
Effect of Various / Different Mulches on Flowering Characters of Marigold (*Tagetes erecta* L.)

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Abstract: In the present study, a field experiment was conducted to study the Effect of different mulches on flowering characters of marigold. A field experiment was performed in sindh agriculture university tando jam, sindh, Pakistan, during the period from October 2021 to march 2022 to quantify the effect of different mulches on flowering characters of marigold flowers. The experiment turned into specified in randomized block layout and five different mulching treatments viz; control (no mulch), black polyethylene mulch, dry grass, paddy straw, and banana leaves. Plants Height, The longest plant (36.1 cm) were obtained from the T2 (black polythene mulch) respectively. However, the shortest plant (23.20 cm,) was recorded from the T1 (control). Number of Leaves per Plants, The greatest number of leaves per plant was recorded from T2 (52.80) (black polythene mulch) while the minimum number of leaves from the T1 (35.11). Numbers of the Branches/Plant, The greatest number of the branches per plant of marigold (34.88) was obtained from T2 (black polythene mulch). The minimum number of branches per plant of marigold (22.55) was observed from T1 (control). The notably early initiation of flowering (35.00) become located in remedy T2 (black polythene mulch). The delayed initiation of flower bud (49.10) turned into discovered in treatment T1 (manipulate). Notably maximum range of days (50.13) turned into required for initiation of flowering in T1 (manage). The earliness in days to flower initiation beneath black polythene mulching may be because of better boom of flora, as end result of excessive soil temperature and excessive soil moisture which helped in profuse and early initiation of bud and flower underneath black polythene mulching. The significantly lowest variety of days required for 70% flowering (47.04 days) and the longest period of flowering (69.50 days) have been additionally taken from treatment T2 (black polythene mulch). Vegetation inside the T2 (black polythene mulch) treatment had the appreciably highest flower diameter (8.00 cm), highest fresh weight (13.50 g/flower) and dry flower weight (3.00 g/flower).

Keywords: Effects of Various Mulching on Marigold Flowering Characters

1. Introduction

Marigold is one of the famous flowers scientific Name: (*Tagetes erecta* L.) Common Name: Marigold) belongs to Asteraceae or Compositae family (Kumar, N., N. Kumar, J. P. Singh and H. Kaushik. 2016) [1]. Those flower use for many purpose like non secular / spiritual, birthday party / feature and maximum of the festivals. Marigold flora is to be had in attractive shapes and colorations and sizes. As a result they're ideal for any lawn ornament or making garlands. Marigold is

used both for ornamental and medicinal purposes. It is also used in cosmetic and perfume industry due to its aromatic nature and essential oil contents (Regaswamy, D. and J. Koilpillai. 2014) [2] Because of a brief cropping duration and low funding and care made this flower to turn out to be popular amongst flower growers. In Pakistan, African marigold plant life is sold within the market as loose for making garland. Aside from reduce flower, marigold especially is used for beautification and additionally panorama flowers due to its variable peak and colorings of plant life. It's far surprisingly suitable as a bedding plant in a herbaceous

border and is likewise perfect for newly planted shrubberies offer coloration and fill the spaces. [3] Mulching is an exercise, which facilitates in proper growth and development of the flora with the aid of modifying soil temperature, providing better nutrient availability and better moisture conservation. Mulching increases the soil temperature and moisture, manipulate the weeds except improving the chemical and bodily houses of soil thereby enhancing the productivity of the crop. Inside the technology of declining resources there may be need to standardize precision farming technologies for farmers with the aim to beautify the productivity and to reduce water foot print per unit of crop produce. Mulching and its skilful utility can lead to progressed soil natural count number contents and via enhancing other soil traits. Commonly straw, rice husk, crop residues or plastic mulch can be used as synthetic mulches in ornamental crops. Marigold crop is generally weak competitor and suffer from heavy infestation of many annual weeds in early levels of increase, so use of mulching is a way to prevent weeds and also enhance the microclimate on soil floor which enhance the boom and flowering. The existing researches become accomplished to assess the effect of different mulching on flowering behavior and flower characteristics in marigold.

