

**COMMUNICATIONS IN AGRICULTURAL AND  
APPLIED BIOLOGICAL SCIENCES**

formerly known as

**MEDEDELINGEN FACULTEIT LANDBOUWKUNDIGE  
EN TOEGEPASTE BIOLOGISCHE WETENSCHAPPEN**

**PUBLISHERS**

Professoren  
Pascal Boeckx  
Peter Bossier  
Guy Smagghe  
Walter Steurbaut  
Els Van Damme  
Niko Verhoest

**EDITORIAL ADDRESS**

Coupure links 653  
9000 Gent (Belgium)

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

ISSN 1379-1176

The content of the contributions is in the responsibility of the authors

**Proceedings**

**62<sup>nd</sup>  
INTERNATIONAL SYMPOSIUM  
ON CROP PROTECTION**

**Editors  
P. Spanoghe  
B. Vandekerkhove**

**Gent, May 18, 2010**

**Part I**

**PATRONS**

Faculty of Bioscience Engineering, Ghent University  
Fund for Scientific Research - Flanders

BASF Crop Protection, Brussels, Belgium  
Bayer CropScience, Brussel, Belgium  
Biobest Biological Systems, Westerlo, Belgium  
Certis Europe, Brussels, Belgium  
Dow Agro Sciences, Edegem, Belgium  
DuPont, Mechelen, Belgium  
Fytolab, Gent, Belgium  
Lemnatec, Wuerselen, Germany  
Noldus Information Technology, Wageningen, the Netherlands  
Notox, 's Hertogenbosch, the Netherlands  
Novolab, Geraardsbergen, Belgium  
Sigma Aldrich, Bornem, Belgium  
Syngenta Crop Protection, Ruisbroek, Belgium  
Taminco, Gent, Belgium  
Thermo Fisher Scientific, Erembodegem, Belgium  
VWR, Leuven, Belgium

**ORGANIZING COMMITTEE**

HONORARY  
CHAIRMEN

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

ORGANIZING  
COMMITTEE

R. BULCKE (Chair), P. DE CLERCQ, M. HÖFTE,  
M. MOENS, G. SMAGGHE, W. STEURBAUT, L. TIRRY

P. SPANOGHE (Secretary-general)  
B. VANDEKERKHOVE (Secretary)  
H. VAN BOST, L. GOSSYE & L. GOETEYN  
(Assistant-secretaries)

ADVISORY  
COMMITTEE

A. CALUS, J. COOSEMANS, P. CORNELIS,  
P. CREEMERS, B. DE CAUWER, W. DE COEN,  
R. DE VIS, B. GOBIN, E. PRINSEN, D. REHEUL,  
E. VAN BOCKSTAELE, E. VAN DAMME,  
J. VANDENBROECK, G. VAN HUYLENBROECK,  
M.C. VAN LABEKE, W. VERSTRAETE,

## SECTIONS

### Chairmen

- P. Creemers, Sint-Truiden, Belgium
- B. De Cauwer, Gent, Belgium
- E. De Rocker, Kruishoutem, Belgium
- R-U. Ehlers, Kiel, Germany
- G. Haesaert, Gent, Belgium
- H.E. Hummel, Giessen, Germany
- M. Maes, Merelbeke, Belgium

### Vice-chairmen

- K. Audenaert, Gent, Belgium
- D.L. Coyne, Ibadan, Nigeria
- F. Henriet, Gembloux, Belgique
- K. Heungens, Merelbeke, Belgium
- B. Marynissen, Gent, Belgium
- A.K. Mourad, Alexandria, Egypt
- E. Van Bockstaele, Gent, Belgium

## CONTENTS

<b>Plenary Session</b>	1
Prize Professor Jozef Van den Brande	3
S.R. Moss Integrated weed management (IWM): will it reduce herbicide use ?	9
B. Gerowitt Between biodiversity and productivity - views on arable weeds from an agricultural, a conservation and a political perspective	19
<b>Special session: Host Plant Resistance</b>	21
N. Desoignies, C. Stocco, C. Bragard and A. Legrève <i>Arabidopsis thaliana</i> , a new tool to investigate <i>Polymyxa betae</i> host interactions	23
K. Bürling, M. Hunsche and G. Noga Pre symptomatic detection of wheat leaf rust in the susceptible cv Skalmeje and the resistant cv Esket by means of UV laser-induced fluorescence	27
<b>Abstracts</b>	35
I. Brants, G. Blache, N. Muelleder, R. Garnett and M-P. Plancke Cultivation of glyphosate tolerant maize in Europe	37
M. Lemmens, A. Koutnik, B. Steiner, H. Buezrstmayr, F. Berthiller, Rainer Schuhmacher, F. Maier and W. Schäfer FHB1 protects wheat against nivalenol and deoxynivalenol	38
M. De Backer, E. Van Bockstaele, M. Maes and K. Heungens Pathotypes of <i>Puccinia horiana</i> , causal agent of chrysanthemum white rust	40
S. Brauc and G. Angenon Involvement of amino acid metabolism in stress responses in <i>Arabidopsis thaliana</i>	41
D. De Vleeschauwer, Y. Yang, C. Vera-Cruz and M. Höfte Map Kinase-mediated antagonistic crosstalk between abscisic acid and ethylene orchestrates basal resistance of rice against the brown spot fungus <i>Cochliobolus miyabeanus</i>	42

