

Banana xanthomonas wilt (523)

Summary

- Narrow. Initially in Ethiopia. Now throughout East and Central Africa.
- Major bacterial disease of banana and enset, and their wild varieties. ABB are especially susceptible. Massive losses in Uganda beginning in 2001.
- Two routes of infection:
 - (i) Suckers already infected at planting or later from contaminated knives when pruning or harvesting: leaves turn yellow, collapse and hang down around the stem; internally, vascular tissues are cream/yellow/pink, and spaces within leaf sheaths fill with ooze.
 - (ii) Insects carrying bacteria to male flowers and their covering leaves. Male buds ('bell') blacken and rot, fruits develop internal reddish rots; fruit ('fingers') yellow prematurely (although often the whole bunch remains green), and vascular tissues of flower stalk turn yellow-orange. Bacteria then travel to rest of plant, followed by yellowing, wilting, death, and sucker infection.
- Spread: infected suckers, knives, insects, fruits. Infection from soil is uncertain as survival is short.
- Biosecurity: risk from unofficial introduction of diseased cuttings for propagation, and trade in fruit. Official movement of germplasm should always follow the FAO/IPBGR Technical Guidelines.
- Biocontrol: none.
- Cultural control: most important recommendations for smallholders are: (i) monitoring and removal of disease plants as soon as seen, *but NOT necessarily the entire mat - not all suckers become systemically infected*; (ii) removal of unopened male flower buds (called 'de-budding') using forked stick; and (iii) keeping cutting tools clean and free from bacteria (bleach). Others: disease-free suckers; do not plant near diseased plots (especially downwind); limit access to visitors/workers/animals; bag flowers after emergence until fruit set (if bell removed); check availability resistant varieties from Bioversity International and IITA.
- Chemical control: not a method to use.

Common Name

Banana xanthomonas wilt. It is also known as Xanthomonas wilt, banana bacterial wilt or enset wilt (enset, or false banana, is in the same family as banana, but used, almost exclusively in Ethiopia, for the starch of its rhizome and stem).

Scientific Name

Xanthomonas vasicola pv. *musacearum*; it was previously known as *Xanthomonas campestris* pv. *musacearum*. The abbreviation is BXW.



Photo 1. Ooze from banana leaf sheaths infected by the banana xanthomonas wilt bacterium, *Xanthomonas campestris* pv. *musacearum*.



Photo 2. Banana sucker infected by xanthomonas wilt disease caused by the bacterium, *Xanthomonas campestris* pv. *musacearum*. Light rusty-brown bacterial ooze showing in the central core of the stem.



Photo 3. Shrivelled male bud, and uneven ripening, symptoms of banana xanthomonas wilt, *Xanthomonas campestris* pv. *musacearum*.



Photo 4. Xanthomonas wilt disease. Fruit cut lengthways to show rusty-brown staining of the vascular tissues, caused by *Xanthomonas campestris* pv. *musacearum*.



Photo 5. *Xanthomonas* wilt disease showing rusty-brown staining of the fruit pulp caused by *Xanthomonas campestris* pv. *musacearum*.

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Information from Blomme G, et al. (2017) Bacterial diseases of banana and enset: Current state of knowledge and integrated approaches toward sustainable management. *Frontiers in Plant Science*. (<https://www.frontiersin.org/articles/10.3389/fpls.2017.01290/full#B66>); and Drenth A, Kema G (2021) The vulnerability of bananas to globally emerging disease threats. *Phytopathology* 111: 2146-2161; and CABI (2021) *Xanthomonas campestris* pv. *musacearum* (banana xanthomonas wilt (BXW)). *Crop Protection Compendium*. (<https://www.cabi.org/cpc/datasheet/56917>); and Vezina A (2020) *Xanthomonas vesicola* pv. *musacearum* (2020). *Musapedia*, the banana knowledge compendium. Promusa. Date of last modification: 22 September. (<https://www.promusa.org/Xanthomonas+vasicola+pv.+musacearum>); and from (and Photos 1&2) *Xanthomonas* wilt of banana. ProMusa. (<https://www.promusa.org/Xanthomonas+wilt>). Photo 1 Guy Blomme, Bioversity International. (https://www.musarama.org/photo-522-BXW_pseudostem_symptoms). Photos 2&3 Pascal Lepoint, Bioversity International. (https://www.musarama.org/photo-517-BXW_fruits_symptom). Photo 4 Banana sucker infected with Banana Xanthomonas Wilt in Uganda. (<https://www.flickr.com/photos/ita-media-library/6755031667/in/photostream/>). Photo 5 Banana fruits infected with Banana Xanthomonas Wilt in Uganda. (<https://www.flickr.com/photos/ita-media-library/6755031667/in/photostream/>).

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*The codes ABB and BBB are the amount of *Musa acuminata* and *Musa balbisiana* (parents of many banana varieties grown) represented in each banana variety. An internationally recognised scoring system is used to determine the proportion.

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