

**COMMUNICATIONS IN AGRICULTURAL AND  
APPLIED BIOLOGICAL SCIENCES**

Formerly known as

**MEDEDELINGEN FACULTEIT LANDBOUWKUNDIGE  
EN TOEGEPASTE BIOLOGISCHE WETENSCHAPPEN**

**PUBLISHERS**

Prof. Pascal Boeckx  
Prof. Peter Bossier  
Prof. Guy Smagghe  
Prof. Els Van Damme  
Prof. Niko Verhoest  
Bjorn Vandekerckhove

**EDITORIAL ADDRESS**

Coupure links 653  
9000 Gent (Belgium)

Website: <http://www.ugent.be/bw>

ISSN 1379-1176

**The contents of the contributions published in this book are under the full responsibility of  
the authors. The organizing committee cannot be held responsible for any errors in this  
publication and potential consequences thereof.**

## **Proceedings**

**68<sup>th</sup>**  
**INTERNATIONAL SYMPOSIUM**  
**ON CROP PROTECTION**

**Editorial Address**  
Coupure links 653  
9000 Gent (Belgium)

**Gent, May 17, 2016**

**Part I**

## **PATRONS**

Primoris, Gent, Belgium

Arche, Gent, Belgium

BASF Crop Protection, Brussels, Belgium

Bayer CropScience, Brussels, Belgium

Belchim Crop Protection, Londerzeel, Belgium

Biobest Biological Systems, Westerlo, Belgium

Clear Detections, Wageningen, the Netherlands

Certis, Brussels, Belgium

Dow AgroSciences, Wilrijk, Belgium

DuPont de Nemours, Mechelen, Belgium

Izotop, Budapest, Hungary

Koppert, Berkel & Rodenrijs, the Netherlands

LemnaTec, Wuerselen, Germany

Monsanto, Brussels, Belgium

Novolab, Geraardsbergen, Belgium

Plants (MDPI AG), Basel, Switzerland

Prime diagnostics, Wageningen, the Netherlands

Syngenta Crop Protection, Brussels, Belgium

VWR International, Leuven, Belgium

## **ORGANIZING COMMITTEE**

HONORARY  
CHAIRMEN

**D. DEGHEELE (†), W. DEJONCKHEERE (†),  
A. GILLARD (†), R.H. KIPS (†), M. MOENS,  
C. PELERENTS (†), J. POPPE (†), W. STEURBAUT,  
J. STRYCKERS (†), J. VAN DEN BRANDE (†),  
W. WELVAERT**

ORGANIZING  
COMMITTEE

**M. HÖFTE (Chair), B. DE CAUWER,  
P. DE CLERCQ, G. SMAGGHE, P. SPANOGHE,  
L. TIRRY, T. VAN LEEUWEN, W. WESEMAEL**

**B. VANDEKERKHOVE (Secretary-general)  
H. VAN BOST (Assistant-secretary)**

ADVISORY  
COMMITTEE

**G. ANGENON, K. AUDENAERT, D. BYLEMANS,  
M. DE MEULEMEESTER, R. DE VIS, B. GOBIN,  
G. HAESAERT, M. MAES, E. PRINSEN, D. REHEUL,  
E. VAN DAMME, J. VANDEN BROECK, M.C. VAN LABEKE,  
M. VAN MEIRVENNE**

## **SECTIONS**

### Chairmen

**G. HAESAERT**, Gent, Belgium  
**H.E. HUMMEL**, Giessen, Germany  
**H. JIJAKLI**, Gembloux, Belgium  
**S. MASSART**, Gembloux, Belgium  
**H. MENNAN**, Samsun, Turkey  
**D. NUYTENS**, Merelbeke, Belgium  
**R. RAE**, Liverpool, United Kingdom  
**P. REIGNAULT**, Calais, France  
**B. SCHIFFERS**, Gembloux, Belgium

### Vice-chairmen

**J. DEBODE**, Merelbeke, Belgium  
**B. DE CAUWER**, Gent, Belgium  
**B. DECLERCQ**, Rumbeke-Beitem, Belgium  
**K. DE JONGHE**, Merelbeke, Belgium  
**A. GIUSTI**, Liège, Belgium  
**K. HEUNGENS**, Merelbeke, Belgium  
**A.J. MOURAD**, Alexandria, Egypt  
**C. OPPERMANN**, Raleigh, United States of America  
**V. OVERBECK**, Braunschweig, Germany

## CONTENTS

<b>Plenary Session</b>	1
<b>Abstracts</b>	
<b>C.E. MORRIS</b>	
The changing notions of pathogen ecology, emergence and the frontiers of surveillance	3
<b>J. STENLID</b>	
Emerging diseases in forest ecosystems in Europe	4
<b>W. WARD</b>	
Protecting plants through standards and networks: the work of the European and Mediterranean plant protection organization	5
<b>Session - Phytopathology</b>	7
<b>A. ROCHEX, A. SIAH, A. EL ARBI, S. ARNAULD, F. MONANGE, A. CIERPKA, S. LESNIK, A. PINOCH, C. CHOMA, N. GHARSALLAH, P. HALAMA &amp; P. JACQUES</b>	
Potential of a <i>Bacillus</i> sp. Strain isolated from Tunisian oasis ecosystem for the bio-control of Septoria tritici Blotch	9
<b>Abstracts</b>	
<b>S. GLAESER, I. ALABID, H. HAGHIGHI, HUIJUAN GUO, M. HARDT, J. IMANI &amp; K.H. KOHEL</b>	
Endofungal bacteria impact the tripartite Sebacinalean symbiosis of <i>Piriformospora</i> (Serendipita) fungi with a broad range of crop plants	17
<b>I. ALABID, J. IMANI, S.P. GLAESER, D. LI, M. ROTHBALLER, A. HARTMANN &amp; K.H. KOHEL</b>	
N-acyl-homoserine lactones regulate beneficial activities of the endofungal bacterium <i>Rhizobium radiobacter</i> RrF4 exhibits on crop plants	18
<b>A. KADDES, S. MASSART, M.L. FAUCONNIER, M.H. JIJAKLI &amp; C. DE CLERCQ</b>	
Effectiveness of volatile organic compounds against barley pathogens	19
<b>A. AL ALI, F. KIRER &amp; P. JACQUES</b>	
Study of factors influencing the colonization of tomato rhizosphere by <i>Bacillus</i> strains	20
<b>J. DEBODE, N. DEFOIRD, P. CREMELE, M. PERNEEL, K. MOREAUX, B. VANDECASSE, H. MUYLLE, M. HÖFTE, J. VAN ACKER &amp; M. MAES</b>	
Inoculated plant fibres for sustainable and disease suppressive substrates	21

