

Influence of Shade on Arecanut Seedlings

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The importance of nursery raising in crop husbandry has been well recognised. This is particularly so in crops like arecanut which, unlike many other palms requires delicate handling. Nursery raising in arecanut involves two stages. In primary nursery selected seednuts are sown for germination. Under South Indian conditions this commences in December - January. The nuts are sown soon after harvest, properly mulched and pot watered daily. Under optimum conditions these nuts sprout in about 40 days. It has been observed that when these sprouts are left exposed to summer sun they get scorched by sun's rays which reduces the vigour of the sprouts and causes mortality in varying degrees. Almost a similar damage has also been observed in the case of the seedlings in secondary nursery to which these are transplanted from the primary stage when they are six months' old.

Patel (1939) and Menon and Pandalai (1958) have stated that during dry and hot weather the nursery beds of coconuts should be mulched and shaded with dry coconut leaves or any other suitable material. Bavappa *et al* (1958) have stated that some shade should be provided to arecanut seed

beds if natural shade does not exist. However, the extent of damage done to the seedlings when they are completely exposed to sun as well as the type of shade required to be given are aspects on which definite information is lacking. In order to elucidate information on these aspects a shade experiment on seedlings in the primary and secondary nurseries was laid out at the Central Arecanut Research Station, Vittal from 1960 onwards. The results of this experiment are given in this paper.

Experimental

Fifty seednuts from selected mother palms were sown in each of the following three treatments laid out on a 3 x 8 randomised replicated design. The trial was laid out in the primary nursery as well as in the secondary nursery separately.

Treatments

- 1) Sprouting seednuts/planting sprouts in open (No shade)
- 2) Sprouting seednuts/planting sprouts in partial shade.
- 3) Sprouting seednuts/planting sprouts in complete shade.

Partial shade was provided by erecting 'Pandal' using unplaited coconut leaves in the top so as to allow filtered shade, while for complete shade plaited coconut leaves were used both for the top as well as for south and western sides. All the treatments were watered regularly and were given uniform agronomic treatments. The experiment was repeated during three nursery seasons. The observation on seedling growth was recorded after one year growth in the secondary nursery.

Results

1) Germination of seednuts :

The percentage of germination obtained under different treatments is given below in Table I.

TABLE I
Percentage of germination

Treatment	I year	II year	III year	Mean	Weighted mean
1. Open	90.50	90.00	97.26	92.58	94.7
2. Partial shade.	90.70	93.75	98.50	94.90	96.3
3. Complete shade.	93.70	91.50	99.50	94.90	96.9

From the statistical analysis of the data for three years, it was observed that the nuts sown under complete shade have recorded significantly higher germination than those under open. Though there was no significant difference in percentage of germination between those in the open and partial shade, the trend is in favour of the latter.

2) Mortality of sprouts :

(a) Primary nursery : The percentage of mortality of the sprouts in the primary nursery was recorded for all the three years. The data gathered are given in Table II below.

TABLE II
Percentage of mortality

Treatment	I year	II year	III year	Mean
1. Open	12.97	3.63	40.20	18.93
2. Partial shade.	2.28	0.60	0.15	1.01
3. Complete shade	0.25	0.00	0.15	0.13

It can be seen from the above that the mortality of sprouts in the open was very high while it was very low in the case of plants under partial shade as well as complete shade.

(b) Secondary nursery : Morphological data i. e. height, girth at collar and number of functioning leaves of the seedlings in the secondary nursery were recorded for each year at the end of one year after planting. The combined analysis of the data for the three years was done and the results are given in Table III below.

TABLE III
Morphological characters of seedlings

Treatment	Height (cm.)	Girth (cm.)	No. of leaves
1. Open	69.18	2.15	4.77
2. Partial shade	106.74	2.55	5.06
3. Complete shade	100.38	2.55	5.06
4. S. E of difference	4.28	0.2444	0.069
5. Critical difference	8.54	0.39	0.14

It can be seen from the above that the morphological characters of seedlings raised under open are significantly lower than those under partial and complete shade.

The mortality of seedlings in the secondary nursery was also studied. It was observed that while 18% of the sprouts died due to sun-scorch in the open, mortality under partial shade and complete shade was 0.6% and 0.88% respectively. It was observed that seedlings under no shade had significantly lesser morphological characters and the turnover of quality seedlings from this plot was approximately 30% as against about 60% obtained from partially shaded plot.

The cost of providing partial artificial shade was also worked out. It was found that providing partial shade to an acre of nursery having approximately 30,000 seedlings will cost about Rs. 1,200/-. Due to the provision of this partial shade there is a 30% increase in the out-turn of quality seedlings obtained both from the primary and secondary nurseries over the no shade. These seedlings give an income of Rs. 1,600/- per acre of nursery area which besides making the shading an economic proposition also enhances the out-turn of much needed quality planting material.

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