High Resistance (HR) to ToBRFV: adding value to the whole supply chain

ENZA ZADEN

At the end of 2020 Enza Zaden announced the discovery of the high resistance gene to ToBRFV. Paired with sanitary precautions, the best solution to fight this devastating tomato virus.

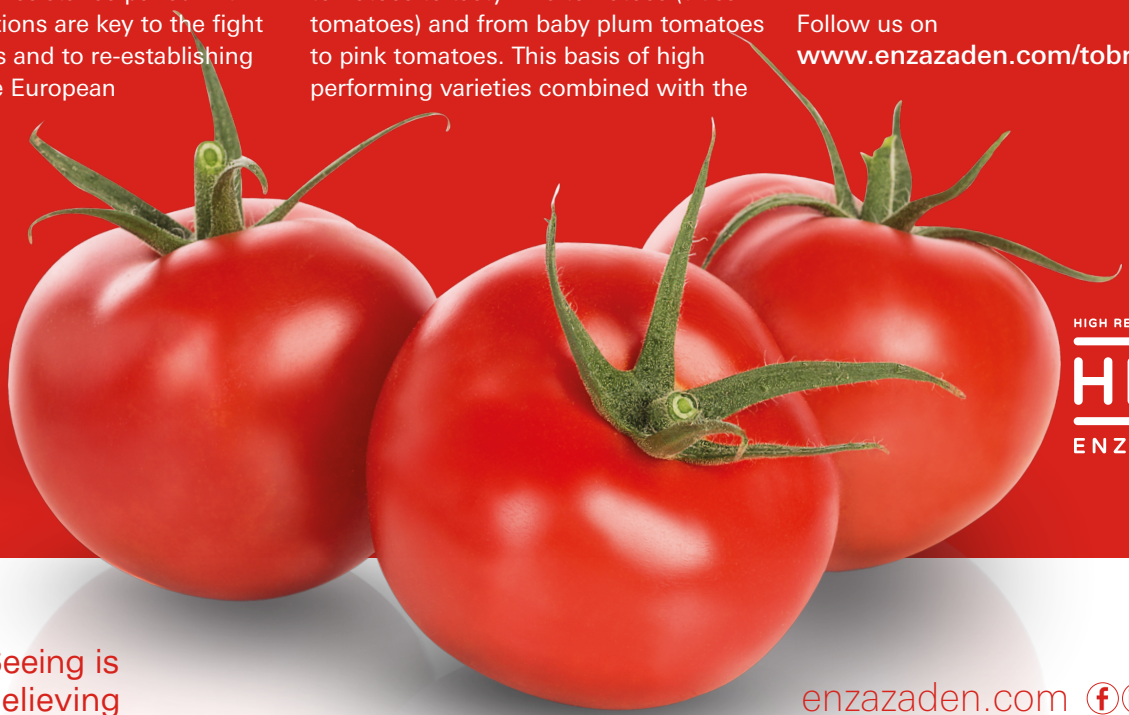
Why is high resistance so important?
An intermediate level of resistance (IR) slows down the multiplication and spread of the virus, but it nevertheless gets into the tomato plants, causing symptoms and affecting the quality, as well as the final crop yield. Conversely, plants and fruits with a high level of resistance (HR), do not act as hosts for the virus, therefore they are no longer a source of its spread. High resistance paired with sanitary precautions are key to the fight against the virus and to re-establishing continuity in the European tomato supply. This is why our team of geneticists has focused on achieving high resistance, and we have been the first to do so.

High quality and high resistance
Since the discovery of the ToBRFV high resistance gene Enza Zaden worked hard on introducing it in the elite parent lines. At this moment there are high-quality parent lines with the ToBRFV resistance. This helps to make high resistance tomato varieties.

Enza Zaden has a long history in breeding tomatoes. "We have a very wide range of tomato varieties, from large beef tomatoes to tasty vine tomatoes (truss tomatoes) and from baby plum tomatoes to pink tomatoes. This basis of high performing varieties combined with the gene we discovered, will enable us to deliver the high performing varieties with high resistance to ToBRFV" explains Kees Könst – Tomato Crop Research Director at Enza Zaden. Trials with highly resistant varieties have been placed in all targeted areas. The results are promising, and high resistance has proven to deliver high performing crops with top fruit quality.

Our solution is right around the corner
Eradicating the ToBRFV virus remains our top priority, so that value will be added for the whole supply chain. Therefore, it is fundamental to collaborate with all its individual parts. From the geneticists all the way through to the final consumers.

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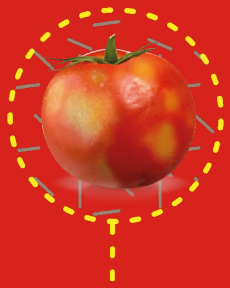
IR or HR. What's the difference?

Enza Zaden identified the gene that ensures high resistance to ToBRFV in their coming tomato varieties. But what's the difference between Intermediate (IR) and High (HR) resistance?



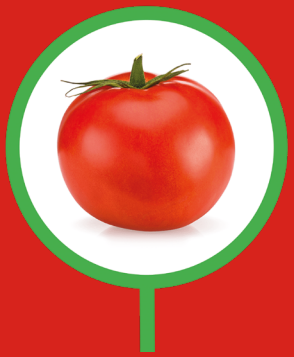
No resistance

- Virus multiplies to a high level in the plant.
- Yellow spots and wrinkled patches on plant & fruits.
- Presence of virus particles in the plant or fruits.
- Yield can be affected.



Intermediate resistance (IR)

- Virus propagation is delayed.
- Presence of virus particles in the plant or fruits.
- The crop can show symptoms of the virus in the leaf and/or fruits.
- Yield can be affected.



High resistance (HR)

- Highly restricts the accumulation of the virus.
- No spread of the virus in the crop.
- Yield is unaffected under normal disease pressure.

Definition:

- **Intermediate resistance (IR)**: plant varieties that restrict the growth and/or development of the specified pest and/or the damage it causes but may exhibit a greater range of symptoms or damage compared to high resistant varieties. Intermediate resistant plant varieties will still show less severe symptoms or damage than susceptible plant varieties when grown under similar environmental conditions and/or pest pressure.
- **High resistance (HR)**: plant varieties that highly restrict the growth and/or development of the specified pest and/or the damage it causes under normal pest pressure when compared to susceptible varieties. These plant varieties may, however, exhibit some symptoms or damage under heavy pest pressure.

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