Grafting to manage tomato leaf curl New Delhi virus in cucurbits

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Tomato leaf curl New Delhi virus (ToLCNDV) is an emerging begomovirus (*Geminiviridae* family) listed in the EPPO Alert-list 2, present in the Mediterranean area and in Italy, where it was reported in 2015 in Sicilian courgette and since then its recurrent outbreaks generated justified concern among growers. The virus is particularly harmful in cucurbits, where it causes 100% production losses, thus a sustainable and environmentally friendly approach must be adopted. Genetic resistances have been identified in *Cucurbita moschata* and *Luffa cylindrica*, but the graft could provide a faster and more flexible solution inducing tolerance rather than resistance, as shown in tomato crops by grafting susceptible commercial tomato varieties onto the tomato wild ecotype Manduria (Ma). Here we report results of a screening among twenty-one local cucurbit ecotypes to evaluate tolerance levels against mechanical transmission of ToLCNDV. Results will lead to the identification of potential rootstocks to attain suitable levels of tolerance against the virus in commercial cucurbit varieties. Plants were challenged with ToLCNDV isolated in Apulia and observed for disease symptoms development and viral DNA accumulation by quantitative dot-blot assays at 14 and 28 days after inoculation. *C. melo* var. Retato standard (F1 commercial hybrid) and *C. pepo* var. Scuro di Milano proved the most susceptible, whereas *C. melo* var. Barattiere and *C. pepo* accession 5 the most tolerant. Tolerant plants did not show disease symptoms and very low level of virus accumulation, suggesting their use as rootstocks of grafted cucurbits against ToLCNDV outbreaks.

Raman spectroscopy detection of virus infection in asymptomatic tomato and grapevine plants

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Plants are exposed to a huge variety of biotic stresses caused by different pathogens and react to them by activating several metabolic pathways. Among pathogens, viruses are the most difficult to control and their reliable detection in the early stages of the disease may help to reduce their spread and alleviate the economic impact. Besides laborious, costly and destructive diagnostic serological and molecular techniques, Raman spectroscopy (RS) is an innovative alternative method for a quick, cheap and non-destructive pathogen detection by the creation of a sample chemical fingerprint. In this study, the efficiency of RS (in combination with chemometric analysis) in virus detection in asymptomatic samples and in the monitoring of the virus infection progress in two selected agricultural crops was investigated. Tomato plants infected by tomato yellow leaf curl Sardinia virus (TYLCSV) and tomato spotted wilt virus (TSWV), and grapevine plants infected by grapevine fanleaf virus (GFLV) and grapevine rupestris stem pitting-associated virus (GRSPaV) were analysed. RS successfully differentiated the RS profiles of healthy and virus-infected asymptomatic plants with 70 and 85% precision for TYLCSV and TSWV, respectively, and with 80 and 100% accuracy for GRSPaV and GFLV in grapevine, respectively. Metabolic changes in chlorophylls, carotenoids, and polyphenolic compounds occurring in asymptomatic infected leaves were identified as the principal biomarkers. The potential uses of this emerging and cutting-edge technique for real-time in-field virus detection in crops will be outlined.

Plant pest surveillance program and survey results in Italy

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Since the second half of the nineteenth century, the introduction of plant pests has been a critical issue for national agricultural production. First in Italy, Umberto I of Savoy created a network of *consortia* with the purpose of monitoring phylloxera infestations. Then, processes such as trade globalization and climate change have greatly facilitated the introduction of non-native pathogens. Nowadays, EU legislation obligates Member States for annual plant health