

PROJECT TITLE

Evaluation of the susceptibility to powdery mildew of genome-edited grapevine plants in different environmental conditions using SunScreen installation

CONSORTIUM

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SUMMARY OF THE REPORT

The project aimed to evaluate the susceptibility of grapevine transgenic lines to powdery mildew, a devastating disease caused by the fungal pathogen *Erysiphe necator*. The plants tested in this experiment were edited lines in which one or two susceptibility genes of the Mildew locus O (MLO) family were knocked out.

The mutants were acclimatised in the SunSCREEN growth chambers installation for one week, then inoculated with *E. necator* and followed for two further weeks. Two growth chambers were used in parallel experiment to follow the progression of the fungus in two climate conditions: the first “control” condition was set to mimic the climate of June 2019 (detected at local vineyard close to Fondazione Mach, Italy), and the second one was identical to the control climate but for a higher temperature (plus 3 °C). The progression of the fungus was done taking advantage of the SignalScreen platform. Together, the SunSCREEN and the SignalSCREEN installations helped to determine the reduced susceptibility of grapevine single and double mutants edited in two *MLO* genes as compared to each other and to the fully susceptible wild type plants of the same cultivar. The SunSCREEN growth chambers allowed to test these transgenic plants in conditions similar to those present in the vineyard.