2. Material and Methods

In the present study, a field experiment was conducted to study the Effect of various/ different mulches on flowering characters of marigold. A field experiment was performed in sindh agriculture university tando jam, sindh, Pakistan, during the period from October 2021 to march 2022 to quantify the effect of different mulches on flowering characters of marigold. The region is underneath warm and humid area with lateritic soil type. The test turned into laid out in randomized block layout and 5 exceptional mulching remedies viz; control (no mulch), black polyethylene mulch, dry grass, paddy straw, and banana leaves. The flat beds of the dimensions 4.2 x 1.2 m had been prepared. The seedlings had been transplanted at the spacing of 30 x 45 cm. The mulches (dry grass, paddy straw, and banana leaves.) changed into laid between the two rows of seedlings in one of this way that it covers the region among two rows. The polythene mulch films of every coloration i.e. Black reduce in size of 4.2 x 1.2 m and laid among rows of seedlings in this kind of manner that it cover all of the location among two rows. The each fringe of polythene stripe has been buried at either aspect of flat beds to guard the movie towards harm through wind. The encouraged cultural practices were followed to raise the crop. The observations on flowering parameters i.e. Plants Height, Number of Leaves/Plants, Numbers of the Branches per Plant, Days to flower bud initiation, Initiation of flowering, 70% flowering, flowering period, and flower characters like diameter, fresh and dry weight of flower have been recorded. [4]

Data recording methodology

Plant height: plant height was measured from bottom to top with measuring tape.

Number of leaves, branches plant-1

The number of leaves, branches were counted visually at the

end of experiment from randomly three plants of each treatment.

Flower diameter: The flower diameter was measured with vernier caliper.

3. Results and Discussion

In the results we are see there are many changes was occurs in the marigold flower after use of different mulches we found many changes in the marigold flower such as Plants Height, Number of Leaves/Plants, Numbers of the Branches/Plant, Days to flower bud initiation, Days to flower initiation, Days to 70% flowering, Duration of flowering, Diameter of flower (cm), Fresh weight of flower (g), and Dry weight of Flower (g).

3.1. Plants Height

The effects of different mulches on plant height of marigold represent great source of variation on the plants height (Figure 1). The longest plant (36.1 cm) were obtained from the T2 (black polythene mulch) respectively. However, the shortest plant (23.20 cm), was recorded from the T1 (control) These treatments were followed by T3 (29.35), T4 (28.21), and T5 (25.81).

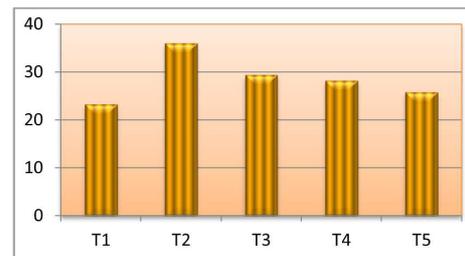


Figure 1. Plants Height.

3.2. Number of Leaves/Plants

Great variation was recorded in terms of number of leaves per plant of marigold (*Tagetes erecta* L.) for different uses of mulches (Figure 2). The greatest number of leaves per plant was recorded from T2 (52.80) (black polythene mulch) while the minimum number of leaves from the T1 (35.11), These treatments were followed by T4 (50.10), T3 (38.62), and T5 (40.80).

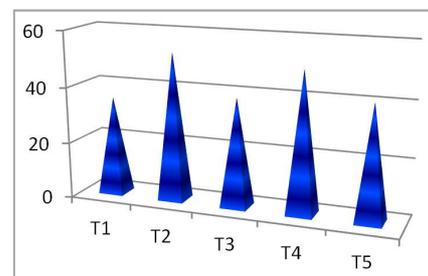


Figure 2. Number of Leaves/Plants.

3.3. Numbers of the Branches Per Plant

The used of mulches showed great source of variation on

number of the branches per plant of marigold (Figure 3). The greatest number of the branches per plant of marigold (34.88) was obtained from T2 (black polythene mulch). The minimum number of branches per plant of marigold (22.55) was observed from T1 (control). These treatments were followed by T3 (34.01), T4 (28.50), and T5 (30.61).

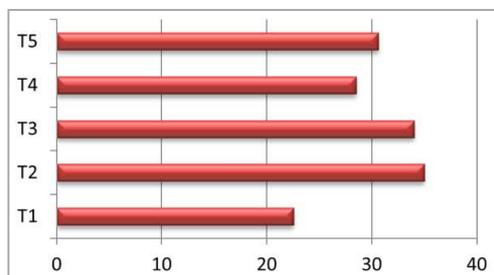


Figure 3. Numbers of the Branches per Plant.

