

Moko

What is Moko?

Moko is a devastating bacterial disease caused by *Ralstonia solanacearum* race 2. This bacterium also causes bugtok of banana, and is closely related to the blood disease bacterium which causes blood disease. Moko is currently the most widely dispersed of the three pests. Moko symptoms have also been confused with those caused by Panama disease (caused by *Fusarium oxysporum* f. sp. *cubense*).

Moko has caused severe losses in banana crops in Central and South America, the Caribbean and the Philippines. Yield reductions of 70% due to Moko have been reported in Guyana.

What do the symptoms look like?

The symptoms produced by Moko may vary depending on the strain of bacterium, and are similar for both banana and heliconia species.

Moko causes yellowing and wilting of leaves that eventually die and collapse. Younger leaves may develop pale green or whitish panels, before dying. Suckers may wilt.

The internal part of the stem becomes progressively discoloured, cream to yellow, eventually turning brown to black. This discolouration can extend into the fruit stems and bases of younger leaves. When cut, the stem will exude bacterial ooze. Bacterial ooze may also be seen on diseased peduncle cushions.

Fruit develop prematurely or split. Prematurely ripened fingers appear amongst otherwise green fingers in hands and bunches of Cavendish bananas. Internally fruit become discoloured yellow, then brown or grey, developing a firm rot. Infected flower buds and peduncles are blackened and shrivelled.





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Externally unaffected looking fruit can have significant internal browning and rotting

What can it be confused with?

Moko is most commonly confused with blood disease or bugtok. Moko has also been confused with Panama disease.

What distinguishes Moko from Panama, bugtok or blood disease?

Panama disease does not cause internal fruit discolouration, produce bacterial ooze, or cause premature ripening of some fingers in otherwise green hands or bunches.

Bugtok causes internal fruit discolouration, but does not cause wilting of the whole plant. Bugtok only affects cooking banana fruit in the Philippines.

Laboratory testing is required to distinguish between Moko and blood disease.

How is it spread?

Moko bacteria persist all year round and can be spread by infected plant parts, with roots, stems, bunches, fruit, peel, suckers or leaf material all being suitable sources of infection. Root to root infection is also possible.

Moko bacteria exist in the soil where infected plants are growing, and can survive for over 18 months. Infected soil can be spread on hands, tools, machinery, shoes, by animals and in water run-off. Pruning can also spread the pest. Insect transmission can occur from infected male buds to distant flowers. It can also be spread by contaminated fruit shipments.

Where is it now?

Moko is endemic to Central and South America, Jamaica, the Philippines and Guam.

Moko was detected in Cairns (1989) on heliconia plants imported from Hawaii, and was eradicated.

How can I protect my farm from Moko?

Only use pest-free planting material.

Check your farm frequently for the presence of new pests and unusual symptoms. Make sure you are familiar with common banana pests, so you can tell if you see something different.

Bacterial oozing from any banana plant or heliconias should be reported immediately.

If you see anything unusual, call the Exotic Plant Pest Hotline on 1800 084 881.

**EXOTIC PLANT PEST HOTLINE
1800 084 881**

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