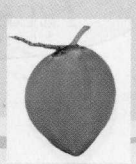

Production of polybag seedlings in coconut

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Polybag nursery is preferred to conventional field nursery as intensive care and maintenance of individual seedlings result in vigorous seedlings with better root system, which attain rapid reproductive development.

In coconut, which is a perennial plantation crop, production and use of good quality seedlings have greater importance. Conventionally coconut seedlings are raised in a nursery prior to field planting as proper care and maintenance of a seedbed facilitates the selection of early germinating vigorous seedlings. Seedling vigour is correlated with adult palm characteristics such as early flowering, high nut and copra yield.

The most common method of production of seedlings in coconut is to sow the nuts in nursery beds and allow them to grow there itself till they are ready for transplanting in the main field. However, transplanting germinated seednuts in polybags filled with suitable potting mixture can also be practised to produce vigorous and quality seedlings.

Raising coconut seedlings in polybags was introduced in 1969 in the Ivory Coast (Wuidart, 1981). Polybag nursery is preferred to conventional field nursery as intensive care and maintenance of individual seedlings result in vigorous seedlings with better root system, which attain rapid reproductive development. Compared to a nursery in the field, watering, weeding and culling operations for the elimination of unwanted seedlings are easier in polybag nursery. Since the root system is intact and does not get damaged at the time of transplanting, the planting shock can be avoided. These seedlings on planting in the field will grow faster. Such seedlings can be used for gap filling to obtain a uniform stand and age group in the garden. The polybags also facilitate, if required to prolong the nursery period until the environment is conducive for main field planting. However, this technique has certain drawbacks. Seedlings are to be raised in close proximately to the planting site, other wise the cost of transportation would be high. Moreover, there could be involvement of additional labour for filling bags and extra costs for materials like polybags and potting mixture.

Selection of site

If polybag seedlings are produced for own field planting, the nursery should be located near a dependable water source to facilitate satisfactory irrigation throughout the nursery period. In order to reduce the transportation cost, it should be near the site of field planting. The land should be generally flat and as a first

step, the area is to be weeded, levelled and topsoil compacted. About 25,000 seedlings could be accommodated in one-hectare area at a spacing of 60x60 cm.

Preparation of potting mixture

Black polythene bags of 500 gauge thickness, 45 x 45 cm size for bigger nuts and 45 x 30 cm for smaller nuts are to be used. The bottom portion of bags should be provided with 8 to 10 holes for draining excess water. To fill bigger polybags around 10-12 kg and for smaller bags, 7-8 kg of potting mixture will be required.

The commonly recommended media are top soil mixed with sand in 3:1 ratio or fertile topsoil, sand or coir dust and well rotten and powdered cattle manure in the ratio of 3:1:1. Red earth, well rotten and powdered cattle mature and sand in 1:1:1 ratio can also be used. A study done by Reddy *et al.* (2001) at CPCRI, Kasaragod on alternative media indicated that potting mixture containing sand+vermicompost in 3:1 ratio or sand + P, K fertilizers (15 g / bag) + bio-fertilizer were similar in response to conventional potting media in terms of seedling growth, physiological parameters and final seedling vigour. The effect of bio fertilizers not only helps growth of seedling in polybag, but may also result in better establishment of microbial population in the main field, which helps in better growth and establishment of seedlings. In Sri Lanka, a potting mixture containing 3 parts of river sand, 2 parts of cow dung and 1 part of coir dust was shown to be the best (Perera *et al.* 1996). Sowing in potting mixture not only holds more moisture but also provides better nutrition to growing seedlings and helps to get higher recovery.

Polybag nursery

Sowing of nuts and transplanting

In order to produce polybag seedlings, initially the seednuts are sown very closely and allowed to germinate in a pre-nursery bed. The seednuts start germinating about three months after sowing. The germinated nuts are picked out from nursery once a week until 80 per cent of nuts are germinated or up to five months from sowing whichever is earlier. The sprouts shall have a length of 2.5 to 10 cm depending on age. The germinated nut is placed in the half filled bags with the sprout positioned upwards in the centre of the bag and sufficient potting mixture is added to fill the bags up to two-third portion and the sides slightly pressed to keep the nut firm so that potting mixture is not lost during watering. Care must be taken not to plant pest or disease affected sprouted nuts and not to cover the collar of the young seedling while filling the bags. The seednuts may be dipped in carbaryl 0.2 per cent solution prior to planting as a precaution against termite attack.

Laying out of polybag nursery

The size and lay out of the land depend on the spacing of bags and irrigation system adopted. Spacing of bags mainly depends on the duration the seedlings are to be kept in the nursery. Usually the polybag seedlings are maintained for about 8 to 10 months in the nursery. The size of the polybag nursery bed can be 6 m x 3m with about 1.0 m spacing between beds for hose irrigation and carrying out other cultural operations.

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, type of potting mixture used and age of seedling. Irrigation is to be given on every alternate day during the summer months in the West Coast.

While sprinkler irrigation is ideal for larger nurseries, hose irrigation is suited for smaller nurseries. However, care must be taken not to wash the medium out of the bag during irrigation. If coir dust is used as a component of potting mixture, it can hold water for longer duration and hence irrigation may be done @ 1 litre / bag once in 4 to 5 days.

Weeding

Since soil or sand is a component of potting medium, there is every chance of weeds growing in polybags. Weeds adversely affect the growth of seedlings and therefore, it is essential that they are to be removed frequently. The surrounding area of the nursery also should be kept weed free by frequent weeding.

Manuring

The nut has considerable reserves of essential plant nutrients in it. However, the roots are capable of absorbing the nutrients one month after their initiation. Since the potting mixture made of fertile topsoil, cattle manure or vermicompost can provide the nutritional requirement of seedlings, it may not be necessary to add any fertilizer. However, if growth of seedlings is not found satisfactory, application of 20 g ammonium sulphate and 25 g muriate of potash per bag after two months may be adopted. The fertilizer is to be spread around the seedlings and forked into the medium. The polybags must be irrigated on the same day after the application of fertilizers.

Selection of seedlings for field planting

Vigorously growing seedlings of about 8 to 10 months old with early splitting of leaves and having 10-12 cm collar girth can be selected for planting in the main field. The seedlings are to be sufficiently watered to ensure adequate moisture content in the bags on the day of transplanting. Then polybag seedlings are to be handled carefully and the plants should not be held at the collar, which can unearth it. If the roots have grown through the bag, they are to be cut before taking from the nursery.

Fertilizer application to polybag seedlings

Shri. Sharafudeen, Vadakke-thalakkal, owner of a nursery aided by the Coconut Development Board is producing polybag coconut seedlings since the last four years. He collects seednuts from mother palms in root (wilt) disease affected areas, which are disease free and high yielding, identified through rigorous selection procedures. He prepares potting mixture using fertile topsoil, coir pith and well rotten and powdered cow dung. He is able to fill about 70 big and 90-100 small bags using one tonne of this mixture. According to Shri. Sharafudeen, the expenditure for collection of seednuts, preparation and maintenance of polybag seedlings till they are sold works out to be Rs. 30 per bag and he is selling at a cost of Rs. 40 per seedling. He guarantees his seedlings for any problems and is also willing to replace them, if necessary. Shri. Sharafudeen produces around 2000-3000 polybag seedlings per year and provides regular employment to at least three persons through his endeavour.

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