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## Economic analysis of marigold production under the different applications of organic manures

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### Abstract

Marigold is one of the most important commercially grown loose flower crops in India. It is used as loose flower or to make garlands, which are extensively used in the religious and social functions. Marigold is broadly classified into two groups, viz., African marigold (*Tagetes erecta* L.) and French marigold (*Tagetes patula* L.). About 342000 ha of area is under floriculture producing 1760000 MT of loose flowers and 769000 MT of cut flowers annually (2017-18 advanced estimates). In order to sustain the growth the floriculture sector must constantly innovate to produce novel products. To meet the objective RBD and CACP tools were used for data analysis. The result shows the T7 perform better in both way i.e. growth aspects as well as economically.

**Keywords:** Economic, marigold, production, organic, manures

### Introduction

India is a long tradition of floriculture. Flowers have been depicted in ancient paintings. However, the social and economic aspects of flowers growing were recognized only later. It is only in the last three decades with changing lifestyles and under increased urban affluence. Floriculture has assumed a definite commercial status. It has also been noted for its potential as a viable agribusiness. Different agro-climatic conditions allow for year-round production in different parts of the world. Millions of people work in this industry. Floriculture was once only practiced on small farms, but it has now spread to a few larger farms.

Marigold is one of the most important commercially grown loose flower crops in India. It is used as loose flower or to make garlands, which are extensively used in the religious and social functions. Marigold is broadly classified into two groups, viz., African marigold (*Tagetes erecta* L.) and French marigold (*Tagetes patula* L.). African marigold (*Tagetes erecta* L.) is a seasonal flowering plant which belonging to the family Asteraceae and is a native of South and Central Americas, especially Mexico. It can be used in landscaping and can also be used as bedding or potted plant. The petals of the flowers serve as a major source of Carotenoids and leaves are effective in controlling root-knot nematodes. The technologies evolved by various R&D establishments, proactive policies of the government and active participation of entrepreneurs and farmers paved the way for a significant improvement in area and production of flower crops in the country. About 342000 ha of area is under floriculture producing 1760000 MT of loose flowers and 769000 MT of cut flowers annually (2017-18 advanced estimates). In order to sustain the growth, the floriculture sector must constantly innovate to produce novel products. The production of high value cash crops such as flowers has always been more beneficial to the farmers than the traditional crops but the marketing, post-harvest management and value addition significantly affected the income of the cultivators/farmers. Rajput *et al.* 2020c<sup>[3, 4, 5]</sup>; Tomar *et al.* 2017<sup>[3-13]</sup>; Tomar *et al.* 2020a and Tomar S. 2020<sup>[3-13]</sup>. The major states being Karnataka Tamil Nadu, West Bengal, Andhra Pradesh and Maharashtra. Tamil Nadu ranks first with 8,383 hectares. Small area for floricultural active states is like Maharashtra, Uttar Pradesh and Madhya Pradesh. The floriculture continues to generate employment opportunities to people in rural area. An area under flower cultivation can support a family consisting of 5 to 6 members. Marigold, belonging to family Asteraceae is an important and popular flower of India and ranks third in number after roses and chrysanthemum. Most of the farmer's livelihood solely depends on the income from Marigold cultivation.

The farmers in this area are having more than ten years of experience in marigold cultivation and in early days they were practiced only the conventional way of cultivation and also, they do not have enough knowledge on the new advanced method of cultivation. Because of their lack of knowledge and awareness about modern management practices and inefficient and indiscriminate use of inputs they have faced the problem of reduction in productivity of Marigold. People sometimes use flowers all told their ceremonies like wedding, birthday, and marriage day greetings, religious offerings and sometimes in social, political, and historical occasions. The universal usage has created a real trend of producing flower on a commercial basis to fulfill increasing demand within the market. Flowers grown in Rajasthan are exported to Japan,

Holland, Singapore, Mauritius, U.A.E. Germany and Switzerland. In U.P. Meerut, Baghpat, Saharanpur, Varanasi, Allahabad, Sultanpur and Ghazipur districts are flowers cultivation districts in which Varanasi is very famous ancient and religious city, so having all over year demand of flowers and flower products.

