

A STUDY ON EPICOTYL GRAFTING IN CASHEW (*ANACARDIUM OCCIDENTALE L*)

S. NAGABHUSHANAM

*Central Plantation Crops Research Institute,
Cashew Farm, Shantigodu-574 202, India*

SUMMARY

Tender cashew seedlings of nearly 15 days old when used as root stocks for epicotyl grafting by cleft method gave success ranging from 45 to 68 per cent in two successive years during monsoon period. This technique ensures quick multiplication in a given time within an unit area of the space unlike in any other method of grafting or budding where the time lag would be anywhere from 6-8 months to produce a graft of planting size. Further, epicotyl grafting can be practised indoors during heavy rainy season and works out economical for large scale multiplication.

INTRODUCTION

Different techniques of vegetative propagation have been tried to propagate cashew by several researchers with varied degrees of success in India and abroad. An economic, easy and quick method of propagation is yet to be found out for large scale multiplication of elite cashew trees existing in different regions. As a step to achieve this objective, trials were carried out at Central Plantation Crops Research Institute, Cashew Farm, Shantigodu in South Kanara district of Karnataka State during 1979-81. The technique of grafting adopted is called 'epicotyl grafting' similar to that of stone grafting in mango. The trials initiated in the year 1979 had given marginal success and the same were repeated in 1980 and 1981 with modification which had given encouraging results. The description of the technique adopted and the results obtained are presented in this paper with suitable illustrations.

MATERIALS AND METHODS

Cashew seednuts were sown in plastic containers to obtain root stock for grafting. Fresh seeds germinate usually within three weeks and grow to a height of

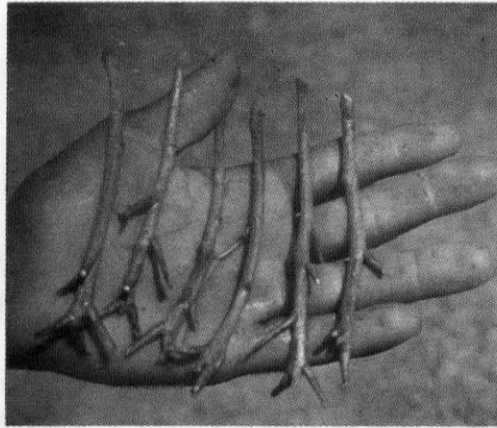
about 15 cm within another two weeks putting forth three or four leaves. The tender seedlings at this stage possess their cotyledons intact. These seedlings (mini root stocks) were used for grafting.

Each month, one hundred graftings were made between June and November when the scion sticks were freely secured for grafting.

Grafting was done by cutting off the succulent slender stems (epicotyls), 4-5 cm. above the cotyledons and a cleft was made in the middle of the root stock with a sharp knife. The scion was trimmed to a wedge shape by giving slanting cuts on either side and was carefully driven into the cleft of the stock. The scion sticks with more diameter than the stock were matched on to one side of the stock for cambial union to take place on matching the cambial cells of both the stock and the scion, the joint was wrapped with a plastic ribbon for further healing. The scion was covered with a narrow polythene bag and secured with a rubber band near the base to prevent desiccation of the scion which otherwise may wither before the cambial joint took place. Bordeaux spray was given at ten day interval, as a prophylactic measure to check fungal infection.



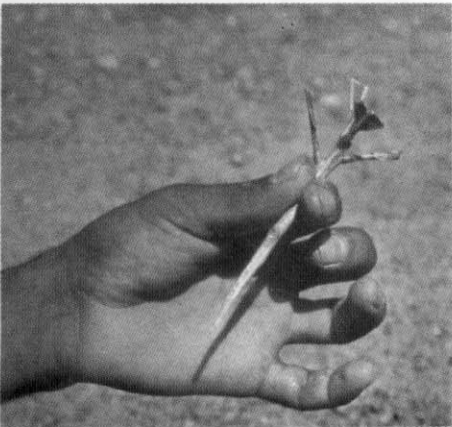
1.



2.



3.



4.



5.



6.



7.



8.



9.



10.



11.

