

## Differential Sets

### *Tomato spotted wilt virus (TSWV) Solanaceae vegetable crops*

*Tomato spotted wilt virus (TSWV)* causes major economic losses globally due to an extremely wide host range involving more than 1000 species of plants in more than 85 families that include important ornamental, fruit, and vegetable crops (German et al. 1992, Pappu et al. 2009)

Resistance to TSWV is present in both tomato and pepper. The most commonly used resistance genes are named *Sw5* (tomato) and *Tsw* (pepper). Isolates originating from tomato can infect pepper and also isolates originating from pepper can infect tomato.

Resistance breaking strains are reported in tomato (Crescenzi et al. 2015, Hoffmann et al. 2001) and pepper (Roggero et al. 2002, Moury 2012). Mutations leading to resistance breaking of *Sw5* and *Tsw* occur at different locations on the virus genome.

- tomato; Nsm (Lopez et al. 2011)
- Pepper; NSs (de Ronde et al. 2013)

An integrated disease management approach must be taken to effectively manage this disease as no single strategy holds up over time. Continuous use of resistant tomato and pepper varieties led to the emergence of resistance breaking strains in both crops.

To characterize resistance breaking isolates per crop coding T1/P1 is used (Smilde and Peters, 2007)

Isolate	<i>Sw5</i>	<i>Tsw</i>
P0	non-breaking	non-breaking
P1	non-breaking	breaking
T0	non-breaking	non-breaking
T1	breaking	non-breaking

Resistance breaking isolates can be grouped in races that can be characterized by the common differentials listed in the tables below:

## Tomato

Differential hosts	TSWV: 0*	TSWV: 1*
VFN8*, Momor*	S	S
Stevens*, Mospomor (Sw5)*	HR	S

S = susceptible, necrotic and chlorotic ringspots, systemic necrosis, stunting in early infections;  
HR = highly resistant, local necrotic lesions

\*differential hosts and isolates that are used by the seed sector

## Pepper

Differential hosts	TSWV: 0*	TSWV: 1*
Yolo Wonder*	S	S
PI152225*, Chi7 (Tsw)*	HR	S

S = susceptible, chlorotic ringspots and mottling, stunting,  
HR = highly resistant, local necrotic lesions.

\*differential hosts and isolates that are used by the seed sector

P1 isolates can cause systemic mosaic and/or necrosis and plant death on pepper plants carrying the *Tsw*-gene.

## References

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### **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](mailto:isf@worldseed.org)

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