Enhancing Phytosanitary Systems for Healthy Plants, Safe & Sustainable Trade"

Sub-theme:

PEST SURVEILLANCE IN PHYTOSANITARY SYSTEMS

Title:

STATUS OF TOMATO BROWN RUGOSE FRUIT VIRUS DISEASE IN TOMATO AND CAPSICUM CROPS IN KENYA

Presented by:

Avedi Edith

Introduction

- *Tomato brown rugose fruit virus* (ToBRFV) is relatively new virus belonging to the genus Tobamoviruses
- First reported in Israel in 2014 on sweet pepper and Jordan in 2015 on tomato
- Has now been reported in Israel, China, Italy, Netherlands, Spain, Greece, Germany, France, Jordan, Turkey, Shandong, Mexico, Belgium and United Kingdom
- Host range: Tomato, capsicum, eggplants
- Can survive for years (upto 20 years) on green house structures, soil, plant debris, pots and tools
- It is very stable and can easily be spread via

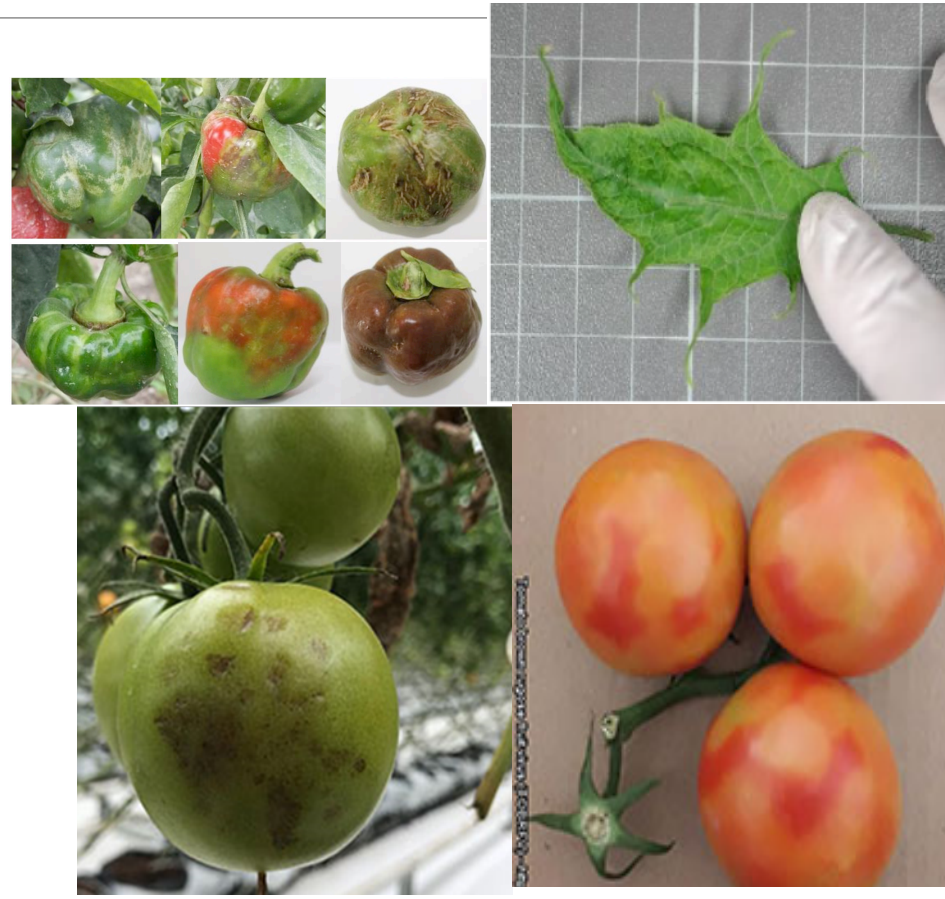
CABI, 2021. Tomato brown rugose fruit virus. In: Invasive Species Compendium. Wallingford, UK: CAB International. https://www.cabi.org/isc

Introduction

- Persist on clothing and workers can be the main 'vector' for upto 14 days
- Contaminated seed is a pathway, also spread by bumble bees during pollination
- RNA virus (ssRNA) that is highly virulent and breaks Tm -2^2 resistance gene hence no tomato is resistant
- Does not infect the embryo of a seed, and instead contaminates the seed coat.
- Seed-to-seedling transmission is very low for most tobamoviruses, as transmission often fails when the seed coat separates from the seedlings

Introduction cont- Symptoms

- Foliar-Chlorosis, mosaic and mottling (spots or smears of color) with occasional leaf narrowing
- Peduncles, calyces and petioles- Necrotic spots
- Fruit -yellow or brown or green spots/stripes, with rugose/wrinkled symptoms, deformed and have irregular maturation