H. Moghaddam Hossein, L. Leus, J. De Riek, J. Van Huylenbroeck and E. Van Bockstaele Quantitative trait for powdery mildew ( <i>Podosphaera pannosa</i> ) resistance in diploid rose population	44
Y. Yanar, O. Düzdemir, B. Selvi and A. Yildirimi Sources of resistance in chickpea ( <i>Cicer arietinum</i> ) land races against <i>Ascochyta</i> blight disease	45
W. Van Hemelrijck, S. Van Laer, S. Hoekstra, A. Aiking and P. Creemers UV-C radiation as an alternative tool to control powdery mildew on apple and strawberry	46
I.S. Sobhy, A.A. Sarhan, M.M. El-Husseini, N.S. Mandour and T.C.J. Turlings Do elicitors of plant pathogen resistance also enhance defences against herbivores?	47
M. Mirnezhad, K.A. Leiss, N. Schidlo and P.G.L. Klinkhamer Variation in genetics and performance of Dutch biotypes of western flower thrips	48
F.E.E. Salah, E.M. Elamin, E.M.A. Eltoum and D. Bordat Susceptibility of some varieties and breeding lines of tomato to <i>Liriomyza</i> spp. Infestation in central Sudan	49
<b>Herbology</b>	51
E. Mechant, T. De Marez, G. Vroman, O. Hermann, G. Legrand, J-F. Misonne and R. Bulcke Distribution of metamitron-resistant <i>Chenopodium album</i> L. in Belgian sugar beet	53
B. De Cauwer, K. Van den Berge, M. Cougnon, R. Bulcke and D. Reheul Weed seed bank response to 12 years of different fertilization systems	61
Abstracts	73
J.M. Rosario, H. Cruz-Hipolito, R.J. Smeda and R. De Prado Chemical control of white mustard ( <i>Sinapsis alba</i> ) resistant to tribenuron methyl in Spain	75
J.M. Rosario, I. Dellaferrera, J.L. Ubera, M.D. Osuna and R. De Prado Tribenuron retention, contact angle and cuticle thickness in <i>Sinapsis alba</i> biotypes	76
J. Aper, B. Rubin, E. Mechant, R. Bulcke and D. Reheul Fate of the triazinone herbicide metamitron in <i>Chenopodium album</i> L.	77



J.L. Prado, H. Cruz-Hipolito, J. Gherekhloo and R. De Prado Differences in levels of tolerance to glyphosate in grass weeds in Spain	78
H. Eelen Trevistar: a new herbicide to control annual and perennial broadleaved weeds in cereals	79
<b>Posters - Herbology</b>	81
E. Mechant, T. De Marez, J. Aper and R. Bulcke Chlorophyll fluorescence protocol for quick detection of triazinone resistant <i>Chenopodium album</i> L.	83
D. Manea, R. Stef, I. Grozea, A. Carabet and L. Piloa Weed control in conventional and transgenic maize with resistance to glyphosate	91
I. Kadioglu, N. Karamanli and Y. Yanar Determination of fungal pathogens of common weed species in the vicinity of Tokat, Turkey	97
E. Lehoczky, R. Szabo, M. Okumu Nelima, P. Nagy and I. Béres Examination of common ragweed's ( <i>Ambrosia artemisiifolia</i> ) allelopathic effect on some weed species	107
V. Nagy, E. Nadasy and E. Lehoczky Effect of seed depth on germination and growth of velvetleaf ( <i>Abutilon theophrasti</i> Medic.)	113
I. Vanaga, Z. Mintale and O. Smirnova Dominant species of dicot-weeds and weed biodiversity in spring barley in Latvia	119
Abstracts	129
J. Gherekhloo, A.R. Franco and R. De Prado Fate of diclofop-methyl in <i>Phalaris minor</i> biotypes from Iran	131
G. Plaza, C. Fuentes, A.R. Franco, A. Rojano and R. De Prado Metabolism of aryloxyphenoxypropionate herbicides in <i>Echinochloa colona</i> found in Colombia	132
F. Gonzalez-Torralva, H.E. Cruz-Hipolito, N. Mülleder, A. Collavo, J.A. Dominguez and R. De Prado Absorption and translocation assays in glyphosate resistance and susceptible horseweed ( <i>Coryza canadensis</i> ) biotypes in Spain	133

H. Eelen Resistant Blackgrass control with Capri and Capri twin after a non-ALS autumn treatment	134
H. Eelen Capri and Capri twin selectivity in spring wheat	135
N. Zapata, M. Vargas and P. Medina <i>Drimys winteri</i> extract applied by spraying for weed control	136
<b>Application and Environmental Technology</b>	137
L. Bruyneel and D. Nuyttens Effect of spray application technology on the biological control of aphids in Brussels sprouts	139
D. Foqué and D. Nuyttens Optimization of the spraying equipment and technology used in ornamental crops	147
Abstracts	157
H.E. Hummel, D.F. Hein, A. Deuker, I. Lindner, C. Hellmann, A. Greiner, J.H. Wendorff, M. Breuer, A. Kratt, H. Kleeberg and G. Leithold Organic nanofibers as dispensers for insect pheromones: an entirely novel technical approach to mating disruption in insect IPM - emphasizing European grape vine moth control in vineyards	159
B. Marynissen, B. Heremans, P. Spanoghe, W. Steurbaut and G. Haesaert Effects of adjuvants in crop protection under critical preconditions	161
B. Beck, E. Brusselman, D. Nuyttens, F. Temmerman, W. Steurbaut and P. Spanoghe Screening adjuvants for use in spray solutions of entomopathogenic nematodes through different parameters	162
E. De Rocker, M. Van Wonterghem, I. Van de Populiere and G. t'Jampens Fate of insecticides (Bifenthrin, cyhalothrin) in bioremediation substrates	163
<b>Posters - Application Technology, Pesticide residues, Toxicology and Ecotoxicology</b>	165
R-M. Sumalan, E. Alexa, M. Negrea, R.L. Sumalan, A. Doncean and G. Pop Effect of glyphosate on the microbial activity of two Romanian soils	167

