

Effect of Cycocel on Varieties of Chrysanthemum in Vidhrbha Condition

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ABSTRACT

The present investigation entitled “Effect of cycocel on varieties of chrysanthemum for Growth, Flower yield and Quality” was conducted during July, 2016 to February, 2017 in the Farm of Maharaj Bag garden, Horticulture Section, College of Agriculture, Nagpur. The experiment was laid out in Factorial Randomized Block Design (FRBD) with four varieties (Pandhari Rewadi, Shinaton, Piwali Rewadi and Brown) and with four treatment i.e control, cycocel at 1000 ppm, 2000 ppm and 3000 ppm with sixteen treatment combinations replicated thrice. The result revealed that among the different varieties the minimum plant height (cm), maximum number of branches plant⁻¹ and maximum plant spread (cm) were recorded with the variety Brown. Among the different cycocel treatments, minimum plant height, maximum number of branches plant⁻¹ and spread of plant (cm) were noticed with cycocel at 3000 ppm was recorded when sprayed at 30 and 60 days after transplanting. In respect of flowering characters days to 50 per cent flowering and maximum blooming period were recorded with the variety Pandhari Rewadi. In respect of different cycocel treatments minimum days to 50 per cent flowering from bud emergence were recorded in control. However maximum blooming period was noticed in the treatment cycocel at 3000 ppm. In respect of quality parameters, the weight of single flower (g) and flower diameter (cm) were found maximum with the variety Piwali Rewadi, whereas minimum disc diameter was noticed with the variety Brown. In respect of different cycocel treatments, the weight of single flower (g) and flower diameter (cm) were found maximum with the cycocel at 3000 ppm, however minimum disc diameter was noticed in control. The yield and yield contributing characters viz., number of flowers plant⁻¹ were recorded with the treatment combination of the variety Brown sprayed with cycocel 3000 ppm.

Keywords: Chrysanthemum, Cycocel, Growth, Flowering, Quality, Yield.

INTRODUCTION

Amongst the flowers used for domestic market, chrysanthemum is considered as one of the important commercial flower. “Chryos” means “Golden”, “Anthos” means “flower” meaning golden colored flower. It belongs to the family ‘Asteraceae’ and is native to

Central and South Europe. Among the wide range of commercial flower crops, Chrysanthemum (*Dendranthema grandiflora*) occupies a selective position because of its prettiness, elegance, diverse form and varied attractive color ranges.

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It has gained considerable importance in flower trade because its flowers are used as loose flowers for garlands, cut flowers for decoration and for preparing bouquets; it is also used for bedding and potting purposes.

Growth and development of plant is controlled by two sets of internal factors, mainly nutritional and hormonal. Application of nutrients essential for manufacture of food material required for growth. However, utilization of those substances for balanced development of plant body is controlled by certain growth regulators. Growth retardants are the chemicals those are having the property to delay cell division and elongation in shoot tissue without exhibiting any formative effect. Growth retardants are known to produce compact plants, increase the number of flowers and delay or hasten flowering. It is also reported by various research workers that use of growth retardant is very useful in commercial industry of floriculture by regulating desired flowering period, reducing plant height, developing more decorative values of flowering plant, easy in handling and transportation without affecting flower quality in minimum expenses.

MATERIALS AND METHODS

An experiment entitled “Effect of cycocel on varieties of Chrysanthemum for Growth, Flower Yield and Quality” was laid out in the field of Maharaj Bag Garden, Horticulture section, College of Agriculture, Nagpur during July, 2016 to February, 2017. The experimental field will be prepared by ploughing and cross harrowing. The healthy suckers will be transplanted during July 2016 at 45 cm x 30 cm spacing. Farm yard manure as a basal dose will be applied two days prior to the transplanting to each of the plots at the rate 5 tons hectare⁻¹ and mixed well in soil.

