

Effect of season of grafting on percentage graft – take and growth of scion shoot of sapota on khirni rootstock

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SUMMARY

Softwood grafting of sapota during the month of July was proved to be superior, followed by August in Vidarbha condition. Highest graft take (63.33%), maximum height of scion shoot (16.06 cm) and highest number of leaves on scion shoot (15.08) were obtained when the grafting was done during the month of July with new seedling of Khirni (rootstocks). Similarly the highest graft take (60.00 %), maximum height of scion shoot (17.47 cm) and highest number of leaves on scion shoot (14.83) were obtained when the grafting was done during the month of July with invigorated seedlings of Khirni (rootstock). There was not much difference between two types of seedlings (rootstocks) with respect to graft take and growth of grafts.

Key words : Graft take percentage, Growth season, New seedlings, Invigorated seedlings

Sapota is mainly valued for its sweet and delicious fruits. It has a high sugar content (20%) in addition to vitamins A, B₁, B₂, B₆, C and also rich in useful minerals.

A number of processed products such as jam, jelly, Marmalade, Toffee, Preserved, Fruit bar and flakes are prepared. Another important feature of this crop is the ease in post handling. Of late, sapota cultivation has attracted by many farmers of Vidarbha region on account of its better adoption to diversified soil and climatic conditions. Hence, there is scope for increasing the area under this crop.

Though the scope is much, the expansion of area under sapota is limited because of non-availability of genuine planting material. The major problem in this regard is difficulties in rapid clonal multiplication. Nurserymen aim at the production of maximum number of grafts within available resource and time. The season is one of the most important factors, which limits the grafting period, because of long unfavourable weather conditions. So there is a need to fix the proper time of grafting to get the maximum survival and growth of the grafts. Therefore, present study was undertaken at RFRS, Katol, Dist. Nagpur.

MATERIALS AND METHODS

Softwood wedge grafting was carried out at monthly interval on 15th of each month from January viz., new seedling (rootstocks) and invigorated seedlings

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(rootstocks). Each month served as a treatment. Totally 30 grafts were prepared in each month taking 10 grafts per replication. Randomized Block Design (RBD) was adopted.

Section of rootstock :

New seedlings (rootstock) :

Two-years old, healthy Khirni rootstock seedlings of uniform height (30 cm) with stem thickness of about 6-9 mm were selected.

Invigorated seedlings (rootstock) :

Two- years old Khirni rootstock seedlings, which were used previously for grafting and failed, were deheaded leaving 4-5 cm stump to get new shoots. Such seedlings with 5-6 month old invigorated shoots were used as a invigorated seedlings (rootstock) for grafting.

Selection of scion :

Scion sticks were taken from Cricket ball variety. For scion 15 years old single Cricket ball tree was selected. Every month terminal, current season, about 5-6 month old, healthy, 6-8 mm thick, greenish brown coloured, round shaped and un-sprouted scion sticks with well developed buds were detached from the selected mother tree in the morning on the day of grafting with help of sharp secateur and were collected in the bucket containing water in order to avoid desiccation. Later leaves on the scion were removed with a sharp secateur without damaging the buds. Soft wedge grafting was done to prepare the grafts and kept in 70% shaded net house.

RESULTS AND DISCUSSION

The results obtained from the present investigation

are presented below:

Grafting on new seedlings (rootstock) :

Percentage graft take :

The results indicated that, there were significant variations among different month of grafting shown in Table 1. The highest bud take was recorded during July. Grafting during the month of July was significantly superior over other months except August, September, October, November and December months were next in the order and were at par with each other. The percentage graft take was nil during the month of May. Grafting during

February, March, April and June resulted in lower success and started declining after 30 dat of grafting.

Height of the scion shoot :

The maximum height of scion shoot (Table 2) was observed with the grafts prepared during July followed by August, September and October months. The height of scion shoot was less in case of grafts prepared during February, March, April and June months.

