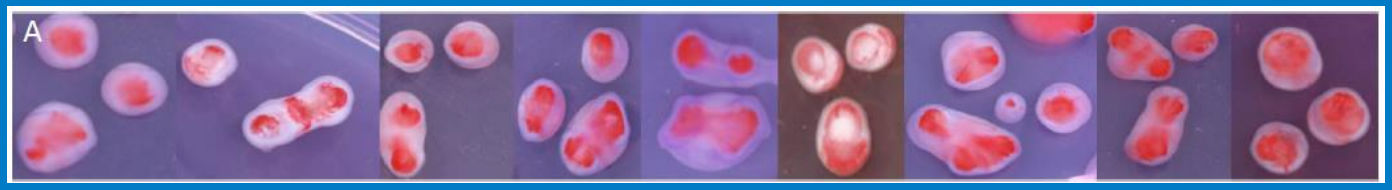
Netherlands Food and Consumer Product Safety Authority
Ministry of Agriculture, Nature and Food Quality

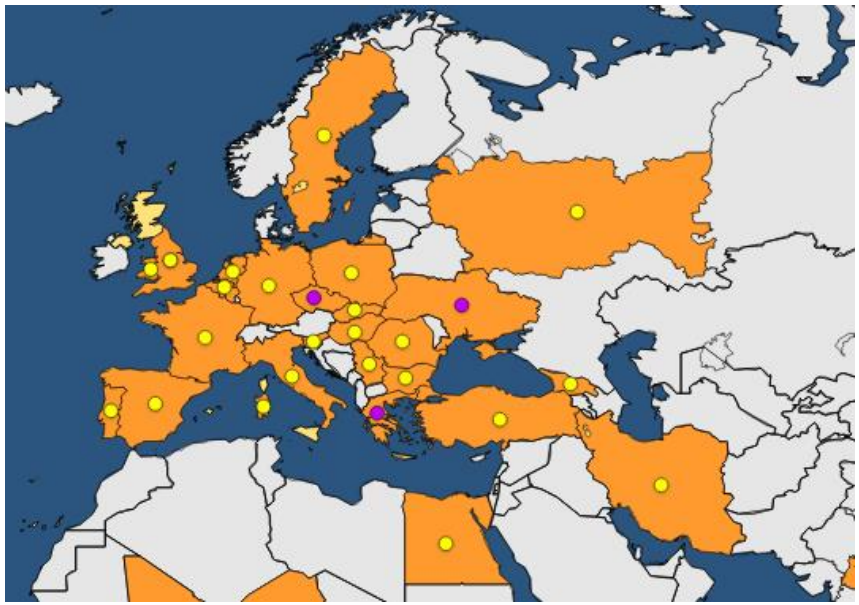
Virulence of an emerging bacterial pathogen on seed potato

Robert Vreeburg & Maria Bergsma-Vlami
Netherlands Institute for Vectors, Invasive plants and Plant health (NIVIP-NVWA)



Ralstonia solanacearum, a well-known pathogen

- *Ralstonia solanacearum* causes potato brown rot
- Present in EU since 1990's
- Widely distributed
- Much knowledge about epidemiology, host range etc.
- Tests and measures named in EU regulations



Ralstonia pseudosolanacearum, ??

Some of the findings:

- Outbreak in rose in 2015 – 2018 in NL
- From 2020 onwards findings in surface water (NL + HU)
- Findings in ginger and curcuma from 2021 onwards

- What do we know about *R. pseudosolanacearum?*

Taxonomy

Polyphasic taxonomic revision of the *Ralstonia solanacearum* species complex: proposal to emend the descriptions of *Ralstonia solanacearum* and *Ralstonia syzygii* and reclassify current *R. syzygii* strains as *Ralstonia syzygii* subsp. *syzygii* subsp. nov., *R. solanacearum* phylotype IV strains as *Ralstonia syzygii* subsp. *indonesiensis* subsp. nov., banana blood disease bacterium strains as *Ralstonia syzygii* subsp. *celebesensis* subsp. nov. and *R. solanacearum* phylotype I and III strains as *Ralstonia pseudosolanacearum* sp. nov.

