

ToBRFV Factsheet

November 2019

1. ToBRFV (Tomato Brown Rugose Fruit Virus)

Tomato Brown Rugose Fruit Virus (ToBRFV) is a member of the Tobamovirus genus, to which Tomato Mosaic Virus (ToMV) and Tobacco Mosaic Virus (TMV) also belong.

2. Spread

ToBRFV is a mechanically transmissible virus. Transmission mainly occurs during crop operations such as pinching out, twisting and harvesting, but also via infected items such as knives, pruners, clothing, jewellery and containers. It can also be spread by insects in the greenhouse such as bumblebees as well as via infected fruits and plant material. The virus can survive in water, soil, plant material residues and host plant seeds, as well as in the ground. It is therefore essential to observe strict hygiene. Other more well-known tobamoviruses can be transmitted through seed and water. The same may apply to ToBRFV as well, but this has not yet been observed.

3. Symptoms

Symptoms include vein yellowing and bubbling on the leaves and yellow blotches on the fruits, sometimes with sunken lesions. Mosaic mottling also occurs, mainly on younger leaves.

Looking at the photographs below, the leaf and fruit symptoms of ToBRFV are quite similar to those of Pepino Mosaic Virus (PepMV) and Tomato Spotted Wilt Virus (TSWV), making it very difficult to identify. PepMV is widespread in the Netherlands and is undoubtedly not always symptom-free (symptoms are determined by a wide range of factors).

Leaf symptoms



Bubbled leaves



Vein yellowing



Combined leaf symptoms

Fruit symptoms



Dull fruits developing rough (wrinkled) patches



Brown mottling on unripe fruits



Yellow mottling on ripe fruits

4. Impact

It has been established that ToBRFV is able to overcome the TM-2² and TM-1 resistance genes in tomatoes. This essentially means that almost all Dutch tomato varieties are susceptible to the virus. Sweet pepper has also been identified as a host plant if it has no resistance genes to Tobamoviruses. The most common sweet pepper varieties in the Netherlands are resistant to ToBRFV; there are therefore no known outbreaks in sweet pepper here. A number of other plants such as Petunia and weeds including Chenopodium (fat hen) species and Solanum nigrum (black nightshade) have also been identified as hosts. Aubergine and potato are not host plants.

Like other plant viruses, ToBRFV poses no threat to public health. However, the virus can have an adverse effect on tomato crop yields and can lead to loss of quality. Affected fruits can exhibit yellow and brown mottling, making them unmarketable as they do not comply with the quality standards.

5. Measures

Strict hygiene measures are the only way to prevent an infection. What form these measures take will vary from farm to farm. We advise growers to draw up an action plan with a specialist, focusing on prevention, avoiding spreading the virus once it is observed, and elimination at crop change-over.

6. Reporting

The European Commission published new emergency measures to prevent and control ToBRFV in September 2019. These rules entered into force on 1 November 2019. In anticipation of this, the Netherlands Food and Consumer Product Safety Authority (NVWA) gave ToBRFV quarantine status in the Netherlands as of 4 October 2019 (publication date 10 October 2019), which means that every suspected case of infection must be reported. This can be done on the [NVWA](https://www.nvwa.nl) website or by phone on 0900 0388.

7. Websites with information

- tuinbouwalert.nl/dossiers/tobrfv-in-tomatengewas (NL)
- nvwa.nl/onderwerpen/plantenziekten-en-plagen/tomato-brown-rugose-fruit-virus-tobrfv (NL)
- gd.eppo.int/taxon/TOBRFV (EN)
- norsec.com/pdf/Tomato_Disease.pdf (EN), pages 114-115 info + images
- fhalmeria.com/noticia-26119/un-nuevo-virus-detectado-en-jordania-y-mexico-seria-amenaza-para-el-tomate-almeriense (ES)