

Tomato brown rugose fruit virus (ToBRFV)

Tobamovirus fructirugosm

Crops affected: Capsicum, Tomato

What is it?

ToBRFV's main hosts are **tomato** and **capsicum**. It is a member of the genus Tobamovirus which are known for their long-term survivability.

What should I look for?

Tomato is a primary host and exhibits a wide range of symptoms. Leaf symptoms often first appear in young shoots at the top of the plant (Fig 1). Symptoms appear as mosaics, spots and yellowing, and leaves can become narrowed, puckered and deformed (Fig 2 & 3). Symptoms on fruit include yellow spotting and discolouration (Fig 4), green spots and deformations, and green grooves and irregular brown spots. Fruit may be deformed, mature irregularly, with have less fruit on each branch.

On capsicum, leaf symptoms include yellowing, mosaics and deformation. Fruit are also deformed, with yellow or brown areas, or green stripes (Fig 5 & 6).

Why is it important?

ToBRFV affects crop production and fruit quality, significantly impacting market value. ToBRFV has the ability to overcome resistance bred into conventional tomato varieties to protect against other Tobamoviruses. ToBRFV contaminates the host plant's seed coat and can remain infective for several years, making greenhouse hygiene important.

How is it transmitted?

ToBRFV is very easily transmitted mechanically from plant to plant by cultural practices, tools and equipment, hands, clothing, soil, contaminated water and soil. ToBRFV is very stable, surviving on host plants, inert materials, and in plant remains, substrate and soil for long periods without losing virulence. Pollinating bumblebees can also carry the virus. Volunteer crop plants and solanaceous weeds can act as reservoirs. Seed transmission occurs and it can be transferred from infected seeds to plantlets during germination.

Where is it present?

ToBRFV was first identified on tomatoes in Jordan in 2015. By 2018 it had spread to Germany as outbreaks continued to occur in Europe, the Mediterranean, and the Middle East. ToBRFV is also present in Morocco, Western Sahara, Uzbekistan, India, China, Canada, USA, Mexico and Argentina, Peru, Colombia and Australia. It has been eradicated from parts of Australia.

How can I protect my industry?

Check your production site frequently for the presence of new pests and unusual symptoms. Make sure you are familiar with common pests of your industry so you can recognise something different.



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Fig 1. First symptoms of ToBRFV on tomato plant. Photo credit: Dr. Agr. Raffaele Giurato, <https://gd.eppo.int>.



Fig 2. Severe mosaic pattern on older leaves. Photo credit: Prof. Salvatore Davino, <https://gd.eppo.int>.



Fig 3. ToBRFV on tomato leaves showing chlorosis and leaf narrowing. Photo credit: Camille Picard, <https://gd.eppo.int>.



Fig 4. ToBRFV symptoms on capsicum Photo credit: Dr Raed Alkowni, <https://gd.eppo.int>.



Fig 5. Typical fruit symptoms with yellow spots. Photo credit: Dr Aviv Dombrovsky, <https://gd.eppo.int>.



Fig 6. Capsicum fruit showing marbling, wrinkling, distortion caused by ToBRFV. Photo credit: [Caruso et al. 2022](https://doi.org/10.1016/j.cropro.2022.105700)