Layout of raised bed of size 1.80 x 2.40 m² will be made in Factorial Randomized Block Design as per treatments. Recommended dose of fertilizer i.e. 100:50:50 kg N, P, K ha⁻¹ will be applied. As chrysanthemum plants are slender in nature, in order to have straight frame work, plants will

be staked with bamboo sticks. For recording the observations five plants will be selected randomly from each plot. The treatment comprised with four varieties (V₁. Pandhari Rewadi, V₂. Shinaton, V₃. Piwali Rewadi and V₄. Brown) and with four treatment i.e C₁-control, cycocel at C₂. 1000 ppm, C₃-2000 ppm and C₄. 3000 ppm with sixteen treatment combinations replicated thrice. Cycocel sprayed twice at 30 days interval. The various observations on growth viz. plant height, number of branches plant⁻¹, plant spread, flowering parameter like days to 50% flowering, Blooming period (days), quality parameters like weight of flower (g), diameter of flower (cm), disc diameter (cm) and yield parameters like number of flowers plant⁻¹. The data was analysed statistically as per the method suggested by Panse and Sukhatme (1967).

RESULT AND DISCUSSION

The data presented in table.1 revealed that, effect of different varieties and cycocel concentrations on growth, flowering, quality and yield parameters.

Growth

At 150th days of transplanting, significantly minimum plant height was recorded with variety Brown (44.33 cm) which was followed by varieties Shinaton (47.09 cm) and Piwali Rewadi (52.11 cm). However, significantly maximum plant height was recorded in variety Pandhari Rewadi (54.31 cm). Significantly minimum plant height (44.80 cm) was recorded with the application of cycocel at 3000 ppm (C₄) which was followed by the treatments (C₃) cycocel at 2000 ppm (46.77 cm) and cycocel at 1000 ppm (49.60 cm). Whereas, significantly maximum plant height (53.16 cm) was recorded in control (C₁), at 150th days of transplanting. These results are in close conformity with the findings of Iftikhar et al. (2007) in Carnation. interaction effect due to different varieties and cycocel on height of plant in Chrysanthemum was found to be non-significant at 150 days after transplanting.

At 150th days of transplanting, significantly maximum number of branches

plant⁻¹ was counted in the variety Brown (40.78) and it was found statistically at par with the variety Shinaton (40.54) and followed by Pandhari Rewadi (32.75). However, the variety Piwali Rewadi had recorded minimum number of branches plant⁻¹ (31.31). Significantly maximum number of branches plant⁻¹ (39.43) was recorded with the application of cycocel at 3000 ppm (C₄) which was followed by the treatments (C₃) cycocel at 2000 ppm (37.18) and cycocel at 1000 ppm (35.16). Whereas, significantly minimum number of branches plant⁻¹ (33.61) was recorded in control (C₁) at 150th days after transplanting. The interaction effect due to different varieties and cycocel treatments on number of branches plant⁻¹ in Chrysanthemum was found to be non-significant.

Significantly maximum plant spread (35.78 cm) was recorded in the variety Brown which was followed by the varieties Shinaton (33.04 cm) and Pandhari Rewadi (30.63 cm). Whereas, minimum plant spread was recorded in Piwali Rewadi (28.60 cm). Significantly maximum plant spread (34.86 cm) was recorded with the application of cycocel at 3000 ppm (C₄) which was followed by (C₃) cycocel at 2000 ppm (32.88 cm) and (C₂) cycocel at 1000 ppm (30.98 cm). Whereas, minimum plant spread (29.33 cm) was recorded in control (C₁). The interaction effect due to varieties and cycocel on spread of the plant in Chrysanthemum was found to be non-significant at 50 per cent flowering.

Flowering

Significantly earliest 50 per cent flowering from transplanting (109.58 days) was noticed with the variety Pandhari Rewadi which was significantly superior to other varieties and it was followed by the varieties Brown (129.67 days) and Shinaton (139.50 days). However, significantly maximum days were required to 50 per cent flowering from transplanting in the variety Piwali Rewadi (162.75 days). Significantly, minimum days to 50 per cent flowering (130.67 days) were found in control treatment (C₁) which was followed by the treatments (C₂) cycocel at 1000 ppm (133.67 days) and cycocel at 2000 ppm (137.17 days).

Whereas, a maximum days (140 days) recorded for 50 per cent flowering was noticed with the application of cycocel at 3000 ppm (C₄). The interaction effect due to the different varieties and cycocel on the days to 50 per cent flowering in Chrysanthemum was found to be non-significant.

