

NURSERY STUDIES IN WEST COAST TALL COCONUT

3. GERMINATION, SEEDLING GROWTH AND OUTPUT OF QUALITY SEEDLINGS IN RELATION TO STORAGE PERIOD OF SEEDNUTS

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ABSTRACT

Studies on germination, seedling growth and output of quality seedlings in relation to storage period of seednuts of West Coast Tall coconut harvested during January to May have indicated that the quality of seednuts at the time of harvest and weather conditions during germination and development of the seedlings rather than storage period largely account for the variation in germination, growth of the seedlings and recovery of seedlings of vigorous growth characters. Hence on the West Coast of India seednuts harvested during the summer months may be stored and planted in the nursery during the onset of the South West Monsoon in

June or July to obtain maximum germination and a high percentage of recovery of quality seedlings.

On the west coast of India the seednuts of coconut collected during the summer months are stored till they are planted in the nursery with the break of the South West Monsoon in June or July when the environment is favourable and the weather conditions are helpful for germination of seednuts and the growth of seedlings. This will incidently help to avoid watering of the nursery. Patel (1938) has stated that when the nuts are allowed to ripen fully on the tree, it is not necessary to store them but otherwise they are stored so

that the husk gets dry and absorbs moisture when planted in the nursery. According to Menon and Pandalai (1958), the seednuts after harvest are not immediately planted in the nursery but are generally stored in shade for about a month till the husk becomes dry. During this interim period of harvest and sowing which is the hottest part of the year, large number of nuts get dried up in spite of storing them in shade. Child (1974) has stated that it is a common practice to store seednuts before planting but he feels that it is unnecessary and if the period exceeds six weeks, germination is delayed. According to Fremont *et al* (1966), it is advisable to leave the seednuts to ripen fully for a month in

the case of Tall coconuts in a well ventilated shed protected from sun and rain before setting them in germinating beds. Liyanage (1956) has confirmed that storage had no bad effects on the viability of seednuts or the quality of seedlings.

The seednuts are stored to prevent driage of nut water and suitable methods are adopted to store them. John and Narayana (1942) had recommended their preservation in fine dry sand. The seednuts are arranged with the stalk-end up on the floor of a shed over a layer of about three inches [8cm] of sand and completely covered up with it till the time of planting. Investigations on storage of seednuts have indicated that storing them for a month or two prior to sowing in the nursery has beneficial effects [Krishna Marar and Balakrishnan, 1963]. Results obtained from studies on the best period of storage by Nampoothiri *et al* [1973] conformed to those of previous workers who had calculated the number of days taken for germination from the date of sowing for comparison of germination characters in West Coast Tall nuts. They have stated that storage is not an absolute necessity and in some cultivars long storage even delayed germination. According to Thampan [1981], storing beyond one month does not give any added advantage. Studies on effect of different periods of storage like no storage, thirty days and sixty days of storage period after harvest at Ambajipet in Andhra Pradesh have indicated that storing of seednuts for thirty days after

harvest improved the mean values of both germination and output of seedlings by about eight per cent [Kailasa Rao and Sri Rama Rao, 1968]. Sundaresan *et al* [1974] have reported that under East Coast conditions seednuts harvested from June to August gave more than 85 per cent of quality seedlings when sown immediately or 30 days or 60 days after harvest and seednuts harvested from March to May and planted one or two months after harvest also gave similar outturn of quality seedlings. In this paper results of studies made on germination, growth characters of seedlings and output of quality seedlings in seednuts of West Coast Tall coconut harvested during January to May and sown in the nursery after a storage period of two months are presented and compared with those of June and July sowings reported earlier [Satyabalan 1983, 1984].