<b>L. MIRE, A. SIAH &amp; M.H. JIJAHLI</b>	
New elicitors to protect wheat against the fungus <i>Zymoseptoria tritici</i> : biocontrol tools for IPM strategies	22
<b>G. AUBEL &amp; P. VAN CUTSEM</b>	
Oligosaccharides differentially induce defences in potato infected by <i>P. Infestans</i>	23
<b>A. NESLER, M. PERAZZOLLI, L. ANTONIELLI, M. CAPPELLETTI, O. GIOVANNINI, M. PINDO, G. PUOPOLI &amp; I. PERTOT</b>	
A complex protein derivative acts as biogenic elicitor of grapevine resistance against powdery and downy mildews	24
<b>S. MEJRI, A. SIAH, A. CHINET, B. RIGO, C. ABUHAIE, M. MAGNIN-ROBERT, B. RANDAUX, Ph. REIGNAUT &amp; P. HALAMA</b>	
Sugar beet-derived products as inducers of wheat defences against <i>Zymoseptoria tritici</i>	25
<b>M. VANDECASSELE, S. LANDSCHOOT, K. AUDENAERT, M. HÖFTE, S. DE SAEGER &amp; H. HAESAERT</b>	
Identification and characterization of <i>Alternaria</i> species causing early blight on potato in Belgium	26
<b>J. RIVIERE, D. LANTERBECQ, L. HANUISE, O. MAHIEU &amp; M. GADENNE</b>	
Spore trap detection for seasonal monitoring of airborne <i>Alternaria</i> spores in potato fields	27
<b>S. LANDSCHOOT, M. VANDECASSELE, J. CARRETTE, B. DE BAETS, M. HÖFTE, K. AUDENAERT &amp; G. HAESAERT</b>	
Fungicide sensitivity and QOI allele variation in the Belgian <i>Alternaria</i> population	28
<b>S. CROES, S. TORFS, V. PHILION, W. KEULEMANS, K. HEUNGENS, W. VAN HEMELRIJCK &amp; D. BYLEMANS</b>	
Rational and site-specific control of apple scab	29
<b>K. VAN POUCKE, T. GOEDEFROID, A. CHANDELIER, L. LEUS &amp; K. HEUNGENS</b>	
Flow cytometry reveals large differences in genome size in the genus <i>Phytophthora</i>	30
<b>B. DECLERCQ, A. VOLCKAERT, S. VENNEMAN, S. ROMBOUTS, J. VAN VAERENBERGH &amp; R. LAVIGNE</b>	
How can growers avoid bacterial diseases in cabbages and leek?	31
<b>N.N.A. TJOU-TAM-SIN, J.I.J. VAN DE BILT, M. WESTENBERG, E.T.M. MEEKES, H.A.S. TEUNISSEN, J. VAN VAERENBERGH &amp; M. BERGSMA-VLAMI</b>	
First report of bacterial wilt caused by <i>Ralstonia solanacearum</i> in ornamental <i>Rosa</i> sp.	32
<b>N. VAN BOGAERT, K. DE JONGHE &amp; G. SMAGGHE</b>	
Evaluating transmission risks of pospiviroids	33

<b>R. TAHZIMA, G. PEUSENS, T. OLIVIER, S. VANDIERENDONCK, Y. FOUCART, F. FAUCHE, T. BELIEN, S. STEYER &amp; K. DE JONGHE</b>	
Status and molecular characterization of little cherry virus 1 and 2 in Belgium	34
<b>S. MASSART, A. MINAFRA, M. RAVNIKAR, R. VAN DER VLUGT, C. VARVERI, T. WETZEL &amp; A. OLMOS</b>	
Virus diagnostic and high throughput sequencing: does bioinformatics really matter? Preliminary analysis of European proficiency testing of bioinformatics pipelines in the frame of COST action FA1407	35
 <b>Posters – Phytopathology</b>	
37	
<b>M. MIRIK, C. ÖKSEL &amp; M. BÜLBÜL</b>	
Identification of bacterial canker caused by <i>Pseudomonas syringae</i> pv. <i>syringae</i> on sweet cherry trees in Tekirdag	39
<b>E. LELESIUS, G. STATKEVICIUTE &amp; E. PETRAITIENE</b>	
The prevalence of <i>Verticillium</i> wilt in oilseed rape in Lithuania	43
<b>T.A.J. PASSEY, M.W. SHAW &amp; X-M. XU</b>	
Population difference of the apple scab fungus <i>Venturia inaequalis</i> on cultivars within a mixed cultivar orchard	51
<b>P. CHEVAL, A. SIAH, A.D. POPPER, Ph. REIGNAULT &amp; P. HALAMA</b>	
Generalization of QOI resistance of <i>Zymoseptoria tritici</i> in northern France	61
<b>A. FANIGLIULO, A. VIGGIANO, R. CARRIERI, E. LAHOZ &amp; A. CRESCENZI</b>	
Report on fungal diseases of Bamboo ( <i>Phyllostachys edulis</i> ) in Italy	65
<b>G. GILARDI, S. FRANCO ORTEGA, S. DEMARCHI, M. PUGLIESE, M.L. GULLINO &amp; A. GARIBALDI</b>	
Variation in the response of lettuce cultivars to Italian isolates of <i>Fusarium oxysporum</i> f.sp. <i>lactucae</i> race 1	69
<b>M. PUGLIESE, M. MARENCO, M.L. GULLINO &amp; A. GARIBALDI</b>	
Hortofan: a growing media for suppressing soil-borne pathogens on potted tomato and cucumber plants	77
<b>M. PUGLIESE, G. CASTELLA, M.L. GULLINO &amp; A. GARIBALDI</b>	
Application of non-conventional treatments for the control of Pythium root rot on Lamb's lettuce	81

