4) Clean (by using Jik or a fire flame) all the tools used on infected or suspected plants to avoid transmission of the disease in case they are to be used on uninfected plants. Tools should only be used to clear affected plants during the period of eliminating the disease from the plantation.

This recommendation has been given an acronym ABCC (A = Avoid; B = Break; C = Clear; C = Clean) for easy recalling. Wherever it has been fully implemented, the disease was eliminated from the plantation in 3 – 6 months. Information generated by NARO shows that in the absence of a host the disease causing bacteria survives for only 20 – 60 days depending on the environment. This makes it an easy disease to eliminate.



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Two main modes of transmission:

(1) Mechanical spread by tools such as pangas, hoes, pruning knives and any other agent (living or non-living) that injures the plant when contaminated.

Control: Disinfect tools with JIK or fire flame. Uproot all infected plants early because they are source of inoculum. Cows and goats should not be fed on diseased plants or be allowed to pass through banana plantations, as these mechanically spread the disease from infected plants to healthy plants (through feeding on the plants).

Note: Infected plants take some time before expressing the disease symptoms. With such plants present in the plantations, farmers unknowingly spread the disease through pruning, corm removal, desuckering, ploughing and harvesting of leaves either used in food preparation or sold to the market.

Control: Suspend pruning, corm removal, ploughing and leaf harvesting and resume these activities only after the disease has been cleared (3-6 months after the last diseased plant). Use tools only when removing infected plants or harvesting. Even during harvesting, take care not to infect other plants (clean the tool every after a plant harvested).

(2) Transmission by insects that visit banana male buds to feed on sap that oozes out when the banana flowers fall off.

As the insects feed from plant to plant, they mechanically bring in bacteria that enter the banana plant through the wounds left when flowers fall off.



Control: Break off male buds from flowered banana plants as soon as the bunch emerges fully to stop insect transmission.



Use a forked stick (NOT a cutting tool) to break off the male buds to avoid transmission by tools (pruning knife).

Daily monitoring and removal of diseased plants is important to stop the spread. Community action, in form of bylaws and working together, is important to mobilize errant farmers who do not want to implement recommended control measures. The public stands to lose when these errant farmers are left alone, and therefore the

problem needs to be addressed by public action.

Summary of the control measures

The measures are based on observing hygiene of plants as is done in humans and livestock to control bacterial infections. A recommendation package that has been tested and found to completely eliminate the disease from plantations/villages/sub-counties requires farmers to observe the following elements:

1) Avoid spreading the disease in your plantation on contaminated tools or on infected plant parts (fleshy plant parts). The easiest way to execute this element is for farmers to suspend using tools in their plantations for 3-6 months whenever they see the disease in their plantations. During this time they should strictly observe elements 2& 3 of this recommendation. All affected plants that show signs should be cleared out.
2) Break off male buds from flowered banana plants as soon as the bunch emerges fully using a forked stick.

3) Clear out all infected plants to remove the source of inoculum (disease causing organisms) from the garden.

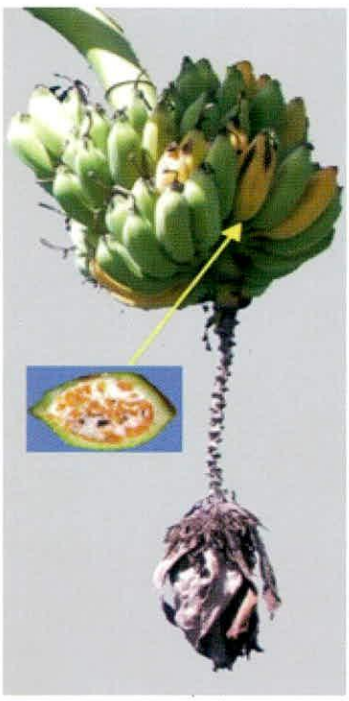
In Uganda, it was first reported in Mukono district in August 2001 and since then, it has spread to all banana-growing areas in the country.

