MARKER-ASSISTED SELECTION OF THE TYLCD RESISTANCE GENES Ty-1 AND Ty-2 IN TOMATO

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Tomato yellow leaf curl disease (TYLCD) is a devastating viral disease worldwide. Two species have been associated with epidemics in Italy: Tomato yellow leaf curl virus (TYLCV) and Tomato yellow leaf curl Sardinia virus (TYLCSV). Genetic resistance is the most economic and sustainable way to control this disease. Several sources of resistance have been discovered in wild tomato species. However, classical selection has been proven to be slow and difficult. This study is focused on the development of traditional Italian varieties of tomato resistant to TYLCD. In order to investigate the effectiveness of two of such resistance loci, we screened lines LA3473 and H24, carrying respectively Ty-1 and Ty-2 genes, against TYLCD isolates collected in tomato production regions in the south of Italy. Ty-1 gene has shown to provide tolerance to TYLCSV isolate whereas Ty-2 has proven to be fully effective against TYLCV isolate. Two CAPS markers linked to each gene, TG178 and TG436 for Ty-1, TG105A and C2_At5g25760 for Ty-2, were screened for their utility in marker-assisted breeding programs. F2 populations from crosses between resistant and susceptible lines were marker-analysed and selected F3 progenies were phenotyped for their resistance.