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(Received: October 2002; Revised: April 2003)

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adras Agric. J. 90 (7-9) : 557-560 July-September 2003

esearch Notes

tandardisation of the age of rootstocks for top wedge grafting in amarind (*Tamarindus indica* L.)

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Top wedge grafting is done on linearly rowing fresh terminal shoot of the rootstock ith the advancement of age naturally the growth arameters of the seedling increases. The height f grafting may thus exerts an influence on ie success and subsequent growth parameters f the seedling increases. The height of grafting ay thus exerts an influence on the success nd subsequent growth of scion portion. As ie maintenance of the seedling for longer duration icur additional maintenance costs, there is need investigate an appropriate rootstock age for aximum success. In view of this the present vestigation was taken up at University of gricultural Sciences, Dharwad during 000-01.

Polythene bags of 400 gauge thickness nd size of 20x10cm were used for raising ootstocks. Potting mixture containing red earth, rmyard manure (FYM and coir dust in 1:1:1 /v]) was used. Selected healthy, large sized eeds were sown flat on the medium at a shallow death. Seeds were sown in polybags during the first week of every month from March to September, so that seedling of different age groups was available at one time for grafting *i.e.* during January. Scions from the clone Dharwad Tamarind Selection-1 (DTS-1) were collected in the morning hours (8.00 to 9.00 am) on the day of grafting and defoliated with sharp secateur. The scions so prepared were further used for grafting on the same day without curing. For the top wedge grafting, the top growth of the rootstock was decapitated with a sharp knife or secateur. Then a longitudinal cut of 5 cm length was given from the terminally pruned rootstock. A scion shoot of same thickness and length of about 8 to 10cm was selected and the cut end of the scion was mended into a wedge shape of 5-6cm long by chopping of the bark and a little portion of wood from two opposite sides, care was taken to retain some bark on the remaining two sides. The wedge of the scion was inserted in to the cleft of the stock plant taking care that the

Table 1. Influence of age of rootstock of graft success (%) in tamarind

Age of the root stock (months)	Period of growth of seedling	Growth parameters of stocks at the grafting time		Graft success (%)		
		Height (cm)	Diameter (cm)	30 DAG	60 DAG	90 DAG
T_1 (4 month)	September - December	22.29	0.31	81.54 (64.58)	44.56 (41.82)	44.56 (41.82)
T_2 (5 month)	August - December	20.85	0.24	6.11 (51.41)	35.18 (36.33)	33.33 (35.24)
T_3 (6 month)	July - December	20.24	0.29	74.03 (59.34)	34.99 (36.20)	34.01 (35.61)
T_4 (7 month)	June - December	21.15	0.32	80.00 (63.43)	45.00 (42.09)	45.00 (42.09)
T_5 (8 month)	May - December	23.39	0.36	75.98 (60.62)	51.96 (46.16)	51.96 (46.16)
T_6 (9 month)	April - December	44.97	0.52	80.00 (63.42)	39.27 (37.79)	38.26 (37.22)
T_7 (10 month)	March - December	48.90	0.56	84.99 (67.15)	24.03 (29.38)	24.03 (29.38)
Mean		28.83	0.37	76.81 (61.42)	39.28 (38.54)	38.73 (38.22)
S.Em±		1.09	0.008	0.71	4.55	4.41
CD at 5%		3.36	0.02	2.20	NS	NS

DAG : Days after grafting
Figures in parentheses indicate are sine transformed values.

cambium layers of stock and scion come in perfect contact with each other. The graft joint was wrapped properly and firmly with 150-gauge polythene strip. The grafts joint was covered with small transparent tubular bag to prevent water entering the grafted portion and also to avoid desiccation of the scions by creating humidity in the microclimate near and above the graft union region. The grafted plants were transferred immediately to the mist chamber and maintained there for 30 days. Then they were shifted to shade house. Observations on per cent graft success at 30,60 and 90 days after grafting (DAG) were recorded.

In the present investigation, the height and diameter of the different age group seedlings varied from 20.2 cm in 6 month old rootstock (T_3) to 48.90 cm in 10 month old rootstock (T_7) and diameter of 0.24 cm (T_2) in 5 month old rootstock to 0.56 cm (T_7) in 10 month old rootstock respectively.

A maximum of height 48.9 cm and diameter 0.56 cm were recorded in 10 month old rootstocks, while the minimum height of 20.24 cm and minimum diameter of 0.24cm observed in 6 month old and 5 month old rootstocks respectively. The 4 month old seedlings expressed comparatively better growth and this may be due to the favourable environmental conditions existed during that growth period (Table 1).

