

Evaluation of Mango Hybrids for Kymore Plateau of Madhya Pradesh

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Abstract

An experiment was conducted to evaluate selected mango hybrids for Kymore plateau region of Madhya Pradesh. The check variety Langra gave the maximum vegetative growth parameters, while the hybrid Swarn Jahangir and Ratna gave the minimum. Hybrid Amrapali attained the earliest flowering (14th February) and fruit setting (6th March). Floral malformation was highest (66.1%) in hybrid Neeleshan, while it was lowest (15.0%) in Amrapali. Hybrid Neelgoa recorded maximum fruit drop (66.8) followed by Langra, while it was minimum (26.9%) in Amrapali. Amrapali and Mallika produced significantly higher number of fruits and fruit yield per tree over the check variety Langra. However, the fruit weight of Mallika was significantly higher (302.6 g) over all the varieties under study except Neeleshan.

Mango (*Mangifera indica* L) is one of the most important commercial fruits of India. India continues to be the largest mango producing country of the world. The total production is about 10.64 million tonnes in India. The area under cultivation of mango in Madhya Pradesh is 7098 ha whereas in Rewa division of Madhya Pradesh it occupies 4321 ha (Anonymous, 2003). Production is an adjustment between heredity and environment and the latter includes cultural practices as well. An ideal mango cultivar should have characters like precocious, dwarf, regular and prolific in bearing, early flowering and fruit setting, attractive fruit colour and size, resistant to major diseases and other biotic-abiotic stresses. Considering the above facts and the bright scope of high yielding hybrids of mango, an attempt has been made to identify them for Kymore plateau of Madhya Pradesh.

Methodology

A study was carried out at the Fruit Research Station, Kuthulia, JNKVV campus, Rewa (M.P.) during 2002-03. The orchard soil was sandy clay, loam and more than two meter deep. The soil pH was 7.2, electrical conductivity 0.34 dsm⁻¹, organic carbon 4.2 kg⁻¹, available N, P₂O₅ and K₂O 214, 9.15, 364 kg ha⁻¹, respectively. The sixteen years old plants of Amrapali, Mallika, Ratna, Prabhaskar, Mahmood Bahar, Neelgoa, Neeluddin, Swarn Jahangir, A.U. Rumani, Bombay Green and Langra as check variety were selected as the control cultivars. Total eight plants of each hybrid were planted in four replications i.e. two plants per replication. Planting was done in randomized block design at 10 m x 10 m distance. The observations were recorded with respect to vegetative growth characters, flowering behaviour, malformation, fruit drop and yield of fruits.

Result and Discussion

Vegetative growth

The growth characters differed significantly amongst the hybrids and control cultivars of mango (Table 1). The control cultivar Langra gave maximum tree height (5.59 m), circumference of root stock and scion (83.25 cm and 78.38 cm, respectively), spread (7.75 m E-W and 7.76 m N-S) and volume of the tree (226.93 m³). Regarding above characters Langra was followed by Mallika. Thus Langra and hybrid Mallika appeared vigorous after sixteen years of plantation. On the other hand, significantly lower growth characters were observed in SwarnJahangir and Ratna hybrids (Table 1). The variation in growth characters amongst the mango hybrids could be due to variation in genetic make up under the present set of environmental conditions and edephic condition. Similar results have also been reported by Sharma *et al.* (1998) and Suryanaraina *et al.* (1998).

Flowering behavior

Among all the hybrids and control varieties, Amrapali showed the earliest panicle emergence (29th

January), start of flowering (14th January), full bloom (1st March) and fruit setting (6th March). This was closely followed by Mallika with fruit setting up to 10 March (Table 2). Ratna hybrid showed fruit setting as late or up to 22 March. The variation in flowering behaviour may be attributed to the genetic characters and the climatic condition. Variation in panicle emergence and flowering behaviour in mango hybrids were also reported by Sharma *et al.* (1998).

Floral malformation

Amrapali and langra recorded significantly lower malformation over all other remaining varieties 15.0 to 15.28% (Table 2). This was equally followed by Prabhashankar (17.0%). On other hand, Neeleshan, Neelgoa, and Ratna were affected in a higher range (55.8 to 66.1%). The variation in the incidence of malformation amongst the hybrids and control cultivars may be related to the genetic characters and the climate conditions. Such results were also reported by Kumar *et al.* (1996).

