



# Factsheet

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## Banana blood disease *Ralstonia solanacearum* (race 2) *Exotic threat to Western Australia*

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### Background

The causal pathogenic bacterium of Banana blood disease (BBD) was originally named *Pseudomonas celebensis* as it was isolated on the island of Sulawesi (Celebes). However, the symptoms and epidemiological characteristics of BBD are very similar to those of insect-transmitted strains of Moko disease in Central and South America, caused by race 2 of *P. solanacearum* [now *Ralstonia solanacearum*]. Therefore, it is likely that BBD is caused by a strain of *R. solanacearum*. Further research is required to determine the causal pathogenic bacterium of the disease.

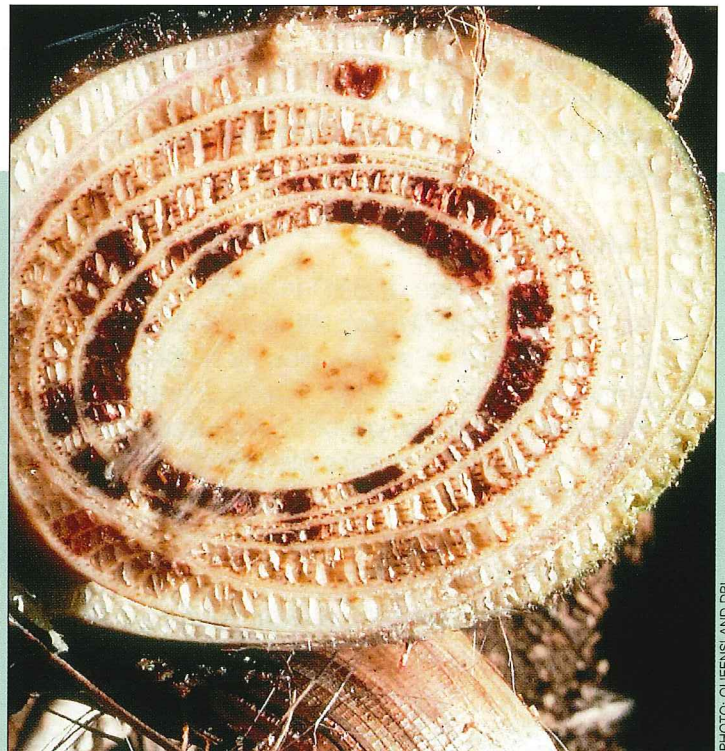
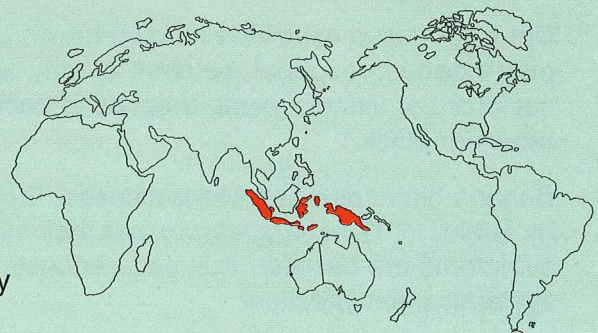


PHOTO: QUEENSLAND DPI

REDDISH-BROWN DISCOLOURATION OF STEM TISSUE

### Distribution

BBD was first reported about 80 years ago from southern Sulawesi in Indonesia. A quarantine order restricting movement of banana fruit and vegetation from Sulawesi was probably instrumental in limiting further spread of the disease until 1987, when an outbreak was confirmed in West Java. There are recent unconfirmed reports of the disease from Kalimantan, the northern Maluku islands [Moluccas], southern Sumatra (Lampung province) and Papua New Guinea, and it is likely that the disease has spread to these regions. BBD is not present in Australia.



DISTRIBUTION



## Potential impact

Due to the restricted distribution of BBD, there has been little research into the potential impact of the pathogen. The disease has caused the abandonment of dessert banana plantations being developed on the Salayar islands. Crop losses have been estimated to be up to 100% for susceptible varieties, particularly those vulnerable to inflorescence infection via presumed insect vectors. BBD has also been observed to spread up to 25 km in a single year.

Due to the number of unconfirmed reports of BBD in Indonesia and Irian Jaya, as well as the dispersal ability of the pathogen, the quarantine importance of distinguishing between threats such as BBD and Moko disease is very high.

## Plants affected

The primary hosts of BBD include most banana species (*Musa*), especially cooking bananas (ABB). Species closely related to *Musa*, such as *Heliconia*, *Strelitzia* and *Ravenala*, have not yet been reported as wild hosts, however, it is possible that they are susceptible.

## Season of occurrence

The bacterium persists all year round.

## Symptoms

Mature leaves of plants of all ages show a conspicuous transient yellowing, followed by loss of turgor, desiccation and necrosis. The base of the petiole collapses, causing wilted leaves to hang down around the pseudostem like a skirt (similar to Panama disease). The youngest leaves stop emerging and develop whitish panels in the lamina. Daughter suckers may show general wilting but infection is not always systemic. Healthy suckers are also sometimes produced.

Cut stem tissue exhibits a reddish-brown discoloration, which, depending on the mode of infection, may extend throughout the plant or may be confined to fruit and the central fruit stem. If kept moist, cut vascular tissues exude droplets of bacterial ooze that can vary in colour from white to reddish-brown or black.

Banana blood disease, Moko disease, Bugtok disease and Tapurok disease are all likely to be caused by strains of *R. solanacearum* and their symptoms are not distinguishable. In the latter two cases the symptoms are basically fruit and peduncle rot, most likely caused by insect transmission, without systemic plant infection.



BLACKISH-BROWN ROT AND DISCOLOURATION OF FRUIT PULP



INFLORESCENCE SYMPTOMS (NECROSIS AND DIEBACK FROM MALE FLOWER BUD) PROBABLY DUE TO INSECT TRANSMISSION, WEST JAVA, INDONESIA