EXPERIMENTAL RESULTS

Seednuts of West Coast Tall coconut palms harvested during the months of January to May were stored separately for a period of two months as per the storage method suggested by John and Narayana [1942] and planted horizontally in the nursery. January nuts were sown in March, February nuts in April and March nuts in May. The date of germination of each nut was noted and recorded till the germination was complete. Based on the observations recorded, the date of germination of each month of harvest was grouped into months in which the germination had taken place. In Table 1

details of seednuts germinated and percentage of total nuts germinated in each month in the nuts of January, February and March harvests sown in March, April and May are presented and compared with those of June and July sowings of seednuts harvested during January to May reported earlier [Satyabalan, 1983]. The data indicate that in all cases except in the seednuts of April and May harvests sown in July, the germination had started from July onwards. Irrespective of the storage period, January nuts had taken 6 months February nuts 5 months and March nuts 4 months to germinate whereas April nuts took 3 months when sown in June and 4 months when sown in July and May nuts took 2 months when sown in June and 3 months when sown in July. Out of the seednuts germinated, more than 90 per cent germinated by September in the nuts of January, February and March harvests sown in March, April and May respectively whereas in the nuts of April and May harvests sown in June and July respectively more than 90 per cent germination was attained by November and December respectively. In the case of storage periods of one month for May nuts, two months for January to May nuts and three months for March and April nuts, the time taken to attain more than 90 per cent germination from the month of sowing varied from 4 to 6 month whereas if the storage period was 4 months for February and March nuts, 5 months for January and February nuts and 6 months for January nuts, the time taken varied from 3 to 4 months. If the period was

calculated from the time of harvest, it varied from 7 to 9 months in all cases except in the case of nuts harvested in March and sown in May when it took only 6 months. These observations show that storage periods do not affect germination very much. The differences noted may be due to the quality of the nuts at the time of harvest and the weather conditions prevailing during the germination period.

The seedlings obtained from the seednuts sown after different storage periods were observed for their important growth characters like collar girth and leaf production exactly at the sixth and twelfth month from the time of germination. The data on the growth characters of seedlings raised from seednuts harvested during January, February and March and sown in the nursery in March, April and May respectively at the 6th and 12th month from the time of germination are presented and compared with those sown during June and July months, in Table 2. In the case of storage period of two months, the seedlings from March nuts sown in May and those from January nuts sown in March were slightly superior to those raised from seednuts of other months in collar girth and leaf production at the sixth month from the time of germination. But at the twelfth month, those from April nuts sown in June and those

from May nuts sown in July were found to have better growth characters than others. In the case of June and July sowings of seednuts of other months, the seedlings from January, February and March nuts sown in June or July had better collar girth and leaf production than in those from April nuts sown in July and those from May nuts sown in June both at the sixth month and twelfth month from the time of germination [Satyabalan 1984.] These differences in the growth characters at the sixth and twelfth month may be due to the weather factors prevailing during the development of the seedlings.

Details of month of harvest, month of sowing, storage period, number of nuts sown and germinated, percentage of germination and number and percentage of quality seedlings obtained to nuts sown in the case of nuts harvested in January, February and March and sown in March, April and May are presented and compared with those of June and July sowings of seednuts harvested during January to May in Table 3. In the case of storage period of two months, the germination percentage varied from 89.7 in the nuts of January, February and April harvests to 92.5 in the nuts of March harvest. But it was only 52.2 in the nuts harvested in May. The percentage of quality seedlings obtained to nuts sown was 83.6 in March nuts

and varied from 77.4 in January nuts to 79.7 in April nuts and was only 35.5 in May nuts. The data from June and July sowings show that the percentage of germination varied from 83.3 in the case of April nuts sown in July to 96.2 in March nuts sown also in July and the percentage of quality seedlings obtained from nuts sown from 71.3 in the case of April nuts sown in July to 90.3 in March nuts sown in June. May nuts sown in June gave a low germination percentage of 73.9 and recovery of 54.6 per cent of quality seedlings. These differences may be due to several factors like maturity, quality of nuts at the time of harvest and effect of climatic factors during germination and development of the seedlings.