Number of leaves on scion shoot:

The maximum number of leaves (Table 2) were

Table 1 : Effect of season of grafting on percentage graft-take in softwood grafting of sapota (cv. CRICKET BALL) on new seedlings (rootstocks)

Month	Percentage graft-take					
	Days after grafting					
	30	60	90	120	150	180
January	13.33 (17.89)	10.00 (15.19)	10.00 (15.19)	6.67 (12.48)	6.67 (12.48)	6.67 (12.48)
February	10.00 (15.19)	6.67 (9.23)	3.33 (6.52)	3.33 (6.52)	3.33 (6.52)	3.33 (6.52)
March	6.67 (9.23)	6.67 (9.23)	3.33 (6.52)	3.33 (6.52)	3.33 (6.52)	3.33 (6.52)
April	6.67 (9.23)	6.67 (9.23)	3.33 (6.52)	3.33 (6.52)	3.33 (6.52)	3.33 (6.52)
May	0.00 (0.57)	0.00 (0.57)	0.00 (0.57)	0.00 (0.57)	0.00 (0.57)	0.00 (0.57)
June	6.67 (9.23)	6.67 (9.23)	6.67 (9.23)	3.33 (6.52)	3.33 (6.52)	3.33 (6.52)
July	70.67 (61.22)	73.33 (59.00)	63.33 (52.78)	63.33 (52.78)	63.33 (52.78)	63.33 (52.78)
August	60.00 (50.85)	56.67 (48.93)	53.33 (46.92)	46.67 (43.08)	46.67 (43.08)	46.67 (43.08)
September	56.67 (46.92)	56.67 (46.92)	50.00 (45.00)	50.00 (45.00)	43.33 (41.15)	40.00 (39.23)
October	50.00 (45.00)	43.33 (41.15)	40.00 (39.23)	36.67 (37.22)	33.33 (35.22)	33.33 (35.22)
November	43.33 (41.33)	40.00 (39.15)	33.33 (35.22)	26.67 (30.99)	26.67 (30.99)	26.67 (30.99)
December	40.00 (39.23)	33.33 (35.00)	30.00 (33.00)	26.67 (30.99)	26.67 (30.99)	26.67 (30.99)
S.E. \pm	5.35	5.65	4.76	4.18	4.06	4.14
C.D. (P=0.05)	15.69	16.56	13.97	12.27	11.92	12.14

Note : Data in the paranthesis indicate are-sin transformed values used in statistical analysis

Table 2 : Effect of season of grafting on growth of scion shoot in softwood grafting of sapota (cv. CRICKET BALL) on new seedlings (rootstocks).

Month	Height of scion – shoot (cm)						Number of leaves on scion shoot				
	Days after grafting						Days after grafting				
	30	60	90	120	150	180	60	90	120	150	180
January	10.21	7.00	7.41	8.08	8.51	9.43	1.33	2.50	3.92	5.83	7.25
February	6.87	3.50	3.76	3.99	4.13	4.33	0.67	1.25	1.75	2.50	3.00
March	3.39	3.53	3.78	3.83	4.00	4.25	0.67	1.08	1.67	2.25	2.67
April	3.40	3.50	3.60	3.73	3.93	4.24	0.67	1.33	2.33	3.00	3.33
May	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
June	3.43	3.53	3.60	3.80	3.97	4.19	0.67	1.50	2.67	3.33	4.00
July	10.43	10.77	12.34	13.53	14.81	16.06	2.17	5.25	9.42	11.83	15.08
August	10.46	10.74	12.17	13.17	14.29	15.62	2.08	4.58	8.83	11.00	13.67
September	10.34	10.71	11.79	12.59	13.68	15.18	1.92	5.08	9.25	11.25	13.08
October	10.32	10.66	11.05	12.46	13.53	14.33	1.92	4.00	7.25	9.25	10.83
November	10.33	10.65	11.30	11.87	12.78	13.73	2.00	4.67	7.50	9.67	12.58
December	10.28	10.64	11.41	12.34	13.43	14.09	1.92	4.25	7.17	10.17	11.92
S.E. \pm	1.76	2.12	2.23	2.23	2.44	2.63	0.41	0.81	1.29	1.68	1.97
C.D. (P=0.05)	5.15	6.22	6.54	6.84	7.16	7.71	1.19	2.37	3.77	4.93	5.79