C.S. Mosquera V., M.J. Martinez C. and J.A. Guerrero D. 14C Teboconazole degradation in Colombian soils	173
V. Pompei, L. Donnarumma, S. Rosati and E. Conte Levels of hexachlorocyclohexanes in agricultural environment of Sacco river valley	183
W. Ruamthum, S. Viseton, J.R. Milne and V. Bullangpoti Toxicity of botanical insecticides on golden apple snail ( <i>Pomacea cana- liculata</i> )	191
S. Arsirapoj, C. Sudthonghong and V. Bullangpoti Acute toxicity of <i>Amaranthus viridis</i> extract on guppies, <i>Poecilia reticu- lata</i>	199
S. Dahamna, D. Harzallah, S. Boussahel, A. Belgeit, M. Merghem and H. Bouriche Biochemical, hematological and histological parameters induced by cy- permethrin toxicity in domestic rabbits	203
S. Dahamna, F. Bencheikh, D. Harzallah, S. Boussahel, A. Belgeit, M. Merghem and H. Bouriche Cypermethrin toxic effects on spermatogenesis and male mouse repro- ductive organs	209
J. Lehel, J. Déri, P. Laczay, E.G. Darin, P. Budai and E. Kormos Investigation on possible ecotoxicological risk of carbofuran insecticides	217
R. Szabo, E. Kormos, P. Budai and A. Pongracz Study of the toxic effects of an insecticide and copper sulphate on chicken embryos	223
L. Donnarumma, T. Annesi, V. Pompei, S. Rosati and E. Conte Preliminary note on potential use of forage crops for soil phytoremedia- tion of dieldrin	229
Abstracts	235
M. Hunsche, A. Alexeenko and G. Noga Deposit characteristics, retention, and rainfastness of selected copper salts as influenced by tank-mix adjuvants	237
G. Rousseau, N. Ducat, P. De Vos and O. Pigeon Comparison of different matrix effects on simultaneous determination of residues of boscalid and pyraclostrobin in vegetables by LC-MS/MS	238
B.M. Keikotlhaile, M. Naert and P. Spanoghe Behaviour of pesticide residues in selected vegetables after domestic steaming	239

I. Delcour, P. Spanoghe, L. Jacksens and W. Steurbaut Impact on pesticide application and pesticide risk assessment by climate changes and globalization	240
N. Hendrickx, K. Sniegowski, T. De Wilde, T. Goossens, K. Bers, C. Debaer, J. Ryckeboer, P. Spanoghe and D. Springael Optimization of an on farm bioremediation system. Results from practice	241
L. Besard, Veerle Mommaerts, G. Sterk and G. Smaghe Risk assessment for lethal and sublethal effects by chemical and micro-biological botryticides on <i>Bombus terrestris</i>	242
D. Indermauer, V. Anderau, R. Wohlhauser and J. Grunder Application technologies and measurement of application quality	243
Volume II	245

**COMMUNICATIONS IN AGRICULTURAL AND  
APPLIED BIOLOGICAL SCIENCES**

formerly known as

**MEDEDELINGEN FACULTEIT LANDBOUWKUNDIGE  
EN TOEGEPASTE BIOLOGISCHE WETENSCHAPPEN**

**PUBLISHERS**

Professoren  
Pascal Boeckx  
Peter Bossier  
Guy Smagghe  
Walter Steurbaut  
Els Van Damme  
Niko Verhoest

**EDITORIAL ADDRESS**

Coupure links 653  
9000 Gent (Belgium)

