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Effect of time of planting on growth and yield of snapmelon (*Cucumis melo* L. var. *momordica* Roxb. Duthie & J. B. Fuller)

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Abstract
The present investigation entitled "Effect of time of planting on growth and yield in snapmelon (*Cucumis melo* L. var. *momordica* Roxb. Duthie & J. B. Fuller)" was carried out at College of Horticulture, Dapoli, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli Dist. Ratnagiri during year 2024-25. The experiment was laid out in Randomized Block Design with seven treatments as time of planting replicated thrice. The various treatments were T_1 - Planting on 1st week of April, T_2 - Planting on 1st week of May, T_3 - Planting on 1st week of June, T_4 - Plating on 1st week of October, T_5 - Planting on 1st week of November, T_6 - Planting on 1st week of December, T_7 - Planting on 1st week of January. The results indicated significant effect of time of planting on various growth and yield parameters in snapmelon. Among various treatments, T_1 - planting on 1st week of April recorded superior performance with respect to germination and growth parameters such as days for germination (3.00), germination (97.77%), length of vine (4.08 m), number of primary branches (12.13), days to first female flower (26.30), nodal position of first female flower (7.70), fruit set (51.13%) as well as number of fruits per vine (3.57). The planting time T_1 - Planting on 1st week of April significantly influenced yield and yield attributing characters i.e. days to first harvest (68.70), fruit yield/vine (4.71 kg), fruit yield /ha (53.07 t). Thus from present investigation it was concluded that planting in 1st week of April is beneficial with respect to growth, yield as well as for higher return is recommended.

Keywords: Snapmelon, Planting time, growth, yield

1. Introduction
Snapmelon (*Cucumis melo* L. var. *momordica* Roxb. Duthie & J. B. Fuller) is one of the underutilized cucurbits belonging to the family Cucurbitaceae having chromosome number (2n=2x=24). India is considered as secondary centre of origin for snapmelon. It is an old cucurbit species that has immense potential as a vegetable and dessert fruit. Snapmelon is a popular indigenous crop known by different names in various states, such as *Phoot* (meaning "split") or *Phut* in North India, *Chibud* in Goa and coastal Maharashtra, *Hibadihannu* or *Phoottikai* in Karnataka and *Pottuvellari* in kerala. It is native to India and distributed in Bangladesh, Nepal, Pakistan, Thailand and Myanmar. In India, it is commercially cultivated in states like Rajasthan, Punjab, Haryana, Uttar Pradesh, Bihar, Madhya Pradesh, Gujrat and West Bengal. Snapmelon is an annual climber growing to 3-5 m long. It is a monoecious in nature; individual flowers are either male or female, but both sexes can be found on same plant.

Flowering in snapmelon starts from July to September and the fruits ripen from August to October. It has highly aromatic, mild-sweet fruits that split at maturity, thin rind, flaky, mealy and sourish flesh. The fruits range in size from small to large, smooth, and oval or cylindrical in shape with whitish orange to light orange flesh which is mealy somewhat insipid or slightly sour with 4 to 6 ºB TSS. Snapmelon fruits are weighed about (0.90-3.00 Kg) and generally edible at full ripe stage; sometimes at early-mid maturity as vegetable (cultivar '*pottuvellari*' in Southern Kerala and in Central Kerala) is eaten raw as salad, or fruits pulp added with jaggery sugar (Pandey *et al*., 2021) [11]. Fruit cracking is also mainly observed in snapmelon, is either longitudinal or starting in the middle of fruit, though in some instances only skin peeling occurs (Dhillon *et al*., 2007) [5]. Recently, by using different

planting times for increasing yield and output has gained popularity for year round production and marketing of fruits. Commercial growers frequently struggle to choose suitable planting times that yield the ideal harvesting conditions in snapmelon; this is mostly because of variations in temperature between growing seasons or periods. Therefore, in high rainfall areas like a Konkan it is necessary to know suitable planting time for higher and continuous production of snapmelon.

2. Material and methods

The experiment "Effect of time of planting on growth and yield of snapmelon (*Cucumis melo* L. var. *momordica* Roxb. Duthie & J. B. Fuller)" was conducted at College of Horticulture, Dapoli, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dist. Ratnagiri (MS) during year 2024-25. The experiment was laid down in Randomized Block Design (RBD) with seven treatments replicated thrice. The treatments applied were Planting on T_1 - 1st week of April, T_2 - Planting on 1st week of May, T_3 - Planting on 1st week of June, T_4 - Planting on 1st week of October, T_5 - Planting on 1st week of November, T_6 - Planting on 1st week of December, T_7 - Planting on 1st week of January. Seedlings of snapmelon were produced in the nursery, were vermicompost and cocopeat in the ratio of 1:1 used as rooting medium. The seeds of snapmelon were sown in trays on 15th march, 15th April, 15th May, 15th September, 15th October, 15th November, 15th December 2024. The experimental area was 572 sq. m. After field preparations, the seedlings were planted on 10 m long and 1.5 m of wide raised bed at a distance of 60 cm apart from each other as per treatments. Plants were fertilized and irrigated using a drip irrigation system. Ten plants were randomly selected from each plot for recording observations of growth and yield characters.

