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Effect of pinching on flowering and quality parameters of chrysanthemum varieties

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Abstract

A field experiment was carried out at Pt. K.L.S. College of Horticulture and Research Station, Pendri Farm Rajnandgaon, Chhattisgarh during *Rabi* season of 2019-2020. The experiment was laid out in factorial randomized block design with three replication having 16 treatment combinations. Treatment consists of four varieties i.e. Yellow Gold, Lalima, Punjab Gold and Aparajita and four pinching level i.e. No pinching (control), pinching at 30 DAT, pinching at 45 DAT and pinching at 30 and 45 DAT. From the present findings result concluded that among chrysanthemum varieties Punjab Gold recorded earlier days taken to first flower bud initiation, days to fully opened flower from bud emergence and Lalima variety in days to first harvesting. The maximum flower diameter, pedicel length, weight of single flower and shelf life of flower was recorded in Yellow Gold variety. In case of pinching levels, no pinching (control) treatment was found superior in flowering and quality parameters followed by pinching at 30 days after transplanting.

Keywords: Chrysanthemum, flowering, pinching, quality

1. Introduction

The Chrysanthemum (*Dendranthema grandiflora*) is most attractive, showy and a matured flowering plant grown commercially in various parts of the world. In floriculture, among various flowers, chrysanthemum holds an important rank though Gladiolus, rose, lily, orchid and gerbera which are highly famous. At present, floriculture profession is generally called as profit-making due to its high returns as compare to other field and some horticulture crops. Two types of chrysanthemum are available viz., spray and standard. Standard type is favoured for cut flower production, potted plant in flower exhibition and shows as well as also for decoration purpose in marriages, functions and parties. Spray are generally prefer to produce loose flower which is used to make garland, Veni, Gajra, button holes, bouquet, vase decoration, bracelet, tiara and border plant in garden as well as for worship purpose. Moreover, it has mentioned health beneficial for anti-inflammatory, anti-arthritis, depressant and effects of anti-hypertension. NASA Air study had informed that plants species of chrysanthemum reduce the air pollution inside indoor garden. In Chhattisgarh, the area for flower production is limited. Due to establishment of a new state the need of flower is highly increasing day by day. Better quality of flowers is preferred by people. The production of any variety depends on interaction between genotype and environment and also pinching can play a vital role in the improvement of flowering and quality parameters of chrysanthemum crop. Limited investigation was done with regards to see the effect of pinching on flowering and quality parameters of chrysanthemum varieties was carried out with objectives to find out suitable pinching time for better performances.

2. Materials and Methods

The experiment was conducted at Pt. K.L.S. College of Horticulture and Research Station, Pendri Farm Rajnandgaon, Chhattisgarh during the year 2019-20 during *Rabi* season. The treatments consists of two factors, factor A consists of Varieties i.e. Yellow Gold (V₁), Lalima (V₂), Punjab Gold (V₃) and Aparajita (V₄) and factor B consists with four pinching treatments i.e. No pinching (control) (P₀), pinching at 30 DAT (P₁), pinching at 45 DAT (P₂) and pinching at 30 and 45 DAT (P₃). Thus, all there were total sixteen treatment combinations. Uniform and healthy cuttings are planted in the raised beds, at a spacing of 40 cm row to row and 30 cm plant to plant distance. Then immediately after planting, irrigation was applied and all the cultural practice was done during the crop growth period and pinching was done as per treatments.

3. Result and Discussion

3.1 Effect of varieties on flowering parameters

The experimental results showed table 1 that, significantly Punjab Gold variety had reported earliness in days taken to first flower bud initiation (58.04 days) and days to fully opened flower from bud emergence (17.83 days) followed by Lalima and Yellow Gold cultivars. The variety Lalima was recorded minimum days to first harvesting followed by cv. Punjab Gold. The variation in days to first bud initiation might also be due to the difference in genetic constitution of the varieties, which might differ variety to variety. Prabhu *et al.* (2018) [6] reported that minimum days to first bud initiation were reported in cv. Punjab Gold.

3.2 Effect of pinching on flowering parameters

The data from table 1 concluded that, significantly early days to bud initiation (55.90 days), days to fully opened flower from bud emergence (15.87 days) and early days to first harvesting (73.96 days) was reported in no pinching (control) treatment which was however *at par* with pinching at 30 DAT and pinching at 45 DAT. Badge *et al.* (2017) [1] in annual chrysanthemum reported that pinching delayed flowering was due to removal of mature portion and new shoots which emerged out from pinched plants took more time to become physiological inductive to produced flowers than non-pinched plants. The findings are in confirmatory with the results of Salve *et al.* (2017) [8] in chrysanthemum and Chopde *et al.* (2018) [2] in china aster.