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

ISSN 1379-1176

The content of the contributions is in the responsibility of the authors

**Proceedings**

**62<sup>nd</sup>  
INTERNATIONAL SYMPOSIUM  
ON CROP PROTECTION**

**Editors  
P. Spanoghe  
B. Vandekerkhove**

**Gent, May 18, 2010**

**Part II**





## CONTENTS

<b>Agricultural Entomology and Acarology</b>	245
R. Liguori, R. Correia, C. Thomas, B. Decaudin, J. Cisneros and A. Lopez Emamectin benzoate (Affirm®). A modern insecticide for the control of <i>Lepidoptera</i> larvae on fruits, grapes and vegetables crops	247
E. Bangels, G. Peusens and T. Belien Integrated management of phytoplasma diseases in pome fruit: an over- view of efficacy results of IPM insecticides against pear psylla ( <i>Cacopsyl- la pyri</i> )	255
T. Navaneethan, O. Strauch and R-U. Ehlers The influence of humidity on the effect of <i>Steinernema feltiae</i> against diapausing codling moth larvae ( <i>Cydia pomonella</i> L.) (Lepidoptera: Tor- tricidae)	265
J. Akello, T. Dubois, D. Coyne and S. Kyamanywa The pathogenicity of <i>Beauveria bassiana</i> : what happens after an endo- phytic phase in plants?	273
A.E. Svinningen, V. Jegathambigai and G. Mikunthan Nomuraea rileyi: a plausible fungi selectively controlling Lepidopteron, <i>Parapnoyx stratiotata</i> L. damaging queen palm ( <i>Livistona rotundifolia</i> L.)	279
M.A. Masoud, A.S.S. Saad, A.K. Mourad and M.A.S. Ghorab Mass rearing of the pink corn borer, <i>Sesamia cretica</i> Led. (Lepidoptera: Noctuidae) larvae, on semi artificial diets	295
Abstracts	305
R. Geerinck, L. De Maeyer and D. Peeters Spirotetramate (Movento), an innovative solution for sucking pest control in fruit and vegetables in Belgium	307
E. Locus, W. Hubrechts and C. Van Ceulebroeck Control of lettuce root aphid in chicory witloof	308
M. Hamshou, G. Smagghe and E.J.M. Van Damme Insecticidal activity of the fungal lectin from <i>Sclerotinia sclerotiorum</i>	309
S. Jeyarani and R.J. Singh Life-history traits and predatory efficiency of the Acarophagous lady beetle, <i>Stethorus pauperculus</i> (Weise) in <i>Tetranychus urticae</i> Koch	310

A. Vandereycken, D. Durieux, E. Haubruge and F.J. Verheggen The occurrence of multi-coloured ladybird <i>Harmonia axyridis</i> Pallas, a biological control agent, in agro-ecosystems in Wallonia	311
H.E. Hummel, K. Mori, M. Bertossa and S. Dinnesen Comparative <i>Diabrotica v. virgifera</i> monitoring with sex pheromones synthesized by two different routes	312
<b>Posters – Agricultural entomology and acarology</b>	313
I. Grozea, R. Stef, A. Carabet, A.M. Virteiu, S. Dinnesen, C. Chis and L. Molnar The influence of weather and geographical conditions on flight dynamics of WCR adults	315
Zs. Marczali, S. Keszthelyi, M. Nadasy, P. Budai and E. Lehoczky Study on weevil pests of oilseed rape at Keszthely, Hungary	323
P.J. Silvie, C.A. Menzel, A. Mello and A.G. Coelho Population dynamics of caterpillars on three cover crops before sowing cotton in Mato Grosso (Brazil)	329
A. Fanigliulo, V. Fili, T. Colella and A. Crescenzi Evaluation of the efficacy and selectivity of Oberon (Spiromesifen) for the control of <i>Tetranychus urticae</i> on strawberry	337
A. Fanigliulo, C.G. Massa, L. Ielpo, R. Pacella and A. Crescenzi Evaluation of the efficacy of Oberon (Spiromesifen), to contain infestations of mites and whiteflies on <i>Capsicum annum</i> L.	341
S. Khadiga Moursi, A.S.H. Abo-Shanab, H.A. Mesbah, S.I. Abdel-Razak, A.K. Mourad, O.A. Zaghloul and R.S. Abdel-Fatah Efficacy of some oils and chemical compounds on <i>Insignorthezia insignis</i> (Browne) (Hemiptera: Orthziidae) infesting <i>Lantana camara</i> in Alexandria, Egypt	345
A. Maize, N. Aribi, G. Smagghe and N. Soltania Effect of an oxadiazine, indoxacarb, on the biochemical composition of ovaries in the German cockroach	359
L. Mirande, M. Haramboure, G. Smagghe, S. Pineda and M.I. Schneider Side-effects of glyphosate on the life parameters of <i>Eriopis connexa</i> (Coleoptera: Coccinellidae) in Argentina	367
M. Haramboure, L. Mirande, G. Smagghe, S. Pineda and M.I. Schneider Compatibility of a <i>Melia azedarach</i> extract with <i>Eriopis connexa</i> (Coleoptera: Coccinellidae)	373

