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## Standardization of period for softwood grafting in tamarind (*Tamarinds indica* L.)

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### Abstract

An Investigation was carried out to “Standardization of period for softwood grafting in dry land fruit crops. The experiment was conducted VNMKV, Parbhani in CRD comprising of twelve treatments with three replications. The Treatments were T<sub>1</sub>, Grafting on 1<sup>st</sup> December 2004, T<sub>2</sub>- Grafting on 1<sup>st</sup> January 2005, T<sub>3</sub>- Grafting on 1<sup>st</sup> February 2005 T<sub>4</sub>- Grafting on 1<sup>st</sup> March, T<sub>5</sub> – Grafting on 1<sup>st</sup> April 2005, T<sub>6</sub> – Grafting on 1<sup>st</sup> May 2005, T<sub>7</sub> – Grafting on 1<sup>st</sup> June 2005, T<sub>8</sub> – Grafting on 1<sup>st</sup> July 2005, T<sub>9</sub> – Grafting on 1<sup>st</sup> August 2005, T<sub>10</sub> – Grafting on 1<sup>st</sup> September 2005, T<sub>11</sub> – Grafting on 1<sup>st</sup> October 2005, T<sub>12</sub> – Grafting on 1<sup>st</sup> November 2005, Among different treatments, significantly highest, initial success (86.66%), Final success (71.66%), height of graft (36.53 cm) diameter of sprouted graft (0.31 cm), Number of sprouted scion bud (5.10), Number of leaves (44.16), Leaf area (225.15 cm<sup>2</sup>), Length of tap root (27.73 cm) and number of secondary roots per graft (37.21) were recorded in treatment grafting was carried out on 1<sup>st</sup> March. When grafting was carried out on 1<sup>st</sup> January, 1<sup>st</sup> may, 1<sup>st</sup> June, 1<sup>st</sup> July, 1<sup>st</sup> August, 1<sup>st</sup> September, 1<sup>st</sup> October, 1<sup>st</sup> November and 1<sup>st</sup> December had given zero percent success.

**Keywords:** Tamarind, softwood grafting, tamarinds indicia

### Introduction

Tamarind is third one of the most important dry land fruit crops of the state. It is cultivated throughout tropic and subtropics. The fruits contains a sweetish acidic pulp, which is commercially widely used for souring curries squashes, chutneys and beverages. Tamarind (*Tamarinds indica*) is one of the most common fruit of India. It is an excellent tree for forestry and agroforestry. In the waste land development and dry land horticulture tamarind assumes great significances due to its multifarious uses and capacity to with stand adverse agro climatic conditions the pulp of the nature rip fruit has considerable export value in many tender leaves and flowers are consumed as a vegetable in salad, soaps, and curries. Generally the dry land fruit crops are propagated by seed. In this region attempts were made by various works to locate superior types through the survey in tamarind and other fruit crops. Superior local elite types have been indentified in tamarind (No- 263. Prathisthan, Yogeshwari). In the recent year softwood grafting g has become popular because of the added advantages over other methods. Therefore, an investigation was planned to study the standardization of period for soft wood grafting in dry land fruit crops.

### Materials and Methods

An experiment was conducted at central nursery scheme. VNMKV, Parbhani. The experiment was laid out in complete. Randomized design (CRD) comparison of twelve (12) treatments which were replicated thrice. The treatment used were T<sub>1</sub>- Grafting on 1<sup>st</sup> December 2004, T<sub>2</sub>- Grafting on 1<sup>st</sup> Janury 2005, T<sub>3</sub>- Grafting on 1<sup>st</sup> Feburary 2005, T<sub>4</sub>- Grafting on 1<sup>st</sup> March 2005, T<sub>5</sub>- Grafting on 1<sup>st</sup> April 2005, T<sub>6</sub>- Grafting on 1<sup>st</sup> May 2005, T<sub>7</sub>- Grafting on 1<sup>st</sup> June 2005, T<sub>8</sub>- Grafting on 1<sup>st</sup> July 2005, T<sub>9</sub>- Grafting on 1<sup>st</sup> August 2005, T<sub>10</sub>- Grafting on 1<sup>st</sup> September 2005, T<sub>11</sub>- Grafting on 1<sup>st</sup> October 2005, T<sub>12</sub>- Grafting on 1<sup>st</sup> November 2005. The seedling were selected about 7 to 10 months old, 40-45 cm in height and 0.3-0.6 cm in diameter above ground level at the time of grafting operation. In tamarind the scion mother tree of pratishthan planted at central nursery, Marathwada Agricultural University, Parbhani, was selected for bud stick. The scion tree was healthy vigorous and high yielding the scion bud stick of current seasons of about one year and 15 to 25 cm in length woth 8 to 10 buds, greenish with gray tinge, were used. The scion bud sticks was defoliated 8-10 days prior to grafting operation. Scion bud stick with plumpy buds were only used for the grafting operation. Softwood grafting in tamarind was done by wedge method as reported in mango by Amin (1974) the rootstock seedling was deheaded by 15-20 cm height above the ground level. A vertical slit of 2.5 to 3.0 cm length was given on the rootstock. On scion shoot similar

