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Effect of storage media and period on bare root transplanting of aonla (*Emblica officinalis* Gaertn) budded plants

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Abstract

The present study was carried out to find out appropriate storage medium and period of storage to improve transplanting success of aonla budded plants. There were four storage media (moist gunny bag, sphagnum moss, polythene sheet and polythene sheet + sphagnum moss) and four storage period (control-zero day, 48, 96 and 144 hours). Ten budded plants were transplanted in field at each date at 30 x 30 cm apart replicated thrice. Among different storage media moist gunny bag and sphagnum moss give better performance with respect to budded plants establishment and other growth characters followed by polythene sheet + sphagnum moss equally effective for a period of more than 48 hours in keeping bare rooted budded plants for transplanting success.

Key words: Budded plants, gunny bag, sphagnum moss, transplanting success

Introduction

Aonla or Indian gooseberry is important fruit crop indigenous to India. It can be successfully cultivated in marginal soils and various kinds of wasteland. The poor establishment of budded plants after transplanting is major problem. On other hand transplanting budded plants with earth ball cost heavy loss of fertile nursery soil and increases cost of transport budded plants to distance places. Bare rooted transplanting with growth regulators was also reported by Singh *et al.* (1982); Singh and Pandey (2003) and Sandhu *et al.*, (1983 a). Storage of budded plants often required because of labour problems, unfavorable weather condition, delay in field preparation, transplanting loss and transplanting success owing to excessive loss from budded plants. To overcome these problems of transplanting of bare rooted aonla budded plants success need to find a suitable storage media and period of storage. Media for storage of budded plants for longer period for better transplanting success is required.

Materials and Methods

The experiment was carried out at experimental orchard of Department of Horticulture, A. N. D. University Agriculture & Technology, Kumarganj, Ayodhya (U.P). For the study, single stem defoliated budded plants, uniform in age and vigour were selected for different storage medium and period of storage. There were four storage media including moist, gunny bag, sphagnum moss, polythene sheet and polythene sheet + sphagnum moss; and four storage period *i.e.* control (zero day) 48, 96 and 144 hours. Ten budded plants were transplanted in field at each date at 30 x 30 cm apart, replicated thrice. The observations were recorded on transplanting success and plant growths of budded plants were recorded after 150 day of transplanting. The data was analyzed as per method given by Panse and Sukhatme (1989).

Results and Discussion

Storage medium and period played vital role in establishment of aonla budded plants (Table 1). Bare rooted budded plants stored in moist gunny bag showed highest success (75.00%) closely followed by sphagnum moss (74.17%) and polythene sheet + sphagnum moss (71.67%). Budded plants establishment decreased during storage but budded plants establishment was not affected up to 48 hrs storage. Data presented in Table 2 indicated sprouting (25.75 days) in polythene sheet + sphagnum moss stored budded plants. Budded plants stored in moist gunny bag (28.42 days) was statistically at par with sphagnum moss stored budded plants. The time taken was significantly less in case of 48 hrs storage (24.50 days) as compared with other storage period.

It is evident from Table 3 and 4 that budded plants height and diameter were influenced by various storage media and period of storage. The plant height was highest (109.25 cm) in moist gunny bag and minimum in polythene sheet stored budded plants. Budded plants diameter ranged between 1.13 cm in polythene sheet to 1.21 cm in moist gunny bag storage media and differed significantly. Budded plants diameter decreased with increase in storage period being (1.25 cm) in immediate transplanting followed by after 48 hrs transplanting moist gunny bag. Storage media and period of storage also influenced number of branchlets per budded plants (Table 5). The highest number of branchlets (154.41) noted in budded plants stored in moist gunny bag which did not differed significantly with other storage media except, polythene sheet however, with increase in storage period it decreased.

Fresh weight of scion shoot and root were also influenced by storage media and period of storage (Table 6). The maximum fresh weight (183.80 g) and root (77.95 g) was recorded with the budded plants stored in moist gunny bag, however, there was no significant difference among budded plants transplanted after storing in moist gunny bag, sphagnum moss or polythene shoot + sphagnum moss.

The present study on storage media and storage period on bare rooted budded plants showed promising results (Table 7). Among different storage media, moist gunny bag and sphagnum moss gave better performance with respect to budded plants establishment and other growth characters followed by polythene sheet + sphagnum moss. Similar results have been reported by Kanwar and Singh (1981) in ber. On the other hand, increased storage period caused contrary effect on the traits. Similar observations were also in conformity with the findings of Beniwal *et al.* (1984) in ber. The reason seems to be that budded plants polythene sheet media got suffocated due to poor aeration and higher temperature. The budded plants in remaining three media as moist gunny bag, moist sphagnum moss and polythene sheet + sphagnum moss remained in good condition up to 48 hrs of storage due to better aeration and in the storage media.