Symptoms

The plant wilts starting with flowers or leaves.

Fruits of diseased plants ripen pre-maturely and appear discoloured when cut open. Male buds shrivel, blacken and dry.



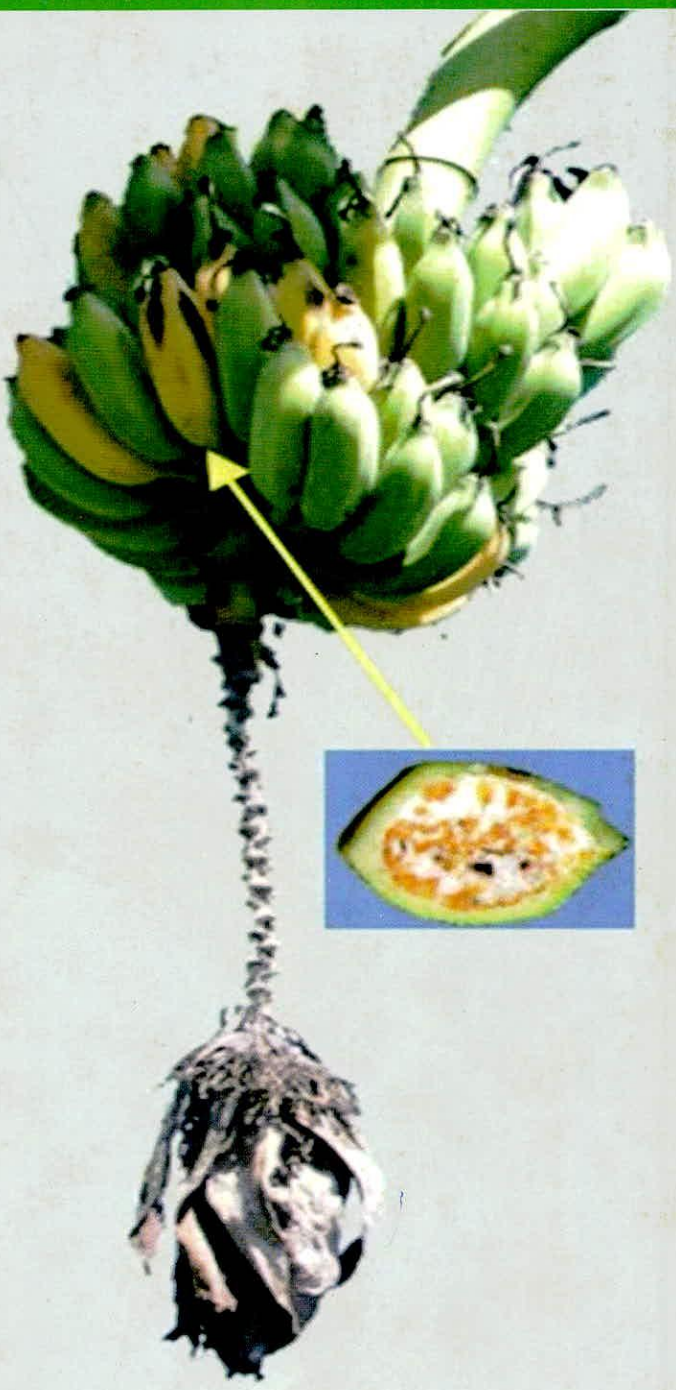


Discolouration of fingers when cut open distinguishes the disease from all other diseases and other disorders of bananas known to exist in Uganda.

Transmission and Control

Once an area is attacked, the disease spreads quickly, from one plant to another, mat to mat within a plantation, farm to farm within a village and village to village, if not controlled in time.

UPDATE ON BANANA BACTERIAL WILT CONTROL



Banana Bacterial Wilt (BBW) is a disease that attacks all types of bananas (Matooke and non-matooke bananas). The disease is caused by a bacterium *(Xanthomonas campestris pv. Musacearum)* and is a threat to banana production in the Eastern African region.