Fruit drop

Fruit drop is an important character governing total productivity of mango crop. The minimum fruit drop

Table 1: Vegetative growth characters of the mango varieties

S. No.	Treatment	Height per tree(m)	Canopy height per tree(m)	Circumference		Spread per tree		Volume per tree (m ³)
				Root stock (cm)	Scion (cm)	E-W (m)	N-S (m)	
1	Amrapali	5.00	4.17	65.00	56.50	5.37	5.65	101.54
2	Mallika	5.22	4.45	78.75	67.50	6.07	5.88	127.19
3	Ratna	2.79	2.15	41.50	36.88	2.99	2.69	13.96
4	Prabhashankar	4.69	4.10	74.00	66.50	5.35	5.35	96.98
5	Mahmood bahar	4.98	4.22	77.25	71.38	5.93	5.87	116.56
6	Neelgoa	3.62	2.85	51.00	42.13	3.42	3.40	26.46
7	Neeleshan	3.91	3.22	57.88	47.38	3.95	3.92	41.30
8	Neeluddin	4.13	3.36	65.75	56.38	4.98	5.00	67.62
9	Swarn Jahangir	2.00	1.58	42.00	37.50	2.90	2.85	10.22
10	A.U.Rumani	3.18	2.66	49.00	43.75	3.61	3.66	27.86
11	Bombay green	4.77	4.04	74.38	66.75	6.01	5.86	119.67
12	Langra	5.59	4.76	88.25	78.38	7.75	7.76	226.93
	S.Em	0.15	0.17	3.73	2.75	0.26	0.23	12.67
	C.D. at 5 %	0.45	0.50	10.73	7.91	0.75	0.67	36.49

Table 2: Flowering behaviour, malformation, fruit drop and yield parameter of mango varieties

S. No.	Varieties	Date of panicle emergence	Date of start of flowering	Date of full bloom	Date of fruit setting	Malformation (%)	Fruit drop (%)	Average No. of fruit/tree	Average yield/tree (kg)	Average wt./fruit (g)
1.	Amrapali	29J	14F	1M	6M	15.0	26.9	383.8	69.78	182.90
2.	Mallika	31J	22F	3M	10M	36.4	56.3	214.1	64.68	302.67
3.	Ratna	13J	3F	15M	22M	55.8	45.0	11.2	1.57	140.82
4.	Prabhashankar	8J	26F	8M	13M	17.0	39.9	280.1	54.37	195.04
5.	Mahmood bahar	7J	26F	7M	16M	29.2	41.0	263.5	50.04	190.58
6.	Neelgoa	8J	28F	13M	19M	57.9	66.8	98.0	23.73	244.51
7.	Neeleshan	8J	1F	10M	19M	66.1	48.2	137.3	40.46	297.87
8.	Neeluddin	14J	6F	14M	20M	36.0	37.0	212.1	41.47	194.96
9.	Swarn Jahangir	29J	22F	8M	15M	25.0	-	-	-	-
10.	A.U. Rumani	30J	24F	6M	14M	35.2	64.1	12.5	2.30	187.61
11.	Bombay green	7J	28F	8M	16M	44.4	43.7	169.7	32.43	192.28
12.	Langra	3J	25F	7M	17M	15.2	65.2	127.2	35.05	276.78
	SEm±					3.25	2.65	30.0	5.98	4.07
	CD at 5%					9.34	7.66	86.8	17.26	11.77

4in Amrapali (26.9) resulted in the highest yield, while the reverse was true in case of Neelgoa (Table3). The A.U. Rumani and Langra also showed similar trend. The fruit drop is associated with the arrangement of stalk with the fruit and the late formation of abscission layer. The variations in the fruit drop of mango varieties were also noted by Jana and Sharangi (1998).

Yield

Amrapali and Mallika produced significantly higher number of fruits and fruits yield per tree over the control cultivar Langra (Table). However, the average fruit weight of Mallika was significantly higher (302.67g) over all the varieties under test except Neeleshan. The hybrids Ratna and A.V. Rumani attained almost the lowest number yield and weight of fruits amongst all the mango cultivars except in Amrapali for its weight per fruit.

Conclusion

The evaluation of mango hybrids with reference to Kymore plateau of M.P. revealed that hangra gave the maximum vegetative growth. While Amarpali had the earliest flowering and fruit setting it also had the lowest

floral malformation along with minimum fruit drop. Besides these characteristics Amarpali and Mallika produced more fruit yield per tree and Neelshan variety had the maximum fruit weight.

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