Plant-microbiota interactions in resistance breeding – The case of pea root rot

L. Wille, M. M. Messmer, P. Hohmann & B. Studer
NO PEA FOR
10 YEARS

Pea for food and feed – an asset for sustainable farming systems

Root rot complexes challenge pea cultivation

Lukas Wille
Pea root rot – A complex phenomenon...

The root rot-Fusarium wilt complex of peas. Kerr 1963 *Australian Journal of Biological Sciences*
Pea root rot – A complex phenomenon...

The plant genotype determines the microbial composition.

The microbial balance determines plant health.

Lukas Wille
Screening for resistance against pathogen complexes

single species/strain inoculation

Naturally infested field soil
Screening for resistance against pathogen complexes

Number of lines

$SDW_{Rel.}$

growing very badly
growing well

Lukas Wille
Who is who in the pathogen complex – work in progress...

Lukas Wille
susceptible pea line

+ *Fusarium solani*
- mycorrhizal fungi

resistant pea line

- *Fusarium solani*
+ mycorrhizal fungi
Microbe-assisted crop production - The future of sustainable farming

- **Microbial markers for plant health**
- **Breeding for beneficial plant-microbiota interactions**
- **Inoculations of specific microbes**
- **Agricultural practises to promote healthy microbiomes**

[Diagram showing HOLOBIONT concept: Multicellular Host (Macrobe) + Microbial Symbionts (Microbes)]
Pierre Hohmann, Monika Messmer & Bruno Studer
Molecular Plant Breeding Team, ETHZ
Crop Department, FiBL
Mario Kurmann, Pilar Perreira & Marco Piccucci
Adnan Šišić, University of Kassel
Marie-Laure Pilet-Nayel, INRAE
Andrea Winterling, Lfl
Hans-Ueli Häberli