



June 2011 PEST REPORT - THE NETHERLANDS

Tomato apical stunt viroid on tomatoes in The Netherlands

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Introduction

This report concerns the first official finding of *Tomato apical stunt viroid* (TASVd) on tomatoes in The Netherlands in May 2011. The disease was detected in a tomato fruit production facility with heavy damage on plants. The origin of this outbreak is not clear at present.

In 2006, TASVd has been detected in The Netherlands for the first time in a sample from symptomless *Cestrum* plants during a survey on pospiviroids in floricultural plants. The *Cestrum* plants had been raised from plantlets possibly imported from Israel. Test results have shown that many ornamental plant species are infected with pospiviroids without showing symptoms. TASVd is not included in the annexes of EU directive 2000/29/EC but is listed on the EPPO alert list and is part of the EFSA PRA on pospiviroids, which should be finalized within a few months. Phytosanitary measures are limited to preventing spread to tomato or potato production in the Netherlands, pending the outcome of the PRA on pospiviroids.



Tomato plants with heavy symptoms caused by Tomato apical stunt viroid (TASVd)

Pest status

Present, widespread on *Cestrum* and *Solanum jasminoides*, localized on *Lycianthes rantonetti*. Incidental outbreak in tomato fruit production. Under surveillance.

Host plants

Plants of *Solanaceae*. Natural infections have been found in the ornamental species *Brugmansia* sp (Olivier et al., 2011), *Cestrum* sp. (Verhoeven et al., 2008a) *Lycianthes rantonnetii* (Verhoeven, 2010a) *Solanum jasminoides* (Verhoeven et al., 2008b), *S. pseudocapsicum* (Spieker et al., 1996), *Streptosolen jamesonii* (Verhoeven et al., 2010). TASVd is considered a serious disease in tomatoes and probably potatoes (see also Pest Significance).

Geographical distribution

Reports of findings in tomatoes from Austria, Finland, Indonesia, Israel, Italy, Ivory Coast, Senegal, Tunisia (Anonymous, 2003), Netherlands (Verhoeven et al., 2008a), Belgium, Germany (Verhoeven, 2008b), France

Biology

Pospiviroids, including TASVd, can be spread via vegetative propagation, by contact, true seed, pollen and ovules. Vegetative propagation from infected ornamentals and potatoes might result in 100% infected progeny plant material. With regard to transmission by contact, successful transfer is dependent on the plant species and temperature. Pospiviroids are transmitted more easily at higher temperatures (Verhoeven et al., 2004, 2010b). For *Potato spindle tuber viroid* (PSTVd) transmission via seed and pollen has been reported (Singh, 1970). TASVd has been shown to be transmitted by bumble bees in greenhouse tomato crops (Antignus, 2007). Their role in the epidemiology of pospiviroids, however, needs further study. The same holds true for the relation between the pospiviroid infections found in ornamental species and the incidental outbreaks in tomato crops.

Detection/identification

The Plant Protection Service in the Netherlands received one tomato (*Solanum lycopersicum*) plant specimen for diagnosis from a tomato fruit production facility in the Netherlands. Growth of the plant was reduced and leaves were chlorotic and brittle (see pictures). Based on the observed symptoms it was decided to test the specimen for pospiviroids by reverse transcription (RT)-PCR using Posp1-RE/FW and Vid-RE/FW primer pairs (Verhoeven et al., 2004). With primer pair Posp1-RE/FW an amplicon of the expected size (194 bp) was obtained. The amplicon was sequenced and showed highest identities to isolates of TASVd in NCBI GenBank. For identification the complete sequence of the isolate was determined by sequencing the amplicon obtained after RT-PCR using primers the primers developed for the detection of *Citrus exocortis viroid* (Önelge, 1997) but also detecting TASVd. The isolate consists of 364 nucleotides and shows highest sequence identity (100%) to a TASVd isolate (GenBank Accession No. FN994891). Subsequently an official leaf sample was taken by the Plant Protection Service and the complete sequence of the isolate was determined as described above. The complete genome sequence of this sample is also identical to TASVd isolate FN994891.

Pest Significance

In Israel TASVd is reported from a few tomato production sites, where the disease spread rapidly along rows possibly by handling of tools and/or plant to plant contact (Antignus et al, 2002). Disease incidences of nearly 100% and heavy yield losses were reported. TASVd can also be a serious pathogen of tomatoes grown under protected conditions. The Netherlands tomato production facility that is found infected with TASVd has reported serious damage. The grower has noticed the first unknown symptoms on a few plants in January 2011. The disease developed slowly along rows during the winter months, but rapidly during the last months. Also in potatoes TASVd can be expected to cause serious damage, based on the symptoms caused by related pospiviroids, like PSTVd (Verhoeven et al., 2004).

Origin of the finding

The origin of the infection is not yet clear. Investigation is ongoing and includes tracking and tracing of origin of planting material and seeds. The variety is new and only planted by this grower. Since the grower does not use the greenhouse for overwintering of ornamental species, the source of the infection is probably not these ornamental species. However, molecular sequence analysis has shown that the TASVd isolates in ornamentals and tomatoes have similar sequences.

Phytosanitary measures

Phytosanitary measures are limited to preventing spread to tomato or potato production in the Netherlands, pending the outcome of the PRA on pospiviroids. Specific surveillance has been completed at tomato producers in the vicinity of the infested nursery (visual inspections). No other infections were reported so far. Since the infection is found in one tomato production facility and since fruits are not considered to be an important pathway, there is no direct risk for spread of the viroid to other growers. The grower has been advised to take measures to eradicate the infection in the greenhouse and to take measures to avoid spread of the viroid to other growers via plant waste. The grower is advised to destroy the infected plants immediately, to avoid contact with other tomato growers, to destroy other plants after the production season is finished, and to disinfect the greenhouse prior to the new planting season.

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