H.A. Mesbah, A. El Sayed Nagda, A.K. Mourad, I. Soad Abdel-Razak and E. Abd El-Rahman Samar Efficacy of five volatile oils and their mixtures against the soft scale insect, <i>Saissetia coffeae</i> (Walker) (Hemiptera: Coccidae) infesting the Sago palm, <i>Cycas revoluta</i> in Alexandria, Egypt	379
A.E. Svinningen, K.P. Rashani, V. Jegathambigai, M.D.S.D. Karunaratne and G. Mikunthan Efficacy of <i>Curcuma aeruginosa</i> rhizome and <i>Adhatoda vasica</i> plant extracts, on red spider mite, <i>Tetranychus urticae</i> in <i>Livistona rotundifolia</i>	391
N. Sukhirun, W. Pluempanupat and V. Bullangpoti Impact of <i>Alpinia galanga</i> rhizome extract on <i>Bactrocera dorsalis</i> population	399
N. Khumrungrsee, W. Pluempanupat, Y. Kainoh, U. Sanguanpong and V. Bullangpoti Toxicity of ethyl-acetate extract from <i>Jatropha gossypifolia</i> senescent leaves against <i>Spodoptera exigua</i> Hübner (Lepidoptera: Noctuidae) and <i>Meteorus pulchricornis</i> (Hymenoptera: Braconidae)	405
M.R. Corpuz and P.P. Raymundo Integrated pest management strategies to sustain corn productivity	411
R. Stef, I. Grozea, G. Simeria, A.F. Carabet, M. Levente, A.N. Virteiu and S. Damianov The effectiveness of Trichotim in control of <i>Cydia pomonella</i> L. in Western Romania	417
Y. Assefa, A. Mitchell, B.P. Le Rü and D.E. Conlong Population genetics of <i>Eldana saccharina</i> Walker (Lepidoptera: Pyralidae) and the implications for management using biocontrol	423
S. Dushimirimana, F. Muratori, D. Damiens and T. Hance Gamma radiation consequences on desert locust <i>Schistocerca gregaria</i> (Forsk.) digestive system	433
Abstracts	441
M. Patten and R. Nauen Biological profile of spirotetramat (Movento®) against pear psylla ( <i>Psylla pyri</i> ) under greenhouse conditions	443
T. Hegyi, L. Földes, I. Molnar, E. Toth and I. Somlyay Efficacy of chloranthraniliprole against pome fruit pests in Hungary	444
E. Bangels and T. Belien An overview of efficacy results of IPM insecticides and alternative products against peas psylla ( <i>Cacopsylla pyri</i> ) in Belgium	445

J. Vandeven, V. Mommaerts, L. Besard, K. Put and G. Smaghe Development of a new laboratory method to test the compatibility of powder formulations with <i>Bombus terrestris</i>	446
P.D. Ledoy, F.J. Verheggen, Q. Capella, F. Francis and E. Haubruge Biological control device using <i>Episyrphus balteatus</i> (de Geer) (Diptera: Syrphidae)	447
R.D. Menjivar, A. Schouten, J. Kranz and S.A. Sikora Systemic biological control activity of mutualistic endophytic fungi to- ward the greenhouse whitefly <i>Trialeurodes vaporariorum</i> (Westwood) in tomato	448
H.E. Hummel Fifty years of pheromones a success story with implications for IPM and environmental protection	449
I. Meeus, D.C. De Graaf, K. Jans and G. Smaghe Multiplex PCR detection of protozoan parasites in bumblebees with broad-range primers	451
<b>Nematology</b>	453
S. Anbesse and R-U. Ehlers Attraction of <i>Heterorhabditis</i> sp. toward synthetic (E)- $\beta$ -cariophyllene, a plant sos signal emitted by maize on feeding by larvae of <i>Diabrotica vir- gifera virgifera</i>	455
T. Prior, S. Hockland and W. Decraemer A new approach to identify species in <i>Xiphinema americanum</i> sensu lato	459
C. Vos, R. Mkandawire, A. Elsen and D. De Waele Arbuscular mycorrhizae induced defence against root-knot nematode early infection	463
Abstracts	467
J. Mukuka, O. Strauch and R-U. Ehlers Improvement of heat and desiccation tolerance in <i>Heterorhabditis bac- teriophora</i> through cross-breeding of tolerant strains and successive ge- netic selection	469
J. Gulsar Banu Ecological characterization of a native isolate of <i>Steinernema siamkayai</i> Stock, Somsook and Reid, 1998 from Indian	470

S. Joseph, G. Gheysen and K. Subramaniam RNAi of pat-10 and unc-87 impedes movement of the migratory nematode, <i>Pratylenchus coffeae</i>	471
E. Grenier, J. Carpentier, M-C. Kerlan and M. Manzanares Positive selection in the nematode virulence factor gp-rbp1	472
A. Haegeman, B. Vanholme, J. Jacob, T.T.M. Vandekerckhove, M. Claeys, G. Borgonie and G. Gheysen An endosymbiotic bacterium in <i>Radopholus similis</i> : member of a new Wolbachia super group	473
D.L. Coyne and I. Hoeschle-Zeledon Nematology IPM in Africa: pesticides and the way forward	474
J. Hoek and L.P.G. Molendijk Yield loss of potato, sugar beet, carrot and black salsify caused by the stubby-root nematode <i>Trichodorus similis</i>	475
A. Ploeg, J. Nunez and J. Ole Becker Cover cropping and seed coating to mitigate root-knot nematode damage in carrot	476
<b>Posters – Nematology</b>	477
S.R. Pariyar, A.A. Dababat, J.M. Nicol and R.A. Sikora Effect of different potting systems; inoculation time; nematode density and sources of cereal cyst nematode ( <i>Heterodera filipjevi</i> ) on juvenile penetration into wheat root system	479
L. Villanueva, M. Flores and N. Pedroche Response of six strawberry ( <i>Fragaria x ananassa</i> Duch.) cultivars to the root lesion nematode ( <i>Pratylenchus penetrans</i> Filipjev and Schurmanns Stekhoven)	487
G. Dugui-es, N. Pedroche, L. Villanuava, J. Galeng and D. De Waele Management of root knot nematode, <i>Meloidogyne incognita</i> in cucumber ( <i>Cucumis sativus</i> ) using silicon	497
T. Addis, M. Mulawarman, L. Waeyenberge, M. Moens, N. Viaene and R-U. Ehlers Intraspecific variability of <i>Steinernema feltiae</i> strains from Cemoro Lawang, eastern Java, Indonesia	507

