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EFFECT OF DATES OF PLANTING ON COMPARATIVE PERFORMANCE OF ARKA HYBRIDS WITH POPULAR HYBRID ON GROWTH AND YIELD OF MARIGOLD UNDER CENTRAL TELANGANA CONDITIONS

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ABSTRACT

The present investigation entitled "effect of dates of planting on comparative performance of Arka hybrids with popular hybrid on growth yield and of Marigold under Central Telangana conditions" was carried out in the year 2024-2025 at Post Graduate Institute of Horticultural Sciences, SKLTGHU, Mulugu, Telangana. The experiment was conducted using a Factorial Randomized Block Design (FRBD) with two factors: Factor 1 - Dates of planting (September 30th, October 15th, October 30th, November 15th, and November 30th), and Factor 2 - Hybrids (Arka Abhi, Arka Bhanu, and Bengal yellow 359 F_1). The study comprised fifteen treatment combinations (T_1 to T_{15}), each replicated three times. Treatments were as follows: T_1 – D_1H_1- September 30th + Arka Abhi, T_2 – D_1H_2- September 30th + Arka Bhanu, T_3 – D_1H_3 - September 30th + Bengal yellow 359 F_1, T_4 – D_2H_1- October 15th + Arka Abhi, T_5 – D_2H_2- October 15th + Arka Bhanu, T_6 – D_2H_3- October 15th + Bengal yellow 359 F_1, T_7 – D_3H_1- October 30th + Arka Abhi, T_8 – D_3H_2- October 30th + Arka Bhanu, and T_9 – D_3H_3- October 30th + Bengal yellow 359 F_1, T_{10} – D_4H_1- November 15th + Arka Abhi, T_{11} – D_4H_2- November 15th + Arka Bhanu, T_{12} – D_4H_3- November 15th + Bengal yellow 359 F_1,T_{13} – D_5H_1- November 30th + Arka Abhi, T_{14} – D_5H_2- November 30th + Arka Bhanu, T_{15} – D_5H_3- November 30th + Bengal yellow 359 F_1. Among planting dates, September 30th planting recorded with maximum plant height (83.34 cm), plant spread (E-W) (60.13 cm), plant spread (N-S) (58.94 cm), number of primary branches per plant (15.92), number of secondary branches per plant (87.44), stem diameter (23.38 mm), yield per plant (716.81 g), per plot (12.90 kg), per hectare (21.50 t) and highest number of pickings (5) per month. Among hybrids, Arka Abhi recorded the maximum plant height (75.15 cm). In contrast, Arka Bhanu showed superiority in other traits, wider plant spread (E-W) (64.15 cm), plant spread (N-S) (62.58 cm), higher number of primary branches (15.76), secondary branches (74.28) thicker stem diameter (24.63 mm), maximum yield per plant (707.39 g), per plot (12.73 kg), per hectare (21.22 t) and highest number of pickings (4.07) per month. In interaction effects, D_1H_1 (September 30th + Arka Abhi) produced the tallest plants (93.78 cm). In contrast D_1H_2(September 30th + Arka Bhanu) showed superiority in other traits, maximum plant spread E-W (70.88 cm), plant spread N-S (69.86 cm), number of primary branches (17.67), stem diameter (27.24 mm), maximum yield per plant (786.92 g), per plot (14.16 kg) and per hectare (23.61 t). This study concludes that September 30th planting is best for marigold hybrids in Central Telangana conditions, resulting in superior growth and maximum yield.

***Key words*:** Marigold, Dates of planting, Growth and yield parameters.

Introduction

Marigold (*Tagetes erecta*), a member of the Asteraceae family, is one of the most widely cultivated flowers worldwide. Native to Mexico, it plays a major role in loose flower trade (Kar and Patra, 2022). Marigold, known for its easy cultivation, adaptability, bright long-

lasting blooms, and low maintenance, is increasingly cultivated in India for garlands, decorations, religious offerings, and ornamental purposes (Swaroop *et al*., 2007).

Marigold provides pigments, dyes, essential oils, and lutein for diverse uses, while its cultivation enhances farmer income, adds value, and supports sustainable farming by reducing soil nematodes (Adhikary and Vishwavidyalaya, 2020). Marigold growth and flowering depend on day length, temperature, and genotype, with planting time being key, while staggered planting ensures year-round supply and better yield (Kumar *et al*., 2019).

