

# Raising coconut nursery for the root (wilt) disease prevalent tracts

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**Considering the huge demand for quality coconut seedlings in the disease prevalent tract, there is ample scope for raising nurseries. If family labour can be utilized for bed preparation, sorting, sowing and maintenance works etc. the net profit in the nursery business will go up.**

Coconut (*Cocos nucifera*, L.) is one of the most useful palms known to mankind. Coconut is associated with the livelihood of millions of people in India. Every part of the palm is useful to mankind in one way or the other and hence popularly called 'Kalpavriksha'. It supplies food, beverage, medicine, fibre, wood and also raw materials for a number of industries.

The coconut productivity across the country has improved marginally over the years. The availability of quality planting material is an important component to increase the productivity of the palms. Due to the long life span of coconut (more than 80 years), the yielding potential of the progeny is known only 10-15 years after planting. If the planting material is of inferior quality, the new plantation will prove to be uneconomic, causing considerable monetary loss to the farmer. Being a cross-pollinated crop and propagated only through seeds, selection of quality planting material is a difficult process. However, by practicing a series of selections at different stages, it is possible to eliminate poor quality seedlings in the nursery.

## Criteria for selecting mother palms

The quality of the seedlings is highly attributed to its parents.

Hence, great care is given for mother palm selection in coconut.

### a. Selection criteria for Talls

- Palms should be regular bearers and should yield 80 or more nuts per year
- Palms should be free from all diseases and pests.
- Palms should be more than 35 years of age with typical WCT characters and surrounded by palms of which at least 80 per cent are affected by the root (wilt) disease in an endemic area.
- Palms should be negative in their reaction to the serological test.
- Palms having medium sized nuts with round and oblong shape are better. Dehusked nuts should weigh not less than 600 g with copra content of 150 g.

Mite infested nuts collected from disease free mother palms need not be rejected and can also be used for producing quality planting material. A study was conducted at CPCRI, Regional Station, Kayangulam, using five categories of mite infested nuts (based on severity of infestation on nut surface). The categories were grade 0 (no damage/infestation), grade 1 (1-25 per cent of nut surface infested), grade 2 (26-50 per cent infested), grade 3 (51-75 per cent infested) and grade 4 (more than 75 per cent infested). Observation on

Table 1. Cost of production of 6250 tall coconut seedlings (from 10,000 seed nuts)

Description	Cost
Cost of 10,000 (open pollinated) seed nuts @ Rs. 10/ seed nut	Rs. 1,00,000
Transportation cost (1100 seed nuts can be transported in a mini truck costing Rs. 1000 for a trip)	Rs. 9,000
Harvesting charges (25 seed nuts can be harvested per palm @ Rs.12 per harvest of single palm) 400 x 12	Rs. 4,800
Preparation of 100 seed beds (each seed bed will accommodate 100 seed nuts). One labourer can prepare 8-9 seed beds per day (i.e., 12 man days x Rs. 175/day)	Rs. 2,100
Sorting and sowing 10,000 seed nuts (one labourer can sow 250 seed nuts per day (40 man days x Rs. 175/day)	Rs. 7,000
Maintenance of 100 seed beds	
a) Initial 3 months (first month: 4 man days and rest two months: 8 man days each. Total 20 man days) 20 x Rs. 175	Rs. 3,500
b). Final 9 months (10 man days per month) 90 x Rs. 175	Rs. 15,750
Miscellaneous cost (Plant protection etc.)	Rs. 350
Total variable cost for one year	Rs. 1,42,500
Interest on working capital @ 1 0% per annum	Rs. 14,250
<b>Total Cost</b>	<b>Rs. 1,56,750</b>
Cost of production of one seedling : $\frac{1,56,750}{6,250}$	= Rs. 25.08
If 6250 tall seedlings are sold @ Rs 30 per seedling :	
Total returns : 6250 X 30	= Rs. 1,87,500
Net Profit	= Rs. 30,750

germination recorded at five months after sowing revealed that grade-3 infested seed nut showed early and highest percentage of germination. Besides, seedling height, number of leaves, collar girth and percentage seedlings with split leaves were also higher in grade-3 nuts. The faster germination recorded in grade-3 infested nuts may be due to the fact that the distance to be covered by the germinating shoot tip to emerge out of the husk was less when compared to uninfested nuts. This study revealed that quality seedling could also be produced from mite infested seed nuts, collected from high yielding and disease-free mother palms. It is recommended that sorting nuts based on severity of infestation and raising nursery separately for each lot led to production of more vigorous seedlings.