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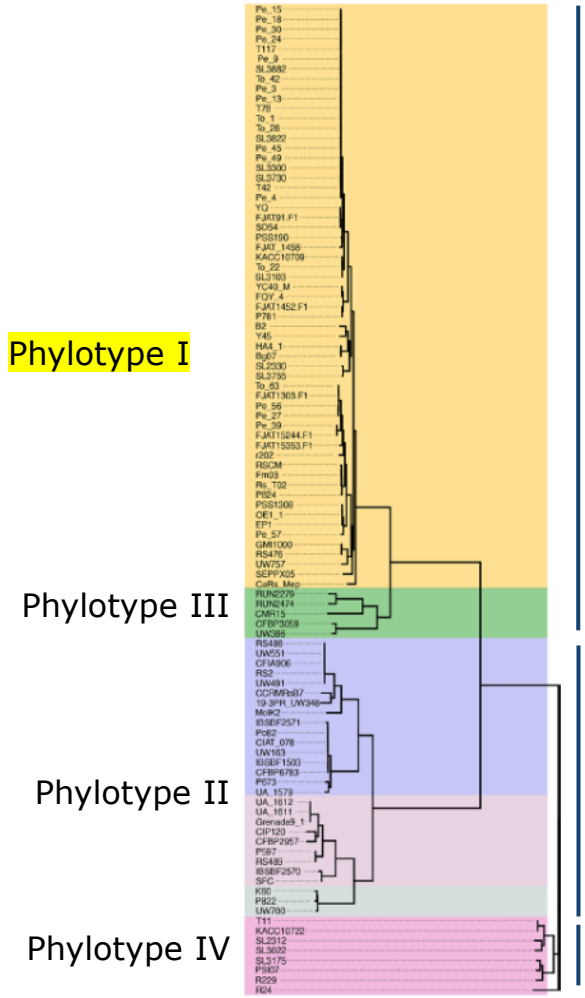
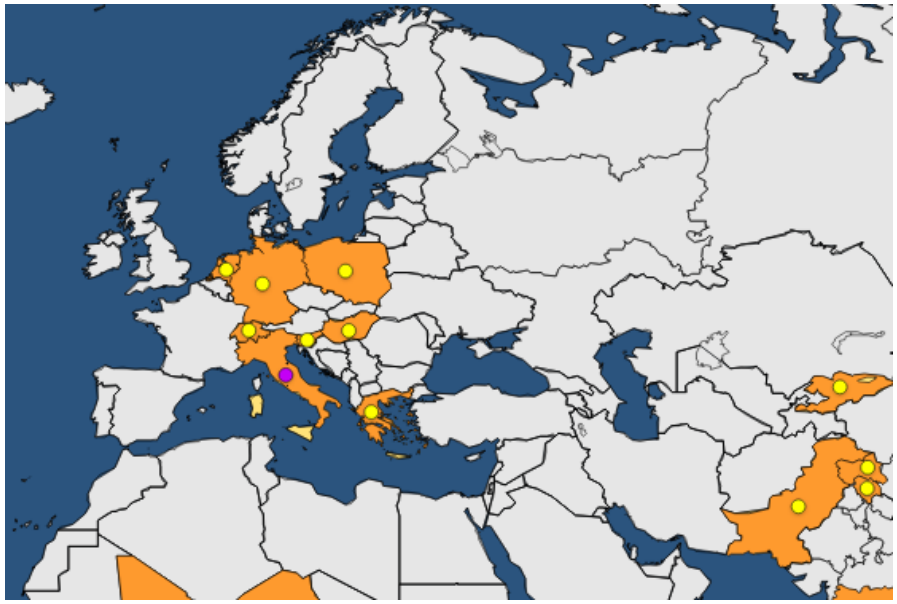
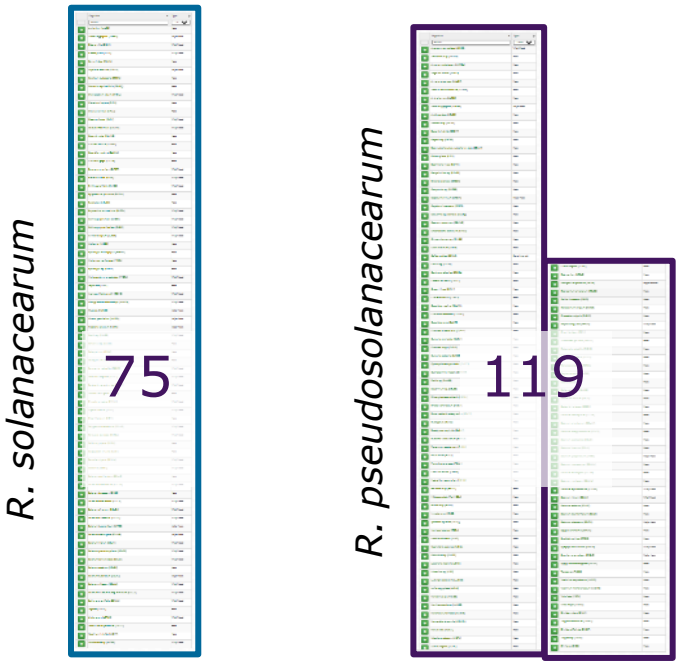


