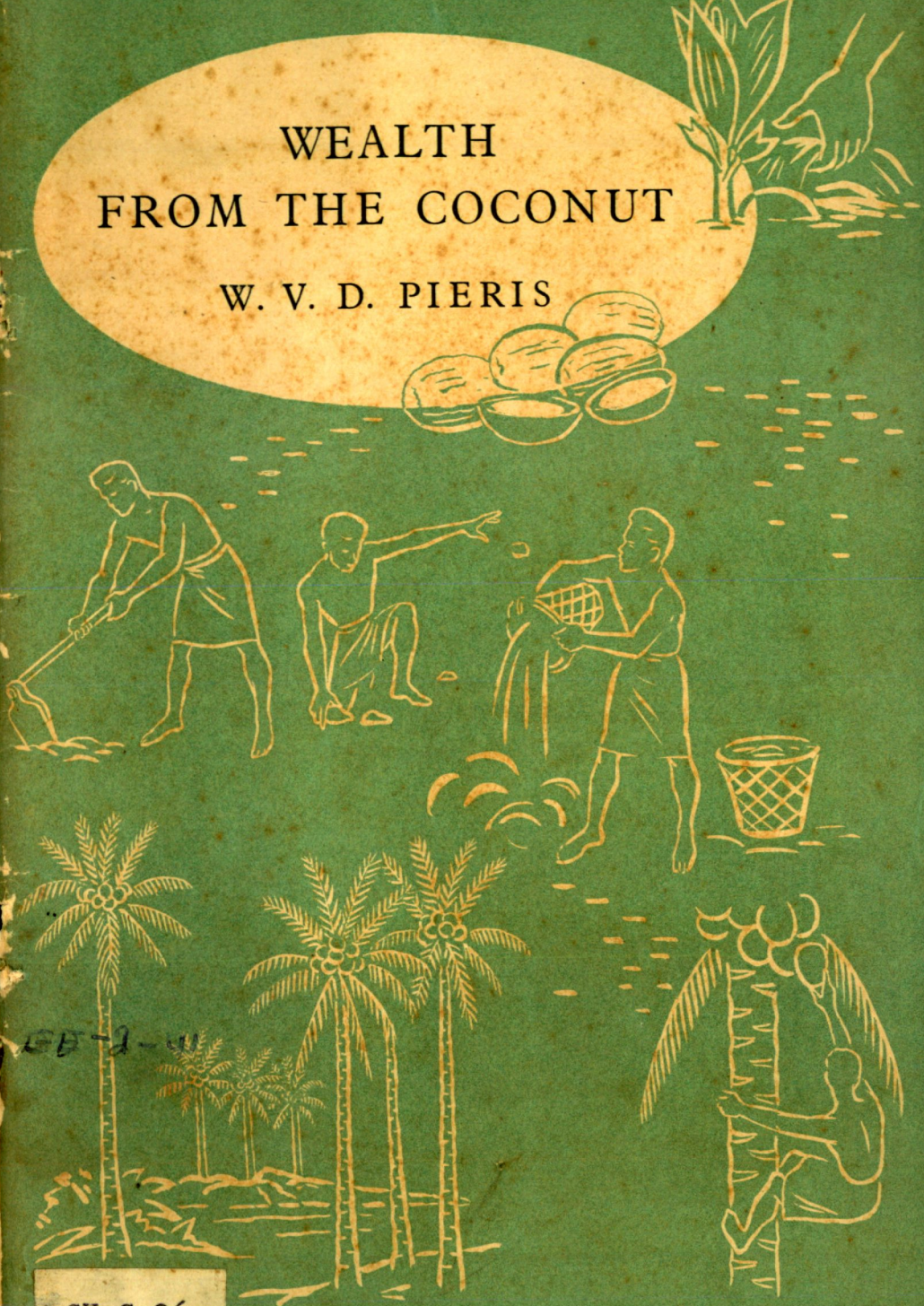


# WEALTH FROM THE COCONUT

W. V. D. PIERIS



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by

W. V. D. PIERIS

Technical Officer  
South Pacific Commission



*In association with the  
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## INTRODUCTION

THE COCONUT PALM is the most valuable agricultural possession of the Pacific.

It provides food, drink, and shelter.

Every part of the palm, from the roots to the topmost leaves, has some important use in island life.

On many islands there would be no people if there were no coconuts.

The export of the dried kernel, copra, enables the islanders to buy from abroad articles that they cannot produce themselves.

The success of the coconut industry as a source of cash income depends on three conditions.

- The presence of only high-yielding palms in groves and plantations.
- Proper care of the palms and the land on which they grow.
- The production of copra of good quality.

Other export products, such as coconut oil, fibre, desiccated coconut, and coconut shell charcoal, can be produced in some islands and groups of islands.

It should also be widely known that all the sugar the islanders require could be produced from the sap drawn from the unopened flowers of the coconut palm.

The purpose of this series of talks is to assist the peoples of the Pacific to obtain the greatest possible good from the cultivation of the coconut palm.

## SELECTION OF MOTHER PALMS

### What are mother-palms?

Palms from which coconuts are taken for planting are known as mother-palms.

They should be the best and most productive palms in your groves and plantations.

A mother-palm should produce in a year not less than 100 nuts and about 60 lb. of copra.

Such palms are to be found in most Pacific islands. So you should be able to obtain all the seednuts you require in your own island.

### How to select mother-palms.

Here are some simple rules to be followed in selecting your mother-palms:—

- (i) Do not select palms growing near houses, in open spaces, or other especially favourable situations.



Select them within groves and plantations where they are growing and thriving in conditions of keen competition with other palms.