Marigold is a major commercial flower crop in India, widely sold as loose flowers for garlands and used in religious and social functions (Singh *et al.*, 2020). Marigold possesses medicinal and nematicidal properties and is recommended as a trap crop with tomato and onion to manage fruit borer in IPM systems (Meena *et al*., 2015). Marigold, a major loose flower crop, is prized for its hardiness, bright colors, and adaptability to diverse soils and climates, making it popular among both novice and experienced growers (Raut and Sarawgi, 2019).

Arka Abhi, a marigold hybrid from ICAR-IIHR Bangalore, bears large bright yellow double type flowers with a shelf life of 5.93 days and 477.6 mg/100g carotenoid content. It is also resistant to powdery mildew and leaf spot. Arka Bhanu, a hybrid developed by IICAR-IIHR, produces attractive double-petaled yellow flowers on moderately tall, bushy plants. It has a shelf life of 4.51 days with a carotenoid content of 233.97 mg/100g. (Ibrahim *et al*., 2023).

Bengal Yellow 359 F_1 is a high-yielding hybrid with large, double-petaled deep yellow blooms and a compact, bushy habit. Its disease resistance and long flowering period make it ideal for both gardens and commercial cultivation.

Materials and Methods

A field experiment was conducted during the *Rabi* season of 2024-25 at Post Graduate Institute for Horticultural Sciences, Mulugu is located at a latitiude of 17.721375° North and a longitude of 78.62577° East. 451 meters above mean sea level, situated in a semi-arid tropical climatic zone. The soil is sandy loamy in texture. The study was laid out in a factorial randomized block design (FRBD) with two factors: Factor 1 - Dates of planting (September 30th, October 15th, October 30th, November 15th and November 30th) and Factor 2 - Hybrids (Arka Abhi, Arka Bhanu and Bengal Yellow 359 F_1). The study comprised fifteen treatment combinations (T_1 to T_{15}), each replicated three times. Treatments were as follows: T_1 – D_1H_1- September 30th + Arka Abhi, T_2 – D_1H_2- September 30th + Arka Bhanu, T_3 – D_1H_3 - September 30th + Bengal yellow 359 F_1, T_4 – D_2H_1- October 15th + Arka Abhi, T_5 – D_2H_2- October 15th + Arka Bhanu, T_6 – D_2H_3- October 15th + Bengal yellow 359 F_1, T_7 – D_3H_1- October 30th + Arka Abhi, T_8 – D_3H_2- October 30th + Arka Bhanu and T_9 – D_3H_3-October 30th + Bengal yellow 359 F_1, T_{10} – D_4H_1- November 15th + Arka Abhi, T_{11} – D_4H_2- November 15th + Arka Bhanu, T_{12} – D_4H_3- November 15th + Bengal yellow 359 F_1,T_{13} – D_5H_1- November 30th + Arka Abhi, T_{14} – D_5H_2- November 30th + Arka Bhanu, T_{15} – D_5H_3- November 30th + Bengal yellow 359 F_1. Marigold seeds from ICAR-IIHR, Bangalore were sown on five dates. After 30 days, healthy seedlings were transplanted in the main field at 60 × 45 cm spacing. From each treatment and replication, five plants were randomly selected for observations. Data on plant height (cm), plant spread (E-W) (N-S) (cm), number of branches, stem diameter (cm), yield per plant (g), per plot (kg), per hectare(t) and number of pickings/ month. Data from the plants were averaged over three replications and analyzed using ANOVA (Panse and Sukhatme, 1985). SEm and CD at 5% level were calculated to test significance.

Results and Discussion

Plant height (cm)

Plant height was significantly impacted by the dates of planting. D_1 - September 30th planting had the highest plant height (83.34 cm), followed by D_2 - October 15th planting (75.27 cm) and D_5- November 30th planting had the lowest plant height (48.89 cm). Among hybrids maximum plant height in H_1 - Arka Abhi (75.15 cm) followed by H_2 - Arka Bhanu (71.16 cm) and lowest in H_3- Bengal Yellow 359 F_1 (53.05 cm). The interaction effect of dates of planting and hybrids on plant height was the highest plant height (93.78 cm) was reported for the treatment combination D_1H_1 - September 30th + Arka Abhi which was on par to D_1H_2 - September 30th + Arka Bhanu (88.67 cm), conversely, D_5H_3 - November 30th + Bengal Yellow 359 F_1 had the smallest plant height (39.09 cm). Similar findings reported by Jyothi *et al*., (2018), Yadram *et al*., (2015), Dhakal *et al*., (2021).

