



Assessment of African Marigold (*Tagetes Erecta*) variety Arka Abhi for Growth and Flowering Attributes

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ABSTRACT

The objective of the study was to evaluate the growth and flowering characteristics of African marigold (*Tagetes erecta*) variety Arka Abhi in YSR Kadapa district. The field experiment was carried out at Gopalapuram and Rachapalli villages of YSR Kadapa district, during the rabi 2021 season. The results revealed significant differences in the growth and flowering parameters of Arka Abhi Marigold variety as compared to variety used by the farmer. Arka Abhi recorded the maximum plant height (92 cm) whereas the minimum plant height was observed in Max Yellow (55 cm). The highest number of primary branches per plant was recorded in Arka Abhi (15.4) followed by lowest number of branches in Max Yellow (7.3). The maximum shelf-life was observed in Arka Abhi (5 d), however, the lowest shelf-life (2.5 d) was registered in max yellow.

Keywords: Assessment, Flowering Attributes, Growth, Marigold, Variety.

Marigold (*Tagetes erecta*), a member of the Asteraceae family has long been valued for both its medicinal and decorative uses (Mahantesh *et al*, 2018). African marigolds plants can grow up to three feet, producing large globe-shaped blooms that are ideal for bedding purposes (Dixit *et al*, 2013). Their vibrant orange to yellow flowers blend well with various colour schemes and are also a crucial raw material in industries due to their high content of carotenoids, essential oils and alkaloids (Pérez *et al*, 2006). The flowers are specifically used to extract compounds like 1-limonene, ecomene, 1-linalyl acetate and 1-linalool (Narsude *et al*, 2010). Marigolds thrive in diverse soil types and require a mild climate for optimal growth and abundant flowering.

Marigolds are primarily cultivated for pigment extraction, particularly xanthophyll, which is widely used in the poultry industry to enhance chicken skin colour and egg yolk pigmentation. Commercial extraction of carotenoids from marigolds is concentrated in regions like Cochin (Kerala), Hyderabad (Telangana), Satyamangalam forest (Tamil Nadu) and Telagi near Harihar and Bangalore (Karnataka). It has been observed that marigold varieties exhibit a lot of variation for flowering characters, which varies with varieties (Sreekala *et al*, 2002). The performance of marigold cultivars varies significantly with region, season and growing conditions (Tomar *et al*, 1972). A variety that

thrives well in one location may perform poorly in another with different climatic conditions. Thus, evaluating and selecting high-yielding and biotic stress-resistant varieties suitable for specific agro-climatic regions is essential. Despite of this, farmers often rely on recommendations from peers or seed retailers, lacking awareness of region-specific varieties (Palthe *et al*, 2019). Hence, evaluating of new marigold variety arka abhi in the YSR Kadapa district of Andhra Pradesh was crucial for identifying variety with desirable growth and flowering traits. This will enable farmers to maximize profitability and ensure the sustainability of marigold cultivation. As floriculture advances, there is a growing need to recommend suitable varieties to farmers based on rigorous evaluations, thereby unlocking the full potential of marigold production (Palthe *et al*, 2019)

MATERIALS AND METHODS

The present experiment was conducted at five farmers' fields at Gopalapuram, Rachapalli, and Chinthakomma Dinne Villages of YSR district during rabi seasons of 2021-22. Total annual rainfall of 1168.6 mm rainfall received during the year 2021-22. During rabi season maximum temperature 32.8 °C and minimum temperature of 21.7° C was recorded. The farming situation was irrigated sandy loam soils. The data were analyzed with appropriate statistical method as suggested by Panse and Sukhatme (1967). The study conducted in the open field condition and

Table 1. Growth and yield attributes performance of Arka Abhi marigold compared to farmers practicing variety max yellow.

Variety	Plant Height (cm)	Number of Primary branches per plant	Number of flowers per plant	Yield (t/ha)	% increase in yield	Crop duration (days)	Shelf life (days)	Net Income (Rs/ha)	B:C ratio
Arka Abhi	92	15.4	102	13.50	50%	150	5	183500	2.17
Max Yellow	55	7.3	58	9.0		120	2.5	90000	1.66
SD value	14.34	3.65	26.54	2.54		15.67	1.44		
t-value	6.57*	5.78*	9.45*	9.54*		4.65*	5.43*		
p-value	0.000	0.003	0.001	0.00		0.000	0.000		

Plate1: Arka abhi and Max yellow field photos



Arka Abhi



Max Yellow

was properly prepared through ploughing, leveling and manual weeding. Harrowing was done to break the clods, followed by criss-cross ploughing with cultivator, then the field was pulverized by rotavator. During harrowing well-rotten farmyard manure was incorporated @ 10 kg/m² into the soil at the time of field preparation. Fertilizer was applied as NPK @ 10:10:10 kg/ha (Mahanta et al, 2020). Half the quantity of nitrogen and the full dose of phosphorus and potash were applied at the time of transplanting, while the remaining dose of nitrogen was applied one month after transplanting. Planting was done at a spacing of 60 cm × 45 cm.

