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## Varietal evaluation of chrysanthemum (*Dendranthema grandiflorum*) for pot purpose in Punjab conditions

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### Abstract

The present investigation entitled “Varietal Evaluation of Chrysanthemum (*Dendranthema grandiflorum*) for pot purpose in Punjab conditions” was carried out in the experimental farm of Mata Gujri College, Sri Fatehgarh Sahib (Punjab) during 2022-2023. The experiment was laid out in Completely Randomized Design (CRD) with three replication. The selected 10 cultivars were Gland Stafford, Chandrama, Dignity, Pink lady, Changhis khan, Pusa shwet, Red no pinch, Case granda, White pink cloud and Improved Lousapocket. All the vegetative and flowering parameters were recorded such as Plant height, Stem length, Number of branches per plant, Number of leaves per plant, Plant spread, days taken to first flowering, number of flowers per plant, number of flowers per stem, flower diameter, duration of flowering and pot presentability. Maximum plant height was observed in Pink Lady, maximum stem length was recorded in Improved lousapocket, maximum number of branches were found in Pusa shwet, maximum number of leaves were found in case granda. Maximum plant spread were observed in Pink lady. Early flowering (72 days) was recorded in improved lousapocket. Maximum number of flower per plant (22.55) was observed in Pusa shwet whereas the maximum number of flowers per stem (5.62) were observed in Chandrama. Maximum flower diameter was observed in Changhis khan and maximum duration was observed in White pink cloud. In terms of pot presentability, it is maximum in Red no pinch.

**Keywords:** Chrysanthemum, varietal evaluation, pot presentability

### Introduction

Chrysanthemum is one of the oldest flowering plant, is scientifically called *Dendranthema grandiflorum* and is commonly called “Gul-e-Daudi” or “Queen of East”. Chrysanthemum belongs to the family Asteraceae. The flower meaning, chryos – golden, anthos – flower, is considered as the leading flower crop at the world level. The chromosome number is  $2n = 18$ . The chrysanthemum is important ornamental crop which is mainly grown for the production of loose flowers, cut flowers and pot plants. Chrysanthemum is generally a short-day plant; hence it requires less light period for flower initiation and long light period for continuing vegetative growth. The known number varieties in the world are about 2000 and in India are about 1000 varieties (Datta and Bhattacharjee, 2001) [3]. The flower is categorized in to two types that is the standard and the spray types, the standard are having large flowers, long and sturdy stems with the specialty of good keeping quality which make them suitable for pot plant, vase flower plant, flower arrangements, bouquets cut flower production. The spray type is having small and more number of flowers on a plant. The standard type flowers are further classified in to 13 classes while the sprays are classified in to 10 classes.

### Materials and Methods

The present investigation was conducted at Research Farm, Mata Gujri College, Fatehgarh Sahib, Punjab. The experiment was laid out in Completely Randomized Design (CRD) with three replications. The 10 varieties selected are V<sub>1</sub> Gland Stafford, V<sub>2</sub> Chandrama, V<sub>3</sub> Dignity, V<sub>4</sub> Pink lady, V<sub>5</sub> Changhis khan, V<sub>6</sub> Pusa shwet, V<sub>7</sub> Red no pinch, V<sub>8</sub> Case granda, V<sub>9</sub> White pink cloud and V<sub>10</sub> Improved lousapocket. All the intercultural operations like irrigation, weeding and fertilizer applications were provided equally to every single plant of each variety.

### Result and Discussion

#### Plant height and plant canopy (cm)

Every variety was subjected to varying observations of plant height at various stages of growth. The variety Pink lady (42.55 cm), shows the maximum plant height as well as plant

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spread (25.39 cm) at 90 days DAT. This could be as a result of the attribution of multiple elements, such as inherited genetic characteristics, plant combinations and climatic variables like light, the most extreme and lowest temperature, food proportion in the medium and so forth. The variation in plant height may be mostly attributed to differences in the genotypes' genetic makeup (Behera *et al.*, 2002) <sup>[1]</sup>. Singh D D *et al.* (2017) <sup>[11]</sup> in chrysanthemum, Suvija *et al.*, (2016) <sup>[10]</sup> and Singh D *et al.* (2017) <sup>[11]</sup> in chrysanthemum reported a finding that was similar.

#### **Stem length (cm)**

The diverse chrysanthemum kinds showed an enormous response in terms of stem length. The variety Improved lousapocket (11.44 cm) had the highest stem length at 90 DAT. Stem length is a varietal characteristic, and variations in stem length may result from genetic differences between varieties or ecological factors. A more firmly established plant may absorb nutrients more readily, utilise them better, and increase metabolic activity within the plants from which phytohormones were produced. The results are consistent with Kumar *et al.*, (2015) <sup>[5]</sup> assessment of changeability among marigold genotypes.

#### **Number of branches per plant**

The striking variation in the number of branches per plant was caused by different chrysanthemum varieties. The variety Pusa shwet had the maximum number of branches per plant (4.44) at 90 DAT. The genotype of the plant exerts the great influence with respect to the plant architecture which effects the formation of branches. The genetic makeup of the chrysanthemum cultivars may have a different contribution towards the formation of branches (Chezhian *et al.*, 1985) <sup>[2]</sup>.

#### **Number of leaves per plant**

The information regarding the number of leaves per plant varied primarily among the different chrysanthemum cultivars. At 90 DAT, respectively, the varieties Changhis Khan and Case granda both had the maximum number of leaves per plant (69.22 and 82.11 respectively). The cooperative coordination of nutrients retention and photo acclimatise with in the view of appropriate temperature and relative mugginess throughout the vegetative development may be the cause of the increased number of leaves per plant. These results are consistent with those from Ali *et al.* (2015) <sup>[13]</sup> who studied chrysanthemum.

