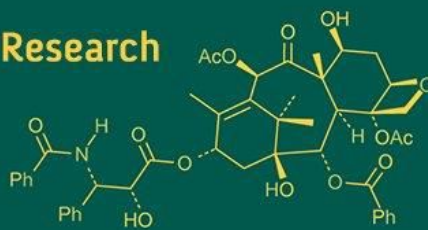


International Journal of Advanced Biochemistry Research



ISSN Print: 2617-4693
ISSN Online: 2617-4707
NAAS Rating: 5.29
IJABR 2025; 9(4): 942-947
www.biochemjournal.com
Received: 22-02-2025
Accepted: 27-03-2025

UD Pansare
Post Graduate Institute,
Department of Horticulture,
Mahatma Phule Krishi
Vidyapeeth, Rahuri,
Ahmednagar, Maharashtra,
India

BB Dhakare
Post Graduate Institute,
Department of Horticulture,
Mahatma Phule Krishi
Vidyapeeth, Rahuri,
Ahmednagar, Maharashtra,
India

AV Kshirsagar
Post Graduate Institute,
Department of Horticulture,
Mahatma Phule Krishi
Vidyapeeth, Rahuri,
Ahmednagar, Maharashtra,
India

Parul Mehra
Post Graduate Institute,
Department of Horticulture,
Mahatma Phule Krishi
Vidyapeeth, Rahuri,
Ahmednagar, Maharashtra,
India

VR Dhakne
Post Graduate Institute,
Department of Horticulture,
Mahatma Phule Krishi
Vidyapeeth, Rahuri,
Ahmednagar, Maharashtra,
India

SV Bocharé
Post Graduate Institute,
Department of Horticulture,
Mahatma Phule Krishi
Vidyapeeth, Rahuri,
Ahmednagar, Maharashtra,
India

Corresponding Author:
UD Pansare
Post Graduate Institute,
Department of Horticulture,
Mahatma Phule Krishi
Vidyapeeth, Rahuri,
Ahmednagar, Maharashtra,
India

Assessing growth and early maturation features in several muskmelon genotypes (*Cucumis melo* L.)

UD Pansare, BB Dhakare, AV Kshirsagar, Parul Mehra, VR Dhakne and SV Bocharé

DOI: <https://www.doi.org/10.33545/26174693.2025.v9.i4k.4254>

Abstract

The selection of parents is critical to the success of any breeding operation. Breeders choose parents with high mean values as an added benefit for hybridization initiatives. The current study aimed to assess the performance of muskmelon genotypes in terms of growth and earliness. Muskmelon (*Cucumis melo* L.) is one of the most well-known desert vegetables, belong to the Cucurbitaceae family. To evaluate 40 genotypes and 1 check of muskmelon the field experiment was conducted at AICRP on vegetable crops, Department of Horticulture, MPKV, Rahuri during viz., 2 February 2022, 8 November 2022, 10 February 2023 and 27 October 2023 in a Randomized Block Design with three replications. The findings indicate that the genotypes RHRMM-4, RHRMM-34, RHRMM-3, RHRMM-8 and RHRMM-133 as elite genotypes were exhibited higher values for different traits like vine length (cm), days to first male flower appearance, days to first female flower appearance, node at which first female flower and days to first fruit harvest. As a result, the above mentioned five genotypes can be used in the hybridization programme, could be exploited to develop elite cultivars with maximum growth and earlier in flowering and harvest.

Keywords: Muskmelon, earliness, genotypes, growth

Introduction

Muskmelon (*Cucumis melo* L.), popularly known as cantaloupe, is the most polymorphic species in the Cucurbitaceae family, notably in terms of fruit characteristics (Luan *et al.*, 2010) [2]. A popular and commercial crop in the tropics and subtropics, muskmelon is a stunning, juicy, delectable fruit that is grown all over the world for its nutritional and therapeutic qualities.

Botanically, it is an annual trailing vine with monoecious flowers. The flower features five gamosepalous sepals and polypetalous yellow petals. The stamens are appendiculate at the connective, with three fused anthers. The ovary is fusiform, covered with dense hairs, lobed, and moist. (Pandey *et al.*, 2021) [3]. Anthesis occurs around 5:30 am, with the stigma becoming receptive 12 hours prior to the day of anthesis. Pollen remains fertile between 5:00 am and 2:00 pm, while anther dehiscence happens between 5:00 and 6:00 am. However, their andromonoecious sex form of most commercial varieties provides the probability of selfing. (Choudhary and Sudhakar, 2010) [1].

