



# Coconut Research Institute of Sri Lanka



Advisory Circular No A 2

## NURSERY MANAGEMENT AND SEEDLINGS SELECTION

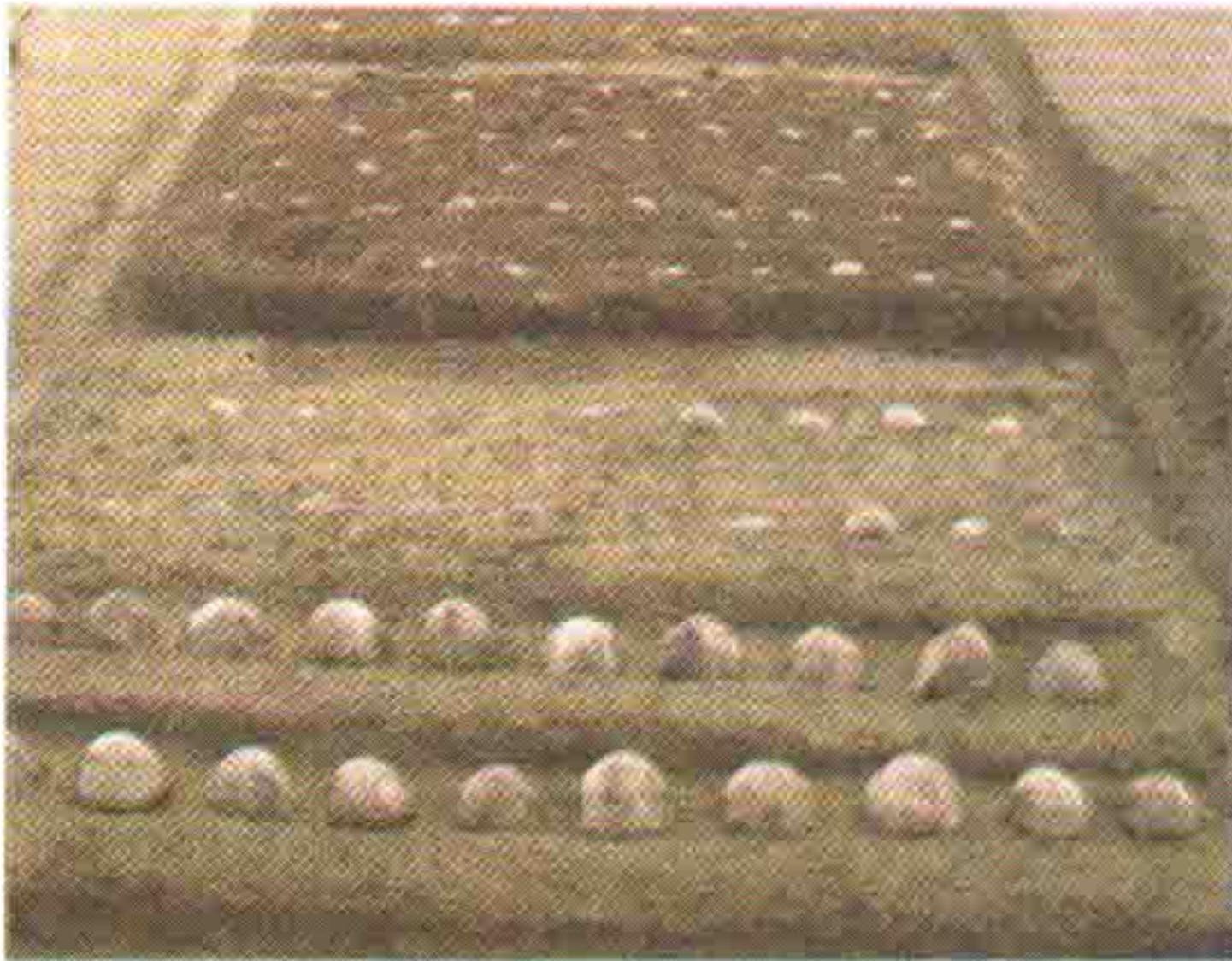
Planting coconut seed nuts directly in planting holes is not recommended. Properly selected, well grown, 7-10 month old seedlings should be transplanted in the field to ensure fast growth and a uniform plantation. Seedlings may be raised either in nursery beds or in poly bags.

### Selection of the nursery site

The land should be flat or with a low gradient. The soil should be sandy or sandy loam and well drained. The site should have sufficient sunlight, scattered shade and a source of water in close proximity (live shade is preferred for nurseries).

### Nursery beds

Each bed should accommodate five rows and the length of the bed can be arranged as desired in order to facilitate routine activities. Seed beds should be about 15-25 cm above ground level and the distance between two rows, should be 25 cm. The seed nuts are placed horizontally, with a spacing of 15 cm between two adjacent nuts in a trench, 10-15 cm deep, and covered with a thin



layer of soil so that the surface of the nut is just visible. The seed nuts in any single trench should face the same direction and the seed nuts in adjoining trench should face the opposite direction. The seed nuts along a trench should also be placed in-between two nuts of the adjacent row (Picture 1). Seed beds should be separated by shallow drains which join up to form a leader drain to remove the excess water during heavy rains.

