



TRAINING GUIDE



# ORGANIC MANGO PRODUCTION



1<sup>ST</sup> Edition 2008

## **INTRODUCTION**

### **CONTEXT**

This guide is intended as introductory technical reference material for training members of the Ghana Organic Mango Outgrowers Association (OMOA) to improve their technical practices in organic mango production. The technical recommendations are supported by the Integrated Tamale Fruit Company (ITFC).

### **DESCRIPTION**

This training guide covers basic practices of organic mango production starting from site selection up to harvesting. This illustrated guide is structured for easy comprehension and complements hands-on training.

This guide does not replace direct advice of a trained extension field agronomist.



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The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

## **CREDITS**

This guide has been prepared under the technical supervision and collaboration of Integrated Tamale Fruit Company (ITFC) and USAID/TIPCEE project. The guide is intended to be used for training of the members of Organic Mango Outgrowers Association (OMOA). For any enquiry on the guide, contact the General Manager of ITFC at:

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## Site selection

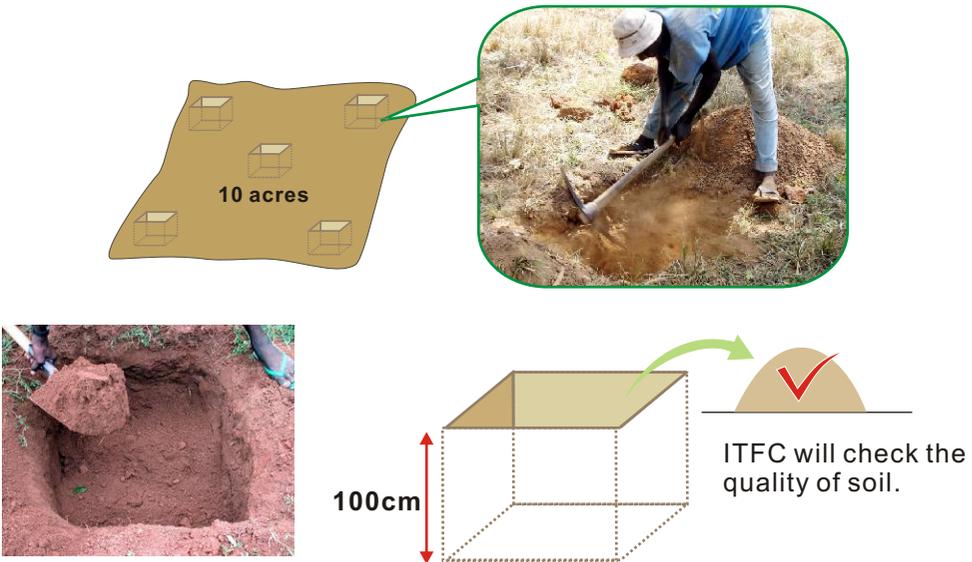
### Avoid chemical contamination

For organic production, the site should be away from...



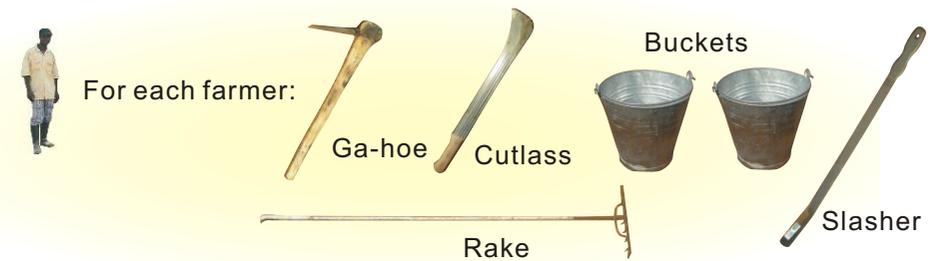
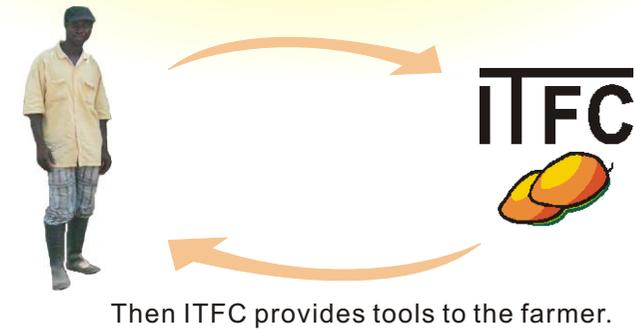
### Profile hole digging