Plant spread E-W (cm)

The effect of different dates of planting maximum (60.13 cm) plant spread (E-W) was recorded in D_1 - September, which was on par with D_2 - October 15th planting (56.88 cm) and the lowest (43.38 cm) was recorded in D_5 - November 30th planting. Among hybrids H_2 - Arka Bhanu noted maximum (64.15 cm) plant spread significantly followed by H_1 - Arka Abhi (54.49 cm) and

Table 1: The effect of dates of planting on comparative performance of Arka hybrids on growth and yield parameters of Marigold under Central Telangana conditions.

Treatments	Plant height (cm)	Plant spread (E-W) (cm)	Plant spread (N-S) (cm)	No. of primary branches per plant	No. of secondary branches per plant	Stem diameter (mm)	Flower yield per plant (g)	Flower yield per plot (kg)	Flower yield per hectare (t)	Number of pickings /Month
Dates of planting										
D1	83.34	60.13	58.94	15.92	87.44	23.38	716.81	12.90	21.50	5.00
D2	75.27	56.88	54.89	14.98	76.87	22.27	691.82	12.45	20.75	4.67
D3	68.84	55.51	52.67	14.31	64.27	21.77	652.63	11.75	19.58	3.89
D4	55.94	48.60	46.16	13.11	50.89	21.31	608.59	10.95	18.26	3.33
D5	48.89	43.38	40.31	12.29	43.91	20.16	568.40	10.23	17.05	2.33
S.Em ±	1.13	1.27	1.15	0.27	2.10	0.39	13.23	0.24	0.40	0.11
CD @ 5%	3.27	3.68	3.33	0.79	0.68	1.14	38.32	0.69	1.15	0.33
Hybrids										
H1	75.15	54.49	51.13	14.45	68.29	21.90	643.00	11.57	19.29	3.87
H2	71.16	64.15	62.58	15.76	74.28	24.63	707.39	12.73	21.22	4.07
H3	53.05	40.06	38.09	12.15	51.45	18.79	592.56	10.67	17.78	3.60
S.Em ±	0.87	0.98	0.89	0.21	1.63	0.30	10.25	0.18	0.31	0.09
CD @ 5%	2.53	2.85	2.58	0.61	4.71	0.88	29.68	0.53	0.89	0.26
Interaction										
T1 - D1H1	93.78	62.24	60.55	15.40	91.67	22.31	708.96	12.76	21.27	5.00
T2 - D1H2	88.67	70.88	69.86	17.67	98.40	27.24	786.92	14.16	23.61	5.00
T3 - D1H3	67.56	47.27	46.41	14.70	72.27	20.58	654.54	11.78	19.64	5.00
T4 - D2H1	86.12	55.14	52.32	15.13	80.20	21.23	680.73	12.25	20.42	4.67
T5 - D2H2	78.71	69.56	67.92	17.33	89.20	26.50	762.01	13.72	22.86	5.00
T6 - D2H3	60.99	45.93	44.43	12.47	61.20	19.08	632.71	11.39	18.98	4.33
T7- D3H1	75.03	52.38	49.84	14.40	68.73	22.41	646.97	11.65	19.41	4.00
T8 - D3H2	74.54	68.35	66.25	15.67	71.87	23.95	713.55	12.84	21.41	4.00
T9 - D3H3	56.95	45.81	41.93	12.87	52.20	18.94	597.39	10.75	17.92	3.67
T10 - D4H1	67.62	51.92	47.12	14.33	55.60	22.12	608.74	10.96	18.26	3.33
T11 - D4H2	59.53	60.65	58.91	14.53	59.33	23.30	658.11	11.85	19.74	3.67
T12 - D4H3	40.66	33.23	32.46	10.47	37.73	18.51	558.92	10.06	16.77	3.00
T13 - D5H1	53.23	50.77	45.82	13.00	45.27	21.44	569.61	10.25	17.09	2.33
T14 - D5H2	54.35	51.30	49.94	13.60	52.60	22.17	616.33	11.09	18.49	2.67
T15 - D5H3	39.09	28.07	25.19	10.27	33.87	16.87	519.26	9.35	15.58	2.00
S.Em ±	1.95	2.20	1.99	0.47	3.64	0.68	22.91	0.41	0.69	0.20
CD @ 5%	5.66	6.37	5.77	1.37	NS	1.97	66.37	1.28	1.28	NS

