

I

Vol 68(4a) 1-456 (2003)
Vol 68(4b) 457-912 (2003)

**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
Erick Vandamme
Niko Verhoest

EDITORIAL ADDRESS

Coupure links 653
9000 Gent (Belgium)

Website: <http://fltbwww.rug.ac.be/>

ISSN 1379-1176

II

Proceedings

**55th
INTERNATIONAL SYMPOSIUM
ON CROP PROTECTION**

Gent, May 6, 2003

III

PATRONS

Ministry of the Flemish Community, Department of Education

Faculty of Agricultural and Applied Biological Sciences

Fund for Scientific Research - Flanders

BASF Belgium, Brussels, Belgium

Bayer Crop Science, Brussels, Belgium

Biobest Biological Systems, Westerlo, Belgium

Dow AgroSciences, Wilrijk, Belgium

Edialux, Bornem, Belgium

Fytolab, Ghent, Belgium

Syngenta Crop Protection, Ruisbroek, Belgium

IV

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**

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

**K. DE JONGHE (Secretary-general)
H. VAN BOST (Assistant-secretary)**

**ADVISORY
COMMITTEE**

**A. CALUS, P. DEBERGH, A. DE
LOOF,
H. KEYMEULEN, E. VANDAMME, H.
VAN LANGENHOVE, C. VERHEY-
DEN,
R. VERSCHOORE, W. VERSTRAETE,
E. VOLCKAERT**

SECTIONS

Chairmen

P.G. ANDERSEN, Helgeshoj, Denmark

G. DE SNOO, Leiden, The Netherlands

C. GAUVRIT, Dijon, France

M.L. GULLINO, Torino, Italy

H.E. HUMMEL, Giessen, Germany

J. JONES, Invergowrie, Scotland

K.H. KOGEL, Giessen, Germany

U. WYSS, Kiel, Germany

Vice-chairmen

K. HEUNGENS, Merelbeke, Belgium

K. LANGENAKENS, Poperingen, Belgium

M. MAES, Merelbeke, Belgium

A.K. MOURAD, Alexandria, Egypt

M.D. OSUNA, Cordoba, Spain

O. PIGEON, Gembloux, Belgium

R.A. SIKORA, Bonn, Germany

CONTENTS Vol 68(4a) 1-456 (2003)

Plenary session	1
R.U. Ehlers	
Entomopathogenic nematodes in the European biocontrol market	3
Y. Elad	
Biocontrol of foliar pathogens: mechanisms and application	17
Special Section – Diabrotica	25
H.E. Hummel	
<i>Diabrotica virgifera virgifera</i> Leconte (Coleoptera: Chrysomelidae) – An entomological challenge to Europe and its maize production	27
H.E. Hummel & R.L. Lampman	
Homage to Robert Lee Metcalf (1916-1998): Entomologist, Environmental toxicologist and insect chemical ecologist	29
H.E. Hummel	
Introduction of <i>Diabrotica virgifera virgifera</i> into the old world and its consequences: a recently acquired invasive alien pest species on Zea mays from North America	45
F. Baca, Z. Javanovic, M. Veskovc & Z. Kaitovic	
Effects of different growing systems and fertiliser rates on attractiveness of maize crop to beetles of <i>Diabrotica virgifera virgifera</i> Leconte and larvae damage	59
J.T. Shaw & H.E. Hummel	
A monitoring trap for <i>Diabrotica virgifera virgifera</i> and <i>D. barberi</i> adults lured with a poisoned cucurbitacin bait	67
J.T. Shaw & H.E. Hummel	
<i>Diabrotica</i> egg separation from soil: an efficient and fast procedure for monitoring egg stages of corn rootworm populations	73
F. Baca, Z. Videnovic, P. Erski, R. Stankovic & D. Dobrikovic	
Time of planting and choice of maize hybrids in controlling WCR (<i>Diabrotica virgifera virgifera</i> Le Conte) in Serbia and Montenegro	79
L. Wenneman & H.E. Hummel	
Distribution patterns of MCA-coated granules aerially applied to corn fields of Southern Hungary between 2000 and 2002	89
H.E. Hummel, F.I. Baca & P. Erski	

VII

Orientation disruption of <i>Diabrotica virgifera virgifera</i> in maize by a liquid MCA formulation released from paper squares in the Banat region of Serbia and Montenegro	99
H.E. Hummel Round table discussion at the special section of <i>Diabrotica</i>	105
Section 1 – Nematology	107
S. Hockland & H. Hoestra Are nematode collections in danger of extinction ?	109
V. Kutwayo Chemical alternatives for soil fumigation with methyl bromide on tobacco seedbeds in nematode and weed control	115
S. Kiewnick & R.A. Sikora Efficacy of <i>Paecilomyces lilacinus</i> (Strain 251) for the control of root-knot nematodes	123
S. Reimann & R.A. Sikora Managing the mycorrhizosphere – an approach to sustainable agriculture after the phaseout of methyl bromide	129
N. Sasanelli, P. Greco, T. D’addabbo, M.I. Coiro & F. Lamberti The use of olive mill wastes for the control of root-knot nematodes	135
A. Saeedizadeh, A. Kheiri, M. Okhovat & A. Hoseininejad Study on interaction between root-knot nematode <i>Meloidogyne javanica</i> and wilt fungus <i>Verticillium dahliae</i> on olive seedlings in greenhouse	139
C.I. Rumbus, R.A. Sikora & S. Kiewnick Risk assessment of biocontrol products: a semi-selective medium for improving quantitative isolation of <i>Paecilomyces lilacinus</i> (Strain 251) from soil	145
J. de Almeida Engler, K. Van Poucke, M. Karimi, R. De Groodt, G. Gheysen, G. Engler & G. Gheysen The cytoskeleton in nematode feeding sites	149
Section 2 – Agriculture Entomology and IPM	157
G. Messelink & W. Van Wensveen Biocontrol of <i>Duponchelia fovealis</i> (Lepidoptera: Pyralidae) with soil-dwelling predators in potted plants	159

