

Veneer grafting for successful Tamarind propagation

Tamarind, the most widely used acidulent spice or condiment in Indian subcontinent. In the recent years it has gained lot of importance worldwide and now it's not just remained as a mere food ingredient of kitchen, but rather became one of the important commodity being exported from India in wide arrays of form like, pulp concentrate, seed kernal powder, dried pulp, etc. Being drought hardy, tamarind is one of the promising crop for regions with frequent drought and low rainfall for climate resilient sustainable agriculture. Being perennial in nature, tamarind seedling origin trees takes 8-12 years for bearing fruits. To overcome this problem, vegetative propagation is the only way. Hence vegetative propagation is evaluated to standardise the method and time of propagation to meet the demand for quality planting material for commercial cultivation and also for growing in kitchen garden to meet the demands of households.

TAMARIND, the most widely used acidulent spice or condiment in Indian subcontinent. It is mainly used as a souring agent for preparation of cuisines like *rasam* and *sambar* etc. From hundreds of year it was one of the major component of homestead gardens of Kerala mainly as a wild tree. Due to fragmentation of land and population pressure, homestead gardens are facing severe threat and at the verge of drain of many important perennial tree components like tamarind. Being drought hardy, tamarind is one of the promising crop for regions with frequent drought and low rainfall for climate resilient sustainable agriculture.

Problems associated with sexual/seed propagation of tamarind:

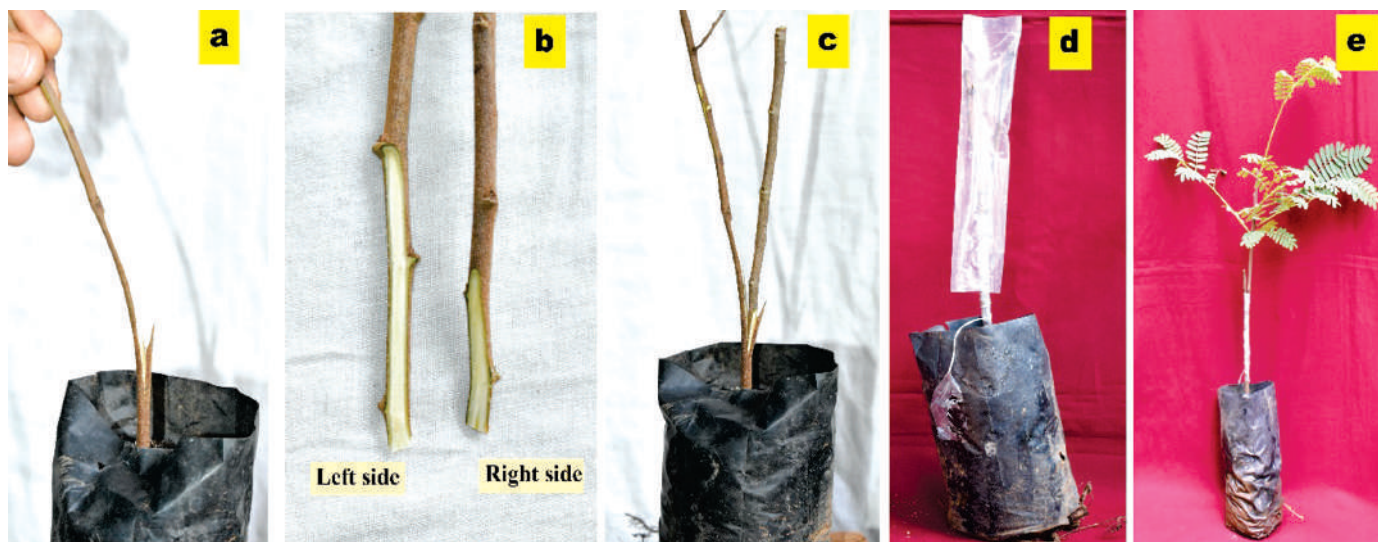
- Being perennial in nature, tamarind seedling origin trees takes 8-12 years for bearing fruits.
- Seedling trees are not true to type and variations are observed among seedling progenies.
- Seedling trees demand more space for proper growth (9-10 m × 9-10 m).