Adapted from Sharma *et al.* 2022

What do we know about *R. pseudosolanacearum* (phI)?



- *R. pseudosolanacearum* still in **Part A** of ANNEX II of (EU) 2019/2072 regulation (pests **not** known to occur in the Union territory).



Host plants in EPPO database.

2015-NL: *Ralstonia pseudosolanacearum* phy I on rose

DISEASE NOTES

First Report of Bacterial Wilt Caused by *Ralstonia solanacearum* in Ornamental *Rosa* sp

N. N. A. Tjou-Tam-Sin, J. L. J. van de Bilt, M. Westenberg, M. Bergsma-Vlami, H. J. Korpershoek, A. M. W. Vermunt, E. T. M. Meekes, H. A. S. Teunissen, and J. Van Vaerenbergh

Plant Disease • 2018 • 102:2258-2267 • https://doi.org/10.1094/PDIS-09-17-1345-RE

e-Xtra*

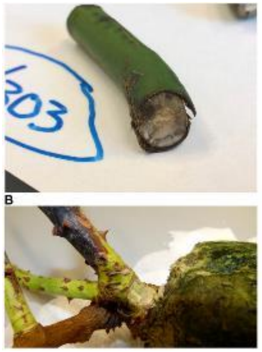
Phylogenetic Assignment of *Ralstonia pseudosolanacearum* (*Ralstonia solanacearum* Phylotype I) Isolated from *Rosa* spp.

M. Bergsma-Vlami,[†] J. L. J. van de Bilt, N. N. A. Tjou-Tam-Sin, and M. Westenberg, Dutch National Plant Protection Organization (NPPO-NL), P.O. Box. 9102, 6700 HC Wageningen, the Netherlands; E. T. M. Meekes and H. A. S. Teunissen, Naktuinbouw, P.O. Box. 40, 2370 AA Roelofarendsveen, the Netherlands; and J. Van Vaerenbergh, Institute for Agricultural, Fisheries and Food Research (ILVO), Plant Health Department B-9820 Merelbeke, Belgium

frontiers in Plant Science
ORIGINAL RESEARCH
published: 02 November 2017

Assessing the Pathogenic Ability of *Ralstonia pseudosolanacearum* (*Ralstonia solanacearum* Phylotype I) from Ornamental *Rosa* spp. Plants

Napoleon N. A. Tjou-Tam-Sin, Jeroen L. J. van de Bilt, Marcel Westenberg, Peggy P. M. A. Gorkink-Smits, N. Marco Landman and Maria Bergsma-Vlami*