#### Material and Method

The experiment was conducted at the department of horticulture, CSA Uni. of Agri. & Tech, Kanpur. The soil of the experimental area was red sandy loam soil having a pH of 7.5-8.0. Three kind of bio fertilizers Azotobacter, Azospirillum, PSB, organic manure, F.Y.M, city compost, vermi compost, and poultry beat used for this study.

**Table 1:** Show the notations treatment of details

S. No.	Notations	Treatment details
1	T1	Azotobacter 1000 ppm
2	T2	Azospirillum 1000 ppm
3	T3	PSB 1000 ppm
4	T4	FYM 10 kg/plot
5	T5	City compost kg/plot
6	T6	Vermicompost 10kg/plot
7	T7	Poultry beat 25kg/plot.
8	T8	Control

#### CACP cost concept was used for the analysis of cost and return of the crop

Cost A1 = All actual expenses in cash and kind incurred in production by the producer. i) Hired human labour, ii) Hired bullock labour, iii) Owned bullock labour, iv) Home produced/purchased seed, v) Plant protection chemicals, vi) Home produced/purchased manure, vii) Fertilizers, viii) Depreciation on farm machinery, equipment, and farm building, ix) Irrigation, x) Land revenue, land development tax and other taxes, xi) Interest on working capital, xii) Interest on crop loan and xiii) Miscellaneous expenses.

Cost A2 = Cost A1 + Rent paid for leased-in land

Cost B1 = Cost A1 + Interest on value of owned capital assets (excluding land)

Cost B2 = Cost B1 + Rental value of owned land (net of land revenue) and rent paid for leased-in land

Cost C1 = Cost B1 + Imputed value of family labour

Cost C2 = Cost B2 + Imputed vale of family labour

Cost C3 = Cost C2 + 10 per cent Cost C2

#### Result and Discussion

From the data presented in Table 1, flower characteristics such as plant height (57.23 cm), leaves per plant (276.00), Number of branches per plant (11.93), plant spread (38.90 cm), stem diameter 1.54 cm, average number of flowers per plant (40.80), fresh weight of flower 10.58gm and yield 272.56 q/ha were found to be significantly higher with T7 (Poultry beat 25kg/plot). The results indicated that application of Poultry beat compare to other organic manure gives better result due to this number of flowers per plant, fresh weight of flower, no of branches per plant and yield per hectare found higher followed by T6, T5, T3, T4, T1, T2 and T8 respectively.

**Table 2:** Show the plant spread stem diameterer

Treatment	Plant height (cm)	Leaves/plant	No. of branches/plant	Plant spread (cm)	Stem diameter (cm)	Average no. of flower/plant	Ave. fresh weight (g)	Yield q/ha
T1	53.28	268.73	9.94	32.00	1.02	36.98	8.92	232.48
T2	53.20	268.00	9.80	31.90	1.00	36.00	8.88	228.92
T3	54.19	270.00	10.23	34.02	1.48	37.20	9.43	241.49
T4	53.98	269.08	10.00	32.00	1.34	37.08	9.03	238.98
T5	55.23	273.98	10.98	35.20	1.50	38.34	10.29	263.98
T6	56.00	274.60	11.02	36.48	1.52	39.48	10.32	266.48
T7	57.23	276.00	11.93	38.90	1.54	40.80	10.58	272.56
T8	48.21	250.20	8.06	28.00	0.98	35.06	7.25	201.04
SE(d)	2500	5.0	0.505	1.5	0.08	1.50	0.55	13.67
CD@5%	NS	10.72	1.10	3.22	0.15	3.21	1.17	29.33

Number of marigold flowers per plant and weight of marigold flowers depend on number of branches, spread of plant in different directions, photosynthetic accumulated in the plant system which altogether are influenced by RDF and Sources of nutrient, nutrient availability in the soil and nutrient uptake by the marigold plant and other practices. Tomar *et al.* 2018a [3-13]; Tomar *et al.* 2018b [3-13]; Tomar *et al.* 2015 [3-13]; Tomar