Farmer digs 5 profile holes for every 10 acres.



## Registration

Farmer gives a bag of maize to ITFC and signs a contract to show his commitment.



## Land preparation & fencing

### Land clearing



### Fencing

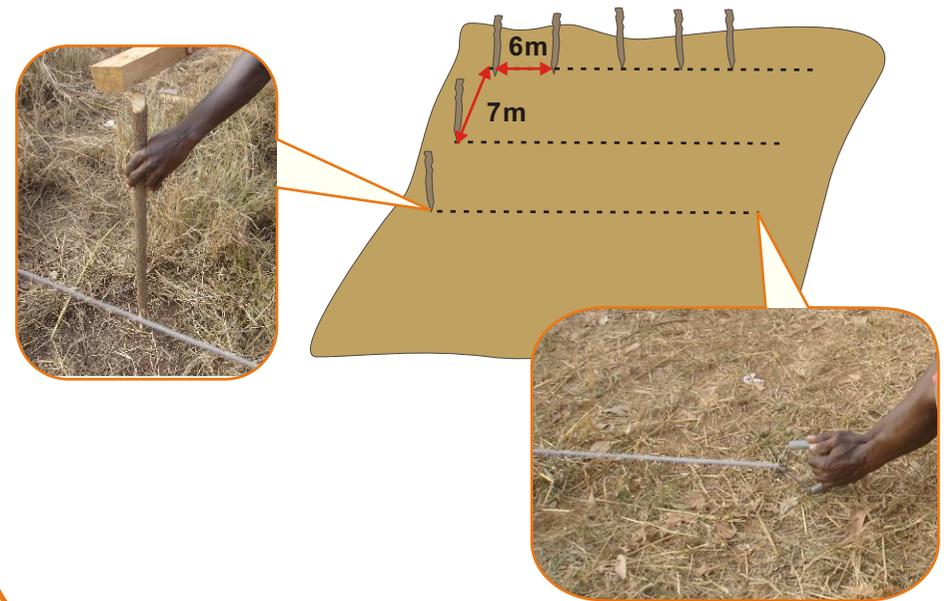
Make sure that cows or goats do not enter.



Plant trees as fences so that you do not need to cut trees for fencing.

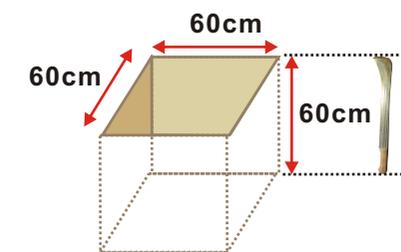
## Pegging

Using the cable, peg 6m within rows and 7m between rows.

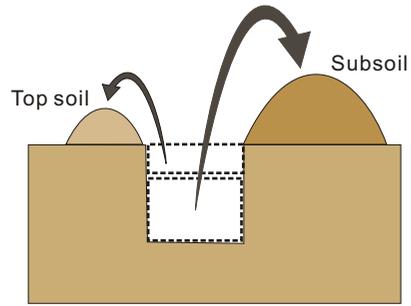


## Planting hole preparation

Dig a square hole.



Separate top soil and subsoil.



Mix chicken manure and rock phosphate with the top soil.