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matching cut was prepared in slanting manner on both the surface in lower portion. It is inserted on rootstock and wrapped by using polythene tape. The emerging shoots on the root stocks were nipped of whenever they appeared. While watering the plants care was takes that tied strips were not welted five uniform grafts were selected in each treatment for recording upto 90 days after grafting operation..

### Result and discussion

The data were recorded on various parameter for two years and pooled data was shown in table -1. Significantly minimum days were required for sprouting when grafting was carried out on 1<sup>st</sup> March (12.55 days) where took significantly longer period for sprouting (31.00 days) period for softwood significantly influence on days required to sprout. The sprouting was delayed when grafting was carried out on 1<sup>st</sup> February this might be due to the presence of low temp which become hurdle in the free flow of cell sap condition. Similar results were also reported by Mawani (1992) [7]. In tamarind similar observation were also recorded by Shinde *et al* (1996) [11]. Bharad *et al* (1999) [3]. Significantly maximum initial success was recorded when grafting was carried out on 1<sup>st</sup> March (86.66 percent) followed by 1<sup>st</sup> April (74.44 percent). The minimum initial percent success was recorded when grafting was carried out on 1<sup>st</sup> February. In tamarind maximum success was obtained in the month of February grafting. During the period from March to April the maximum and minimum temperature ranged from 31 °C to 37.8. These conditions are favorable for rapid cell growth i.e. 12.8 °C to 32 °C temperature as stated by Hartman and kaster (1972) [5]. when grafting was carried out on 1<sup>st</sup> January, 1<sup>st</sup> may, 1<sup>st</sup> June, 1<sup>st</sup> July, 1<sup>st</sup> August, 1<sup>st</sup> Septembers, 1<sup>st</sup> October, 1<sup>st</sup> November And 1<sup>st</sup> December, had given zero percent success. Significantly final percent success was found when grafting was carried out on 1<sup>st</sup> march (71.66 percent) minimum success was found when grafting was carried out on 1<sup>st</sup> February (20.00 percent). The results obtained in present study are in accordance with the finding of shinde (1996) [11].

that softwood grafting in march or the first week of April resulted in highest success.

The results presented in Table 2. Significantly maximum height (36.53 cm) was found when grafting was carried out on 1<sup>st</sup> March followed by 1<sup>st</sup> April. Minimum height was observed when grafting was carried out on 1<sup>st</sup> February. The results are supported by Naike (1997) [8]. obtained more height of the graft on 25<sup>th</sup> march. Similar results were also obtained by Banger (1992) Reddy (2000) [9]. in tamarind. Significantly maximum diameter of sprouted scion shoot (0.31 cm) was recorded in grafting was carried out in 1<sup>st</sup> April. Whereas grafting prepared on 1<sup>st</sup> February and 1<sup>st</sup> April were statistically at par each other. The maximum number of sprouted scion bud per graft was recorded when grafting was carried out on 1<sup>st</sup> April (6.00). However grafting done on 1<sup>st</sup> February and 1<sup>st</sup> march were at per each other. In tamarind, grafts prepared on 1<sup>st</sup> april had maximum sprouted scion buds per graft. As temperatures and humidity were enough for sprouting of buds in the month of April. These findings are in conformity with Kulkarni, (1990) [6] and Gayake (1992) [4]. Significantly maximum number of leaves were recorded when grafting was carried out on 1<sup>st</sup> march (44.16) minimum number of of leaves were observed. When grafting was carried out on 1<sup>st</sup> February. Significantly maximum leaf area (225. 15 cm<sup>2</sup>) was recorded in 1<sup>st</sup> march. Regarding the influence of different treatments on length of tap root. Maximum length of top root recorded in treatment 1<sup>st</sup> march. This might be due to vigorous shoot length growth 1<sup>st</sup> March treatment which produced more number of leaves resulting in more production of photosynthetic products and their translocation through phloem to the root zone which might have helped in increasing the length of tap root. The results are supported by Sarada *et al* (1991) [10]. in cashew. The grafts prepared on 1<sup>st</sup> march produced more number of secondary roots. Less number of secondary roots were produced when grafting was carried out on 1<sup>st</sup> February treatment. Maximum root: shoot ration was produces when grafting was carried out on 1<sup>st</sup> march (0.68).