On an average, muskmelon fruit pulp contains 5.6 to 36 µg/g of β-carotene in fresh fruit pulp. It also provides 42.2 mg of ascorbic acid per 100 g of its edible portion, which supports a healthy immune system, helps fight bacterial infections, and aids in the prevention of cardiovascular diseases. Besides, melon fruit also possesses carbohydrates (8.36 g), proteins (0.88 g), water (89.7 g), dietary fiber (0.8 g), sugar and essential mineral salts. Its seeds are edible and greatly nutritious contain crude protein (34.4%) and oil (40-44%) which is valuable for painful discharge and suppression of urine (Shashikumar and Pitchaimuthu, 2016) [4].

Annual worldwide production of muskmelon was about 1495 M tons on a harvested area of 66 thousand hector in India. (Anonymous, 2024) [5].

Vegetable productivity can be raised to a greater extent through varietal improvement, with the improvement activity focusing on genotype selection for better yield and superior quality. As a result, the current study aims to analyse the 41 muskmelon genotypes based on their

individual performance and identify the superior genotypes for growth and earliness characteristics.

Materials and Methods

The present experiment consists of 41 genotypes and one check of muskmelon. The plants were grown in three replications with spacing of 2 m x 60 cm over the four seasons *viz.*, 2 February 2022 (summer season), 8 November 2022 (*rabi* season), 10 February 2023 (summer season) and 27 October 2023 (*rabi* season) in a Randomized Block Design with three replications at AICRP on vegetable crops, Department of Horticulture, MPKV., Rahuri. A successful crop was raised by adhering to advised cultural customs. Five plants were randomly selected from each entry in each replication to record observations vine length (cm), days to first male flower appearance, days to first female flower appearance, node at which first female flower and days to first fruit harvest. Analysis of variance of data from each character was calculated by using INDOSTAT on software computer programme. The significant differences test at 1% and 5% of probability was used to test the significance among the mean values.

Results and Discussion

From the data presented in the Table 1. It was seen that the range of variation for vine length among the genotypes was from 110.25 to 289.87 cm in E₁ 97.48 to 258.5 cm E₂ 108.37 to 283.79 cm in E₃ 94.12 to 252.65 cm in E₄ and 104.52 to 262.50 cm in average mean respectively. Among the different environments, genotypes RHRMM-17 (289.87 cm) recorded significantly longer vines in E₁ at par with genotypes RHRMM-27 (283.67 cm), RHRMM-53 (279.12 cm), RHRMM-67 (276.55 cm) and RHRMM-80 (275.26 cm). In E₂, significantly longer vines was recorded by the genotype RHRMM-80 (258.56 cm) followed by RHRMM-17 (220.52 cm) and RHRMM-35 (219.58). In E₃, genotype namely RHRMM-17 (283.79 cm) recorded statistically significant longer vines which was at par with genotypes RHRMM-53 (273.58 cm), RHRMM-35 (271.86 cm) and RHRMM-67 (270.10 cm). In E₄, significantly longer vines was recorded by the genotype RHRMM-80 (252.65 cm) followed by RHRMM-56 (234.18 cm) and RHRMM-17 (231.66 cm). However, genotype RHRMM-80 (262.50 cm) recorded significantly longer vine length followed by genotype RHRMM-17 (256.46 cm) in average mean as compared to check Rasila Sunhari-2 (C) (197.58 cm). However, the minimum vine length was observed in RHRMM-49 (104.52 cm) all the environments.

Vine length significantly affected in E₂ and E₄ (*rabi* season) due to cool temperature and short day length during growth period. Vine length had been the minimum in *rabi* seasons as compared to summer seasons. Similar results were obtained by Dhakare and More (2008)^[6] in muskmelon and snap melon, Shivaprasad (2013)^[7] in muskmelon, Indrajia *et al.* (2021)^[8] in muskmelon, Kalaiselvan and Lenin (2023)^[9] in muskmelon.

As evident from Table 1. The number of days required for anthesis of first male flower ranged from 25.19 to 38.73 days in E₁, 28.53 to 40.83 days in E₂, 25.94 to 37.94 days in E₃, 28.90 to 41.20 days in E₄ and 27.14 to 39.63 days average mean respectively.

The examination of data over environments revealed that, in E₁, genotype RHRMM-4 (25.19 days) found to be significantly early for this character followed by RHRMM-34 (27.05 days), RHRMM-39 (27.24 days), and RHRMM-133 (28.52 days) in order of merit. In E₂, only one genotype RHRMM-4 (28.53) produced significantly earliest flowering followed by RHRMM-34 (30.18 days), RHRMM-3 (30.95 days) and RHRMM-133 (31.25 days). In E₃, genotype RHRMM-4 (25.94 days) were found to be significantly earlier followed by RHRMM-34 (27.79 days) and RHRMM-3 (28.83 days). In E₄, genotype RHRMM-4 (28.90 days) found to be significantly earlier which was closely followed by RHRMM-34 (30.96 days), RHRMM-3 (31.93 days) and RHRMM-133 (32.28 days). However, over the four environments only one genotype namely RHRMM-4 (27.14 days) were found to be significantly earlier followed by RHRMM-34 (29.00 days), RHRMM-3 (30.11 days) and RHRMM-133 (30.22 days) as compared to check Rasila Sunhari-2 (C) (32.20 days). In general, among the different environments, E₄ took the maximum days for anthesis of first male flower in all genotypes as compared to other environments. The maximum days to first male flower appearance was observed in genotype RHRMM-129 (39.63 days) all the environments.

