

DIFFERENTIAL SET

Tobamoviruses (Tobacco mosaic virus (TMV), Tomato mosaic virus (ToMV), Tomato mottle mosaic virus (ToMMV), Tobacco mild green mosaic virus (TMGMV), Paprika mild mottle virus (PaMMV), Pepper mild mottle virus (PMMoV) and Bell pepper mottle virus (BPMoV))- **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), tomato mottle mosaic virus (ToMMV) and several other plant viruses.

The nomenclature of Tobamoviruses has been the subject of several revisions in the period between 1980 and 2004. The 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 Tobamovirus species that are classified into four groups (pepper Tobamovirus groups Tm:0-3) on the basis of their differential interactions with the corresponding plant resistance genes.

The individual pepper Tobamovirus Groups contain multiple, different viruses.

Note that historically, to facilitate easy communication of resistance claims on Tobamoviruses in pepper, commercial claims by companies were made by using the pest code for TMV (Tm) as a reference to the entire Pepper Tobamovirus Group (instead of claiming each specific individual virus). Now, for pepper the code Tm does not refer specifically to TMV anymore, but to the pepper Tobamovirus Group as a whole.

The same naming rules and guidelines for coding individual viruses, are also applied for the Pepper Tobamovirus Group codes.

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.

		Group	Tm:0	Tm:1	Tm:2	Tm:3
Differentials		ISF Code and races	TMV ToMV BPMoV ToMMV	TMGMV PaMMV	PMMoV: 1.2	PMMoV: 1.2.3
		Gene (s)				
		Lamu, Early Calwonder	<i>L0</i>	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, CAPMVR, (PI260429)	<i>L4</i>	HR	HR	HR	HR	

Explanatory Note:

When evaluating plant varieties for resistance to specific pathogens or pests, the following classifications are used to describe their response:

- **S** – Susceptible
- **HR** – Highly Resistant

All groups/races and differentials are actively used across the seed sector

You can find further information on these definitions in the following ISF document <https://worldseed.org/document/definitions-of-the-terminology-plants-pests-v-o-seed-industry-2022/>

References:

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

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