



Cassava bacterial blight

Xanthomonas axonopodis pv. *manihotis*



Photo: Fen Beed

Yellow patches spread outwards from the leaf spots as the leaf withers.



Photo: Fen Beed

Bacteria block movement of water and nutrients in the woody stem; the leaves above the blockage wilt without developing any leaf spots.

SUMMARY: Cassava bacterial blight is perhaps less well known in Africa than cassava mosaic disease and cassava brown streak. It deserves more attention, however, given the continuing risk of major outbreaks and the large losses due to the disease in the past, particularly in DR Congo. The disease is introduced in symptomless cuttings which fail to grow. The bacteria are then spread by rain splash and physical contact. Varieties with good tolerance to the disease are available though they may not be widely known.

KEY SIGNS

When an infected cutting starts to grow (primary infection), the new shoots wilt and the stem dies back. Secondary infections occur through leaf 'breathing' holes (stomata), or directly through wounds and leaf scars on the woody stems. On the leaves, the first symptoms are small dark-green to blue leaf spots. Minor veins initially restrict the development of the leaf spot, which is angular and water-soaked. Later, the spots enlarge and join up, often along the leaf edge. Yellow patches spread outwards from the leaf spots as the leaf withers and droops. On young leaves this can occur in two to three days under humid conditions.

High humidity favours movement of bacteria in infected plants, leading to production of a sticky ooze containing bacteria, most noticeably on stems but also from infected leaves. Dark areas (lesions) develop along the leaf stalks and woody stems. Bacteria block movement of water and nutrients in the woody stem, causing leaves to wilt without developing any leaf spots. The soft tissue at the top of the growing shoot dies, giving plants a characteristic 'candle' appearance. New leaves grow out lower down the stem but they will also eventually die.

MANAGEMENT

Prevention – what to do before signs are seen

Cultural approaches: In Brazil, where the disease was first seen, the development of integrated control strategies has greatly reduced losses of a once catastrophic disease. The most important part of this strategy is the selection of healthy cuttings and use of resistant or tolerant cultivars.

Although much research has been done on resistance it is difficult to find information on named cultivars. One publication from the year 2000 for West Africa lists 'tolerant' cultivars such as: TMS 4(2)1425 and TMS 30572 from IITA; Afisiafi and Abasa fitaa from Ghana; and NR 8082 from Nigeria. Check locally for availability of cultivars with known resistance or tolerance to the disease.

Infected cuttings do not show any symptoms of bacterial blight. Great care should be taken therefore to obtain planting material from trusted sources or areas free from the disease.

Control – what to do after signs are seen

Cultural approaches: Once the disease is present, careful cleaning of tools will limit spread to healthy plants while animal and human movement within the crop should be restricted to prevent physical transfer of bacteria. The disease spreads less rapidly during dry periods. Cutting out most of the above ground stems of infected plants may limit losses in varieties with some resistance to the disease, but success also depends on how long the plant has been infected and the spread of the bacteria within the plant.

If only a few plants in a field show symptoms, speedy removal and safe disposal of infected plants may reduce further spread.

Chemical approaches: There is no chemical treatment for controlling the disease.

CAUSE

The disease is caused by the bacterium *Xanthomonas axonopodis* pv. *manihotis*. In the past it was also known as *Xanthomonas campestris* pv. *manihotis*.

This is an important and serious bacterial disease of cassava. It is spread in cuttings and in seed. Within fields, the bacteria are spread by rain splash, cutting tools and by people and animals brushing against infected plants.

When new cassava is planted at the same time as harvesting mature plants, machetes and pangas can spread the disease to uninfected cuttings.

IMPACT

Cassava leaves are an important food in many countries and bacterial blight greatly limits their availability. The failure of cuttings to grow can be catastrophic; in the early 1970s a serious outbreak in Zaire led to starvation when up to 75% of the fresh roots were lost. Outbreaks in Uganda and Nigeria caused yield losses of 75-100% in some areas.

Fungal diseases can also attack plants with bacterial blight and further increase losses.

The elimination of varieties of cassava susceptible to bacterial blight, following progressive outbreaks of the disease in several countries, has apparently helped to contain the disease.

DISTRIBUTION

In eastern and central Africa, bacterial blight occurs in Congo, DR Congo, Central African Republic, Sudan, Uganda, Rwanda, Burundi, Tanzania and Kenya. In southern Africa the disease has been reported from Malawi and South Africa but not from Zambia, where strict quarantine measures were introduced to prevent its introduction. In West Africa, bacterial blight occurs in Cote d'Ivoire, Mali, Ghana, Niger, Benin, Togo, Nigeria and Cameroon.

FURTHER READING

Crop Protection Compendium (www.cabi.org/cpc)

An old but still useful paper from 1986 is available online and gives a good summary of the disease: www.apsnet.org/publications/plantdisease/backissues/Documents/1986Articles/PlantDisease70n12_1089.PDF.

For information on 'tolerant' cultivars see:

Msikita W, James B, Nnodu E, Legg J, Wydra K, Ogbe F (2000). Disease Control in Cassava Farms. IPM Field Guide for Extension Agents. IITA. Available at: <http://old.iita.org/cms/details/ipm/Disease%20control.pdf>