Low temperature delayed the germination and seized the crop growth extending vegetative growth largely and delayed the appearance of first male flowering in E₂ and E₄ (*rabi* season) as compared to E₁ and E₃ (summer season). This is in corroboration with the findings of Dhakare and More (2008)^[6] in muskmelon, Gichimu *et al.* (2008)^[11] in watermelon, Begum *et al.* (2010)^[10] in muskmelon, Kalaiselvan and Lenin (2023)^[9] in muskmelon, and Jahan *et al.* (2024)^[12] in muskmelon.

Among the genotypes, days to first female flower appearance ranged from (Table 2) 28.66 to 42.34 days in E₁, 31.13 to 45.69 days in E₂, 28.89 to 43.27 days in E₃, 32.81 to 46.27 days in E₄ and 30.37 to 44.39 days in average mean respectively.

In different environments, significantly the minimum days to anthesis of first female flower was found in the genotypes namely RHRMM-4 (28.66 days) which was statistically on par with RHRMM-39 (30.20 days) and RHRMM-34 (30.81 days) in E₁. In E₂, genotypes RHRMM-4 (31.13 days) recorded significantly the minimum days to anthesis of first female flower at par with RHRMM-34 (34.37 days). The genotypes RHRMM-4 (28.89 days) produced significantly earlier female flowers which was at par with RHRMM-34 (31.05 days) in E₃. In E₄ genotypes, RHRMM-4 (32.81 days) recorded significantly the minimum days to anthesis of first female flower followed by RHRMM-133 (35.70 days), RHRMM-34 (35.83 days), RHRMM-3 (35.98 days) and RHRMM-15 (36.12 days). However, in average mean genotype RHRMM-4 (30.37 days) were found to be significantly early for days to anthesis of first female flower which was statistically on par with genotype RHRMM-34 (33.01 days) as compared to check Rasila Sunhari-2 (C) (35.95 days). Number of days required for anthesis of first female flower was significantly the minimum in E₁ and the maximum in E₄ for all the genotypes. However, the maximum days to first female flower appearance was observed in genotype RHRMM-129 (44.39 days) in all the environments.

Table 1: Mean performance of muskmelon genotypes for length of vine (cm) and days to first male flower appearance