3. Result and Discussion

The data pertaining to various parameters were statistically analysed and the results obtained from the experiment are presented in Table 1.

3.1 Germination

3.1.1 Days required for germination

The minimum number of days required for germination (3.00) was recorded in T_1 - Planting on 1st week of April and T_2 - Planting on 1st week of May, however the maximum days (6.00) were noted in treatment T_5 - Planting on 1st week of November. Early germination recorded in April planting might be due to availability of ideal temperatures and growing conditions which further might have triggered germination process further resulting in early germination. Similar findings were also recorded in Khan *et al*. (2001) [7] and Ahmad *et al*. (2021) [17].

3.2.2 Germination (%)

The T_1 - Planting on 1st week of April exhibited maximum germination (97.77%) which was at par with T_7 - Planting on 1st week of January (95.55%), whereas minimum germination (68.67%) was recorded in T_3 - Planting on 1st week of June. High germination percentage recorded during April planting can be attributed to availability of warm temperatures, optimum relative humidity and ideal light intensity. Kishor *et al*. (2010) [8] and Ahmad *et al*. (2021) [17] also recorded with significantly high germination percentage during April planting than other planting times.

3.2 Growth parameters

3.2.1 Length of vine (m)

The data regarding the effect of time of planning on vine length were recorded at 30,60 and 90 DAP and presented in Table 2.

At 30 DAP, highest vine length (2.60 m) was recorded in T_1 - Planting on 1st week of April and lowest (1.26 m) was observed in T_3 - Planting on 1st week of June. At 60 DAP, maximum vine length (3.79 m) was reported in T_1 - Planting on 1st week of April was which was at par with T_7 - Planting on 1st week of January (3.66 m), while minimum vine length (1.26 m) was noticed in T_3 - Planting on 1st week of June. At 90 DAP, highest vine length (4.08 m) was observed in T_1 - Planting on 1st week of April which was at par with T_7 - Planting on 1st week of January (3.66 m), however lowest vine length (2.33 m) was noticed in T_3 - Planting on 1st week of June. Higher vine length in April planting might be due to availability of an ideal microclimate which might have promoted plant metabolic processes like photosynthesis and which accelerates growth. Moreover, early planting encouraged proper light utilization, vegetative development and nutrient uptake which promotes plant height. Similar results were also reported by Anusha *et al*. (2021) [1] and Gola *et al*. (2024) [6].

3.2.2 Number of primary branches

The data regarding number of primary branches was presented in Table 3 and evidently revealed that effect of time of planting on number of primary branches affected significantly at all the growth stages i.e. 30, 60 and 90 DAP. At 30 DAP, the maximum number of primary branches (6.13) were observed in T_1 - Planting on 1st week of April which was at par with T_7 - Planting on 1st week of January (5.25), while minimum number of primary branches (3.10) were observed in T_3 - Planting on 1st week of June. At 60 DAP, the highest number of primary branches (10.17) were observed in the treatment T_1 - Planting on 1st week of April which was at par with treatment T_7 - Planting on 1st week of January (9.33), however the lowest number of primary branches (6.70) were noticed in treatment T_3 - Planting on 1st week of June. At 90 DAP, the T_1 - Planting on 1st week of April had exhibited the maximum number of primary branches (12.13) which was at par with treatment T_7 - Planting on 1st week of January (11.07), though minimum number of primary branches (9.73) were noted in treatment T_3 - Planting on 1st week of June. April planting resulted in a higher number of primary branches per plant which might be because of availability of congenial environmental conditions. Longer growing seasons and ideal day length and temperature has significantly enhanced the number of primary branches. These outcomes are in line with conclusions reported by Kumar *et al*. (2017) [9], Anusha *et al*. (2021) [1] and Gola *et al*. (2024) [6].

3.2.3 Days to 1st female flower

An examination of data in Table 3 revealed that planting times had a significant effect on days to 1st female flower of snapmelon. The minimum number of days required for 1st female flower (26.30 days) were recorded in T_1 - Planting on 1st week of April which was at par with T_6 - Planting on 1st week of December (27.50) and T_7 - Planting on 1st week

of January (28.43) whereas, the maximum days for 1st female flower (44.63) were found in T_3 - Planting on 1st week of June. The early appearance of female flower in snapmelon may have resulted from the favourable temperature that prevailed during April planting, which was found to be favourable for endogenous production of some hormones. The similar findings were also reported by Pandit *et al*. (2010) [12] and Sarkar *et al*. (2013) [15].

