

NURSERY MANAGEMENT IN COCONUT

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Through a series of selections made at different stages, it is possible to obtain quality seednuts and seedlings. There are five selection procedures to be gone through for obtaining seedlings of guaranteed quality. They are as follows:

1. Selection of areas.

1. The area should be free from diseases. Seednuts should not be collected from areas in which the palms suffer from infectious diseases such as yellowing of leaves, leaf rot, bud rot, root wilt etc.
2. The area should not be located in the soils having very high water table and very fertile. Seedlings raised from them will not thrive in less congenial environments.

2. Selection of Seed gardens

1. Gardens should have palms with a high proportion of heavy bearers.
2. Garden should be free from the incidence of diseases and not prone to severe attacks of pests.
3. Avoid palms located near cattle sheds and compost pits.
4. The palms in the garden should be nearly of the same age.

3. Selection of Mother palms

1. Palms should be regular bearers with annual yield of 80 nuts and above, with copra content not less than 150g/nut under rainfed condition (Irrigation-120 nuts/year)
2. Palms should have reached full bearing stages and have been giving consistently high yields for atleast four years.
3. Avoid very old palms of about 50 years age.
4. Seednuts can be collected from the newly established seed gardens

irrespective of the age of the palms as the performance of its parents is known and only high yielders are maintained.

5. Palms should have atleast 30 fully opened leaves having leaf orientation to all directions i.e., umbrella shape crowns are ideal.
 6. The leaves should have short strong petioles with wide leaf base firmly attached to the stem. Their arrangement should provide support to the bunches and should not show any tendency to buckle or droop down.
 7. Each leaf axil should have one inflorescence with large number of spikes and one or two female flowers per spike.
 8. Bunch stalk should be short, stout and strong and should not show any tendency to droop down or buckle.
 9. Palms having medium sized nuts (about 1200g when the husk is fully dried) with round and oblong shape. Husked nuts should be large (about 570g) with thick kernel.
 10. Palms which produce barren nuts or those shedding large number of immature nuts should be discarded.
- ## 4. Collection of seednuts
1. Collect seed nuts from January to April months
 2. Only fully matured nuts i.e., about 12 months old should be harvested.
 3. Nuts should not be damaged while harvesting.
 4. Discard nuts having irregular shape and size and improper development.
 5. Reject nuts which do not contain nut water and also those having loose kernel which rattles on shaking.

5. Raising nursery

1. Select well drained, coarse-textured soil near dependable water source for irrigation.
2. Prepare raised beds if water stagnation is a problem during rainy season.
3. Soil may be treated with chlodane 5% @ 120 kg/ha in place where nursery is taking for the first time as a precaution against white grubs and termites.
4. Nursery can be raised either in the open with artificial shade or in gardens where the palms are tall and the ground is not completely shaded.
5. The seednuts should be planted in long and narrow beds at a spacing of 40 x 30 cm during May-June, either vertically or horizontally in 20-25 cm deep trenches.

Care and management of nursery

Germination of the nuts commences in about three months after sowing and allow another two months for germination. Usually 90 to 95% of the seednuts germinate. Ungerminated nuts and those which germinate after five months will have to be rejected and removed from the nursery bed as they will be weak and lack in vigour. The nursery should be regularly inspected and kept in proper condition. Weeds should be managed on seed beds. Light and frequent watering to be done during dry season. Mulching and shading should be done immediately after the monsoon ends, when the nursery is raised in the open space. Regular surveillance for any incidence of pests and disease is a must. Also during heavy rains water should not be allowed to accumulate between seedbeds.

Polybag nursery

Raising of coconut seedlings in polybags was introduced in 1969 in the Ivory Coast, superseding the technique of field nurseries and is now popular in major coconut growing countries. Polybag nursery is preferred to the conventional field nursery because of many advantages such as reduced transplanting shock at field due to the absence of root damage, ease of irrigation and fertilizer application in the bag. The improved water holding capacity of the potting medium would also help to maintain required moisture for early germination. Apart from these, the polybag nursery receives intensive care and management of individual seedlings which helps to produce vigorous seedlings with better root system resulting in better establishment and earlier bearing. At CPCRI, while studying the different methods of sowing in coconut nursery, more number of roots (16/seedling) and better root growth were recorded in polybags compared to conventional method of sowing (6.75/seedling). However, this technique has certain drawbacks, unless seedlings are raised in close proximity to the planting site the cost of transportation would be more. Besides, the extra labour for filling bags and material costs are the major constraints in the polybag nursery system.

Technique of raising polybag nursery

Selection of site: The nursery must be located near a dependable water source to facilitate satisfactory irrigation throughout the year. Moreover, to reduce the transportation cost, it should be near the site of field planting. The land should be generally flat. It is to be weeded, levelled and top soil compacted. About 25,000 seedlings can be accommodated in one hectare nursery area at a spacing of 60 x 60 cm.

Filling the bags and sowing: The bags are made of black polyethylene of

500 gauge thickness and 60 x 40 cm size for bigger nuts and 40 x 40 cm for smaller nuts. The bottom portion of bag should be provided with 8 to 10 holes for draining excess water. Polybags of above size usually take in about 13-16 kg top soil for filling two third portion of the bag. The commonly recommended media are top soil mixed with sand in the ratio of 3:1, loose friable soil, river sand in combination with cattle manure and coir dust and soil and compost mixture in 1:1 ratio. Decomposed saw dust, corn cobs, rice hull or similar organic materials can also be used. At CPCRI, using of potting mixture of red earth, sand and cowdung in 1:1:1 proportion was found to give about 10 per cent higher germination and 1 or 2 more number of leaves per seedling besides increasing the girth of seedling compared to conventional method of sowing.

