

Short Communication

Budding in Aonla as Influenced by Season, Rootstock Raising and Cultivar

D.K. Sharma* and Shafaat Mohammad

Department of Horticulture, Rajasthan College of Agriculture, Udaipur 313 001, India

Aonla (*Emblica officinalis* G.) is a hardy fruit crop grown under diversified soil and climatic conditions. It is one of the richest sources of vitamin C among fruits, except Barbados cherry. Fruits are used for preparing preserve and several other processed value-added products. Hence, in recent years, it has attracted the attention of several orchard owners in this region. One of the bottlenecks in the rapid spread of aonla cultivation is the shortage of quality planting material in required number. Nowadays, propagation of aonla by patch method of budding is becoming popular and replacing the grafting (inarching) method of propagation. However, nursery men are getting poor success, because of the lack of information on the best season for budding, type of rootstock suitable for budding and response of different cultivars to budding performance.

Propagation of promising cultivars by patch budding has been tried by various workers under different agroclimatic conditions and period with varying degrees of success (Pathak *et al.*, 1991; Dixit, 1997; Vaghasia, 1997).

A field experiment was, therefore, designed to find out the optimum time

of budding for two cultivars of aonla in polybag and *in situ* raised rootstocks under Udaipur agroclimatic conditions.

The present investigation was carried out at the Rajasthan College of Agriculture, Udaipur, during the year 1996-97. Rootstocks were raised by sowing the seeds in raised bed in the month of January under polyhouse and then transplanted in polybags and *in situ* in the month of June for experimental purpose.

The experiment was laid out in factorial Randomized Block Design with three replications and sixteen treatments. The experiment involved patch budding using scion bud from Banarasi and Chakaiya cultivars of aonla at the end of July, August, September and October. Observations were recorded after four months of the operation on different characters, viz., per cent bud take, emergence of new shoot, length and diameter of new shoot.

The *in situ* raised rootstocks performed better than polybag raised rootstock (Table 1). The maximum bud take (95.76%) and emergence of new shoot (81.29%) was recorded in *in situ* budding in polybag raised rootstocks. Similarly, as long as 1.64 cm new shoot was observed *in situ* budded plant as compared to 1.27 cm in polybag raised plants. Similarly length, shoot

* Krishi Vigyan Kendra (SURE) Danta, Barmer 344 001, India.

diameter and number of leaves per shoot were also influenced (Table 1).

The highest survival was recorded in *in situ* budded plants (52.39%) as compared to only 39.17% in polybag budded plants. Present findings are supported by Dixit (1997) who reported that *in situ* budding gave more than 60% success while it was 47% in potted plant by using patch method of budding in aonla.

The most likely reason for better bud take, emergence of new shoot and subsequent growth could be due to better environment under *in situ* condition as compared to polybag conditions. Therefore, a healthy, vigorous and robust rootstock raised in *in situ* condition would lead to good bud union, emergence of new shoot and subsequent better growth and development.

Season also played an important role in the success of budding in aonla. The highest success in bud take (98.29%) and emergence of new shoot (92.16%) were recorded when the budding was done in the month of August. Similarly, the maximum shoot length and shoot diameter was recorded when the budding was performed in August (Table 1). The highest number of leaves (3.43) and highest survival (69.13%) were also recorded in August budded plant. There is overwhelming evidence in the literature for such a high success in the month of August. For instance, Gangwar *et al.* (1975) found 81.80% bud take in August in aonla. Almost cent per cent success was recorded in aonla budded during July/August (Anonymous, 1986). The results thus strongly support the present findings.

Success of budding depends to a great extent on the environmental conditions, which may vary from place to place. The maximum relative humidity and optimum temperature for the bud union and emergence of new shoot prevails during the month of August under north Indian agroclimatic conditions, particularly in Udaipur and surrounding area, hence leads to the highest budding success.

Poor budding success in the month of July season may be due to the frequent rains and cloudy weather which might have affected the photosynthesis resulting in less vegetative growth. Regular weeding operation could not be carried out due to frequent rains hence excessive weed growth might have suppressed the vegetative growth of budded plants.

