teresa	20.03	27.11	23.83	1.07	4.47	2.67	3.90
T_{12}	Little Orange	40.34	30.29	29.33	1.00	4.00	3.03	4.53
	S.E.± (m)	0.87	0.79	0.77	0.07	0.15	0.13	0.14
	C.D. at 5%	2.56	2.31	2.26	NS	0.44	0.37	0.40

Table-2: Mean performance of chrysanthemum genotype for flower character

Treatments/ Genotypes		Days to Bud Initiation	Days to Colour break	Days to Full bloom	Fresh weight (g)	Flower duration (days)	Flower diameter (cm)	No. of flowers/ plant	Flower colour group	RHS colour code	Flower type
T_1	Pusa Sona	75.53	88.47	103.73	0.64	34.00	3.96	43.47	Yellow	9 -A	Single
T_2	Pusa Guldasta	95.07	109.07	120.07	1.38	30.87	3.55	46.60	Yellow orange	14-B	Semi Double
T_3	Himani	85.20	103.87	112.13	1.83	32.67	5.73	79.07	White	NN-155-B	Double Korean
T_4	lilliput	86.47	98.47	110.13	0.42	30.27	1.96	78.27	Yellow	6-A	Button
T_5	Little Pink	89.07	101.33	116.07	1.55	34.00	3.72	81.60	Red purple	NN-74-B	Pompon t
T_6	Bidhan Mum	84.87	97.87	110.67	1.67	31.27	3.61	42.27	Yellow orange	17-C	Pompon t
T_7	Mini Jessie	81.40	93.40	107.13	1.05	32.47	3.36	36.20	Yellow orange	14-B	Pompon t
T_8	Fire Ball	75.40	87.40	98.73	0.66	32.33	3.51	117.00	Greyed-purple	186-B	Single Korean
T_9	DFR C-3	85.27	100.27	109.47	1.29	27.27	6.51	107.93	Yellow	5 C	Single
T_{10}	DFR C-4	86.20	102.20	114.20	1.62	32.07	4.69	123.07	Yellow	5 B	Semi Double
T_{11}	Mother Teresa	82.40	98.67	111.40	0.63	30.80	3.25	36.47	White	NN - 155-D	Single Anemone
T_{12}	Little Orange	84.07	95.93	110.13	1.28	29.47	3.39	41.00	Yellow orange	15-C	Double
	S.E.± (m)	1.52	2.34	2.19	0.05	0.91	0.09	2.23			
	C.D. at 5%	4.43	6.83	6.40	0.13	2.67	0.26	6.52			

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