PPO-Special Report no. 14

December 2010
H.T.A.M. Schepers (editor)

Applied Plant Research (Praktijkonderzoek Plant & Omgeving, PPO) part of Wageningen UR, is the ultimate knowledge institute for arable Farming, Multifunctional Agriculture and Field Production of Vegetables.

December 2010
Colofon

© 2010 Wageningen, DLO Foundation
All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of the DLO Foundation, Praktijkonderzoek Plant & Omgeving (Applied Plant Research), Business Unit Arable Farming, Multifunctional Agriculture and Field Production of Vegetables.

The Foundation DLO is not responsible for any damage caused by using the content of this report.

PPO Publication no. 396; at € 30,-

The twelfth workshop and proceedings were sponsored by the companies: BASF, Bayer CropScience, Belchim, Gowan, Nufarm, Dow AgroSciences, DuPont, Germicopa, Syngenta, Agrovision and Nordox

Applied Plant Research (Praktijkonderzoek Plant & Omgeving, PPO) part of Wageningen UR, is the ultimate knowledge institute for arable Farming, Multifunctional Agriculture and Field Production of Vegetables.

Address: P.O. Box 430, NL-8200 AK Lelystad, The Netherlands
Tel. +31 320 291 111
Fax +31 320 230 479
Email: infoagv.ppo@wur.nl
Internet: www.ppo.wur.nl
Preface

EuroBlight Workshop Arras, France 3-6 May 2010

A European network of scientists and other specialists working on potato early and late blight meet every 18 months. The network combines two previous networks originating from European Concerted Actions and has 150 members.

• EU.NET.ICP: “European network for development of an integrated control strategy of potato late blight” (1996-2000). Coordinated by Huub Schepers

The Twelfth Workshop was organised by Serge Duvauchelle, Ludovic Dubois (Ministère de l’Alimentation, l’Agriculture et de la Pêche, SDQPV), Didier Andrivon & Roselyne Corbière (INRA Rennes), Catherine Chatot (Germicopa SAS) and Marie-Pascale Latorse (BayerCropScience) in Arras, France from 3-6 May 2010.

Agrovision, BASF, Bayer, Belchim, Dow, DuPont, Germicopa, Gowan, Nordox, Nufarm and Syngenta sponsored the Workshop.

The Workshop was attended by 112 persons from 13 European countries, Russia, Algeria and United States of America. Representatives from all countries presented the late blight epidemic in 2009 and recent research results regarding integrated control, decision support systems, resistance of varieties and population biology of the late blight pathogen in potatoes. Since early blight is an increasing problem in Europe, also reports on this disease are included.

The papers and posters presented at the Workshop and discussions in the subgroups are published in these Proceedings, PPO-Special Report no. 14. The Proceedings are also available on the internet www.euroblight.net.

Alison Lees, Scottish Crop Research Institute (UK)
Jens G. Hansen, Aarhus University (DK)
Huub Schepers, Wageningen University (NL)

For further information please contact the network secretariat where also additional copies of this Proceedings can be ordered.

Secretariat
PPO-AGV Lelystad
Att. H. Schepers
PO Box 430
NL-8200 AK Lelystad
The Netherlands
Telephone: + 31 (0) 320 291111
Telefax: + 31 (0) 320 230479
E-mail: huub.schepers@wur.nl
Internet: www.ppo.wur.nl
# Table of contents

**PAPERS**

**Potato – a world production, a European business**  
Martine Schwartzmann ................................................................. 11

**The development and control of Late Blight (Phytophthora infestans) in Europe in 2009**  

**EuroBlight in a global context**  
Greg Forbes ................................................................................... 35

**Chosen characteristics of Polish Phytophthora infestans isolates**  
Marcin Chmielarz, Sylwester Sobkowiak, Renata Lebecka and Jadwiga Śliwka ....................... 39

**Monitoring the Dutch Phytophthora infestans population for virulence against new R-genes**  
Marieke Förch, Trudy van den Bosch, Petra van Bekkum, Bert Evenhuis,  
Jack Vossen and Geert Kessel .......................................................... 45

**The phenotypic characteristics of Estonian populations of Phytophthora infestans from organic and conventional potato crops**  
E. Runno-Paurson ........................................................................... 51

**Use of Geographic Information Systems (GIS) in Crop Protection Warning Service**  
Benno Kleinhenz and Thorsten Zeuner ............................................. 59