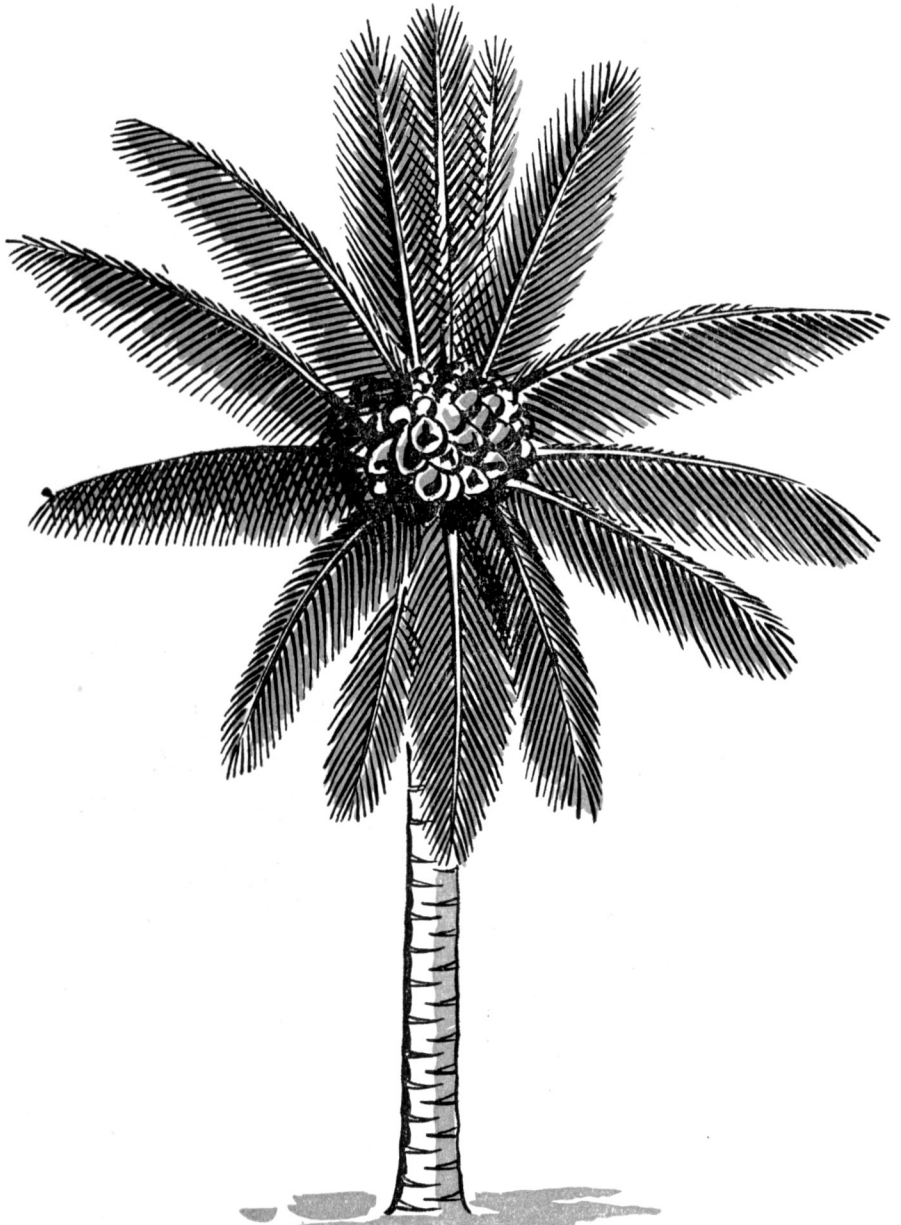


- (ii) Do not select palms which are over 60 years of age. The best age is from 15 to 50 years.
- (iii) Make certain that the palms are strong-growing, with stout trunks, free from diseases and pests, and without serious blemish or abnormality. The leaf-scars on the trunk should be close to each other.
- (iv) The leaves should be evenly distributed on the crown, and should have short, broad stalks. Palms with short and broad leaf-stalks usually have short and strong stalks to the bunches of nuts. On such palms the ripening bunches will rest on the leaf-stalks. They will not fall over and shed their nuts unripe.

On the other hand, when the leaves have long and narrow stalks the bunch-stalks are also long and weak. The leaves droop or hang down and the leaf-stalks do not support the ripening bunches. When this happens the bunches slip over and the nuts fall before they are fully ripe. So palms whose leaves have long and narrow stalks should not be selected as mother-palms.

Palms are often seen with their leaves pointing upwards. They are poor and irregular producers and seednuts should not be taken from them.

- (v) Since a coconut palm is able to produce as many bunches of coconuts as there are leaves, select palms with the largest possible number of leaves.
- (vi) Examine the crown of the palm from all sides and make certain that there are flowers and bunches of ripening nuts clustered all round it.



*The Ideal Mother-palm*

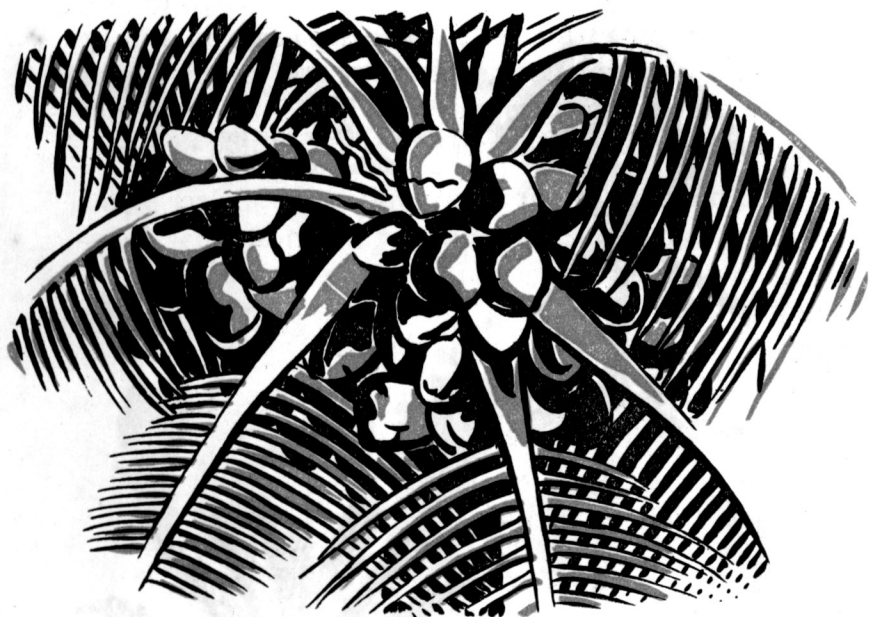


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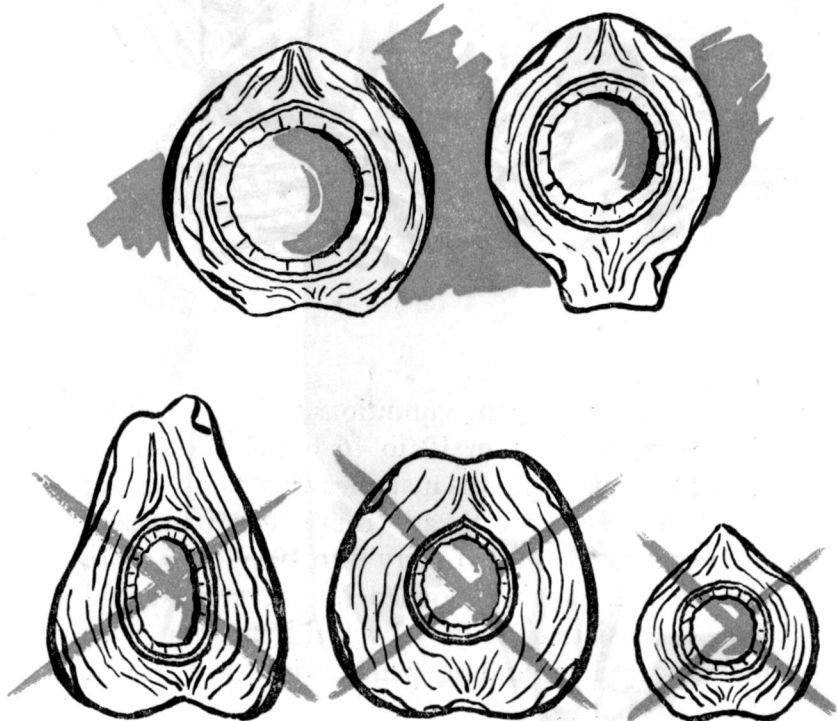


If you stand at the foot of a healthy, high-yielding palm and look upwards through the crown, you will not see any light or sky.



(vii) Under good climatic conditions, a fully productive palm yields from 12 to 16 bunches of coconuts a year and drops as many leaves. The number of nuts in a bunch will vary from season to season, but each bunch should carry 8 to 10 nuts or more and all the bunches ripened in one year should yield not less than 60 lb. of well-dried copra. You may succeed in finding palms with even higher yields than this.

- (viii) The size of seednut is important. Palms with very large or very small nuts should not be selected. A medium-sized nut is best. As a general rule, the weight of dried copra produced from a nut is equal to about one-third the weight of the nut in the shell without the husk. Thus, by weighing the husked nuts from each mother-palm, you will be able to obtain a fairly good estimate of its capabilities as a producer of copra. The higher the weight of husked nuts, the higher will be the weight of copra.
- (ix) The shape of nut is also important. Select palms that carry spherical or nearly spherical nuts. Long nuts usually have too much husk in relation to kernel.



