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Effect of nitrogen and vermicompost on floral and yield parameters of African marigold

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Abstract : An experiment was conducted of African marigold cv. SIERRA YELLOW to evaluate the effect of nitrogen along with vermicompost on floral and yield parameters. The various levels of nitrogen (0, 120, 160, 200, 240 kg/ ha) and vermicompost (0, 5, 10, 15 t/ha) studied under FRBD with three replications. Application of 160 kg N per ha with 10 t/ha vermicompost minimized days to 50 per cent flowering (64.25), increased the number of flowers (58.38), flower yield (203.42 g/plant and 8793.60 kg/ha), flower diameter (7.60 cm), and keeping quality (9.28 days) of African marigold cv. SIERRA YELLOW.

Key words : Nitrogen, Vermicompost, Floral parameters, Yield, African marigold

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African marigold (*Tagetes erecta* Linn.) is commonly used for the loose flower in India because of easy cultivation, adoptability to varying soil and climatic conditions, long duration of flowering and keeping quality. It has been established that nutrition play an important role in improvement of flower and yield in marigold. Nitrogen is absorbed by plants in huge amount and it is most limiting factor for crop production. With application of vermicompost, it supplies nitrogen, phosphorus and other micro nutrient in trace quantity. Under such conditions balanced nitrogen and other nutrients are highly imperative to obtain higher yield of African marigold.

RESEARCH METHODS

Present investigation was carried out at College Farm, N.M. College of Agriculture, Navsari Agricultural University Navsari during winter 2005-06 to standardize the dose of nitrogen along with vermicompost in African marigold cv. SIERRA YELLOW. Total 20 treatments combinations comparing five levels of nitrogen (0, 120, 160, 200, 240 kg/ ha) and four levels of vermicompost (0, 5, 10, 15 t/ha) were tried in Factorial Randomized Block Design with three replications in black soil. In the initial stage, soil had available nitrogen (160.00 kg/ha), available

phosphorus (40.02 kg/ha), available potash (384.50 kg/ ha) with pH (7.7). One month old seedlings of uniform growth were transplanted at the spacing of 40x30 cm. The observations taken in the experiment were days taken to 50 per cent flowering, flower yield per plant and hectare basis, number of flower per plant, flower diameter, keeping quality etc.

RESEARCH FINDINGS AND DISCUSSION

The results obtained from the present investigation as well as relevant discussion have been summarised under following heads:

Days taken for 50 per cent flowering:

Data present in Table 1 clearly reveals that significantly minimum (64.25) days taken for 50 per cent flowering after transplanting were recorded in N₂ (160 kg N/ ha). Among vermicompost treatment V₂ showed minimum (66.20) days for 50 per cent flowering. This might be due to vigorous vegetative growth of plant, which resulted in better food assimilation so increase in carbohydrates levels. This was translocated rapidly to flower bud initiation resulting early development. This was in accordance with the result obtained by Dahiya *et al.*

Table 1 : Effect of nitrogen and vermicompost on floral and yield parameters of African marigold cv. SIERRA YELLOW

Treatments	Days to 50 % flowering (days)	Number of flower per plant	Yield of flower per plant (g)	Yield of flower per ha (kg)	Flower diameter (cm)	Keeping quality (days)
Nitrogen						
0	74.92	36.20	92.07	3949.62	5.93	6.23
120	69.50	51.88	155.84	7295.49	6.72	7.75
160	64.25	58.38	203.42	8793.60	7.60	9.28
200	66.75	56.55	191.85	8404.64	7.38	8.58
240	68.00	55.18	185.97	8244.91	7.15	8.18
C.D. (P=0.05)	3.03	3.14	15.60	522.34	0.55	0.67
Vermicompost						
0	72.20	41.72	112.53	6057.59	6.29	6.72
5	69.00	53.20	165.91	7228.08	6.94	7.88
10	66.20	56.62	194.91	8151.44	7.34	8.88
10	67.33	55.00	189.97	7913.49	7.24	8.52
C.D. (P=0.05)	2.71	2.81	13.96	467.19	0.49	0.59

(1998) in African marigold.

Number of flower per plant:

Data in Table 1 clearly indicated that the significantly maximum number of flower per plant (58.38) was obtained in N₂ (160 kg/ha) treatment. Among vermicompost doses, 10 t/ha showed maximum number of flower. This might be due to assimilation of carbohydrates to nitrogen which increase hydrolysis and get reproductive sugar which ultimately helps in increase number of flower, similar result were also obtained by Yadav *et al.* (2000) in African marigold.

Yield of flower per plant and hectare basis:

Data in Table 1 revealed that the significantly maximum yield per plant and hectare (203.42 g/plant and 8793.60 kg/ha, respectively) obtained in 160 kg N per ha application. While 10 t/ha vermicompost also produced higher yield (194.91g/plant, 8151.44 kg per ha). This may be due to the nitrogen at low rate increase the carbohydrate levels in plant, which goes in hydrolysis and get sugar which help in the increase the yield potential of marigold plants. Similar finding were observed by Jain and Gupta (2004) in African marigold.

Flower diameter:

Data presented in Table 1 revealed that maximum flower diameter (7.60 cm) was observed in N₂ (160 kg/ha), significantly maximum flower diameter (7.34cm) was observed in V₂ (10 t/ha). This might be due to appropriate dose of nitrogen resulted more carbohydrates. When carbohydrates translocated to reproductive organs under

goes hydrolysis and get in to reproductive sugar which ultimately help in the increase the flower diameter (Anuradha *et al.*, 1990).

Keeping quality:

Data (Table 1) showed that the significantly maximum keeping quality (9.28 days) of flower was observed in N₂ (160 kg/ ha), and vermicompost (10t/ha) recorded (8.88 days) application. This might be due to increase level of carbohydrates due to appropriate dose of nitrogen which hydrolyse sugar which responsible to extant keeping quality of flower. Similar findings were observed by Avari (1990) in marigold and Belorkar *et al.* (1996) in chrysanthemum.

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