Top wedge grafting is done on linearly growing fresh terminal shoot of the rootstock. The height of grafting might thus exerted an influence on the success and subsequent growth of scion portion. Hence, it is considered worth

able 2. Influence of age of rootstock of average number of sprouts in tamarind

ge of the root stock (months)	Average number of sprouts		
	30 DAG	60 DAG	90 DAG
T_1 (4 month)	3.33	3.38	3.61
T_2 (5 month)	2.94	2.91	3.05
T_3 (6 month)	3.06	3.09	3.44
T_4 (7 month)	3.12	2.82	3.01
T_5 (8 month)	3.64	3.54	3.54
T_6 (9 month)	2.96	3.07	3.22
T_7 (10 month)	3.61	3.80	3.85
Mean	3.24	3.23	3.39
S.Em±	0.19	0.25	0.27
CD at 5%	NS	NS	NS

)AG : Days after grafting

able 3. Influence of age of rootstock of average sprout length (cm) in tamarind

ge of the root stock (months)	Average sprout length (cm)		
	30 DAG	60 DAG	90 DAG
T_1 (4 month)	1.05	1.80	2.86
T_2 (5 month)	0.99	1.40	2.10
T_3 (6 month)	1.04	2.21	3.10
T_4 (7 month)	1.10	1.67	2.10
T_5 (8 month)	1.27	1.92	3.04
T_6 (9 month)	1.65	5.15	6.41
T_7 (10 month)	2.85	6.37	7.08
Mean	1.42	2.93	3.81
S.Em±	0.19	0.29	0.43
CD at 5%	0.61	0.91	1.35

DAG : Days after grafting

to perform grafting at lower height. The rootstock age had significant influence on initial graft success at 30 DAG, while it was found non-significant at other stages of observation (Table 1). The highest graft success was observed in 10 month old rootstock followed by four months old rootstock at 30 DAG, whereas it was non significant at 60 and 90 days after grafting. However, numerically higher graft success was observed in eight (51.96%) and seven (45.0%) month old rootstock followed by 4 month old (44.56%) rootstock, while lesser (24.03%) graft success was observed with 10 month old rootstock at 90 days after grafting. It may be due to the physiological maturity of rootstock which could played an important role in the success of graft union and growth of grafts. It is evident from the observations that the rootstocks of younger age (8,7 and 4 month old rootstock) with 0.3 to 0.4 cm of diameter produced higher graft success. The lower graft success in 10 month old rootstocks was reported by several workers in different crops (Reddy and Melan, 1988; Jayarama Gowda and Melanta, 1989; Satisha *et al.* 1997). They opined that the younger rootstocks give more success in soft wood grafting than older ones.

Satisha *et al.* (1997) documented the lowest graft success in 9 months and above age rootstock

in tamarind. Similar findings were obtained by Reddy and Melanta (1988) in mango, Gowda and Gowda (1989) in champaka. The present studies also revealed that the average number of sprouts produced were non-significant at all the stages of observation (Table 2). A greater number of sprouts (3.85) were continued to be maintained in 10 months old rootstock, while the lower number of sprouts (3.01) were observed in 7 month old rootstocks at 90 DAG.

The sprout length recorded was found to be significant at all stages of observation. After 30 days the heighest sprout length (2.85 cm) was observed in 10 month old (T_7) rootstock age group, while it was significantly higher than all other rootstock age groups. The lowest sprout length (0.99cm) was recorded in 5 month (T_7) old root stage group. A higher sprout length in T_7 may be due to the thicker scion shoots used for the grafting as they may hae reserve food material for the better development of the sprouts. The average sprout length recorded was continued to be the highest in 10 monti old rootstock followed by 9 month old rootstock while all other age rootstocks were found o1 par with others (Table 3).

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(Received: July 2002; Revised: February 200

Madras Agric. J. 90 (7-9) : 560-562 July-September 2003

Research Notes

Performance of certain sweet orange varieties in Andhra Pradesh

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In recent years, sweet orange crop is grown extensively in Andhra Pradesh. Among the sweet orange varieties, only two varieties *viz.* Sathgudi and Mosambi are the promising

Table 1. Plant growth and yield parameters of certain sweet orange varieties

Sl. No.	Name of the variety	Plant height (m)	Plant volume (cu.m)	Yield/tree 1-1-01 to 31-12-01		Cumulative yield/tree from December 1998	
				No.	weight (kg)	No.	weight (kg)
1.	Kodur sathgudi	3.44	68.02	235.50	43.28	670.50	123.88
2.	Mosambi	3.57	63.01	185.22	35.14	573.32	104.61
3.	Blood red malta	2.41	19.40	24.00	4.12	29.10	4.95
4.	Jaffa	4.28	81.76	198.38	37.99	549.78	105.50
5.	Hamlin	3.88	76.60	261.13	43.05	415.38	105.13
5.	Valencia	3.76	74.01	295.80	58.52	566.56	93.95
7.	Valencia late	3.43	59.37	372.30	58.61	560.35	94.63
	CV (%)	9.72	17.62	17.76	11.20	2.77	4.27
	CD 5%	0.61	19.86	70.96	7.76	23.63	6.89