

adhere to South Africa's phytosanitary regulatory legislation, administered under the Agricultural Pests Act, 1983 (Act No. 36 of 1983). This legislation involves import control of regulated plant products, and following proper procedures when moving plant material within the country.



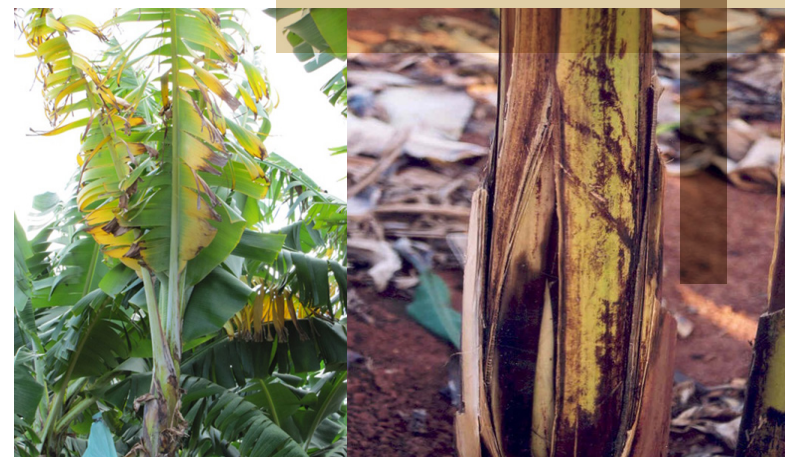
**For technical enquires and reporting a suspected case of the disease contact:**

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# Banana Fusarium wilt tropical race 4 (TR4)



**NB: Please do not import plants and plant products into South Africa without authorisation.**



**agriculture, land reform  
& rural development**

Department:  
Agriculture, Land Reform and Rural Development  
**REPUBLIC OF SOUTH AFRICA**



External symptoms of banana Fusarium wilt showing leaf yellowing (left) and a splitting of the pseudostem (right) (Photos by University of Stellenbosch).

### What is Banana Fusarium wilt tropical race 4 (TR4)

Banana Fusarium wilt is a fungal disease of banana that is regarded as one of the most destructive plant diseases in recorded history. Fusarium wilt is caused by a soil-borne fungus, named *Fusarium oxysporum* f. sp. *cubense* (Foc), which invades the banana plant through the roots and blocks the xylem vessels causing a lethal wilt of the plant. Foc TR4 is a tropical strain of the fungus that affects Cavendish banana in tropical and subtropical countries. This strain is currently not present in South Africa. It is rather the Foc subtropical race 4 (STR4) strain, which causes disease to Cavendish banana only in the subtropics that is present in the country. Foc TR4 is far more virulent than Foc STR4, and can destroy Cavendish plantations within a few years. Once introduced into a plantation, Foc TR4 cannot be eradicated.

### Risks associated with the introduction of TR4 into South Africa

The risk that Fusarium wilt TR4 poses to the South African banana industry is immense. The occurrence of the disease in northern Mozambique, and the movement of people and vehicles between Mozambique and South Africa, pose a serious risk of introduction. It is not possible to distinguish between Fusarium wilt symptoms caused by Foc STR4 (present in South Africa) and Foc TR4 (not present in South Africa) without laboratory diagnosis, which would make its early detection in South Africa difficult. If proper biosecurity measures are not adhered to, it could be a matter of time before Foc TR4 is introduced into the country. It is, therefore, imperative that import regulatory measures are adhered to at all times. Individuals travelling between Mozambique and South Africa, or from any country affected by Fusarium wilt, need to ensure that their clothes and vehicles are properly disinfected if they have visited banana farms. People should also obtain an importation permit to bring

banana plants or products into South Africa. This is to minimise the risks of introducing the TR4 fungus and any other potential pest of concern into the country. If the occurrence of Fusarium wilt TR4 is suspected, this should be reported to the Directorate: Plant Health immediately.

### Symptoms and signs to look out for:

- Leaf yellowing (chlorosis) starts at the margins of the older banana leaves and progresses towards the midrib. The yellowing is often followed by a browning (necrosis) as the leaf tissue dies.
- Yellowing progresses from the older to younger leaves, with the petioles of older leaves buckling. When the leaves collapse, they hang down the pseudostem like a skirt of dead leaves.
- Longitudinal splits may also appear on the pseudostem of infected plants.
- Internal symptoms are characterised by a reddish-brown discolouration of the xylem vessels of the rhizome and pseudostem.



Internal symptoms of Fusarium wilt TR4 showing the reddish-brown discolouration of a banana pseudostem. (Photos by University of Stellenbosch)

### Spread of the disease

Foc TR4 can be disseminated to new areas with infected propagation material, irrigation water infested with fungal spores, soil attached to the tyres/wheels of vehicles and farm machinery, shoes and plantation tools of farmworkers, and by farm animals.

### Management strategies for Fusarium wilt TR4

Management of Fusarium wilt TR4 is difficult because no pesticide is available to completely eradicate the disease from infested fields. The disease can be prevented by applying strict biosecurity measures (awareness and farm access control) and by using clean planting materials produced in tissue culture. Once introduced, the disease can be managed by replacing susceptible Cavendish cultivars with partially-resistant Cavendish somaclones, even though the somaclones might be slower-growing with lower yields than existing cultivars.

To protect the local banana industry against Fusarium wilt TR4, the public and banana growers are advised to