<b>U. WACHOWSKA, A. DUBA, J. RATUSZNY, K. GORIEWA &amp; M. WIWART</b>	
The health status of <i>Triticum aestivum</i> and <i>T. durum</i> leaves protected with biological control agents, a plant biostimulator, a plant resistance inducer and chemical fungicides	85
<b>G. HAZARHUN &amp; N. ÖZER</b>	
Control of sunflower downy mildew ( <i>Plasmopara halstedii</i> ) with antagonistic fungi	91
<b>M. GHADBANE, S. MEDJEKAL, H. BELHADJ, L. BENDERRADJI, D. HARZALLAH &amp; S. DA-HAMA</b>	
Isolation and characterization of rhizospheric <i>Streptomyces</i> spp. for the biocontrol of the Fusarium wilt (Bayoud) disease of date palm ( <i>Phoenix dactylifera</i> L.)	99
<b>G. RYCKAERT</b>	
IPM approach using fungicides in seed crops of perennial and Italian ryegrass	115
<b>R. SAHLI, C. RIVIERE, A. SIAH, J. SAMAILLIE, R. KSOURI, P. HALAMA &amp; S. SAHPAZ</b>	
Antifungal activity of extremophile plants from Tunisia against the wheat pathogen <i>Zymoseptoria tritici</i>	125
<b>H. CHIKH-ROUHOU, A. OUMOULLOUD, R. STA-BABA, A.M. BEN BELGACEM &amp; W. HAMADA</b>	
Plant oligosaccharides and ascorbic acid enhance melon defense response against Fusarium wilt race 1.2	135
<b>L. BOCQUET, A. SIAH, J. SAMAILLIE, J.L. HILBERT, P. HALAMA, S. SAHPAZ &amp; C. RIVIERE</b>	
Antifungal activity of hop extracts against the wheat pathogen <i>Zymoseptoria tritici</i>	143
<b>A. FANIGLIULO, A. VIGGIANO, F. GUASTAMACCHIA, A. CAPELLE &amp; A. CRESCENZI</b>	
Evaluating the efficacy of thiophanate-methyl in the control of corky root in tomato	151
<b>A. FANIGLIULO, G. PIEGARI, S. RAMELLA, A. GUALCO &amp; A. CRESCENZI</b>	
Cyantraniliprole – acibenzolar-s-methyl strategy: evaluation of the suppression of tomato spotted wilt disease on pepper in greenhouse conditions	155
<b>R. SAFAEI ASADABADI</b>	
Determination of the mutation frequency in a tilling population of the highly Fusarium head blight resistance wheat line CM82036	159
<b>A. FOURQUEZ, M. MAGNIN-ROBERT, B. RANDOUX, Ph. REIGNAULT, A. SIAH, P. HALAMA and other members of IRIS+ consortium</b>	
A combined use of biostimulants and resistance inducers on wheat in order to improve plant protection	169

**V. JEGATHAMBIGAI, A.E. SVINNINGEN, R.S. WILSON WIJERATNAM & R.L.C. WIJSUNDERA**

Identification and evaluation of *Trichoderma* species as a bio control agent against soil borne plant pathogens and plant parasitic nematodes in ornamental foliage nursery, Sri Lanka 175

**Abstracts****H. ALIZADEH, M. FARZANEH & Z. AZAMI SARDOOEI**

Nano-emulsion of Cinnamon oils decreasing *Rhizopus stolonifer* and *Botrytis cinerea* post-harvest rots of strawberry 187

**A. AYSEGUL, M. DURDANE, H. SUMER & Y. AYSAN**

Determination of bacterial blight disease reactions in different local pea lines in Turkey 188

**E. YILDIRIM & I. ERPER**

Characterization and pathogenicity of *Rhizoctonia solani* isolated from vegetable crops grown in Greenhouses in Samsun province 189

**O. BELDEK & I. ERPER**

Determination of *Fusarium* species in bean growing areas in Samsun province and their virulence 190

**M. TÜRKKAN, I. ERPER and M. ÇEBİ KILIÇOGLU**

Characterization and pathogenicity of *Rhizoctonia* spp. Isolated from kiwifruit in Ordu province in Turkey 191

**K. DE JONGHE, I. DE ROO, B. DECLERCQ, D. CALLENS, K. DEMEULEMEESTER & M. MAES**

Phytoplasma and *Candidatus liberibacter solanacearum* survey reveal wide-spread aster yellows infections in Belgian carrot (*Daucus carota* L.) fields 192

**J. SPOELDER, R. DE BOER-DE VRIES, R.H. ELLENS and L.J. TURKENSTEEN**

Trends in diagnostics 193

**J. SPOELDER, R.H. ELLENS, R. DE BOER-DE VRIES & L.J. TURKENSTEEN**

Diagnostics of leaf spots: early blight, ozone and digital detection 194

**J. SPOELDER, J.D. VAN ELSAS, Y. YI, O.P. KUIPERS & J.T.M. ELZENGA**

Plant-microbe interactions: *Bacillus mycoides* as case study for symbiosis 195

**A. OUMOULLOUD, H. CHIKH-ROUHOU, M. MOKHTARI, J.M. ALVAREZ & R. GONZALEZ-TORRES**

Marker-assisted selection of Fusarium wilt-resistance melon (*Cucumis melo* L.) 196