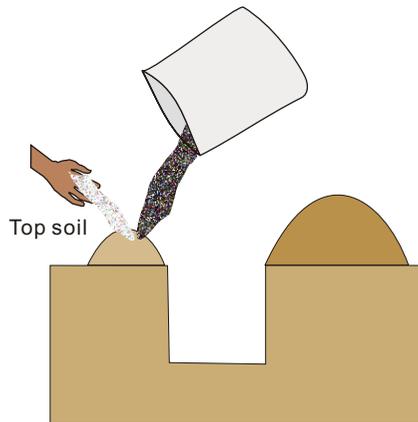


Chicken manure (3kg)  
(Wear gloves when handling chicken manure)

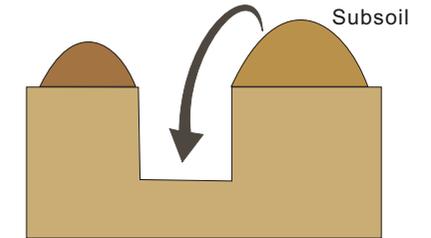


Rock phosphate (Handful: 500g)

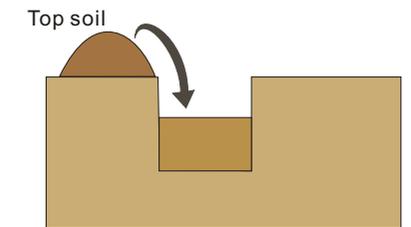
Mix well.



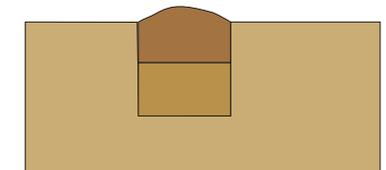
Fill the hole with the subsoil first.



Then put back the top soil mix.



Fill the hole completely.



# Planting

Tank structure is installed.



Water each planting hole with one bucket of water.

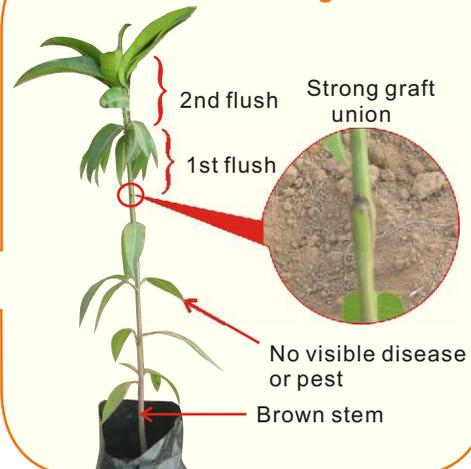


ITFC brings the young trees.  
Keep young trees under the shade.



Select only good trees.

## Characteristics of a good tree



Dig a planting hole.



Remove the plastic bag.



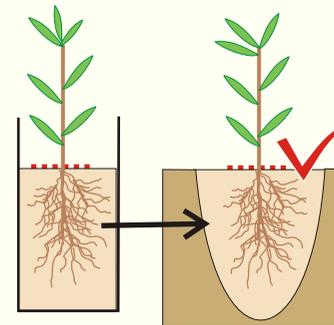
Hold the tree and fill the hole.



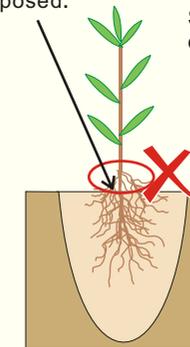
Press the soil softly.



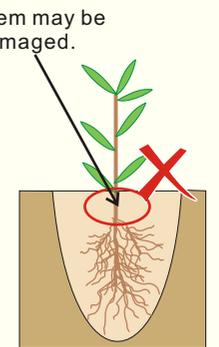
Make sure that the soil level remains the same.



Roots are exposed.



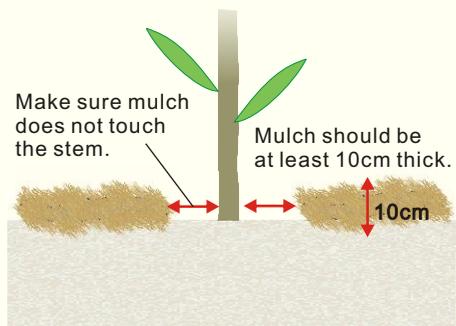
Stem may be damaged.