- (x) In order to do the work well, you should examine every single bearing palm in your grove or plantation, so that no desirable palm is overlooked.

Number each selected palm and paint a broad tar-band round its trunk. This band will be plainly visible and everyone who sees it will know that the palm is a mother-palm, that its nuts have special value, and that these nuts are needed for the urgent purpose of replanting and improving village groves and plantations as well as for the extension of coconut cultivation to new areas.



- (xi) Now that you have selected your mother-palms, numbered them, and decorated their trunks in order to separate them from their less important neighbours, you will find it both interesting and useful to keep a record of their yields of nuts and copra, month by month and year by year.

High-yielding palms, selected according to the rules given above, usually remain high-yielding throughout their lives, but it is important to know which of them are the best yielders and which are not so good. There is also the possibility that a few of them will prove to be bad.

After you have taken all this trouble to select the best palms in your grove or plantation, it would be a great pity if the ripe nuts that fell from them were to get mixed up with fallen nuts from their undesirable neighbours. Therefore, not only the mother-palms but their nuts also must be kept apart if you are to derive the best results from your labours.

Under good conditions, good palms ripen at least one bunch of nuts every month. Therefore, if you wish to make certain that only nuts from selected mother-palms are used as seednuts, harvest the ripest bunch (which is also the lowest bunch) by hand at the end of each month. The number of nuts harvested in this way from each mother-palm should be recorded in a note-book, specially ruled and prepared in the manner shown on the next page.

When the nuts have been harvested, the next step is to sort them out for plantation in a nursery. That will be dealt with in the next talk, entitled SELECTION OF SEEDNUTS.

### Monthly Yield Record of Mother-Palms.

Name of Village (Grove or Plantation):

Date of Harvest:

Palm Number	Number of Bunches Harvested	Number of Nuts	Weight of Husked Nuts	Estimated weight of Copra = $\frac{1}{3}$ weight of Husked Nuts.

The yearly totals should be recorded in another note-book as follows:—

### Yearly Yield Record of Mother-Palms.

Name of Village (Grove or Plantation):

Year:                      Number of Harvests:

Palm Number	Total Number of Bunches Harvested	Total Number of Nuts	Total Weight of Husked Nuts	Total estimated Weight of Copra

## SELECTION OF SEEDNUTS

In the first talk of this series, I gave you some simple rules for the selection of mother-palms.

These palms will be the mothers of the next generation of palms to be grown in your island.

Look after them with care. They will be of value to yourselves, your children, and your grandchildren.

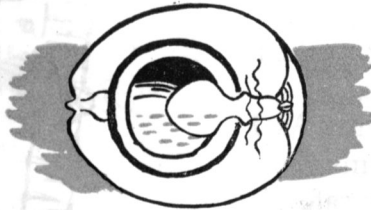
I now wish to tell you something about seednuts, since not every ripe nut picked from a selected mother-palm will produce a good daughter-palm. The seednuts themselves must be selected.

### How to select seednuts

- (i) Make certain that the nuts lying under your mother-palms really belong to them and not to neighbouring palms. As I have said in my first talk, the only safe method is to climb the palms and pick the ripe nuts by hand once a month.
- (ii) If you decide to do this, the bunch of nuts you harvest should be fully ripe and turning brown.



(iii) After you have harvested the ripe bunches from all the mother-palms, collect the nuts to one place. Then, by the usual method of shaking each nut and judging the quality of the sound made by the water within it, reject without hesitation every nut with a false sound. A nut that is even slightly under-ripe or spoilt will not give rise to a healthy and productive palm. Reject also all nuts that have no water inside them. The water inside the seednut keeps the "apple" moist and is essential for the proper growth of the young seedling.



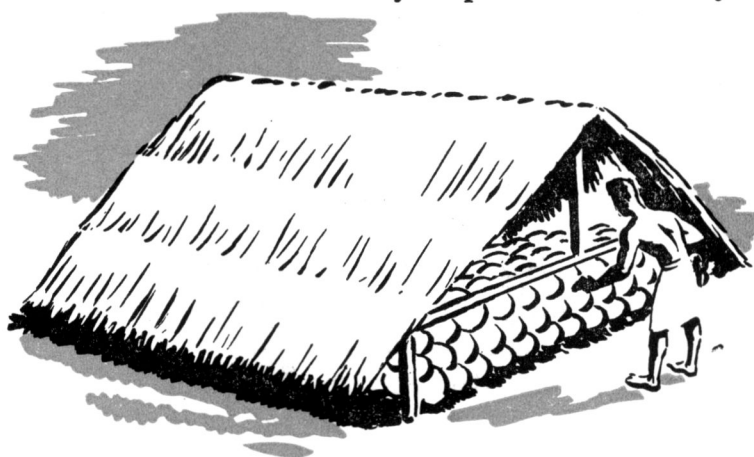
The rejected nuts will be suitable for feeding to your pigs and chickens or for making second quality copra.

(iv) Throw out all nuts that show signs of attack by insect pests and diseases.

- (v) Reject all nuts that are badly formed, blemished, or damaged.



Seednuts selected according to these rules will be of high quality. They should be stored in a cool, dry, well-ventilated shed until they are planted in a nursery.



The preparation and establishment of a coconut nursery is the next important step in the development of a good plantation, and will be the subject of the next talk.

## THE COCONUT NURSERY

In many Pacific islands, when people wish to plant new land under coconuts or replant old or hurricane-damaged groves or plantations, what they usually do is:

Either to plant fallen coconuts picked up carelessly from under the palms (unselected seednuts from unselected mother-palms);

Or to plant sprouted fallen coconuts, again picked up carelessly from under the palms (unselected seedlings from unselected fallen nuts from unselected mother-palms);

Or to allow fallen coconuts to sprout and grow where they fall.

The first two methods are bad because, quite apart from other evils, more than half the number of palms in such groves and plantations are poor producers of copra. The third method is even worse because it turns groves and plantations into untidy and overcrowded forests of palms.

In my talk on the selection of seednuts, I said that not every nut that falls from a selected mother-palm is able to produce a good daughter-palm and I told you how to sort out the good seednuts from the bad ones.

Now I have to go further and tell you that not every seednut selected in this way is capable of producing a healthy and high-yielding palm.

The truth is that only about half the number of selected seednuts from high-yielding mother-palms will give us the type of palm that we require in order to get the highest weight of kernels or copra per acre.

How are we to know which seednuts will give rise to good copra-producing palms?

The only way to answer this question is to plant all

the selected seednuts in a nursery and to see which seednuts sprout early and produce the best seedlings.

### **Where should the nursery be?**

Choose a bright, sunny position, away from trees and buildings.

The top-soil of the nursery should be light and sandy to a depth of 1 foot to 18 inches and well-drained.

Place the nursery near the area to be planted. Coconut seedlings suffer damage when they are carried long distances.

If you have a supply of fresh water, place the nursery near it. Seednuts sprout better and seedlings grow fast if they are watered during dry weather.

It is much easier to look after one large central nursery than many small scattered ones.

Get together with your neighbours and have a communal nursery.