Picture 1: A nursery bed

## Conservation of soil moisture in nursery beds

Normally coconut fronds are used as a mulch (Picture 2), but a coir dust layer with 3-5 cm thickness is also suitable. If in case coir dust is used, rotation of the area where nursery beds are laid should be carried out. In areas where fronds or coir dust cannot be obtained, weed thrash, straw or saw dust could be used as alternatives depending on the availability.

### Water supply

Regular watering is necessary during dry weather. Watering should commence if there is no rain (rainy day = rainfall of 0.25mm) continuously for 6 days and continued at 3 day intervals.



Picture 2 : Mulching of nursery beds

### Weed control

Weed control is an important practice because the weeds compete with coconut seedlings for soil moisture. Weeding should be carried out depending on the weather conditions, once or twice a month.

### Pests and diseases

#### 1. Termite control

Termites or white ants cause considerable damage to coconut seed nuts/seedlings and are usually attracted to the husk and eventually tunnel through the nut damaging the growing point. To prevent this damage, seed nuts should be dipped in a recommended insecticide solution prior to planting. If termites are observed in the soil, and especially for nurseries in clayey soils, drenching of the nursery bed with an insecticide is recommended.

#### Recommended insecticide/Dosage

**Dipping** - Chlorpyrifos 20%, 3-5 ml in one liter of water, dip a nut for 3 minutes prior to planting.

**Drenching** - Chlorpyrifos 20%, 15-25 ml in five liters of water for one squire meter. Use watering can for drenching.

## 2. Collar rot

Collar rot is common in nursery seedlings with high moisture availability. The basal portion of the seedling starts decaying leading to bacterial infections. Seedlings affected with collar rot sometimes show symptoms similar to termite attack but the former could be differentiated due to the characteristic odour emitted from the rotten seed nut. To prevent this situation, deep planting and thick mulching should be avoided.



