

Original Research Article

Yield and Quality of African marigold as Influenced by Different Varieties under Vidarbha Conditions

Manoj J. Patokar¹, R. P. Gajbhiye¹, Siddhi Patil¹ and P. N. Bhute^{2*}

¹Horticulture Section, College of Agriculture, Nagpur (M.S.), India

²JRA Horticulture Section, College of Agriculture, Nagpur (M.S.), India

*Corresponding author

ABSTRACT

A field experiment was conducted at farm of Horticulture Section, College of Agriculture, Nagpur during *kharif* season of 2016-2017 with view to study the yield and quality of African marigold as influenced by different varieties under Vidarbha conditions. The experiment was laid out in Randomized Block Design with eight different treatments namely, African Double Orange, Pusa Basanti Yellow, African Giant Double, Pusa Narangi Gaiinda, NAM-2, Crackerjack Mix, African Giant and African Marigold planted in three replications. The results revealed that, NAM-2 recorded maximum number of flowers plant⁻¹ (62.67), yield of flowers plant⁻¹ (642.15 g), yield of flowers plot⁻¹ (14.77 kg), yield of flowers ha⁻¹ (23.24 tonnes), weight of flower (10.68 g), diameter of fully opened flower (7.07 cm), length of flower along with pedicel (12.58 cm), length of pedicel (8.26 cm), number of petals flower⁻¹ (266.53), and consumer acceptance (7.80) in respect of flower size, flower colour (8.13), petal compactness (8.07) and overall acceptance (8.00). Whereas, African Giant Double noticed significantly maximum shelf life (4.07 days).

Keywords

African
Marigold,
varieties,
quality, yield

Introduction

Marigold is one of the commercially exploited flower crop belongs to family Asteraceae and genus *Tagetes*. In India marigold (*Tagetes* spp.) ranks first among the loose flowers. There are about 33 species of marigold. Apart from its significance in ornamental horticulture, it has been valued for other purposes too.

The aromatic oil extracted from marigold, is called as "*Tagetes* oil". It is used in preparation of high grade perfumes and also as an insect fly repellent. Recently dried flower petals of marigold are used as poultry feed in order to improve the colour of egg yolk as well as broiler's skin.

There is plenty of area under local varieties on account of lack of availability of seeds and awareness of farmers about the knowledge of improved varieties. Farmers are growing the local varieties without knowing the yield potential and quality. There are several varieties released in different states having many desirable characters, high yield potential and better quality parameters. Moreover, the information on the suitability of varieties in the region is very scanty. There was also a feedback on this aspect from state agricultural extension agency and farmers. Keeping these points in view the present investigation has been planned at

Horticulture Section, College of Agriculture, Nagpur during the year 2016-17.

Materials and Methods

A field experiment was carried out at research farm of Horticulture Section, College of Agriculture, Nagpur during *kharif* season of the year 2016-2017. The experiment was laid out in Randomized Block Design with eight treatments replicated thrice. The experiment comprised with eight treatments *viz.*, T₁ – African Double Orange, T₂ – Pusa Basanti Yellow, T₃ – African Giant Double, T₄ – Pusa Narangi Gainda, T₅ – NAM-2, T₆ – Crackerjack Mix, T₇ – African Giant, T₈ – African Marigold.

The seeds of varieties of African marigold were collected from different seed suppliers of India. The seedlings were prepared in crates in Hi-tech polyhouse of Maharajbag. The crates were prepared thoroughly by mixing soil with farm yard manure and linden powder. Seeds were treated with fungicide for healthy growth of seedlings and sown in lines at 10 cm spacing and 2-3 cm deep in the soil. Seeds were then gently covered with the soil. Crates were watered lightly with the help of rose can. After about 3 to 4 days the seeds started germinating and potential germination was completed within eight days. The crates were watered regularly and weeding operation was carried out in order to keep the crates free of weeds. Seedlings were transplanted on raised bed with planting of one seedling hill⁻¹ in the experimental field on 31th July, 2016 at the distance of 45 cm x 30 cm.

