

## MANAGEMENT OF INFECTED FIELDS

1. Sleeve the bunch, deflower early and **break off** the ' bull ' as soon as the last hand is seen. Do not use a cutlass as this spreads the bacteria to healthy plants.
2. Use twine instead of sticks to prop plants
3. Disinfect all tools used with household bleach at 1 part bleach to 9 parts water.
4. When returning from infested fields, disinfect shoes immediately. Either dip in the bleach solution or use a spray bottle. Remove all soil !
5. Do not attempt to use any materials from an infested field to replant. Wait at least one year after the plants have been destroyed before replanting that same field. Other crops such as sweet potato, yam, corn, and carrot can be safely planted.
6. Be sure to know the areas island-wide that are infested. Do not take material from these to replant your fields. Instead contact your Extension Officer.

## CONTACT:

Ministry of Agriculture, Forestry and Fisheries

- |                             |   |          |
|-----------------------------|---|----------|
| 1. Plant Protection Unit    | - | 457 1283 |
| 2. Dumbarton Agric Station  | - | 458 5326 |
| 3. Wallilabou Agric Station | - | 456 0310 |
| 4. Communications Unit      | - | 450 0312 |

Banana Growers Association: - 457 1605

## SYMPTOMS



4

*Older leaves rot, bend and hang loose*



5

*Young plants wilt, dry up and die.*



**Zero tolerance for Moko  
Moko must go!**

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Ministry of Agriculture, Forestry and Fisheries  
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# Moko Disease

## of Banana, Plantain and Bluggoe

## SYMPTOMS



1 *Rotting extends from the navel upwards.*



2 *Fruit pulp blackens*



3 *Internal tissue of cut stem shows yellowish brown discoloration*

**MOKO DISEASE** is the name given to the deadly bacterial wilt of bananas, plantains and bluggoe (maugh faugh baugh). The disease is caused by the bacterium *Ralstonia (Pseudomonas) solanacearum*. This bacterium does not affect humans or animals.

Once a plant in the field becomes infected, Moko can cause an epidemic in a short period, especially so if the bacteria begin to ooze from the male bud of the flowers, onto the other parts of the plant and even into the soil. Moko has been responsible for loss in yields of up to 74%.

## HOSTS

Moko disease affects ornamentals such as the Heliconia species, anthuriums as well as the Musa species to which banana belongs. Others include the solanaceae family (eg. Tomato, peppers, eggplant), cassava, tannia, ginger, castor beans, groundnuts and some legumes.

## SYMPTOMS

Moko affects all parts of the plant, (root, pseudo-stem, bunch, fruit, sucker and flowers).

1. The first signs of the disease are the yellowing and wilting of the older leaves which become necrotic and collapse.
2. Then the younger leaves develop pale green or whitish panels before becoming rotting.
3. Suckers may begin to wilt.
4. Fruits stop developing and the fingers may ripen or split.
5. Internally, the fruits become blackened and eventually rot.
6. When the stem of the plant is cut, it is discolored and oozes a bacterial latex.

( See back page photos as well )

## HOW MOKO SPREADS

1. Through movement of the infected plant parts within a field or to other fields.
2. Pruning and improper discarding of materials.
3. Through insects which transmit infected ooze from one flower to the next
4. Through infested soil carried on hands, tools, shoes, machinery, animals and run-off water from the infested farm.

n.b. The bacterium *R. solanacearum* is present within the soil and has been shown to survive in the soil for period from 6 - 18 months.

## CONTROL

MOKO cannot be cured and it is difficult and expensive to control. The primary means of control is the protection of areas where the disease does not occur. The only effective means of control is the destruction of the infected plant and any host plants such as the Heliconia species.

## DEALING WITH MOKO - Do 's & Dont 's

1. Inspect the fields carefully each week for symptoms.
2. If seen, do not touch or disturb the infected plant. Instead, mark the spot and report it IMMEDIATELY to the Ministry of Agriculture, Forestry and Fisheries or the Banana Growers Association.
3. Do not remove any sucker, corm, fruit or leaf from the field.
4. Do not harvest bunches from treated plants or fields
5. Do not enter fields cordoned off with the yellow ribbon. These are infected and treated fields.