S.N	Genotypes	Length of vine (cm)					Days to 1 st male flower appearance				
		E ₁	E ₂	E ₃	E ₄	Mean	E ₁	E ₂	E ₃	E ₄	Mean
1.	RHRMM-1	254.30	199.82	252.36	205.16	227.91	33.84	38.38	35.02	38.94	36.55
2.	RHRMM-2	228.28	174.76	220.62	177.42	200.27	30.74	35.62	32.64	36.72	33.93
3.	RHRMM-3	169.03	149.52	158.96	140.41	154.14	28.72	30.95	28.83	31.93	30.11
4.	RHRMM-4	206.30	186.52	198.95	184.44	194.05	25.19	28.53	25.94	28.90	27.14
5.	RHRMM-8	211.55	153.96	203.84	162.58	182.98	29.78	32.93	29.65	33.48	31.46
6.	RHRMM-12	168.23	109.35	156.59	118.03	138.05	33.24	35.46	33.62	37.97	35.07
7.	RHRMM-15	174.22	156.23	166.94	148.38	161.44	30.73	33.59	30.50	33.78	32.15
8.	RHRMM-16	212.16	191.56	203.87	186.35	198.49	32.14	34.38	33.35	35.66	33.88
9.	RHRMM-17	289.87	220.52	283.79	231.66	256.46	31.87	37.93	32.86	38.80	35.37
10.	RHRMM-18	135.91	111.03	141.26	145.65	133.46	31.75	36.81	33.43	38.05	35.01
11.	RHRMM-22	156.33	126.53	151.69	133.07	141.91	33.15	37.34	33.26	36.96	35.18
12.	RHRMM-23	218.23	165.37	209.89	169.27	190.69	28.08	32.20	29.80	32.94	30.76
13.	RHRMM-27	283.67	213.63	262.84	203.16	240.83	30.23	36.84	31.91	36.09	33.77
14.	RHRMM-28	120.23	98.62	108.37	94.12	105.34	31.38	36.35	32.59	37.20	34.38
15.	RHRMM-34	219.12	208.56	227.46	217.90	218.26	27.05	30.18	27.79	30.96	29.00
16.	RHRMM-35	269.56	219.58	271.86	223.30	246.08	31.37	37.39	32.46	36.83	34.51
17.	RHRMM-38	145.11	138.32	139.69	123.33	136.61	31.45	35.20	31.17	36.39	33.55
18.	RHRMM-39	167.27	133.25	159.88	127.67	147.02	27.24	32.94	28.88	33.12	30.55
19.	RHRMM-41	216.66	175.46	214.96	176.40	195.87	30.60	35.07	31.01	35.01	32.92
20.	RHRMM-46	164.11	122.41	157.59	116.40	140.77	30.79	35.92	30.61	36.17	33.37
21.	RHRMM-49	110.25	97.48	110.79	99.57	104.52	30.89	34.23	31.02	34.41	32.64
22.	RHRMM-52	232.27	209.56	233.85	217.00	223.17	29.88	32.54	29.95	32.87	31.31
23.	RHRMM-53	279.12	202.17	273.58	213.03	241.98	29.46	34.90	30.21	36.77	32.84
24.	RHRMM-54	230.12	188.04	223.96	187.31	207.36	28.71	33.06	29.14	32.98	30.97
25.	RHRMM-56	238.58	209.56	250.76	234.18	233.27	29.88	33.92	30.89	34.73	32.36
26.	RHRMM-64	197.74	157.49	198.01	166.95	180.05	30.37	35.03	30.73	35.36	32.87
27.	RHRMM-67	276.55	210.06	270.10	212.10	242.20	32.66	36.62	32.96	37.54	34.95
28.	RHRMM-71	201.19	157.01	196.85	162.30	179.34	33.07	37.20	34.33	37.54	35.54
29.	RHRMM-76	165.30	152.56	168.73	158.48	160.97	30.80	33.89	30.12	33.98	32.20
30.	RHRMM-80	275.26	258.56	263.52	252.65	262.50	34.43	38.17	35.86	37.29	36.44
31.	RHRMM-81	170.23	118.23	165.82	124.26	144.63	32.82	37.67	33.79	37.54	35.45
32.	RHRMM-83	195.23	140.92	187.96	152.70	169.20	31.89	37.91	31.84	36.42	34.52
33.	RHRMM-90	191.45	168.59	187.79	170.69	179.63	30.55	32.74	32.61	34.79	32.67
34.	RHRMM-91	210.49	171.74	205.81	173.36	190.35	31.21	35.40	31.46	37.02	33.77
35.	RHRMM-92	219.67	178.39	230.37	172.79	200.30	33.34	36.10	33.81	36.99	35.06
36.	RHRMM-121	235.76	185.02	232.89	188.31	210.49	35.38	38.56	34.16	37.00	36.27
37.	RHRMM-125	198.23	139.29	186.96	145.23	167.43	34.36	38.02	35.40	41.20	37.24
38.	RHRMM-127	240.34	180.34	231.73	178.58	207.75	36.04	39.93	35.92	39.51	37.85
39.	RHRMM-129	162.19	100.01	154.98	107.39	131.14	38.73	40.83	37.94	41.04	39.63
40.	RHRMM-133	198.34	172.04	198.02	183.79	188.05	28.52	31.25	28.83	32.28	30.22
41.	Check	218.67	183.00	208.56	180.10	197.58	30.20	34.23	30.23	34.12	32.20
	Mean	206.27	166.71	201.77	169.89	186.2	31.28	35.27	31.86	35.78	33.55
	S.E.±	5.70	4.47	5.62	5.05	5.23	0.57	0.54	0.32	0.35	0.44
	C.D.at 5%	17.14	13.38	16.93	15.12	13.85	1.75	1.61	0.99	1.02	1.17
	C.D.at 1%	22.73	17.74	22.45	20.04		2.32	2.13	1.31	1.35	
	C.V.	5.11	4.94	5.16	5.48		3.45	2.80	1.91	1.75	

Low temperature delayed the germination and seized the crop growth extending vegetative growth largely and delayed the appearance of first female flowering in E₂ and E₄ as compared to E₁ and E₃ similar findings reported by Dhakare and More (2008)^[6] in muskmelon, Begum *et al.* (2010)^[10] in muskmelon, Reddy *et al.* (2012)^[13] in muskmelon, Jahan *et al.* (2024)^[12] in muskmelon, Indrajia *et al.* (2021)^[8] in muskmelon and Kalaiselvan and Lenin (2023)^[9] in muskmelon.

The node at which first female flower appeared (Table 2) varied from 3.30 to 7.33 in E₁, 2.34 to 6.31 in E₂, 3.23 to 7.14 in E₃, 2.83 to 6.73 in E₄ and 3.00 to 6.88 in average mean respectively.