2020-2024 NL: *R. pseudosolanacearum* phy I in surface water and bittersweet

APS Publications
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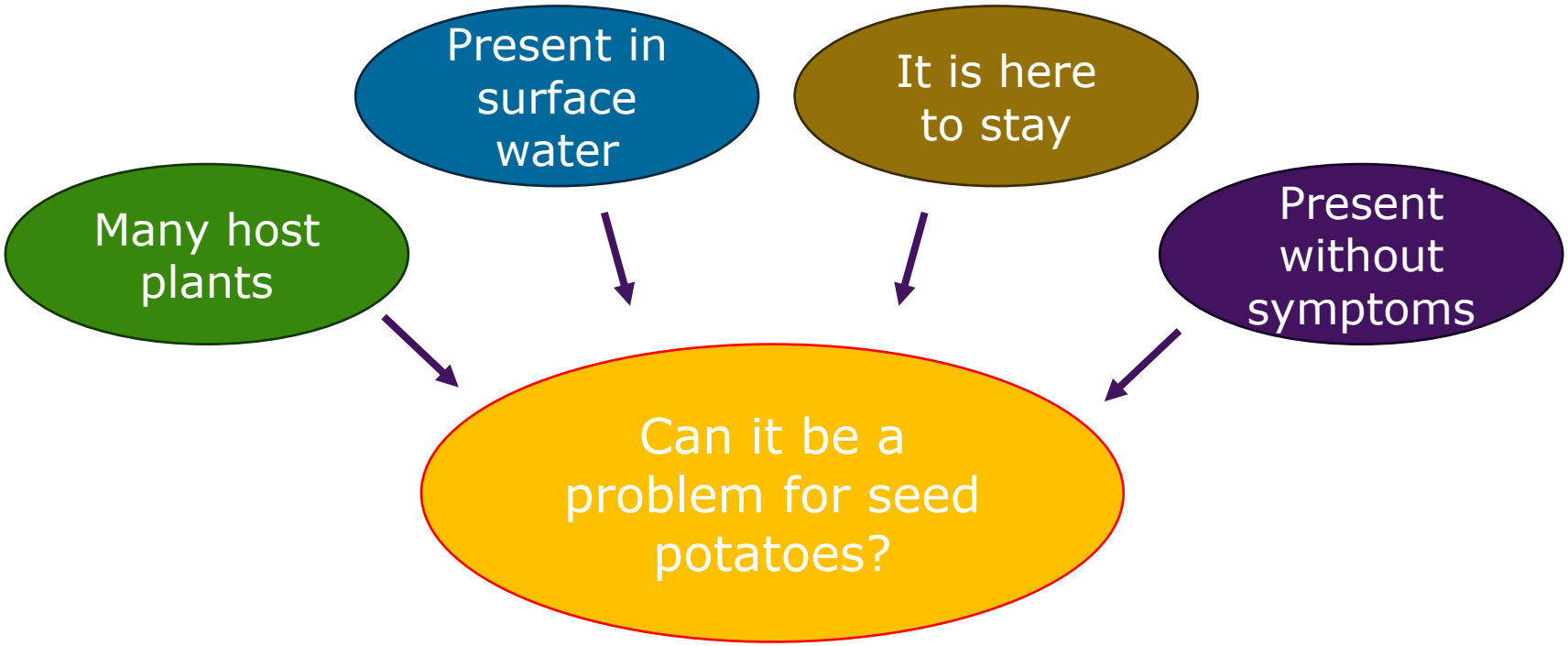
Presence of Ralstonia pseudosolanacearum (phylotype I) in aquatic environments in the Netherlands

Published Online:

Indirect evidence of pathogen survival under temperate climate!

2024-NL: *Ralstonia pseudosolanacearum* phy I on imported ginger

What do we know about *R. pseudosolanacearum* (phI)?



Virulence experiments on seed potato

Isolate	Equivalent	Pathogen	Phylotype	Sequevar	Host	Country	Year of isolation	Reference
PD 2762	CFBP 3857=NCPPB 4156	*R. solanacearum*	II	1	*Solanum tuberosum*	NL	1995	Wenneker et al., 1999
PD 7123	CFBP 8587	*R. pseudosolanacearum*	I	33	*Rosa* spp. cv. "Red Naomi"	NL	2015	Tjou-Tam-Sin et al. (2017b)
P 781	PD 7318	*R. pseudosolanacearum*	I	14	*Mandevilla*	USA	2014	Bocsanczy et al., (2014)
P 824	PD 7319	*R. pseudosolanacearum*	I	13	*Vaccinium corymbosum* L. *cv. "Arcadia"*	USA	2016	Norman et al., (2017)

Fontane

Kondor

Rosagold

Tomato

20°C

28°C

n = 8 plants (potato cultivar × *Ralstonia* strain)

