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NEW DISEASE REPORT

Potato spindle tuber viroid detected from Solanum sisymbriifolium seed in trade

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Solanum sisymbriifolium (sticky nightshade) originates from South America and was initially introduced to Europe as an ornamental plant. However, the species has recently been added to the European and Mediterranean Plant Protection Organisation alert list due to the high fecundity of the species, leading to the plant being considered a noxious weed in Sicily and coastal areas in the Mediterranean region (European and Mediterranean Plant Protection Organisation, 2021). With the reduction in availability of chemical controls for potato cyst nematode (PCN; *Globodera pallida* and *G. rostochiensis*) the species has recently received increased interest for use as a trap crop. This is because the root exudates promote hatching of PCN juveniles but do not allow establishment of nematode populations.

Throughout 2018, 19 samples consisting of 1000 seeds each, and one sample of 3000 seeds, were submitted to Fera Science Ltd. from seed lots of *S. sisymbriifolium*, to be tested for *Potato spindle tuber viroid* (PSTVd). These were submitted as part of commercial "due diligence" testing prior to importing seed into the UK for efficacy trials. Each of the seed lots was subdivided into sub-samples of 250 seeds, i.e. four sub-samples for each of the 1000 seed samples, and 12 sub-samples for the 3000 seed sample. RNA was extracted from the seeds using a magnetic bead extraction method (Kingfisher Flex, Thermo Scientific, UK) and tested by real-time RT-PCR using an assay that detects PSTVd, *Tomato chlorotic dwarf viroid* and *Tomato planta macho viroid* (Boonham et al., 2004). Five samples tested positive using this assay. To identify the species of pospiviroid detected, RNA extracts were tested by RT-PCR with a Verso 1-step RT-PCR Reddymix kit (Thermo Scientific, USA) using pospi 1 FW and pospi 1 RE primers (Verhoeven *et al*., 2004). Bands were detected of the correct size (c. 196 bp) for sub-sample extracts from five samples. The resulting PCR products were sent for sequencing using the above primer sets (Sequiserve, Germany or Eurofins, Germany). PSTVd was confirmed in all five samples by sequence comparison using BLAST, with >99.4% identity to an isolate from The Netherlands (KY936876), and the sequences were added to GenBank (MZ226444-MZ226448).

Due to the samples being submitted during commercial testing, the origin of the seed samples is unknown. Whilst *S. sisymbriifolium* has only previously been listed as an experimental host of PSTVd (Diener, 1979), it has previously been intercepted in this host by the Netherlands Plant Protection Service. These interceptions indicate that the species is a natural host of PSTVd, and contaminated seeds are present in commercial seed lots of this host which could pose a plant health risk through the introduction of the viroid (Netherlands Food and Consumer Product Safety Authority, 2017). Given the increased interest in the use of *S. sisymbriifolium* as a trap crop for PCN management in potato rotations, the role of this crop as a host of PSTVd and the risk of seed transmission and transmission via roots should be further investigated.

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