**EuroBlight tool for the comparison of late blight sub-models - Status and perspectives**  

**Opportunities for potato late blight DSS’s in Argentina**  
G. Kessel, M. Huarte, F. Lucca, M. Santini, C. Rijzebol, P. Raatjes, J. Rovers,  
J. den Boer and H. Schepers ............................................................ 75

**Effect of spore density, cultivar resistance and Phytophthora infestans isolate on tuber blight under field conditions**  
A. Evenhuis, P.J. van Bekkum and G.J.T. Kessel ........................................... 79

**Post-Harvest Application of Phosphorous Acid for Control of Phytophthora infestans on Potatoes**  
Steven B. Johnson .............................................................................. 85
Initium*: a new fungicidal active ingredient for the control of Oomycetes
Stephan Reimann, Klaas Jilderda, Matthias Gerber, Vanessa Tegge and Kristin Klappach...........89

Initium* based products for the control of Phytophthora infestans in potatoes
Stephan Reimann, Klaas Jilderda, Matthias Gerber, Vanessa Tegge and Kristin Klappach...........95

Infinito: protection of new growth from infection with Phytophthora infestans
M.P. Latorse, G. Duclos, S. Rauscher, C. Rhoné, R. Wanningen and S. Tafforeau...............101

Evaluation of mandipropamid for the control of potato late blight in Northern Ireland
Louise R. Cooke and George Little ..........................................................109

Report of the fungicide sub-group meeting on 5 May 2010: Discussion of potato blight fungicides, their properties and ratings
Ruairidh A. Bain .................................................................117

Breeding for host resistance: the key to sustainable potato production.
Simon White and David Shaw..........................................................125

Phenotypic and genotypic characteristics of Algerian isolates of Phytophthora infestans
Roselyne Corbiére, Fatma Zohra Rekad, Amina Galfout, Didier Andrivon and Zouaoui Bouznad ....................................................133

Changes within the Irish potato late blight population
S. Kildea, L.R. Cooke, L. Quinn, G. Little, C. Armstrong, F. Hutton, L.J. Dowley and D. Griffin ..........................................................147

Genotypic variation of Phytophthora infestans within and between fields in the Nordic countries
L. Grönberg, B. Andersson, N. Högberg, A.K. Widmark and J. Yuen.........................151

Öko-SIMPHYT (= Organic-SIMPHYT): A forecasting system for specific scheduling of copper fungicides against late blight
Beate Tschöpe, Benno Kleinhenz, Sven Keil and Michael Zellner.................................153

Report of subgroup epidemiology and decision support systems
Geert J.T. Kessel and Jens Grønbech Hansen ......................................................159

Occurrence of Alternaria solani in Sweden and its sensitivity to strobilurins
Eva Blixt and Björn Andersson ..............................................................161

Will the real Alternaria stand up please: Experiences with Alternaria-like diseases on potatoes during the 2009 growing season in The Netherlands
L.J. Turkensteen, J. Spoelder and A. Mulder ..........................................................165

Population genetics – consequences on early blight disease
Juergen Leiminger, Guenther Bahnweg and Hans Hausladen ........................................171
Molecular Analysis of Alternaria Populations Early Blight Causal Agents in Potato Plants
M.P. Latorse, F. Schmitt, S. Peyrard, S. Veloso and R. Beffa ....................................................... 179

Control of potato late blight using a dose model to adjust fungicide input according to infection risk
Bent Nielsen, Lars Bødker and Jens G. Hansen ........................................................................... 187

Reduced fungicide input in late blight control (REDUCE 2007-2011) – Preliminary results from 2007 to 2009
R. Nærstad, V.H. Le and A. Hermansen .................................................................................... 193

Experimental control strategies reducing the fungicide input at a practical scale
Geert Kessel, Joanneke Spruijt, Bert Evenhuis, Petra van Bekkum and Huub Schepers ......... 199

POSTERS ........................................................................................................................................ 205

Early Dormancy Break in Blighted Progeny Tubers
Holly Rivett, Ruairidh Bain and Mark McQuilken ..................................................................... 207

Crossability of wild potato species and advanced breeding lines resistant to late blight
B. U. Carlson-Nilsson and N. M. Zoteyeva ................................................................................. 209

Phenotypic characteristics of North-West Russian populations of Phytophthora infestans (2003-2008)
N.M. Zoteyeva and M.V. Patrikeeva ............................................................................................213