### **How to make a nursery.**

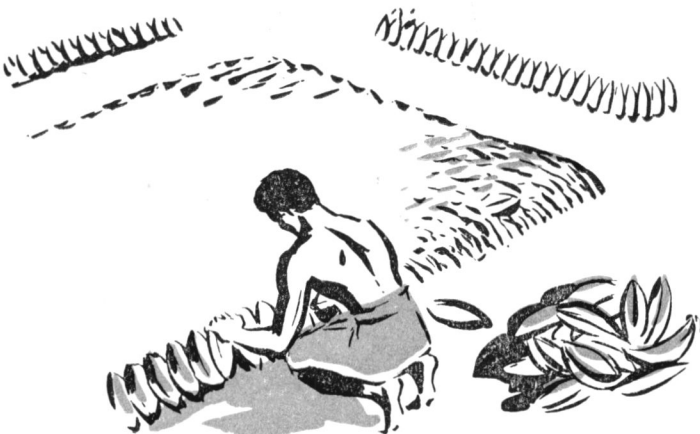
Dig the soil well and loosen it up to a depth of about 12 inches.

Remove all large stones and roots.

Mix the loosened soil with dried or rotten leaves and ash from burnt fresh coconut husks at the rate of 25 lb. of husk-ash to 225 square feet. Repeat this treatment every time you plant a fresh lot of seednuts in the nursery.

Divide the area into seed-beds. Make each seed-bed 8 feet wide and raise it 8 to 10 inches above ground level. 50 feet is a convenient length for seed-beds. The distance between seed-beds should be 1 foot to 18 inches.

Strengthen the four sides of each seed-bed with large stones or coconut husks.

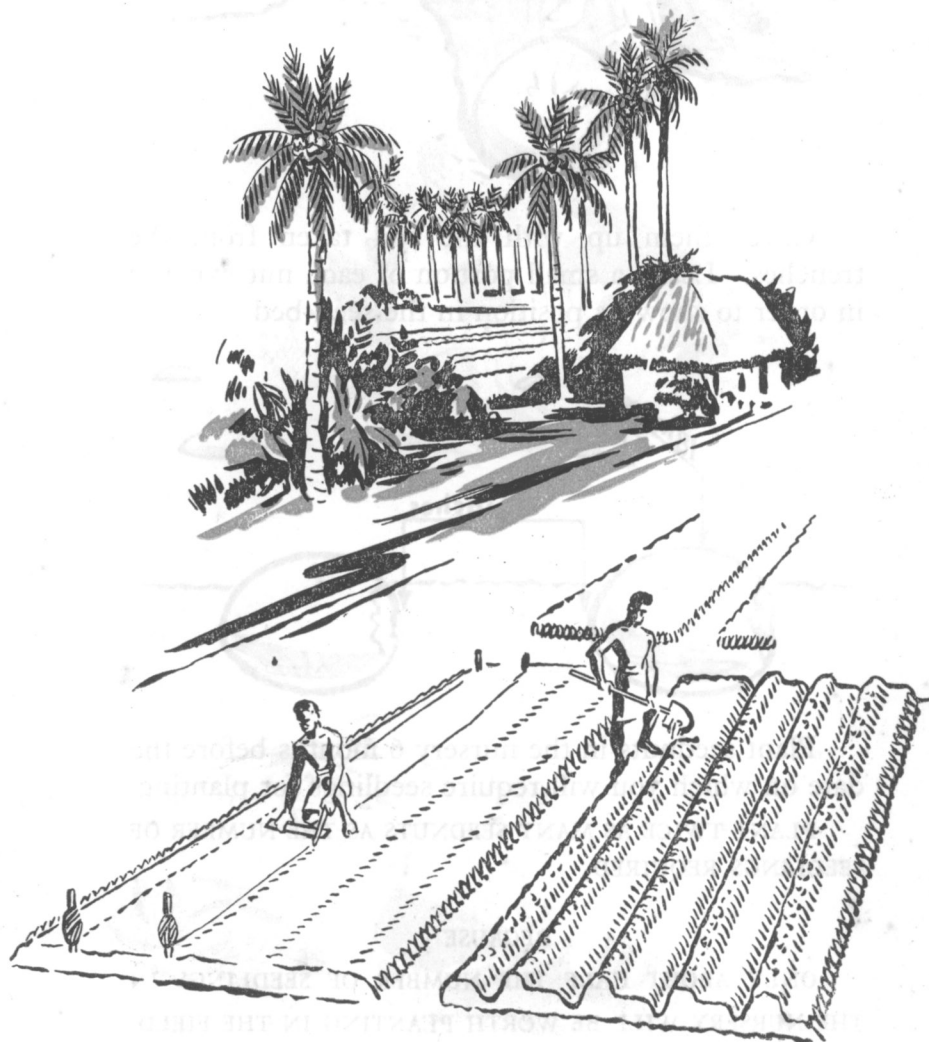


## Spacing and planting of seednuts.

Plant seednuts in straight rows in the seed-beds.

Trace the rows 18 inches apart with the aid of a length of twine or sennit and a stick 18 inches long.

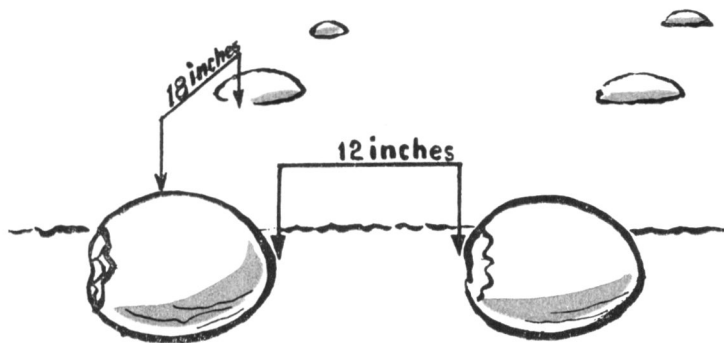
Dig a trench 6 inches deep along each trace placing the soil on one side of the trench.



Place the seednuts on their broadest side in the trench at intervals of 12 inches from nut to nut.



Cover them up with the soil taken from the trenches. Leave a small portion of each nut exposed in order to show its position in the seed-bed.



Plant seednuts in the nursery 6 months before the date on which you will require seedlings for planting.

PLANT TWICE AS MANY SEEDNUTS AS THE NUMBER OF SEEDLINGS REQUIRED,

BECAUSE

ONLY ABOUT HALF THE NUMBER OF SEEDLINGS IN THE NURSERY WILL BE WORTH PLANTING IN THE FIELD.

Smooth down the surface of the seed-beds and cover them evenly with two layers of coconut branches from which the butt-ends have been removed. The coconut branches will keep the seed-beds cool and moist.

In dry, windy weather, water the seed beds at least three times a week in the late afternoon. Unfortunately this will not be possible on atolls.