Dates of planting (D) - $\mathbf{D_1}$- September 30th, $\mathbf{D_2}$- October 15th, $\mathbf{D_3}$- October 30th, $\mathbf{D_4}$- November 15th, $\mathbf{D_5}$-November 30th
Hybrids (H) - $\mathbf{H_1}$ – Arka Abhi, $\mathbf{H_2}$ – Arka Bhanu, $\mathbf{H_3}$ – Bengal Yellow 359 F_1

lowest (40.06 cm) plant spread in H_3 - Bengal Yellow 359 F_1. A significant interaction between planting dates and hybrids the highest plant spread (70.88 cm) was recorded in the treatment combination D_1H_2 - September 30th + Arka Bhanu, which was on par with D_2H_2 - October 15th + Arka Bhanu (69.56 cm) and D_1H_3 - October 30th (68.35 cm), the lowest plant spread (28.07 cm) was noted in D_5H_3- November 30th + Bengal Yellow 359 F_1.

Plant spread N-S (cm)

Effect of different dates of planting maximum (58.94 cm) plant spread (N-S) was recorded in D_1 - September 30th, followed by (54.89 cm) in D_2 - October 15th planting and the lowest plant spread (40.31 cm) was recorded in D_5- November 30th planting. Among hybrids H_2 - Arka Bhanu noted maximum plant spread (62.58 cm) significantly followed by H_1- Arka Abhi (51.13 cm) and lowest (38.09 cm) plant spread in H_3- Bengal yellow 359 F_1. A significant interaction between planting dates and hybrids the highest spread (69.86 cm) was recorded in the treatment combination D_1H_2 - September 30th + Arka Bhanu, which was on par with D_2H_2 - October 15th + Arka Bhanu (67.92 cm) and D_3H_2 - October 30th + Arka

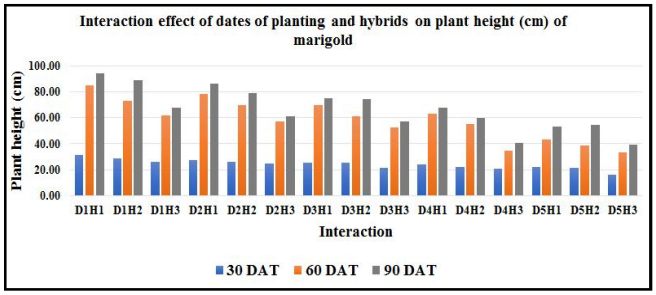

Fig. 1: Interaction effect of dates of planting on comparative performance of Arka hybrids with popular hybrid on plant height (cm) at 30, 60 and 90 DAT of marigold (*Tagetus erecta* L.) [**Dates of planting (D) - D_1**- September 30th**, D_2**- October 15th**, D_3**- October 30th**, D_4**- November 15th**, D_5**-November 30th; **Hybrids (H) - H_1** – Arka Abhi, **H_2** – Arka Bhanu**, H_3** – Bengal Yellow 359 F_1]

Bhanu (66.25) and the minimum spread (25.19 cm) was noted in D_5H_3 - November 30th + Bengal Yellow 359 F_1. Similar findings of more plant spread reported by Lakshmi *et al.*, (2014) and Singh *et al.*, (2015), Dhakal *et al.*, (2021) in marigold, Laxmi and Pratap (2011) in chrysanthemum.

Number of Primary branches per plant

The number of primary branches per plant was significantly influenced by the different planting dates. The highest number of primary branches was observed in the D_1- September 30th planting (15.92), followed by the D_2- October 15th planting (14.98) and the lowest number of primary branches (12.29) was recorded in the D_5 - November 30th planting. Among Hybrids highest number of primary branches was observed in H_2 - Arka Bhanu (15.76), followed by H_1 - Arka Abhi (14.45) and the lowest number of primary branches (12.15) was recorded in H_3 - Bengal Yellow 359 F_1. The interaction effect of different dates of planting and hybrids number of primary branches was significant the treatment combination D_1H_2- September 30th + Arka Bhanu

