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Original Research Paper

Influence of container, potting media and nutrients on production and post-production consumer acceptance of potted marigold (*Tagetes patula* L.)

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ABSTRACT

Production of potted plants is influenced by factors viz., type of container, potting medium, nutrient dose. A study was conducted to standardize these factors for potted French marigold var. Arka Pari. The treatments comprised of two type of containers (plastic and coir), three potting media [red soil + FYM + sand (1:1:1 v/v), Arka fermented cocopeat (AFC), AFC + vermicompost (1:1 v/v)] and four nutrition concentrations (160:30:180 ppm N:P: K, 128:24:144 ppm N:P: K, 96:18:108 ppm N:P:K and 3% Jeevamrutha) laid out in factorial completely randomized design replicated thrice. Plants grown in potting media combination of Arka fermented cocopeat (AFC) + vermicompost (1:1 v/v) along with weekly application of nutrient solution (128:24:144 ppm NPK) produced maximum number of flowers plant^{-1} (147.61) and registered highest uptake of nitrogen (2.87 g plant^{-1}), phosphorus (0.53 g plant^{-1}), potassium (3.24 g plant^{-1}), magnesium (0.85 g plant^{-1}) and sulphur (0.21 g plant^{-1}). Based on the attributes of the potted plants, this treatment combination also registered the highest score (81.2 on a scale of 100), willingness of the consumers to purchase (4.5 on a scale of 5), overall acceptability (2.7 on a scale of 3) and the benefit cost ratio of 1.18.

Keywords : Consumer preference, container type, nutrition, potted marigold, potting media

INTRODUCTION

Potted plants occupy a sizable share in the floriculture trade both in the global and domestic markets.The indoor plants market was valued at USD 17.93 billion in 2021 and is expected to reach USD 26.23 billion by 2029, at a CAGR of 4.87% during the forecast period of 2022-2029 (Anon., 2022). Besides being a decorative element, potted flowering plants have positive effects on the human psychology and when placed indoors, improves the air quality. Popular flowering potted plants include marigold, petunia, geranium, chrysanthemum, orchids, anthurium and so on. French marigold (*Tagetes patula* L.), is one of the, most versatile, low-maintenance and popular flowering plants that can be grown in beds and as containers.

Production of floriferous and well maintained attractive canopy is imperative in enhancing the aesthetics and consumer appeal of the potted plants. The container type, potting media and the nutrient dose have a considerable effect on the growth, flowering and quality of the potted plants. Among the containers, plastic, ceramic, terracotta, metallic and biodegradable containers like coir pots are used for commercial production. According to Anil and Roshan (2022), the plastic segment was the highest contributor to the flower pots and planters market size, with $328.1 million in 2020, and is estimated to reach $479.6 million by 2030, at a CAGR of 3.6%. Conventional potting media in India is comprised of soil, sand and farmyard manure, whereas in other countries, peat and amended peat substrates were widely used. Problems of compaction, presence of soil borne pathogens in the soil based media and restriction on harvesting of peat due to environmental concerns has increased the need for alternate substrates. Similarly nutrition and in particular, the concentration of each of the major nutrients and the source of nutrients play an important role in the growth and development of the plant. Consumer acceptance and willingness to purchase the product is a key factor in successful production and marketing of the potted plants. The production of potted ornamental plants must be based on consumer preferences (Megersa *et al*., 2018).

Considering all these aspects, the present study was conducted to standardize the three important elements *viz*., container type, potting media composition and the nutrient dose in potted plant production of marigold and to gauge the consumer preference.

MATERIALS AND METHODS

The study on potted plant production of French marigold var. Arka Pari, under open field conditions, was conducted at the ICAR - Indian Institute of Horticultural Research, Bengaluru, during 2019 and 2020, to standardize the container type, composition of the potting media, the nutrient doses and to evaluate the consumer acceptance of the containerized plants. French marigold var. Arka Pari is a short statured plant with spreading habit, bearing orange flowers and flowering duration is 30 to 45 days.

