

Mini data sheet on *Tomato torrado virus*

Added in 2009 - Deleted in 2013

Reasons for deletion:

Tomato torrado virus has been included in EPPO Alert List for more than 3 years and during this period no particular international action was requested by the EPPO member countries. In 2013, it was therefore considered that sufficient alert has been given and the pest was deleted from the Alert List.

Tomato torrado virus

Why	<p>Since spring 2001, a new disease called 'cribado', or 'torrao', has been observed on tomatoes grown under protected conditions in the region of Murcia, in Spain. This disease was found associated with high population levels of whiteflies. Recent studies have identified the causal agent as a new virus species (possibly belonging to a new genus) which was tentatively called Tomato torrado virus (ToTV). Since its initial description in 2007, the virus has been detected in a few other countries from distant continents (Europe, America and Oceania). Interestingly, a similar disease called 'tomato marchitez' is currently emerging in Mexico (Sinaloa, Sonora and Baja California). The causal agent was identified as a new virus species related to ToTV. As for ToTV, the disease was also associated with high populations of whiteflies (see EPPO RS 2008/080). Considering that ToTV is an emerging disease of tomato crops, the EPPO Panel on Phytosanitary Measures recommended its addition to the Alert List.</p>
Where	<p>EPPO region: France (detected in 2008 in a few samples), Italy (detected in 2009/2010 in 1 glasshouse (mainland)- again in 2011 in 1 glasshouse (Sicilia), in both cases all plants were destroyed), Spain (Andalucía, Cataluña, Comunidad Valenciana, Murcia and Islas Baleares and Canarias), Hungary (isolated outbreaks under eradication), Poland (glasshouse tomatoes).</p> <p>In Spain, ToTV was first detected in Murcia in 2007 (but disease symptoms had been observed since 2001) and in Islas Canarias (observed since 2003 in glasshouse tomatoes in Las Palmas, Gran Canaria). Disease symptoms have also been observed to a lesser extent in Almería (Andalucía), Alicante (Comunidad Valenciana) and Baleares (Mallorca) but the presence of ToTV has not been confirmed by testing in these regions. However, this might suggest that the virus could be more widespread than originally thought. In Poland, ToTV was detected for the first time in 2003 and 2004 on glasshouse tomatoes in the Wielkopolska region. In Hungary, a single tomato plant showing symptoms was found infected by ToTV at the end of the 2007 growing season. Because all tomato plants of the glasshouse were destroyed (as part of routine practice) and no further infection was detected, the virus was considered eradicated.</p> <p>Central America: Panama (field tomatoes in several regions).</p> <p>South America: Colombia.</p> <p>Oceania: Australia (glasshouse tomatoes in South Australia).</p>
On which plants	<p>Tomato (<i>Lycopersicon esculentum</i>), and several weed species belonging to various plant families (Amaranthaceae, Caryophyllaceae, Chenopodiaceae, Cruciferae, Malvaceae, and Polygonaceae). In inoculation studies, it was observed that ToTV could systemically infect aubergine (<i>Solanum melongena</i>), and capsicum (<i>Capsicum annuum</i>). Inoculated aubergine plants remained symptomless but capsicum plants showed severe symptoms (conspicuous mosaic, stunting, but no necrosis). However for the moment, natural infections have only been reported in tomato crops and several weed species. Further studies are needed to better define the host range of ToTV, both on cultivated and wild plants (as the latter may act as reservoirs for the virus).</p>
Damage	<p>Affected plants show necrotic lesions at the base of the leaflets, which later turn into shot holes (hence the Spanish name 'cribado'). Longitudinal necrotic lesions also appear on the stems, necrotic line patterns or blotches followed by deformations appear on the fruits rendering them unmarketable. Affected plants</p>