Lay mulch around the tree.



Apply water on the mulch.



***Plant all the trees and water them on the same day!***

Collect the plastic bags afterwards.  
Do not leave them in the field!



Collected bags are disposed into a pit and burnt.

## Irrigation

### Manual irrigation

Water your tree regularly with a bucket of water.



### Irrigation program

	Dry season	Rainy season
For 1 week after planting	Everyday	Everyday (when no rain)
After 1 week	At least twice in 4 days	When no rain

### Drip irrigation

When there is a sufficient water source and when there are enough farmers, a drip irrigation system is installed.

Water source



Filtering station



Water is applied from 4 emitters around the tree. Irrigation cycle is determined by ITFC.



## Weed control & mulching

Weed regularly.



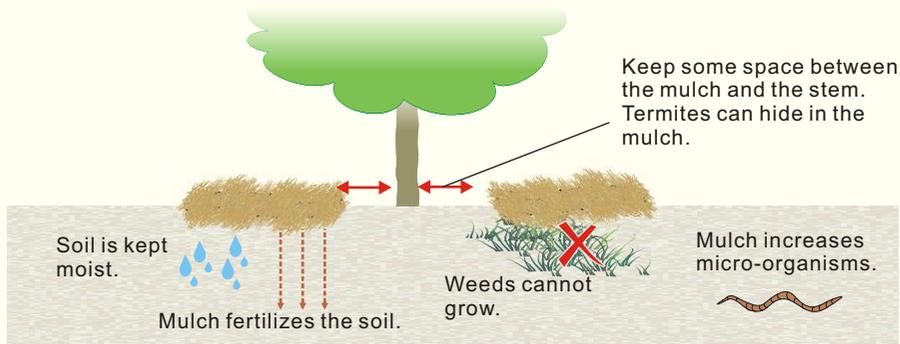
Wait until the grasses dry.



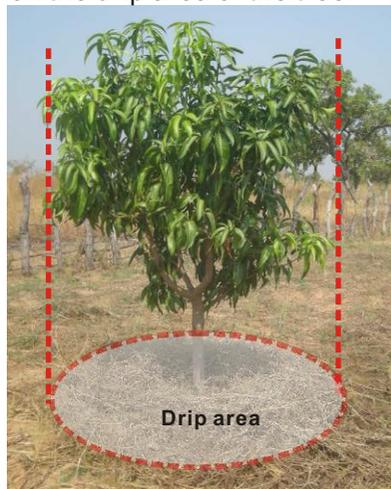
Use them as mulch around the tree.



### Benefits of mulch



There should always be mulch on the drip area of the tree.



You can use groundnuts as a cover crop.



Nitrogen fixation    Weed control    Income from the groundnuts

## Pest & disease control

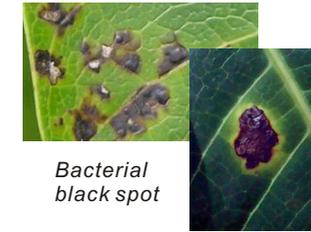
### Prevention

Spray copper every month to prevent *anthracnose* and *bacterial black spot*.

Copper



Anthracnose



Bacterial black spot

③ Spray outside.



④ Spray from different points around the tree.



① Spray the stem.



② Spray inside.



⑤ At each point, stop and spray systematically.



Wear protective clothing.

Spray all the parts you see. Do not miss any part!

Respect the Pre-Harvest Interval of 14 days: Do not harvest within 14 days after spraying!

You can also use Jacto sprayer for spraying.



### Monitoring

Check for the following insects.