Significantly maximum blooming period was noticed in the variety Piwali Rewadi (44.88 days) which was significantly superior to the other varieties and it was followed by the varieties Pandhari Rewadi (40.20 days) and Brown (38.58 days). However, significantly minimum blooming period was noticed with the variety Shinaton (36.32 days). Similar results were found by Katwate et al. (1991) and Dhiman (2003) in Chrysanthemum. Significantly, maximum blooming period (42.82 days) was found in treatment cycocel at 3000 ppm (C₄) which was followed by the treatments (C₃) cycocel at 2000 ppm (40.95 days) and cycocel at 1000 ppm (39.12 days). Whereas, a minimum blooming period (37.08 days) was noticed in the control (C₁). Similar results were also reported by Mital and Polara (2015) in Chrysanthemum. The interaction effect due to the different varieties and cycocel on the blooming period in Chrysanthemum was found to be non-significant.

Quality

Significantly maximum weight of single flower was recorded with the variety Piwali Rewadi (3.11 g) which was followed by the varieties Pandhari Rewadi (1.75 g) and Shinaton (1.49 g), whereas, the variety Brown (1.47 g) had recorded the minimum weight of single flower. Rao and Sushma (2014) in Chrysanthemum. Significantly, maximum flower weight (2.11g) were found at the treatment of cycocel at 3000 ppm (C₄) which was at par with the treatment (C₃) cycocel at 2000 ppm (2.01 g) and followed by cycocel at 1000 ppm (1.91g). Whereas, a minimum flower weight (1.79 g) was noticed in control (C₁). Similar results were also reported by Naresh and Singh (2012) in Pusa Narangi Gainda. The interaction effect due to the different varieties and cycocel on the flower

weight in Chrysanthemum was found to be non-significant.

Significantly maximum flower diameter of single flower was recorded with the variety Piwali Rewadi (5.56 cm) which was followed by the varieties Pandhari Rewadi (5.09 cm) and Shinaton (4.96 cm), whereas, the variety Brown (3.36 cm) had recorded the minimum flower diameter of flower. Similar results were also reported by Joshi et al. (2008) in Chrysanthemum, Significantly, maximum flower diameter (5.03 cm) were found in the treatment cycocel at 3000 ppm (C₄) which was followed by the treatments (C₃) cycocel at 2000 ppm (4.85 cm) and cycocel at 1000 ppm (4.71 cm). Whereas, a minimum flower diameter (4.38) was noticed in the control (C₁). The interaction effect due to the different varieties and cycocel on the flower diameter in Chrysanthemum was found to be non-significant.

Significantly minimum disc diameter of flowers was recorded with the variety Brown (0.40 cm) which was followed by the varieties Pandhari Rewadi (0.64 cm) and Shinaton (0.74 cm) whereas, the variety Piwali Rewadi (1.63 cm) had recorded the maximum disc diameter of flower. Similar results were also reported by Rajiv kumar et al. (2007) in Chrysanthemum. Significantly, minimum disc diameter (0.75 cm) were found in control treatment (C₁) which was followed by the treatments (C₂) cycocel at 1000 ppm (0.80 cm) and cycocel at 2000 ppm (0.85 cm). Whereas,

a maximum disc diameter was noticed in the application of cycocel at (C₄) 3000 ppm (1 cm). The interaction effect due to the different varieties and cycocel on the disc diameter in Chrysanthemum was found to be non-significant.

Yield

Significantly maximum number of flowers plant⁻¹ was recorded in the variety Brown (225.52) which was followed by the varieties Shinaton (166.18) and Piwali Rewadi (75.52), whereas, significantly minimum number of flowers plant⁻¹ was produced by the variety Pandhari Rewadi (68.40). Significantly, maximum number of flowers plant⁻¹ (155.28) was recorded with the application of cycocel at 3000 ppm (C₄) which was followed by the treatments (C₃) cycocel at 2000 ppm (142.63) and (C₂) cycocel at 1000 ppm (128.52). However, minimum number of flowers plant⁻¹ (109.18) was recorded in control (C₁). The treatment combination of the variety Brown sprayed with cycocel of 3000 ppm (V₄ C₄) was found to be significantly superior over all other treatment combinations and produced the maximum number of flowers plant⁻¹ (216.08) and it was followed by the treatment combinations of variety Brown (241.33) sprayed with cycocel at 2000 ppm (V₄ C₃). Whereas, the treatment combination of the variety Pandhri Rewadi in control (V₁ C₁) had recorded minimum number of flowers plant⁻¹ (50.73).