In different environments, genotype RHRMM-4 (3.30) significantly recorded the minimum node number at which first female flower occur at par with genotypes RHRMM-18 (3.31), RHRMM-49 (3.41), RHRMM-49 (3.41), RHRMM-52 (3.63), RHRMM-90 (3.63), RHRMM-28 (3.64), RHRMM-76 (3.87) and RHRMM-39 (3.93) in E₁. The genotype RHRMM-4 (2.34) significantly recorded the minimum node number at which first female flower occur at par with genotypes RHRMM-12 (2.36), RHRMM-49 (2.45), RHRMM-8 (2.63) and RHRMM-90 (2.96) in E₂. In E₃ genotype RHRMM-4 (3.23) significantly recorded the minimum node number at which first female flower occur on par with genotypes RHRMM-90 (3.54), RHRMM-52 (3.60), RHRMM-28 (3.74) and RHRMM-76 (3.77), RHRMM-39 (3.82) and RHRMM-49 (3.41). The genotype RHRMM-4 (2.83) significantly recorded the minimum node number at which first female flower occur on par with genotypes RHRMM-28 (2.85), RHRMM-49 (2.97), RHRMM-12 (3.15) and RHRMM-8 (3.16), RHRMM-90 (3.18), RHRMM-52 (3.33), RHRMM-3 (3.41) and RHRMM-16 (3.48) in E₄.

According to average mean genotype RHRMM-4 (3.00), significantly recorded the minimum node number at which first female flower occur on par with genotypes RHRMM-49 (3.17), RHRMM-90 (3.33), RHRMM-28 (3.41), RHRMM-52 (3.45), RHRMM-15 (3.55) and RHRMM-8 (3.48) as compared to check Rasila Sunhari-2 (C) (4.48). The maximum number of nodes for first female flower appearance was recorded in E₁ and the minimum number of nodes for first female flower recorded in E₂. However, the maximum number of nodes for first female flower was observed in genotype RHRMM-67 (6.88) all the environments.

Node number at which first female flower significantly the minimum in E₂ and E₄ due to cool temperature and short day length during growth period. Vine length had been the minimum in *rabi* seasons as compared to summer seasons These results are in conformity with the findings of Dhakare and More (2008)^[6] in muskmelon, Begum *et al.* (2010)^[10]

in muskmelon, Reddy *et al.* (2012)^[13] in muskmelon, Sushmitha (2013) in muskmelon, Shivaprasad (2013)^[7] in muskmelon, Indrajia *et al.* (2021)^[8] in muskmelon and Kalaiselvan and Lenin (2023)^[9] in muskmelon.

Among the genotypes, days to first fruit harvest (Table 3) varied from 66.07 to 86.70 days in E₁, 69.31 to 91.19 days in E₂, 67.22 to 87.43 days in E₃, 70.51 to 92.49 days E₄ and 68.28 to 89.45 days in average mean respectively.

In the present study, in E₁ genotype RHRMM-4 (66.07 days) significantly took lesser days for first fruit harvest which was on par with RHRMM-34 (67.27 days), Punjab Sunhari-2 (C) (69.33 days), RHRMM-133 (69.66 days), RHRMM-3 (69.67 days) RHRMM-15 (70.38 days), RHRMM-39 (70.93 days) RHRMM-41 (70.93 days), RHRMM-54 (72.13 days) and RHRMM-52 (71.28 days). In E₂, RHRMM-4 (69.31 days) were found significant earlier for days to first fruit harvest statistically on par with Punjab Sunhari-2 (C) (69.33 days), RHRMM-34 (71.29 days), RHRMM-8 (72.41 days), RHRMM-3 (73.05 days) and RHRMM-133 (73.25 days). In E₃, genotype RHRMM-4 (67.22 days) were found significant earlier for days to first fruit harvest statistically on par with genotypes RHRMM-15 (68.15 days), RHRMM-34 (68.24 days), RHRMM-3 (70.04 days), RHRMM-133 (70.04 days), RHRMM-8 (70.12 days), Punjab Sunhari-2 (C) (70.79 days) and RHRMM-41 (71.34 days). In E₄ genotypes, RHRMM-4 (70.51 days) were found significant earlier for days to first fruit harvest statistically at par with genotypes RHRMM-34 (72.84 days), RHRMM-8 (73.05 days), RHRMM-3 (73.32 days) and RHRMM-133 (73.54 days), Punjab Sunhari-2 (C) (73.69 days) and RHRMM-15 (76.15 days). In overall average mean genotype RHRMM-4 (68.28 days) recorded significantly earlier days to first fruit harvest statistically at par with genotypes RHRMM-34 (69.91 days), RHRMM-8 (71.36 days), RHRMM-3 (71.52 days), RHRMM-133 (71.62 days), Punjab Sunhari-2 (C) (72.08 days), RHRMM-15 (72.84 days), RHRMM-41 (73.61 days) and RHRMM-52 (73.79 days).

Number of days required for days to first harvest was significantly the minimum in E₁ and the maximum in E₄ for all the genotypes. However, the maximum days to first fruit harvest was observed in genotype RHRMM-129 (89.45 days) all the environments.

