

ORIGINAL ARTICLE

Standardization on Propagation techniques in Guava Under Western UP Conditions

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ABSTRACT

An experiment was conducted to standardize method and time of propagation in Guava. Patch budding and Wedge grafting (cleft method) were carried out at monthly interval. The results of propagation study indicate that patch budding performed in May was significantly superior to wedge grafting on account of higher success (76.67%) with maximum number of leaves (60.40%) and primary branches (5.95). However, Wedge grafted plants sprouted earliest in compare to Patch budded plants when performed in July (25 days).

Key words: Guava (*Psidium guajava*), Patch budding, Wedge grafting, Time, Success.

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INTRODUCTION

Vegetative propagation, whose techniques have been standardized in most of the fruit crops, has substantially revolutionized fruit industry in our country [7, 13]. Air layering and stooling have been most widely adapted methods of vegetative propagation of guava in the country. However, both the techniques have problem to raising the grafted plants. Vegetative methods of propagation such as patch budding and wedge grafting have employed in guava in different part of the country. However, season of propagation techniques varies from region to region due to the variation in agro-climatic condition. Owing to lacking research finding a standardization of propagation techniques for western Uttar Pradesh which quality guava is produced as commercial scale, it was felt necessary to standardized method of propagation (patch budding and wedge grafting) and time of vegetative propagation of guava for this region.

MATERIAL AND METHODS

The experiment was conducted at Horticultural Research Centre of the university during 2006-07 to standardize the time and techniques of vegetative propagation in guava. Two methods of vegetative propagation namely patch budding and wedge grafting were tried for present study and 9 months, viz. March, April, May, June, July, August, September, October and November were selected for propagation. All the propagation methods were performed as described by Shanker [12]. The experiment was laid out randomized complete block design with three replications having 10 plants in each replication. Data on sprouting were recorded soon after bud burst. The data on the per cent cuttings/layers/buds/graft take success and per cent sprouting were recorded after 180 days of budding/grafting by taking the ratio multiplied by 100. Length and diameter of sprout, number of leaves and primary branches per plant was recorded at an interval of 180 days after grafting. The data were then analyzed as per method suggested by Panse and Sukhtame [11].

RESULTS AND DISCUSSION

The perusal of the data presented in Table 1 reveals that days required for bud sprouting differed significantly due to time and method of propagation. It was observed that patch budded plants sprouted earliest in May (28 days), closely followed by June, while maximum time was taken when it was performed in September. Similarly, wedge grafted plant took least time to sprout in July (25 days) closely followed by August. However it took the maximum time to sporut in November (34 days). Interaction effect of method and time of propagation on days required for bud sprouting showed that budding and grafting in May, June and July August respectively induced significantly early bud sprouting (Table-1). No bud took place in October-November in Patch budding. Similarly, no bud sprouting was recorded in May

and June in case of wedge grafting. The delayed and no bud sprouting during winter season probably caused due to low temperature and inadequate flow of cell sep. Higher temperature during April to August has helped in early sprouting which may be due to fast establishment of vascular cambium in rootstock and scion as has been reported by Awasthi and Shukla [1] and Singh and Singh [13]. Similar results were obtain by Bhardwaj and Awasthi [2], Chovatia and Singh [3] , Dubey *et al* [5] in pecan nut, custard apple, Jamun Mandarin and Kiwi respectively.

Table 1. Effect of time and method of propagation on bud sprouting, time taken for bud sprout and its success.

Treatment	Time taken for Bud sprout (Days)		Bud sprout (%)		Success %	
	Patch budding	Wedge grafting	Patch budding	Wedge grafting	Patch budding	Wedge grafting
March	40.20	26.40	30.00	26.66	26.67	20.00
April	36.20	29.00	56.66	13.33	46.67	10.00
May	28.00	No Sprouting	83.33	0.00	76.67	0.00
June	30.20	No Sprouting	80.00	0.00	73.33	0.00
July	36.80	25.00	63.33	36.66	56.67	33.33
August	42.40	28.60	46.66	33.33	33.33	30.00
September	48.50	29.20	32.33	30.00	23.33	26.67
October	No Sprouting	32.50	0.00	26.66	0.00	20.00
November	No Sprouting	34.00	0.00	20.00	0.00	16.67

CD (P=0.05)

Method of Propagation	0.81	0.63	0.58
Time of Propagation	1.72	1.34	1.23
Method X Time	2.43	1.90	1.74

Table 2. Effect of time and method of propagation on Length of sprout, Diameter of sprout, No. of leaves and No of Primary branches..