The various observations were taken on growth and flowering parameters viz., plant height (cm), number of primary branches per plant, number of flowers per plant, yield per kg, percentage of increase in yield, crop duration, shelf life, net income (Rs/ha), B:C ratio. Three readings were taken from each treatment and the data were recorded once in a

peak season of flowering during the experimental period. The results obtained were statistically analysed with SPSS, one way ANOVA and repeated measures mixed ANOVA was carried out for pooled analysis

RESULTS AND DISCUSSION

Growth attributes

Analysis of variance revealed significant differences in traits in Arka Abhi and farmer's variety Max Yellow for growth and flowering characteristics. The vegetative growth parameters of marigold variety Arka Abhi and Max Yellow were evaluated based on plant height (cm), number of primary branches. The data (Table 1) showed a considerable range of variation in plant height among the different Arka Abhi and farmer variety Max Yellow. Significantly, the maximum plant height was recorded in Arka Abhi (92 cm). The minimum plant height was recorded in Max Yellow (55 cm). Plant

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height is a critical varietal trait influenced by the genetic composition of the plant. The variation in plant height among the different varieties may be due to genotypic differences in phenotypic expression of plant height and the impact of environmental factors. This variation in plant height is likely due to the genetic makeup of the varieties, which affects meristematic activity, cell division, and elongation during early growth, as well as the synthesis of phytohormones and the influence of environmental conditions. Similar variation in plant height due to genotypes was also reported by Shobha *et al* (2025), Mahanta *et al* (2020), Prateeksha *et al* (2024), and Bhusaraddi *et al* (2022), Rao *et al* (2005), Singh and Singh, (2006) and Khanvilkar *et al* (2003) in marigold.

Number of primary branches was significantly higher in variety (Arka Abhi 15.4) and lowest in Max Yellow (7.3). Variation in the number of primary branches per plant is attributed to genetic characters. These variations were likely due to the genetic makeup of the varieties, which influence photosynthesis rates and, in turn, the number of branches produced, as well as the effect of environmental factors that affect light interception. Similar results were observed by Palthe *et al* (2019), Prateeksha *et al* (2024), and Sharma *et al* (2021), Singh and Singh, 2005, Jauhari and Singh, (2006), Shobha *et al* (2025) and Bhusaraddi *et al* (2022).

Flowering Attributes

The data (Table 1) showed significant differences among the varieties. The maximum number of flowers was recorded in Arka abhi (102), whereas the lowest was observed in Max yellow (58 gm). Similar variability was also observed by Shobha *et al* (2025), Bhusaraddi *et al* (2022) in different marigold genotypes.

Shelf life

The maximum shelf-life was observed in Arka Abhi (5 days), however, the lowest shelf-life (2.5 days) was registered in max yellow. These result variations in vase-life may be attributed to differential accumulation of carbohydrates from varied leaf production, sensitivity of cultivars to ethylene and genetically framework of the plant. Similar finding reported by Divya *et al* (2018) , Samantray (2018), Ibrahim (2023), Shobha *et al* (2025) in other marigold varieties.

The longest crop duration (150 days) was recorded in Arka Abhi and lowest in the control (120 days). The genetic control of these character and modification in their expression due to environmental factors might be possible causes of observed variation. Similar findings have been also reported by Raghuvanshi and Sharma (2011), Palthe *et al* (2019) and Shubhashish *et al* (2023). The genotypes differed significantly in flower yield/ha. The maximum (13.5 t/ha) flower yield was recorded in Arka Abhi. However, lowest (9 t/ha) was recorded in the control. This result could be due to the vigorous plant stature, enhanced branching, increased flower production, higher flower weight, environmental conditions and also cultural practices which collectively enhanced productivity. These similar results were reported by Kumari *et al* (2025), Kumari and Singh (2022), Narsude *et al* (2010), Mahantesh *et al* (2018) and Palthe *et al* (2019).

Economics

Arka abhi shown high net returns of Rs. 1,83,400/ ha with B: C ratio of 1:2.17, where as max yellow net returns were Rs. 90,000/ha with B:C ratio 1:1.66. Arka Abhi showed 50% increased yield with good market preference. The long crop duration improves the profit. Similar results were reported by Kanwar Pal Singh *et al* (2014).

CONCLUSION

It was concluded that cultivation of Arka Abhi shown superior performance in YSR district, Andhra Pradesh and cultivation was beneficial due to their traits. On the basis of results obtained it can be said that among the varieties, Arka Abhi was found superior in yield and yield attributing parameters. Hence farmers realized to achieve maximization of marketable crop yield by cultivating Arka Abhi in YSR district.

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Received on 20/07/2025 Accepted on 26/08/2025