

**Development of a universal and reliable scale for evaluation
Of TYLCV-resistance level in tomato plants**

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Tomato yellow leaf curl virus (TYLCV) is one of the most devastating viral pathogens of cultivated tomatoes in tropical and subtropical regions. The virus is a monopartite geminivirus, transmitted by whiteflies. Control measures in infected regions are based on limitation of the vector population, which usually requires heavy pesticide use and/or physical barriers such as 50 mesh nets. However, control of the viral vector by mechanical barriers is difficult, expensive, and hardly applicable to open-field cultivation, while heavy pesticide use has a deleterious effect on the environment. Thus, genetic resistance in the host plant is an ideal defense against whitefly-transmitted viruses, since it requires no chemical input and may be stable and long lasting. As all tomato (*L. esculentum*) cultivars are extremely susceptible to TYLCV, breeding programs have been based on the transfer of resistance genes from accessions of wild origin into the domesticated tomato. Since growth conditions have a strong affect on severity of disease symptoms induced by TYLCV, one of the major obstacles in the development of TYLCV-resistance is the assessment of resistance level displayed by the plant. We have developed a scale of differential hosts, which enables the determination and comparison of level of resistance to TYLCV expressed by resistant tomato plants. The scale is composed of seven different homozygous tomato genotypes that exhibit different levels of TYLCV resistance, ranging from fully susceptible to highly resistant. The resistant differential hosts composing the scale were inoculated with TYLCV under different environmental conditions. Four weeks after inoculation the plants were evaluated for disease symptom severity, and virus level in the inoculated plants was determined. While the score of each individual resistant genotype indeed changed under different environmental conditions, its position on the scale did not. Thus, in order to evaluate disease resistance of a given tomato genotype, the genotype in question is being inoculated alongside the differential hosts composing the scale, and within four weeks one can determine the relative level of resistance of the tested genotype related to its position on the resistance scale.