This might be due to the enhanced conversion of chlorophyll pigment into anthocyanin and lycopene due to the prevailing temperature forcing the plants to complete their life cycle at a faster rate. These results were in conformity with the findings of Dhakare and More (2008)^[6] in muskmelon, Venkatesan *et al.* (2016)^[15] in muskmelon, Indrajia *et al.* (2021)^[8] in muskmelon and Kalaiselvan and Lenin (2023)^[9] in muskmelon.

Table 2: Mean performance of muskmelon genotypes for days to first female flower appearance and node at which first female flower appearance

S. N.	Genotypes	Days to 1 st female flower appearance					Node at which 1 st female flower appearance				
		E ₁	E ₂	E ₃	E ₄	Mean	E ₁	E ₂	E ₃	E ₄	Mean
1.	RHRMM-1	33.84	38.38	35.02	38.94	36.55	6.21	5.66	5.87	5.95	5.92
2.	RHRMM-2	30.74	35.62	32.64	36.72	33.93	5.46	4.58	5.28	5.14	5.12
3.	RHRMM-3	28.72	30.95	28.83	31.93	30.11	4.23	3.23	4.33	3.41	3.80
4.	RHRMM-4	25.19	28.53	25.94	28.90	27.14	3.30	2.34	3.23	2.83	3.00
5.	RHRMM-8	29.78	32.93	29.65	33.48	31.46	4.14	2.63	4.27	3.16	3.48
6.	RHRMM-12	33.24	35.46	33.62	37.97	35.07	4.46	2.36	4.23	3.15	3.55
7.	RHRMM-15	30.73	33.59	30.50	33.78	32.15	4.60	4.30	4.81	4.41	4.53
8.	RHRMM-16	32.14	34.38	33.35	35.66	33.88	5.24	3.65	4.96	3.48	4.33
9.	RHRMM-17	31.87	37.93	32.86	38.80	35.37	6.53	5.62	6.27	5.98	6.10
10.	RHRMM-18	31.75	36.81	33.43	38.05	35.01	3.31	4.32	4.40	4.87	4.20
11.	RHRMM-22	33.15	37.34	33.26	36.96	35.18	4.66	4.51	4.80	4.65	4.66
12.	RHRMM-23	28.08	32.20	29.80	32.94	30.76	5.33	4.89	5.52	5.18	5.23
13.	RHRMM-27	30.23	36.84	31.91	36.09	33.77	6.33	5.17	5.86	4.91	5.57
14.	RHRMM-28	31.38	36.35	32.59	37.20	34.38	3.64	3.42	3.74	2.85	3.41
15.	RHRMM-34	27.05	30.18	27.79	30.96	29.00	4.34	4.30	5.20	4.13	4.49
16.	RHRMM-35	31.37	37.39	32.46	36.83	34.51	6.47	5.97	6.60	6.17	6.30
17.	RHRMM-38	31.45	35.20	31.17	36.39	33.55	4.80	5.60	4.63	5.74	5.19
18.	RHRMM-39	27.24	32.94	28.88	33.12	30.55	3.93	5.63	3.82	5.47	4.71
19.	RHRMM-41	30.60	35.07	31.01	35.01	32.92	5.00	4.12	5.36	4.53	4.75
20.	RHRMM-46	30.79	35.92	30.61	36.17	33.37	4.40	3.86	4.73	3.95	4.23
21.	RHRMM-49	30.89	34.23	31.02	34.41	32.64	3.41	2.45	3.83	2.97	3.17
22.	RHRMM-52	29.88	32.54	29.95	32.87	31.31	3.63	3.23	3.60	3.33	3.45
23.	RHRMM-53	29.46	34.90	30.21	36.77	32.84	6.40	5.98	6.53	5.80	6.18
24.	RHRMM-54	28.71	33.06	29.14	32.98	30.97	4.27	5.12	4.13	5.03	4.66
25.	RHRMM-56	29.88	33.92	30.89	34.73	32.36	4.68	5.20	4.83	5.80	5.11
26.	RHRMM-64	30.37	35.03	30.73	35.36	32.87	4.73	4.22	4.80	4.41	4.54
27.	RHRMM-67	32.66	36.62	32.96	37.54	34.95	7.33	6.31	7.14	6.73	6.88
28.	RHRMM-71	33.07	37.20	34.33	37.54	35.54	4.43	5.13	4.12	5.74	4.86
29.	RHRMM-76	30.80	33.89	30.12	33.98	32.20	3.87	4.12	3.77	4.20	3.99
30.	RHRMM-80	34.43	38.17	35.86	37.29	36.44	5.67	6.24	5.20	5.80	5.73
31.	RHRMM-81	32.82	37.67	33.79	37.54	35.45	5.14	4.62	5.10	4.81	4.92
32.	RHRMM-83	31.89	37.91	31.84	36.42	34.52	5.80	4.35	5.32	4.52	5.00
33.	RHRMM-90	30.55	32.74	32.61	34.79	32.67	3.63	2.96	3.54	3.18	3.33
34.	RHRMM-91	31.21	35.40	31.46	37.02	33.77	5.53	5.42	5.13	5.43	5.38
35.	RHRMM-92	33.34	36.10	33.81	36.99	35.06	5.73	4.12	4.86	3.98	4.67
36.	RHRMM-121	35.38	38.56	34.16	37.00	36.27	6.67	5.94	6.58	6.12	6.33
37.	RHRMM-125	34.36	38.02	35.40	41.20	37.24	6.42	5.82	6.12	5.73	6.03
38.	RHRMM-127	36.04	39.93	35.92	39.51	37.85	6.27	5.98	6.14	5.84	6.06
39.	RHRMM-129	38.73	40.83	37.94	41.04	39.63	5.39	4.63	4.96	5.12	5.02
40.	RHRMM-133	28.52	31.25	28.83	32.28	30.22	4.20	4.03	4.40	4.06	4.17
41.	Check	30.20	34.23	30.23	34.12	32.20	4.73	4.16	4.59	4.46	4.48
	Mean	31.28	35.27	31.86	35.78	33.55	4.98	4.54	4.94	4.70	4.79
	S.E.±	0.57	0.54	0.32	0.35	0.44	0.26	0.22	0.27	0.24	0.25
	C.D.at 5%	1.75	1.61	0.99	1.02	1.17	0.82	0.73	0.79	0.75	0.67
	C.D.at 1%	2.32	2.13	1.31	1.35		1.09	0.97	1.04	1.00	
	C.V.	3.45	2.80	1.91	1.75		10.14	9.90	9.79	9.90	