*et al.* 2020b [3-13]; Rajput *et al.* 2020b [3, 4, 5]; Rajput *et al.* 2020a and Tomar *et al.* 2019 [3-13]. Yield is depending on so many factors, more precisely, on vegetative traits and reproductive traits. Yield is a combination of influence of so many extrinsic and intrinsic factors, it could be due to the genetic make-up of the plant, however, certainly there will be influence of factors including the environment imposed on the

plant during the period of growth of the crop in the above table treatment 7 (Poultry beat 25kg/plot) significantly gives the higher result compare to other treatments in all parameters.

### Economic analysis of marigold crop

It seen from the table 2.0 that per hectare total yield obtained from marigold was found highest on T7 i.e. 272.56 q/ha followed by T6, T5, T3, T4, T1, T2 and T8 were found to be 26.48, 263.98, 241.49, 238.98, 232.48, 228.92 and 201.04 respectively. The average price per quintal of marigold loose flower in the market was Rs.1200/quintal. The gross return and net return were found to be higher in case of treatment 7 (T7-poultry beat) i.e. Rs. 327072 and 162528 followed by T5,

T6, T3, T4, T1, T2 and T8 respectively. Cost A1 (input cost) was found highest Rs.75650 on T5 followed by T7, T6, T3, T4, T2, T1 and found least Rs 54620 in case of control condition i.e. T8. Cost A2 and B1 were calculated based on the rental value of land and imputed value of family labour, respectively. Cost C3 calculated on 10 percent managerial cost over C2, Cost of cultivation (Cost C3) was found higher at T6 (Rs.164642) and minimum in case of control (T8) Rs.138209. Cost of cultivation (Rs./ha) having the marginal difference amongst the treatments and same trends also found in the yield and B:C ration. In all the treatments B:C ration reflects the profitability of the experiment, T7 was most profitable among the all followed by T5, T6, T4 found to be 1.98, 1.97, 1.94, 1.85 respectively.

**Table 3:** Economics of marigold cultivation under different treatment (Rs/ha)

Items	T1	T2	T3	T4	T5	T6	T7	T8
Cost A1	67420	68650	70251	69820	75650	72650	74560	54620
Cost A2	107420	108650	110251	109820	115650	112650	114560	94620
Cost B1	119420	120650	122251	121820	127650	124650	126560	106620
Cost B2	119420	120650	122251	121820	122840	124650	126560	106620
Cost C1	138445	138675	143276	140845	145865	149675	149585	125645
Cost C2	138445	138675	143276	140845	145865	149675	149585	125645
Cost C3	152289	152542	157603	154929	160451	164642	164543	138209
Yield (q/ha)	232.48	228.92	241.49	238.98	263.98	266.48	272.56	201.04
Ave. Price (Rs./kg)	1200	1200	1200	1200	1200	1200	1200	1200
Gross return (Rs/ha)	278976	274704	289788	286776	316776	319776	327072	241248
Net profit (Rs./ha)	126686.5	122161.5	132184.4	131846.5	156324.5	155133.5	162528.5	103038.5
B:C ratio	1.83	1.80	1.83	1.85	1.97	1.94	1.98	1.74

### Conclusion and Summary

In the present study total eight treatments were used namely T1-Azotobacter 1000ppm, T2-Azospirillum 1000 ppm, T3-PSB 1000 ppm, T4-FYM 10 kg/plot, T5-City compost kg/plot, T6-Vermi compost 10kg/plot, T7-Poultry beat 25kg/plot, T8-Control. The flower characteristics such as plant height (57.23 cm), leaves per plant (276.00), Number of branches per plant (11.93), plant spread (38.90 cm), stem diameter 1.54 cm, average number of flowers per plant (40.80), fresh weight of flower 10.58 gm and yield 272.56 q/ha were found to be significantly higher with T7 (Poultry beat 25kg/plot) and economically T7 found to be most beneficial among all the treatments.

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