Statement of the problem

- Tomato and capsicum plants are infested by many viruses including tobamoviruses such as Tomato mosaic virus and Tobacco mosaic virus
- ToBRFV is a relatively new tobamovirus that is affecting tomato and capsicum crops, its a quarantine pests in most countries world wide including Kenya and EU
- Currently, propagative materials (including seedlings for planting, seeds, grafts and cuttings) and fresh fruits are considered high risk pathways for the introduction of ToBRFV
- Kenya imports tomato/capsicum seed from countries where the virus has been reported
- Hence there is a risk of introduction of this virus via contaminated seed and this will significantly impact on production of tomato and capsicum in Kenya as well us lead to trade restrictions

Justification

- Preventing introduction of alien pests is a key mandate of any NPPO
- Early detection of new pest invasions enables an NPPO to develop contingency plans for its eradication
- Since Kenya imports tomato and capsicum seeds from countries where ToBRFV has been reported, it was important to determine the status of the pest in Kenya
- This will determine development of appropriate phytosanitary measures that will facilitate safe trade

Objective

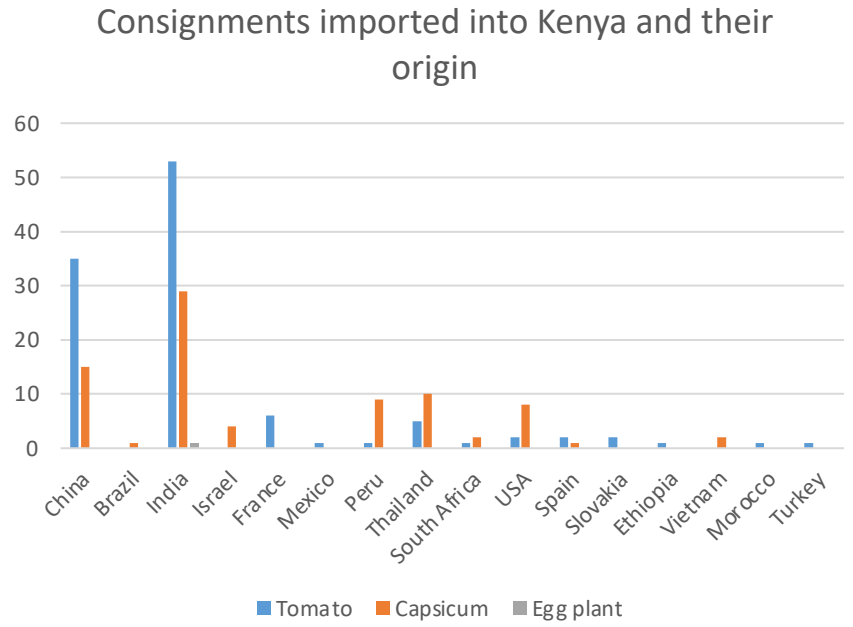
To contribute to safe trans-boundary trade of tomato and capsicum seeds by determining the status of *Tomato brown rugose fruit virus* in Kenya