#### Beneficial insects



Predatory beetle  
(Larvae eats the scale)



Predatory beetle  
(adult)



Praying mantis

#### Pests



Leaves eaten by  
grasshoppers



Tip wilters



Leaf eating beetle

Damage by  
tip wilters

#### Intervention

➔ If you see them,  
destroy by  
hand.

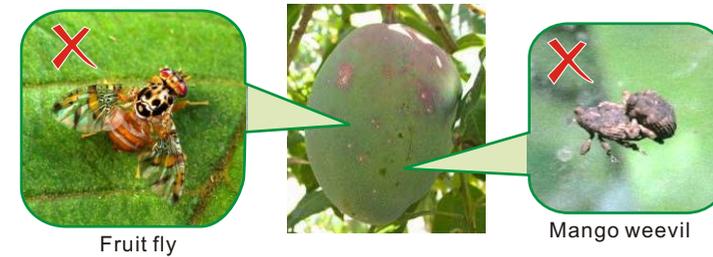


Mealybugs



Scale

➔ If you see them,  
notify Field  
Assistant.



Fruit fly

Mango weevil

➔ If you see  
affected fruits,  
remove the  
fruit.

To monitor fruit fly, hang McPhail trap (pheromone trap): 1 trap/ acre.



➔ Fruit fly will enter.

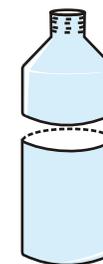


➔ Monitor the number of  
flies caught.



To control fruit fly, hang bottle trap: 1 bottle/ tree.

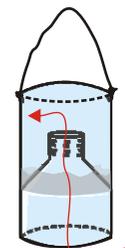
Cut a bottle in half. Put them together.



➔ Put 50ml of bait inside.  
(Bait can be made with  
800g sugar/ 10L of water.)



➔ Hang it on a tree.



➔ Flies can enter but  
cannot come out.

➔ Refill the bait every week.



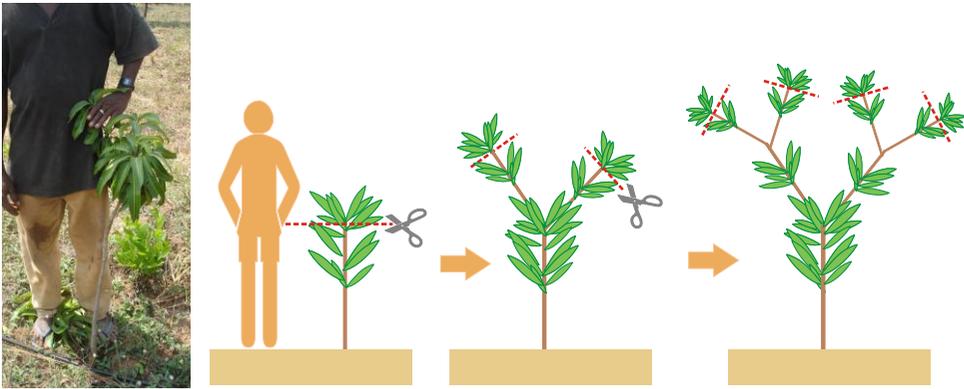
## Pruning

### Tools used



### Structural pruning

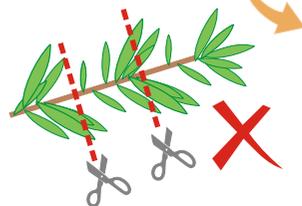
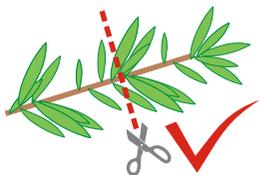
When the tree reaches hip height, every 2nd flush should be pruned.



Make sure that you prune before the node.

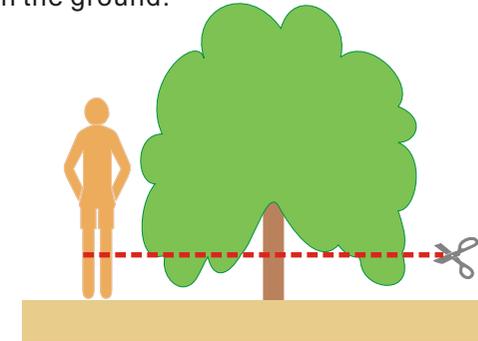


If you prune after the node, too many stems will shoot.