Table 3: Mean performance of muskmelon genotypes for days to 1st fruit harvest

S.N	Genotypes	Days to 1 st fruit harvest				
		E ₁	E ₂	E ₃	E ₄	Mean
1.	RHRMM-1	79.20	83.90	81.08	84.25	82.11
2.	RHRMM-2	74.83	79.88	76.07	81.34	78.03
3.	RHRMM-3	69.67	73.05	70.04	73.32	71.52
4.	RHRMM-4	66.07	69.31	67.22	70.51	68.28
5.	RHRMM-8	69.85	72.41	70.12	73.05	71.36
6.	RHRMM-12	79.47	84.02	80.21	83.24	81.73
7.	RHRMM-15	70.38	76.77	68.15	76.07	72.84
8.	RHRMM-16	72.58	76.18	73.21	76.71	74.67
9.	RHRMM-17	79.87	84.90	80.48	85.89	82.79
10.	RHRMM-18	79.94	85.72	80.84	86.54	83.26
11.	RHRMM-22	77.24	82.09	77.86	80.78	79.49
12.	RHRMM-23	72.47	78.22	73.24	79.21	75.79
13.	RHRMM-27	77.60	85.02	79.25	83.89	81.44
14.	RHRMM-28	75.20	81.81	77.22	83.78	79.50
15.	RHRMM-34	67.27	71.29	68.24	72.84	69.91
16.	RHRMM-35	83.14	88.24	85.04	87.07	85.87
17.	RHRMM-38	77.37	80.13	76.34	81.31	78.79
18.	RHRMM-39	70.93	77.56	73.01	78.43	74.98
19.	RHRMM-41	70.93	75.82	71.34	76.36	73.61
20.	RHRMM-46	73.40	80.26	73.22	80.79	76.92
21.	RHRMM-49	81.20	87.72	82.34	86.68	84.48
22.	RHRMM-52	71.28	75.61	72.08	76.19	73.79
23.	RHRMM-53	75.46	81.02	76.37	83.24	79.02
24.	RHRMM-54	72.13	78.21	74.91	76.82	75.52
25.	RHRMM-56	74.07	78.70	75.21	78.57	76.64
26.	RHRMM-64	72.80	77.41	73.14	78.75	75.53
27.	RHRMM-67	83.13	90.18	84.45	91.04	87.20
28.	RHRMM-71	75.87	80.94	76.09	78.86	77.94
29.	RHRMM-76	73.67	76.15	72.75	78.35	75.23
30.	RHRMM-80	80.97	87.21	81.75	86.49	84.10
31.	RHRMM-81	82.17	86.76	83.64	85.70	84.57
32.	RHRMM-83	80.47	85.20	79.94	84.87	82.62
33.	RHRMM-90	72.34	76.91	73.41	78.14	75.20
34.	RHRMM-91	77.03	81.56	77.86	82.29	79.69
35.	RHRMM-92	78.80	82.12	79.42	83.20	80.88
36.	RHRMM-121	85.58	89.56	86.86	89.04	87.76
37.	RHRMM-125	83.27	88.06	84.75	92.01	87.02
38.	RHRMM-127	86.33	91.09	86.89	91.42	88.93
39.	RHRMM-129	86.70	91.19	87.43	92.49	89.45
40.	RHRMM-133	69.66	73.25	70.04	73.54	71.62
41.	Check	69.33	74.52	70.79	73.69	72.08
	Mean	76.08	80.97	76.88	81.38	78.83
	S.E.±	2.04	1.84	1.75	1.87	1.85
	C.D.at 5%	6.17	5.55	5.22	5.64	5.60
	C.D.at 1%	8.18	7.36	6.92	7.48	
	C.V.	4.99	4.22	4.17	4.27	