3.2.4 Nodal position of first female flower

The 1st female flower appeared on lowest node (7.70) in T_1 - Planting on 1st week of April, whereas the female flower on highest node (14.33) was noticed in T_3 - Planting on 1st week of June. Planting in 1st week of April facilitated the ideal microclimate which favoured the conditions like early vegetative and reproductive development, causing a female flower emerge at lower nodes. These outcomes were line with conclusions of Pandit *et al*. (2010) [12], Poonam *et al*. (2023) [14] and Bathula *et al*. (2024) [2].

3.2.5. Number of fruits per vine

The T_1 - Planting on 1st week of April produced maximum number of fruits per vine (3.57), however minimum number of fruits per vine (1.73) was observed in T_3 - Planting on 1st week of June. Planting during April was found to be superior may due to favourable environment and enhanced nutrient availability resulted in increased vine length and number of primary branches. Warm and dry weather in April encourages insect activity, especially of pollinators, increasing fruit set and pollination efficiency which further resulted in more fruits per vine. These results are in line with results reported by Khan *et al*. (2001) [7], Sarkar *et al*. (2013) [15] and Ahmad *et al*. (2021) [17].

3.2.6 Fruit set (%)

The maximum fruit set (51.13%) was recorded in T_7 - Planting on 1st week of January, though minimum fruit set (25.58%) was observed in T_4 - Planting on 1st week of October. In the month of January low temperatures and short-day conditions, led to higher number of female flowers and also encourages insect activity particularly pollinators which can led to higher fruit set percentage. Similar were also recorded by Singh *et al*. (2016) [16], Cheena *et al*. (2018) [4] and Poonam *et al*. (2023) [14].

3.3 Yield attributing characters

The results given in Table 5 indicated that planting times has significant effect on yield and yield attributing characters.

3.3.1 Days to first harvest

The minimum days required for first harvest (68.70) were exhibited in T_1 - Planting on 1st week of April which was at par with T_2 - Planting on 1st week of April (69.77), while the maximum number of days (79.93) were noticed in T_6 - Planting on 1st week of December. Ideal climatic conditions in month of April enhanced the vegetative and floral development. Due to earliness of female flowers and faster fruit development, ultimately leading to early harvest. Similar results were recorded by Mohanty *et al*. (2023) [10], Pandit *et al*. (2010) [12] and Poonam *et al*. (2023) [14].

3.2.2 Fruit yield per vine (kg)

The maximum yield (4.71 kg/vine) was noticed in T_1 - Planting on 1st week of April, while minimum yield (1.70 kg/vine) was obtained in T_3 - Planting on 1st week of June. The 1st week of April planting resulted in the highest yield per vine because it coincided with ideal climatic conditions, such as warm temperatures and long day conditions, that promote vegetative growth and reproductive development in snapmelon. These findings parallel with the findings reported by Bellad and Hieremath (2018) [3] and Poonam *et al*. (2023) [14].

3.2.3 Fruit yield (t/ha)

The highest fruit yield (53.07 t/ha) was reported in T_1 - Planting in 1st week of April which was observed significantly superior over all treatments, though minimum fruit yield (18.85 t/ha) was observed in T_3 - Planting on 1st week of June. Sarkar *et al*. (2013) [15] and Ahmad *et al*. (2021) [17] reported similar findings.

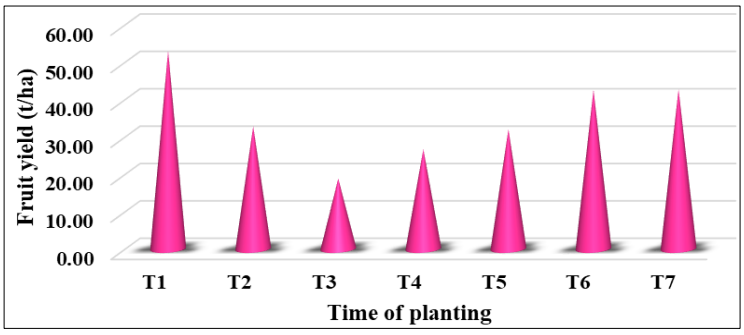

Fig 1: Effect of time of planting on fruit yield/ha (t) in snapmelon

4. Conclusion

From present investigation, it can be concluded that different planting times, recorded significant effect on various germination, growth and yield parameters of snapmelon. The T_1 - Planting on 1st week of April recorded with significantly best performance in relations to germination, growth parameters as well as yield and yield attributing characters. Thus from present investigation it can be concluded that planting on 1st week of April is beneficial with respect to germination, growth and yield and yield attributing characters.