The recommended dose of fertilizer (100: 50: 25 kg NPK ha⁻¹) was applied to all the plots in the form of urea, single super phosphate and muriate of potash. Out of this, full dose of P₂O₅ and K₂O and 1/2 dose

of nitrogen was applied at the time of transplanting. The remaining dose of nitrogen was applied in two split doses, first dose was given at 15 days and second dose was given at 30 days after transplanting.

Observations were recorded on number of flowers plant⁻¹, flower yield plant⁻¹ (g), flower yield plot⁻¹ (kg), flower yield ha⁻¹ (tonnes), weight of flower (g), diameter of fully opened flower (cm), length of flower along with pedicel (cm), length of pedicel (cm), number of petals flower⁻¹, shelf life (days) were recorded after harvesting and consumer acceptance at harvest and collected data were statistically analyzed as per method suggested by Panse and Sukhatme, (1967).

Results and Discussion

Yield parameters

The data in table 1 revealed that, significant differences were observed in yield parameters among the African marigold varieties. Significantly maximum number of flowers plant⁻¹ (62.67) was noticed with NAM-2 which was found statistically at par with African Giant Double (58.40). Whereas, minimum number of flowers plant⁻¹ (42.93) was recorded in Pusa Basanti Yellow. The increased number of flowers plant⁻¹ might be due to cell elongation and rapid cell stimulation. Similar results were also noticed by Choudhary *et al.*, (2014), Bharathi and Jawaharlal (2014) in African marigold.

Significantly maximum yield of flowers plant⁻¹ (642.15 g) was recorded in NAM-2 which was found statistically superior over all other varieties under study. However, significantly minimum yield of flowers plant⁻¹ (126.31 g) was recorded in African Marigold.

Table.1 Yield and quality of African marigold as influenced by different varieties under Vidarbha conditions

Treatments	Number of flowers plant ⁻¹	Yield of flowers plant ⁻¹ (g)	Yield of flowers plot ⁻¹ (kg)	Yield of flowers ha ⁻¹ (t)	Weight of flower (g)	Diameter of fully opened flower (cm)	Length of flower along with pedicel (cm)	Length of pedicel (cm)	Number of petals flowers ⁻¹	Shelf life (days)
T ₁ - African Double Orange	45.93	339.24	10.17	16.01	7.39	5.46	11.29	7.20	240.07	3.87
T ₂ - Pusa Basanti Yellow	42.93	138.25	4.69	7.38	3.22	2.94	9.01	6.20	92.00	2.33
T ₃ - African Giant Double	58.40	325.81	9.77	15.37	5.58	5.05	10.51	6.86	208.47	4.07
T ₄ - Pusa Narangi Gaiinda	43.33	203.10	6.16	9.70	4.69	4.51	10.21	6.76	152.67	2.80
T ₅ - NAM-2	62.67	642.15	14.77	23.24	10.68	7.07	12.58	8.26	266.53	3.13
T ₆ - Crackerjack Mix	56.00	233.28	6.99	11.00	4.12	3.38	9.32	6.43	134.07	2.27
T ₇ - African Giant	49.13	218.99	6.56	10.33	4.45	4.26	10.35	7.14	88.67	2.40
T ₈ - African Marigold	44.47	126.31	4.29	6.75	2.84	2.73	10.43	7.46	79.33	2.13
SE(m)±	1.49	7.94	0.28	0.38	0.17	0.14	0.31	0.22	4.32	0.10
CD at 5%	4.53	24.08	0.86	1.14	0.52	0.42	0.94	0.68	13.10	0.30

Table.2 Consumer acceptance as influenced by varieties of African marigold under Vidarbha conditions

Treatments	Consumer acceptance (Max score 10)			
	Flower size	Flower colour	Petal compactness	Overall acceptance
T ₁ - African Double Orange	7.53	7.27	7.07	7.40
T ₂ - Pusa Basanti Yellow	5.00	6.07	5.60	5.40
T ₃ - African Giant Double	7.13	7.67	7.40	7.60
T ₄ - Pusa Narangi Gaiinda	6.73	6.87	6.67	6.47
T ₅ - NAM-2	7.80	8.13	8.07	8.00
T ₆ - Crackerjack Mix	6.53	6.67	6.87	6.87
T ₇ - African Giant	5.73	5.87	6.07	6.67
T ₈ - African Marigold	4.80	5.47	5.20	5.00
SE(m)±	0.30	0.24	0.19	0.23
CD at 5%	0.91	0.73	0.58	0.69

The results are in close confirmity with Choudhary *et al.*, (2014), Singh *et al.*, (2008) in marigold.