The treatments comprised of twenty four combinations laid out in factorial CRD design with three replications and ten pots per replication. Three factors *viz*., factor A: type of pots (P_1: 6" plastic pot; P_2: 6" coir pot); factor B: potting media [S_1: red soil + FYM + sand (1:1:1 v/v), S_2: Arka fermented cocopeat (AFC), S_3: AFC + vermicompost (1:1 v/v)]; factor C: nutrition concentration (N_1- 160:30:180 ppm, N_2- 128:24:144 ppm, N_3 - 96:18:108 ppm $N:P_2O_5:K_2O$, N_4 - Jeevamrutha @ 3% were imposed. Secondary and micronutrients were applied uniformly for the treatments N_1, N_2 and N_3. Nutrient application was scheduled at weekly intervals @ 50 ml pot^{-1}. One month old seedlings @ one seedling pot^{-1} were transplanted in the centre of the pot. Need based watering was done at regular intervals, taking into consideration the water holding capacity of the media (governed by the texture and porosity of the media) and the prevailing weather conditions. To encourage canopy spread through induction of more lateral branches, first pinch was done one month after transplanting and it was followed by the second pinching of the lateral branches. Prophylactic sprays of plant protection chemicals was done to check infestation of pest and diseases. Standard procedures were adopted to analyse the physical and chemical properties of the potting media. AFC recorded bulk density of 0.16 Mg m^{-3}; porosity 67.8%; pH 6.75; electrical conductivity 0.5 dSm^{-1}; total carbon 36.1%; total N 0.98%; total P 0.07%; total K 2.20% and Na 0.35%. The average concentration of macronutrients was estimated at 0.58% N, 0.26% P_2O_5 and 0.60% K_2O in FYM. Physical and chemical characteristics of the soil were recorded as bulk density (1.28 Mg m^{-3}); porosity (51.3%); pH (6.97), electrical conductivity (0.26 dSm^{-1}); organic carbon (7.8 g kg^{-1}); available N (0.13 g kg^{-1}); 18 mg kg^{-1} Olsen's P, ammonium acetate (CH_3COONH_4) extractable nutrients are as follow: 0.90 g Ca kg^{-1}, 0.174 g Mg kg^{-1} and 0.15 g K kg^{-1} and DTPA extractable micronutrients as follow: 10.3 mg kg^{-1} Fe, 5.70 mg kg^{-1}Mn, 2.24 mg kg^{-1} Cu and 1.35 mg kg^{-1} Zn. Analysis of N, P, K content and uptake by plant were done. Nitrogen (N) contents in the plant samples were analysed after mineralization with sulphuric acid by Kjeldahl method (Jackson, 1973). Phosphorus, potassium, calcium, magnesium, iron, manganese, zinc and copper were estimated after digesting with a triacid mixture of nitric acid, perchloric acid and sulphuric acid (9:4:1 v/v HNO_3: $HClO_4$: H_2SO_4) as described by Jackson (1973).

Observations were recorded on the vegetative growth, floral parameters and nutrient uptake during the cropping period, pooled and analysed using the OPSTAT statistical package (Sheoran *et al*., 1998). Post-production analysis of the potted plants was done with a sample size of 35 respondents, based on attributes such as cultural perfection (dense foliage, typical colour of cultivar, attractive), form (symmetrical appearance), plant size (height, spread and fullness), flower number (open flowers and buds), flower colour (true to the cultivar, clear, attractive, and free from blemishes) and distinctiveness (desirable characters) by assigning scores for these out of 30,15,15,20,10 and 10, respectively (Beck *et al*.,1985). According to Zeithaml (1988) the consumers' willingness to purchase is affected by objective price, perceived quality, perceived value, and product attributes. Willingness of the consumer to purchase the product was also ascertained by using the scale of 1-definitely would not; 2-probably would not; 3-might or might not; 4-probably would; 5-definitely would. The potted plants were also rated on an overall visual yardstick on a scale of 1 to 3 *viz*., 1-unacceptable; 2-acceptable and 3-visually excellent. The economics of potted plant production for varying container types, potting media and nutrients was calculated and the benefit: cost ratio was worked out.

RESULTS AND DISCUSSION

The canopy and flowering of the potted plants of marigold was influenced by the container type, potting media, nutrients and the interaction effect of these factors.

Container type potting media and nutrients : Pot type has significant influence on the number of leaves at flowering, internodal length, number of flowers $plant^{-1}$ and root spread (Table 1). Plants grown in plastic pots (P_1) recorded the highest number of flowers $plant^{-1}$ (124.54), root spread (18.17 cm), the lowest number of leaves $plant^{-1}$ (54.75) and internodal length (1.94 cm), whereas coir pots (P_2) recorded the highest number of leaves at flowering (57.06), internodal length (2.06 cm), the lowest number of flowers $plant^{-1}$ (112.17) and root spread (15.76 cm). In plastic pots, lesser permeability of the container walls, leading to better water and nutrient retention in the media, might have influenced the rhizosphere environment, contributed to better uptake of water and nutrients and thereby to better growth and development of the plant as compared to coir pots. This is in line with the findings of Evan and Hensley (2004) in *Vinca rosea*.

The number of flowers $plant^{-1}$ was significantly influenced by the potting media composition (Table 1). The treatment S_3-Arka fermented cocopeat + vermicompost (1:1 v/v) produced the highest number of flowers $plant^{-1}$(123.68), whereas, AFC alone (S_2) recorded the lowest number of flowers $plant^{-1}$ (113.65). This might be due to the fact that the AFC + vermicompost medium does not tend to compact, stores and allows uptake of nutrients, as opposed to the conventional soil based media. Further, the presence of vermicompost, a rich organic source of nutrition, would have contributed to better plant growth and thereby production of highest number of flowers. This corroborates the findings of Rawat *et al*. (2020) in Geranium.