<b>E-A. BRAUNA, O. TREIKALE, S. BUMANE, L. FEODOROVA-FEDOTOVA, K. GULBIS &amp; S. ZUTE</b>	
Folia diseases of field beans <i>Vicia fabae</i> L. in Latvia	197
<b>A. CEUSTERMANS, W. VAN HEMLRIJCK, P. LIETEN &amp; D. BYLEMANS</b>	
Pestalotiopsis crown rot on strawberry in Belgium	198
<b>D. ANGELI, S. MASSART, A. SARE, M.H. JIJAKLI &amp; I. PERTOT</b>	
Insights gained from metagenomic sequencing of apple fruit surface (cv. Pinova)	199
<b>P. DELTOUR, S.C. FRANÇA &amp; M. HÖFTE</b>	
Harmful or beneficial? Graminoids as reservoir of pathogenic and non-pathogenic <i>Fusarium oxysporum</i>	200
<b>L. TYVAERT, S. DEKETELAERE, S.C. FRANÇA, W. CUIJPERS &amp; M. HÖFTE</b>	
The role of <i>Verticillium isaacii</i> in Verticillium wilt of sweet pepper	201
<b>F. BELHADJ BEN YAHIA &amp; H. BOURAGHDA</b>	
<i>Fusarium culmorum</i> aggressiveness and the effect of wheat genotypes on the efficiency of <i>Trichoderma</i> in the protection against root rot disease	202
<b>H. BOUREGHDA, F. BELHADJ BENYAHYA, I. LARABA &amp; N. ABDALLAH</b>	
Fusarium head blight and root rot of wheat in Algeria: study of pathogenicity and biocontrol by <i>Trichoderma</i> spp.	203
<b>S.M. MIRMAJESSI, M. MÄND, N. NAJDABBASI &amp; E. LOIT</b>	
Inhibitory effect of <i>Trichoderma harzianum</i> metabolites on strawberry Verticillium wilt	204
<b>J. BOUARDA, F. BENTATA, M. LABHILILI, A. EL AISSAMI, I. MAAFA &amp; M. BENCHACHO</b>	
Study of the antifungal activity of Moroccan plants against <i>Fusarium culmorum</i>	205
<b>N. MEGHAZI &amp; A. MEBARKIA</b>	
Antifungal activity of some essential oils against mold of stored wheat	206
<b>O. TREIKALE, Z. VIGULE, J. PUGACOVA, E.A. BRAUNE &amp; L. GRANITIA-IEVANA</b>	
Biological control of <i>Rhizoctonia solani</i> on potato with <i>Bacillus subtilis</i>	207
<b>G. STOUVENAKERS, S. MASSART &amp; M.H. JIJAKLI</b>	
Characterization and biocontrol properties of <i>Lactuca sativa</i> rhizosphere microbiota in an aquaponic system	208
<b>T. GENÇ KESIMCI, C. EKEN &amp; H.Ç. KAYMAK</b>	
Effect of sowing date on the incidence of root rot and wilt diseases in faba bean	209
<b>C. EKEN, N. ALKAN, M. TÜRK &amp; M. ALAGÖZ</b>	
Preliminary results on reaction of alfalfa genotypes to <i>Rhizoctonia solani</i> under controlled conditions	210

<b>S. ANDRIANARISOA, L. RABHI &amp; P. HALAMA</b>	
Nitrogen-stressed plants of wheat are better armed to face <i>Septoria tritici</i> blotch	211
<b>M. TÜRKCAN, I. ERPER, M. ÖZCAN &amp; Y. TOPCU</b>	
Antifungal effect of carbonate and bicarbonate salts against <i>Botrytis cinerea</i> causing grey mould on kiwi fruit	212
<b>S.C. FRANÇA &amp; J. DEBODE</b>	
A good soil health strategy: the starting point to suppress soil-borne diseases; recommendations of eip-agri focus group on soil-borne diseases	213
<b>H. ALIZADEH, K. BEHBOUDI &amp; P.A.H.M. BAKKER</b>	
Evaluation of defense genes expression in cucumber root after inoculation with <i>Trichoderma</i> , <i>Pseudomonas</i> and their combination	214
<b>M.E. GORE, O. ERDOGAN, N. ALTIN &amp; M.H. AYDIN</b>	
Searching for sources of resistance to <i>Verticillium</i> wilt of cotton in seedlings from the genus <i>Gossypium</i>	215
<b>M.E. GORE, ERDOGAN, I. OZKAN, V. SEZENER, N. ALTIN &amp; Y. BÖLEK</b>	
Studies on resistance to <i>Verticillium</i> wilt ( <i>Verticillium dahliae</i> ) in cotton cv. Giza 45	216
<b>H. BENKORTEB-LYAZIDI, Z. BOUZNAD &amp; L. HANIFI-MEKLICHE</b>	
Study of three resistance characters of durum wheat F1 hybrids and their parents to <i>Septoria tritici</i> blotch	217
<b>V. JEGATHAMBIGAI, A.E. SVINNINGEN, R.S. WILSON WIJERATNAM &amp; R.L.C. WIJESUNDERA</b>	
Identification and evaluation of <i>Trichoderma</i> species as a bio control agent against soil borne plant pathogens and plant parasitic nematodes in ornamental foliage nursery, Sri Lanka	218
<b>Session - Herbology</b>	219
<b>Abstracts</b>	
<b>M. DIERICKX, F. RYS, E. PAUWELS, Y. CNUDDE, F. GOOSSENS, P. BRAECKMAN, E. MECHANT &amp; B. GOBIN</b>	
Venzar 500 SC and Toki: new tools for weed control in woody ornamentals	221
<b>H. MENNAN, E. KAYA-ALTOP, S. ERKEN &amp; K. HAGHNAMA</b>	
PCR-based detection of resistance to ALS inhibitors in <i>Lolium multiflorum</i> L. populations from wheat fields	222