These studies generally indicate that whatever may be the storage period, a high percentage of germination and recovery of quality seedlings can be obtained only if the weather conditions are favourable during germination and development of seedlings. Otherwise both germination and vigorous growth of the seedlings will be affected. Hence on the West Coast of India seednuts harvested during the summer months may be stored and planted in the nursery during the onset of the South West Monsoon in June or July to obtain maximum germination and a high percentage of recovery of quality seedlings.

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— Editor

Table 1

Percentage of germination in different months in nuts harvested during January to May and sown after different storage periods

Month of harvest	Month of sowing	No. of nuts germinated	Percentage of total nuts germinated till							
			July	August	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
January	March	313	2.6	61.1	95.9	99.7	100.0	—	—	—
"	June	408	15.2	61.0	86.2	93.6	99.2	100.0	—	—*
"	July	362	3.0	44.2	79.0	90.3	95.9	98.9	100.0	—*
February	April	460	1.9	43.8	90.1	100.0	—	—	—	—
"	June	929	8.0	40.0	81.9	95.9	99.5	100.0	—	—*
"	July	490	3.7	44.7	85.7	95.9	98.4	99.2	100.0	—*
March	May	271	1.1	46.1	94.5	99.3	100.0	—	—	—
"	June	824	1.3	38.8	76.2	96.7	99.6	100.0	—	—*
"	July	659	0.5	14.7	65.3	89.8	96.8	99.5	100.0	—*
April	June	1455	0.1	10.0	53.3	87.3	97.7	99.2	99.9	100.0*
"	July	722	—	1.8	30.6	66.2	89.1	97.8	100.0	—*
May	June	557	0.4	1.7	18.0	48.5	75.8	96.1	99.3	100.0*
"	July	107	—	3.7	25.2	52.3	81.3	93.5	100.0	—*

*Satyabalan K. (1983)

Table-2

Growth characters in seedlings from seednuts harvested during January to May sown after different storage periods

Month of harvest	Month of sowing	Girth at collar (cm) (6th month from the date of germination)	Number of leaves	Girth at collar (cm) (12th month from the date of germination)	Number of leaves	Number of seedlings studied
January	March	9.9	6.3*	13.2	8.0	62
"	June	9.9	6.6	14.7	9.4	127*
"	July	10.1	5.9	14.9	8.5	221*
February	April	8.6	5.9	12.8	7.5	83
"	June	9.7	6.4	14.4	9.1	241*
"	July	10.1	6.0	14.9	8.5	186*
March	May	10.1	6.0	11.9	7.5	40
"	June	9.4	6.5	14.1	9.0	173*
"	July	10.2	5.9	14.7	8.2	223*
April	June	9.2	6.2	13.7	8.9	193*
"	July	9.8	5.7	13.7	8.3	177*
May	June	8.3	5.5	12.5	7.5	46*
"	July	9.4	5.8	14.2	8.4	32*

* Satyabalan, K. (1984)

Germination and output of selected seedlings in nuts harvested during January to May and sown in the nursery after different storage periods

Month of harvest	Month of sowing	Storage period	Seednuts sown	Seednuts germinated	Germination %	Seedlings selected	Selected seedlings (% nuts sown)
January	March	2 months	349	313	89.7	270	77.4
"	June	5 months	448	408	91.1	390	87.1 *
"	July	6 months	418	363	86.6	351	83.9 *
February	April	2 months	512	460	89.8	402	78.5
"	June	4 months	985	929	94.3	877	89.1 *
"	July	5 months	525	490	93.3	472	89.9 *
March	May	2 months	293	271	92.5	245	83.6
"	June	3 months	860	824	95.8	777	90.3 *
"	July	4 months	686	659	96.2	618	90.1 *
April	June	2 months	1622	1455	89.7	1292	79.7 *
"	July	3 months	867	722	83.3	618	71.3 *
May	June	1 month	753	557	73.9	411	54.6 *
"	July	2 months	207	107	52.2	73	35.3 *

* Satyabalan K. (1984)