### b. Selection criteria for Dwarfs

- Parental palms should be at least 20 years of age
- Palms should yield 100 or more nuts/year
- Palms should be negative in their reaction to the serological test

### Characters suitable for identifying typical dwarf palms

1. In Dwarfs, there are two distinct colours, viz. green and orange.
2. Dwarf palms come to flowering earlier than Talls.
3. Dwarfs have a narrow trunk (stem girth will be less compared to Talls), leaf scars on the trunk will be very close and bole is absent.
4. The leaves will be shorter, petiole length less, leaflets closely

arranged and width of leaflets will be less than that of Talls.

5. Retention of the female flowers are seen along with mature nuts in the same bunch.

### Collection of seed nuts

Seed nuts can be collected from selected palms when they attain full maturity. In Talls it takes usually 11-12 months for maturity, whereas in Dwarfs nuts will mature after 10-11 months. The mature nuts should be harvested when at least one nut in the oldest bunch becomes dry. Nuts can be collected throughout the year, but January-April is the ideal time. Harvested nuts can be stored in shade to prevent drying up of nut water. Seed nuts of the tall variety can be stored for two months, whereas seed nuts of the dwarf variety should be sown within two weeks of harvest, before drying up of nut water.

### Raising Nursery

#### Selection of site and preparation of seed beds

A flat land with well-drained, coarse-textured soil should be preferred for raising nursery. The nursery must be located near a dependable water source. Raised beds may be prepared in places where drainage becomes impeded during monsoon. If the nursery is prepared in an open place with full sunlight, it is better to give partial shade in summer months. Dry coconut leaves can be used for this purpose.

Seedbeds are usually of 1.5 m width and of convenient length (4-5 m). A spacing of 30 cm between rows and 20-25 cm between nuts are ideal for the growth of seedlings and



Table 2. Cost of production of 6250 dwarf coconut seedlings (from 10,000 seed nuts)

Description	Cost
Cost of 10,000 (open pollinated) seed nuts @ Rs. 7 / seed nut	Rs. 70,000
Transportation cost (1250 seed nuts can be transported in a mini truck costing Rs. 1000 per trip)	Rs. 8,000
Harvesting charges (25 seed nuts can be harvested per palm @ Rs. 10 / harvest of single palm) 400 x 10	Rs. 4,000
Preparation of 100 seed beds (each seed bed will accommodate 100 seed nuts) One labourer can prepare 8-9 seed beds per day (i.e., 12 man days x Rs. 175/day)	Rs. 2,100
Sorting and sowing 10,000 seed nuts (one labourer can sow 300 seed nuts (35 man days) 35 x Rs. 175)	Rs. 6,125
Maintenance of 100 seed beds	
a). Initial 3 months (first month: 4 man days and rest two months : 8 man days each. Total 20 man days) 20 x Rs. 175	Rs. 3,500
Final 9 months (10 man days per month) 90 x Rs. 175	Rs. 15,750
Miscellaneous cost (Plant protection etc)	Rs. 350
Total Cost for one year	Rs. 1,09,825
Interest on working capital @ 10% per annum	Rs. 10,980
<b>Total Cost</b>	<b>Rs. 1,20,805</b>

Cost of production of one seedling :  $\frac{1,20,805}{6,250} = \text{Rs. } 19.33$

If 6250 tall seedlings are sold @ Rs 25 per seedling :  
 Total returns : 6250 X 25 = **Rs. 1,56,250**  
 Net Profit = **Rs. 35,445**

other operations like weeding and culling of weak seedlings. After sowing, the seed nuts should be covered with soil, leaving about 1 cm above the surface. The depth of planting may be adjusted so that a small portion of the husk is visible at the surface. Seed nuts can be sown either vertically or horizontally. When seedlings are to be transported to long distances, vertically planted seedlings are easier to handle and can be compactly packed. If the nut water is less in the seed nut horizontal planting is advisable as nut water remains in close contact with the embryo and promotes germination.

### Management of nursery

Watering the nursery beds is very much important to ensure quick germination and proper growth of seedlings. Irrigating the beds during

initial three months (period until the sprout emerges) is very important. Irrigate the beds once in two days during summer months to ensure proper germination. Lack of adequate irrigation (at least once in two days) affects germination percentage considerably. In addition, providing organic mulches promotes early and better germination. Mulching is necessary to prevent drying of the topsoil and reduces weed growth. Coconut fronds are the most ideal mulch in coconut nursery beds. The frequency of irrigation should be adjusted depending upon the rainfall pattern.