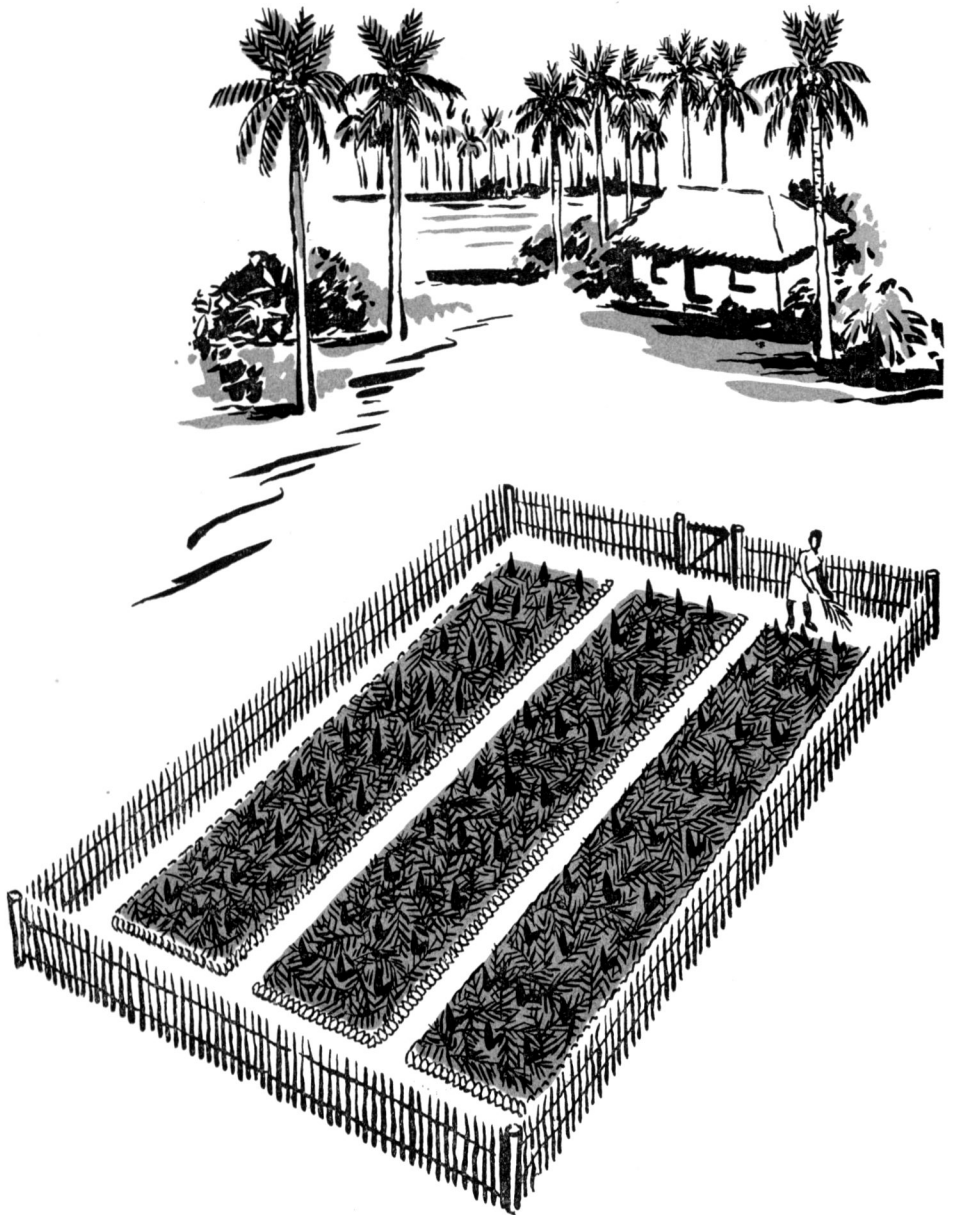
### **Take a pride in your coconut nursery.**

A well-laid-out coconut nursery is a pleasant sight and something to be proud of.

Keep it neat and tidy and free from weeds.

Build a strong fence round the nursery to keep out animals, but let the chickens in as they eat up pest-insects and manure the beds, but do not disturb the seednuts.

The subject of the next talk will be SELECTION OF SEEDLINGS.



*A well-laid-out coconut nursery*

## SELECTION OF COCONUT SEEDLINGS

THE SELECTION OF COCONUT SEEDLINGS IN NURSERIES IS THE MOST IMPORTANT SINGLE TASK IN THE CREATION OF A HEALTHY, UNIFORM, AND HIGH-YIELDING PLANTATION.

SELECTED SEEDLINGS USUALLY GROW UP INTO HIGH-YIELDING PALMS.

### **How to look after and select coconut seedlings.**

Seednuts begin to sprout in three to four months.

FOUR MONTHS AFTER THE DATE OF PLANTING, REMOVE FROM THE NURSERY ALL SEEDNUTS THAT HAVE NOT SPROUTED.

These discarded seednuts can be turned into copra.

Repair the fence round the nursery and keep out ALL animals, as well as chickens.

Renew the cover of coconut branches on the seed-beds.

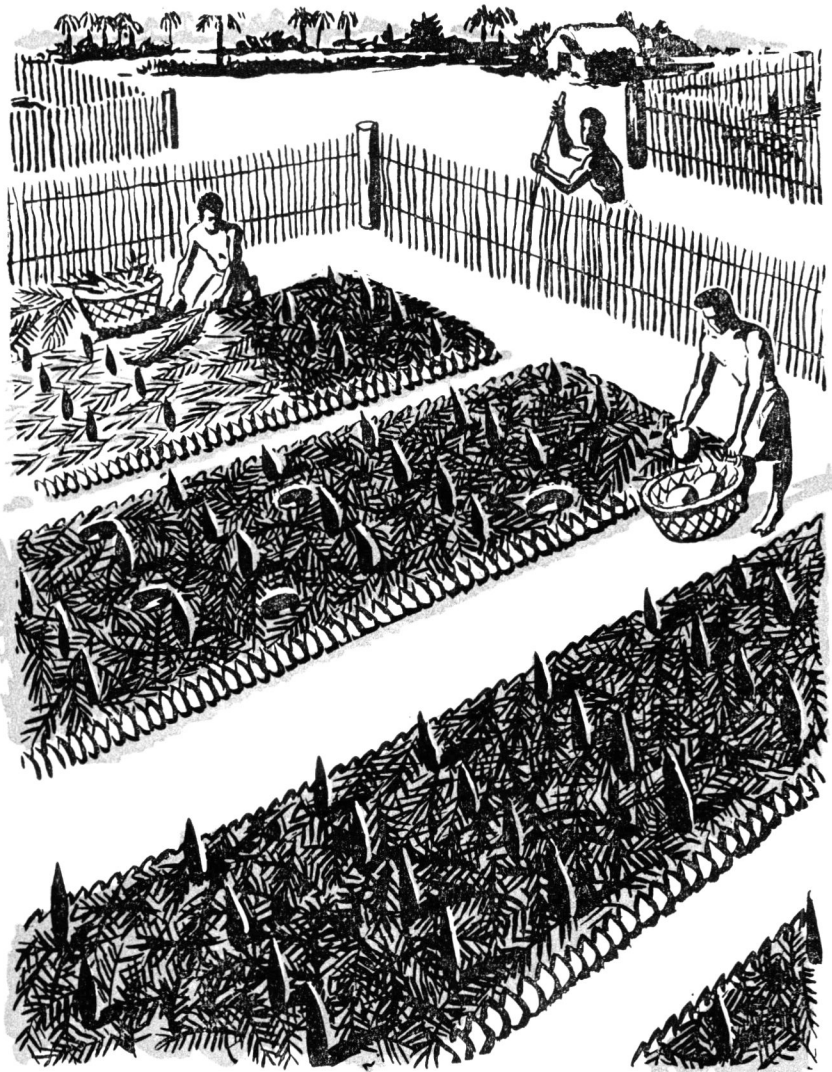
Water the young seedlings regularly whenever possible.

Look out for insect-pests and diseases.

If you see any caterpillars on the seedlings, pick them off and destroy them.

Go over the nursery every day.

A good nurseryman examines every seedling every day.



Two months after the seednuts have sprouted — about six months after they have been planted in the nursery — the seedlings will have two green leaves fully formed and a third leaf half-open, standing up like a spear. At this third-leaf stage, there will be very few roots gone into the ground.