Abstracts	515
<b>M.E. Selim, R.A. Sikora and A. Schouten</b> Influence of root exudates from tomato plants colonized by the mutualistic endophyte <i>Fusarium oxysporum</i> (Fo162) on <i>Meloidogyne incognita</i> juveniles host finding behaviour	517
<b>A. Martinuz and R.A. Sikora</b> Interrelationships between the root-knot nematode <i>Meloidogyne incognita</i> , the sucking insects <i>Trialeurodes vaporariorum</i> and <i>Aphis gossypii</i> as affected by the mutualistic endophytes - <i>Glomus intraradices</i> 510, <i>Fusarium oxysporum</i> Fo162 and <i>Rhizobium etli</i> G12	518
<b>H.B. Khatri-Chhetri, L. Waeyenberge, H.K. Manandhar and M. Moens</b> Diversity and distribution of entomopathogenic nematodes in Nepal	519
<b>F. Fekrat and W.M.L. Wesemael</b> Effects of root diffusates and nematode age on the attachment of the bacterial hyper parasite <i>Pasteuria penetrans</i> to the cuticle of <i>Meloidogyne chitwoodi</i> and <i>M. fallax</i>	520
<b>C. Hillnhütter, R.A. Sikora and E.C. Oerke</b> Visualize soil-borne plant pathogenic organisms by means of leaf reflectance	521
Volume III	523

i

Vol 75(4) 523-816 (2010)

**COMMUNICATIONS IN AGRICULTURAL AND  
APPLIED BIOLOGICAL SCIENCES**

formerly known as

**MEDEDELINGEN FACULTEIT LANDBOUWKUNDIGE  
EN TOEGEPASTE BIOLOGISCHE WETENSCHAPPEN**

**PUBLISHERS**

Professoren  
Pascal Boeckx  
Peter Bossier  
Guy Smagghe  
Walter Steurbaut  
Els Van Damme  
Niko Verhoest

**EDITORIAL ADDRESS**

Coupure links 653  
9000 Gent (Belgium)

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

ISSN 1379-1176

The content of the contributions is in the responsibility of the authors



**Proceedings**

**62<sup>nd</sup>  
INTERNATIONAL SYMPOSIUM  
ON CROP PROTECTION**

**Editors  
P. Spanoghe  
B. Vandekerkhove**

**Gent, May 18, 2010**

**Part III**



## CONTENTS

<b>Biological and integrated control strategies of plant diseases</b>	523
<b>K.H.S. Kouassi, M. Bajii, A. Zhiri, P. Lepoivre and M.H. Jijakli</b> Evaluation of three essential oils as potential sources of botanical fungicides	525
<b>C. Schuster, S. Konstantinidou-Doltsinis and A. Schmitt</b> Glycyrrhiza glabra extract protects plants against important phytopathogenic fungi	531
<b>A. Scherf, C. Schuster, P. Marx, U. Gärber, S. Konstantinido-Doltsinis and A. Schmitt</b> Control of downy mildew ( <i>Pseudoperonospora cubensis</i> ) of greenhouse grown cucumbers with alternative biological agents	541
<b>G. Arras, G. Pani, M.G. Molinu, A. Dore, T. Venditti, A. Petretto, S. Marceddu and G. D'Hallewin</b> Synergic interactions between 2-deoxy-d-glucose and <i>Candida saitoana</i> enhances citrus green mould control	555
<b>M. Wenneker and J. Kanne</b> Use of potassium bicarbonate (Armicarb) on the control of powdery mildew ( <i>Sphaerotheca mors-uvae</i> ) of gooseberry ( <i>Ribes uva-crispa</i> )	563
<b>T. Deckers, H. Schoofs, W. Verjans and L. De Maeyer</b> Reduction in bacterial ooze formation on immature fruitlets after preventive treatments of fosetyl-AI against fire blight <i>Erwinia amylovora</i>	569
Abstracts	577
<b>E. Adriaenssens, M. Maes, V. Dunon, D. Vandenheuvel, P.J. Ceysens, A. Kropinski, M. De Proft, J. Van Vaerenbergh and R. Lavigne</b> Bacteriophages for control of potato tuber rot <i>Dickeya</i> spp.	579
<b>C. Van Ceulebroeck, W. Hubrechts, E. Locus and S. Van Beneden</b> Biological control of <i>Sclerotinia sclerotiorum</i> on chicory witloof by Contans WG	580
<b>D. Marquardt and R-U. Ehlers</b> Reduction of oil seed rape pathogens by seed treatment with the rhizobacterium <i>Serratia plymuthica</i>	581
<b>B. Declercq, N. Cap, J. De Nies, S. Pollet and M. Höfte</b> Integrated disease management based on new insights in the life cycle of <i>Phytophthora porri</i>	582