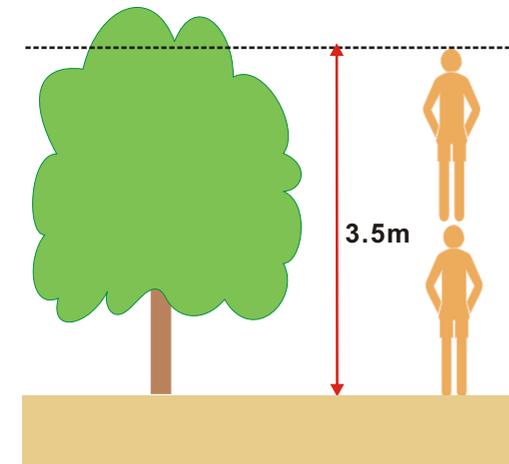
### Skirt pruning

All branches should be above knee height. If below, fruits will touch the ground.

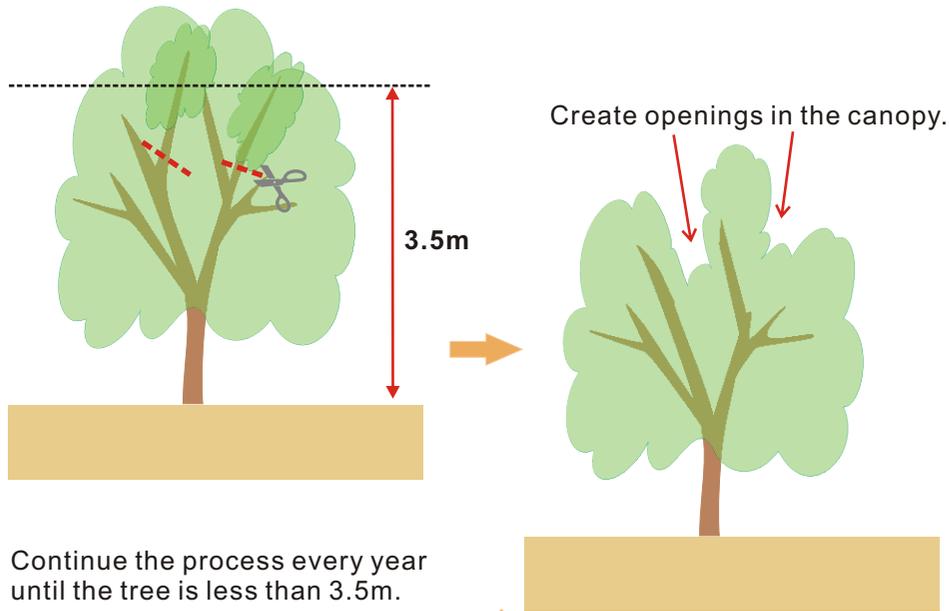


### Height control

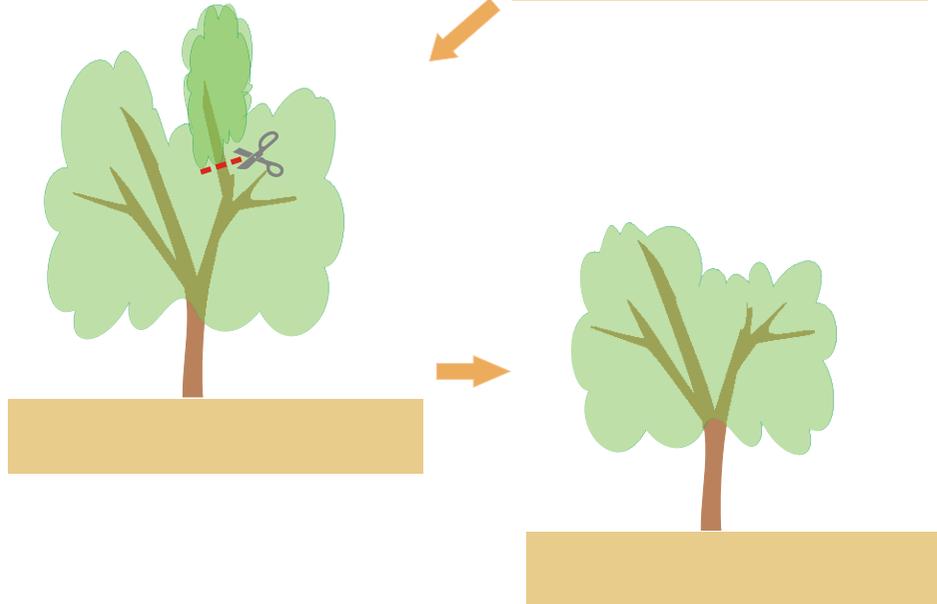
Tree should not be taller than 3.5m.



If a tree is taller than 3.5m, cut one or two tallest branches a year.  