<b>T. GEEROMS, S. DIERICKX, J. VERMAELEN &amp; J. VANHERCK</b>	
Synergy between pyridate and HPPD-inhibitors opens new possibilities for the control of weeds in maize	223
<b>S. CLAERHOUT, M. HOUBRAKEN, P. SPANOGHE &amp; B. DE CAUWER</b>	
Efficacy and foliar absorption of HPPD-inhibiting herbicides in <i>Echinochloa crus-galli</i> and <i>Echinochloa muricata</i>	224
<b>B. DE CAUWER, A. CARDINAEL, B. MANDERYCK &amp; S. CLAERHOUT</b>	
Sensitivity of Belgian <i>Atriplex patula</i> populations to foliar – and soil-acting sugar beet herbicides	225
<b>S. BEN KAAB, O. PARISI, R.K. SOURI &amp; M.H. JIJAKLI</b>	
Herbicidal activity of Tunisian plant extract against various weeds	226
 <b>Session – Nematology</b>	
227	
<b>Abstracts</b>	
<b>C. OPPERMANN, T. SIT, S. KHAN &amp; A. AFFOKPON</b>	
A novel seed-piece nematicide application method shows enhanced protection	229
<b>J.H.M. VISSER, W. VAN DEN BERG &amp; L.P.G. MOLENDIJK</b>	
Effect of pre-sowing population density of <i>Pratylenchus penetrans</i> , a granular nematicide and soil compaction on yield of <i>Allium cepa</i>	230
<b>F. OLLIVIER, A. LETORT, P. LEPOUTRE, L. WARANGOT &amp; N. LENNE</b>	
Management of regulated <i>Meloidogyne</i> in France and estimated molecular quantification	231
<b>M. İMREN, H. TOKTAY, E. Börteçine KASAPOĞLU, A.A. DABABAT, R. BOZBUĞA &amp; İ. Halil ELEKÇİOĞLU</b>	
Genetic resistance to cereal nematodes: <i>Heterodera</i> spp. and <i>Pratylenchus</i> spp. in Turkey	232
<b>N. VIAENE, A-M. DEEREN, W. WESEMAEL, M. GOEMINNE, P. DUPONT, K. DEMEULEMEESTER, A. LECLERCQ, J. RIVIERE, D. LANTERBECQ, M. GADENNE &amp; M. DE PROFT</b>	
Rapid and reliable detection of potato cyst nematodes by modifications of sampling and extraction methods	233
<b>R. RAE</b>	
<i>Phasmarhabditis hermaphrodita</i> : a behaviour manipulating nematode parasite of slugs?	234

Comm. Appl. Biol. Sci, Ghent University, 81/2, 2016	xv
<b>T. JANSSEN, G. KARSEN, V. ORLANDO &amp; W. BERT</b>	
Multi-gene phylogenetics in combination with morphology allow species delineation and DNA barcode based diagnostics within a cryptic <i>Pratylenchus</i> species complex	235
<b>S. HABASH, M.W. FLORIAN, W. GRUNDLER &amp; A. ELASHRY</b>	
Parallel sequencing of <i>H. Schachtii</i> transcriptome revealed pioneer putative effectors	236
<b>D.T.P. NAALDEN, A. HAEGEMAN, F. BIRHANE ESHETU, N. XUAN HUY, I. LARTEY &amp; G. GHEYSEN</b>	
Functional analysis of the effector Mg-52 secreted by the root-knot nematode <i>Meloidogyne graminicola</i>	237
<b>R. BOZBUGA, C.J. LILLEY, J.P. KNOX &amp; P.E. URWIN</b>	
Analysing the molecular architecture of nematode-induced galls by using enzyme-linked immunosorbent assay	238
<b>Posters – Nematology</b>	239
<b>Abstracts</b>	
<b>H. ZEMENE, K. NAHAR, T. KYNDT, M. HÖFTE &amp; G. GHEYSEN</b>	
Gibberellin mediates rice susceptibility to <i>Meloidogyne graminicola</i>	241
<b>A. SANCHEZ-MONGE, T. JANSSEN, Y. FANG, M. COUVREUR, G. KARSEN &amp; W. BERT</b>	
Potential of mDNA – COI – as a diagnostic tool for plant-parasitic <i>Aphelenchoides</i> species	242
<b>M. MOULIN, D. LANTERBECQ &amp; M. GADENNE</b>	
Improvement of detection methods of <i>Ditylenchus</i> sp. in faba beans – <i>D. dipsaci</i> or <i>D. gigas</i>	243
<b>E. BÖRTEÇINE KASAPOĞLU, M. İMREN, R. BOZBUGA, H. TOKTAY &amp; İ. HALİL ELEKÇIOĞLU</b>	
Importance of plant parasitic nematodes ( <i>Helicotylenchus multicinctus</i> , <i>H. dihystera</i> and <i>Meloidogyne</i> spp. (Nemata)) in banana growing areas of Turkey	244
<b>M. İMREN, H. TOKTAY, E. BÖRTEÇINE KASAPOĞLU, A.A. DABABAT, R. BOZBUĞA &amp; İ. HALİL ELEKÇİOĞLU</b>	
Current data on pathotype characterisation and resistance reactions of cereal cyst nematodes: <i>Heterodera avenae</i> and <i>Heterodera filipjevi</i> in Turkey	245
<b>K. SIMEUNOVIC &amp; M. RADIVOJEVIC</b>	
Longidorinae (Nematoda: Dorylaimida) at the mountain Tara in Serbia	246
<b>S. TOKSÖZ, S. MENNAN &amp; İ. ERPER</b>	
Possible use of <i>Trichoderma</i> spp. for biological control of root knot nematodes ( <i>Meloidogyne</i> spp.)	247