G. D'Hallewin, M.G. Molinu, A. Dore, T. Venditti, S. Marceddu, M. Chessa and N. Culeddu NMR imaging, thermography and SEM observations of citrus fruit following hot water dips: understanding pathogenesis and improving decay control	583
<b>Phytopathology</b>	585
L. El Chartouni, B. Tisserant, A. Siah, F. Duyme, R. Durand, P. Halama and Ph. Reignault Evolution of <i>Mycosphaerella graminicola</i> at the wheat leaf level and at the field level	587
A. Siah, B. Tisserant, L. El Chartouni, C. Deweer, C. Roisin-Fichter, J. Sanssené, R. Durand, Ph. Reignault and P. Halama Single strand conformation polymorphism is a sensitive method for screening nucleotide variations in <i>Mycosphaerella graminicola</i>	593
M.M. Zerroug, S. Mezaache, R.N. Strange and J. Niclin Production of <i>Ascochyta rabiei</i> lacking solanapyrone a toxin production	601
Abstracts	607
E. Van Buyten, D. De Vleeschauwer, C.M. Vera Cruz and M. Höfte <i>Pythium</i> spp. In the tropical aerobic rice cultivation: identification, intraspecific variability, pathogenicity and disease resistance	609
S. Landschoot, K. Audenaert, W. Waegeman, B. Pycke, B. Bekaert, G. Haesaert and B. De Baets Composition of primary Fusarium head blight (FHB) inoculum and the finale population on wheat ears	610
V. Troch, K. Audenaert, M. Höfte and G. Haesaert Virulence and genetic diversity of the powdery mildew ( <i>Blumeria graminis</i> (DC.) Speer) population on triticale	611
J.U. Wunderle and E. Koch Detection of the loose smut pathogen <i>U. nuda</i> in barley and wheat seedlings by microscopy and Elisa	612
S. Steyer, T. Oliver, I. Hanssen and K. De Jonghe Study on pospiviroid isolates in horticultural crops: molecular characterisation, status and risk assessment	613
J.M. Van der Wolf, P. Kastelein, M. Krijger, R. Czajkowski, T. Been, J. Vandroemme and M. Maes Spatial distribution, spread and survival on <i>Xanthomonas fragariae</i> in strawberry	614

J. Vandroemme, W. Verjans, P. Melis, M. Thoelen, K. Heylen, W. Baets, S. Clemens, J. Van Vaerenbergh, T. Deckers, C. Van Malderghem, P. De Vos and M. Maes Symptomatology and pathogenicity of <i>Xanthomonas fragariae</i> in strawberry plants	615
L. Detemmerman, B. Cottyn, J. Van Vaerenbergh, S. Baeyen, P. De Vos and M. Maes Diagnostics for regulated plants pests: DNA barcodes of quarantine <i>Xanthomonas</i> bacteria	616
J. Debode, K. Van Poucke, S.C. Franca, M. Höfte, M. Maes and K. Heungens Detection of multiple <i>Verticillium</i> species in soil using density flotation and real-time PCR	617
K. Van Poucke, J. Devlamynck, B. Declercq, M. Maes, M. Höfte and K. Heungens Quantitative detection of <i>Phytophthora porri</i> in soil using zoospore induction and real-time PCR	618
<b>Posters – Phytopathology</b>	619
E. Croes, W. Van Hemelrijck, A. De Landtsheer, W. Keulemans and P. Creemers Epidemiological research of twig scab on pear as basis for a rational and ecological disease management	621
O. Treikale, I. Priekule, B. Javoisha and L. Lazareva Fusarium head blight: distribution in wheat in Latvia	627
M. Duvivier, G. Dedeurwaerder, G. Marchal, M.E. Renard, V. Van Hese, J.M. Moreau and A. Legreve Distribution of airborne <i>Mycosphaerella graminicola</i> inoculum at the field scale	635
J. Baert, A. Ghesquiere and M. Vandewalle Consistency of crown rust evaluation in ryegrass cultivars	641
A.Y. Elbekali, A. Ramdani, B. Tisserant, C. Deweer, A. Siah, Ph. Reighnault and P. Halama Both mating types of the wheat pathogen <i>Mycosphaerella graminicola</i> are present in Morocco	643
T. Vleugels, J. Baert, J. De Riek, K. Heungens, M. Malengier, G. Cnops and E. Van Bockstaele Diversity study on <i>Sclerotinia trifoliorum</i> Erikks., the causal agent of clover rot in red clover crops ( <i>Trifolium pratense</i> L.)	649

A. Trzewik and T. Orlikowska Detection and identification of <i>Phytophthora alni</i>	655
M. Ptaszek, L.B. Orlikowski, A. Trzewik, T. Orlikowska and C. Sadowski Relationship between occurrence of <i>Phytophthora cambivora</i> on plants in hardy ornamental nursery stocks and detection of the pathogen from water ponds	659
M. Pugliese, M.L. Gullino and A. Garibaldi Efficacy of microorganisms selected from compost to control soil-borne pathogens	665
S. Mezaache, A. Guechi, M.M. Zerroug, R.N. Strange and J. Nicklin Antifungal activity of rhizospheric bacteria	671
M. Jensen, N. Nerat and N. Ale-Agha New remarkable records of microfungi from Sardinia (Italy)	675
J.I. Zebrowska In vitro selection in resistance breeding of strawberry ( <i>Fragaria x ananassa</i> Duch.)	699
N. Korolev, M. Mamiev and Y. Elad Monitoring for resistance to fungicides in <i>Botrytis cinerea</i> and <i>Sclerotinia sclerotiorum</i> , the pathogens of sweet basil	705
J.A. Martinez, R. Valdes and S. Banon Effects of paclobutrazol on <i>Botrytis cinerea</i> isolates obtained from potted plants	709
M.M. Zerroug, H. Laouer, R.N. Strange and J. Nicklin The effect of essential oil of <i>Ammoides pusilla</i> (Brot.) Breistr on the growth and the production of solanapyrone A by <i>Ascochyta rabiei</i>	721
A. La Torre, V. Pompei and A. Coramusi Natural products alone or with copper vs. grape downy mildew: efficacy, costs, Cu impact	725
G. Pani, M.G. Molinu, A. Dore, T. Venditti, A. Petretto and G. D'Hallewin In vitro studies on the effect of some chemicals on the growth and sporification of <i>Penicillium digitatum</i> and <i>P. italicum</i>	733
A. Dore, M.G. Molinu, T. Venditti and G. D'Hallewin Immersion of 'Coscia' pear fruit in water at 55°C for 60 sec controls <i>Penicillium expansum</i> decay and delays ripening during short storage	741
T. Venditti, M.G. Molinu, A. Dore, M. Agabbio and G. D'Hallewin Postharvest behaviour of two Sardinian apple varieties following immersion in heated sodium bicarbonate solution	747

