

9. Monitor Water Sources

Where are you sourcing water from?

Well water and public water sources are less likely to be contaminated than water from rivers and creeks.

10. Planting Material

Only get your planting material from reliable, certified sources!!

GlobalGAP TR4 Biosecurity Add-On

All Fyffes suppliers must include the **TR4-Biosecurity Add-On For Bananas** in their next GlobalG.A.P. audit.

This is an evaluation, and does not affect the score of the audit, but will provide guidance on where the farm can improve their biosecurity measures.

By enforcing these biosecurity measures you are helping protect not only your own farm, but the country's banana industry.

What to look out for:

- Yellowing of the margins of older leaves
- Wilted leaves folding creating a skirt around the pseudo stem
- Split pseudo stem at the base (but not always)
- Discoloured vascular tissue in the corm and the stem



- ★ Raise awareness amongst workers.
- ★ Work with National and Local Authorities.

If you suspect a plant, please notify:

- **Ministry of Agriculture Representative**
- **Fyffes Food Safety and Compliance Department (+506) 83096960**
- **National Plant Health and Protection Authority**

Note: Do not cut the suspected plant until authorities allow it.

If you have any queries, please contact Eimear Lynch at elynch@fyffes.com

For more information visit: <http://www.fao.org/world-banana-forum/disease/tr4-global-network/tr4documents/es/>



About TR4

What is TR4? A soil-borne fungal disease

Common Name: TR4, or 'Panama disease'
Scientific Name: *Fusarium oxysporum* f. sp. *Cubense*, Tropical Race 4

Affects: Cavendish Bananas and Plantains

How does it affect the plant?

The spores germinate and send hyphae into the plant roots. The fungus then blocks the vascular tissue carrying water and nutrients causing wilting.

How is it spread?

The spores can be spread via soil, water and planting material, and can survive up to 30 years, even without the presence of banana crop.



What can we do?

Take Biosecurity Measures!

10 biosecurity actions to take to prevent TR4 entering your farm

1. Zoning

To restrict movement in/out of the farm and field, three zones should be created on the farm. This prevents movement into the field without complying with or respecting the biosecurity measures (such as boot change, footbaths, tool disinfection), therefore reducing the chance of contaminated spores reaching your soil.

1) Exclusion Zone At the farm entrance (with space for vehicles to park/turn around)

2) Separation Zone Usually consisting of the farm entrance-road, the office, and the Packhouse (excluding patio)

3) Production Zone Field area and patio

2. Control Visitor Entry

The visitor questionnaire should ask visitors if they've been to a TR4 affected country in the past six months.

If yes, it is strongly advised they be refused entry to the farm, or apply extreme biosecurity measures.

3. Restrict Vehicle Entry

In the **Exclusion Zone**, ask the question: is it necessary for the vehicle to enter the farm?

Non-essential vehicles should be parked in the **Exclusion Zone**.

4. Footbaths

Clean water and brushes to clean boots, and a footbath with disinfection is needed.

Locations: At the boot-change area between the **Exclusion Zone** and **Separation Zone**. Also between the **Separation Zone** and **Production Zone**.

Footbath Design: minimum two steps in length, with sides and barriers (to ensure the footbath is always used), and signs.

Note: Disinfection is only effective on clean boots.

5. Vehicle Washdown & Dip

If a vehicle must enter the **Separation Zone**: Disinfect.

If a vehicle must enter/exit the **Production Zone** it will need to be **fully cleaned and disinfected**. This is a high risk movement, and should be avoided unless absolutely necessary.

6. Change Boots

Personal shoes should **never** be worn on the farm.

A boot-change area should be set up in the farm **Exclusion Zone**, where workers and visitors must change out of personal shoes into the farm boots.

Suggestion: Different colour boots for the **Separation Zone** and **Production Zone**.

7. Disinfection of Tools

Set up tool disinfection stations and ensure they are used.

Tools for the field (**Production Zone**) should not mix with those from the **Separation Zone**.

No tools should be taken off the farm!

8. Farm Barriers

Barriers at the **Exclusion Zone** are vital to stop vehicles and people entering without complying with or respecting the required biosecurity actions.

Fencing, vegetation and/or trenches are some options for the farm perimeter barriers to prevent unrestricted entry without respecting the farm's biosecurity measures.

A barrier between the **Separation** and **Production Zone** to keep these separate is highly important.

