

POTATO RESISTANCE GENE *R1* IS EXPRESSED IN TOMATO PLANTS AND CONFERS RACE SPECIFIC RESISTANCE TO *PHYTOPHTHORA INFESTANS*

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Tomato (*Solanum lycopersicon*) is one of the most important vegetable crops in Italy. During its cultivation it is challenged by several pathogens. Serious damages are often caused by oomycete *Phytophthora infestans* (the casual agent of late blight) under greenhouse conditions. In tomato germplasm, several resistance genes to late blight have been identified and mapped. However, the control of this disease is mainly carried out by chemical treatments, as these sources of resistance were found not effective against the pathogen.

Two tomato cultivars (Moneymaker and S. Marzano) were transformed with *Agrobacterium tumefaciens* strain LBA 4404 10_2, which contains the *R1* gene of resistance to *P. infestans*. About 250 explants were co-cultivated with *A. tumefaciens*. In total 39 shoots (18%) were regenerated with an average of 8 plants per experiment (4%). Kanamycin resistant plants were tested for the presence of the gene of interest using specific primers. Out of 8 regenerated plants, 5 showed the expected PCR genomic product of 1.4 kb and the c-DNA PCR product of 1.2 kb in all lines. Molecular analysis to detect the introgression of the gene and the gene copy numbers was conducted by Southern blot and by relative Real Time PCR. The primary transformants (T0) were grown in a greenhouse and each plant gave a progeny (T1). About 30 T1 seedlings were screened by genetic analysis with *R1* specific primers. Pathogenesis tests revealed that T1 genotypes containing the *R1* gene are resistant to *Phytophthora infestans* race 4, which carries the avirulence gene *Avr1*. To understand the number of resistance pathway and to identify the signaling molecules involved in the induction of defense response, functional characterization of these plants is in progress.