



S U C C E S S S T O R Y



## EVOLEP : encouraging the sustainable management of resistances to the phoma of new hybrids of rapeseed

The aim of the EVOLEP project was to perfect at the level of a local area **management strategies for cropping systems**, with a view to **limiting the risk of phoma** on rapeseed and ensuring the long-term effectiveness of varietal resistances. The intention in particular is to monitor the variations in the virulence of the pathogen populations in the Centre region of France following the introduction of the specific resistance "Rlm7", and to perfect knowledge of the populations at varietal evaluation sites. The possible scenarios for the sustainable management of resistances were studied with the help of a SIPPOM-WORS spatio-temporal risk assessment model.



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### ► PLANT2PRO® BODIES

Terres Inovia & UMR Agronomie (Thiverval-Grignon, France)

### ► CREATION CONTEXT

The EVOLEP project was coordinated by Terres Inovia as part of the UMT Pivert. It started in 2008 for a planned duration of 3 years, in a context in which the phoma was relatively well controlled by genetic, quantitative or specific resistances. Nevertheless, the preceding cases of overcoming specific resistances and the deployment of a large-scale specific resistance encouraged the pursuit of the work, with the expectation of developing strategies for the sustainable management of these resistances. The project brought together Terres Inovia, the UMR Bioger (Versailles, France), the UMR Agronomie (Thiverval-Grignon, France), the French national Study and Control Group for Varieties and Seeds (GEVES) and Oleosem.

### ► ADDED-VALUES FOR COMPANIES

Thanks to the perfecting of high-throughput molecular methods, EVOLEP made it possible to define more easily varietal assessment sites and different alleles of virulence. The project led to the acquisition of totally new knowledge about the structures of populations of *Leptosphaeria maculans* and specific interactions between virulences. The model for promoting sustainable management of resistances makes it possible to simulate different agronomic scenarios, so as to foresee the future development of populations of pathogens, by taking into account the performances of the different varietal types. This model led to the re-thinking with stakeholders in the field of management strategies for cropping systems so as to foster the sustainable management of resistances to phoma and to reduce the impact of the disease.

### ► FUTURE PROSPECTS

The high-throughput molecular method used has shown its capacity to distinguish between different alleles of the "Avrim7" gene. This technique will then be developed for other applications for the recognition of specific alleles: target mutations for insects' resistance to pyrethrins, alleles of resistance to sclerotinia rot in certain fungicides, or the resistance of adventitious plants to certain herbicides. The SIPPOM model will be used for the construction of spatio-temporal models capable of managing several rotation crops, each with their communities of pests.

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