Weeds will adversely affect the growth of seedlings and it acts as a harbour for rats, which will destroy the coconut seedlings. Hence, nursery beds should be weeded periodically. Monitor the nursery beds regularly for presence of pests

and diseases. Leaf blight and collar rot are the common diseases in nurseries. Against leaf blight, spray 1 per cent bordeaux mixture. Avoiding deep planting can prevent collar rot. Termite is one of the common pest in coconut nursery. Termites damage seed nuts and seedlings. They enter the seed nuts and rotting occurs because of the injury. If symptoms of termite attacks are noticed, apply chlorpyrifos (2 ml / litre per sq. meter).

### Selection of seedlings

Selection of seedlings is the most important step. Under good management, seed nuts of WCT palms will germinate within 60-120 days after sowing. Seed nuts of dwarf variety germinate within 30-100 days after sowing. The rest of the nuts, even if it germinates, are of inferior quality. In the case of WCT, ungerminated nuts, multiple sprouts, thin / etiolated, bent/spindled and albino seedlings can be removed from 150 days from the date of sowing and in dwarfs culling can be taken from 120 days onwards. If rigorous standards of selection are adopted, 60 to 65 per cent quality seedling can be obtained from the total nuts sown. The best time to remove seedlings from nursery for transplanting is when they are about a year old. An ideal one year old coconut seedling has the following characters.

- Early germination
- 10-12 cm girth at collar region (for one year old seedling)
- Minimum number of leaves should be six.
- Early splitting of the leaves.



### Cost of production

The details of cost of production of tall (WCT) seedlings and dwarf seedlings are given in Table 1 and 2 respectively. It can be noted that the cost of seed nuts contributes to 64 per cent of the cost of production, labour charges (for nursery preparation, sorting, sowing and maintenance of beds) contribute to 18 per cent of the cost, transportation charges 6 per cent, and harvesting charges 3 per cent of cost of production.

Considering the huge demand for

quality coconut seedlings in the disease prevalent tract, there is ample scope for raising nurseries. As per the current trend, the demand is for seedlings of dwarf varieties, especially CGD, MOD, and COD. If family labour can be utilized for bed preparation, sorting, sowing and maintenance works etc. the net profit in the nursery business will go up. Taking into consideration the above aspects, progressive farmers, Self Help Groups (SHG's) and NGOs can venture into coconut nursery raising as a profitable enterprise. The coconut

Development Board is providing assistance to the tune of Rs. 50,000 for sowing 10,000 seed nuts and raising 6,250 seedlings. For further details, interested farmers/agencies may contact Chief Coconut Development Officer, Coconut Development Board, Kera Bhavan, Kochi - 682 011, Kerala. For technical guidance/training regarding raising coconut seedlings in disease prevalent tract, the Head, CPCRI, Regional Station, Kayamkulam, Krishnapuram P.O., Alappuzha-690 533, Kerala may be contacted.

### New 'Green' Flower

Coir and dust which are thrown away as garbage are now being used to make flower pots, a green product to fight global warming.

Asst. Prof. Theeravet Thitikul from Rajamangala University of Technology, Thailand instructs his students to make flowers from coconut coir and dust, a product for which there is high demand. An order of 1,500,000 flower pots came from Germany.

An hydraulic press machine to make flower pots was a student's graduation project of the Faculty of Technical Education. It takes three minutes to produce one flower pot. The high quality prototype machine is expected to be finished at the end of this month for sale to communities where coconut coir and dust can be found. Flower pots made from coconut coir normally last for seven months, or three months if exposed to extreme sunlight.

Asst. Prof. Theeravet Thitikul said "We will produce hydraulic press machines for sale. They will help villagers earn more income from producing flower pots from agricultural waste."

One kg of tapioca flour mixed with six litres of water is boiled to make glue. One kg of coconut dust, 200 g of coconut fibre and 1.2 kg of glue can make six flower pots of six inches diameter.

Flower pots made of coir were given to garden shops for testing. The owner of one shop said degradable flower pots should be popular as people were more concerned about the environment.

Owner of another garden shop said, "Flower pots made from coir can well absorb water and store water for plants. They are better than plastic flower plots. Using coconut fiber flower pots limits watering of plants once a day in the morning."

In the fight against global warming, trees are planted as a protective measure. But it's important to realize plastic bags and plastic flower pots which come with seedlings will eventually become garbage. Coconut fibre flower pots are another option to help efforts to save the environment.

<http://enews.mcot.net/view.php?id=5173>