Classes for disease severity evaluation

0

1

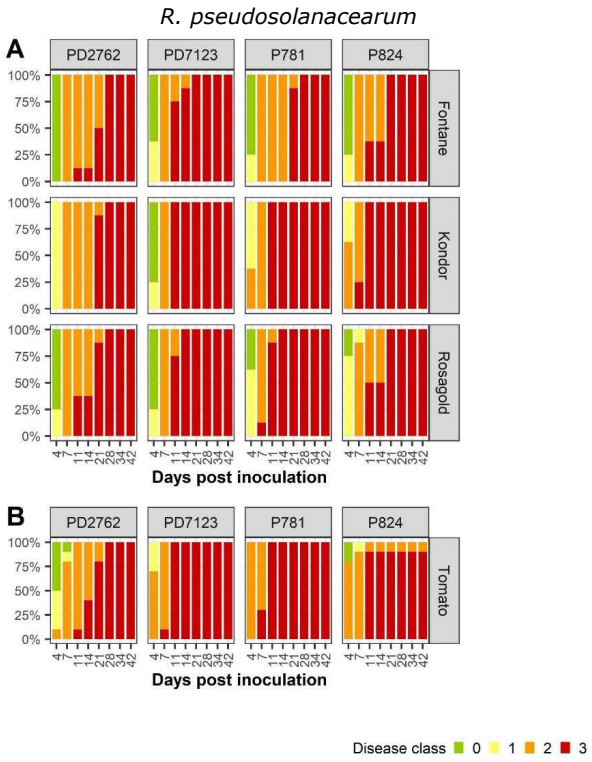
2

3

Disease class 0 1 2 3

Disease severity on potato

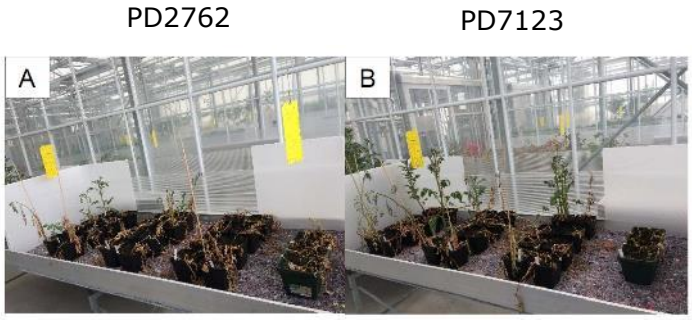
28°C



All three *R. pseudosolanacearum* strains highly virulent on potato/tomato 28° C!

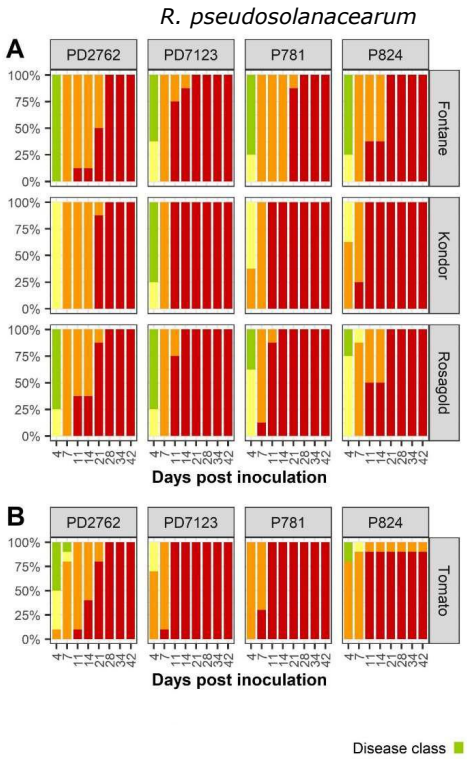
28°C

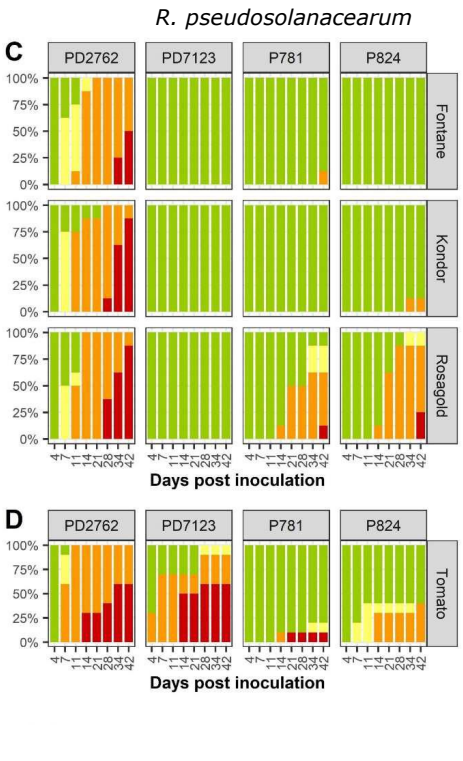
40 dpi



Disease severity on potato

28°C





20°C

Latent infections at 20° C!