Do not cut more than two branches at a time!



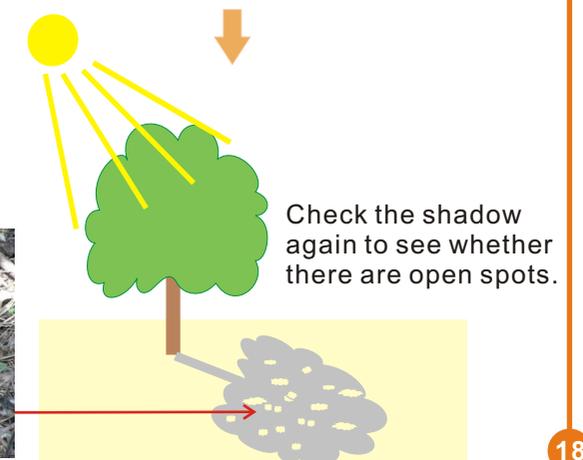
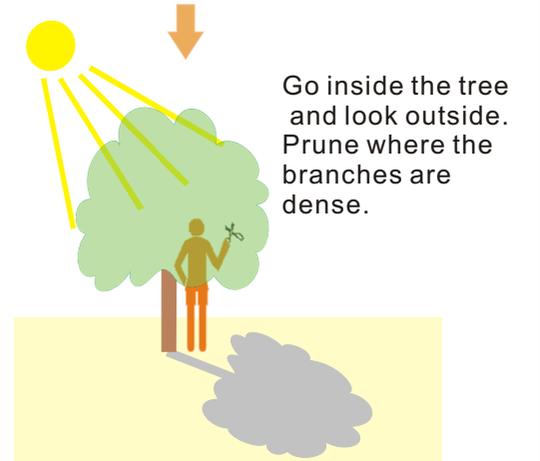
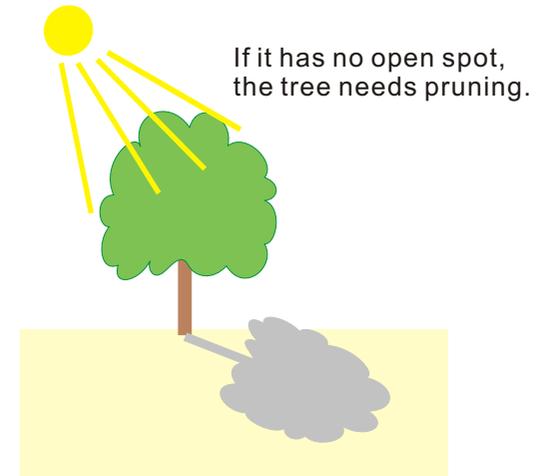
Continue the process every year until the tree is less than 3.5m.



If you cut many branches, tree will react and will have many shoots.  
The tree quickly comes back to the same height.