Application of inorganic source of nutrients of varying concentrations and an organic source (Jeevamrutha) recorded significant differences for the number of leaves at flowering, flower diameter and number of flowers $plant^{-1}$ (Table 1). The treatment N_3 - 96:18:108 ppm $N:P_2O_5:K_2O$, recorded the maximum number of leaves at flowering (59.39) and was at par with N_4 - Jeevamrutha @ 3% (57.02), whereas N_1- 160:30:180 ppm N: P_2O_5: K_2O recorded the minimum number of leaves (52.44). N_1- 160:30:180 ppm N: P_2O_5: K_2O recorded the highest flower diameter (4.48 cm) and number of flowers $plant^{-1}$ (125.87), whereas the minimum flower diameter (4.32 cm) was recorded by application of N_2- 128:24:144 ppm

Table 1 : Influence of type of pot, potting media and nutrients on growth and flowering in marigold var. Arka Pari

Treatment	Plant spread at flowering (cm)	Number of leaves at flowering	Internodal length (cm)	Flower diameter (cm)	Number of flowers $plant^{-1}$	Root spread (cm)
P_1	33.20	54.75	1.94	4.37	124.54	18.17
P_2	33.45	57.06	2.06	4.41	112.17	15.76
SEm±	0.34	0.63	0.04	0.03	1.61	0.49
CD (P= 0.05)	NS	1.80	0.11	NS	4.58	1.39
S_1	33.24	54.72	1.98	4.37	117.73	16.10
S_2	33.66	55.88	2.03	4.38	113.65	18.36
S_3	33.07	57.11	2.00	4.41	123.68	16.43
SEm±	0.42	0.77	0.05	0,03	1.97	0.60
CD (P= 0.05)	NS	NS	NS	NS	5.62	1.71
N_1	33.41	52.44	2.00	4.48	125.87	16.01
N_2	33.65	54.76	1.92	4.32	117.18	17.81
N_3	33.95	59.39	2.03	4.41	112.78	17.48
N_4	32.28	57.02	2.05	4.33	117.60	16.55
SEm±	0.48	0.89	0.05	0.04	2.28	0.69
CD (P= 0.05)	NS	2.54	NS	0.1	6.48	NS

P_1: 6" plastic pot, P_2: 6" coir pot; S_1: red soil + FYM + sand (1:1:1 v/v), S_2: Arka fermented cocopeat (AFC), S_3: AFC + vermicompost (1:1 v/v)]; N_1- 160:30:180 ppm $N:P_2O_5:K_2O$, N_2- 128:24:144 ppm $N:P_2O_5:K_2O$, N_3 - 96:18:108 ppm $N:P_2O_5:K_2O$, N_4 - 3% Jeevamrutha

N: P_2O_5: K_2O and minimum number of flowers plant^{-1} (112.78) by N_3 - 96:18:108 ppm N: P_2O_5: K_2O. Higher concentrations of the major nutrients resulted in production of maximum number of flowers with larger flower size, which might be attributed to the availability of sufficient amount of nutrients to the plants, as also observed Kang and Van (2004) in *Salvia splendens*. However, it was observed the number of leaves did not increase with the increase in nutrient concentration and was also at par with the organic source of nutrients.

Interaction effect : Significant difference was observed with respect to the number of flowers plant^{-1}and root spread on account of the interaction of three factors *viz*., pot type, potting media composition and nutrients (Table 3), whereas, parameters like plant spread, number of leaves at flowering, internodal length (Table 2) and flower diameter (Table 3) did not vary significantly with these treatment combinations. Maximum number of flowers plant^{-1} (147.61) was produced by the plants grown in plastic pots, on a potting media combination of Arka fermented cocopeat + vermicompost (1:1 v/v) along with nutrient solution of concentration 128:24:144 ppm N: P_2O_5: K_2O ($P_1S_3N_2$) and it was on par with $P_1S_1N_4$ (142.06), $P_1S_2N_1$ (137.28) and $P_2S_1N_1$ (137.83), whereas $P_1S_3N_2$ (94.16) produced the minimum number of flowers plant^{-1}. Plastic pots containing the potting media combination of Arka fermented cocopeat and vermicompost with inorganic nutrient solution of concentration 128:24:144 ppm N: P_2O_5: K_2O produced most floriferous plants, which might be attributed to the walls of the plastic container and the nutrient rich porous potting media, holding adequate nutrients and moisture besides the key factor being the optimum concentration of the major nutrients applied at weekly intervals for the growth and production of the plant. According to Marinari *et al*. (2000) adding vermicompost to container media modifies the soil structure, increases availability of macro and micro-nutrients, stimulates microbial activity, augments production of plant growth-promoting substances by microorganisms through interactions with earthworms. Similar observation was made by Sahni *et al*. (2008) in strawberry. Root spread was significantly highest (23.70 cm) in plants grown in plastic pots on a potting media combination of red soil + FYM + sand (1:1:1 v/v) and nutrient solution of concentration 160:30:180 ppm N: P_2O_5: K_2O ($P_1S_1N_1$), which was on par with

Table 2 : Interaction effect of type of pot, potting media and nutrients on vegetative parameters at flowering stage