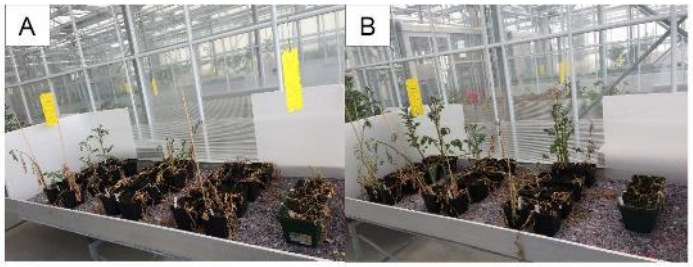
Disease class 0 1 2 3

All three *R. pseudosolanacearum* strains highly virulent on potato/tomato 28° C!

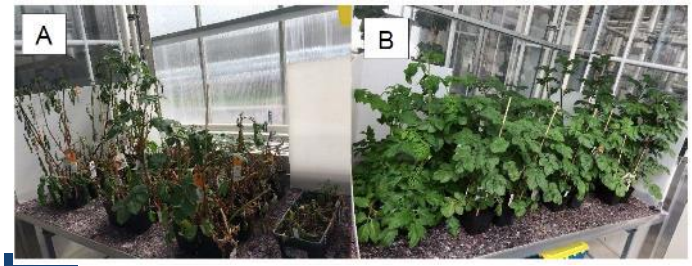
28°C

40 dpi

PD2762 PD7123

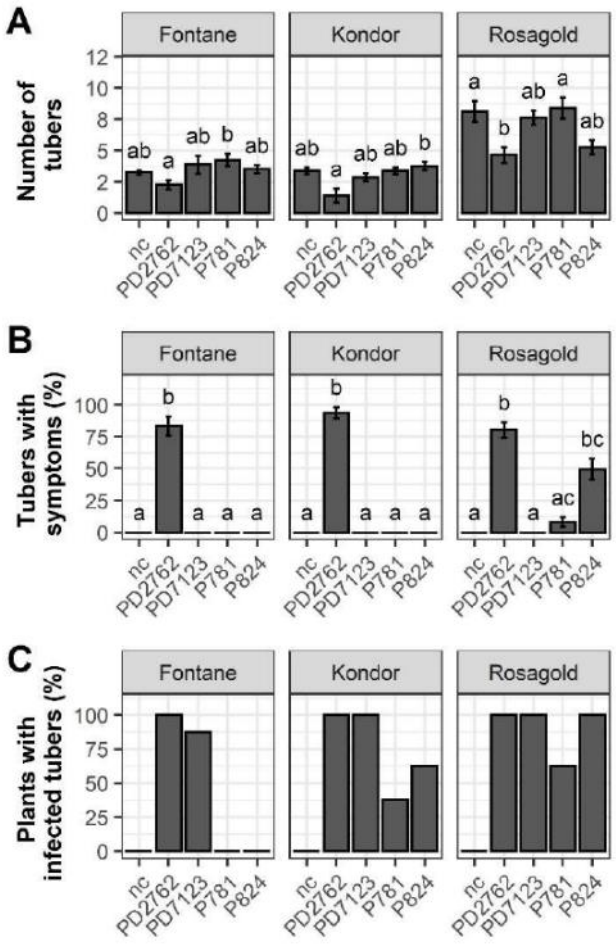


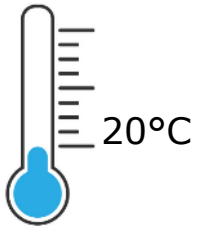
PD2762 PD7123



20°C

Infections of the daughter tubers at 20°C





Most tubers were infected
Only part had symptoms
Majority of daughter tubers were latently infected!

Conclusions

- *R. pseudosolanacearum* (PhI) are virulent on potato at high temperatures.
- Infections can be latent and inherited to daughter tubers.

