Mini data sheet on *Pepino mosaic virus*

Pepino mosaic virus was added to the EPPO A2 List in 2012. A full datasheet will be prepared, in the meantime you can view here the data which was previously available from the EPPO Alert List (added to the EPPO Alert List in 2000-deleted in 2012).

Pepino mosaic virus

Why: *Pepino mosaic virus* (*Potexvirus,* PepMV) came to our attention because it was recently found in Europe on glasshouse tomatoes, first in the Netherlands and UK, and then in other European countries. UK and Sweden suggested that it should be added to the EPPO Alert List.

Where: Originally described in Peru on pepino and first found in Europe in January 1999 in the Netherlands (in approximately 50 tomato glasshouses) and in United Kingdom (in 2 tomato glasshouses in the south of England).
EPPO region: Austria, (found in 2007, under eradication), Bulgaria (found in 1 location in 2004, under eradication), Croatia (eradicated), Cyprus (found in 2009), Czech Republic (found in 2008 in 1 site, under eradication), Greece (found in 2010), Italy (first found in 2001 in Sardegna, in 2005 in Sicilia, in 2011 in Campania), Finland (first found in 2001, again in 2003 and 2011, under eradication), France (2 isolated findings in 2000/2001 were subsequently eradicated. In 2002 and 2003, few outbreaks were detected in Centre and Bretagne - under official control), Germany (several cases have been reported in Hessen, Thüringen, Hamburg and Sachsen, eradication was achieved in most cases and the virus is considered as transcient), Hungary (first found in 2004 in one glasshouse), Netherlands (found in a few fruit-producing sites), Norway (found once in 2001 and eradicated), Poland (found in 2001 on 2 tomato plants, eradicated), Slovakia (found in 1 location in 2004, further surveys confirmed eradication), Spain (first found in 2000 - Almeria, Andalucia, Cataluña, Galicia, Comunidad Valenciana, Murcia and Canary Islands, so far with little economic impact), Sweden (found once in 2001 in 1 tomato glasshouse, no longer found), Switzerland (found in 2004, in the French-speaking part but then eradicated, other outbreaks have been found in Ticino and Zurich cantons), Turkey (detected in 2008/2009 in the Aegean region), United Kingdom (since 1999 several outbreaks were reported in various regions of the country, but most of them were eradicated at the end of each growing season - in 2011, only 3 outbreaks of PepMV were recorded).
Africa: South Africa.
Asia: Syria (found in 2008 near Latakia).
North America: In winter 2000, the presence of PepMV was discovered in Canada, and its presence in several states of USA (Arizona, California, Colorado, Florida, Minnesota, Oklahoma, Texas) has now been confirmed. It was also found for the first time in Mexico in 2010.
South America: Chile, Ecuador, Peru.

On which plants: Originally described on pepino (*Solanum muricatum*), it mainly affects glasshouse tomatoes (*Lycopersicon esculentum*). Experimental host range includes mostly Solanaceous plants, including potato and tobacco (no data on *Capsicum annuum, Solanum melongena*). On potato, symptoms could be obtained with the 'pepino type strain' on *S. tuberosum* cvs. Merpata and Revolucion and with the 'tomato strain' on cvs. Maris Peer, Pentland Dell and Charlotte (but so far, the disease has never been seen in potato crops). In Italy, PepMV has been detected causing mild symptoms on basil (*Ocimum basilicum*). In Spain, studies have shown that the virus could be detected in several naturally infected weed species (e.g. *Amaranthus, Chenopodium murale, Convolvulus arvensis, Echium creticum, Malva parviflora, Nicotiana glauca, Plantago afra, Rumex, Solanum nigrum* and *Sonchus oleraceus*). Recently, surveys carried out in Peru showed that the virus was naturally

present in wild *Lycopersicon* species (*L. chilense, L. chmielewskii, L. parviflorum, L. peruvianum*) as well as in cultivated tomato and pepino.

Damage: In Peru, it caused a yellow mosaic in young leaves of pepino. In the Netherlands, affected tomato plants showed yellow spots on the leaves, mild interveinal chlorosis and in some cases minor leaf malformations. Fruits sometimes showed discoloration. It appears that losses were not very significant (only 5% of the growers reported economic losses of less than 5%). In UK, affected tomatoes showed distorted leaf development, with bubbling of the leaf surface and chlorosis. Affected plants were very stunted and distorted. It appears that the disease spreads very rapidly and that the virus can cause significant crop losses, if early action is not taken to eliminate infection. Finally, a new tomato disease has been observed in Spain since 2001 (called torrao or cribado) and studies have showed that most diseased plants were infected with a newly described virus (*Tomato torrado virus*) and PepMV. Although further studies are needed, it seems that PepMV could interact at least with this new virus, and cause damage to tomato plants.

Transmission: PepMV is transmitted by contact: contaminated tools, hands, clothing, direct plant-to-plant contact, and propagation (grafting, cuttings), as well as by seeds. Bumble bees (*Bombus* spp.) used as pollinators in tomato crops can also spread the virus.
NOTE: Molecular studies showed that the Dutch and UK isolates were identical, but slightly different from the 'pepino type strain'. The pepino type strain only caused systemic symptomless infection on tomato. Further studies concluded that European tomato isolates differ from the type strain found on pepino, and belong to a distinct strain called tomato strain.

Pathway: Plants for planting (including vegetative parts used for propagation) of tomatoes, seeds, vegetables?, growing media?

Possible risks: Tomato is a major crop in the EPPO region both indoor and outdoor. Pepino (*Solanum muricatum*) is grown on a very small scale in Spain, and experimentally in a few European countries. So far, the disease has only been found under glass but eradication would probably be much more difficult if it was found on outdoor crops. Other Solanaceous crops may be at risk, and in particular potato, as it has been shown that certain cultivars expressed symptoms during inoculation tests. However, natural infections have never been observed in potato crops.

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