



STANDARDIZATION OF STONE GRAFTING IN SOME MANGO CULTIVARS UNDER LUCKNOW CONDITIONS

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ABSTRACT : The present investigation was carried out during 2005- 2006 at the Horticultural Research Farm of Babasaheb Bhimrao Ambedkar University, Lucknow. The experiment was conducted using six varieties viz. Amrapali, Dashehari, Mallika, Langra, Chausa and Lucknow Safeda in a Randomized Block Design with five replications. Results reflect that the highest success per cent and over all performance of stone grafting operations was recorded by using scion stick cultivar Amrapali, whereas minimum success per cent was in cultivar Lucknow Safeda under Lucknow conditions.

Keywords : *Mangifera indica* L., stone grafting, scion woods.

The mango (*Mangifera indica* L.) is the best known important fruit of the family Anacardiaceae, having excellent taste, flavour and aroma which occupies a prominent place among the fruit crops. It is regarded as the 'King of the fruit' as well as "National fruit" of the India. One of the outstanding developments in mango has been the standardization of propagation techniques in different agro-climatic conditions which is reflected in terms of large scale of multiplication of plant using soft wood or stone grafting. It is an easy, cheap and rapid method and has certain advantages over other methods. The soft wood and stone grafted plants grow faster and have early bearing nature. Mukherjee *et al.* (4) first reported the success from India by splice method of grafting. This was further standardized under Delhi conditions and named as Epicotyl grafting. Temperature and humidity appear to be the major limiting factors affecting the success of stone grafting. High rate of transpiration and lower humidity adversely affect the success of grafts (Ram and Sirohi, 7). Therefore, attempts have been made to study the success of stone grafting in some mango cultivars under Lucknow conditions.

MATERIALS AND METHODS

The present investigation was carried out during 2005-2006 at the Horticultural Research Farm of Babasaheb Bhimrao Ambedkar University,

Lucknow. The experiment was in a Randomized Block Design with five replications. Scion wood of 4-6 month old, 6-10 cm in length and 0.6 to 0.8 cm thickness (girth) with uniform maturity, containing 4 and 6 well developed vegetative buds and free from any infestation of disease and pests were selected. This type of scion materials were collected from the Residential Campus and Fruit Nursery Farm of Central Institute for Subtropical Horticulture, Rae Bareli Road, Lucknow from healthy and mature trees of standard commercial varieties viz., Amrapali, Dashehari, Langra, Lucknow Safeda, Chausa and Mallika. Stone grafting was performed by employing epicotyle method inside the poly house. In this method, the rootstocks were selected with proper age and thickness of stem and collected from the rural area of the city for stone grafting. Observations were recorded likewise, success per cent of grafting by cumulative numbers of sprouted stone grafts were counted at different stages. Diameter (cm) of rootstock and scion was measured with the help of vernier calipers whereas, sprout length (cm), height of the graft (cm), leaf length (cm) and width (cm) were measured with the help of measuring scale. Number of leaves was counted manually.

RESULTS AND DISCUSSION

The different cultivars had significant effect on success percentage of grafting which was maximum in Amrapali (70%) followed by

Table 1: Success of grafting and performance of different scion woods cultivars after 30 and 90 days in stone grafting.

Treatments	Diameter of root-stock (cm)		Diameter of scion (cm)		Sprout length of graft (cm)		Success of grafting (%)
	30 days	90 days	30 days	90 days	30 days	90 days	
T ₁ (Amrapali)	5.10	5.29	5.02	5.22	2.11	3.32	70.0
T ₂ (Dashehari)	4.71	4.99	4.70	4.95	1.96	2.87	56.0
T ₃ (Langra)	5.02	4.98	4.65	4.93	1.85	3.03	50.6
T ₄ (Lucknow Safeda)	4.67	4.99	4.94	4.44	1.93	2.52	42.4
T ₅ (Chausa)	5.07	4.92	4.81	4.94	1.94	2.54	41.8
T ₆ (Mallika)	5.09	4.97	4.94	4.58	1.93	2.57	49.0
C.D. (P = 0.05)		0.303	0.176	0.122	0.142	0.352	0.303

Table 2: Performance of different scion woods cultivars after 30 and 90 days in stone grafting.