**F.G. GÖZE ÖZDEMİR, M.A. SÖĞÜT, N. ALKAN, D. DEMİR & C. EKEN**

In vitro parasitism of isolates of the nematode-trapping fungus *Arthrobotrys* against  
*Meloidogyne hapla* 248

**D. DEMİR, F.G. GÖZE ÖZDEMİR, N. ALKAN, M.A. SÖĞÜT & C. EKEN**

Effect of inoculating tomato roots with *Meloidogyne javanica* and isolates of the  
nematode-trapping fungus *Arthrobotrys* on the polyphenol oxidase activity 249

**COMMUNICATIONS IN AGRICULTURAL AND  
APPLIED BIOLOGICAL SCIENCES**

Formerly known as

**MEDEDELINGEN FACULTEIT LANDBOUWKUNDIGE  
EN TOEGEPASTE BIOLOGISCHE WETENSCHAPPEN**

**PUBLISHERS**

Prof. Pascal Boeckx  
Prof. Peter Bossier  
Prof. Guy Smagghe  
Prof. Els Van Damme  
Prof. Niko Verhoest  
Bjorn Vandekerckhove

**EDITORIAL ADDRESS**

Coupure links 653  
9000 Gent (Belgium)

Website: <http://www.ugent.be/bw>

ISSN 1379-1176

**The contents of the contributions published in this book are under the full responsibility of  
the authors. The organizing committee cannot be held responsible for any errors in this  
publication and potential consequences thereof.**

## **Proceedings**

**68<sup>th</sup>**  
**INTERNATIONAL SYMPOSIUM**  
**ON CROP PROTECTION**

**Editorial Address**  
Coupure links 653  
9000 Gent (Belgium)

**Gent, May 17, 2016**

**Part II**



**CONTENTS**

<b>Session: Agricultural Entomology and Acarology</b>	251
<b>J. PIJNAKKER, Y. ARIJS, D. VANGANSBEKE &amp; F. WACKERS</b>	
The predatory mite <i>Euseius gallicus</i> and pollen food supplements: an effective line of defense in Dutch protected roses	253
<b>L. SARLES, A. VERHAEGHE, G. LOGNAY, M-L. FAUCONNIER, F. FRANCIS &amp; F.J. VERHEGGEN</b>	
Development of a semiochemical-based control method against the walnut husk fly	261
<b>A. BOULLIS, B. FASSOTTE, L. SARLES, S. HEUSKIN, G. LOGNAY, S. BARTRAM, F. FRANCIS &amp; F.J. VERHEGGEN</b>	
Do changes in atmospheric CO <sub>2</sub> concentration affect aphid alarm signalling?	263
<b>S. KENDALL, K. STORER, M. RAMSDEN, S. ELLIS &amp; P. BERRY</b>	
Re-evaluating threshold for pollen beetle in oilseed rape	267
<b>N. KUMRUNGSEE, W. PLUEMPANUPAT, O. KOUL &amp; V. BULANGPOTI</b>	
Toxicity of <i>Houttuynia cordata</i> thunb extracts on <i>Spodoptera exigua</i> Hubner (Lepidoptera: Noctuidae)	275
<b>Abstracts</b>	279
<b>D. VANGANSBEKE, J. PIJNAKKERS, Y. ARIJS, P. DE CLERCQ &amp; F. WÄCKERS</b>	
Characteristics of a novel phytoseiid predator: <i>Euseius gallicus</i>	281
<b>T. VAEULLO, A. PINEDA &amp; A. MARCOS</b>	
Preference and performance of the predator <i>Sphaerophoria rueppellii</i> on two insect pest: <i>Myzus persicae</i> and <i>Frankliniella occidentalis</i>	282
<b>H. WUSTENBERGHS, V.M. VAN DAMME, E. BERCKMOES, R. MOERKENS, H. CASTEELS, F. MARCHAND, L. LAUWERS, L. TIRRY &amp; P. DE CLERCQ</b>	
Tomato greenhouses without pesticides myth or reality?	283
<b>J. BONTE, J. WITTERS &amp; J. MOENS</b>	
Can a flower strip reduce thrips infestations in Belgian strawberry?	284
<b>M. KHALIGHI, W. DERMAUW, N. WYBOUW, M. RIGA, J. VONTAS, L. TIRRY &amp; T. VAN LEEUWEN</b>	
Molecular analysis of cyenopyrafen resistance in the two-spotted spider mite <i>Tetranychus urticae</i> : CYP392A11 metabolizes cyenopyrafen	285

