

Differential Sets

Tobamoviruses (Tobacco mosaic virus (TMV), Tomato mosaic virus (ToMV), Tobacco mild green mosaic virus (TMGMV), Paprika mild mottle virus (PaMMV), Pepper mild mottle virus (PMMoV)) and Bell pepper mottle virus (BPMoV) - Pepper - **Pepper**

The genus *Tobamovirus* includes multiple species that are pathogenic on *Capsicum spp* including the type species *Tobacco mosaic virus* (TMV), and the serologically related *Tomato mosaic virus* (ToMV), *Pepper mild mottle virus* (PMMoV) and several other plant viruses.

The nomenclature of Tobamoviruses has been the subject to several revisions in the period between 1980 and 2004. International Committee on Taxonomy of Viruses (ICTV) is the standard reference for virus taxonomy. More information can be found in the ICTV master species list <https://talk.ictvonline.org/>

Resistance is governed by four different dominant single genes (*L1*, *L2*, *L3* and *L4*), which are considered to be alleles at the locus *L*. The different alleles provide resistance towards multiple *Tobamoviruses* species that are classified into four groups (pepper Tobamovirus group 0-3) on the basis of their interaction with the corresponding plant resistance genes.

Pepper mild mottle virus isolates which overcome the *L4* resistance gene have been reported in Japan (Genda et al 2007) and Israel (Antigus et al, 2008) however till now those isolates did not lead to commercial damage.

Pepper Tobamovirus Group	0	1	2	3
ISF Code →	TMV: 0,1,2 ToMV: 0,1,2 BPMoV	TMGMV PaMMV	PMMoV: 1.2	PMMoV: 1.2.3

Differential hosts

	Gene	0	1	2	3
Lamu, Early Calwonder	-	S	S	S	S
Tisana, Yolo Wonder	<i>L1</i>	HR	S	S	S
Tabasco	<i>L2</i>	HR	HR	S	S
Solario F1, Novi 3, PI159236	<i>L3</i>	HR	HR	HR	S
Tom4, PI260429	<i>L4</i>	HR	HR	HR	HR

S = susceptible; HR= highly resistant

All isolates and differential hosts are used by the industry

References

- Boukema, I. W., Jansen K. and K. Hofman. (1980) Strains of TMV and genes for resistance in Capsicum. In Proc. Fourth EUCARPIA meeting. Wageningen, The Netherlands, 44-48.
- Boukema, I.W. (1984). Resistance to TMV in *Capsicum chacoense* HUNZ. is governed by an allele of the L-locus. *Capsicum Newsletter* 3: 47-48.
- Rast, A.B. (1988). Pepper tobamoviruses and pathotypes used in resistance breeding. *Capsicum Newsletter* 7: 20-23.
- Green, S.K. and J.S.Kim (1991). Characteristics and control of viruses infecting peppers: a literature review. Asian Vegetable Research and Development Center Technical Bulletin No. 18.
- Takeuchi, S., Hamada, H., Toyoda, K., Suzuki, K., Kiba, A., Hikichi, Y. and T. Okuno (2005). Discrimination between tobamoviruses and their pathotypes for L-gene-mediated resistance in green pepper (*Capsicum annuum* L.) by reverse transcription-polymerase chain reaction. *Journal of General Plant Pathology* 71: 60-67.
- Hamada, H., Takeuchi, S., Morita Y., Sawada, H., Kiba, A. and Hikichi, Y. (2003). Characterization of Paprika mild mottle virus first isolated in Japan. *Journal of General Plant Pathology* 69:199-204.
- Genda, Y., Kanda, A., Hamada, H., Sato, K., Ohnishi, J. and Tsuda, S. (2007). Two amino acid substitutions in the coat protein of Pepper mild mottle virus are responsible for overcoming the L4 gene-mediated resistance in *Capsicum* spp. *Phytopathology* 97:787-793.
- Wetter, C. and Contil, M. H. V. (1984). Pepper mild mottle virus: a tobamovirus infecting pepper cultivars in Sicily. *Phytopathology* 74: 405-410.
- Antignus, Y., Lachman, O., Perlsman, M., Maslenin, L., and Rosner, A., (2008). A new pathotype of pepper mild mottle virus (PMMoV) overcomes the L4 resistance genotype of pepper cultivars. *Plant Disease* 92, No.7 1033-1037.

Protocol

CPVO. See <http://www.cpvo.europa.eu/> for a protocol on disease resistance testing

For more information contact the ISF Secretariat at isf@worldseed.org

Disclaimer: The information contained on this paper is for general information purposes only. You should not rely upon as a basis for making any business, legal or any other decisions. Whilst we endeavour to keep the information up to date and correct, ISF makes no representations or warranties of any kind, express or implied about the completeness, accuracy, reliability, suitability or availability with respect to the information contained on the paper for any purpose. Any reliance you place on this information is therefore strictly at your own risk.