3.4. Days to Flower Bud Initiation

In the marigold flowers uses different mulches after Transplanting represent great source of variation on Days to flower bud initiation. (Table 1). The notably early initiation of flowering (35.00) become located in remedy T2 (black polythene mulch). The delayed initiation of flower bud (49.10) turned into discovered in treatment T1 (manipulate). These treatments were followed by T3 (43.29), T4 (48.22), and T5 (47.91).

3.5. Days to Flower Initiation

Notably maximum range of days (50.13) turned into required for initiation of flowering in T1 (manage). The

earliness in days to flower initiation beneath black polythene mulching may be because of better boom of flora, as end result of excessive soil temperature and excessive soil moisture which helped in profuse and early initiation of bud and flower underneath black polythene mulching. [5-7]

3.6. Days to 70% Flowering

The information concerning days required for 70% flowering in marigold flower are showed in table 1 found out that the notably lowest wide variety of days required for 70% flowering (47.04 days) have been taken in treatment T2 (black polythene mulch) and, It turned into accompanied with the aid of T4 (50.10 days), T5 (49.92 days) and T3 (52.00 days). The maximum number of days taken for 70% flowering (55.00 days) became in control (T1). Ok moisture and suitable temperature of soil cause more suitable vegetative growth and ultimately flower emergence. [8]

3.7. Duration of Flowering

The longest period of flowering (69.50 days) changed into determined inside the remedy T2 (black polythene) (table 1). Each remedies were observed via treatment T4 (68.91 days), T3 (68.00 days) and T5 (63.40 days). The shortest period of flowering (60.56 days) changed into located within the treatment T1 (control). The prolong duration of flowering in polythene mulching treatments is probably attributed to conservation of more soil moisture leading to decorate lifestyles span of the marigold flower. The natural mulches have also superb influence on soil moisture conservation. Except this, the weed control because of mulching is probably useful in extending the crop increase and flowering span. [6]

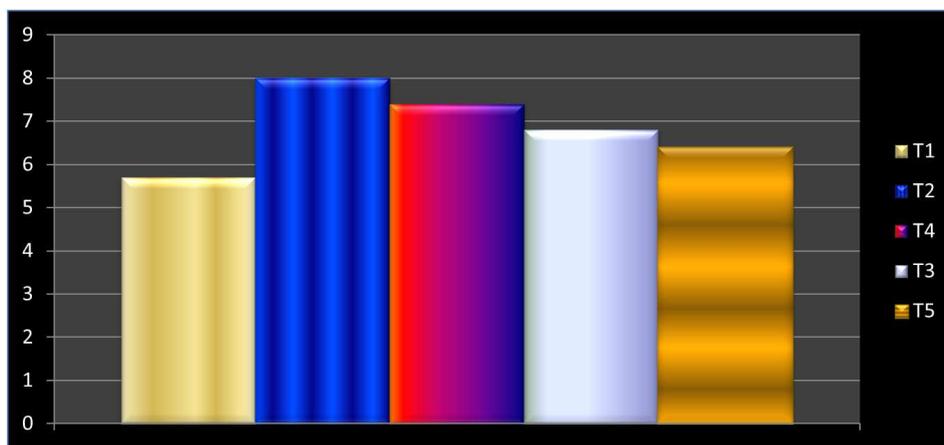


Figure 4. Flower diameters.

Table 1. Effect of various types of mulches on flowering parameters in marigold (*Tagetes erecta* L).

Treatments	Days to flower bud initiation	Days to flower initiation	Days to 70% flowering	Duration of flowering
T1 control	49.10	50.13	55.00	60.56
T2 black polyethylene mulch	35.00	40.91	47.04	69.50
T3	43.29	50.00	52.00	68.00
T4 paddy straw	48.22	42.91	50.10	68.91
T5 banana leaves	47.9	43.00	49.92	63.40
Means	44.702	45.39	50.812	66.074
Range	35.00-49.10	42.91-50.13	47.04-55.00	60.56-69.50

3.8. Diameter of Flower (cm)

The information related to flower first-class in marigold as influenced by exclusive mulching treatments is presented in figure 4 Flower diameter is the parameter that finally defines the quality and suitability of variety as loose flower. There has been sizable difference some of the specific plant mulching treatments with appreciate to flower diameter. Most of the specific mulching treatments T2 (black polythene mulch) registered the significantly highest flower diameter (8.00 cm) and it became at par with the treatment T4 (7.40 cm) which changed into higher in comparison to other natural mulches and control. The lowest flower diameter (5.70 cm) was acquired in treatment T1 (manipulate). From the facts, it is found out that the pinching exercise helped in improve the flower diameter in assessment with control. The conservation of soil moisture and availability of moisture as well as vitamins because of mulching is probably helpful for enhancing flower length. [5, 9, 6, 7]

3.9. Fresh Weight of Marigold Flower

The fresh weight of marigold flower became substantially influenced by using the distinct mulching treatments in marigold as proven in table 2. The fresh weight of marigold flower ranged from 10.90 g to 13.50 g in step with flower.