**Table 1:** Effect of grafting period on number of days required for sprouting, initial success and final success of grafting in Tamarind

T. No	Treatment	Number of days required for sprouting	Percent of intitial success of 30 days after grafting	per cent of Final success of 90 days after grafting
T <sub>1</sub>	1 <sup>st</sup> December 2004	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)
T <sub>2</sub>	1 <sup>st</sup> January 2005	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)
T <sub>3</sub>	1 <sup>st</sup> February 2005	31.00 (2.34)	20.00 (1.98)	20.00 (1.98)
T <sub>4</sub>	1 <sup>st</sup> March 2005	12.55 (3.61)	86.66 (8.67)	71.66 (8.49)
T <sub>5</sub>	1 <sup>st</sup> April 2005	19.29 (4.44)	74.44 (8.27)	32.10 (5.59)
T <sub>6</sub>	1 <sup>st</sup> May 2005	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)
T <sub>7</sub>	1 <sup>st</sup> June 2005	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)
T <sub>8</sub>	1 <sup>st</sup> July 2005	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)
T <sub>9</sub>	1 <sup>st</sup> August 2005	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)
T <sub>10</sub>	1 <sup>st</sup> Sep 2005	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)
T <sub>11</sub>	1 <sup>st</sup> Oct 2005	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)
T <sub>12</sub>	1 <sup>st</sup> Nov 2005	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)
	SE <sub>+</sub>	0.68	0.00 (0.70)	0.00 (0.70)
	CD at 5%	1.88	0.41	0.43
			1.15	1.20

Figure in the parenthesis denote square root transformation value.

**Table 2:** Effect of grafting period on vegetative parameter after 90 days of grafting in Tamarind.

T. No	Treatment	Height of graft (cm)	Diameter of sprouted scion shoot (cm)	Number of sprouted bud per graft	Number of leaves per graft	Leaf area per grafting (cm <sup>2</sup> )	Length of tap root (cm)	Number of secondary roots per graft	Root: shoot Ratio
T <sub>1</sub>	1 <sup>st</sup> December 2004	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)
T <sub>2</sub>	1 <sup>st</sup> January 2005	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)
T <sub>3</sub>	1 <sup>st</sup> February 2005	27.56 (2.85)	0.30 (0.76)	5.00 (1.25)	3.54 (2.01)	24.70 (5.02)	20.50 (1.99)	7.31 (2.76)	0.68 (1.08)
T <sub>4</sub>	1 <sup>st</sup> March 2005	36.53 (6.07)	0.31 (0.90)	5.10 (2.37)	44.16 (6.68)	225.15 (15.01)	27.73 (5.15)	37.21 (6.11)	0.66 (1.07)
T <sub>5</sub>	1 <sup>st</sup> April 2005	35.82 (6.01)	0.31 (0.90)	6.00 (2.56)	24.00 (4.94)	171.40 (13.10)	26.62 (5.15)	30.19 (5.50)	0.65 (1.05)
T <sub>6</sub>	1 <sup>st</sup> May 2005	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)
T <sub>7</sub>	1 <sup>st</sup> June 2005	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)
T <sub>8</sub>	1 <sup>st</sup> July 2005	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)
T <sub>9</sub>	1 <sup>st</sup> August 2005	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)
T <sub>10</sub>	1 <sup>st</sup> September 2005	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)
T <sub>11</sub>	1 <sup>st</sup> October 2005	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)
T <sub>12</sub>	1 <sup>st</sup> November 2005	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)
	SE <sub>+</sub>	0.69	0.01	0.17	0.42	1.36	0.48	0.69	0.04
	CD at 5%	1.91	0.05	0.49	1.16	3.78	1.35	1.91	0.12

Figure in the parenthesis denote square root transformation value.

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