



ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; 12(12): 1830-1832
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www.thepharmajournal.com
Received: 01-09-2023
Accepted: 04-10-2023

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Flowering and flower quality of marigold as influenced by the intercropping with sweet corn

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Abstract

The experiment was conducted at College of Horticulture, Dapoli in rabi season of the year 2022-23 to assess the flowering parameters and flower quality of marigold grown as main crop with sweet corn intercrop. The marigold was intercrop with sweet corn with six different ratios viz; 1:1, 2:1, 3:1, 3:2, 4:1 and 4:2 along with marigold and sweet corn sole crops. The early commencement of flowering and days to 50% flowering (51.07 days and 61.16 days, respectively) was observed in treatment T₁ (marigold as sole) and delayed commencement of flowering (53.15 days) and highest days to 50% flowering (65.62 days) was observed in treatment T₃ (Marigold + Sweet corn (1:1)). The maximum flower diameter (63.70 mm) was recorded in treatment T₃ (Marigold + Sweet corn (1:1)). The highest weight of flower (13.72 g) was recorded in treatment T₃. However, the lowest weight of flower (12.44 g) was found in treatment T₁.

Keywords: Marigold, Sweet corn, Intercrop, flowering

Introduction

Marigold is one of the most well-liked annual flowers in India because to all these advantages. The use of plants in the genus *Tagetes* by humans for beverages, condiments, ornamentals, and medicinal purposes such as analgesics, antiseptics, carminatives, diuretics, antispasmodics, anthelmintic, stimulants, vermin repellents, and for the treatment of stomach and intestinal diseases has a long history.

Marigold is a popular flower crop in India due to its wide adaptability and yearround flower production with easy cultivation practices. Its free flowering habit, short duration to produce marketable flowers, wide spectrum of attractive colours, shapes, size and good keeping quality has attracted the attention towards it by many amateur and commercial flower growers (Malshe *et al.*, 2021) [3].

Marigold has become more and more popular among gardeners and flower vendors due to its simple cultivation and wide range of adaptation. Flower farmers were drawn to it because of its propensity for free blossoming, short time it takes to produce commercial blooms, wide range of beautiful colour, shape, and size variations, and exceptional keeping qualities. The annual African marigold is strong, straight, branched, and grows to a height of around 90 cm. The leaves are pinnately divided, with lanceolate, serrated leaflets. Marigold blooms can be single or completely double and feature enormous globular heads. There are either the two-tipped or quilled florets. Orange to golden yellow and lemon yellow to yellow are just a few of the flower colours.

Intercropping is an old method of growing two or more crops on the same plot of land at the same time. It is a crop intensification approach in both time and space in which crop competition may occur for a portion or the entire crop growth period. With a view, the present investigation was carried out to assess the flowering and flower quality of marigold with sweet corn intercrop.

Materials and Methods

The field experiment was conducted at nursery No. 4, College of Horticulture, Dapoli in rabi season of the year 2022-23 to assess the flowering parameters and flower quality of marigold grown as main crop with sweet corn intercrop. The experiment was laid out in Randomized Block Design with eight treatments of intercropping and three replications. The intercropping treatments comprised with row ratios as given in Table 1.

The experimental land was prepared by following tillage practices and plots of 3.6 m X 2.8 m size was laid out. The planting of main crop (Marigold) and intercrop (Sweet corn) was done in rows. The recommended cultural operations were followed to raise the crop.

The observations on flowering and flower quality of marigold were recorded. The data was analyzed. The data obtained was analyzed statistically as per the method suggested by Panse and Sukhatme (1995) [5].

Table 1: Treatments details of marigold + sweet corn intercropping

Sr. No.	Treatment	Treatment combination	Row ratio
1	T ¹	Sole Marigold	Sole
2	T ²	Sole Sweet corn	Sole
3	T ³	Marigold + Sweet corn	1:1
4	T ⁴	Marigold + Sweet corn	2:1
5	T ⁵	Marigold + Sweet corn	3:1
6	T ⁶	Marigold + Sweet corn	3:2
7	T ⁷	Marigold + Sweet corn	4:1
8	T ⁸	Marigold + Sweet corn	4:2

Results and Discussion

The data on the effect of intercropping of sweet corn in marigold on days to commencement of flowering, days to 50% of flowering and number of plucking and are presented in Table 2.

The data pertaining to days required for commencement of flowering varied significantly by intercropping of sweet corn in marigold. The significantly early commencement of flowering (50.87 days after planting) was noticed in T₈ treatment. It was at par with T₁ (51.07 days) which was at par with T₅ (52.38 days), T₆ (52.21 days) and T₇ (51.18 days). The maximum number of days required for commencement of flowering (53.15 days) was observed in T₃ which was at par with T₄ (53.02 days), T₅ (52.38 days) and T₆ (52.21 days).

