

# WATERING OF COCONUT NURSERIES

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ALTHOUGH Copeland (page 134) and Sampson (page 109) both advocate that nurseries should be watered, an opinion has been expressed that coconut seedlings, required for planting in the drier areas, should not be watered in the nursery as it makes it more difficult to establish them in their new environment without regularly watering the young plants, which is a costly matter. It is opportune, therefore, to consider why nurseries should be mulched with coconut leaves and regularly watered and weeded, and why the seednuts must be laid on their sides and just below ground level (Ambrose, C.C.Q., 1951, No. 4, page 169).



A COCONUT NURSERY.

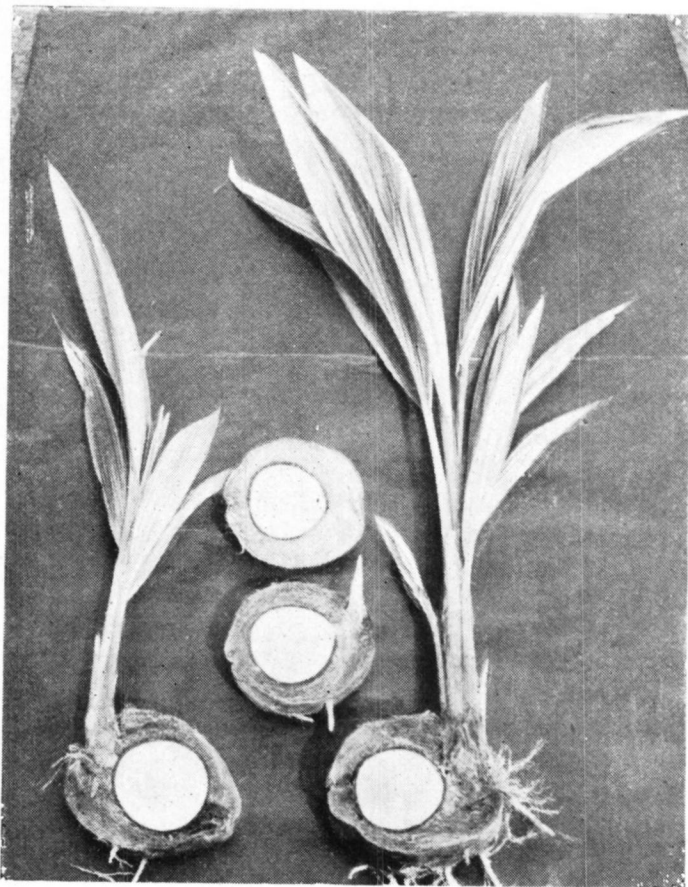
It is true that a heavy seednut, well-charged with coconut water, is provided with its full requirements of plant food and moisture to allow for its germination and development into a seedling, without any attention whatsoever, when it is lying as a fallen nut in moist undergrowth in the shade of coconut palms. However, seedlings produced under shade conditions are "leggy" and weak.

This casual method of producing seedlings is neither a satisfactory nor a practicable method to follow for large-scale replanting. It is essential first to select your seednuts for ripeness, shape, size and weight and it is also necessary to collect them from a selected block of high-yielding palms; they must be then planted out in a nursery where they can be regularly watered, weeded and protected from termites; and finally the resulting seedlings must be selected. In this final selection all weak, leggy and distorted seedlings have to be rejected as also those which germinate late or do not germinate at all. Sturdy seedlings with a stout stem, dark green broad leaves, short leaf stalks and stout midribs will produce a sturdy palm under satisfactory environmental conditions.

If the seed bed is not weeded or watered, the percentage of seednuts which germinate is reduced, many of the seedlings are stunted or deformed due to retarded growth, and the young plants are generally leggy, the foliage pale green in colour and the leaves concertinaed (corrugated) due to the premature drying up of the water in the seednuts.

The key to the development of a good seedling is the water in the nut, which must be maintained by keeping the nut cool and the seed bed moist. A selected seednut should be full of water and if it becomes dehydrated due to excessive heat, dry soil conditions or competition with weeds, germination and growth are bound to be affected. That is why heavy ripe nuts, full of water, are chosen, why it accelerates germination to soak them before laying them out, why the seednuts have to be surface-mulched, and why seed beds have to be regularly watered and weeded if there is no rain.

#### THE GERMINATION OF A SEEDNUT.



Watering is done early in the morning before the sun is very hot and late in the evening when the land has cooled. In wet weather it is, of course, quite unnecessary to water. If the soil tends to get hardened in dry weather, watering alone will not be sufficient to keep the soil round the nuts moist, as the water cannot penetrate down into the soil. Such a soil can be kept soft and moist by mulching with coconut fronds fibre dust or dry leaves. Mulching with grass encourages termites and must never be done.

The germ, embryo, or growing point of a ripe nut is situated immediately under the "soft eye" where the shell is quite thin. This embryo, which is hard and about the size of a small pea, is to be found buried in the white coconut meat or endosperm. So long as it is kept moist, it will continue to swell and if it is constantly kept moist its growth will be accelerated so that there will be steady development and early germination otherwise the embryal plant will dry up and die. This embryo grows in two directions—a shoot develops outwards towards the soft eye and the pea itself develops into an "Apple," an absorbent wet spongy growth, known botanically as the haustorium, which swells up and ultimately fills the whole of the cavity of the nut.

Some very active enzymes or yeasts are formed in this haustorium which act on and break down the white meat of the nut, in the same way as certain yeasts acts on the sugar in sweet jaggery and converts it into another product, arrack. Wherever the "apple" touches the endosperm (white meat), the enzyme breaks down the walls of the oil-containing cells, so releasing the oil; this free oil in turn is gradually converted by chemical action into sugar, which is absorbed by the spongy haustorium and so feeds the young plant.

If the moisture is still maintained, germination can proceed and the plant will continue to develop until ultimately the shoot presses against the soft eye with such force as to open the lid. If the water present in the nut is inadequate or if the nut is vertical so that the haustorium is not constantly immersed in coconut water, growth is retarded and germination is late, because the shoot is not sufficiently firm and vigorous to force open the eye. This is why seednuts should be laid on their sides.

The shoot having forced its way through the eye commences to develop rapidly into a plant. If the husk of the nut has been softened and rotted by water, it will meet with little resistance and its hard horny beak will be able to force its way on through the soft fibre. About six weeks later, roots begin to appear and then numerous rootlets which will spread through the damp fibrous husk, which is rich in plant food especially potash. To make this potash available to the young plant, water is necessary, otherwise if the husk and the soil dry up, the plant certainly cannot develop any further and it will die. Conversely if the husk is soft and moist, rootlets will be rapidly formed and soon the shoot will begin to develop leaves, after which more and more water will be required to develop leaf tissue at an increasing rate.

Thus although there is enough water in a good seednut to allow for its germination, it must be maintained and to ensure that the embryo will develop, it must be kept moist; otherwise either it will die or, if the moisture is inadequate, it cannot produce a sturdy and vigorous plant.



The Escalator Ladder.



Reaching to the sky.



Inspection of the crown.