

ROBIO PROJECT

TOWARDS INTEGRATED PROTECTION OF ROSE AGAINST FOLIAR FUNGAL DISEASES: BIOCONTROL AND VARIETAL RESISTANCE

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PROJECT PARTNERS



Introduction

Roses face major fungal leaf diseases:



Black spot
Hemibiotroph
(*Diplocarpon rosae*)



Mildew
Biotroph
(*Peronospora sparsa*)



Powdery mildew
Biotroph
(*Podosphaera pannosa*)



Rust
Biotroph
(*Phragmidium mucronatum*)

In a context of reducing chemical pesticide use, the ROBIO project explores sustainable ways to limit the impact of these pathogens.

This initiative is part of France's Ecophyto II+ plan and is funded by the French Office for Biodiversity (OFB).

A 3 steps experimental design

Results overview

1. LABORATORY SELECTION OF THE MOST PROMISING PRODUCTS BASED ON THEIR MODE OF ACTION

10 PRODUCTS

Biocontrol products or base substances - Approved or under development

Extensive laboratory testing to determine their mode of action (IRSH, Vegenov)

Direct effects

(competition test and/or spore germination test)



Competition tests

Stimulation of plant defenses

(qPFD® chip – INRAE License)

+ Efficacy trials (Vegenov)

- ✓ Different modes of action observed
- ✓ Good efficacy of 5 products, selected for step 2: *Limocide*, *Soriale*, *Fytosave*, *CL*, *Triatum*

2. EVALUATION OF THE INTERACTION "BIOCONTROL X VARIETAL RESISTANCE" ON THE MANAGEMENT OF FUNGAL PATHOGENS IN ROSE, IN SEMI-CONTROLLED CONDITIONS

5 PRODUCTS

Assays on plants from cuttings in greenhouses or climatic chambers

Artificial inoculation



5 genotypes with different genetic backgrounds

- ✓ Different genotype resistance observed
- ✓ 3 products selected for step 3: *Limocide*, *Soriale* and *Fytosave*



Rust symptoms on three genotypes, showing variations in symptom intensity depending on genotype (source: Vegenov)

3. VALIDATION OF THE INTERACTION "BIOCONTROL X VARIETAL RESISTANCE" ON THE MANAGEMENT OF FUNGAL PATHOGENS IN ROSE, IN NATURAL CONDITIONS

3 PRODUCTS

Same 5 genotypes

One year (2024)

field trials in 5

sites with varied

environments



- ✓ Interesting resistance of "La garçonne" against black spot disease
- ✓ Heterogenous product efficacy of *Soriale* and *Limocide* that need to be further explored

Conclusion

The ROBIO project validated a stepwise method for testing (biocontrol × variety) combinations from lab to field, identifying promising candidates for rose disease control. It delivered key tools: the qPFD® gene-expression chip (patent extension pending) and a rust pathotest for rose resistance and biosolutions evaluation.

A France multi-site field network was also established to support future research and trials.

FUNDERS



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