Food and Agriculture Organization of the United Nations

International Plant Protection Convention

The third session of the workshop series on *Fusarium* TR4 Diagnostic, Surveillance, Inspection and Simulation Exercises

10 May 2022

Questions & Answers

Session on *Fusarium* TR4 Inspection and Simulation Exercises

This document compiles Questions & Answers from the third session of the workshop series on ***Fusarium* TR4 Diagnostic, Surveillance, Inspection and Simulation Exercises** held on 10 May 2022, 11:00 – 13:30 (CET). Over one hundred twenty (120) participants from 100 countries worldwide attended the session.

The speakers' profile, agenda, presentations and recording of the sessions can be found here.

1. **What plant protection products are used to disinfect the road, vehicles, and containers, and what is the fate of those used to disinfect vehicles at country borders?**

According to Lindsay 2018[1], products like quaternary ammonium (QA)-based products [120 g/L (12%) didecyldimethylammonium chloride (DDAC) applied at the recommended label rate (1200 ppm)] are frequently used to inactivate TR4 propagules (especially chlamydospores) that can be carried on footwear or other articles (see http://era.daf.qld.gov.au/id/eprint/6540/1/ba14013---final-report-complete.pdf). The Corporacion Bananera Nacional (CORBANA) from Costa Rica has recommended the use of quaternary ammonium, glutaraldehyde or iodophor (see http://www.corbana.co.cr/fusarium/wp-content/uploads/2019/09/CORBANA-DI-SF-FI-PROT-007-2019-Desinfectantes-i.a.-dosis.pdf). Furthermore, Nguyen *et al.* (2019)[2] may be consulted. They evaluated the efficacy of commercial disinfectants, including quaternary ammonium.

[1]Lindsay, S. J. (2018). *Fusarium Wilt Tropical Race 4–Biosecurity and Sustainable Solutions* (p. 39). Hort Innovation

[2] Nguyen, T. V., Tran-Nguyen, L. T. T., Wright, C. L., Trevorrow, P., & Grice, K. (2019). Evaluation of the efficacy of commercial disinfectants against Fusarium oxysporum f. sp. cubense race 1 and tropical race 4 propagules. *Plant disease*, *103*(4), 721-728.

2. **Is the race 1 of *Fusarium oxysporum* f. sp. *cubense* present in Ecuador?**

Race 1 is present in Gros Michel banana. The Cavendish variety is resistant to Race 1 and is the one that is marketed worldwide. Race 1 is known for causing Fusarium Wilt Banana in Gros Michel (AAA), Silk (AAB), Pisang awak (ABB), Abaca (AA), "Maqueño" (AAB) and Pome (AAB) cultivars. Race 2 affects ABB cooking bananas, such as "Bluggoe" (ABB) cultivars. Tropical race 4 affects race 1 and race 2 susceptible cultivars in addition to the Cavendish cultivars.

3. **Regarding the experiences in the simulations conducted in central America, can the same simulation protocol be used for other pests?**

Exercises conducted in central America were specific to *Fusarium* TR4. FAO and OIRSA will release a document on the protocol for developing simulations in phytosanitary emergencies. Further information might be provided by contacting Raixa Llauger from FAOSLM (Raixa.Llauger@fao.org). OIRSA has conducted simulation exercises for other pests like exotic fruit flies, Huanglongbing, Central American Locust, Khpra beetle, and Giant African Snail. To access more information please contact svegetal@oirsa.org

4. **In Senegal, we do not have TR4 yet, but we have a wide range of *Fusarium oxysporum* strains on almost all cultivated species, including bananas. Is there a possibility of strain mutation depending on climatic conditions or cultural practices?**

There are over 150 different "*formae speciales*" (f. sp.) of *Fusarium oxysporum*. Each one has a unique host or is restricted to a narrow range of host plant species, and it has now been demonstrated that special forms have evolved independently. That means *F. oxysporum* f. sp. *cubense* is polyphyletic[3] with strains in different clades or lineages.

5. **In Venezuela, producers have innovated with plant extracts such as "GuatePajarito" which dried the fungus and bacteria, but it is all empirical knowledge. Could it be an alternative method to control this pest?**

Relevant evaluations must be conducted to demonstrate any control of the fungus scientifically. So far, no chemical or biological substances are recognized to be used in soil or banana plants for the *Fusarium* TR4 suppression or eradication.

[3] derived from more than one common evolutionary ancestor or ancestral group and therefore not suitable for placing in the same taxon.