Treatment	Plant spread at flowering (cm)						Number of leaves at flowering						Internodal length (cm)					
	P_1			P_2			P_1			P_2			P_1			P_2		
	S_1	S_2	S_3	S_1	S_2	S_3	S_1	S_2	S_3	S_1	S_2	S_3	S_1	S_2	S_3	S_1	S_2	S_3
N_1	31.21	33.28	30.97	38.24	34.62	32.12	50.28	53.06	57.83	48.50	51.33	53.67	1.96	1.88	2.17	2.24	1.93	1.80
N_2	32.19	32.47	35.89	33.98	33.45	33.91	51.83	52.50	51.83	52.34	61.67	58.41	1.81	1.88	1.92	1.97	1.97	1.99
N_3	33.62	33.38	33.46	34.58	34.43	34.23	59.11	52.67	56.95	65.22	59.39	63.00	2.03	1.97	2.00	2.21	2.11	1.85
N_4	32.63	35.99	33.28	29.47	31.65	30.69	58.44	55.94	56.55	52.00	60.50	58.67	2.00	2.01	1.96	1.98	2.24	2.11
		SEm±			CD(P= 0.05)			SEm±			CD (P= 0.05)			SEm±			CD (P= 0.05)	
P		0.34			NS			0.63			1.80			0.04			0.11	
S		0.42			NS			0.77			NS			0.05			NS	
P X S		0.59			NS			1.09			NS			0.07			NS	
N		0.48			NS			0.89			2.54			0.05			NS	
P X N		0.68			1.93			1.26			3.60			0.08			NS	
S X N		0.83			2.37			1.55			4.40			0.09			NS	
P X S X N		1.18			NS			2.19			NS			0.13			NS	

P_1: 6" plastic pot; P_2: 6" coir pot; S_1: red soil + FYM + sand (1:1:1 v/v), S_2: Arka Fermented Cocopeat (AFC), S_3: AFC + vermicompost (1:1 v/v)]; N_1- 160:30:180 ppm N:P_2O_5:K_2O, N_2- 128:24:144 ppm N:P_2O_5:K_2O, N_3 - 96:18:108 ppm N:P_2O_5:K_2O, N_4–3% Jeevamrutha

Table 3 : Interaction effect of type of pot, potting media and nutrients on floral parameters and root spread

Treatment	Flower diameter (cm)					
	P_1			P_2		
	S_1	S_2	S_3	S_1	S_2	S_3
N_1	4.55	4.49	4.42	4.38	4.44	4.62
N_2	4.21	4.44	4.32	4.30	4.36	4.28
N_3	4.33	4.25	4.35	4.70	4.26	4.57
N_4	4.30	4.34	4.40	4.20	4.47	4.28
		SEm±			CD (P= 0.05)	
P		0.03			NS	
S		0.03			NS	
P X S		0.05			NS	
N		0.04			0.10	
P X N		0.05			NS	
S X N		0.06			0.18	
P X S X N		0.09			NS	

Treatment	Number of flowers per plant					
	P_1			P_2		
	S_1	S_2	S_3	S_1	S_2	S_3
N_1	127.11	137.28	130.67	137.83	116.06	106.26
N_2	114.89	110.33	147.61	108.11	104.44	117.67
N_3	107.67	111.72	118.89	110.00	103.78	124.61
N_4	142.06	121.45	124.78	94.16	104.17	118.95
		SEm±			CD (P= 0.05)	
P		1.61			4.58	
S		1.97			5.62	
P X S		2.79			NS	
N		2.28			6.48	
P X N		3.22			9.17	
S X N		3.94			11.23	
P X S X N		5.58			15.88	

Treatment	Root spread (cm)					
	P_1			P_2		
	S_1	S_2	S_3	S_1	S_2	S_3
N_1	23.70	18.17	19.27	11.40	11.31	12.23
N_2	21.90	11.53	18.60	17.83	19.20	17.80
N_3	21.57	18.37	13.53	17.00	17.33	17.10
N_4	21.40	17.67	13.67	12.07	17.90	16.58
		SEm±			CD (P= 0.05)	
P		0.49			1.39	
S		0.60			1.71	
P X S		0.85			2.41	
N		0.69			NS	
P X N		0.98			2.79	
S X N		1.20			NS	
P X S X N		1.69			4.82	

P_1: 6" plastic pot; P_2: 6" coir pot; S_1: red soil + FYM + sand (1:1:1 v/v), S_2: Arka Fermented Cocopeat (AFC), S_3: AFC + vermicompost (1:1 v/v)]; N_1- 160:30:180 ppm N:P_2O_5:K_2O, N_2- 128:24:144 ppm N:P_2O_5:K_2O, N_3 - 96:18:108 ppm N:P_2O_5:K_2O, N_4–3% Jeevamrutha

$P_1S_1N_2$ (21.90 cm), $P_1S_1N_3$ (21.57 cm), $P_1S_1N_4$ (21.40 cm), $P_1S_3N_1$ (19.27 cm) and $P_2S_2N_2$ (19.20 cm), whereas $P_2S_2N_1$ (11.31 cm) recorded the minimum root spread. This contradicts the findings that cocopeat based substrates encourage better root growth and spread, which might be due to the interaction of all the three factors. The longevity of flowers from bud stage to the end of display stage was assessed (Fig. 1) and the maximum longevity was recorded in the treatment combination $P_2S_2N_2$ (21.4 days), which was on par with $P_1S_3N_2$ (20 days), whereas $P_2S_1N_3$ had the least longevity (15 days). This might be attributed to the optimum dose of nutrients supplied to the plants at weekly intervals and the water and nutrient holding capacity of the potting media and the root spread that must have led to enhanced uptake of the nutrients.

