



"The importance of WP5 "Improving resistance against (emerging) disease" work in HARNESSTOM project."

In the EU project HARNESSTOM, one of our objectives is to improve tomato resistance against three emerging diseases caused by a tobamovirus - ToBRFV (Tomato brown rugose fruit virus), a begomovirus - ToLCNDV (Tomato leaf curl new Delhi virus) and a fungus - *Fulvia fulva* (*syn. Cladosporium fulvum*).

- (ToBRFV) is an emerging RNA virus that threatens tomato production worldwide. Currently, no commercial ToBRFV-resistant tomato cultivars are available. Therefore, there is a great need to identify resistance sources in order to develop resistant cultivars. In the HARNESSTOM project, we have screened about 1000 wild tomato accessions and identified a number of resistant ones. Molecular markers are being developed to assist introducing the identified resistance into cultivated tomato cultivars.
- The fungus *Fulvia fulva* causes tomato leaf mold disease. Resistant tomato recognizes *F. fulva* avirulence (*Avr*) effectors by means of *Cf* receptor proteins leading to resistance. So far, several *Cf* genes have been characterized and deployed in tomato cultivars. To help breeders accelerate their breeding programs, we have reported details methods for *Avr*-based detection of the functional *Cf* genes. Due to the fast evolution of the *Avr* effectors, the durability of the *Cf* genes has proven to be limited. In order to achieve a more durable resistance, we are introgressing, mapping and characterizing a significant number of novel *Cf* genes from wild tomato relatives.
- To combat the begomovirus ToLCNDV, tomato lines have been generated that carry a number of genes for resistance to a related begomovirus, TYLCV (tomato yellow leaf curl virus). These tomato lines are being tested in the field of HARNESSTOM partners to evaluate their effectiveness to ToLCNDV.



Symptoms on fruits of *S. lycopersicum* infected with ToBRFV.