<b>M. HAMSHOU, C. SHANG, E.M. VAN DAMME &amp; G. SMAGGHE</b>	
Highly enhanced resistance to the beet armyworm ( <i>Spodoptera exigua</i> ) mediated by the transgenic expression of the apple rips in tobacco plants	286
<b>Posters – Agricultural Entomology and Acarology</b>	287
<b>D. SON, I. SOMDA, A. LEGREVE &amp; B. SCHIFFERS</b>	
Comparison of efficiency and selectivity of three bio-insecticides for the protection of tomatoes in Burkina Faso	289
<b>E.C. FABRE ANGUILET, T. ALABI, T. BENGONE NDONG, B.K. NGUYEN, E. HAUBRUGE &amp; F. FRANCIS</b>	
First survey on prevalence and infestation rate of Varroa mites in Gabon	299
<b>A. DI LASCIO &amp; M. NANNINI</b>	
A survey of the bronze bug <i>Thaumastocoris peregrinus</i> on <i>Eucalyptus camaldulensis</i> in the site of its first recovery in Sardinia (Italy)	307
<b>A. DI LASCIO &amp; M. NANNINI</b>	
Susceptibility of different <i>Eucalyptus</i> species to natural infestation of the red gum lerp Psyllid in Sardinia (Italy)	309
<b>L.M. TANING, J. WITTERS, N. BERKVENS, F. TEMMERMAN, V. DE BLAUWER, N. RUTTEN, L. VERHAEREN, C. VAN CEULEBROECK &amp; H. CASTEELS</b>	
Occurrence of wireworms in agricultural fields in Flanders, Belgium	319
<b>H.A. MESBAH, S. MOURSI KHADIGA, A. NAGDA, A. EL-SAYED, A.K. MOURAD &amp; M.A.A. OMAR</b>	
Dynamical fluctuating occurrence of the purple scale insect <i>Lepidosaphes beckii</i> (Newman) (Hemiptera: Diaspididae) on navel oranges in El-Beheira governorate, Egypt	325
<b>H.E. HUMMEL &amp; S.S. LANGNER</b>	
J.H. FABRE and T. EISNER – Two exceptional figures in chemical ecology of the 19 <sup>th</sup> and 20 <sup>th</sup> century and their significance for plant protection	337
<b>H.E. HUMMEL, D.F. HEIN, S.S. LANGNER &amp; Y. ITO</b>	
Multifunctional tetraneortriterpenoids for IPM isolated from neem seeds ( <i>Azadirachta indica</i> A. Juss and <i>A. excelsa</i> Jack): a challenge for the chemical ecologists met by MLCCC at the milligram to multigram scale	347
<b>B. CZARNOBAI DE JORGE, J. SANT'ANA, S.S. LANGNER &amp; H.E. HUMMEL</b>	
Nanofibers are excellent dispensers for Grapholita molesta sex pheromones suitable for attractant in Brazilian peach orchards	357
<b>N. NANNINI, F. ATZORI, F. MUSIO, R. PISCI &amp; M. PORCU</b>	
Effects of selected release methods on the establishment of predatory mirids on greenhouse tomatoes	365

**S. TRDAN & T. BOHINC**

New records of biological control agents in Slovenia in the period 2012-2014 375

**H.A. MESBAH, M.B. EL-KADY, A.M. HAMED, A.K. MOURAD & S.M.H. MOUSTAFA**Comparative toxicity and mutagenicity of four insecticides on the cotton leaf worm *Spodoptera littoralis* Boisd. (Noctuidae: Lepidoptera) 381**C. SAIAITONG, V. BULLANGPOTI, W. PLUEMPANUPAT & N. KUMRUNGSRI**Pesticidal and detoxification enzyme study of monoterpene compounds on *Spodoptera exigua* (Hübner) (Lepidoptera: Noctuidae) 399**Y. PHANKAEN, A. MANAPRASERTSAK, W. PLUEMPANUPAT & V. BULLANGPOTI**Repellency efficacy of *Coffea arabica* L. cv. Catimor parchment extracts against *Tribolium castaneum* (Herbst) (Coleoptera: Tenebrionidae) under laboratory conditions 407**E. TAYAT, N. ÖZDER, Ö. BANDUR & A. PEHLIVAN**Effect of short term cold storage on the quality *Trichogramma pintoi* and *Trichogramma evanescens* 413**V. PREMSUJA, A. SVINNINGEN, G. MIKUNTHAN & V. JEGATHAMBIGAI**Efficacy of *Bacillus thuringiensis* on larvae of *Junonia atlites* damaging *Hygrophila difformis* and it's on farm method of small scale production 417**Abstracts**

425

**D. RUTH AMULEN, L. DE SMET, J. OKWEE-ACAI, P. CROSS, F.J. JACOBS, G. SMAGGHE & D.C. DE GRAAF**

Diversity, distribution and prevalence of honeybee pests and pathogens in Ugandan colonies: implications to beekeeping productivity among smallholder farmers in Uganda 427

**H. DE RO, T. DEVOS, N. BERKVENS, H. CASTEELS, J. GOFFIN, T. BELIEN & P. DE CLERCQ**Cold hardiness of *Drosophila suzukii* (Diptera: Drosophilidae) in Belgium 428**A. ALHMEDI, S. RAYMAEKERS, D. BYLEMANS & T. BELIEN**

Landscape plant composition differentially influences aphid parasitoids in fruit orchards 429

**B.B. YAROU, F. VERHEGGEN, S. HEUSKIN, G. LOGNAY & F. FRANCIS**

Can tropical basil be integrated in vegetable crop pest management? 430

**G. KAÇAR**

Investigations of pest species within branches and trunks on olive trees and their pest management in Turkey 431

