Department
for Environment
Food & Rural Affairs

Proposal to keep tomato ringspot virus (*Nepovirus lycopersici*) regulated on *Prunus* - fruit propagating material and fruit plants intended for fruit production

November 2024

Objective

To review the status of tomato ringspot virus in GB legislation.

Assessment

The following is a summary of an assessment undertaken by Defra following the method outlined by EPPO (European and Mediterranean Plant Protection Organisation) (Picard *et al*., 2017).

Regulated non-quarantine pest (RNQP) assessment for Great Britain: tomato ringspot virus (*Nepovirus lycopersici*) on *Prunus* - fruit propagating material and fruit plants intended for fruit production

Background

Tomato ringspot virus (also known as *Nepovirus lycopersici* or ToRSV) is currently an RNQP (Regulated Non-Quarantine Pest) for GB (Great Britain), but the listed hosts concerning this pest needed a review. The pest has a scattered worldwide distribution, with most impacts occurring in North America where the nematode vectors are widespread.

Current listing of pest in GB legislation

RNQP for GB

Current regulated plants for planting – host plants

Pelargonium; Prunus; Rubus; Malus

Taxonomy

Pest name

Nepovirus lycopersici; tomato ringspot virus; ToRSV; TomRSV

Will the pest be listed at species level?

Yes

Status in GB

Is this pest present in GB?

Yes: There is a long history of ToRSV causing symptomless findings of infection on *Pelargonium* (geranium) stocks in the UK, with unpublished records beginning in 1979 and the most recent survey being from 2003 (Defra, unpublished data). The results of the most recent survey did indicate that levels of viral contamination had dropped, but there is no evidence that ToRSV has ever been fully eradicated from *Pelargonium* (especially since the virus can be transmitted via seed and pollen in *Pelargonium*, Scarborough & Smith, 1977).

Pathways

Are the listed plants for planting the main pathway for the "pest/host/intended use" combination?

Yes: ToRSV is primarily spread by nematodes in the *Xiphinema americanum senso lato* complex. These vectors of ToRSV are not known to occur in the UK, though the rapid PRA for these nematodes (Fera, 2014 unpublished) acknowledged that some populations may have been inadvertently imported in large, containerised plants. If nematode vectors were to enter, they are very likely to be able to establish both outdoors and in protected conditions.

The virus is not thought to be seed transmitted with woody hosts.

Plants for planting, via propagating/grafting, are considered to be the main means of spreading ToRSV.

Economic Impact

Are there documented reports of any economic impact on the host?

Yes

All *Prunus* spp. show stem pitting (abnormal thickening of the bark, which shows a spongy aspect associated with pits and grooves in the wood) associated with graft union staining and abnormalities. (EPPO, 2021).

Prunus avium: ToRSV causes enations and rosetting of leaves on sweet cherry. ToRSV causes gradual decline as symptoms spread throughout the tree canopy, which ultimately leads to reduced yield and tree death. ToRSV also causes the yellow bud mosaic disease in sweet cherry. Symptoms include enations, reduction in fruit quality, decline, and tree death of sweet cherry. When ToRSV infects a susceptible host from the roots, the tree's ability to uptake and transport water and nutrients is inhibited resulting in symptoms on the fruit and foliage (Reinhold, 2020 and references therein).

Prunus cerasifera: ToRSV causes prune brownline symptoms – a dark brown line and necrotic phloem tissue forms at the scion/rootstock junction and extends into pits and grooves in the woody (xylem) cylinder. Girdling causes interveinal chlorosis and tree mortality (Cummins & Gonsalves, 1986).

Prunus domestica: ToRSV causes prune brownline symptoms, though own-rooted 'Stanley' prune trees seem to remain free of symptoms (Cummins & Gonsalves, 1986). In California, prune brownline disease in prune has caused 'considerable losses', particularly those trees propagated on *P. cerasifera* and *P. persica* rootstock (Hoy *et al*., 1984).

Prunus dulcis: almond trees show leaf deformation and rosetting in Iran (Moini *et al*., 2010)

Prunus persica: ToRSV causes peach yellow bud mosaic disease (restricted to N. America) - chlorotic spots and rings or oak-leaf mottles are observed on leaves (mosaic phase). This is followed by the second phase, characterized by a severe reduction of leaf growth on buds, giving a rosette appearance (yellow bud phase). After a few years, infected trees display a denuded appearance and fruit production is reduced (Cambra *et al*. 2008 and references therein).

The severity of the diseases caused by ToRSV on *Prunus* are species-, cultivar-, and rootstock/scion-dependent.

What is the likely economic impact of the pest irrespective of its infestation source in the absence of phytosanitary measures?

Minor impact in the *Prunus* fruit sector in the absence of phytosanitary measures:

The UK Pest Risk Analysis (Defra, 2018) rates economic impact in this pest's current range as Medium for all fruit crops (inc*. Prunus, Vaccinium, Capsicum, Rubus*). The potential economic impact to all sectors in the UK are rated as Small (with the suggestion that most impacts will be in the ornamental sector). When assessing which area of the UK is endangered from ToRSV, the PRA states "*Fruit crops could incur greater impacts, but unless the vectors are introduced any effects are likely to be limited by controlling planting material*."

The potential impact to individual growers will depend on the *Prunus* species, cultivar, and rootstock/scion combination, but losses could be substantial as symptoms can take a few years to appear and the replacement of trees is costly.

Is the economic impact due to the presence of the pest on the named host plant for planting, acceptable to the propagation and end user sectors concerned?

No

Risk Management Measures

Are there feasible and effective measures available to prevent the presence of the pest on the plants for planting at an incidence above a certain threshold (including zero) to avoid an unacceptable economic impact as regards the relevant host plants?

Yes

Similar methods as those described in EPPO PM 4/029 (1) *Certification scheme for cherry* and EPPO PM 4/030 (1) *Certification scheme for almond, apricot, peach and plum* could be used (though ToRSV is not explicitly listed in these standards). See also EPPO PM 7/49 *Tomato ringspot virus* (Diagnostics) (EPPO, 2005).

Data Quality

Is the quality of the data sufficient to recommend the pest to be listed as an RNQP?

Yes

There is sufficient evidence of host association and symptoms that show ToRSV is harmful to fruiting trees of *Prunus* and could cause an unacceptable level of damage.

Proposal for regulation

No change proposed. This regulation is judged to be appropriate to the risk of this pest.

References

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Name of Pest Risk Analyst

Claire Gent & Alex Linay

This regulation proposal has been undertaken taking into account the environmental principles laid out in the Environment Act 2021. Of particular relevance are:

- The prevention principle, which means that any policy on action taken, or not taken should aim to prevent environmental harm.
- The precautionary principle, which assists the decision-making process where there is a lack of scientific certainty.