TOGETHER, WE CAN PREVENT THE SPREAD OF TROPICAL RACE 4 (TR4)

TR4 GLOBAL NETWORK
- an initiative of the World Banana Forum -

WHY BANANAS MATTER

Bananas and plantains are essential crops around the world for both their economic importance and deep cultural roots.

BANANAS ARE THE MOST EXPORTED
FRUIT IN THE WORLD

BANANAS AND PLANTAINS CONTRIBUTE GREATLY
TO FOOD SECURITY
TO INCOME GENERATION

WORLD TRADE

With some 15 percent of global production exported, the total trade value of bananas was approximately USD 7.5 billion in 2018, making them the largest traded fruit crop in terms of production value.

15% GLOBAL PRODUCTION EXPORTED

VALUED AT 7.5 USD BILLION
FOOD SECURITY AND LIVELIHOODS

Grown in over 135 countries in the Caribbean, Latin America, Asia, Oceania and Africa, bananas and plantains are staple crops for the food security of some 400 million people.

On average, income from banana and plantain farming accounts for around 75 percent\(^1\) of total monthly household income for smallholder farmers.

A TRANSBOUNDARY PEST

\textit{The first objective must be to contain this fungus to its present location.} \\
- David Nowell, Plant Production and Protection Officer, FAO

Tropical race 4 (TR4) is the latest race of the fungus \textit{Fusarium oxysporum} f. sp \textit{cubense}. It is a soil-borne pathogen that attacks the roots of the banana causing the Banana Fusarium Wilt disease by clogging its vascular system.

Once established in a field, TR4 can cause complete yield loss.\(^2\)

More than 80 percent of global banana production is thought to be based on TR4 susceptible germplasm.

After the first detection in Asia in the 1970s of what would later become known as Tropical race 4 and its subsequent spread to Africa in 2013, TR4 arrived in Latin America in 2019—where around 2/3 of the global banana trade originates.

1 Research conducted in ten banana-producing countries by Bioversity.

Distribution of Tropical race 4 (TR4) as of January 2020

TR4 is recognized as one of the most aggressive and destructive fungi in the history of agriculture and the world’s greatest threat to banana production.

Clearly, solutions in the form of effective resistance are urgently needed to avoid losses in a diverse array of sectors and communities. Research to breed TR4 tolerant or resistant varieties is being carried out by several institutions, but this takes time.
GLOBALLY RECOGNISED TERMS

DISEASE
Banana Fusarium Wilt (Banana FW)

FUNGUS
The fungus that causes Banana FW is *Fusarium oxysporum* f. sp *cubense* (Foc)

RACE OF FUNGUS
The latest race of the fungus causing Banana Fusarium Wilt in Cavendish cultivars (and many others) is *Fusarium oxysporum* f. sp *cubense* tropical race 4 (Foc TR4), also known as Tropical race 4 (TR4)

THE MOST EFFECTIVE APPROACH TO COMBAT TROPICAL RACE 4

IS THE PREVENTION OF ITS SPREAD INTO NON-INFECTED AREAS AND IMMEDIATE CONTAINMENT WHEN IT IS DETECTED

CLEANING PROCESS TO ENSURE DECONTAMINATION

- SCRUB
- WATER RINSE
- FOOTBATH
- DISINFECT
- RECORD
HOW DOES IT MOVE?

The fungus spreads through infected plant materials and contaminated soil particles attached to items such as farm tools, shoes, clothes, animals and vehicles.

Irrigation and drainage water also play a critical role in its spread. Typhoons and other storms can also carry the TR4 fungus to new plantations. The survival form of the fungus, spores with a thick wall called chlamydospores, can remain dormant in the soil or on several host plants for decades.

The fungus affects many varieties including Cavendish bananas, which provide around half of global banana supply and almost all of the bananas exported.

Prevention and phytosanitary measures are the most effective ways of controlling the spread of the fungus. Diversity is also key to prevention of the spread of TR4. Diversification of crops and better use of available genetic resources are key to building resilience in the long term.
**WHAT IS THE TR4 GLOBAL NETWORK?**

*The TR4GN is both a knowledge hub and a platform for stakeholder collaboration*

FAO and the World Banana Forum host the TR4 Global Network (TR4GN) as a knowledge hub for awareness and prevention of the spread of the disease.

**The TR4GN is a neutral convener.** It:

- Creates the basis for inclusive and open collaboration among stakeholders, for the benefit of all.
- Fosters information sharing and better understanding about TR4, with inputs from World Banana Forum members, governments, the academy, and the banana industry.
- Acts as a catalyst for materials, findings, and events that are relevant for the common fight against TR4.
- Facilitates the creation of partnerships at the local and regional level by bringing visibility to industry stakeholders’ work on TR4.
- Is the reference point for awareness-raising and capacity development materials to promote prevention and control of TR4.

TR4GN is built upon two dedicated tools for the sharing of content: a dynamic website and a newsletter.

Supporting this process is the TR4 Task Force, formed by a group of experts from different countries and sectors ranging from governments to private sector, from civil society organizations to research institutions.

Anyone who is interested in banana production and its sustainability around the world can access the content available on the website. Users can also join the exchange, by sharing information, data and materials with the facilitators.
MEASURES BEING TAKEN

Currently there are no effective cures for TR4... only prevention

Once TR4 is in the soil, there are no effective treatments, chemicals or otherwise. Fungicides and soil fumigants are not efficient in controlling or eradicating TR4 from infested soil.

TR4 is a soil pathogen. Promotion of biodiversity in healthy soils as defence line to weaken the impact of TR4 is an interesting hypothesis, but needs to be proven.

Enforcing strict biosecurity measures as well as early detection, rapid destruction of infected banana plants and on-farm restrictions, are the only way to manage and contain the disease.

Support is needed for disease management and containment in affected countries. International collaboration and local action are essential.

FUNGICIDES and SOIL FUMIGANTS are NOT EFFICIENT IN CONTROLLING OR ERADICATING TR4 FROM INFESTED SOIL

BANANAS AND PLANTAINS SUSTAIN OUR WORLD’S COMMUNITIES IN SO MANY WAYS AND HELP US ACHIEVE #ZEROHUNGER
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The continued spread of TR4 would be devastating for the communities who rely on bananas for their livelihoods, but also sad for those who simply enjoy eating them.

The global food and agriculture system will need to undergo profound change if we are to nourish the 820 million people who are hungry today and the additional 2 billion people expected to be undernourished by 2050.

Bananas and plantains are critical to food security and livelihoods of around 400 million people.

Investments in agriculture, including in innovation in the banana sector, are crucial to increasing the capacity for agricultural productivity and sustainable food production systems necessary to achieve #ZeroHunger.

If we don’t act quickly and effectively, we risk the long term viability of these important crops.

By working together, we can prevent the spread of TR4.