This might be due to sweet corn crop modify the microclimate by providing shade and altering air movement. This can impact the flowering parameter of marigold, potentially influencing the flowering parameter. Singh and Fatmi (2021) [5] observed the similar trend when marigold was intercropped with leafy vegetables. Similar trend was also earlier reported by Devdhar (2016) [1] in Rose + Marigold and Devdhar (2016) [1] in Jasmine + Gaillardia.

The data regarding days required for 50% flowering was significantly influenced by intercropping of sweet corn in marigold (Table 2). The minimum number of days for 50% flowering was observed in T₁ (61.16 days) which were at par with T₈ (62.56 days), T₇ (63.15 days) and T₆ (63.67 days). The extended period for 50% flowering was noticed in T₃ (65.62 days) which was at par with T₄ (64.71 days) and T₅ (64.16 days).

The treatment T₃ - Marigold + Sweet corn (1:1) recorded maximum number of days taken for 50% flowering (65.62

days) while the earliness for 50% flowering was (61.16 days) observed in T₁ (Marigold sole crop). The flowering trend might be associated with the physiological stage of the plant to induce flowering. In flowering crops, the cultural practices have influence on flowering induction and flowering period. In this case, it is cleared that the early induction of flowering inclined to earliness in flowering span. The similar trend was also noticed by Singh and Fatmi (2021) [5].

The data recorded on number of plucking is presented in Table 2. The data collected perceived that the number of plucking were not far from each other. The number of plucking resulted as non-significant. The average number of number of plucking was 5.67.

The data on the effect of intercropping of sweet corn in marigold on diameter of flower (mm), weight of flower (g) and shelf life of flower (days) were observed and data are presented in Table 3.

The maximum flower diameter (63.70 mm) was recorded in T₃ which was statistically at par with T₄ (61.52 mm) and T₅ (61.19 mm) whereas, the minimum flower diameter was observed in T₁ (Marigold sole crop). The microclimate in intercropping system might be beneficial for flower size improvement. Kichu *et al.* (2022) [2] noted similar trend in tomato.

The fresh weight of flower was significantly influenced by intercropping pattern. The data presented in Table 3 revealed that fresh weight of flower ranged from 12.44 g to 13.72 g. The average weight of flower was 13.03 g. The highest weight of flower was recorded in T₃ (13.72 g) which were statistically at par with T₄ (13.23 g) and T₅ (13.11 g). However, the lowest weight of flower was found in T₁ (12.44 g) which was statistically at par with T₆ (13.00 g), T₇ (12.85 g) and T₈ (12.76 g). The better flower weight in intercropped may be associated with the suitable ecology like shade effect, higher wetness, lower temperature in crop canopy due to intercropping system. The highest values of quality attributes were also observed by Kichu *et al.* (2022) [2] in tomato.

The data regarding shelf life of marigold flower was not significantly influenced by intercropping pattern (Table 3). The average shelf life of flower was 7.48 days. The highest shelf life of flower was reported in T₁ (7.53 days) whereas, the minimum shelf life of flower was observed in T₉ (7.37 days).

The shelf life of flower is associated with the several physiological factors and more shelf life of marigold flower in sole crop could be ascertained with lower weight of flower and less moisture content.

Table 2: Effect of marigold + sweet corn intercropping on days to commencement of flowering, days to 50% flowering and number of plucking of marigold

Treatment	Flowering parameter		
	Days to commencement of flowering	Days to 50% flowering	Number of plucking
T ₁ (Sole marigold)	51.07	61.16	6.02
T ₂ (Sole sweet corn)	-	-	-
T ₃ (1:1)	53.15	65.62	5.94
T ₄ (2:1)	53.02	64.71	5.18
T ₅ (3:1)	52.38	64.16	5.21
T ₆ (3:2)	52.21	63.67	5.53
T ₇ (4:1)	51.18	63.15	5.68
T ₈ (4:2)	50.87	62.56	5.89
Mean	51.98	63.43	5.63
SE.m ±	0.48	0.870	0.123
CD at 5%	1.44	2.612	- NS

Table 3: Effect of sweet corn + marigold intercropping on diameter of flower (mm), weight of flower (g) and shelf life (days) of marigold

Treatment	Quality parameters		
	Diameter of flower (mm)	Weight of flower (g)	Shelf life (days)
T ₁ (Sole marigold)	58.33	12.44	7.53
T ₂ (Sole sweet corn)	-	-	-
T ₃ (1:1)	63.70	13.72	7.50
T ₄ (2:1)	61.52	13.23	7.45
T ₅ (3:1)	61.19	13.11	7.47
T ₆ (3:2)	60.19	13.00	7.53
T ₇ (4:1)	59.02	12.85	7.40
T ₈ (4:2)	58.59	12.76	7.37
Mean	60.36	13.03	7.48
S.Em±	0.70	0.201	0.107
CD at 5%	0.204	0.604	NS

Conclusion

The extended period for flowering was observed that the flowering time of marigold was extended in Marigold + Sweet corn (1:1) system but the flower diameter was higher.

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