Department for Environment Food & Rural Affairs

Regulation proposal for tobacco ringspot virus (*Nepovirus nicotianae*) on *Vaccinium* - fruit propagating material and fruit plants intended for fruit production

November 2024

Objective

To review the status of tobacco 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: tobacco ringspot virus (*Nepovirus nicotianae*) on *Vaccinium* - fruit propagating material and fruit plants intended for fruit production

Background

Tobacco ringspot virus (also known as *Nepovirus nicotianae* or TRSV) is currently a Quarantine Pest (QP) for GB (Great Britain). Available evidence suggests that this pest is present in GB and it is not under official control. As such, TRSV does not meet the requirement for QP status. Assessments were therefore undertaken to see if this pest could become an RNQP (Regulated Non-Quarantine Pest) and if so, which hosts should be listed under the regulations. TRSV 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

Quarantine Pest (Annex 2, Part A)

Current regulated plants for planting – host plants

None

Taxonomy

Pest name

Nepovirus nicotianae; tobacco ringspot virus; TRSV

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Yes: There is a long history of TRSV causing symptomless infection of *Pelargonium* (geranium) stocks in the UK, with unpublished records beginning in 1979 and the most recent survey being from 2003 (Defra, unpublished data).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 TRSV 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

TRSV can spread over longer distances via seeds, by grafting of woody hosts, by vegetative propagation of herbaceous hosts, and via adherent soil containing viruliferous nematode vectors and/or infected seeds (EPPO, 2022).

Movement of infected vegetatively propagated plants, grafts and seeds are the most efficient ways of spreading TRSV over longer distances. In this respect, the trade of symptomless infected hosts, such as tolerant genotypes of blueberries, pose a high risk of spreading the virus. Most records of TRSV outside North America are associated with the movement of plant material from this region. In addition, TRSV and its vectors may also be introduced in new areas via adherent soil or growing media of imported plants from infested areas (EPPO, 2022)

In GB, the nematode vectors of TRSV (nematodes in the *Xiphinema americanum senso lato* complex) are not known to occur, 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 GB, they are very likely to be able to establish both outdoors and in protected conditions (Defra, 2018).

According to Card *et al*. (2007 and references therein), transmission is possible in *Vaccinium* pollen. But the original reference could not be accessed.

No information on seed transmission was found for *Vaccinium*.

Therefore, infected plants for planting are likely to be the main pathway for this pest on *Vaccinium*, as it has only been known in *Pelargonium* plants for planting in GB.

Economic Impact

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

Yes

A necrotic ringspot disease associated with TRSV in blueberry was first identified in New Jersey in the early 1960s. The disease was then identified in six more states in the US (Arkansas, Connecticut, Illinois, Michigan, New York, Oregon and Washington) as well as two other countries (Canada and Chile).

TRSV-infected blueberry (*V. corymbosum*) plants produce symptoms including necrotic spots on leaves or flower buds, mosaic, leaf distortion, and shoot defoliation, leading to gradual decline in bush productivity in some cultivars or even plant death in others. TRSV-affected cultivars include 'Collins', 'Concord', 'Draper', 'Jersey', 'Pemberton', 'Rubel', 'Stanley' and 'Top Shelf', although no cases have been documented in rabbiteye (*V. virgatum*) or lowbush blueberry (*V. angustifolium*) (Ramsdell, 1978; Mitra *et al*., 2021; Saad *et al*., 2021 and references therein). In a laboratory study, however, Jaswel (1990) reported symptoms in hybrid clones (*V. corymbosum* and *V. angustifolium*).

Highbush blueberry 'Bluecrop' is known to recover from TRSV infection. This recovery phenomenon likely results from the manifestation of RNA silencing (Fuchs *et al*., 2010). Paduch-Cichal *et al*., 2011 found no symptoms typical of TRSV on 'Bluecrop', 'Darrow' and 'Herbert' despite the presence of the virus confirmed by serological testing.

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

Minor impact in *Vaccinium* fruit sector in absence of phytosanitary measures.

The UK rapid Pest Risk Analysis for TRSV (Defra, 2018) concluded that, on all hosts, the potential economic impacts would be small with high confidence, and they were

expected to be largely limited to ornamentals (similar to impacts seen in the past in the UK and EU countries).

There is evidence of severe impacts including reduction of productivity and fruit yields, and stunting, reduced vigour and plant death that could occur in GB. However, some evidence of recovery due to RNA silencing. Impacts are cultivar dependent.

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

EPPO PM 4/018(1) Pathogen-tested material of *Vaccinium* (production and maintenance of nuclear stock, indicator plants, ELISA testing and heat treatment) (EPPO, 1998).

Test for detection (RT-PCR) and identification of TRSV in *Vaccinium* are laid out in EPPO PM 7/2 (2) Tobacco ringspot virus (EPPO, 2017).

The presence of TRSV in blueberry can be identified using RT-PCR or by ELISA but can be difficult due to their unequal distribution in various sections of plant tissues (Saad *et al*., 2021).

Data Quality

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

Yes, although information is lacking on economic losses specifically as most reports concern incidence and symptoms. No reports of symptoms in *Vaccinium* species other than *V. corymbosum* and hybrids, but this could be due to these species being less commonly planted.

Proposal for regulation

We propose to remove TRSV from the QP list and instead regulate TRSV as an RNQP on fruit propagating material and fruit plants intended for fruit production of *Vaccinium* species, by amending Annex 4, Part I, of the Phytosanitary Conditions Regulation[1]. As a result, these plants would need to be free from TRSV to be imported into, or moved within, Great Britain.

[1] Commission Implementing Regulation (EU) 2019/2072 of 28 November 2019 establishing uniform conditions for the implementation of Regulation (EU) 2016/2031 of the European Parliament and the Council, as regards protective measures against pests of plants, and repealing Commission Regulation (EC) No 690/2008 and amending Commission Implementing Regulation (EU) 2018/2019

References

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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.