Nutrient uptake: Maximum uptake of nitrogen (2.87g plant^{-1}), phosphorous (0.53g plant^{-1}), potassium (3.24g plant^{-1}), magnesium (0.85g plant^{-1}) and sulphur (0.21g plant^{-1}) was recorded by the plants grown in plastic pots, on a potting media combination of Arka fermented cocopeat + vermicompost (1:1 v/v) along with nutrient solution of concentration 128:24:144 ppm N: P_2O_5: K_2O ($P_1S_3N_2$), whereas the minimum uptake of nitrogen (0.84 g plant^{-1}), phosphorous (0.21g plant^{-1}), potassium (1.02g plant^{-1}), calcium (0.74g plant^{-1}), magnesium (0.25g plant^{-1}) and sulphur (0.07 g plant^{-1}) was recorded by the plants grown in coir pots, on a potting media combination of Arka fermented cocopeat + vermicompost (1:1 v/v) along with nutrient solution of concentration 96:18:108 ppm N: P_2O_5: K_2O ($P_2S_3N_3$) as is evident from Fig. 2 and 3. Profuse flowering and longevity might be attributed to the uptake of optimum amount of nutrients in this treatment combination. This corroborates the findings of Krol (2011) in pot marigold. Micronutrient uptake by the potted plants (Fig. 4 and 5) was the highest (3.29,4.57 and 8.10 mg plant^{-1} of Cu, Zn and Mn, respectively) in the plants grown in plastic pots, on a potting media combination of red soil + FYM + sand (1:1:1 v/v) along with nutrient solution of concentration 128:24:144 ppm N: P_2O_5: K_2O ($P_1S_1N_2$), whereas, the Fe uptake was the highest (34.09mg plant^{-1}) in $P_2S_1N_1$.

Scoring based on attributes, willingness of the consumer to purchase and the overall acceptability: The potted plants were scored based on attributes such as cultural perfection, form, plant size, flower number, flower colour and distinctiveness on a scale of 100 (Fig. 6 and 7).

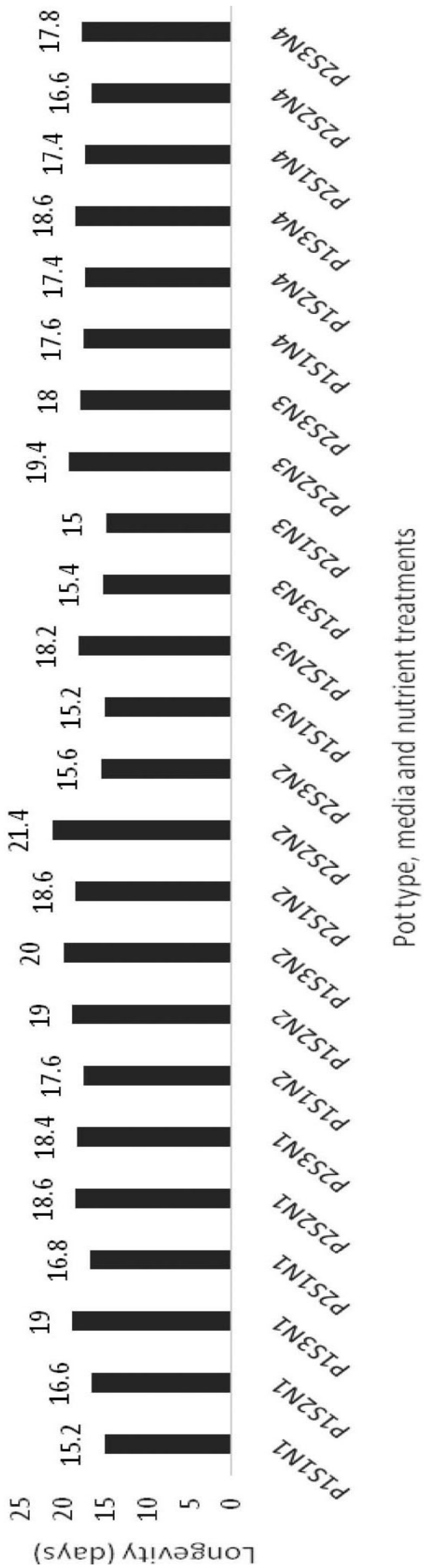

Fig. 1 : Effect of pot type, potting media and nutrients on longevity of individual flower on the plant