5. Disclaimer (Artificial Intelligence)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT etc.) and text-to-image generators have been used during writing or editing this manuscript.

Table 1: Effect of time of planting on germination (%) and days required for germination in snapmelon

Treatment	Days for germination	Germination (%)
T_1 - Planting on 1st week of April	3.00	97.77
T_2 - Planting on 1st week of May	3.00	92.22
T_3 - Planting on 1st week of June	4.00	68.67
T_4 - Planting on 1st week of October	5.00	74.44
T_5 - Planting on 1st week of November	6.00	81.11
T_6 - Planting on 1st week of December	5.33	94.44
T_7 - Planting on 1st week of January	5.00	95.55
Mean	4.48	86.31
Result	SIG	SIG
S.Em.±	0.13	1.14
C.D @ 5%	0.39	3.51

Table 2: Effect of time of planting on length of vine in snapmelon at 30,60 and 90 days after planting

Treatment	Vine length (m)		
	Days after planting		
	30	60	90
T_1 - Planting on 1st week of April	2.60	3.79	4.08
T_2 - Planting on 1st week of May	1.40	1.98	2.54
T_3 - Planting on 1st week of June	1.26	1.71	2.33
T_4 - Planting on 1st week of October	1.33	1.87	2.50
T_5 - Planting on 1st week of November	1.36	1.91	2.56
T_6 - Planting on 1st week of December	1.30	1.80	2.52
T_7 - Planting on 1st week of January	2.23	3.66	3.91
Mean	1.64	2.39	2.92
Result	SIG	SIG	SIG
S.Em.±	0.09	0.18	0.12
C.D @ 5%	0.28	0.54	0.36

Table.3: Effect of time of planting on number of primary branches in snapmelon at 30,60 and 90 days after planting

Treatment	No. of primary branches		
	Days after planting		
	30	60	90
T_1 - Planting on 1st week of April	6.13	10.17	12.13
T_2 - Planting on 1st week of May	4.50	7.60	10.57
T_3 - Planting on 1st week of June	3.10	6.70	9.73
T_4 - Planting on 1st week of October	4.17	6.83	10.07
T_5 - Planting on 1st week of November	4.30	7.53	10.20
T_6 - Planting on 1st week of December	4.47	8.03	10.80
T_7 - Planting on 1st week of January	5.25	9.33	11.07
Mean	4.65	8.03	10.65
Result	SIG	SIG	SIG
S.Em.±	0.40	0.15	0.10
C.D @ 5%	1.22	0.47	0.30

Table 4: Effect of time of planting on days to first female flower, nodal position of first female flower, number of fruits per vine and fruit set (%) in snapmelon

Treatment	Days to first female flower	Nodal position of first female flower	No. of fruitsper vine	Fruit set (%)
T_1 - Planting on 1st week of April	26.30	7.70	3.57	48.18
T_2 - Planting on 1st week of May	31.93	10.53	2.53	44.78
T_3 - Planting on 1st week of June	44.63	14.33	1.73	26.10
T_4 - Planting on 1st week of October	36.53	11.57	1.83	25.58
T_5 - Planting on 1st week of November	34.97	10.30	2.67	40.22
T_6 - Planting on 1st week of December	27.50	10.83	2.73	47.40
T_7 - Planting on 1st week of January	28.43	10.30	3.00	51.13
Mean	32.90	10.80	2.58	40.48
Result	SIG	SIG	SIG	SIG
S.Em.±	0.74	0.17	0.11	3.51
C.D @ 5%	2.29	0.52	0.35	10.81

Table 5: Effect of time of planting on yield and yield attributing characters of snapmelon

Treatment	Days to first harvest	Fruit yield/vine (kg)	Fruit yield (t/ha)
T_1 - Planting on 1st week of April	68.70	4.71	53.07
T_2 - Planting on 1st week of May	69.77	2.95	32.77
T_3 - Planting on 1st week of June	70.93	1.70	18.85
T_4 - Planting on 1st week of October	75.20	2.40	26.70
T_5 - Planting on 1st week of November	77.77	2.88	32.03
T_6 - Planting on 1st week of December	79.43	3.83	42.59
T_7 - Planting on 1st week of January	76.93	3.85	42.74
Mean	74.10	3.19	35.53
Result	SIG	SIG	SIG
S.Em.±	0.56	0.07	0.75
C.D @ 5%	1.74	0.22	2.31

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