Vegetative propagation of tamarind

- Advantages:
 - ♦ High yielding varieties and quality fruit types can be multiplied with ease.
 - ♦ Yield realization from the grafted/budded plants generally starts from 3-4 years after planting.
 - ♦ Vegetatively propagated plants are suitable for high density planting (HDP) (4.5-5 m × 4.5-5 m).
 - ♦ It occupies comparatively lesser space with proper training and pruning.
- Weather parameters such as temperature, relative

humidity and rainfall are the deciding factors for success of any propagation methods. In order to reintroduce this crop into home gardens and also for taking up commercial cultivation for sustaining agriculture under changing climate along with conserving local landraces from extinction, vegetative propagation methods in this tropical humid agroclimatic zone needs to be standardised, wherein the elsewhere (semi-arid regions) standardised methods needs to be validated before recommending for this region. Hence, different vegetative propagation methods were evaluated in four seasons under agroclimatic situation of coastal midland region, in Thrissur, Kerala in order to identify best method for mass multiplication of tamarind and in the meantime focussing on conservation of germplasms of Kerala.

One-year-old seedlings of uniform growth and pencil thickness were used as rootstocks for grafting. Scion sticks of approx. 10-12 cm with 5-8 buds are grafted on rootstocks of same girth. Four vegetative propagation methods (two detached method of grafting, viz. veneer grafting and wedge grafting; one attached method of grafting - approach grafting and air layering) were evaluated under four seasons (March, June, September and December). Overall highest success (51%) was obtained in propagules produced during March month. Propagules produced during December recorded success of only 17%, followed by September (10%) and lowest success was recorded in propagules produced during June period (2%). Among the different treatment combinations, veneer grafting recorded highest success of 70% during March. Results showed that best time for taking up grafting is March. Among the propagation methods, veneer grafting and wedge grafting turned out to be more successful than



Veneer grafting (a-prepared rootstock, b-prepared scion, c-placing scion on rootstock, d-grafted plant covered with polythene cap, e-successful graft)

other methods and the procedure for these two methods are explained below.

Procedure for grafting

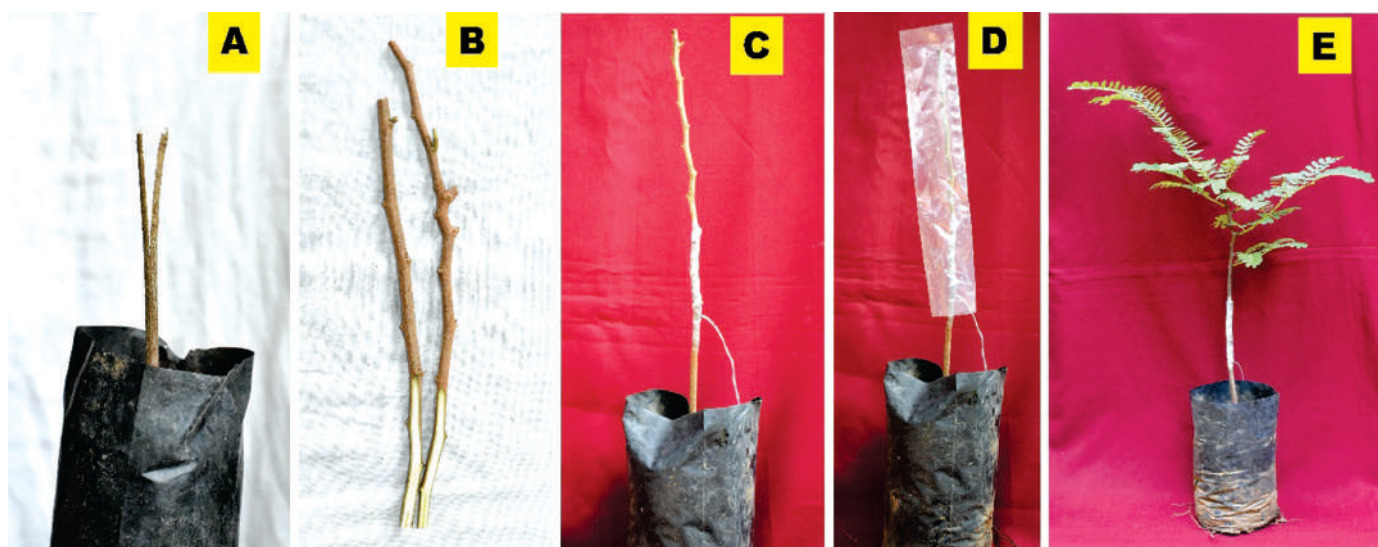
Veneer grafting

Scion collection is same as mentioned in wedge grafting. During the month of March, there is no need to

defoliate if naturally defoliated scion shoots are available. Rootstock was prepared by giving a slant cut of 5 cm downwards to the centre at a height of 10-15 cm and an oblique cut was made at the base of first cut. A piece of bark along with wood was removed from the cut made on the stock. Similar cut was given on the scion base and then fitted into the rootstock such that their cambial