COCONUT SEEDLINGS SHOULD BE SELECTED AND TRANSPLANTED AT THE THIRD-LEAF STAGE.

The seedlings you select for transplantation must have the following characters:—

Sprouting within four months.

Quick growth.

Broad, dark-green leaves.

Short, broad leaf-stalks.

Straight, thick stems.

No diseases or pests.

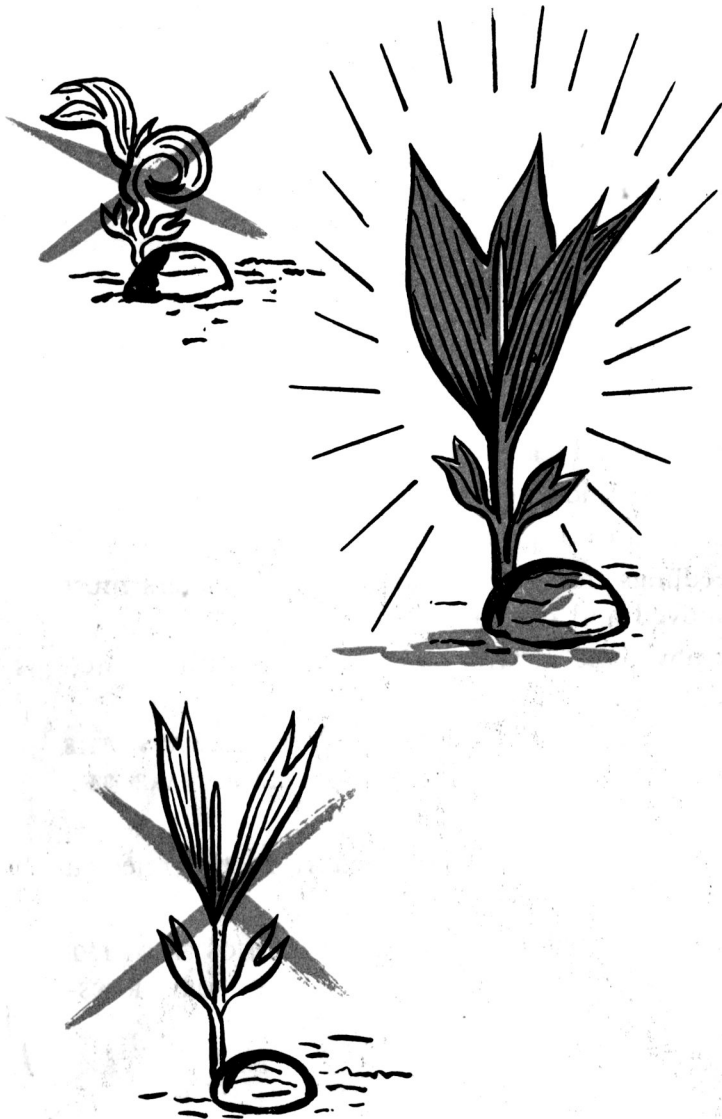
Seedlings that do not have these characters must be removed and destroyed.

Remove and destroy all seedlings with twisted leaves or stems.

THE TALLEST SEEDLINGS ARE NOT ALWAYS THE BEST. SOMETIMES THE TALLEST SEEDLINGS ARE THE WORST.

Some copra can be obtained from the rejected seedlings.

DO NOT REMOVE THE SELECTED SEEDLINGS FROM THE NURSERY UNTIL YOUR LAND IS READY FOR TRANSPLANTATION.



## PLANTING DISTANCE AND PREPARATION OF SEEDLING HOLES

**The right distance between palms.**

Coconut palms need plenty of room in the ground for their roots and plenty of light for their leaves.

Palms are unhealthy and yield very few nuts when they are growing too close to each other.

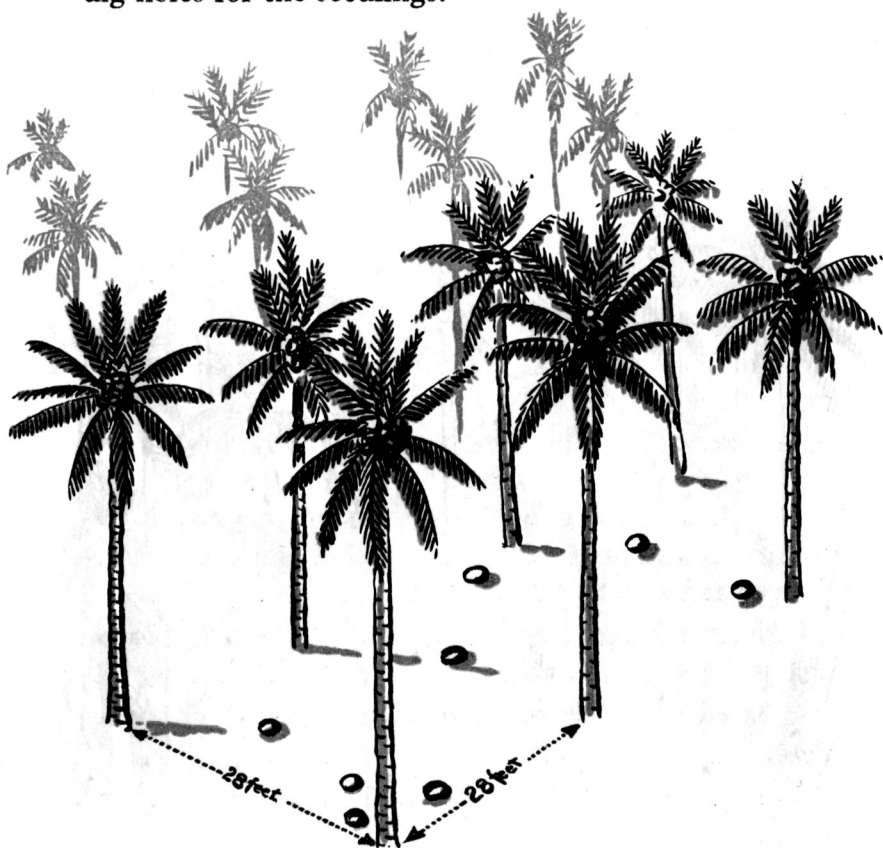
If palms are overcrowded, many nuts get lost and cannot be gathered for copra.



To obtain the highest possible yield and to avoid loss of nuts, plant your palms at the right distance from each other.

FOR THE PRODUCTION OF COPRA, THE BEST DISTANCE BETWEEN PALMS IS 28 FEET ON THE SQUARE.

Plant your selected seedlings in straight rows. Mark the rows with wooden pegs 28 feet apart. Place wooden pegs in the rows at intervals of 28 feet. If you do this you will find that there are 55 pegs to the acre. These pegs mark the places where you will dig holes for the seedlings.



### **Importance of well-made seedling-holes.**

In the Pacific Islands, seednuts and seedlings are usually planted on the surface of the ground or in holes just large enough for the nut. These are very bad practices. They do not give the seedlings a chance to send out their roots freely. Nor do these roots anchor the palms firmly to the ground. Such palms have their boles, the swollen bases of the stems, exposed above ground and grow up crooked. They lean over in all directions and are easily blown down by hurricanes and strong winds.

DO NOT PLANT SEEDLINGS ON THE SURFACE OF THE  
GROUND OR IN SHALLOW HOLES.

Palms planted in well-made, deep holes put forth many roots. The boles sink below ground. The stems grow up straight, firmly anchored and resistant to hurricanes and strong winds. Such palms seldom get blown down.