Treatment	Length of Sprout (cm)		Sprout Diameter (cm)		No. of Leaves		No. of Primary branches	
	Patch budding	Wedge grafting	Patch budding	Wedge grafting	Patch budding	Wedge grafting	Patch budding	Wedge grafting
March	20.42	29.75	0.65	0.64	37.26	44.50	4.95	5.10
April	25.67	33.13	0.72	0.60	44.67	40.10	5.10	4.72
May	35.10	0.00	0.83	0.00	60.40	0.00	5.95	0.00
June	33.31	0.00	0.78	0.00	55.28	0.00	5.80	0.00
July	23.86	38.49	0.66	0.87	42.10	46.68	5.05	5.46
August	18.15	33.75	0.56	0.84	35.16	35.10	5.00	5.30
September	14.40	28.38	0.50	0.69	28.67	29.60	4.65	4.33
October	0.00	30.16	0.00	0.78	0.00	32.00	0.00	4.60
November	0.00	20.17	0.00	0.73	0.00	34.26	0.00	4.10

CD (P=0.05)

Method of Propagation	0.55	0.04	0.74	0.30
Time of Propagation	1.17	0.10	1.57	0.64
Method X Time	1.65	0.14	2.22	0.91

Different time and methods of propagation had significant influence on per cent sprouting in guava. Data presented (Table 1) indicates that among different time and methods of propagation highest (83.33%) of sprouting was recorded in patch budding performed in May. However, plants propagated through wedge grafting recorded the highest bud sprouting in July closely followed by August. No sprouting was recorded in the plants propagated through patch budding and wedge grafting during October-November and May-June respectively. The highest bud sprouting irrespective of patch budding and wedge grafting was achieved during May and July respectively. Similarly, time and methods of propagation also had a significant effect on per cent success of guava. After 180 days from propagation, highest per cent success (76.67%) was recorded in patch budding during May which was significantly superior to wedge grafting performed in July (33.33%). Superiority of patch budding over other methods with respect to per cent success might be due to the larger bark and cambium tissues in patch which come in contact easily between stock and scion after budding operation. Highest success in patch budding is in accordance with the findings of Kumar *et al.* [6], Moti *et al* [8], Nowshad *et al* [10] and Nayak and Sen [9]. Such a wide variation in sprouting and graft success may passively by attributed due to variation in temperature and relative humidity during the period of study. These factors influence the sprouting and graft success.

Chovatia and Singh [4] also recorded that total nitrogen and carbohydrate content showed increasing trend during March-April and that must have equally contributed for graft union. No or below average percentage of successful bud-take was recorded in the budding performed during September-November, the low bud-take percentage during this period might be due to immature bud wood and low sap flow.

The results presented in Table 2, revealed significant variation in length of sprouts that ranged between 14.40 to 35.10 cm and 20.17 to 38.49 cm in patch budding and wedge grafting respectively. Maximum mean length of sprout was recorded when patch budding was done in May, However, it was noted to be highest in July in case of wedge grafting. In diameter of sprouts shows same trend. The maximum number of leaves (60.40) per plant was recorded in May in patch budded plant and in July in wedge grafted plants after 180 days of grafting. With respect to number of primary branches per plant, significantly difference were observed at different time of budding and grafting. After 180 days of operation, the maximum (5.95) number of primary branches per plant was recorded in May in patch budding. However, it was noted to be maximum in July in wedge grafted plants. The quick and strong union formation, better nutrient uptake and ample growing period might have caused better plant growth and more number of leaves per plant in April, May, June, July and August. Chovatia and Singh [3], Awasthi and Shukla [1] and Singh and Singh [13] recorded similar finding in custard apple, jamun, tamrind under different agro-climatic condition. Out study conclusively demonstrated that that patch budding performed in May was significantly superior to wedge grafting on account of higher success (76.67%) with maximum number of leaves (60.40%) and primary branches (5.95) under North Indian condition. . Due to lack of standard propagation technique farmers generally prefer to raise guava plants through seeds which does not give true to type planting material and they do not get good remuneration from their produce. Hence the standardization of patch budding method of propagation will facilitate the large scale multiplication of genuine planting material by farmers, which will increase productivity. Increase in yield and quality will help the farmers to fetch good price in market thus raising their socio-economic condition.

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