



Research Paper

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Effect of pinching on growth and quality characters of china aster varieties

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ABSTRACT : A field experiment, on the effect of pinching on growth and quality characters of China aster varieties was conducted at farm of Horticulture Section, College of Agriculture, Nagpur, during the year 2010-11. The experiment consists of sixteen treatments of four China aster varieties with four pinching treatments and it was laid out in Factorial Randomized Block Design with three replications. The vegetative growth parameters in terms of plant height was recorded maximum in Phule Ganesh Purple variety under the control treatment of pinching. However, number of primary branches were recorded maximum in Phule Ganesh White variety with single pinching at 30 days after transplanting. Where as, spread of plant was found maximum in Phule Ganesh Pink under the treatment single pinching at 30 days after transplanting. Whereas, stem diameter of plant was maximum under the treatment single pinching at 30 days after transplanting and in Phule Ganesh White. The maximum weight of flower, diameter of the flower, longevity of intact flower, and vase life of flowers was found maximum in Phule Ganesh White variety and in control treatment. However, length of the pedicle was recorded maximum in Phule Ganesh Violet and under control treatment of pinching.

KEY WORDS : China aster, Height, Spread, Diameter, Vase life, Pinching

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Among the wide range of commercial flower crops, china aster occupies a selective position because of its prettiness, elegance, diverse form and varied attractive colour ranges. It is native to china and has spread to Europe and other tropical countries during 1731 A.D (Desai, 1967). Among the annual flowers, china aster ranks next to chrysanthemum and marigold and is one of the important commercial flower crops of our country. China aster is a half hardy annual and it has gained considerable importance in flower trade because of its wide range of colors and utility and is also found suitable for intercropping in coconut gardens (Janakiram, 1997). Successful cultivation of china aster depends upon proper selection of varieties. In recent years, several new cultivars of aster with wide range of colors have entered the market but all the cultivars cannot be grown everywhere successfully.

Hence, it is necessary to identify the suitable cultivar for commercial cultivation in Vidarbha region and even it is felt necessary to find out suitable pinching time for different varieties for better yield. Hence the present investigation was carried out to know the effect of pinching on flowering and

yield characters of china aster varieties.

RESEARCH METHODS

A field experiment, on the effect of pinching on flowering and yield characters of china aster varieties was conducted at farm of Horticulture Section, College of Agriculture, Nagpur, during the year 2010-11. The experiment was laid out in Factorial Randomized Block Design comprising sixteen treatments, with two factors. First factor consisting of four varieties of china aster *i.e.* Phule Ganesh White (V_1), Phule Ganesh Pink (V_2), Phule Ganesh Violet (V_3), Phule Ganesh Purple (V_4); and second factor consisting of four pinching treatments, no pinching (P_0), single pinching at 30 DAT (P_1), single pinching at 45 DAT (P_2), double pinching at 30 and 45 DAT (P_3). The entire treatments were replicated thrice. Irrigation, fertilizer application and weeding was done as per recommendations.

RESEARCH FINDINGS AND DISCUSSION

Significantly maximum plant height was noticed in control treatment *i.e.* no pinching (45.39cm) followed by single

pinching at 30 days after transplanting (43.21cm). Whereas, significantly minimum plant height was recorded in double pinching at 30 and 45 days after transplanting (38.11cm). These results are in close agreement with and finding of Sehwat *et al.* (2003) who observed reduction in plant height by pinching in *T. erecta*, Chavan *et al.* (2004) in carnation, Ranjitsingh *et al.* (2005) in canation. Significantly maximum plant height was noticed in Phule Ganesh Purple (45.68cm) followed by Phule Ganesh White (43.60cm) and Phule Ganesh Violet (41.85cm). However, significantly minimum plant height was recorded in Phule Ganesh Pink (37.34cm). The results obtained during this investigation are in close agreement with the findings of Kulkarni and Reddy (2006) who studied six china aster cultivars under North Karnataka conditions and revealed that, the cultivar Phule Ganesh white recorded highest plant height (66.4 cm). Significantly maximum number of branches per plant was recorded in single pinching at 30 days after transplanting (21.51) followed by single pinching at 45 days after transplanting (20.28). However, minimum number of branches per plant were recorded in control treatment *i.e.* no pinching (17.73). These results are in close agreement with the findings of Yassin and Pappiah (1990) and Sehwat *et al.* (2003) in marigold and Sunita *et al.* (2007) in African marigold. Significantly maximum number of branches per plant was noticed in Phule Ganesh White (21.03) which was statistically at par with Phule Ganesh Purple (19.79). However, significantly

minimum number of branches per plant was recorded in Phule Ganesh Violet (18.71). The results obtained during this investigation are in close agreement with the finding of Malleshappa (1984) in china aster. Significantly maximum stem diameter of plant was noticed in single pinching at 30 days after transplanting (1.55cm) followed by single pinching at 45 days after transplanting (1.51cm). Whereas, significantly minimum stem diameter of plant was recorded in control treatment *i.e.* no pinching (1.46cm). Similar results were reported by Maharnor *et al.* (2011) in African marigold who revealed that, maximum stem diameter were recorded in pinching at 30 days after transplanting. With respect to varieties, significantly maximum stem diameter of plant was noticed in Phule Ganesh White (1.54cm) followed by Phule Ganesh Purple (1.53cm). Whereas, significantly minimum stem diameter of plant was recorded in Phule Ganesh Violet (1.45cm). The results obtained during this investigation are in close agreement with the findings of Kulkarni and Reddy (2006) who noticed that the china aster cultivar Phule Ganesh white performed better in terms of vegetative growth followed by Phule Ganesh violet and Phule Ganesh purple. Significantly maximum fresh weight of the plant was noticed in single pinching at 30 days after transplanting (67.44 g) followed by single pinching at 45 days after transplanting (61.01g) and double pinching at 30 and 45 days after transplanting (53.91g) Whereas, significantly minimum fresh weight of the plant was