### **How to make seedling-holes.**

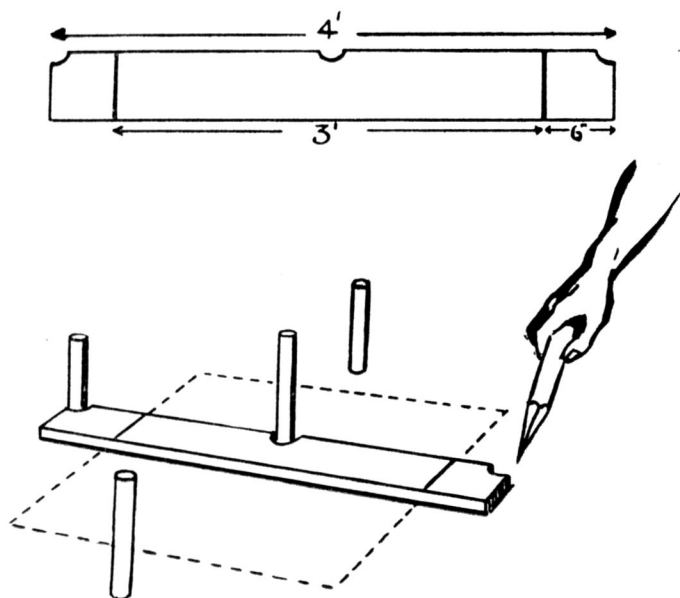
The ideal seedling-hole is 3 feet long, 3 feet wide and 3 feet deep.

Make a planting-board 4 feet long, 4 to 6 inches wide and 1 inch thick. Cut 3 notches, one in the middle and one at each end. Mark the board by straight lines drawn across it, 6 inches from each end. The distance between these two lines will be 3 feet.

Place the centre-notch of the planting-board against each peg marking the holes in the field.

Place one peg firmly in the ground at each end-notch. These pegs should be 18 inches long.

Mark the ground against the 6-inch marks on the board.



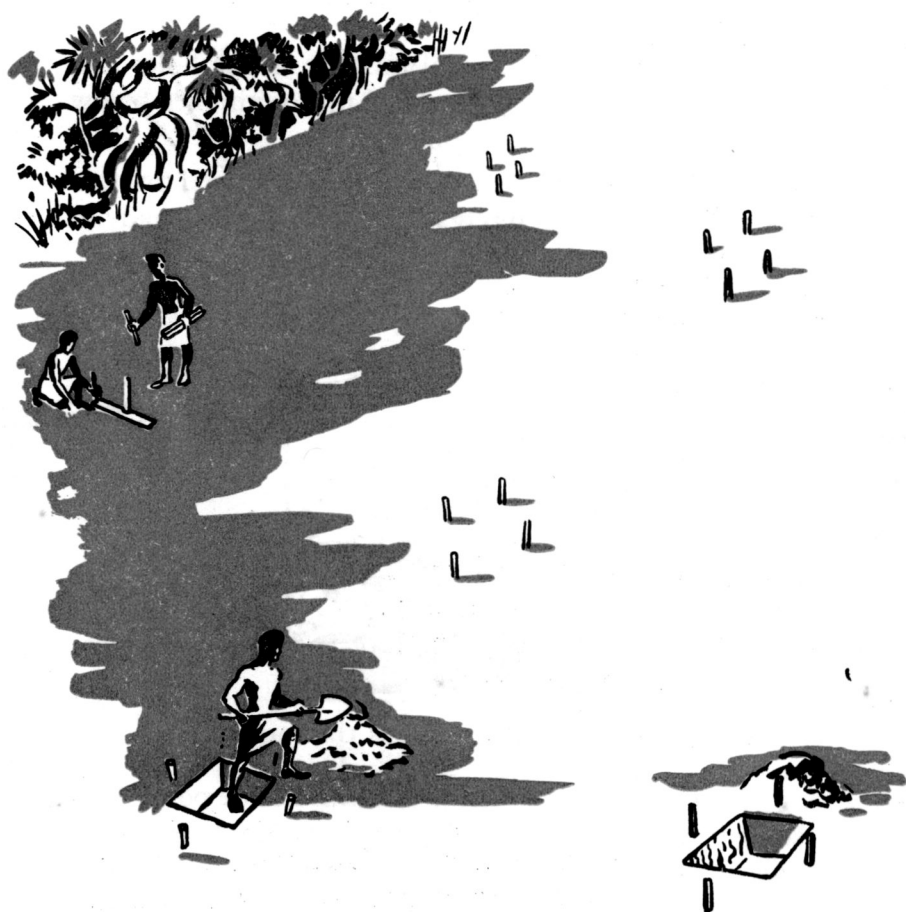
Repeat the operation by placing the planting-board at right-angles to the straight line made by the centre-peg and the two end-pegs, with the centre-notch once more against the centre-peg.

Now you will be able to mark the four sides of the 3-foot square hole.

Remove the centre-peg, but leave the four other pegs firmly fixed in the ground. Do not disturb them. They will save you a lot of work when you come to plant the seedlings later on.

The ideal seedling-hole is 3 feet deep. If the ground is so hard that you cannot dig so deep, go down as far as you can but never less than 2 feet deep. In some countries, dynamite is used to deepen seedling-holes.

When you dig the holes, place the top-soil on one side of the hole and the lower layers of soil on the other.



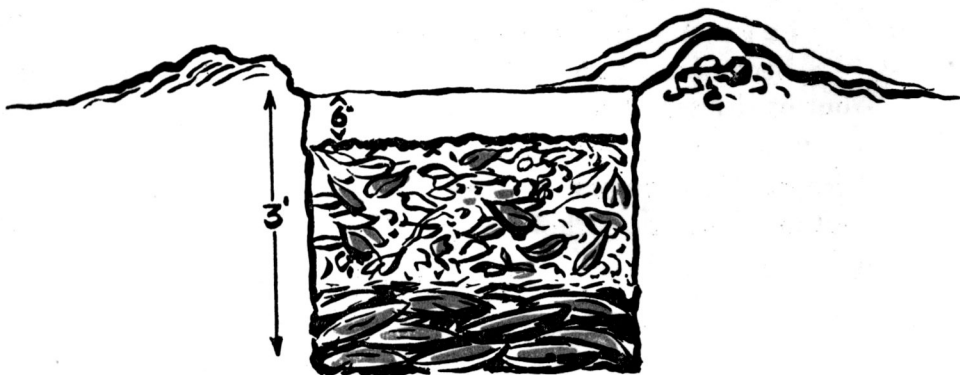
Place two layers of coconut husks, without shells, at the bottom of the hole. Then, fill it up to within 6 inches of the outside ground-level with top-soil mixed with dry leaves, leaf-mould or other decayed vegetable matter, and 4 lb. of ash from burnt fresh coconut husks.

The husk ash supplies potash which is essential for good growth and fruiting of coconut palms.

Muriate of potash, at the rate of 2 lb. to each hole, is even better than husk-ash.

Tread down the top-soil mixture in the holes and add more of it to bring the level up to 6 inches below the level of the ground outside.

When all the holes have been prepared in this manner, water them freely. They will then be ready to take the seedlings.



Watering is not essential and will not be possible in some islands. But if you have a good supply of water, give some to your coconut seedlings and see how fast they grow.

Our next talk will be on TRANSPLANTATION AND CARE OF TRANSPLANTED SEEDLINGS.

## TRANSPLANTATION AND CARE OF TRANSPLANTED SEEDLINGS

### What is transplantation ?

Transplantation consists of three distinct operations —

LIFTING THE SEEDLINGS FROM THE SEED-BEDS.