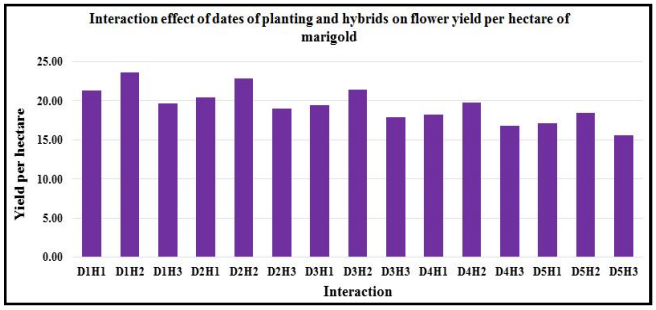

Fig. 2: Interaction effect of dates of planting on comparative performance of Arka hybrids with popular hybrid on flower yield per hectare of marigold (*Tagetus erecta* L.) [**Dates of planting (D) - D_1**- September 30th**, D_2**- October 15th**, D_3**- October 30th**, D_4**- November 15th**, D_5**- November 30th; **Hybrids (H) - H_1** – Arka Abhi, **H_2** – Arka Bhanu**, H_3** – Bengal Yellow 359 F_1]

recorded the maximum (17.67) number of primary branches, which was on par with (17.33) was observed in D_1H_1 - October 15th + Arka Bhanu and the lowest (10.27) number of primary branches were recorded in D_5H_3 - November 30th + Bengal Yellow 359 F_1.

Number of Secondary branches per plant

The effect of dates of planting on number of secondary branches per plant significantly maximum was recorded in D_1- September 30th planting (87.44), followed by D_2- October 15th planting (76.87) and the lowest number of secondary branches (43.91) were recorded in D_5- November 30th planting. Among Hybrids the highest number was observed in H_2 - Arka Bhanu (74.28), followed by H_1 - Arka Abhi (68.29) and the lowest number of secondary branches (51.45) were recorded in H_3 - Bengal Yellow 359 F_1. The results showed the interaction effect on different dates of planting and hybrids had no significant difference for number of secondary branches per plant. Similar findings of more plant spread reported by Jyothi *et al.*, (2018), Yadram *et al.*, (2015), Pakhale (2011), Singh *et al.*, (2015) in marigold.

Stem diameter (mm)

Stem diameter showed significant variation based on the planting dates. The highest stem diameter (23.38 mm) was observed in the D_1 - September 30th planting, which was on par to D_2 - October 15th planting (22.27 mm) and the smallest stem diameter (20.16 mm) was recorded in the D_5 - November 30th planting. Among hybrids thickest stem diameter was recorded in H_2 - Arka Bhanu (24.63 mm), followed by H_1 - Arka Abhi (21.90 mm), while the thinnest stem diameter was observed in H_3 - Bengal Yellow 359 F_1 (18.79 mm). The interaction between planting dates and hybrids the highest stem diameter was recorded in D_1H_2 - September 30th + Arka Bhanu (27.24 mm), which was statistically on par with D_2H_2 - October 15th + Arka Bhanu (26.50 mm) and the lowest stem diameter (16.87 mm) was observed in D_5H_3 - November 30th + Bengal Yellow 359 F_1. Similar findings of Smita *et al.*, (2012), Sahu (2021) in marigold.

Yield parameters

Flower yield per plant (g)

The effect of different dates of planting on flower

Fig. 3: Different hybrids of marigold (*Tagetus erecta* L.).

yield per plant was significantly maximum flower yield per plant (716.81 g) was achieved in D_1- September 30th planting, which was on par with D_2- October 15th planting (691.82 g), Whereas, the minimum flower yield per plant was noted in D_5- November 30th planting (568.40 g). Among hybrids maximum flower yield per plant (707.39 g) was observed in H_2 - Arka Bhanu followed by (643 g) in H_1 - Arka Abhi and minimum flower yield per plant (592.56 g) in H_3 - Bengal Yellow 359 F_1. The interaction effect between planting dates and hybrids the maximum yield per plant was achieved with the treatment D_1H_2 - September 30th + Arka Bhanu (786.92 g), which was on par with D_2H_2 - October 15th + Arka Bhanu (762.01 g) and the minimum flower yield per plant was recorded in D_5H_3 - November 30th + Bengal Yellow 359 F_1 (519 g). The results are in agreement with the findings of Anil *et al*., (2015), Dhakal *et al*., (2021), Sahu (2021), Bisht *et al*., (2021) in marigold.