### Density control

Watch the shadow of the tree.



## Removal of dead panicles

### Before harvest

Cut off dry panicles.



Bend green panicles.  
(If you cut it, glue will come out and stain your fruits.)



### After harvest

Cut off dead panicles.



## Treatment after pruning

After each time you prune, cover the cut with Nordox copper solution.



Pruning



Copper solution  
(100g/ 100L of water)

For big cuts, soak a cloth or brush with the solution and paint the cuts.



For many small cuts, use a knapsack to spray.



## Cleaning of tools

### Between each tree

Dip the secateur into copper solution to prevent transmission of diseases.



### After a day of work

Wash the secateur with water.



Dry it with a cloth.



Dry it under the sun.



Put a drop of oil.



## Sunburn control

### Young tree

When the tree is young, leaves can be burned by the sunshine.



Sunburnt leaves

Paint the young tree's stem with whitewash soon after planting.



## Fruits

Fruits can also be burnt by the sunshine.



Sunburnt fruit

Dip the fruits into Kaolin solution to prevent sunburn.



Control the fire with fire fighting equipment.



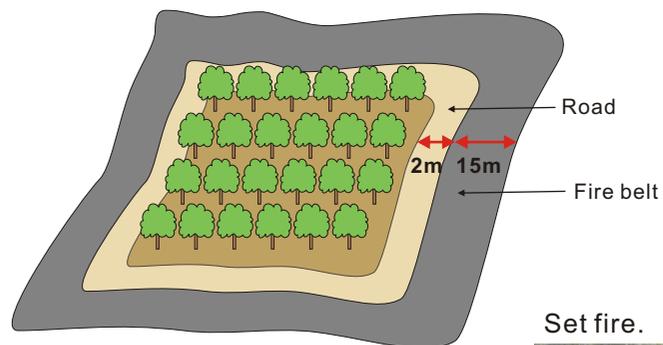
Put out the fire completely.



## Fire belt burning

Burn fire belt in October or November every year.

Clear the road around the field before the burning.



Set fire.



Notify the landowners around the field in advance.

Burn the fire belt late in the afternoon when the wind is not blowing.

## Harvesting

ITFC informs the farmer when to pick the fruits.

Cut with the long stem.



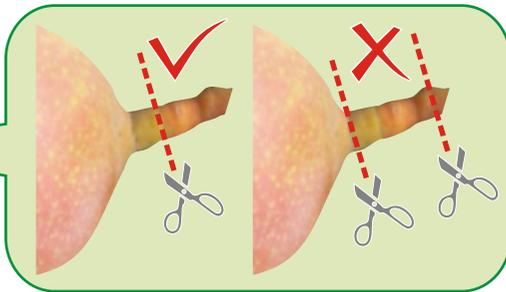
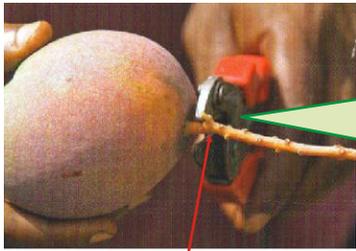
Put them with the stem in single layer into a harvesting crate.



Do not put the fruits directly on the ground!



Trim the stem



5mm from the fruit

Drain the latex on a drip tray for 30 minutes.



Separate diseased or damaged fruits.



Put the fruits into crates.

Fruits will be transported to the packhouse.

Also collect dropped fruits from the field to prevent fruit fly.

Wash the crates regularly.



## Fertilizer application

### Chicken manure

Apply chicken manure right after harvesting.

Put chicken manure on top of mulch.



Place the manure 20 cm away from the stem but within the drip area of the tree.

Poke it with a stick to mix.



Apply water.



### Foliar fertilizer

Before harvesting, ITFC collects leaf samples for analysis.



Leaves with nutrient deficiency

If deficiency is detected, Boron and/or Zinc may be sprayed together with copper.



Boron



Zinc