TAKING THE SEEDLINGS TO THE FIELD.

PLANTING THE SEEDLINGS IN PREPARED HOLES.

### How to lift seedlings from seed-beds.

DO NOT PULL UP SEEDLINGS BY THE STEMS OR LEAVES.

Loosen the soil round the nuts on all sides.

Place both hands under each nut and lift it gently out of the seed-bed.

6 months old seedlings have very few roots in the ground. If some of these are broken or bruised during lifting, it will do little harm.



**EVERY SEEDLING LIFTED FROM THE SEED-BEDS MUST BE TAKEN TO THE FIELD AND PLANTED AT ONCE. PLAN YOUR WORK AND DO NOT LIFT MORE SEEDLINGS THAN YOU NEED FOR EACH DAY'S PLANTING.**

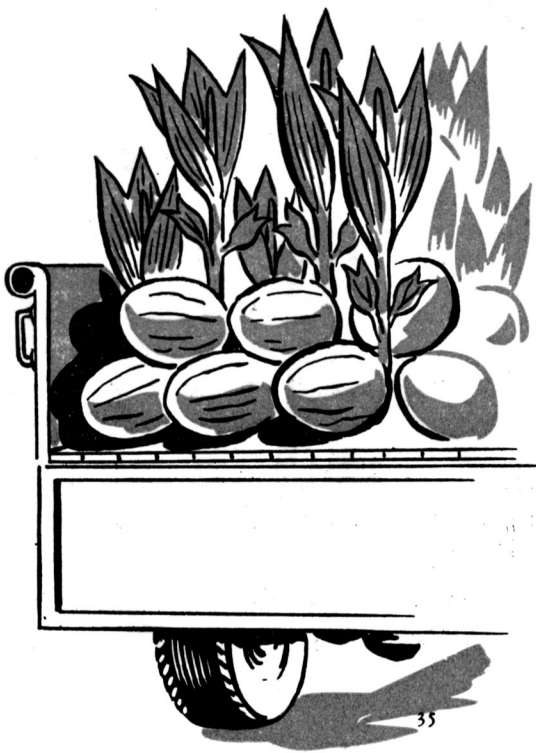
**How to take seedlings to the field.**

**NEVER CARRY SEEDLINGS BY THEIR STEMS OR LEAVES. Take them in baskets, hand-carts, jeeps, or trucks.**

Pack the seedlings with care, so that the leaves do not get crushed. Do not pack more than two layers of seedlings in hand-carts, jeeps, or trucks.

Place the upper layer of seedlings so that their nuts rest on the nuts of the lower layer. If the packing is well done, the seedlings will support each other during the journey from the nursery to the field.

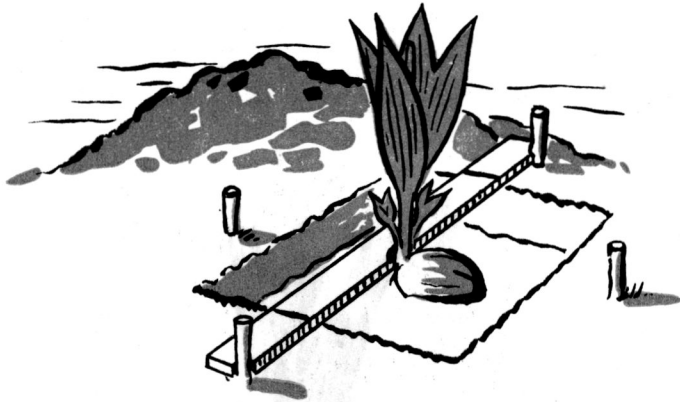
Take the same care when you carry seedlings in boats or rafts.



## How to plant seedlings.

### PLANT SEEDLINGS IN THE CENTRE OF THE HOLES.

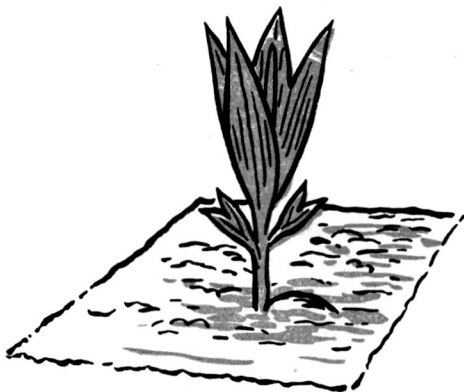
To do this correctly, fit the end-notches of the planting-board to the end-pegs on either side of each hole and fit the stem of the seedling into the centre-notch, with the nut in a hollow just large enough to take it.



Pack the earth round the nut lightly to keep the seedling upright.

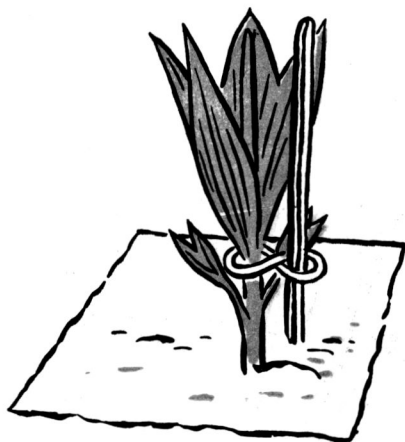
When all the seedlings have been placed in the holes in this way, they should be in perfectly straight rows.

Correct errors in position by sighting first along one row and then along the row at right angles to it.



Cover the nuts with soil packed tight, but leave the stems of the seedlings almost entirely exposed.

Support each seedling by tying it loosely to a stake driven into the ground.



**TRANSPLANT SEEDLINGS IN RAINY WEATHER.**

## How to look after transplanted seedlings.

KEEP THE LAND ROUND THE SEEDLINGS CLEAN.

During dry weather, pull up by hand or dig out all weeds and grasses to a distance of 6 feet round each seedling.

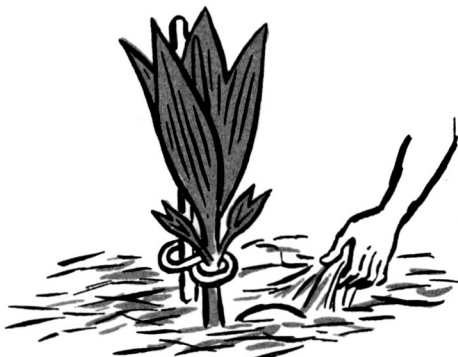


Leave 2 feet to the seedling all round and loosen the soil in the remainder of the weeded circle.



Spread the dried weeds and grasses over the loosened soil.

Loosening the soil and covering it with dried weeds and grasses will keep the ground round the seedlings cool and moist.



Water the seedlings in dry weather if you can. In some countries transplanted coconut seedlings are watered three times a week.

Go over the plantation frequently and keep an eye on the growth of the seedlings. You will find that, with the best care in the world, some seedlings will die, or grow badly or turn out to be unhealthy. These must be removed and replaced during the rainy season every year.

**KEEP A REPLACEMENT NURSERY GOING FOR AT LEAST THE FIRST FIVE YEARS OF THE LIFE OF YOUR PLANTATION.**

One-quarter of the area of the first nursery will be sufficient for the replacement nursery. Plant it with selected seednuts and look after it as before.

Use selected seedlings from this nursery to replace dead and bad seedlings on the plantation.

**IF YOU DO THIS WORK WELL, THE PALMS ON YOUR PLANTATION WILL BE UNIFORM IN GROWTH, HEALTHY, AND HIGH-YIELDING.**