Flower yield per plot (kg)

The different dates of planting had maximum flower yield per plot (12.90 kg) was recorded in D_1- September 30th planting, which was on par with D_2- October 15th planting (12.45 kg) and the minimum flower yield per plot (10.23 kg) was noted in D_5- November 30th planting. Among hybrids the maximum yield per plot (12.73 kg) was recorded in H_2- Arka Bhanu, followed by (11.57 kg) in H_1 - Arka Abhi and minimum flower yield per plot (10.67 kg in H_3 - Bengal Yellow 359 F_1. The interaction effect of planting dates and hybrids had the highest yield per plot was obtained from D_1H_2 - September 30th + Arka Bhanu (14.16 kg), which was on par to D_2H_2 - October 15th + Arka Bhanu (13.72 kg). In contrast, the lowest plot yield was recorded in D_5H_3- November 30th + Bengal Yellow 359 F_1 (9.35 kg). These results are consistent with the findings of Jyothi *et al*., (2018), Anil *et al*., (2015), Dhakal *et al*., (2021) in marigold.

Flower yield per hectare (tonnes)

The different dates of planting had significantly highest flower yield per hectare (21.50 t/ha) was observed in D_1 - September 30th planting, which was on par with D_2 - October 15th planting (20.75 t/ha) and the minimum flower yield per hectare (17.05 t/ha) was noted in D_5 - November 30th planting. A significant effect of hybrids on flower yield per hectare was observed. The highest yield (21.22 t/ha) was obtained from H_2- Arka Bhanu, followed by H_1- Arka Abhi with (19.29 t/ha). The lowest yield (17.78 t/ha) was recorded in H_3 - Bengal Yellow 359 F_1. The interaction between planting dates and hybrids the highest yield was recorded in D_1H_2 - September 30th + Arka Bhanu (23.61 t/ha), which was on par with D_2H_2 - October 15th + Arka Bhanu (22.86 t/ha) and the lowest yield per hectare was obtained from D_5H_3 - November 30th + Bengal Yellow 359 F_1 (15.58 t/ha). These results support the findings of Pakhale (2011), Mohanty *et al*., (2015) and Sahu (2021) in marigold.

Number of pickings / months

Different planting dates had a significant effect on the number of pickings per month. The highest number of pickings (5.00) was recorded in D_1 - September 30th, planting which was statistically on par with D_2 - October 15th planting (4.67) and the lowest number of pickings per month (2.33) was observed in D_5 - November 30th planting. Among hybrids the number of pickings per month was observed. The highest number of pickings (4.07) was obtained from H_2 - Arka Bhanu, which was on par with by H_1 - Arka Abhi (3.87). The minimum number of pickings per month (3.60) was recorded in H_3 - Bengal Yellow 359 F_1. The interaction effect of different planting dates and hybrids had no significant effect on the number of pickings per month.

Conclusion

The findings indicated that planting dates had a notable influence on the growth and yield of marigold hybrids. Out of the five planting dates tested, D_1 - September 30th planting (21.5 t/ha) was the most suitable, ensuring the best overall growth and yield. Among the hybrids, Arka Bhanu (H_2) produced the highest yield of 21.22 t ha{ ¹, showing clear superiority over the other hybrids. The treatment combination D_1H_2 - September 30th planting with Arka Bhanu (23.61 t/ha) recording maximum growth and yield under Central Telangana conditions.

References

Adhikary, K. and Vishwavidyalaya M. (2020). Management of temple floral waste and utilization of value-added floral waste product: a review. *International Journal for Environmental Rehabilitation and Conservation*. **11**, 120-128.

Anil, K.S., Udit K. and Arun K. (2015). Effect of planting date and spacing on performance of African marigold (*Tagetes erecta* Linn) cv. Pusa Narangi Gainda under North Bihar agro-ecological conditions. *International Journal of Forestry and Crop Improvement*. **6(1)**, 16-20.

Bisht, A., Rao V.K. and Dimri D.C. (2021). Studies on flowering behaviour of double type varieties of African marigold (*Tagetes erecta* L.) in different seasons under Uttarakhand conditions. *Pantnagar Journal of Research*. **19(2)**, 159-165.

Dhakal, M., Pun A.B. and Bhattarai S. (2021). Effect of different planting time and varieties on growth and yield of African marigold (*Tagetes erecta*) in the Kavre district, Nepal.

Nepal Journal of Science and Technology. **20(1)**, 20-28.