Table 1. Success percentage at 90 days after grafting

Grafting season	Propagation method				Season mean
	Air layering	Approach grafting	Wedge grafting	Veneer grafting	
March (Summer)	10	60	65	70	51
June (Monsoon)	00	08	00	00	02
September (Post-monsoon)	30	10	00	00	10
December (Winter)	28	25	00	15	17
Methods mean	17	26	16	21	



Wedge grafting (A-prepared rootstock, B-pre-cured scion, C-united rootstock and scion, D-grafted plant covered with polythene cap, E- successful graft)

layers' touch each other and tied together with 150-gauge polythene strip. Rootstock was cut 2-3 cm above the graft union immediately after grafting and covered with a wet polythene hood till the sprout emerge from the scion. The wrapped polythene tape is removed 3 months after successful union.

Wedge grafting

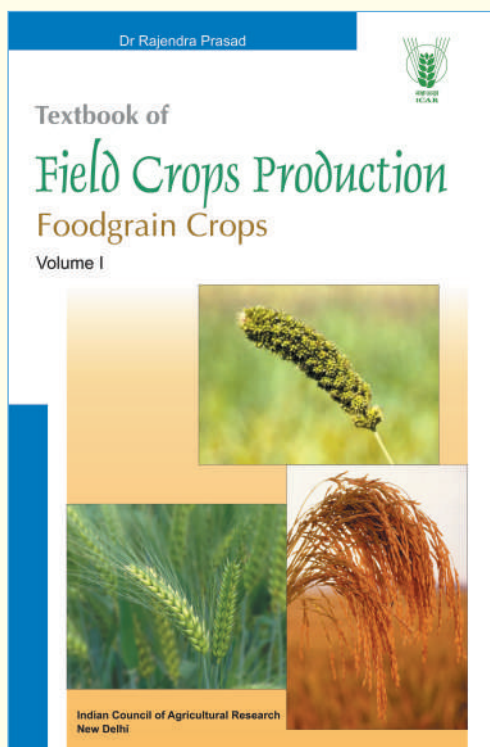
Scion shoots were collected from the elite trees and defoliated prior to grafting. During the month of March, scion shoots defoliates naturally hence no need of pre-curing. Rootstocks were decapitated at 15-20 cm height and a split was made at center to a depth of 5 cm. Base of the scion was given wedge cut of 5 cm and inserted in

the split of the rootstock and firmly wrapped together with 150-gauge polythene tape. Grafts were covered with wet polythene hood till the sprout emerged from the scion. The wrapped polythene tape was removed 3 months after successful union. Successful grafts should be hardened before transplanting into the field. These propagules can be transplanted in field after 6-12 months of grafting based on the plant growth.

For further interaction, please write to:

Shankarprasad KS (PhD Scholar), University of Horticultural Science, Bagalkot, Karnataka 587 104. Corresponding author
e-mail: shankru.ks@gmail.com

Textbook of *Field Crops Production* – Foodgrain Crops



(Volume I)

The first edition of Textbook of Field Crops Production was published in 2002 and there has been a heavy demand for the book. This book is now being brought out in two volumes. The chapters cover emerging trends in crop production such as System of Rice Intensification (SRI), export quality assurance in the production technology of commodities like Basmati rice, organic farming, resource conservation technologies, herbicide management etc. Good agronomic practices must judiciously inter-mix the applications of soil and plant sciences to produce food, feed, fuel, fibre, and of late nutraceuticals while ensuring sustainability of the system in as much possible environment and eco-friendly manner. The advent of hydroponics, precision farming, bio-sensors, fertigation, landscaping, application of ICT, GPS and GIS tools, micro-irrigation etc. is in the horizon. The textbook covers both the fundamentals of the subject and at the same time inspire and prepare both teachers and students for the emerging frontiers.

TECHNICAL SPECIFICATIONS

No. of pages : i-xii + 396 • Price : ₹ 700 • Postage : Rs 100 • ISBN No. : 978-81-7164-116-1

For obtaining copies, please contact:

Business Manager

Directorate of Knowledge Management in Agriculture
Krishi Anusandhan Bhavan-I, Pusa, New Delhi 110 012
Tel : 011-25843657, Fax 91-11-25841282; e-mail : bmicar@gmail.com