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Side Grafting and Various Scion Parts Interaction in Guava

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Abstract: A research project "Side grafting and various scion parts interaction in guava" was carried out at Government Fruit Nursery Farm, Jabban, Dargai Malakand Agency during 2002-2003. Three scion parts i.e. Apical, Middle, Basal and two grafting methods i.e. side veneer and side T. grafting were studied. The experiment was laid out according to Randomized Complete Block design with two factorial arrangement. Maximum graft take success (77.5%), survival percentage (27.9) and percent saleable plants (97.6) were recorded in plants developed from middle scion part whereas minimum of these parameters were recorded by apical scion part. Significantly maximum scion length (99.0 cm) was by using basal scion part, In grafting methods, maximum scion length (81.8 cm), graft take success (75.0%), survival percentage (34.4) and percent saleable plant (95.7) were recorded in plant propagated through side veneer grafting. In interaction of various scion parts and grafting methods, Side veneer grafting using middle scion part resulted in better success and growth of guava.

Key words: Guava, side grafting, scion parts, veneer graft

INTRODUCTION

Guava is usually propagated from seeds and is highly cross pollinated (35.6 %) in nature^[1]. Vegetative methods of propagation like layering, inarching and budding are practiced in various countries but in Pakistan, these methods are not used commercially.

Guava is hardy to roots even the cuttings are taken from strong succulent greenwood^[2]. T. grafting was practiced by Ali^[3] but no success was recorded. Khattak *et al.*^[4] used T. grafting at monthly interval from April 15 and three different scion woods. They got maximum sprouting (83.0%) and survival (76.0%) from grafting on July, 15. In various scion wood, apical portion exhibited maximum sprouting (79%), shoot growth (18.0 cm) and survival (74%). Khattak *et al.*^[2] got 82-92% grafting success in side veneer grafting on 1 year seedling of guava. Khalil *et al.*^[5] grafted 2 cultivars of guava by four different methods and got 82-92% grafting success in veneer grafting in both cultivars.

Keeping in view the importance of vegetative propagation, this study was initiated to see the effect of grafting methods and scion parts for better graft take success and survival.

MATERIALS AND METHODS

The experiment was conducted at the Fruit Nursery Farm Jabban, Dargai, Malakand Agency during 2002-2003. Side T and veneer grafting were done on 1 year

seedlings of guava. Three scion parts (apical, middle and basal) of seedless variety having a pair of leaves and 8 cm in length were grafted in July 2002. The experiment was laid out as Randomized Complete Block design with 2 factors and 4 replication. The number of grafts in each treatment was 30. The data on graft take and survival success, scion length, saleable plants were taken and data were analyzed using LSD test^[6].

RESULTS AND DISCUSSION

Graft take success: The maximum graft take success (77.5%) was recorded by use of middle scion parts and minimum graft take success (52.1%) from apical scion parts (Table 1). The apical portion is soft wood, tender and sensitive to exposure for temperature and sunlight which may have resulted in low graft take success. Due to transpiration, the apical portion which was tender suffered more before cambium union and hence gave low graft taken success.

The difference in grafting success between the grafting method is non significant, however, the success was more (75.0%) in side veneer grafting as compared to 61.9% in side T. grafting. It might be due to the fact that in side veneer grafting there is more cambial area exposed for union, which might have resulted in a strong and more successful union than side T. grafting. In interaction, more graft take success (84.2%) was recorded by side veneer graft using middle scion parts and less success (39.2%) by side T. grafting using apical scion part.