Significantly maximum yield of flowers plot⁻¹ (14.77 kg) was recorded in NAM-2 which was significantly superior over all other varieties under investigation. However, significantly minimum yield of flowers plot⁻¹ (4.29 kg) was recorded in African Marigold. Similar observations were also observed previously by Choudhary *et al.*, (2014) in marigold, Poornima *et al.*, (2006) in China aster.

The data presented in table 1 revealed that, NAM-2 produced significantly maximum yield of flowers ha⁻¹ (23.24 tonnes ha⁻¹) as compared to other varieties which was found significantly superior over all other varieties under study. However, significantly minimum yield of flowers ha⁻¹ (6.75 tonnes ha⁻¹) was recorded in African Marigold. These results might be due to variation in production of flower yield. Similar results were also reported by Deepa *et al.*, (2016), Poornachandragowda *et al.*, (2016) in marigold.

Quality parameters

The data presented in table 1 and table 2 revealed that, significant differences were observed in quality parameters among the African marigold varieties.

NAM-2 produced significantly maximum weight of flower (10.68 g). Whereas, significantly minimum weight of flower (2.84 g) was recorded in African Marigold. The variation in weight of flower might be due to the variation in size, length of flower and number of petals flower⁻¹. The results are in close agreement with the findings of Narsude *et al.*, (2010), Deepa *et al.*, (2016) in marigold.

As regards diameter of fully opened flower, NAM-2 recorded significantly maximum diameter of fully opened flower (7.07 cm). Whereas, significantly minimum diameter of fully opened flower (2.73 cm) was recorded in African Marigold. The variation in diameter of fully opened flower might be due to the differences in genetic makeup of different varieties used. Similar results were observed by Narsude *et al.*, (2010), Deepa *et al.*, (2016) in marigold.

Significantly maximum length of flower along with pedicel (12.58 cm) was recorded in NAM-2. Whereas, significantly minimum length of flower along with pedicel (9.01 cm) was recorded in Pusa Basanti Yellow. This might be due to the genetic differences of the varieties used and superiority of some varieties over the other. Similar results were also obtained by Vetrivel and Jawaharlal (2014) and Dahiya *et al.*, (2007) in chrysanthemum.

Significantly maximum length of pedicel (8.26 cm) was observed in NAM-2. Whereas, significantly minimum length of pedicel (6.20 cm) was recorded in Pusa Basanti Yellow. The variation in pedicel length might be due to the genetic diversity in different varieties. Similar results were documented by Choudhary *et al.*, (2014) in marigold, Raveendra *et al.*, (2014) in daisy.

NAM-2 recorded maximum number of petals flower⁻¹ (266.53). However, minimum number of petals flower⁻¹ (79.33) was recorded in African Marigold. This might be due to variation in their genetic factor. The results are in close confirmity with the findings of Singh *et al.*, (2008) and Bharathi and Jawaharlal (2014) in African marigold.

Significantly maximum shelf life (4.07 days) was recorded in African Giant Double which was significantly superior over all other

varieties except African Double Orange (3.87 days) to which it was statistically at par. However, significantly minimum shelf life (2.13 days) was recorded in African Marigold. Similar results were also reported by Dewan *et al.*, (2016) in chrysanthemum.

