

Flower Regulation in Chrysanthemum

Bhargav B. Nariya¹ and Dr. Harsh S. Hathi^{2*}

¹M. Sc. Student, College of Horticulture,
Sardarkrushinagar Dantiwada Agricultural University, Jagudan, Gujarat, India.

²Assistant Professor, Department of Agriculture, Faculty of Science,
Marwadi University, Rajkot, Gujarat, India.

Corresponding Author

Dr. Harsh S. Hathi

Email: harsh.hathi@marwadieducation.edu.in



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ABSTRACT

Flower regulation is not so popular practice in Gujarat but is adopted by farmers in other states of India. It means to produce flowers at desired periods for getting higher economic return than normal blooming season and to reduce market glut during peak flowering time. It is necessary to produce off season flowers for continuous accessibility of flowers throughout the year. Photoperiodic manipulation, pinching, planting time, use of plant growth regulators and offseason cultivars are various techniques for flower forcing in chrysanthemum. The goals of flower regulation are production at specific-date, year-round production, to distribute employment throughout the year, to reduce imports and balance of trade deficit, to increase farmers' income and to satisfy the customers at the time of needs.

INTRODUCTION

Flowers are associated with mankind since the dawn of civilization. They play a significant role on every occasion in human life. Chrysanthemum, popularly known as Queen of East, Winter queen and National flower of Japan, is a herbaceous perennial plant, belongs to the

family Asteraceae. Chrysanthemum ranks second after rose in the terms of economical cut flowers (Kafi and Ghahsareh, 2009). It is a popular flower crop of commercial importance grown in India which has diverse and beautiful range of color shades, shapes and size, making it suitable for every purpose conceivable for a

flower crop. It is grown as cut flower, loose flower, potted flowering plants, bedding plant and for exhibitions. Short-day condition induces flower bud initiation in chrysanthemum. The manipulation of photoperiod to maintain the plants in vegetative phase or to induce flowering, as per demand, revolutionized the cultivation of chrysanthemum (Blanchard and Runkle, 2009). In the open cultivation, the flowering of chrysanthemum is confined only to limited period from October to December thus, by the flower regulation provides growers with an efficient crop schedule according to demand of flowers in the market (Thakur and Grewal, 2019). As flower being a perishable horticultural commodity, it makes a huge loss to the farmers. As a result, we have to go for flower regulation.

Review and Discussion:

Dutta *et al.* (1998) revealed from their experiment that minimum days to first flowering (114.3 days), maximum flowering duration (212 days) and flower diameter (6.4 cm) were found best in PG₃ photoperiod of 18 hrs. combined with 150 ppm GA₃. For yield in the terms of number of flowers per plant (501) and in the terms of weight (0.887 kg) were highest in PG₂ photoperiod of 18 hrs. combined with 100 ppm GA₃.

Shinde *et al.* (2010) observed that the application of GA₃ @ 150 ppm took minimum days for flower initiation (96.98 days), for peak flowering (111.79 days), maximum flowering duration (64.08 days) and fresh flower weight (6.34 g). They also noted that the treatment with GA₃ @ 200 ppm recorded maximum number of flowers per plant (49.82) and flower yield per plant (185.73 g) whereas the treatment with no pinching had minimum fresh flower weight (6.14 g) as compared to other pinching treatments. They also added that the pinching at 60 days after transplanting took minimum days for flower initiation

(104.25 days), maximum days taken for peak flowering (118.78 days), longest flowering duration (59.27 days) as well as maximum number of flowers per plant (47.49), flower yield per plant (177.94 g) as compared to the rest of pinching treatments.

Parit *et al.* (2015) observed that Winter Queen variety took minimum days for flower bud initiation (28.5 days) among all the different cultivars planted in October whereas Garden Beauty cultivar lasted for maximum flowering duration (110.5 days) when planted in October month. They also noted that the maximum number of flowers per plant (214.6) and flower yield (29 t/ha) in cultivar Garden beauty which was planted in June month.

Sangma *et al.* (2016) observed that the minimum days for flower bud initiation (91.07 days) and maximum numbers of cut stems per plant (4.21) found with HDPE covering material.

Thakur and Grewal (2016) concluded that with the application of night interruption of 120 min., maximum days to flower bud appearance (136.84), days to colour break stage (183.22) and days for full bloom (202.25) were found superior. While maximum duration of flowering (11.87 days) was recorded when plants were exposed for night interruption of 60 mins. Kumar *et al.* (2017) revealed that with extended photoperiod for 15 days, maximum time taken for bud initiation (61.00 days), time taken for flower opening (68.00 days), bud and flower diameter (12.08 and 90.04 mm respectively) could be attained.

Dhiman *et al.* (2018) stated that maximum plant height (54.63 cm), minimum days taken for visible flower bud formation (64.17 days), maximum flower diameter (3.19 cm) and maximum number of flowers per plant (67.17) were recorded in black satin cloth, HDPE, tarpaulin and controlled condition respectively.

Hawa *et al.* (2018) suggested that planting of chrysanthemum on 15th October gives maximum number of flowers per plant (92.59), flower yield per plant (202.30 g), flower yield per plot (7.27 kg), flower yield (14.97 t/ha). They also found that pinching at 30 DAT gave maximum number of flowers per plant (94.37), flower yield per plant (219.16 g), flower yield per plot (7.87 kg), flower yield (16.20 t/ha).

Palai *et al.* (2018) recorded the minimum days taken for flower bud initiation (41.33 days) and maximum number of flowers per plant (42.33) in the treatment (1st December and natural photoperiod) and (1st June 14 hours' dark and 10 hours' daylight) respectively. While maximum duration of flowering (26.00 days), size of the flower (5.93 cm) and weight of flower (2.77 g) were found in the treatment (1st August & natural photoperiod).

Thakur and Grewal (2019) with night interruption of 120 mins obtained maximum days to flower bud appearance (156.40 days), days taken to color break stage (188.10 days), days to full bloom (201.84 days) and number of flowers per plant (80.25) while with night interruption of 60 mins, longest duration of flowering (19.27 days) and at controlled condition maximum flower diameter (5.38 cm) was recorded.

CONCLUSION:

Early flowering with extended flower duration and higher yield when foliar application of GA3 @ 150 ppm along with 18 hours' artificial light was given in CO 1 variety of chrysanthemum; higher yield by GA3 @ 200 ppm. Late flowering and higher yield of flowers by pinching at 60 DAT. Early planting *i.e.* in June with artificial shade condition of 14 hours with HDPE resulted in improved growth, better flower quality and higher yield; planting on 1st June gave higher flower yield on short day condition and planting annual chrysanthemum on 15th October with single

pinching at 30 DATP recorded highest flower yield.

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