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COMBATTING **FUSARIUM WILT DISEASE OF BANANA**


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FUSARIUM WILT DISEASE is caused by the soil-borne fungus *Fusarium oxysporum f.sp. cubense* and is one of the most destructive diseases of banana worldwide. Its new race Tropical Race 4 (Foc TR4) has been causing serious losses in Southeast Asia and severely affecting livelihoods of small producers. It has recently spread to Africa (Mozambique) and some countries of the Middle East. This is raising concerns that it might also spread to the Indian Sub-continent and Latin America.

Banana, together with plantains, is the most exported fruit in the world and the fifth most produced food crop in least-developed countries.

TR4 poses a serious threat to production and trade of this popular crop, with serious repercussions on livelihoods of small holder producers, workers and banana value chain.

The disease can spread through infected plant materials and spores and infested soil particles attached to farm tools, shoes, vehicles and any other means. Irrigation and drainage water and particularly floods play critical roles in spread.

BANANA FUSARIUM WILT DISEASE FOC TR4 *key facts*

FUSARIUM WILT DISEASE OF BANANA CAUSED BY TR4 RACE IS AMONG THE MOST DESTRUCTIVE DISEASES OF BANANA WORLDWIDE

TR4 AFFECTS PARTICULARLY CAVENDISH BANANAS REPRESENTING AROUND HALF OF GLOBAL BANANA PRODUCTION

WHAT IS **TROPICAL RACE 4?**

TR4 was discovered about 20 years ago in Southeast Asia and has been affecting banana production severely.

TR4 affects particularly Cavendish variety, the popular banana found largely in markets today. Many other varieties cultivated by smallholder farmers are also susceptible to this race.

TR4 produces characteristic Fusarium wilt symptoms. The first external symptom is usually the yellowing of the older leaves. As the disease progresses, the leaves collapse, forming a skirt of dead leaves around the lower part of the plant. Once established in a plantation, it can easily spread and can remain viable in the soil for decades.

The global concern of TR4 is that so far there are no effective eradication solutions.

GENETIC DIVERSITY NEEDED FOR LONG TERM RESILIENCE

The spread of TR4 has raised fears of a repetition of the disastrous outbreak of the disease in the 1900's, when a different race of the fungus (race 1) spread across Latin America, nearly decimating the global banana industry.

The world's export banana was saved only by switching from the Gros Michel banana to the Cavendish banana. However, TR4 is now threatening the sustainable production of Cavendish variety and many other varieties.

Thus, the industry, scientific and international communities are in search of possible solutions.

Developing new banana varieties is not an easy task as it propagates vegetatively.

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BANANA FUSARIUM WILT DISEASE FOC TR4 *features*

EFFECTIVE ERADICATION OF THE DISEASE IS CURRENTLY NOT POSSIBLE. ONCE ESTABLISHED, IT REMAINS VIABLE FOR DECADES IN SOIL

PREVENTION AND STRICT IMPLEMENTATION OF PHYTOSANITARY MEASURES ARE THE MOST EFFECTIVE WAY OF COMBATTING THE DISEASE

CROP DIVERSIFICATION AND BETTER USE OF AVAILABLE GENETIC RESOURCES IS KEY TO BUILDING RESILIENCE TO THE DISEASE IN THE LONG TERM

FAO EMPRES Plant Protection

Fazil.Dusunceli@fao.org
Food-Chain-Crisis@fao.org
Web site
www.fao.org/food-chain-crisis

Developing varieties which are appropriate for the value chain and disease resistant at the same time is challenging. Promising genetic materials showing certain levels of resistance, including somaclones, can be considered in disease management when there is no other option.

The long term solution lies not only in developing new resistant varieties, but also in making the banana production systems more resilient by promoting more multi-crop based and genetically diverse systems.

HOW TO PREVENT SPREAD OF TR4?

Prevention is the most effective way of combatting the disease. Implementation of appropriate regulations and phytosanitary measures, along with guidelines provided by the International Plant Protection Convention (IPPC) is essential to stop entrance of the fungus into a country or region.

Specific actions needed to prevent the spread include use of certified disease free tissue culture planting material, avoiding sharing of farm equipment, border controls, regular surveys, early detection and containment.
In case of outbreaks, infested areas should be fenced in promptly, infected plants destroyed and quarantine measures employed.

FAO'S ROLE

FAO promotes international collaboration, communication and advocacy globally. FAO has been raising awareness through news releases and several activities globally, and particularly in Latin America and Caribbean, Africa and the Near East. A multi-stakeholder task force was established under the World Banana Forum to promote collaboration and advocacy.

Workshops on surveillance methodology, advocacy and capacity building were organized. Policy and technical guides were produced to assist concerned countries in prevention, and diagnostics of Foc TR4, and in identifying risk pathways for its containment and preventing its spread.

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An emergency project has been implemented to contain the disease in Nampula province of Mozambique. As the challenge persists, a national strategy document has been prepared for the government.

An expert consultation on prevention of the disease was organized at FAO Headquarters in Rome, resulting in the development of a global programme for prevention of Fusarium wilt disease of banana.

The global programme aims to promote preventive approaches and support efforts for improved preparedness and disease management. It addresses awareness raising, policy support, surveillance, contingency planning, risk and impact assessments, regulatory aspects, best agronomic practices, research efforts, capacity development and response actions. It foresees strong partnerships and collaboration with CGIAR centers, international institutions, regional organizations and networks, universities and national institutions as well as private sector and NGOs.

Concerted effort and international collaboration is crucial to combat TR4 fungal disease.

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