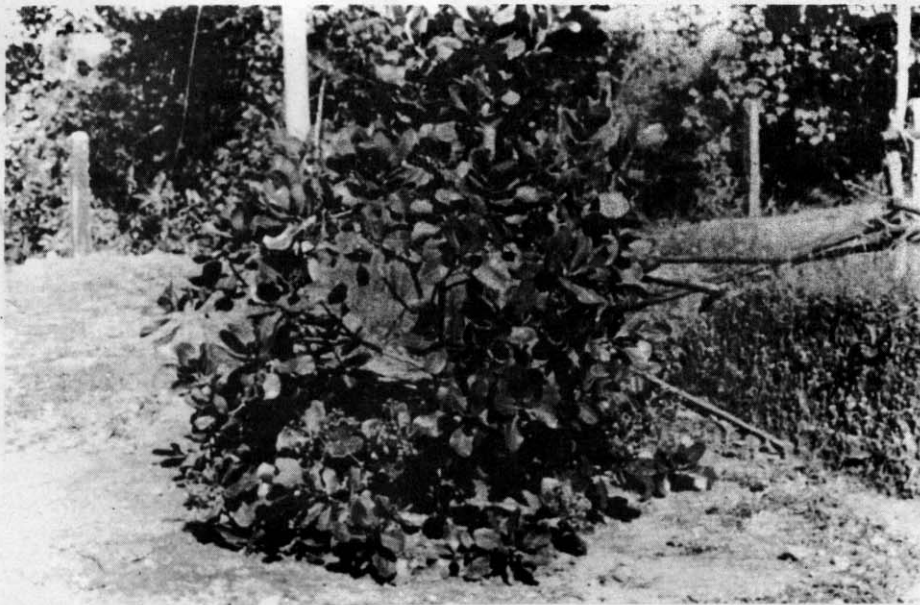


12.

1. A batch of tender cashew root stocks
2. Scion sticks with apical dormant buds
3. A scion stick is being given slanting cuts on either side
4. Scion trimmed for grafting on to the stock
5. A transverse cut is being given 4-5 cm above the cotyledons
6. A cleft is being made in the middle of the root stock
7. Scion duly shaped is being positioned in to the cleft of the stock.
8. A perfect matching of the stock and the scion
9. The graft joint is being secured with a plastic ribbon
10. Narrow alkathe bag covering the scion to protect the apical bud from desiccation
11. Epicotyl grafts at different stages of growth being arranged in rows
12. A batch of epicotyl grafts ready for planting.

Table 1. Number of graftings done and percentage success recorded from June to November with relevant meteorological observations for the year 1980 and 1981

Month	1980						1981					
	Number made			Meteorological observations			Number made			Meteorological observations		
	Success %	Rain fall (mm)	No. of rainy days	Max. Temperature °C	Min. Temperature °C	Relative humidity	Success %	Rainfall (mm)	No. of rainy days	Max. Temperature °C	Min. Temperature °C	Relative humidity
June	60.0	1461.0	29	32.5	26.0	92.0	100	1140.0	28	31.0	23.0	90.3
July	68.0	1277.0	31	31.0	25.0	91.0	100	1212.5	31	31.0	23.5	88.5
August	63.0	1107.0	31	31.0	25.5	90.0	100	1078.0	27	32.0	23.0	89.0
September	56.0	183.5	19	35.0	28.0	88.0	100	411.0	23	34.0	24.0	87.1
October	48.0	244.5	13	36.0	30.0	80.0	100	212.0	15	35.0	25.0	85.2
November	47.0	68.5	8	37.5	30.5	74.0	100	49.0	7	36.8	25.0	84.2
Mean	57.0	723.5	21.8	34.0	27.5	86.0	58.0	683.7	22.0	33.3	24.0	87.3



A two-year old epicotyl graft in bloom.

The grafted root stocks were kept under shade. The scions showed signs of growth within a month from the date of grafting and percentage success was recorded when the scions had put forth 2-3 leaves.

The successful grafts were re-set in polybags of size 30 x 20 cm filled with two parts of compost and one part each of soil and sand for further nourishment.

A trial planting of epicotyl grafts gave cent per cent stand in the field. The trials were repeated for two cycles in 1980 and 1981 and the particulars of grafting done monthwise and percentage success and meteorological observation recorded during the period of grafting are furnished in the Table 1.

RESULTS AND DISCUSSION

The percentage success obtained with epicotyl grafting in two successive years during monsoon period has been almost similar under fairly uniform climatic conditions, as could be seen from the data tabulated. More number of rainy days and the precipitation received in each month might have been a major contributing factor for the increase in the percentage success whereas the decline in the success during October-November had coincided with the decrease in the rainfall and the number of rainy days. Further, the juvenile condition of the root stocks with their rapid cambial growth might have contributed for the better union of the stock and the scion.

The earlier studies on stone grafting in cashew

made by Nagabhushanam and Mohan (1979) gave a marginal success due to desiccation of the scion much before the cambial joint was established and this was remedied by covering the scion with a narrow polythene bag to create humid situation.

Epicotyl grafting in cashew ensures quick multiplication in a given time within an unit area of the space unlike in any other method of grafting or budding where the time lag would be anywhere from 6-8 months to produce a graft of planting size. Further, epicotyl grafting can be practised indoors during heavy rainy season and works out economical for large scale multiplication. The technique of epicotyl grafting, if made popular through Extension Agencies would go a long way to supply high yielding clonal progenies which are very much sought for by growers.

Acknowledgements

I thank Dr. N. M. Nayar, Director, Central Plantation Crops Research Institute, Kasaragod for the encouragement given to take up the study. My thanks are also due to Shri K. N. Murthy, Sr. Scientist in charge, CPCRI Regional Station, Vittal for the facilities provided.

References

- NAGABHUSHANAM, S. AND MOHAN, E 1979. Stone grafting in Cashew (*Anacardium Occidentale* L.). Approved for publication in the Indian Journal of Horticulture.