Table 1. Effect of storage media and period on the establishment of budded plants

Storage media	Storage period				Mean
	Planting immediately	Planting after 48 hours	Planting after 96 hours	Planting after 144 hours	
Moist gunny bag	80.00 (63.93)	80.00 (63.93)	73.33 (59.00)	66.67 (54.78)	75.00 (60.97)
Sphagnum moss	80.00 (63.93)	76.67 (61.22)	73.33 (59.00)	66.67 (54.78)	74.17 (59.73)
Poly. sheet	80.00 (63.93)	70.00 (56.79)	60.00 (50.85)	56.67 (43.08)	64.17 (53.66)
Poly. sheet+ Sphag. moss	80.00 (63.93)	76.67 (61.22)	70.00 (56.79)	60.00 (50.77)	71.67 (58.18)
Mean	80.00 (63.93)	75.84 (60.79)	69.17 (56.41)	60.00 (51.40)	
C.D. (5%):Storage media 0.05, Storage period 0.05, Storage media x storage period NS					

Table 2. Effect of storage media and period on days taken to start sprouting budded plants

Storage media	Storage period				Mean
	Planting immediately	Planting after 48 hours	Planting after 96 hours	Planting after 144 hours	
Moist gunny bag	32.00	25.00	26.67	30.00	28.42
Sphagnum moss	32.00	24.33	26.00	29.00	27.83
Poly. sheet	32.00	26.00	30.00	40.67	32.17
Poly. sheet+ Sphag. moss	32.00	22.67	23.00	25.33	25.75
Mean	32.00	24.50	26.42	31.25	
C.D. (5%): Storage media 0.94, Storage period 0.94, Storage media x storage period 1.88					

Table 3. Effect of storage media and period on diameter of budded plants (cm)

Storage media	Storage period				Mean
	Planting immediately	Planting after 48 hours	Planting after 96 hours	Planting after 144 hours	
Moist gunny bag	1.25	1.22	1.19	1.17	1.21
Sphagnum moss	1.25	1.20	1.17	1.14	1.19
Poly. sheet	1.25	1.15	1.10	1.01	1.13
Poly. sheet+ Sphag. moss	1.25	1.20	1.17	1.12	1.18
Mean	1.25	1.19	1.16	1.11	
C.D (5%): Storage media 0.05 Storage period 0.05 Storage media x storage period NS					

Table 4. Effect of storage media and period on height of scion shoot (cm)

Storage media	Storage period				Mean
	Planting immediately	Planting after 48 hours	Planting after 96 hours	Planting after 144 hours	
Moist gunny bag	115.36	110.85	107.28	103.50	109.25
Sphagnum moss	115.36	108.56	105.50	98.82	107.06
Poly. sheet	115.36	103.72	95.80	91.40	101.57
Poly. sheet+ Sphag. moss	115.36	107.90	104.10	97.25	106.15
Mean	115.36	107.76	103.17	97.74	
C.D. (5%) Storage media 5.05 Storage period 5.05 Storage media x storage period NS					

Table 5. Effect of storage media and period on number of branchlets per budded plants

Storage media	Storage period				Mean
	Planting immediately	Planting after 48 hours	Planting after 96 hours	Planting after 144 hours	
Moist gunny bag	160.33	156.60	153.20	147.50	154.41
Sphagnum moss	160.33	154.40	148.47	138.53	150.43
Polythene sheet	160.33	138.24	126.10	120.30	136.24
Polythene sheet + Sphagnum moss	160.33	150.50	145.27	133.60	147.42
Mean	160.33	149.93	143.26	134.98	
C.D. (5%): Storage media 11.83, Storage period 11.83, Storage media x storage period NS					

Table 6. Effect of storage media and period on fresh of weight scion shoots (g)

Storage media	Storage period				Mean
	Planting immediately	Planting after 48 hours	Planting after 96 hours	Planting after 144 hours	
Moist gunny bag	188.62	184.21	182.56	179.81	183.80
Sphagnum moss	188.62	183.27	179.00	172.35	180.86
Polythene sheet	188.62	175.30	171.42	160.08	173.85
Polythene sheet + Sphagnum moss	188.62	182.50	178.80	171.20	180.28
Mean	188.62	181.37	177.94	170.86	
C.D. (5%): Storage media 7.05, Storage period 7.05, Storage media x storage period NS					

Table 7. Effect of storage media and period on fresh weight of roots (g)

Storage media	Storage period				Mean
	Planting immediately	Planting after 48 hours	Planting after 96 hours	Planting after 144 hours	
Moist gunny bag	82.30	79.46	75.80	74.23	77.95
Sphagnum moss	82.30	78.21	75.36	70.60	76.62
Polythene sheet	82.30	74.27	70.04	63.20	72.45
Polythene sheet + Sphagnum moss	82.30	77.32	75.00	70.20	76.20
Mean	82.30	77.32	74.05	69.56	
C.D. (5%): Storage media 3.72, Storage period 3.72,Storage media x storage period NS					

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