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Special Report

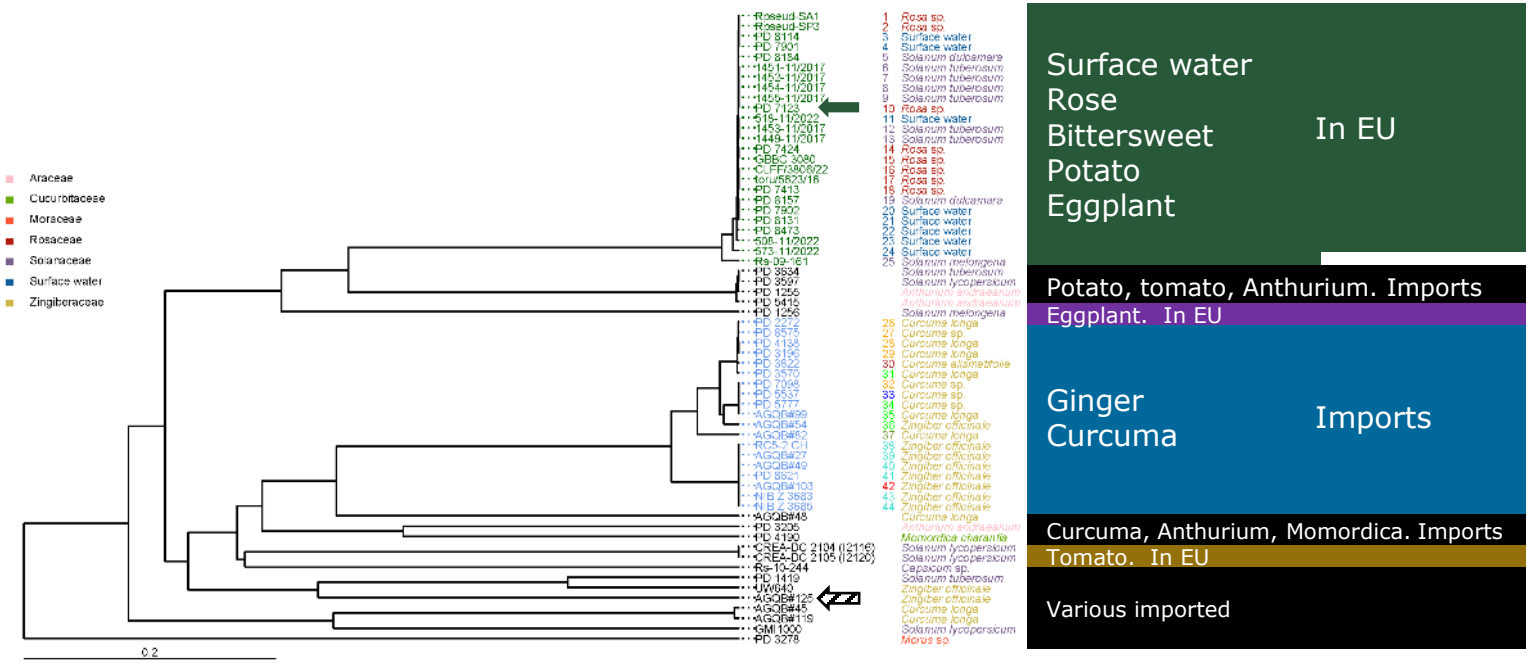
Virulence of Novel *Ralstonia pseudosolanacearum* (Phylotype I) Strains from Rose, Blueberry, and Mandevilla on Seed Potato

Remco Overeem,[1] Chiel Pel,[1] Napoleon Tjou-Tam-Sin,[1] Jeroen van de Bilt,[1] Peggy Gorkink-Smits,[1] Marco Landman,[1] Ana Maria B. Bocsanczy,[2] David Norman,[2] and Maria Bergsma-Vlami[1,†]

[1] Netherlands Institute for Vectors, Invasive Plants, and Plant Health (NIVIP), Wageningen, the Netherlands
[2] Department of Plant Pathology, Mid-Florida Research and Education Center, University of Florida, Apopka, FL 32703, U.S.A.

- Do we now know everything about *R. pseudosolanacearum* (PhI) infections on plants?

Conclusions – genetic diversity of *R. pseudosolanacearum* found in EU



- High genetic diversity of *R. pseudosolanacearum* found in EU.
- Virulence of new strains can be different from previously tested strains.

Acknowledgements

Thank you for your attention