Conclusion

The profitability of any breeding operation is largely determined by the parents chosen. Breeders select parents with good per se performance as an added benefit for hybridization initiatives. As a result, the genotypes RHRMM-4, RHRMM-34, RHRMM-3, RHRMM-8, and RHRMM-133, which were determined to be superior genotypes, had higher values for various traits such as vine length (cm), days to first male flower appearance, days to first female flower appearance, node at which first female flower appeared, and days to first fruit harvest. As a result, these five genotypes used in the hybridization procedure may be more advantageous for developing superior varieties and obtaining outstanding recombinants for growth and earliness traits.

References

- Choudhary BR, Sudhakar. Breeding of F1 hybrids in muskmelon: Accomplishment and prospects. Indian Journal of Arid Horticulture. 2010;5(1-2):1-5.
- Luan F, Sheng Y, Wang Y, Staub JE. Performance of melon hybrids derived from parents of diverse geographic origins. Euphytica. 2010;173:1-16.
- Pandey A, Ranjan P, Ahlawat SP, Bharadwaj R, Dhariwal OP, Singh PK, *et al.* Studies on fruit morphology, nutritional and floral diversity in less-known melons (*Cucumis melo* L.) of India. Genetic Resources and Crop Evolution. 2021;68(4):1453-1470.
- Shashikumar KT, Pitchaimuthu M. Heterosis and combining ability analysis of quantitative and qualitative traits in muskmelon (*Cucumis melo* L.). International Journal of Agriculture. 2016;6:341-348.
- Anonymous. Area and production of horticultural crops for 2023-24 (3rd advance estimates). Department of Agriculture and Farmers Welfare, Ministry of Agriculture and Farmers Welfare, Government of India. 2024. Available from: <https://agriwelfare.gov.in/en/StatHortEst>
- Dhakare BB, More TA. Genotype × environmental interaction of muskmelon with special reference to earliness, yield and yield contributing traits. The Asian Journal of Horticulture. 2008;65:158-162.
- Shivaprasad MK. Studies on performance of muskmelon (*Cucumis melo* L.) hybrids under northern dry zone of Karnataka [dissertation]. Bagalkot: University of Horticultural Sciences; 2013.
- Indraja G, Syed S, Madhumathi C, Priya BT, Sekhar MR. Genetic variability studies for horticultural traits in muskmelon (*Cucumis melo* L.). Electronic Journal of Plant Breeding. 2021;12(1):170-176.
- Kalaiselvan S, Lenin AR. Assessment of growth and early maturation traits in various genotypes of muskmelon (*Cucumis melo* L.). Crop Research. 2023;58(5&6):243-247.
- Begum H, Thirupathi R, Reddy RVSK, Dilip BJ. Crop improvement in muskmelon. Andhra Pradesh Horticultural University. Tentative Technical Programme of Work. 2010;7-11.
- Gichimu BM, Owuor BO, Dida MM. Agronomic performance of three most popular commercial watermelon cultivars in Kenya as compared to one newly introduced cultivar and one local landrace grown on dystric nitisols under sub-humid tropical conditions. Journal of Agriculture Biological Science. 2008;3(5-6).
- Jahan N, Ahmed QM, Khatun MF, Rahman S, Hossain MG, Islam MR. Morphological diversity assessment of local muskmelon (*Cucumis melo* L.) germplasm in Bangladesh. The Journal of Agricultural Sciences-Sri Lanka. 2024;19(3):439-451.
- Reddy BPK, Begum H, Sunil N, Reddy MT, Babu JD, Reddy RSK, Reddy BP. Genetic divergence analysis in muskmelon (*Cucumis melo* L.). International Journal of Current Microbiology and Applied Sciences. 2012;6(6):2251-2260.
- Sushmitha P. Evaluation of certain varieties and hybrids of muskmelon (*Cucumis melo* L.) for yield and quality traits [M.Sc. thesis]. Andhra Pradesh: Dr. Y.S.R. Horticultural University; 2013.
- Venkatesan K, Reddy BM, Senthil N. Evaluation of muskmelon (*Cucumis melo* L.) genotypes for growth, yield and quality traits. Electronic Journal of Plant Breeding. 2016;7(2):443-447.