M.G. Molinu, T. Venditti, A. Dore, M. Agabbio, G. Rosas and G. D'Hallewin Postharvest behaviour of five Sardinian prune varieties as affected by immersion in heated sodium bicarbonate solution	753
A. Alizadeh, E. Zamani, R. Sharafi, M. Javan-Nikkhah and S. Nazari Antifungal activity of some essential oils against toxigenic <i>Aspergillus</i> species	761
A. Alizadeh, R. Sharaifi, M. Javan-Nikkhah and N. Sedaghat Survey of <i>Thymus migricus</i> essential oil on aflatoxin inhibition in <i>Asper-</i> <i>gillus flavus</i>	769
M.R. Mohammadi, G. Vadamalai and H. Joseph An optimized method for extraction and detection of Coconut cadang- cadang viroid (CCCVD) from oil palm	777
S. Bahrami-Kamangar, K. De Jonghe, S. Kamangar, M. Maes and G. Smag- ghe Preliminary survey of potato virus Y (PVY) strains in potato samples from Kurdistan (Iran)	783
F. Shahryari, M.R. Safarnajad, M. Shams-Bakhsh and G.R. Salehi Jouzani Toward immunomodulation of witches broom disease of lime (WBDL) by targeting immunodominant membrane protein (IMP) of <i>Candidatus Phyto-</i> <i>plasma aurantifolia</i>	789
Abstracts	797
W. Van Hemelrijck, J. Debode, K. Heungens, M. Maes and P. Creemers <i>Colletotrichum acutatum</i> : a threat to other cultures except strawberry ?	799
N. Delhaye, M. Helson, C. Fassotte and A. Chandelier Survey of emerging diseases and insect pests for riparian woody species in Wallonia	800
A. Chandelier and F. André Fusarium head blight in winter wheat in Wallonia	801
J. Debode, W. Van Hemelrijck, P. Creemers, M. Maes and K. Heungens Potential inoculum sources and spread of <i>Colletotrichum acutatum</i> in the field	802
K. Van Poucke, S. Monbaliu, F. Munaut, K. Heungens, S. De Saeger and F. Van Hove Molecular and mycotoxicological characterization of four new <i>Fusarium</i> populations from sweet pepper	803
M. Maes et al. QBOL: DNA barcoding to identify quarantine organisms in support of plant health	804

- S. Schmitz, A. Bodart, H. Jijakli and A. Chandelier  
Effectiveness of biological control commercial products against *Verticillium dahliae* in strawberry production 805
- L. D'Hondt, L. Leus, J. Van Vaerenbergh, B. Cottyn, E. Van Bockstaele and M. Höfte  
Detecting *Pseudomonas cichorii* with immunomagnetic separation and PCR or flow cytometry 806
- M. Vargas, N. Zapata, F. Garrido, G. Belmar and M. Tapia  
Isolation of epiphytic yeasts with potential for biocontrol of *Botrytis cinerea* on table grapes 807
- H.G. Khuong Hua, K. De Maeyer, J. D'ae and M. Höfte  
Substrate and plant-pathogen system dependent role of phenazines and cyclic lipopeptides in biocontrol by *Pseudomonas* sp. CMR12a 808
- C.A. Berdugo, C. Hillnhütter, E-C. Oerke and R.A. Sikora  
Evaluation of inoculation techniques for screening sugar beet varieties for resistance to *Rhizoctonia solani* 809
- P. Van Bochaute, E. Dewaele and G. Angenon  
Plant resistance to pathogens: interaction between amino acid metabolism and biotic stress 810
- Z. Azami-Sardooui, S.C. França, D. De Vleeschauwer and M. Höfte  
Riboflavin induces resistance against *Botrytis cinerea* in bean but not in tomato 811
- J. Van Bockhaven, D. De Vleeschauwer and M. Höfte  
Silicon-induced broad spectrum resistance in rice (*Oryza sativa* L.) 812
- H. Seifi, K. Curvers, J. Carlos Cabrera, P. Van Cutsem, F. Van Breusegem and M. Höfte  
The role of cuticle permeability in the defence response of sitiens, an abscisic acid deficient tomato mutant, against thenecrotrophic pathogen *Botrytis cinerea* 813
- R. Sousa Resende, D. De Vleeschauwer, F. Avila Rodrigues and M. Höfte  
Silicon enhances sorghum resistance to *Colletotrichum sublineolum* 815