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Short Note

Studies on grafting methods in apricot (*Prunus armeniaca* L.)

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The apricot is a very important fruit crop of North Western Himalayas region of the country. It is cultivated in areas situated between 900-1200 m above mean sea level. Its cultivation in India is confined to Himachal Pradesh, Jammu and Kashmir, Uttaranchal and to a limited extent in the hills of North- Eastern states. Among the stone fruits, apricot rank second to plum in area of about 2897 hectare (Anonymous, 2004).Very little work has been done on propagation of apricot so there is need to explore the possibility of finding a suitable method of propagation of apricot under mid hill area of Himachal Pradesh.

The experiment was laid out in nursery field of Department of Pomology, Dr. Y.S. Parmar University of Horticulture and Forestry, Nauni-Solan (H.P.). Seedlings of uniform size and thickness of wild apricot (Chulli) were selected for the experiment as rootstocks. Bud sticks of same size and thickness of New Castle cultivar were collected from healthy and bearing trees of previous year's growth for grafting. Three grafting methods used were tongue grafting, cleft grafting and crown grafting. Tying material used was alkathene and the trial was laid out in a randomized block design. Fifteen plants were used as a unit which was replicated three times for recording the data.

The observations on bud sprouting were recorded on alternate days till it was completed under all the treatments. The average time (days) taken for completion of bud sprouting in each treatment was calculated from date of grafting of scion cultivar. Data on bud take was recorded after two months of grafting and was expressed in per cent. Linear growth, radial growth, number and length of laterals were measured at end of growing season i.e. during month of November. Total number of laterals per plant were counted and their length was taken from the base to the tip and expressed as average length of lateral per plant (cm). The data on leaf number and leaf area was recorded during September. All the leaves, irrespective of their size, on the marked plants were counted and average number of leaves per plant was calculated, whereas for leaf area ten leaves were selected randomly and leaf area was measured with licor leaf area meter. Observations on morphological characters such as smoothness, roughness and swelling at graft union and proportion of saleable plants were also recorded at end of growing season.

Perusal of data in Table 1 clearly reveals that minimum time (31.67 days) was taken by tongue grafting, which was statistically at par with crown grafting (31.78 days). The maximum time (36.56 days) was taken by the cleft grafting, which was significantly higher than the tongue and crown grafting. Lesser time taken for bud sprouting in tongue grafting might be due to the better contact of cambial layers of rootstock,

Table 1. Effect of different grafting methods on time taken for sprouting, per cent bud take success, saleable plant per cent and other vegetative characters

Methods	Time taken for sprouting	Per cent budtake success	Saleable plant per cent	Av. Linear growth	Av. Radial growth	Av. No. of laterals	Av. Length of laterals	Av. No. of leaves	Av. Leaf area
Tongue grafting	31.67	46.67 (42.54)	84.14 (71.25)	137.43	10.84	6.39	38.59	117.70	29.30
Cleft grafting	36.56	24.44 (28.06)	59.03 (48.87)	122.70	9.29	3.14	30.16	97.89	26.30
Crown grating	31.78	18.33 (24.63)	52.38 (44.74)	109.53	8.37	5.70	33.97	105.00	27.28
CD (P=0.05)	0.86	3.5	12.88	0.32	0.13	1.52	0.90	3.09	1.04

scion and favourable climatic conditions resulting in early callus formation and subsequent sprouting.

These findings are in agreement with those of Blondel Thapar (1963), Sahrawat (1967) abd Rindhe (1997) who also observed that tongue grafting took minimum time for bud sprouting in temperate fruits.

Bud take was also influenced significantly by the methods of grafting. Tongue grafting showed the highest bud take success (46.67%) which was significantly higher than other two methods of grafting. These findings are in agreement with those of Way *et al.* (1967). The higher percentage of success with tongue grafting may be attributed to more contact of cambial tissues between rootstock and scion, which resulted in quick healing and comparatively strong union formation (Sewal, 1975 and Ananda *et al.*, 1996).

Among the three methods of grafting, tongue grafting registered the maximum linear (137.43 cm) and radial (10.84 mm) growth of scion (Table 1). These findings are in conformity with those of Sewal (1975). The higher growth of the plants with tongue grafts appears to be primarily due to the better union formation, earlier sprouting and subsequent growth of the grafts.

The methods of grafting exerted a significant influence on the number of laterals, length of laterals, leaf number and leaf area. Tongue grafting produced the maximum number (6.39) and length of laterals (38.59 cm). These results are in conformity with those of Sharma and Singh (1979) who reported a significantly greater number of lateral branches produced per plant in peach in the case of tongue grafting.

Maximum leaf number (117.70) and leaf area (29.30 cm^2) were recorded with tongue grafting. These results are in conformity with those of Kumar (1996) who recorded the maximum leaf number and leaf area under tongue grafting in apple. The maximum number obtained with the increase in linear and radial growth and lateral growth of plants might be due to favourable climatic condition which causes quick cell division and cell elongation.

The proportion of saleable plants was significantly influenced by different methods. The highest percentage (84.14%) of saleable plants was produced in tongue grafting followed by cleft grafting (59.03). These findings are in agreement with those of Sewal (1975) in almond and Davis (1976) in plum and apricot. This perhaps is due to early bud sprouting, greater linear and radial growth of grafted plants and quick union formation.

References

Anonymous 2004. Directorate of Horticulture, Nav Bahar, Shimla -2 H.P.

Blondel L 1951. The best method of grafting the pecan. Fruits et Prim. **21**: 273-274.

Rindhe AB 1997. Studies on various budding and grafting methods in the propagation of pecan. M Sc Thesis, Dr. Y.S. Parmar University of Horticulture and Forestry, Solan (unpublished).

Sahrawat NS 1967. Vegetative propagation studies in walnut (*Juglans regia* L.). Him. Hort. **8**: 21-25.

Thapar AR 1963. The Almond In: *Fruit Culture in India*, ICAR, New Delhi, pp. 354-362.

Way RD, Dennis FG and Gilmer RM 1967. Propagation fruit trees in New York. NewYork State Agricultural Experimental Station, pp 817-834.

Sewal HD 1975. Studies on vegetative propagation of almond (*Prunus amygdalus* Batsch.). M Sc Thesis, Dr. Y.S. Parmar University of Horticulture and Forestry, Solan (unpublished).

Ananda SA, Negi KS and Dwivedi MP 1996. Evaluation of chip budding in apple propagation. Ind. J. Hort. **56** (1): 42-45.

Sharma HC and Singh R 1979. Vegetative propagation of peach under sub-tropical conditions. Punjab Hort. J. **19**: 53-55.

Kumar R 1996. Effect of different methods and height of grafting on the development of one-year old nursery plants of spur type apples. M Sc Thesis, Dr. Y.S. Parmar University of Horticulture and Forestry, Solan (unpublished).

Davis BII 1976. Bench grafting plum and apricot as compared to T-budding. Comb. Proc. Int. Pl. Prop. Soc. **26**: 253-255.