Table 2. Effect of different type of mulches on fresh weight and dry weight of marigold flowers (Tagetes erecta L).

Treatments	Fresh weight of marigold flower (g)	Dry flower weight (g)
T1 control	10.90 g	1.90 g
T2 black polythene	13.50 g	3.00 g
T3 dry grass	12.00 g	2.90 g
T4 paddy straw	12.20 g	2.40 g
T5 banana leaves	13.10 g	2.20 g
Means	12.34g	2.48g
Range	12.00-13.50g	1.90-3.00g

The highest fresh weight (13.50 g/flower) changed into recorded in treatment T2 (black polythene mulch). It becomes observed with the aid of T5 (13.10 g/flower). The remedies T4 (12.20 g/flower) and T3 (12.00 g/flower) have been at par with every different. The bottom fresh flower weight (10.90 g/flower) was registered in treatment T1 (manipulate).

3.10. Dry Flower Weight

The dry flower weight (3.00 g) changed into maximum in treatment T2 (black polythene mulch) and it turned into at par with treatments T3 (2.90 g), T4 (2.40 g). The minimal dry weight (1.90 g/flower) turned into recorded in remedies T1 (manage) and T5 (2.20 g). The sparkling and dry weight of the flower became most in polythene mulching treatment which might be attributed to improved sparkling and dry weight of the plant. The professed plant increase in mulching remedies produced voluminous flora. The wonderful effect of mulching on morphological and physiological improvement of vegetation can be the reason of higher sparkling and dry weight of plants. [6] also noted the same fashion because of mulching. From the present take a look at, it's far construed that mulching with black polythene paper become the practice for early induction of flowering in marigold which also advanced the scale of flower.

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References

[1] Kumar, N., N. Kumar, J. P. Singh and H. Kaushik. 2016. Effect of GA3 and Azotobacter on growth and flowering in African marigold (*Tagetes erecta* L.) cv. Pusa Narangi Gaiinda. The Asian J. Hortic., 11: 382-386. <https://doi.org/10.15740/HAS/TAJH/11.2/382-386>

[2] Regaswamy, D. and J. Koilpillai. 2014. Physicochemical Screening of *Tagetes erecta* Linn. Proceedings of the World Congress on Engineering Vol I, WCE 2014, July 2 - 4, London, U.K.

[3] Arora JS, Kaur A, Sidhu GS, Kaur A. Performance of carnation in polyhouse. Jou. rnal of Ornamental Horticulture 2002; 5: 58-63.

[4] Panse VG, Sukhantme PV. "Statistical Methods for Agricultural Workers. I. C. A. R., New Delhi 1985.

[5] Chawla SL. Effect of irrigation regimes and mulching on vegetative growth, quality and yield of flowers of African marigold. Ph.D. Thesis, Department of Horticulture, Maharana Pratap University of Agriculture and Technology, Udaipur 2006.

[6] Kokkeragadda RB, Sumangala HP, Rupa TR, Sangama, Sujatha AN. Effect of Fertigation, Irrigation and Mulching on Growth, Flowering and Yield Parameter in African marigold. International Journal of Current Microbiology and Applied Sciences 2018; 7 (3): 23197706.

[7] Sikarwar PS, Vikram B, Sengupta J. Effect of different mulches on vegetative growth, quality and flower yield of African marigold (*Tagetes erecta* L.) cv. Pusa Narangi Gaiinda. The Pharma Innovation Journal 2021; 10 (2): 279281.

- [9] Solaiman AHM, Kabir MH, Uddin AFMJ, Hasanuzzaman M. Black plastic mulch on flower production and petal coloration of Aster (*Callistephus chinensis*). Am- Euras. J. Bot 2008; 1 (1): 05-08.
- [10] Malshe KV, Sagavekar VV, Chavan AP. Effect of mulching on growth and flower yield of African marigold (*Tagetes erecta* L.). Bioinfolet 2017; 14 (3): 233-234.