#### **Days taken to first flowering**

The V<sub>10</sub> i.e., Improved lousapocket was found to take the smaller number of days to open its flowers (72 days), while the V<sub>4</sub> i.e., pink lady required the most amount of time (96.77 days). It's possible that the shorter flowering period is caused by early foundation, higher supplement absorption and excellent vegetative development. The current results are very close to the findings from Negi *et al.* (2015) <sup>[6]</sup>. According to Behera *et al.*, (2002) <sup>[1]</sup> in chrysanthemum and comparative observations published by Kanamadi in chrysanthemum, the

character responsible for the variety's late or early blossoming is heritably controlled.

#### **Number of flowers per plant**

Regarding the number of flowers per plant, chrysanthemum cultivars were kept in a wide diversity. The V<sub>6</sub> i.e., "Pusa shwet" delivery had the most flowers per plant (22.55). These genotypes' variation in bloom count may be modified by genetic and environmental factors. In some genotypes, having more branches per plant may be justified in order to produce more flowers per plant, or some genotypes may have really high dry matter accumulation rates, which may have helped to increase floral yield. Chrysanthemum experimental results were compared (Negi and Raghava, 1985) <sup>[7]</sup>.

#### **Flower diameter (cm)**

After sprouting, the flower head diameter across the chrysanthemum varieties varied significantly. The V<sub>5</sub> i.e., "Changhis Khan" flower has the largest floral diameter (10.66 cm). A V<sub>6</sub> i.e., "Pusa Shwet" flower has the smallest flower diameter (8.00 cm). There may be variation in bloom size according to genotype hereditary composition. These results are in line with those of Negi *et al.* (2015) <sup>[6]</sup> and Gupta and Datta (2005) <sup>[4]</sup> who found significant differences in the breadth of different chrysanthemum types.

#### **Duration of flowering**

The length of the flowering phase has been perceived as generally not being the same for every variety. The length of flowering was greatest in V<sub>9</sub> "white pink cloud" (69.44 days) and lowest in V<sub>1</sub> "Gland stafford" (56.66 days), which may have been due to the varieties' predominating characteristics. The difference in genotype genetic composition can be used to explain how the flowering of different kinds varies. It was discovered that potted chrysanthemum durability varied greatly, as suggested by cultivars. The difference in days taken to bloom senescence may be due to varietal characteristics as ethylene non-delicate flowers are generally not delicate. In gerbera, comparative findings were located (Nair and Medhi, 2002) <sup>[8]</sup>. Kumar *et al.* declared significant differences between genotypes for many attributes in 2017.

#### **Pot presentability**

The V<sub>7</sub> 'Red no Pinch' achieved the highest pot satisfactory score (92.22 out of 100), the cultivar achieved plant height appropriate to the holder size (12 inch), produced an adequate number of branches, adequate plant spread, and produces the good number of flowers that were open at the time and remain fresh and exhibiting prolonged flowering duration on the basis of its inherent genetic capability. Although V<sub>5</sub> Changhis Khan received the lowest score for pot satisfactoriness (82.22 out of 100), it failed to demonstrate the positive traits that were essentially expected to showcase pot respectability credits. This could be due to the influence of its hereditary makeup. The size of the pot is also responsible for the vegetative growth as well as the flowering parameters. Similar results were reported by Thapa *et al.*, (2015) <sup>[12]</sup>.

**Table 1:** The best presentable variety by scoring maximum points in pot

Varieties	Plant height (cm)	Stem length (cm)	No. of branches per plant	Plant spread (cm)	Days taken to first flowering	No. of flowers per plant	Flower diameter (cm)	Duration of flowering	Pot presentability
V <sub>1</sub>	30.11	11.33	3.78	20.44	94.33	11.33	10.17	56.66	87.66
V <sub>2</sub>	39.33	7.83	3.44	22.33	96.66	15.33	9.50	67.33	89.22
V <sub>3</sub>	33.44	10.11	2.78	19.11	93.77	12.22	9.66	58.22	89.89
V <sub>4</sub>	42.55	7.44	3.33	25.39	96.77	10.22	9.78	63.22	84.11
V <sub>5</sub>	33.44	9.33	3.77	23.77	85.28	12.11	10.66	63.77	82.22
V <sub>6</sub>	33.77	9.66	4.44	22.55	90.00	22.55	8.00	60.00	89.55
V <sub>7</sub>	35.11	7.33	2.55	24.94	96.66	14.55	8.72	60.33	92.22
V <sub>8</sub>	30.11	6.44	4.22	21.61	93.33	10.89	9.27	68.67	85.78
V <sub>9</sub>	26.89	6.00	3.22	18.88	94.55	10.22	9.50	69.44	87.77
V <sub>10</sub>	36.00	11.44	4.33	22.72	72.00	9.77	8.33	63.00	87.77
Sem	2.80	1.92	0.36	2.18	0.32	0.67	0.35	0.33	0.89
CD	8.27	5.67	1.07	6.43	0.96	1.97	1.04	0.97	2.63

### Conclusion

The results of the current investigations indicate that each variety had a unique performance pattern and that each one excelled in a particular advantageous trait. The variety Improved lousapocket is considered best for the early season flowering varieties with maximum stem length and also as good presentable pot plant, variety Pusa Shwet is found with the maximum number of branches and flowers whereas the Variety Red no pinch is concluded as the best presentable variety by scoring maximum points in pot presentability table as well as having all standard qualities for 12 inch pot. For long duration purposes, the variety white pink cloud is found best.

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### Conflict of Interest

I do not have any personal desire to publish my research. Instead i want to publish it for professional work.

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