Table 1 : Representation of effect of pinching on growth and quality characters of China aster varieties

	Height of plant (cm)	Stem diameter (cm)	Fresh weight of plant at 50% flowering (g)	Weight of flowers (g)	Diameter of fully opened flower (cm)	Vase life of flowers (days)
Varieties(V)						
Phule Ganesh White	43.60	1.54	56.94	2.10	5.17	9.37
Phule Ganesh Pink	37.34	1.48	55.71	1.76	4.89	7.83
Phule Ganesh Violet	41.85	1.45	50.65	1.82	4.99	7.33
Phule Ganesh Purple	45.68	1.53	66.13	2.00	5.06	8.05
'F' test	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.
S.E. (m) ±	1.21	0.017	0.047	0.02	0.065	0.039
C.D. (P=0.05)	3.51	0.049	0.135	0.07	0.187	0.112
Pinching (P)						
No Pinching	45.39	1.46	47.06	2.21	5.61	9.23
Single Pinching at 30 DAT	43.21	1.55	67.44	1.96	5.21	8.52
Single Pinching at 45 DAT	41.76	1.51	61.01	1.80	4.92	7.85
Double Pinching at 30 and 45 DAT	38.11	1.48	53.91	1.71	4.38	6.98
'F' test	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.
S.E.(m) ±	1.21	0.017	0.047	0.02	0.065	0.039
C.D. (P=0.05)	3.51	0.049	0.135	0.07	0.187	0.112
Interaction (VxP)						
'F' test	NS	NS	Sig.	NS	NS	Sig.
S.E. (m) ±	2.43	0.034	0.093	0.05	0.129	0.078
C.D. (P=0.05)	--	--	0.270	--	--	0.225

NS=Non-significant

Sig.=Significant



Fig. 1 : Vase life studies in different varieties of China aster

recorded in control treatment *i.e.* no pinching (47.06g). These results are in close agreement with findings of Beniwal *et al.* (2005) conducted an experiment in chrysanthemum cv. Flirt and revealed that, fresh weight of plant was highest at the early pinching *i.e.* pinching at 25 Days after transplanting.

Significantly maximum fresh weight of the plant was noticed in Phule Ganesh Purple (66.13 g) followed by Phule Ganesh White (56.94g). Whereas, significantly minimum fresh weight of plant was recorded in Phule Ganesh Violet (50.65 g). Similar results were reported by (Chavan *et al.*, 2010) and confirmed that, highest fresh of plant was recorded in Phule Ganesh Purple.

With respect to the interaction between different varieties and different levels of pinching, significantly maximum fresh weight at 50 per cent flowering was reported in (V_4P_1) treatment.

Significantly maximum weight of flower was noticed in control treatment of pinching (2.21g) followed by treatment single pinching at 30 days after transplanting (1.96g) whereas, significantly minimum weight of flower was recorded in double pinching at 30 and 45 days after transplanting (1.71g). Similar results were also recorded by Srivastava *et al.* (2002) in Pusa naringa ginda who noticed that, the flower weight of marigold were maximum for unpinched plants, and minimum in plants pinched at 20 days after transplanting. Maximum weight of flower was observed in Phule Ganesh White (2.10g) this was followed by, Phule Ganesh Purple (2.00 days). Where as the minimum weight of flowers is found in Phule Ganesh Pink

(1.76 days).

Significantly maximum diameter of fully opened flower was noticed in control treatment *i.e.* no pinching (5.61 cm) followed by single pinching treatment at 30 days after transplanting (5.21 cm), whereas, significantly minimum diameter of fully opened flower was recorded in double pinching treatment *i.e.* pinching at 30 and 45 days after transplanting (4.38 cm). Similar results were also recorded by Srivastava *et al.* (2002) in marigold, who noticed that, the flower size of marigold was maximum in unpinched plants and minimum flower size was recorded in plants pinched at 20 days after transplanting and Dalal *et al.* (2006) in carnation. Maximum diameter of flower was observed in Phule Ganesh White (5.17cm) followed by Phule Ganesh Purple (5.06cm) while minimum diameter of flower was observed in Phule Ganesh Pink (4.89cm) variety.

The data showed significant differences for extending the vase life of flowers with different varieties, the V_1 variety *i.e.*, Phule Ganesh White has more vase life (9.37 days) followed by V_4 variety *i.e.*, Phule Ganesh Purple (8.05 days) and the V_3 variety *i.e.*, Phule Ganesh Violet reported minimum vase life (7.33 days). In the same line of investigation, Archana *et al.* (2004) reported that carnation cultivar 'Gaudina' exhibited significantly superior results in case of vase life. The different levels of pinching negatively influenced vase life of flowers, longest vase life was obtained in unpinched plants (9.23 days) while double pinching at 30 and 45 days after transplanting had negative influence in extending the vase life of china aster flowers (6.98 days).

This is in close agreement with Dalal *et al.* (2006), Shinde *et al.* (2005) and Chavan *et al.* (2004) who found that, flowers from unpinched plants recorded the longest vase life (8.22 days), which was significantly reduced by double pinching (6.10 days) in carnation.

Interaction effect due to the varieties and pinching on vase life of flowers were found to be significant. With respect to the interaction between different varieties and different levels of pinching, maximum vase life was reported in V_1P_0 treatment (10.53 days).

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