Table 3 : Effect of season of grafting on percentage graft-take in softwood grafting of sapota (cv. CRICKET BALL) on invigorated seedlings (rootstocks)

Month	Percentage graft-take					
	Days after grafting					
	30	60	90	120	150	180
January	16.67 (20.11)	10.00 (15.19)	6.67 (12.48)	6.67 (12.48)	6.67 (12.48)	6.67 (12.48)
February	13.33 (17.89)	13.33 (17.89)	10.00 (15.19)	6.67 (12.48)	6.67 (12.48)	6.67 (12.48)
March	0.00 (0.57)	0.00 (0.57)	0.00 (0.57)	0.00 (0.57)	0.00 (0.57)	0.00 (0.57)
April	0.00 (0.57)	0.00 (0.57)	0.00 (0.57)	0.00 (0.57)	0.00 (0.57)	0.00 (0.57)
May	0.00 (0.57)	0.00 (0.57)	0.00 (0.57)	0.00 (0.57)	0.00 (0.57)	0.00 (0.57)
June	16.67 (20.11)	13.33 (17.90)	10.00 (15.19)	10.00 (15.19)	10.00 (15.19)	10.00 (15.19)
July	76.67 (61.71)	70.00 (56.99)	60.00 (50.85)	60.00 (50.85)	60.00 (50.85)	60.00 (50.85)
August	60.00 (51.14)	53.33 (47.01)	50.00 (45.08)	43.33 (41.07)	43.33 (41.07)	43.33 (41.07)
September	50.00 (45.00)	43.33 (41.07)	33.33 (35.22)	33.33 (35.22)	33.33 (35.22)	33.33 (35.22)
October	50.00 (45.00)	43.33 (41.15)	36.67 (37.22)	33.33 (35.22)	33.33 (35.22)	33.33 (35.22)
November	36.67 (37.14)	30.00 (33.00)	23.33 (28.78)	20.00 (26.56)	20.00 (26.56)	20.00 (26.56)
December	30.00 (33.00)	26.67 (30.99)	16.67 (23.85)	16.67 (23.85)	16.67 (23.85)	16.67 (23.85)
S.E. ±	5.18	5.05	4.45	4.07	4.07	4.07
C.D. (P=0.05)	17.05	14.81	13.04	11.94	11.94	11.94

Note : Data in the paranthesis indicate are-sin transformed values used in statistical analysis

recorded by the grafts prepared during July followed by August and September months. February, March, April and June months grafting recorded less number of leaves.

Similar results were obtained in deciduous trees Ihra and Tamari (1961). Madalgeri *et al.* (1990) in sapota, Patel and Amin (1981) in mango, Sawke *et al.* (1986) in cashew and Deshmukh *et al.* (1992) in Sapota.

Grafting on invigorated seedlings (rootstock):

Percentage graft take:

Significant results were obtained with respect to season of grafting shown Table 3 . The highest graft take was observed when the grafting was done in the month of July followed by August. These two months were at par with each other. September, November and December months were next in the order and they did not differ significantly among themselves.

There was no graft-take, when grafting was done during March, April and May. Percentage graft-take was low in January and February months.

Height of scion shoot:

The maximum height of scion shoot (Table 4) was recorded by the grafts prepared during the month of July. This was followed by August, September and October months grafting. Growth of scion shoot was minimum in case of grafts prepared during January, February and June months.

Number of leaves on scion shoots :

The grafts prepared during month of July recorded maximum number of leaves on scion shoot and it was followed by the grafts that were prepared during August, September and December months. The number of leaves on scion shoot were minimum, when the grafting was done during the month of February. Madalgeri *et al.* (1990) corroborated the high rate of graft. Success during July and reported that invigorated rayan rootstocks could be successfully used for softwood grafting in sapota. Similar results were obtained in sapodilla with 91 per cent success in July (Amin, 1978) and 83.66 % success in August with cashew (Sawke *et al.*, 1986) (Table 4).

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