

PRODUCTION OF TRANSGENIC WHEAT PLANTS EXPRESSING THE PROTEIN INHIBITORS AcPMEI AND PvPGIP2 TO ENHANCE RESISTANCE TO FUNGAL DISEASES

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Many pathogens produce a wide range of cell wall degrading enzymes (CWDE) and among them polygalacturonases (PGs) are one of the first enzymes produced during the infection process. Plants possess cell wall inhibitors that inhibit PG activity (PGIPs). Wheat plants expressing a bean PvPGIP2 showed a reduced disease symptom caused by *Bipolaris sorokiniana* and *Fusarium graminearum*. PG activity is also limited by the level of methyl esterification of the cell wall pectin. Pectin methyl esterification is controlled by the activity of the pectin methyl esterase (PME) and its inhibitor (PMEI). Wheat plants expressing a kiwi AcPMEI showed a reduced disease symptom caused by *Bipolaris sorokiniana* and *Fusarium graminearum*. In order to test the possibility to enhance further wheat resistance against fungal pathogens by limiting the degradation of cell wall pectin, we used traditional breeding to cross the transgenic wheat plants expressing PvPGIP2 and AcPMEI. PCR assays and inhibition analyses of F1 and F2 progenies demonstrated the possibility to combine the expression of both transgenes. Parental lines and F1 and F2 hybrid plants expressing both inhibitors were tested against *B. sorokiniana* and the evaluation of the symptoms showed similar level of protective effect of hybrid plants and AcPMEI and PvPGIP2 parental lines. Additional tests with *B. sorokiniana* and *F. graminearum* on AcPMEI/PvPGIP2 homozygous plants are under evaluation.