

Effect of different polyembryonic and monoembryonic rootstocks on performance of Dashehari mango

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ABSTRACT

The influence of seven polyembryonic and a monoembryonic rootstock on performance of Dashehari during pre bearing stage was investigated. Dashehari grafted on Bappakai rootstock recorded significantly maximum height of scion (86.00 cm), number of branches (9.73) and leaves (179.00), higher stock scion ratio (0.98), canopy (volume), nitrogen and chlorophyll content in leaves. Amongst all the rootstocks Bappakai was the best rootstock for Dashehari followed by the Muvandan and Ec 95862.

Key words : Mango, Rootstock, Polyembryonic, Monoembryonic

INTRODUCTION

Mango (*Mangifera indica* L.) is an important fruit crop of India. It has very good commercial value and important in processing. It has also a prime position in export of the fruit. In recent past mango was commercially propagated by approach, veneer, stone/ epicotyl and soft wood grafting. Although these methods impart a great degree of genetic uniformity, considerable variation and random use of unknown origin rootstock. It well known that the vigour, yield, longevity, size and quality in most of the fruit crops are influenced by rootstock.

Formation of uniform trees for quality fruit production and uniform trees for crop management are necessary. Polyembryonic rootstock imparted better vigour to the scion as compared to monoembryonic rootstock (Naik, 1947).

MATERIALS AND METHODS

The experiment was laid in a randomized block design with three replications at Telankhedi fruit garden, Nagpur during 1999-2000. Eight rootstocks viz., Nakkare, Bappakai, Olour, Kitchner, Ec 95862, Muvandan, Starch and monoembryonic local seedlings were used and Dashehari as a scion. The periodical observations were recorded at monthly interval for 2 ½ years and statistical analysis was done. Means of various growth observations like height of scion, number of branches, number of leaves, stock and scion girth, leaf area were recorded. Canopy (volume) was calculated by formula

$$\text{Canopy} = \frac{4}{3} \pi \times \frac{1}{2} a^2 \times \frac{1}{2} b$$

Where, a = spread of crown of the tree
b = tree height.

The nitrogen content in leaf was determined by microkjeldahl method as given by Somichi *et al* (1972) and chlorophyll content in leaf was estimated in mg/g by procedure given by Bruinsma (1961).

RESULTS AND DISCUSSION:

1. Height of the scion:

Performance of Dashehari on Bappakai rootstock exhibited significantly maximum height (86.00 cm) followed by Muvandan (83.96 cm) and Ec 95862 (81.35 cm) rootstocks respectively. The height was suppressed by Nakkare (62.50 cm) rootstock which was on par to local rootstock (62.90 cm). The suppressed growth was due to natural dwarf characters of these varieties. The present findings are in line with the Singh *et al.*, (1986) and Kohil and Reddy (1989).

2. Number of branches and leaves:

Observations recorded on means of number of branches (9.73) and leaves (179.00) were significantly superior in Bappakai than all other rootstocks. Minimum number of branches (5.20) were recorded in Nakkare while lowest number of leaves (76.40) were recorded in local rootstocks.

3. Diameter of stock and scion:

The diameter of stock and scion was superior with respective value of 2.78 and 2.74 cm, respectively in grafts on Bappakai rootstock. It was followed by Muvandan, Olour, Ec 95862. Better diameter of Dashehari on Bappakai may be due to significant performance of other characters like more number of leaves and leaf area.

Table : Effect of Different rootstocks of Mango on growth performance of scion cv. Dashehari.

Sr. No.	Rootstocks	Characters									
		Mean height of Scion (cm)	Mean No. of Branches	Mean No. of leaves	Mean Diameter of scion (cm)	Mean Diameter of Stock (cm)	Mean Stock Scion ratio	Mean Leaf area (cm ²)	Mean Canopy (Volume) (m ³)	Mean Nitrogen content in leaf (%)	Mean Chlorophyll content in leaf (mg/g)
1	Nakkare	62.50	5.20	81.10	1.45	1.70	0.85	49.25	0.10	0.77	1.22
2	Bappakai	86.00	9.73	179.00	2.74	2.78	0.98	98.55	0.21	1.26	1.31
3	Olour	71.98	7.66	119.20	1.91	2.05	0.92	66.51	0.16	0.42	1.39
4	Kitchner	71.10	7.60	108.20	1.87	2.09	0.89	63.36	0.12	0.35	1.16
5	Ec 95862	81.35	8.03	151.70	1.59	2.13	0.74	83.37	0.15	0.56	1.44
6	Muvandan	83.96	8.31	157.60	2.17	2.35	0.92	85.35	0.17	0.93	1.28
7	Strach	65.68	5.71	81.70	1.59	1.75	0.90	50.43	0.12	0.28	1.15
8	Local	62.90	5.66	76.40	1.60	1.76	0.90	43.72	0.10	0.21	1.10
S.E.±		0.169	0.015	0.323	0.012	0.012	0.009	0.680	0.013	0.080	0.0186
C. D. at 5 %		0.515	0.046	0.982	0.038	0.037	0.030	2.064	0.040	0.172	0.0399

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4. Stock-scion ratio:

The results of stionic compatibility on the basis of ratio (0.74) of scion and stock was found in Dashehari grafted on Ec 95862 rootstock and higher ratio (0.98) was found in Dashehari on Bappakai. The height of Dashehari on different polyembryonic varieties had a positive correlation with stem girth and leaves. Better combining ability was reflected in stock scion ration in Bappakai.

5. Leaf area:

Significantly superior results were recorded in mean leaf area and was 98.55 cm² in Bappakai rootstock. It was followed by Muvandan (85.35 cm²) while lowest leaf area was recorded in local rootstock (43.72 cm²). There was asinificant variation among all rootstock in this character.. Similar findings were also noted by Chakladar (1967).

6. Canopy:

The maximum canopy (volume) 0.21 m³ was recorded in Dashehari on Bappakai but was on par to Muvandan (0.17 m³), while minimum canopy was recorded on Nakkare and local rootstock (0.10m³). The maximum canopy in Bappakai may be due vigorous growth shown by vegetative characters like height and number of branches.

7. Nitrogen content in leaf:

Significantly maximum per cent of nitrogen content (1.26) in leaf was noticed in Dashehari on Bappakai and was followed by Muvandan (0.93 %). The minimum nitrogen content in leaf (0.21 %) was recorded by Dashehari on local rootstocks which was on par to Starch (0.28 %) rootstock.

8. Chlorophyll content in leaf:

Dashehari on Ec 95862 rootstock recorded significantly more chlorophyll content in leaves (1.44 mg/g) than all other rootstocks. The lowest chlorophyll in leaf was recorded in local rootstock (1.10

mg/g). The results were on par in Starch and Kitchner rootstock having respective values of chlorophyll content as 1.15 mg/g and 1.16 mg/g.

The above performance of Dashehari on various rootstocks indicated that Bappakai rootstock was better rootstock than all other rootstocks under test. It was followed by Muvandan and Ec 95862.

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