

HIP-BB3.1 'Resistance to microbes and viruses'

WP lead: Dr. Jack Vossen, Wageningen U&R, Plant Breeding

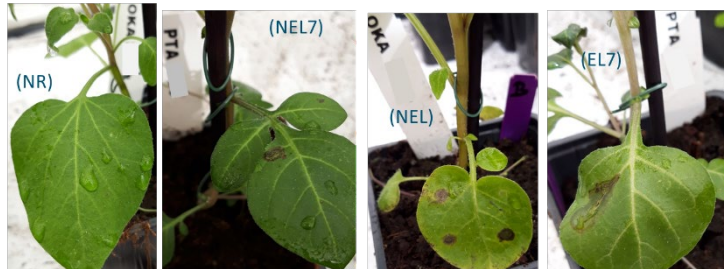
Highlights: In this workpackage we design foliage based phenotypic assays to provide a robust tool for high throughput screening of germplasm material. The work is divided in different modules. In 2019 a screen for module soft rot was performed and a pilot for module dry rot.

- Module soft rot: In 2019 we screened >300 genotypes from the PBR Solanum collection for foliar resistance to *Pectobacterium brasiliensis* and *Dickeya solani*. Around 100 genotypes for each bacterial species were found that responded differently than susceptible potato varieties (Figure 1). This is a surprisingly high number and suggests that foliar resistance is common among wild Solanum species and indeed has been overlooked in previous germplasm screens. The knowledge obtained in 2019 will be subject of practical validation research in 2020.

Figure 1.
Different lesion types observed in foliage inoculation assay with *Pectobacterium brasiliensis*. Varieties typically show expanding lesions, while in Solanum accession we find different types of responses reminiscent of resistance.

Lesion types

- Expanding lesions (EL)
- Non expanding lesions (NEL)
- Expanding lesions only at 10^7 (EL7)
- Non-expanding lesions only at 10^7 (NEL7)
- No response (NR)



- Module dry rot: We designed a stem inoculation method for *Fusarium solani* and *Fusarium sambucinum*. For the detection and quantification of both species in plant tissue we set up a Q-PCR assay.

Bottlenecks: No bottlenecks were encountered

Planning: In 2020 we will proceed according to the multiyear project description.

- Module soft rot: At WUR we will proceed with inventory research of the positive accessions. A selection of accessions will be made to validate their resistance in practical settings. This validation research is mainly performed by the participating companies.
- Module dry rot: >300 Solanum accessions will be screened for their resistance to *Fusarium solani* and *F. sambucinum*.
- Module agroinfiltration: A pilot will be performed in which effectors from fungal bacterial and viral effectors will be cloned into plant expression vectors.

Products: The expected products have been produced according to the plan

1: High throughput assays for *Fusarium* resistance screening.

2: Resistant accessions to soft rot