Methodology

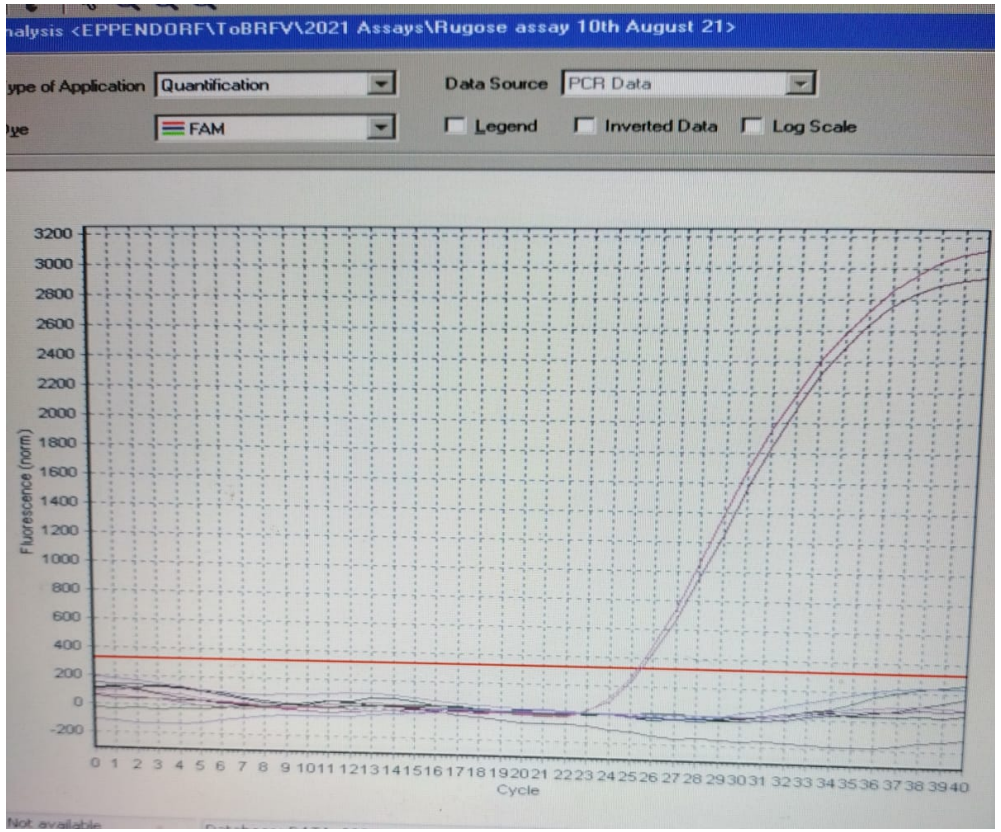
- Field surveys were conducted in tomato and capsicum growing areas between August to December 2020.
- Sampling and testing of imported seed of tomato and capsicum irrespective of the origin
- Seed samples tested using real time PCR (ISF protocol, 2020)
- Leave and fruit samples tested using conventional PCR (Alkwoni et al., 2019)

Results

- No visual symptoms of ToBRFV disease were observed during the survey
- A total of 256 leaf samples were analyzed (245 tomato, 10 capsicum, 1 black night shade)
- 192 imported seed lots were tested (India, China, Israel, Thailand, USA, Mexico, Spain, S.Africa)
- 448 exports tested
- All tests were found negative



Results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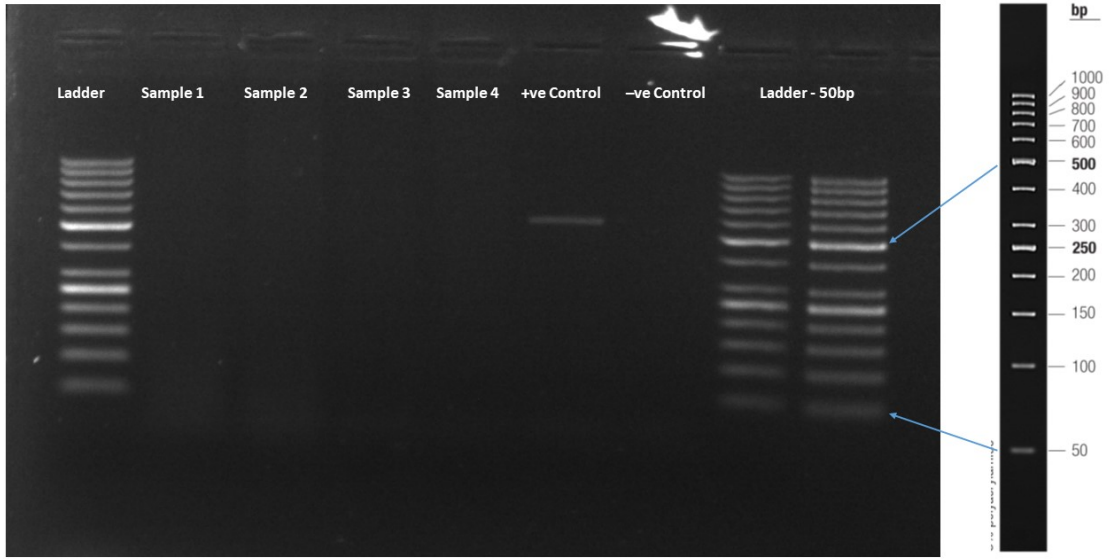
Ladder
Sample 1
Sample 2
Sample 3
Sample 4
+ve Control
–ve Control
Ladder - 50bp
bp
1000
900
800
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250
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100
50

Conclusion

- ToBRFV is not present in tomato and capsicum plants in Kenya as at now
- Tomato and capsicum seeds exported from Kenya are free from the virus
- Need to sensitize farmers on the disease to enable reporting of any outbreaks

Recommendations

- Monitoring of ToBRFV to be done in both cultivated and uncultivated host plants
- Continuous testing of imported tomato and capsicum seed and ornamental host plants
- Assessing response of pepper cultivars propagated in Kenya to the virus to provide information on resistant varieties

Acknowledgements

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