Treatments	Height of the grafts (cm)		Number of leaves		Leaf length (cm)	Leaf width (cm)
	30 days	90 days	30 days	90 days	90 days	90 days
T ₁ (Amrapali)	19.54	30.68	3.39	7.67	16.17	3.80
T ₂ (Dashehari)	18.26	28.69	3.01	5.62	15.95	3.19
T ₃ (Langra)	18.91	27.80	2.61	6.34	14.56	2.40
T ₄ (Lucknow Safeda)	19.24	28.87	2.75	4.78	15.15	2.82
T ₅ (Chausa)	17.86	28.87	2.54	6.12	16.14	2.72
T ₆ (Mallika)	16.02	29.50	2.90	6.72	14.34	2.92
C.D. (P = 0.05)	0.742	0.782	0.612	0.721	0.474	0.372

Dashehari (56%) and Langra (50.6%) whereas, minimum was in cultivar Chausa (41.8%). Maximum success in soft wood grafting was obtained in month of June-July in the present study. However, Patil *et al.* (5) obtained maximum success in the month of August and similar results have also been reported by Singh and Srivastava (10). However, Singh and Srivastava (9) found July to be the best period for soft wood grafting. These variations may be due to prevailing condition during the experimentation. It was observed (Table 1) that after 30 to 90 days of grafting, grafts attained maximum diameter of rootstock in cultivar Amrapali (5.10 - 5.29 cm) while, minimum diameter of rootstock in cultivar Lucknow Safeda (4.67-4.99 cm). Diameter of scion after 30 and 90 days of grafting was higher in grafts of cultivar Amrapali (5.02 and 5.22 cm), while it was minimum in cultivar Dashehari (4.70 and 4.95 cm). Hartman and Kestar (1) have also recorded similar

results on diameter of scion in mango. Sprout length of grafts was observed maximum in cv. Amrapali (2.11 and 3.32 cm), whereas, the minimum was in cultivar Langra (1.85 and 3.03 cm) after the grafting of 30 and 90 days, respectively. The finding was in close conformity to Lal (3) and Rajan *et al.* (6) on sprout length of grafting in mango.

It is obvious from the Table 2 that the cultivar had significant effect on height of the grafts after 30 and 90 days from grafting. The height of the graft was maximum in Amrapali (19.54 and 30.68 cm) however, it was minimum in cv. Mallika (16.02 cm) and in cv. Langra (27.80 cm) after the grafting of 30 and 90 days, respectively. Sharma and Chauhan (8) studied the effect of different grafting heights in veener grafting of walnut and observed that the grafting at a height of 22.5 cm from the ground level was most successful in comparison to grafting at 15 and 30 cm heights. The higher per cent of

success at 22.5 cm height was attributed to better contact between the cambium of scion and rootstock because the thickness of scion was generally similar of stock at this height. It was observed that the final stage *i.e.*, after 90 days of grafts have significantly higher scion length in cv. Amrapali (16.17 cm) as compared to the rest of the treatments. The influence of the cultivar on number of leaves per graft recorded after 30 and 90 days found significant. The number of leaves at 30 and 90 day graft was significantly maximum in cv. Amrapali (3.39 and 7.67), whereas it was minimum in cultivars Chausa (2.54) and Lucknow Safeda (4.78) after 30 and 90 days of grafting, respectively. It is quite evident from results the (Table 2) that the cultivars had significant effect on the size of leaves on the grafts after 90 days of grafting. Maximum leaf width was also found in cultivar Amrapali (3.80 cm) while it was minimum in cultivar Langra (2.40). Kumari *et al.* (2) also have reported similar results with respect to study.

CONCLUSIONS

The highest success per cent and overall performance of stone grafting operation was recorded by using scion stick cultivar Amrapali, whereas minimum success per cent was in cultivar Lucknow Safeda.

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