



## Banana bunchy top disease: A threat to the banana industry

Archana Nunkumar

Banana bunchy top disease (BBTD) caused by Banana bunchy top virus (BBTV) is the most serious viral disease of banana and plantain worldwide. Banana bunchy top disease is widespread in Southeast Asia and the South Pacific, and is present in parts of India and Africa. In 2015 BBTV was detected for the first time in South Africa, at Hibberdene, on the South Coast of KwaZulu-Natal (Jooste *et al.*, 2016).

BBTV is transmitted by the banana aphid, *Pentalonia nigronervosa* Coq, or by infected plant material. The aphid acquires the virus after at least four hours of feeding on infected plant material. The aphid can retain the virus throughout its adult life (15-20 days) and during this time the aphid can transmit the virus to a healthy banana plant by feeding on it.

The outbreak of BBTD in South Africa is of major concern to the banana industry, as yield losses of up to 100% can occur.

BBTV is a quarantine pest for South Africa and is regulated in terms of the Agricultural Pest Act (Act No. 36 of 1983) and associated regulations.

### Symptoms

BBTD is named after the characteristic symptoms of an advanced infection, when the leaves become progressively dwarfed, upright and bunched at the top of the plant (Figure 1).



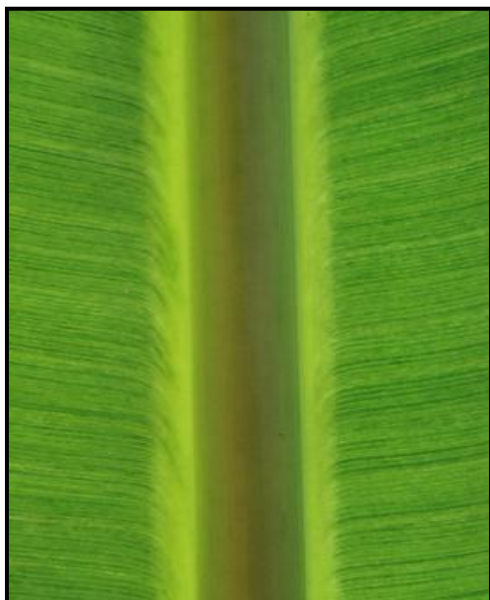
**FIGURE 1:** Showing typical BBTV symptoms, bunched, upright leaves with pale yellow margins (Pearson, 2017).

The initial symptoms are dark green streaks on the lower portion of the leaf's midrib and later on the secondary veins. The streaks consist of dot-dash patterns, which is the most diagnostic symptom of BBTD (Figure 2).



**FIGURE 2:** Symptoms of BBTD which consist of dark green dots and dashes along the veins of the leaf (Anonymous, 2017).

As the infection progresses, the streak symptoms become more evident on the leaf blade. Dark green hook-like extensions of the veins can also be seen in the narrow, light green zone between the midrib and lamina. The short hooks point along the midrib towards the petiole (Figure 3). Each new leaf is narrower and shorter and stands more upright than the previous one.



**FIGURE 3:** The J-hook symptom, which consists of dark green streaks that run along the vein and terminate at the midrib in the distinctive pattern after which it is named (Anonymous, 2017).

Symptoms of BBTV only appear about 25 days after infection by aphids. The symptomless plants may act as a source from which aphids can obtain the virus and spread it to surrounding plants. Plants infected early in their growth and those infected severely usually bear no fruit or bear deformed fruits (Jooste *et al.*, 2016).

### Host Range

Alternative hosts for BBTV have been investigated since the aphid vector colonises numerous plant families, including Araceae, Commelinaceae, Musaceae and Zingiberaceae.

BBTV also infects the Abyssinian banana, a closely related species in the Musaceae. Outside the Musaceae family, Red ginger, Elephants ear, Cana lily

and White ginger lily have been reported as alternative hosts for BBTV, although these species have not been found as hosts of BBTV in South Africa.

### Management

There is no cure for bunchy top. Regular inspections to detect and remove infected plants and replanting with virus-indexed tissue culture plantlets that have been certified “virus-free” are the basis for good management.

Banana bunchy top virus can be controlled by treating the banana aphid infestation with a registered insecticide (Imidacloprid (neonicotinoid)) and then destroying (burning) the infected plant material. Banana aphid infestations must be treated before destroying the infected plant because if the infected plant is destroyed first the banana aphids will fly to nearby healthy plants and spread the disease.

### References

- Anonymous, 2017. Banana bunchy top virus. <http://www.promusa.org/Bunchy+top> (Accessed May 2018)
- Jooste A.E.C., Wessels N. and van der Merwe M. 2016. First report of Banana bunchy top virus in Banana (*Musa spp*) from South Africa. *Plant Disease* (2016) 100:6, 1251
- Pearson, M.N. 2017. Banana bunchy top virus. <http://www.ecoport.org> (Accessed March 2018)

### Contact

Archana Nunkumar  
Professional Scientist: Plant Pathologist  
Tel: 033 343 8094  
[Archana.Nunkumar@kzndard.gov.za](mailto:Archana.Nunkumar@kzndard.gov.za)

KZN Department of Agriculture & Rural Development  
Directorate: Agricultural Crop Research Services  
Sub-directorate: Crop Scientific Research Services  
Division: Crop Protection Services, Cedara

**Published:** March 2018