Table 1: Percent graft take success as affected by different grafting methods and scion parts

Grafting methods	Scion parts			Means
	Apical	Middle	Basal	
Side T	39.2	70.8	75.8	61.9
Side veneer	65.0	84.2	75.8	75.0
Means	52.1B	77.5A	75.8A	

LSD at 1% for scion parts = 18.9

Table 2: Survival percentage as affected by different grafting methods and scion parts

Grafting methods	Scion parts			Means
	Apical	Middle	Basal	
Side T	0.0	11.9	16.2	9.4B
Side veneer	30.0	43.9	29.1	34.4A
Means	15.0B	27.9A	22.6AB	

LSD at 1% for scion parts = 9.557

Means of each category followed by a common letter(s) are statistically non-significant

Table 3: Scion length (cm) as affected by different grafting methods and scion parts

Grafting methods	Scion parts			Means
	Apical	Middle	Basal	
Side T	00.0B	76.6A	75.4A	50.7B
Side veneer	84.4A	78.3A	82.6A	81.8A
Means	42.2B	77.4A	79.0A	

LSD at 1% for scion parts = 8.654

LSD at 1% for interaction = 12.24

Table 4: Percent saleable plant as affected by different grafting methods and scion parts

Grafting methods	Scion parts			Means
	Apical	Middle	Basal	
Side T	0.0B	100.0A	91.7A	63.9B
Side veneer	100.0A	95.0A	92.2A	91.9A
Means	50.0B	97.5A	91.9A	

LSD at 1% for scion parts = 9.689

LSD at 1% for interaction = 13.70

Means of each category followed by a common letter(s) are statistically non-significant

Percent plant survival: It is evident from Table 2 that different scions parts had significant effect, while different grafting methods and their interaction had non-significant effect on percent plant survival.

The mean values of different scion parts reveal maximum plant survival (27.9%) by use of middle scion parts, followed by 22.6 and 15.0% survival by basal and apical scion parts, respectively. The apical scion part did not show better survival percentage. The reason may be that they are soft wood and more sensitive to temperature. Mostly they dried before the union of scion and stock.

The effect of grafting method on percent plant showed maximum survival of 34.4% in side as compared to 9.4% in side T method. The reason for high survival may be that in veneer grafting union were strong due to more cambium in contact. In interaction of different scion

parts and methods the difference in plant survival was non significant, however, plant survival was more (43.9%) by using of the middle scion in side veneer method, while no plant was survived by using apical scion part in side T. graft.

Scion length: Different scion parts, grafting methods and their interaction had significant effect on scion length (Table 3).

The maximum scion length (79.0 cm) was noted for basal scion part, followed by 77.4 cm by using middle scion part, while the minimum scion length (42.2 cm) was noted by use of apical scion part. In grafting methods, the significantly maximum scion length (81.8 cm) was obtained for side veneer method, as compared to 50.7 cm in side T. grafting. In interaction between scion parts and grafting methods the maximum scion length (84.4 cm) was recorded in plants grafted by side veneer method using apical scion part followed by 82.6 cm in plants grafted by side veneer method using basal scion part, while the minimum scion length (75.4 cm) was observed for T. graft using basal scion part.

The better scion growth in using basal scion part may be due to early sprouting while less growth by using apical scion part due to more days taken to sprouting. The period for growth of basal scion part was more which resulted maximum scion vigour. The maximum growth in veneer grafting might be due to the stronger graft union and the development of normal vascular tissues at the graft union, which regulates the transport of water and nutrients thus enhanced the active growth of scion.

Percent saleable plant: It is evident from Table 4 that grafting of different scion parts, methods and their interaction had significant effect on percent saleable plant. In grafting of different scion parts, maximum saleable plants (97.5%) were obtained from grafting of middle scion part closely followed by 91.9% from grafting of basal scion part. While the minimum saleable plants (50.0%) were got from grafting of apical scion part.

In different methods, significantly highest saleable plants (95.7%) were obtained from side veneer methods, while minimum saleable plants (63.9%) were obtained from side T. grafting. In interactions all plants were saleable in side veneer method using apical scion part and side T methods and middle scion part, while the minimum saleable plant (91.7%) were obtained by use of basal scion part in side veneer grafting. Khattak *et al.*^[4] got more shoot growth by use of apical scion part which may resulted in production of highest numbers of saleable plants.

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