Latent infection rate of potato seed tubers with Phytophthora infestans (Mont.) de Bary
S. Keil, M. Benker and M. Zellner ...............................................................................................217

Role of oospores in the overwintering and year-on-year development of the late blight pathogen on tomato en potato

Potato resistance to late blight as related to the R1 and R3 genes introgressed from Solanum demissum
Emile E. Khavkin, Ekaterina A. Sokolova, Maria P. Beketova, Artem A. Pankin,
Maria A. Kuznetsova, Irina N. Kozlovskaya, Svetlana Yu. Spiglazova,
Natalia V. Statsyuk and Isolda M. Yashina ..................................................................................231

Late blight-resistant tuber-bearing Solanum species in field and laboratory trials
Elena V. Rogozina, Maria A. Kuznetsova, Maria V. Patrikeyeva, Svetlana Y. Spiglazova,
Tatjana I. Smetanina, Natalia N. Semenova, Kenneth L. Deahl .............................................239
Characteristics of the *Phytophthora infestans* population in Russia

Rating of fungicides used for the potato late blight control
A.V. Filippov ..................................................................................................................... 255

Wild Tuber Bearing Solanum Species screening for Late Blight Resistance under natural conditions
Pellé Roland, Kermarrec Marie-Paule and Chauvin Jean-Eric ........................................ 259

Efficacy of different fungicides for the control of early blight
B. Heremans, L de Lange, J. Carrette and G. Haesaert ....................................................... 261

Modelling the effects of spatially distributed cropping systems on the epidemics of potato late blight and on the durability of cultivar resistances
Toky Rakotonindraina Jean-Eric Chauvin, Roland Pelle, Catherine Chatot, Frédérique Aurousseau and Jean-Noël Aubertot ................................................................. 263

Phenotypic variation within a clonal lineage of *Phytophthora infestans* from Nicaragua

Marker-assisted selection of QTL PiXspg in potato diploid backcross populations
Florence Esnault, Rosanne Quelennec, Jean-Paul Dantec, Stephane Mauger and Jean-Eric Chauvin ............................................................................................................ 267

Definition of thresholds for soil moisture to assess zoospore infections by *Phytophthora infestans*
Jeanette Jung, Martin Ebli and Benno Kleinhenz .................................................................. 271

Searching among wild *Solanum* species for homologues of *RB/Rpi-blb1* gene conferring durable late blight resistance
Artem A. Pankin, Ekaterina A. Sokolova, Elena V. Rogozina, Maria A. Kuznetsova, Kenneth L. Deahl, Richard W. Jones and Emile E. Khavkin .................................................... 277

Field comparison of mancozeb efficacy with other protectant fungicides for the control of tomato late blight
S. Gengotti, C. Sbrighi, L. Antoniacci and R. Bugiani ........................................................... 285

Efficacy evaluation of different fungicides for the control of potato late blight in Italy
S. Gengotti, C. Sbrighi, L. Antoniacci and R. Bugiani ................................................................ 287

Study of invasive French populations (2006-2008) of *Phytophthora infestans*, the Oomycete causing potato late blight
Roselyne Corbière,, Hélène Magalon, Frédéric Boulard and Didier Andrivon ............................ 289
Occurrence of late blight in Algeria during 2009 and evaluation of potato cultivars for resistance to *Phytophthora infestans*
Amina Galfout, Abdelaziz Kedad, Roselyne Corbière and Zouaoui Bouznad .............................291

In vitro evaluation of difenoconazole and chlorothalonil on conidial germination and mycelial growth of *Alternaria alternata* and *A. solani* causal agent of early blight in Algeria
Feriel Issiakhem and Zouaoui Bouznad ................................................................. 297

Late blight resistance of potato mapping populations in front of naturally evolving pathogen populations
S. Marhadour, R. Pelle, J.M. Abiven, F. Aurousseau, H. Dubreuil, Y. Le Hingrat and J.E. Chauvin ................................................................. 303

Modern fungicides in control of early and late blight in Polish experiments
J.S. Kapsa ........................................................................................................... 305

Curative effect of fungicides against tomato late blight
R. Bugiani, L. Antoniacci and I. Trevisan .................................................................. 311

The effect of late blight population changes on host resistance ratings
Alison Lees, Stuart Carnegie, David Shaw and Ruairidh Bain ........................................ 313

The changing *Phytophthora infestans* population: implications for Late Blight epidemics and control
Allison Chapman, Alison Lees, David Cooke and Louise Cooke .................................... 315