Regarding consumer acceptance of African marigold flower, NAM-2 recorded maximum score for flower size (7.80) which was found at par with African Double Orange (7.53) and African Giant Double (7.13). Whereas, minimum score (4.80) was recorded in African Marigold. NAM-2 scored maximum score for flower colour (8.13) which was found at par with African Giant Double (7.67). However, minimum score (5.47) was recorded in African Marigold. NAM-2 scored maximum score for petal compactness (8.07). Whereas, minimum score (5.20) was recorded in African Marigold. Score for overall acceptability was recorded maximum (8.00) in NAM-2 which was found at par with African Giant Double (7.60) and African Double Orange (7.40). However, minimum score (5.00) was observed in African Marigold. Similar variation was previously observed by Shekara *et al.*, (2013) in daisy.

References

- Bharathi, T. U. and M. Jawaharlal, 2014. Evaluation of African marigold (*Tagetes erecta*. L.) genotypes for growth and flower yield under Coimbatore condition. *Tren. In. Biosci.* 7(16): 2197-2201.
- Choudhary, M., B. S. Beniwal and A. Kumari, 2014. Characterization of marigold genotypes using morphological characters. *Res. On Crops.* 15(4): 839-845.
- Choudhary, M., B. S. Beniwal and A. Kumari, 2014. Evaluation of marigold genotypes under semi-arid conditions of Haryana. *Annals. of Hort.* 7(1): 30-35.
- Dahiya, D. S., S. K. Sehrawat and G. S. Rana, 2007. Evaluation of spray chrysanthemum under semi-arid climatic conditions. *Haryana. J. Hort. Sci.* 36(1-2): 76-77.
- Deepa, V. P., V. S. Patil, C. K. Venugopal, M. S. Biradar and K. Shridhar, 2016. Study on the growth and yield attributes of marigold (*Tagetes spp.*) hybrids under Dharwad condition. *HortFlora Res. Spectrum*, 5(1): 43-47.
- Dewan, N., S. Kumar, S. Sharma and S. Chakraborty, 2016. Evaluation of Chrysanthemum (*Chrysanthemum morifolium* Ramat) genotypes under west Garo hills district, Meghalaya. *HortFlora Res. Spectrum*, 5(3): 189-194.
- Narsude, P. B., A. S. Kadam and V. K. Patil, 2010. Studies on the growth and quality attributes of African marigold (*Tagetes erecta* L.) genotypes under Marathwada condition. *Asian. J. Hort.* 5(2): 407- 410.
- Panase, V. G. and P. V. Sukhatme. 1967. *Statistical methods for agricultural workers*, ICAR, New Delhi.
- Poornachandragowda, G., R. Jayanthi and M. Jogi, 2016. Evaluation of African marigold (*Tagetes erecta* L.) genotypes for growth, yield and xanthophyll content. *Environment and Ecology* 34(2A): 807-810.
- Poornima, D., D. P. Kumar and G. K. Seetharamu, 2006. Evaluation of China aster (*Callestephus chinesis* (L.) ness) genotypes under hill zone of Karnataka. *J. Orna. Hort.* 9(3): 208-2011.
- Raveendra, Y. C., A. M. Shirol, K. S. Nagaraj, B. S. Kulkarni and K. Rachappa, 2014. Performance of daisy (*Aster amellus* L.) genotypes for growth, flowering, yield and quality

- parameters under Northern Dry Zone of Karnataka. *Tren. In. Bios.* 7(12): 1236-1238.
- Shekara, K. H., A. M. Shirol, R. Girisha, B. S. Reddy and T. Anupa, 2013. Flower yield, and consumer acceptance in daisy (*Aster amellus* L.) genotypes. *Intl. J. Agric. Env. Biotech.* 6(1): 127-130.
- Singh, D., S. Kumar., A. K. Singh and P. Kumar, 2008. Assessment of African marigold (*Tagetes erecta*) genotypes in Uttarakhand. *J. Orna. Hort.* 11(2): 112-117.
- Vetrivel, T. and M. Jawaharlal, 2014. Evaluation of chrysanthemum (*Dendranthema grandiflora* Tzelev.) varieties for yield and quality under Subtropical Hills. *Tren. In. Biosci.* 7(14): 1812-1815.