Table 1: Growth, flowering, quality and yield as influenced by varieties of chrysanthemum and different cycocel concentrations

Treatments	Plant height (cm) 150 Days	Number of branches plant ⁻¹ 150 Days	Plant spread at 50% flowering	Days 50 per cent flowering (Days)	Blooming period (days)	Weight of flowers (g)	Diameter of flowers (cm)	Disc diameter (cm)	Number of flowers plant ⁻¹
A) Varieties (V)									
V ₁ - Pandhari Rewadi	54.31	32.75	30.63	109.58	40.2	1.75	5.09	0.64	68.4
V ₂ - Shinaton	47.09	40.54	33.04	139.5	36.32	1.49	4.96	0.74	166.18
V ₃ - Piwali Rewadi	52.11	31.31	28.6	162.75	44.88	3.11	5.56	1.63	75.52
V ₄ - Brown	44.33	40.78	35.78	129.67	38.58	1.47	3.36	0.4	225.52
F test	Sig	Sig	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.
SE (m) ±	0.38	0.43	0.24	0.33	0.21	0.03	0.03	0.016	1.8
CD at 5 %	1.12	1.24	0.71	0.96	0.63	0.11	0.11	0.04	5.2
B) Cycocel (C)									
C ₁ - Control	53.16	33.61	29.33	130.67	37.08	1.79	4.38	0.75	109.18
C ₂ - CCC 1000ppm	49.60	35.16	30.98	133.67	39.12	1.91	4.71	0.8	128.52
C ₃ - CCC 2000ppm	46.77	37.18	32.88	137.17	40.95	2.01	4.85	0.85	142.63
C ₄ - CCC 3000ppm	44.80	39.43	34.86	140	42.82	2.11	5.03	1	155.28
F test	Sig	Sig	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.
SE (m) ±	0.38	0.43	0.24	0.33	0.21	0.03	0.03	0.016	1.8
CD at 5 %	1.12	1.24	0.71	0.96	0.63	0.11	0.11	0.04	5.2
C) Interaction (VxC)									
F test	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	Sig.
SE (m) ±	0.77	0.86	0.49	0.66	0.43	0.07	0.07	0.03	3.6
CD at 5%	--	--	--	-	--	-	--	--	10.4

REFERENCES

- Deepa, Isac, & N. Chezhiyan, (2002). Evaluation of chrysanthemum cultivars for yield and related traits. *South Indian J. Hort.* 50(4/6), 444-450.
- Joshi, M., Varma, L. R., & Masu, M. M. (2008). Performance of different varieties of Chrysanthemum on flower yield under North Gujrat Conditions. *J. Maharashtra Agric. Univ.* 34(2), 170-172.
- Mital, V., & N. D. Polara (2015). Effect of Plant Growth Retardants on Growth, Flowering and Yield of Chrysanthemum (*Chrysanthemum morifolium* Ramat.) cv. IIHR-6 Malays. *J. med. biol. res.* 2(2), 161-166.
- Navale, M.U., Aklade, S.A., Desai, J.R., & Nannavare, P.V. (2010). Influence of Plant Growth Regulators on Growth, Flowering and Yield of Chrysanthemum (*Dendranthema grandiflora* Tzvelev) CV. 'IIHR-6'. *International Journal of Pharma and Bio Sciences*, 1(2), 1-4.
- Panse, V. R., & Sukhatme, P. N. (1967). Statistical methods for agricultural workers. I. A.R.I., New Delhi, pp 145-156.
- Peddy, L., Pratap, M., & Reddy, S. A. (2008). Evaluation of yellow coloured chrysanthemum (*Dendranthema grandiflora*) cultivars for growth, flowering and yield. *Orrisa J. Hort.* 36(1), 116-119.
- Rajiv, K., Singh, G. N., & Misra, R. L. (2007). Performance of different Chrysanthemum cultivars for growth and quality. *Journal of Ornamental Horticulture* 6(2), 104-106.
- Rao, K. D., & Sushma, K. (2014). Performance of chrysanthemum (*Dendranthema grandiflora*) hybrids. *J. Res. PJTSAU.* 42(3), 58-61.
- Sharifuzzaman S. M., Ara, K. A., Rahman, M. H., Kabir, K., & Talukdar, M. B. (2011). Effect of GA₃, CCC and MH on vegetative growth, flower yield and quality of chrysanthemum. *Int. J. Expt. Agric.* 2(1), 17-20.