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Effect of time on budding and grafting success in jamun (*Syzygium cumini* Skeel)

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INTRODUCTION

Jamun is a hardy fruit corp. It can tolerate drought conditions if occurs for some time as well as heavy rainfall conditions. The tree is evergreen and partially deciduous under drought condition. The tree bears flowers and fruits profusely up to such an extent that many a times the branches/ twigs loaded with heavy fruit load cause them to drop. The branches are brittle, i.e. they are not flexible. Jamun tree produces a large quantity of seeds, and freshly extracted seeds germinate up to 90%. Generally, seeds are sown in nursery and one-year-old seedlings are planted in the main field. Becuase of its medicinal values and suitability for planting as windbreak, its demand is increasing day by day that will require selected plants of superior quality and high yield potential. That is only possible when desirable mother trees are used for vegetative propagation. Therefore, main objective of the present study was to find out optimum time of budding and grafting of jamun.

MATERIAL AND METHODS

The experiment was conducted on jamun cultivar 'Paras Local' at Department of Horticulture, Gujarat Agricultural University, Junagarh Campus, Junagarh during 1992-93 and 1993-94. The design of experiment was completely randomized block design with 3 replications. The propagation was done by 2 methods i.e., patch budding and wedge grafting at monthly interval for 6 months started from 10th Feburary to 10th July. Total treatment combinations were 12. Morphological parameters were studied as described by Hartmann and Kester (5). Standard methods for biochemical studies were followed, e.g. total N (AOAC, 1), soluble N (Patnaik *et al.*, 8). Insoluble N was calculted from the difference between total N and protein N. The protein N content was calculated by multiplying the N percentage by factor 6.25, carbohydrate by Dreywood (4) and Bruyn *et al.* (3), reducing sugars by Nelson (7) and phenol by Bray and Thorpe (2) methods.

RESULTS AND DISCUSSION

Early bud sprouting was observed in plants raised by grafting (16 days) as compared to those raised by budding (18.27 days). Number of days required for bud sprouting decreased from February to July operations (Table 1). Minimum days were taken in June and July. February took significantly longer period for sprouting. Interaction effect of method and time on number of days required for bud sprouting showed that grafting in June and July induced significantly early bud sprouting (Table 2).

The delayed bud sprouting in February probably caused due to low temperature and inadequate flow of cell sap. Poor and delayed bud sprouting was also reported by Mawani and Singh (6) in ber

Table 1. Effect of time and method of propagation on days for bud sprouting, success, shoot length, diameter and number of functional leaves/shoot at 180 days in jamun.

Treatments	Days for bud sprouting	Success (%)	Shoort length (cm)	Shoot diameter (cm)	No. of functional leaves/shoot
		Method of propagation			
Budding	18.27	47.42	43.70	6.75	15.02
Grafting	16.00	41.67	37.22	6.40	13.16
CD (5%)	0.56	2.48	0.99	NS	0.67
		Time of propagation			
February	22.25	29.49	36.24	6.16	10.58
March	19.66	38.33	39.71	6.45	13.58
April	18.00	33.36	41.24	6.46	15.00
May	16.25	38.34	46.39	7.29	17.91
June	13.41	66.80	40.95	6.79	16.08
July	13.25	64.15	38.22	6.57	15.03
CD (5%)	0.97	4.29	1.71	0.19	1.15

Table 2. Interaction effect of time and method of propagation on number of days required for sprouting and success in jamun.

Timing	Sprouting days		Success (%)	
	Budding	Grafting	Budding	Grafting
February	21.17	20.33	32.21	26.77
March	21.67	17.67	47.77	28.89
April	19.00	17.00	36.72	30.00
May	16.83	15.67	34.50	42.17
June	14.17	12.67	69.77	61.83
July	13.83	12.67	65.55	63.33
CD (5%)	1.38		6.05	

and Patolia and Singh (9) in gunda (*Cordia dichotoma*).

Budding gave significantly higher success (47.42%) than grafting (41.67%). Further, success was significantly higher irrespective of months of propagation in June, but it was at par with July. Poor success was from February to May. Interaction between methods and time of propagation indicated the highest success due to budding performed in June followed by July. Similarly, time of grafting was also found suitable in June and July (Table 2). Suitable time for budding in jackfruit and jamun was also reported by Singh *et al.* (10). The shoot length of budded plants was significantly more than of grafted plants (Table 1). The shoot growth was significantly higher in budding on grafting done in May followed by April

and June. It was lower in February, March and June. The diameter of shoot did not differ significantly due to budding or grafting.

The budded plants had significantly higher number of leaves than grafted ones. Regardless of methods of propagation, significantly highest number of leaves was obtained in May followed by June and July. The number of leaves was poor in plants propagated during February and March (Table 1).

The total N content was significantly higher in rootstock than in scion (Table 3). As regards the effect of timings, the content of total N was significantly higher in February followed by March and July. It was minimum in May followed by April and June. The rootstock had higher content of soluble N than scion (Table 2). It was significantly higher in February followed by March. Significantly more content of carbohydrate was recorded in rootstock than that of scion. However, it was non-significant in different months.

The C:N ratio did not differ signifiantly both in rootstock and scion but it differed significantly due to diffferent months. The C:N ratio ranged from 22.15 to 34.50 and was highest in May followed by April. There was significantly higher protein content in rootstock than scion. The protein content was influenced significantly by the time of propagation. It was significantly highest in February followed by March and July. The lowest protein accumulation was recorded in May. The phenol content was significantly more in scion than in rootstock. In February, the content of phenol was highest than that in April, June and July (Table 3).

SUMMARY

In jamun, bud sprouting was early in June and July. Budding method proved superior to grafting when it was performed in June. The success was poor from February to May. Budding in May resulting in significantly maximum shoot length, shoot diameter and number of functional leaves.

Table 3. Biochemical constituents of scion and rootstock at the time of budding and grafting in jamun.

Treatments	Total N (%)	Soluble N (%)	Insoluble N (%)	Total carbohydrate (%)	C:N ratio	Protein (%)	Phenol content (mg/g)
			Method of propagation				
Scion	0.40	0.12	0.30	11.61	29.65	2.51	9.04
Rootstock	0.45	0.16	0.29	12.89	28.96	2.86	8.50
CD (5%)	0.03	0.02	NS	0.40	NS	0.12	0.35
			Time of propagation				
February	0.53	0.22	0.29	11.61	22.15	3.37	9.77
March	0.46	0.17	0.32	12.05	25.76	2.90	9.55
April	0.39	0.12	0.29	12.28	31.45	2.47	9.19
May	0.36	0.10	0.26	12.52	34.50	2.28	9.64
June	0.39	0.11	0.30	12.45	31.77	2.48	7.59
July	0.42	0.12	0.31	12.58	30.20	2.63	6.89
CD (5%)	0.03	0.05	NS	NS	2.99	0.22	0.60

Total and soluble N contents were higher in rootstock than scion. February recorded significantly higher content of total and soluble N but isoluble N differed non-significantly. Carbohydrate and phenol content was higher in rootstock than in scion. The C : N ratio did not differ significantly between rootstock and scion. May recorded highest C:N ratio. Protein content was significantly higher in rootstock in February.

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