Euphresco

Success story

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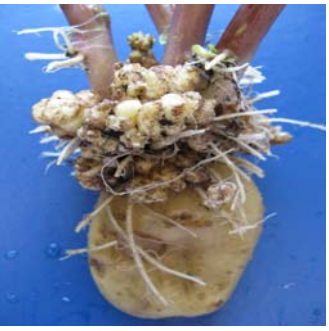
Detection and identification of pathotypes in potato wart disease



Potato wart disease, caused by the fungal pathogen *Synchytrium endobioticum*, is a major quarantine pathogen in potato worldwide. The disease causes wart-like outgrowths at growing points, e.g. on buds on tubers, in leaf axils, and also on stolons. Different 'forms' of the pathogen occur in potato fields, and these different forms are officially called 'pathotypes' or 'races'. The pathotypes differ in their ability to infect cultivars of potato. Nowadays, many cultivars of potato are fully resistant to the originally introduced *S. endobioticum* pathotype 1(D1), which was introduced into Europe around 1880-1900. New pathotypes have developed since the 40-ties of the last century, when the first signs in the field arose that the resistance against pathotype 1(D1) had been broken. Since that moment many pathotypes have been described in the literature. Unfortunately, different countries have used different potato cultivars to identify pathotypes, and today efforts are made to harmonise the set of potato cultivars used via EPPO and EPPO Diagnostic Protocols. Recently, perspectives of using molecular tools to discriminate between pathotypes became more and more realistic.

The aims of this project were to test differential cultivars for pathotype identification in *Synchytrium endobioticum*. Moreover, the consortium took the initiative to validate PCR methods developed for detection and identification of *S. endobioticum* and its pathotypes. Finally, the initiative for whole genome assembly in *S. endobioticum*, initiated by Plant Research International in 2009/2010, was developed further.

One bio-assay, the Glynne-Lemmerzahl method, was used for a test performance study in identification of pathotypes. Five laboratories joined this validation, and the potato cultivars 'Talent' and 'Gawin' showed perspective to replace some older/less stable cultivars currently used. Three PCR tests described in the literature were also tested for performance, with about ten participants. Two tests focused on the detection of *S. endobioticum* (one conventional, one real-time PCR). The third test, developed by Plant Research International, discriminates between isolates of pathotype 1(D1) and other pathotypes (e.g. 2(G1) and 18(T1)). Using wart material as starting material, all PCR tests performed much better (e.g. sensitivity, reproducibility) than when using dilutions of (pure) resting spores obtained from inoculum collections.

Project ID: Diagnostic methods for *Synchytrium endobioticum*, especially for pathotype identification (SENDO).