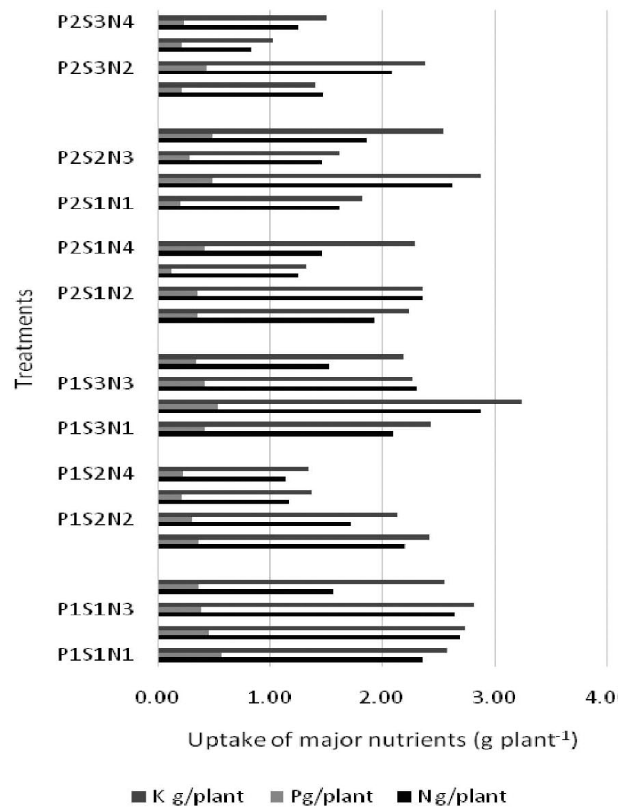

Fig. 2 : Effect of pot type, potting media and nutrients on uptake of major nutrients

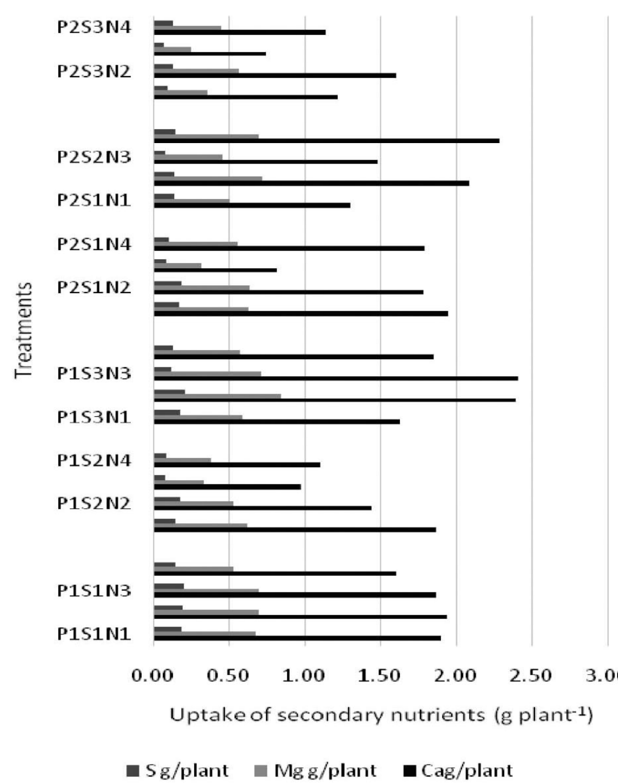

Fig. 3 : Effect of pot type, potting media and nutrients on uptake of secondary nutrients

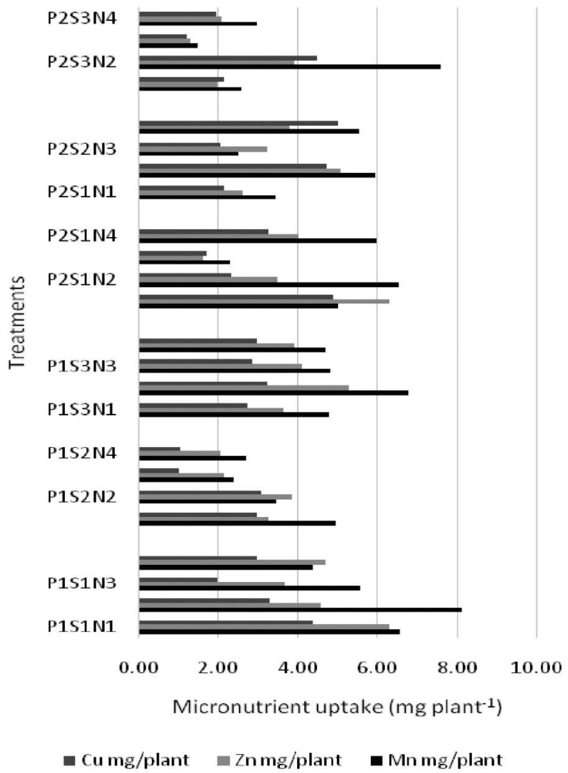

Fig. 4 : Effect of pot type , potting media and nutrients on uptake of Cu, Zn and Mn.