3.3 Effect of varieties on quality parameters

The data results of table 2 revealed that significantly variety

Yellow Gold had recorded maximum diameter of flower (5.80 cm), pedicel length (8.40 cm), weight of single flower (2.99 g) and shelf life (4.42 days) as compared to other varieties. Minimum diameter of flower, pedicel length, weight of single flower and shelf life was noted under Punjab Gold variety. The differences in observations of quality parameters might be due to genetic constitution of the varieties of chrysanthemum and their interaction with prevailing genotype and environment. Peddy *et al.* (2008) [5] in chrysanthemum reported that maximum diameter was expressed in Yellow Gold variety. Similar findings were obtained by Prabhu *et al.* (2018) [6] who reported minimum weight of flower was registered in variety Punjab Gold as compared to other eighteen varieties.

3.4 Effect of pinching on quality parameters

Table 2 concluded that significantly maximum flower diameter (5.42 cm), pedicel length (7.48 cm) and shelf life (3.97 days) was registered in no pinching (control) treatment followed by pinching at 30 DAT. The maximum weight of single flower (2.44 g) was found non significant. Maximum diameter of flower, pedicel length, weight of single flower and shelf life of loose flower was noticed when plant non-pinched plants. This might be due to more accumulation of carbohydrates in no pinching (control) and minimum in pinching at 30 and 45 DAT treatments. These results are in agreed with Kour (2009) [4] in chrysanthemum, Sailaja and Panchbhai (2014) [7] in china aster and Jindal *et al.* (2018) [3] in chrysanthemum.

Table 1: Effect of pinching on flowering parameters of chrysanthemum varieties

Treatment	Days to first flower bud initiation (days)	Days to fully opened flower from bud emergence (days)	Days to first harvesting (days)
Varieties			
V ₁ -Yellow Gold	67.06	20.33	86.97
V ₂ -Lalima	60.08	18.28	77.93
V ₃ -Punjab Gold	58.04	17.83	78.46
V ₄ -Aparajita	70.16	21.02	89.10
S.E.(m) ±	0.55	0.48	0.66
CD at 5%	1.59	1.41	1.92
Pinching			
P ₀ -No Pinching	55.90	15.87	73.96
P ₁ -Pinching at 30 DAT	57.95	17.61	75.96
P ₂ -Pinching at 45 DAT	67.91	20.14	87.83
P ₃ -Pinching at 30 and 45 DAT	73.58	23.84	94.71
S.E.(m) ±	0.55	0.48	0.66
CD at 5%	1.59	1.41	1.92
Interaction (V×P)			
S.E.(m) ±	1.10	0.97	1.32
C.D. at 5%	3.19	2.82	3.84
CV (%)	2.98	8.71	2.75

Table 2: Effect of pinching on quality parameters of chrysanthemum varieties

Treatment	Flower diameter (cm)	Pedicel length (cm)	Weight of single flower (g)	Shelf life (days)
Varieties				
V ₁ -Yellow Gold	5.80	8.40	2.99	4.42
V ₂ -Lalima	5.24	6.35	2.50	3.56
V ₃ -Punjab Gold	4.69	6.17	1.51	2.64
V ₄ -Aparajita	5.06	7.38	1.89	3.80
S.E.(m) ±	0.11	0.22	0.11	0.12
CD at 5%	0.34	0.65	0.33	0.36
Pinching				

P ₀ . No Pinching	5.42	7.48	2.44	3.97
P ₁ . Pinching at 30 DAT	5.35	7.45	2.31	3.68
P ₂ . Pinching at 45 DAT	5.26	6.74	2.16	3.45
P ₃ . Pinching at 30 and 45 DAT	4.77	6.62	1.98	3.32
S.E.(m) ±	0.11	0.22	0.11	0.12
CD at 5%	0.34	0.65	NS	0.36
Interaction (V×P)				
S.E.(m) ±	0.23	0.44	0.23	0.25
CD at 5%	NS	NS	NS	NS
CV (%)	7.87	10.98	18.04	12.03

4. Conclusion

Experimental results revealed that among varieties Punjab Gold and Yellow Gold variety performed better in all the parameters of flowering and quality parameters respectively but except in Lalima variety for days to first harvesting observation. With respect to pinching treatments no pinching (control) treatment was recorded better results as compared to other.

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