	<p>present a general burnt-like appearance (hence the Spanish name 'torrao'). In some cases, ToTV has been detected in mixed infections with other viruses (i.e. <i>Pepino mosaic virus</i> in Spain, and <i>Cucumber mosaic virus</i> in Panama), but it is not known whether this might play a role in the disease severity. Although severe symptoms have been observed on some tomato crops, the economic impact of the disease remains to be determined.</p>
Transmission	<p>Preliminary transmission trials strongly suggested that both <i>Bemisia tabaci</i> and <i>Trialeurodes vaporariorum</i> can transmit the virus. For the moment, it is not known whether ToTV can be transmitted by seeds. Many aspects of the disease epidemiology remain to be studied. Over long distances, trade of infected plants can spread the virus.</p>
Pathway	<p>Tomato plants for planting, seeds? viruliferous whiteflies?</p>
Possible risks	<p>Tomatoes are widely grown across the EPPO region (indoors and outdoors) and are of significant economic importance. Although the economic impact of ToTV has not been yet determined, the virus can cause severe symptoms. Its whitefly vectors are present in the EPPO region (<i>T. vaporariorum</i> is widespread across the region, <i>B. tabaci</i> has a more limited distribution). Although data is lacking on its distribution, host range, epidemiology and possible interactions with other viruses, it seems desirable to prevent any further spread of ToTV in tomato crops.</p>
Source(s)	<p>Alfaro-Fernández A, Bese G, Córdoba-Selles C, Cebrián MC, Herrera-Vasquez JA, Forray A, Jordá C (2009) First report of Tomato torrado virus infecting tomato in Hungary. <i>Plant Disease</i> 93(5), p 554.</p> <p>Alfaro-Fernández A, Córdoba Sellés MC, Cebrián Micó MC, Font I, Juárez M, Medina V, Lacasa A, Sánchez Navarro, Pallás V, Jordá Gutiérrez C (2006) [Tomato necrosis disease: 'torrao' or 'cribado']. <i>Boletín de Sanidad Vegetal, Plagas</i> 32(4), 545-562.</p> <p>Alfaro-Fernández A, Córdoba Sellés MC, Cebrián Micó MC, Font I, Juárez M, Medina V, Lacasa A, Sánchez Navarro, Pallás V, Jordá Gutiérrez C (2007) [Advances in the study of tomato 'Torrao' or 'Cribado' syndrome.]. <i>Boletín de Sanidad Vegetal, Plagas</i> 33(1), 99-109.</p> <p>Alfaro-Fernández A, Córdoba-Selles C, Cebrián MC, Sánchez-Navarro JA, Espino A, Martín R, Jordá C (2007) First report of Tomato torrado virus in tomato in the Canary Islands, Spain. <i>Plant Disease</i> 91(8), p 1060.</p> <p>Alfaro-Fernández A, Córdoba-Selles C, Cebrián MC, Herrera-Vásquez JA, Sánchez-Navarro JA, Juárez M, Espino A, Martín R, Jordá C (2008) First Report of Tomato torrado virus on weed hosts in Spain. <i>Plant Disease</i> 92(5), p 831.</p> <p>Alfaro-Fernández, A, Córdoba-Selles MC, Juárez M, Herrera-Vásquez JA, Sánchez-Navarro JA, Cebrián MC, Font MI, Jordá C (2010) Occurrence and geographical distribution of the 'Torrado' disease in Spain. <i>Journal of Phytopathology</i> 158(7-8), 457-469.</p> <p>Amari K, Gonzalez-Ibeas D, Gomez P, Sempere RN, Sanchez-Pina MA, Aranda MA, Diaz-Pendon JA, Navas-Castillo J, Moriones E, Blanca J, Hernandez-Gallardo MD, Anastasio G (2008) Tomato torrado virus is transmitted by <i>Bemisia tabaci</i> and infects pepper and eggplant in addition to tomato. <i>Plant Disease</i> 92(7), p 1139.</p> <p>Anonymous (2009) Incidencia de plagas y enfermedades en las Comunidades Autónomas en 2008. <i>Phytoma-España</i> no. 207, pp 14-50 & 208, pp 36-62 & 209, pp 44-52 & 210, pp 50-55.</p> <p>Davino S, Bivona L, Iacono G, Davino M (2010) First report of Tomato torrado virus infecting tomato in Italy. <i>Plant Disease</i> 94(9), p 1172</p> <p>Jordá C, Martínez L, Córdoba MC, Martínez O, Juárez M, Font I, Lacasa A, Guerrero MM, Cano A, Monserrat A, Barceló N, Alcázar A (2003) El 'cribado' o 'torrao', ¿una nueva enfermedad del cultivo del tomate? <i>Phytoma España</i> no.152, 130-136.</p> <p>NPPO of Hungary (2008-06, 2010-04).</p> <p>NPPO of Italy (2011-02). Pospieszny H, Borodynko N, Obręplowska A, Hasiów B (2007) The first report of Tomato torrado virus in Poland. <i>Plant Disease</i> 91(10), p 1364.</p> <p>Verbeek M, Dulleman AM (2012) First report of <i>Tomato torrado virus</i> infecting tomato in Colombia. <i>Plant Disease</i> 96(4), p 592.</p> <p>Verbeek M, Dulleman AM, van den Heuvel JFJM, Maris PC, van der Vlugt RAA (2007) Identification and characterization of tomato torrado virus, a new plant picorna-like virus from tomato. <i>Archives of Virology</i> 152(5), 881-890 (abst.).</p> <p>Verdin E, Gognalons P, Wipf-Scheibel C, Bornard I, Ridray G, Schoen L, Lecoq H (2009) First report of Tomato torrado virus in tomato crops in France. <i>Plant Disease</i> 93(12), 1352-1353.</p>
EPPO RS 2007/128, 2013/041	2007/174, 2008/129, 2009/032, 2010/084, 2011/012, 2011/013, 2011/014, 2011/015, 2011/108,
Panel review date	2013-03
	Entry date 2009-02