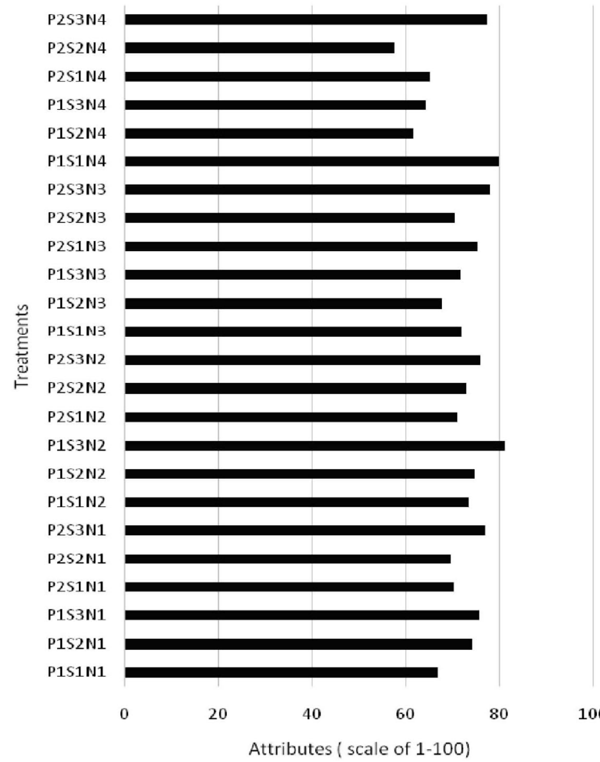

Fig. 6 : Effect of pot type, potting media on nutrient on attributes of consumer to purchase

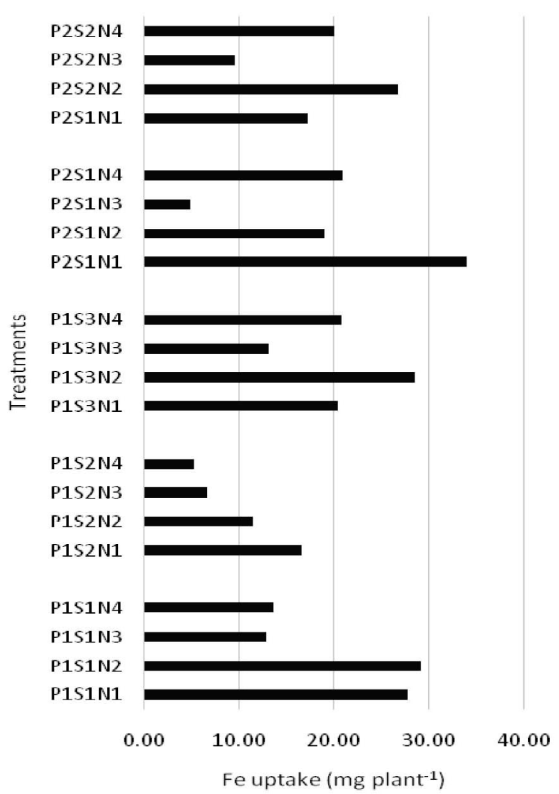

Fig. 5 : Effect of pot type, potting media and nutrients on uptake of Fe

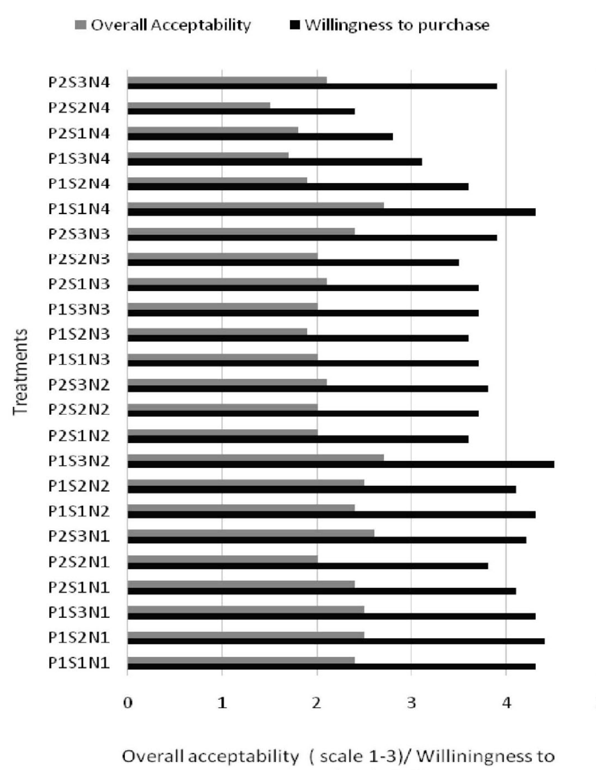

Fig. 7 : Effect of pot type, potting media and nutrients on scores based on the consumer to purchase

Plants grown in plastic pots on potting media combination of Arka fermented cocopeat + vermicompost (1:1 v/v) along with nutrient solution of concentration 128:24:144 ppm N: P_2O_5: K_2O ($P_1S_3N_2$) scored the highest (81.20), whereas, plants grown in coir pots, on a potting media combination of Arka fermented cocopeat along with 3% Jeevamrutha ($P_2S_2N_4$) registered the lowest score (57.70). Quality depends on the shape, size, colour of flowers and leaves, and number of flowers (Noordergraaf, 1994; Wang *et al*, 2005). Based on the consumers' willingness to purchase on a scale of 1-5, the same treatment combination $P_1S_3N_2$, registered the highest score of 4.5, and $P_2S_2N_4$ recorded the lowest score of 2.4. The overall acceptability based on visual appearance was assessed on a scale of 1-3. On visual assessment also $P_1S_3N_2$ and $P_1S_1N_4$ registered the highest score of 2.7 and $P_2S_2N_4$ recorded the lowest score of 1.5. According to Ferrante *et al*. (2015) improvement of visual quality of potted plants plays a key role in increasing the sale. Coir pots had poor mechanical properties and resulted in a faster degradation and tended to rupture during handling, transport and marketing. Besides, roots also protruded from the pot walls in some treatments with discolouration of the pots.