In polybag system, seed nuts are allowed to germinate in a pre-nursery bed, sown very closely and transplanted in polybags when the sprouts are 8-10 cm long. The germinated nuts are picked out from the nursery once a week until 80 per cent of nuts are germinated or upto 5 months from sowing whichever is earlier. The germinated nut is placed in the half-filled bags with the sprout planted vertically in the center of the bag and enough potting mixture is added to fill the bag upto two third portion and the sides slightly pressed to keep the nut firm so that it is not bared during watering. Care must be taken not to cover the collar of the young seedling. The seednuts may be dipped in carbaryl 0.2% solution prior to planting as precaution against termite attack.

Laying out of polybag nursery: The size and lay-out on the land depends on the irrigation system adopted and spacing of bags. Spacing of the bags, mainly depends on the time the seedlings are to remain in the nursery. The size of the polybag nursery bed can

be 3 x 6 m with about 1.5 m spacing between beds. Each can accommodate 50 seedlings and these bags are arranged in a triangular manner with 60 cm space between bags.

Maintenance

Irrigation: Regular watering of the polybag nursery is very important to ensure proper growth of seedlings. The frequency of watering should be adjusted depending upon rainfall and other weather conditions, age of the seedlings and type of potting mixture used. Irrigation may be required every alternate day during the summer months on the west coast. Sprinkler irrigation is preferable for larger nurseries. In small nurseries, hose irrigation is commonly practised. However, care must be taken not to wash the medium out of the bag.

Weeding: Weeds adversely affect the growth of seedlings and therefore, it is essential to have weed free nursery and also keep the surroundings clean by controlling the weeds as and when required.

Preparation of plants for field planting: The selected seedlings (10-12 months old) should be prepared on the eve of their transport to the field for planting. They are abundantly watered to ensure a moisture reserve, handled with care to avoid baring them or tearing the bag. If the roots have grown through the bag, they must be cut before being moved from the nursery. The plant should not be held at the collar, which will unearth it. There is also a scope for introduction of bio-fertilizers like VAM (vesicular arbuscular mycorrhizae) and phosphate solublizers in the polybag before field planting for better establishment of organisms.

Plant protection

Careful inspection is a must for detecting the incidence of pests and diseases in the nursery and suitable plant protection measures are to be taken up as soon as insect/disease symptoms are noticed.

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contain 'camptothecin' and used for anti-cancer drugs in Europe. 'Koshta' (*Saussurea Lappa*) whose root is used for chronic skin disorders. A bulbous herb *Fritillaria cirrhosa*, distributed in central and eastern Himalayas and Sikkim. Dried corms of this plant are used for respiratory infections. Recently, *Gamboge* tree (*Garcinia cambogia*), a small tree from western ghats, the extract of the fruit is used as anti-obesity drug in USA and Europe. The population of this species is coming down rapidly due to indiscriminate cutting of trees from the wild to meet the industries demand for fruits.

The *in situ* and *ex situ* conservation efforts are on by demarcating series of

medicinal plants conservation areas in forests and establishing herbal gardens and gene banks by several governmental and non-governmental organisations. But the speed and scale of these conservation efforts are much lower compared to the ruthless collection of medicinal plants in the wild by industries. The plants are being over exploited from all eco-systems. Several of the relatively few species used in industrial manufacturing are cultivated as field crops, because this is the only way to ensure a steady supply and maintain continuous quality standards.

The situation can be saved if industries come forward to support the studies to find the actual status of various raw materials and initiate the

viable schemes for farmers to cultivate medicinal plants with buy-back guarantees. Systematic planning is needed for this purpose. Both industries and banks should join together to encourage commercial cultivation of medicinal crops. The cultivation of these crops as intercrops has been proved more profitable instead of traditional single crop cultivation as in other food crops. Further, the cultivated medicinal plants have been selected and bred to contain a higher content of biologically active ingredients than their wild forms. These high yielding varieties can fetch high returns to farmers. □

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Ants and termites: The medium around the nut is to be treated with chlodane 5% dust.

Scales and mealy bugs: Spray dimethoate 0.05% on the under surface of the leaves.

Mites: Spray dicofol or dimethoate 0.05% on the under surface of the leaves.

Leaf-defoliators: The whole foliage is to be sprayed with carbaryl @ 20 g is 15 litres of water.

Fungal Diseases: The most widespread fungal diseases are leaf-spots caused by *Helminthosporium*, *Pestalotia* and *Colletorichum* and bud-rot caused by *phytophthora*. In areas where there is a risk of attack, preventive treatments should be given

twice a month, spraying both sides of the leaves with a solution of Bordeaux mixture (1%) or Indofil - M45 (0.3%). To back up the treatment, severely infected leaves can be removed and burnt to avoid dissemination of spores.

Selection of seedlings in the nursery

- i) Eliminate those seedlings which are deformed or whose development is stunted and those that are thin and lanky.
- ii) Select seedlings which have germinated early.
- iii) From the one year old nursery, select vigorous seedlings having minimum of six leaves and girth of 10 cm at the collar.
- iv) Early splitting of leaves is a good

indicator of the rapid developers and early bearing.

- v) The recovery of good seedlings will be 60 to 65% of total seednuts sown.

The best time when seedlings can be removed from the nursery for transplanting is when they are about one year old. The seedlings should not be pulled out of the seed bed by force, but the seedlings with the nut gently removed by holding the nut. In case of polybag nursery the seedling along with bag should be taken to main field without damaging the root system and keep the bag in centre of the pit and cut open the bag and fill with soil. □

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