Ibrahim, I., Prasanth P., Jyothi G., Salma Z. and Praneeth kumar S. (2023). Study on the performance of new African Marigold (*Tagetes erecta* L.) genotypes. *The Pharma Innovation Journal*. **12(10)**, 1783-1786.

Jyothi, K., Goud C.R., Girwani A. and Kumar T.S. (2018). Studies on the effect of planting dates and levels of pinching on growth, flowering and yield in marigold (*Tagetes erecta* L.) cv. 'Arka Agni'. *International Journal of Current Microbiology and Applied Sciences*. **7**, 2705-13.

Kar, S. and Patra S. (2022). A Review on Marigold (*Tagetes erecta* Linn): the Phytochemicals Present and its Biological activities. *Prayogik Rasayan*. **6(4)**, 50-58.

Kumar, V., Singh R.S., Pal M., Ojha M.D., Verma R.B., Verma R.K., Kumar N. and Singh A.P. (2019). Growth and flower yield attributes of African marigold (*Tagetes erecta* L.) as influenced by planting geometry and varieties. *Journal of Pharmacognosy and Phytochemistry* **8**, 819-22.

Lakshmi, Rajesh K. Pandey, Sheetal Dogra, Nomita Laisharm, Deepji Bhat, Arvinder Singh and Shivani Jamwal (2014). Studies on effect of planting dates and spacing in African marigold (*Tagetes erecta* L.) *Progressive Horticulture*. **46(1)**, 149-152.

Laxmi, P. and Pratap M. (2011). Effect of dates of planting on growth, flowering and yield of different Chrysanthemum (*Dendronthema grandiflora* L.) cultivars. *Research on Crops*. **12(3)**, 813-816.

Meena, Y., Sirohi H.S., Tomar B.S. and Kumar S. (2015). Effect of planting time, spacing and pinching on growth and seed yield traits in African marigold (*Tagetes erecta* L.) cv. Pusa Narangi Gainda. *Indian Journal of Agricultural Sciences*. **85(6)**, 797-801.

Mohanty, C.R., Mohanty A. and Parthi R. (2015). Effect of planting dates and pinching on growth and flowering in African marigold cv. Sirakole. *The Asian Journal of Horticulture*. **10(1)**, 95-99.

Pakhale, S. (2011). Response of African marigold varieties to different planting time. M. Sc. (Horticulture) thesis, PDKV, Akola.

Panse, V.G. and Sukhatme P.V. (1985). Statistical Methods for Agricultural Workers. ICAR, New Delhi.

Raut, Y. and Sarawgi A.K. (2019). Trend analysis and growth rate of area, production and productivity of Marigold flower in Ratlam districts of Madhya Pradesh. *International Journal of Current Microbiology and Applied Sciences*. **8(6)**, 927-931.

Sahu, T.L. (2021). Studies on Effect of Planting Date, Fertigation and Mulch on growth, yield and flower quality of african marigold (*Tagetes erecta* L.) (Doctoral dissertation, INDIRA GANDHI KRISHI VISHWAVIDYALAYA RAIPUR (Chhattisgarh)).

Singh, A.K., Kumar U. and Kumar A. (2015). Effect of planting date and spacing on performance of marigold (*Tagetes erecta* Linn) cv. Pusa Narangi under North Bihar Agro-ecological conditions. *International Journal of Forestry and Crop Improvement*. **6(1)**, 16-20.

Singh, Y., Gupta A. and Kannojia P. (2020). *Tagetes erecta* (Marigold)-A review on its phytochemical and medicinal properties. *Current Medical and Drug Research*. **4(1)**, 1-6.

Smita, P., Golliwar V.J., Panchabhai D.M., Prathana J. and Sonali D. (2012). Response of African marigold varieties to different planting time on growth and yield under vidarbha conditions (Maharastra). *Journal of soils and crops*. **22(1)**, 183-187.

Swaroop, K., Singh K.P. and Raju D.V.S. (2007). Vegetative growth, flowering and seed characters of African marigold (*Tagetes erecta* Linn) as influenced by different growth substances during mild off seasons. *Journal of ornamental. Horticulture*. **6(2)**, 134-136.

Yadram, M., Sirohi H.S, Tomar B.S. and Sanjay K. (2015). Effect of planting time, spacing and pinching on growth and seed yield traits in African marigold (*Tagetes erecta*) cv. Pusa Narangi Gainda. *Indian Journal of Agricultural Sciences*. **85(6)**, 797-801.