**G. KAÇAR**

Predator insects of Lepidopteran pests in olive groves in Turkey 432

<b>H.M.T. HOKKANEN, I. MENZLER-HOKKANEN, G. SMAGGHE, G. LÖVEI &amp; E. VEROMANN</b>	
IPM4meligethes – a new C-IPM project for pollen beetle management	433
<b>M.F. FLORES, T. CURKOVIC, C. BELLESTEROS, D. DE LA TORRE &amp; A. VALVERDE</b>	
Preliminary studies of use of sex pheromone of <i>Proeulia auraria</i> (Lepidoptera: Tortricidae) for monitoring and mating disruption in vineyards	434
<b>H. CENGİZ, Şaban GÜÇLÜ &amp; C. EKEN</b>	
Effectiveness of <i>Lecanicillium muscarium</i> (Petch) Zare and Gams, in the biological control of European birch aphid, ( <i>Euceraphis punctipennis</i> Zetterstedt), and growth of the fungus at different temperatures	435
<b>J. DE ZAEYTIJD, G. SMAGGHE &amp; E.J.M. VAN DAMME</b>	
Toxicity of some ribosome-inactivating proteins from rice against insects	436
<b>Y. ULU, R. KAYA &amp; I. KARACA</b>	
Effects of different foods and essential oils on bumblebees	437
<b>S. AKKOÇ, A. KARAHAN &amp; I. KARACA</b>	
The effects of some pesticides on honey bees and bumblebees	438
 <b>Session – Formulation and Application Technology</b> 439	
<b>K. THOMAS, I. CURCIC, F. MOONIE, C. STORM &amp; A.B. DILLON</b>	
Entostat sprayable – a novel formulation	441
<b>M. STAS, D. NUYTTEENS, O. MOSTADE, J. DECLERC, I. ZWERTVAEGHER, G. DEFAYS, D. DEKEYSER &amp; B. HUYGHEBAERT</b>	
Development of a risk assessment procedure for pesticide application equipment within the framework of article 8 of the EU directive 009/128	453
<b>Abstracts</b>	463
<b>C. TAYEH, D. GUINEHUT, A. LE VAN, X. TASSUC, E. GACHET &amp; C. MANCEAU</b>	
BiOR <sup>2</sup> : a database/software process dedicated to plant pests ranking	465
<b>N. ARIAS, A. PILAR ARMESTO, D. SOLA &amp; C. PARRADO</b>	
Pest monitoring and warning system of Navarra (Spain): a collaborative approach for precise monitoring	466
<b>S. VULGARAKIS MINOV, F. COINTAULT, J. VANGEYTE, J.G. PIETERS &amp; D. NUYTTEENS</b>	
Imaging of pesticide sprays using high speed camera techniques	467
<b>H.H. BOUKHALFA, M. MASSINON, F. LEBEAU &amp; M. BELHAMRA</b>	
Effect of drop impact on spray retention by plant leaves	468

<b>V. OVERBECK, J. HUHS, T. PELZER &amp; K. WEGENER</b> Precise application by using innovative sensor technology?	469
<b>D. DEKEYSER, T. VANWALLEGHEM, A. AMBAW, P. VERBOVEN, W. VAN HEMELRIJCK &amp; D. NUYTTENS</b> Evaluation of fogging devices for BCO application in fruit cold storages	470
<b>M. HOUBRAKEN &amp; P. SPANOGHE</b> Reduction of post-application pesticide volatilisation by adjuvants from glass surfaces	471
<b>R. KARISE, G. DREYERSDORFF, M. JAHANI, R. MULJAR, E. VEROMANN, E. RUNNO-PAURSON, T. KAART, G. SMAGGHE &amp; M. MÄND</b> Entomovectoring of Prestop-mix with bumblebees to control <i>Botrytis cinerea</i> in open field strawberries in Estonia	472
<b>I. MENZLER-HOKKANEN</b> Safety of Prestop-mix to pollinators: properties and use in entomovectoring	473
 <b>Posters – Formulation and Application Technology</b> <span style="float: right;">475</span>	
<b>M. DE LLUCH SALAS VICENS, E. BRAET, L. VERHAEGHE &amp; J. HANSSENS</b> Effectiveness and selectivity of traps and attractants for <i>Drosophila suzukii</i>	477
 <b>Abstracts</b> <span style="float: right;">485</span>	
<b>H.H. BOUKHALFA, M. MASSINON, F. LEBEAU &amp; M. BELHAMRA</b> Spray retention measurement	487
<b>D. VON HOERSTEN, H.J. OSTEROTH &amp; J.K. WEGENER</b> Reduction in the use of pesticides by tramline deactivation on field sprayers	488
<b>E. VAN DE VIJVER, G. SMAGGHE, B. DE BAETS &amp; G. HAESAERT</b> Development of IPM-tools for the control of cereal leaf beetle and aphids in grains	489
<b>E.E. HAFIZ ABD-ELALL &amp; M.A. HUSSEIN</b> Effect of spraying date and concentration of garlic extract for advancing bud burst of flame seedless grapevines	490
 <b>Session – Pesticide Residues, Toxicology and Ecotoxicology</b> <span style="float: right;">491</span>	
<b>K. TOUMI, C. VLEMINCKX, J. VAN LOCO &amp; B. SCHIFFERS</b> A survey of pesticide residues in cut flowers from various countries	493

<b>A. GIUSTI, A. GALLOY, G. GERARD, O. PIGEON, A. DELVAUX &amp; S. REMY</b> Ambient air concentrations of 46 currently-used pesticides in Wallonia, Belgium	503
<b>Abstracts</b>	509
<b>E. LEHMANN, J.J. NFON DIBIE, Y. KONTE &amp; L.F. DE ALENCASTRO</b> Pesticide use in gardening areas in Burkina Faso and evaluation of the resulting risk for the operator using the new AOEM proposed by EFSA guidelines	511
<b>D. SENAEVE, P. SPANOGHE, L. JACKSENS, G. VAN DONKERSGOED &amp; J. VAN KLAVEREN</b> Cumulative exposure assessment of triazole pesticide using MCRA 8.0 model	512
<b>J. JORIS, L. DECORTE, S. VAN LOOY, W. PEELAERTS, P. SEUNTJENS &amp; M. EGSMOSE</b> PERSAM: a software tool for calculating PEC's in soils	513
<b>Posters – Pesticide Residues, Toxicology and Ecotoxicology</b>	515
<b>W. THAIMUANGPHOL &amp; P. KASAMESIRI</b> Toxicity of abamectin to aquatic organisms, golden apple snail, silver barb and tadpole	517
<b>C. BENZIDANE, S. DAHAMA, S. BOUHARATI, P. SPANOGHE, L. GASMI &amp; D. ABDELLLOUCHE</b> Toxicity of organophosphorus insecticides on some biochemical and histopathological parameters in rats inducing pathological changes in certain tissues	525
<b>Abstracts</b>	531
<b>S. MEKONEN, A. AMBELU &amp; P. SPANOGHE</b> Effect of household coffee processing on pesticide residues	533