Economics: Plants grown in plastic pots on Arka fermented cocopeat alone along with nutrient solution of concentration 160:30:180 ppm N: P_2O_5: K_2O ($P_1S_2N_1$) recorded the highest benefit cost ratio of 2.03, however the number of flowers plant^{-1} and the consumer acceptance scores were lower for this treatment combination. The best performing treatment combination with respect to floriferousness, cultural attributes, willingness of the consumer to buy and overall visual acceptability ($P_1S_3N_2$) recorded a benefit cost ratio of 1.18 (Fig. 8). Coir pots increased the cost of production and have to be retailed at higher prices as compared to the plastic pots. Selling price of Rs.70 per coir potted plant resulted in B: C ratios ranging from 0.37 to 0.63.Willingness of the customer to purchase the coir pots depended on their purchasing power and concern for the environment by using eco-friendly products.

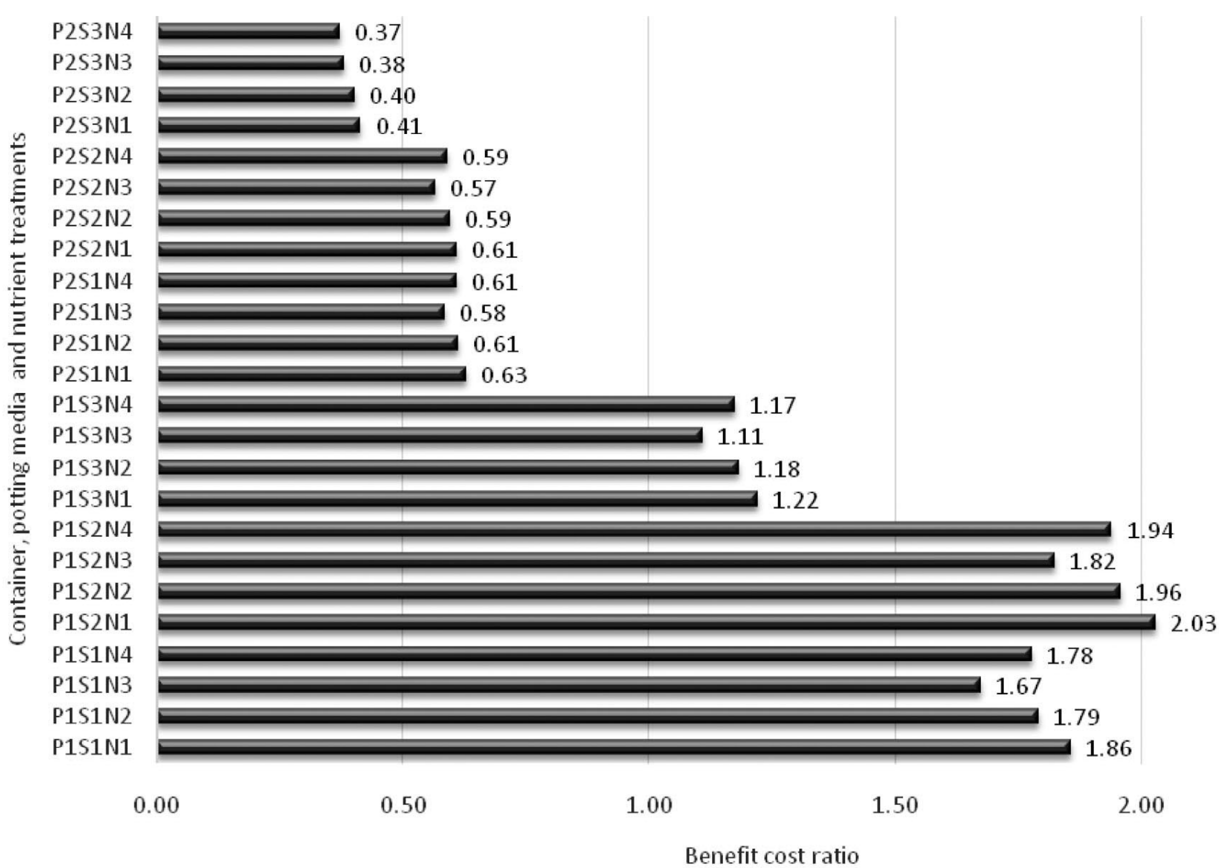

Fig. 8 : Effect of pot type, potting media and nutrients on the economics

CONCLUSION

From the present study, it can be concluded that potted plant production of marigold (*Tagetes patula* L.) can be taken up on a commercial basis by nurserymen in plastic pots on a potting media combination of Arka fermented cocopeat+ vermicompost (1:1 v/v) supplemented with weekly application of nutrient solution of 128:24:144 ppm N: P_2O_5: K_2O @ 50 ml pot^{-1}. This combination produced highly floriferous plants with attractive form and shape and had the highest consumer preference and overall visual acceptability.

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