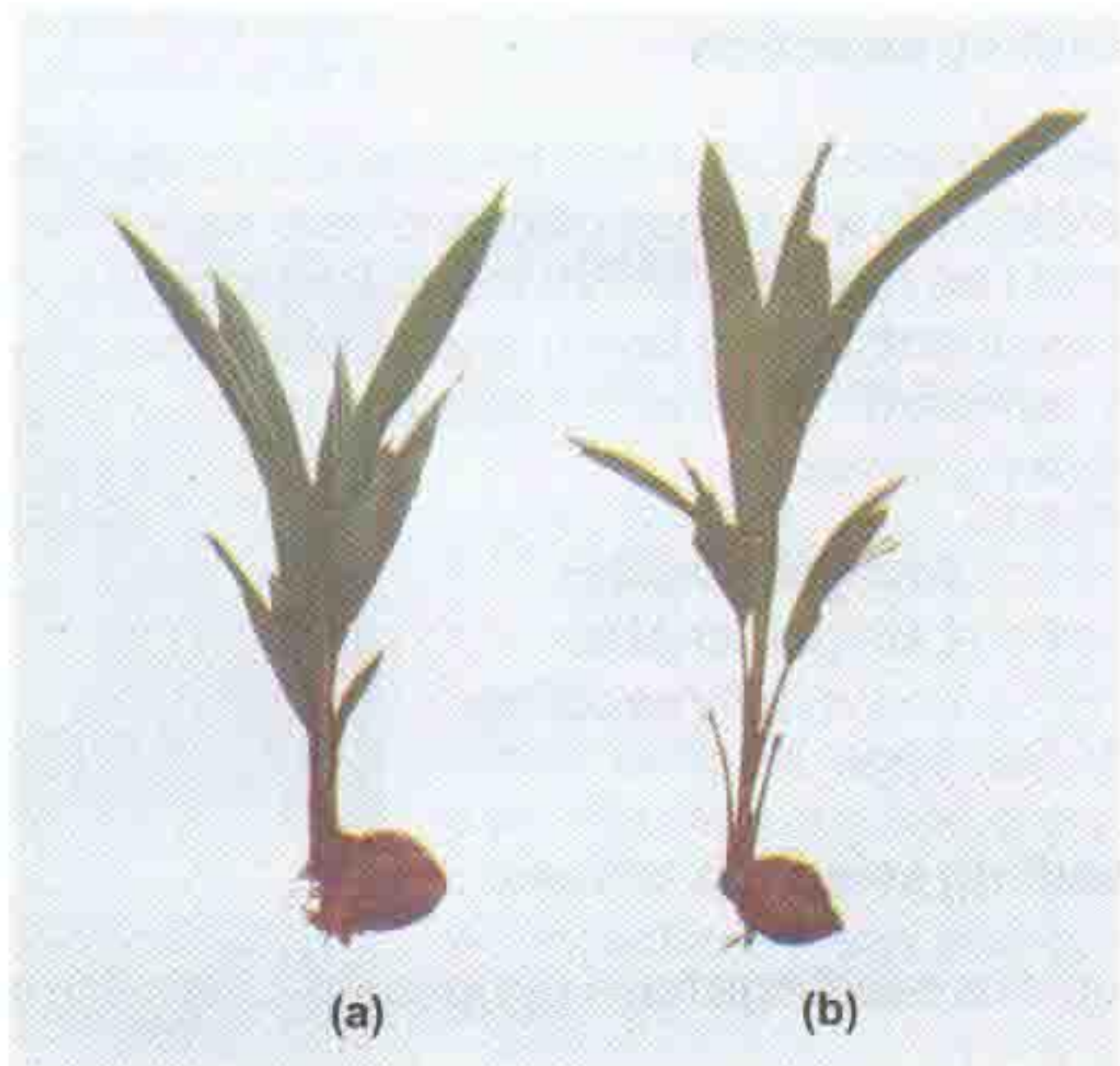
Picture 3 : A well managed nursery bed

Adequate drainage should be provided in nurseries where the water table is close to the surface.

## 3. Leaf die-back

In certain instances nursery seedlings show extensive die-back of leaves. The die-back starts from the tip of the leaf and circular brown patches could also be seen in the middle portion of the leaf. *curvularia*, a mould, causes this condition and is common during periods of dry weather. In nurseries the disease spreads rapidly when plants are regularly watered as it increases the humidity of the environment.

This could be easily controlled by spraying 1% copper fungicide.



Picture 4 : (a) A good seedling for planting (b) A bad seedling-not suitable for planting

## Crop rotation

Continuous use of nursery beds reduces the soil fertility and to avoid this, crop rotation with a legume can be practiced.

## Non germinating seed nuts

These should be removed at the end of five months from laying. In a well managed nursery at least 80% of seed nuts should have been germinated by this time.

## Fertilizer application

Fertilizer application is generally not recommended for nurseries. If deficiency symptoms are shown six months after seed nuts are laid, the following fertilizer mixture is recommended.

Urea	1.5 parts
Muriate of potash	2 parts
Concentrated super phosphate	1 part
Kieserite	1 part

Fertilizer should be broadcast at the rate of 70 g per seedling and mixed with soil. Soon afterwards, beds should be irrigated if there is no rain.

## Seedling selection

Seedling selection should be carried out with great care as a quality seedling will develop into a vigorous palm and bear early (Picture 4). All non-germinated nuts should be removed at five months from laying. A second selection is done after seven months from laying and at this stage; all non-vigorous seedlings should be removed. In a well-managed nursery the rejections should be kept at following levels.

Non germination	8%
Late germination	10%
Low quality seedlings	12%
Total	30%

## Seedling selection criteria

Vigorous seedlings have the following characteristics.

- \* Stout stem
- \* Dark green leaves
- \* Broad well spread leaves
- \* Short petioles
- \* Early splitting of leaves

Seedlings are ready for issue from the seventh month.

## Raising seedlings in poly bags

Selected seed nuts are kept in a pre-nursery vertically until they sprout and are then transferred to poly bags. The bags are made of UV radiation resistant black polythene sleeves of 200-500 gauge, 20/100 mm thick, and 40 x 28 cm with gussets measuring 15cm. Several small punches should be made on the bag 1" from the bottom to facilitate draining of excess water.

In a pre-nursery, the distance between adjacent nut rows can be 15 cm (6") and the nuts can be laid with just 5 cm (2") distance between two nuts in a row. In the pre-nursery, seed nuts are laid vertically in the beds. With the spacing recommended above, a nursery of one hectare in extent can raise about 50,000 seedlings (20,000 seedlings/ac). Seedlings are suitable for field planting after 8 months of poly bagging, but these can be kept up to 04 months.



Picture 6 : Spacing of poly bagged nursery seedlings

(Picture 5). Roots are cut 1-2 cm from the husk if they are too long. The bag is filled with the soil mixture and the sprouted nut is placed upright. The mixture is further added so that the upper surface of the nut is barely visible. It is advisable to leave about 3 cm from the top to facilitate watering. Laying of nuts in poly bags can be done in weekly intervals for easy management.



Picture 5 : A germinated nut suitable for laying in poly bag obtained from a pre-nursery

## Filling the bags

The mixture should have,

Top soil	3 parts
Cow dung	2 parts
Coir dust	1 part

Three parts of coir dust, two parts of cow dung and one part of top soil is recommended when sufficient top soil is not available.

## Laying in poly bags

A germinating nut is ready for poly bagging once the sprout attains 5 - 10 cm

## Watering

Should be neither insufficient nor excessive. About 2.5 liters/poly bag a day is recommended, preferably in the morning or late afternoon.

## Spacing of bags

Spacing of bags obviously depend on the time the plant remains in the nursery, and a triangular spacing of 75 cm x 75 cm x 75 cm is recommended, if prolonged retention in the nursery is required (Picture 6).

## Advantages of poly bagged seedlings

1. Less root damage at transplanting.
2. Plants establish sooner and are likely to flower earlier.
3. Less field casualties and uniform plantations.
4. Easy to fertilize, control weeds and to irrigate at the nursery stage.
5. Poly bagged seedlings could be kept for some time until weather conditions are suitable for field planting.



Picture 7 : A good poly-bagged seedling