In the present study a considerable difference in the response to two cultivars (Banarasi and Chakaiya) as scion bud-wood was noticed. From the results (Table 1) it is clear that highest bud take (92.74%) and emergence of new shoot (75.08%) was recorded when cultivar Chakaiya was used as scion as compared to only 81.29% bud take and 65.03% emergence of new shoot in cv. Banarasi. Similarly, the maximum shoot length (1.87 cm), shoot diameter (0.17 cm), number of leaves per new shoot (2.57) and survival (60.82%) were recorded when cv. Chakaiya was used as scion as compared to cv. Banarasi (Table 1).

Present findings are supported by Pathak *et al.* (1991) as they achieved better vegetative growth by using cv. Chakaiya as scion with patch budding in aonla. Singh *et al.* (1995) also studied the influence of cultivar on the success of veneer grafting

Table 1. Effect of cultivar, season of budding and root stock raising on different developmental characters

Treatment	Bud take (%)	Emergence of new shoot (%)	Length of new shoot (cm)	Diameter of new shoot (cm)	No. of leaves/new shoot	Survival (%)
Rootstock						
<i>In situ</i>	78.12 (95.76)	64.37 (81.29)	1.64	0.165	2.19	49.37 (52.39)
Polybag	60.62 (75.62)	48.12 (55.44)	1.27	0.105	1.88	38.75 (39.17)
SEm±	2.0364	1.8078	0.0281	0.0034	0.0456	1.3881
CD (5%)	5.9597	5.2198	0.0811	0.0098	0.1316	4.0079
Budding season						
July	63.75 (80.43)	51.25 (60.80)	1.34	0.123	1.33	41.25 (43.47)
August	82.50 (98.29)	73.75 (92.15)	2.37	0.221	3.43	56.25 (69.13)
September	73.75 (92.16)	58.75 (65.03)	1.17	0.095	2.37	40.00 (41.31)
October	57.30 (70.81)	46.25 (52.18)	0.92	0.102	1.02	38.75 (39.17)
SEm±	2.9182	2.5566	0.0397	0.0048	0.0645	1.9632
CD (5%)	8.4284	7.3618	0.1146	0.0138	0.1862	0.1862
Cultivars						
Banarasi	64.37 (81.29)	53.75 (65.03)	1.04	0 (100)	1.51	36.87 (36.00)
Chakaiya	74.37 (81.29)	53.75 (65.03)	1.86	0.170	2.57	51.25 (60.82)
SEm±	2.0634	1.8078	0.028	0.0034	0.0456	1.3881
CD (5%)	5.9597	5.2198	0.0811	0.0098	0.1316	4.0079

Figures in parenthesis are retransformed values in percentage.

in mango and reported that Dashehary scion gave 87% establishment against 85.5% in Langra and this indirectly support the present findings.

Certain cultivars are genetically more vigorous and more amenable to forming bud union than other cultivars. As observed in the present study cv. Chakaiya has vigorous growth as compared to cv.

Banarasi. Therefore, this might have led to higher success in bud take and emergence of new shoot in cv. Chaiya as compared to cv. Banarasi.

An overall comparison between the previously discussed characters, i.e., bud take and emergence of new shoot, length and diameter of new shoot, number of leaves per new shoot and survival percentage

indicate that patch budding performed *in situ* in the month of August by using cv. Chakaiya as scion is the best treatment.

References

- Anonymous 1986. Propagation studies in aonla. *Research Paper and Reports. Fourth National Workshop on Arid Zone Fruit Research*. All India Coordinated Research Project on Arid Zone Fruits. ICAR, p. 146.
- Dixit, C.K. 1997. Comparative study on patch budding in aonla. *Indian Nursery News* 12(6): 3-4.
- Gangwar, R.P., Singh, D. and Chundawat, B.S. 1975. A note on rejuvenation of aonla (*Emblca officinalis* G.) tree by T budding. *Haryana Journal of Horticulture Science* 4: 150-151.
- Patel, B.M. and Amin, R.S. 1981. Investigation in to the best period for soft wood grafting of mango in situ. *South Indian Journal of Horticulture* 29: 90-94.
- Pathak, R.K., Ojha, C.M., Dwivedi, R.S. and Om, H. 1991. Propagation studies in aonla. *Indian Journal of Horticulture* 83: 270-272.
- Vaghasia, M.U. 1997. Investigation of budding in aonla. *Indian Nursery News* 12(6): 9-10.