VIII

- G. Mölck & U. Wyss**
Effect of aphid-infested plants on the host location and learning behaviour of the parasitoid *Aphelinus abdominalis* 167
- B. Adisu, B. Freier & C. Büttner**
Effectiveness of predators and parasitoids for the natural control of *Diuraphis noxia* (Homoptera: aphididae) on barley in central Ethiopia 179
- D. Bylemans, L. De Maeyer, A. Auwerkerken, H. De Craen, J.W. Wijismuller & D. Peeters**
Methoxyfenozide, a reliable IPM compatible compound against Lepidoptera in pome fruit and vegetables with sterilising, ovicidal and larvicidal efficacy of codling moth 189
- M. Breuer, H.-G. Kontzog & A. De Loof**
The sex attractant pheromone of the oak processionary, *Thaumetopoea processionea* a field evaluation 203
- M. Harhash, A.K. Mourad & S.M. Hammad**
Integrated crop management of the lesser date moth *Batrachedra amydraula* Meyr. (Lepidoptera: Cosmopteridae) infesting some date-palm varieties in Egypt 209
- R. Abraham & G. Kuroli**
Role of mites and thrips in the agrobiocoenosis of the soybean 223
- K. Vig**
Data on the biology of cabbage stem flea beetle, *Psylloides chrysocephalus* (Linnaeus, 1758) (Coleoptera, Chrysomelidae, Alticinae) 231
- C. Siongers & J. Coosemans**
Biological control of greenhouse whitefly (*Trialeurodes vaporariorum*) with fungal insecticides 239
- L. Blindeman & M.C. Van Labeke**
Control of the two-spotted spider mite (*Tetranychus urticae* Koch) in glasshouse roses 249
- A. Polgar & G. Kuroli**
Interaction between nutrient supplies and aphid numbers on potato (2001-2002) 255
- W. Warabieda, A. Miszczak & R.W. Olszak**
The influence of methyl jasmonate and β -glucosidase on induction of apple tree resistance mechanisms to two-spotted spider mite (*Tetranychus urticae* Koch.) 265

- G.R. Rassoulian & B. Shekarian**
Evaluation of tolerance of 20 wheat cultivars to Russian wheat aphid *Diuraphis noxia* (Mordvilko) at seedling stage under greenhouse conditions 271
- B. Baric & I. Ciglar**
Testing of the attract and kill technique against *Cydia pomonella* in Croatia 275
- A. Huerta, P. Medina, G. Smagghe, P. Castañera & E. Viñuela**
Topical toxicity of two acetic fractions of *Trichilia havanensis* Jacq. and four insecticides to larvae and adults of *Chrysoperla carnea* (Stephens) (Neuroptera: Chrysopidae) 277
- I. Zezlina & M. Blazic**
Testing the efficacy of different insecticides to control onion thrips (*Thrips tabaci* Indeman, Thysanoptera: Thripidae) in onion crops 287
- A.S. Bream**
Laboratory evaluation of heavy metals stress on certain biochemical parameters of the aquatic insect, *Sphaerodema urinator* Duf. (Hemiptera: Belostomatidae) 291
- H. Draredja-Beldi & N. Soltani**
Laboratory evaluation of dimilin on growth and glutathione activity in mosquitofish, a non-target species 299
- A. Boukachabia, N. Soltani-Mazouni, G. Smagghe & N. Soltani**
Comparative effects of some ecdysteroid agonists in mealworms: ecdysteroid amounts and protein analysis in developing ovaries under 'in vivo' conditions 307
- S. Trdan, M. Vidrih, A. Vesel & A. Bobnar**
Research on the influence of red deer (*Cervus elaphus* L.) grazing on grassland production in the south-eastern part of Slovenia 313
- Section 3 – Herbology** 321
- C. Casado, M.D. Osuna & R. De Prado**
Evaluation of resistance in *Amaranthus quitensis* Kunth populations to imazethapyr and other imidazolinones 323
- J.P. Ruiz-Santaella, Y. Bakkali, A.J. Fisher & R. De Prado**
Is it possible to detect *Echinochloa* spp. tolerance to ACCase-inhibiting herbicides using a simple quick tolerance test ? 331

G. Plaza, M.D. Osuna & R. De Prado Cross resistance to ALS-inhibiting herbicides in <i>Euphorbia heterophylla</i> L. biotypes resistant to imazethapyr	335
R. Moray, A. Büchse & K. Hurle <i>Bromus</i> species in winter wheat-population dynamics and competitiveness	341
C. Gauvrit, T. Lamrani-Lucotte & J.-C. Gaudry Influence of application volume on herbicide efficacy	353
A. Maataoui, M. Bouhache, M. Benbella & A. Talouizte Critical period of weed control in oilseed rape in two moroccan regions	361
E. Lehoczky & P. Reisinger Study on the weed-crop competition for nutrients in maize	373
G. Rijckaert & D. Lepiece Study on the selectivity of Primstar (Fluroxypyr+Florasulam) in two key grass species (Fesru & Lolpe) grown for seed production	381
Y. Bakkali, J.P. Ruiz-Santaella, I. Calha, F. Rocha, C. Zaragoza & R. De Prado Biotypes resistant to herbicides in paddy fields in the Iberian Peninsula	391
P. Michitte, N. Espinoza & R. De Prado Cross-resistance to accase inhibitors of <i>Lolium multiflorum</i> , <i>Lolium perenne</i> and <i>Lolium rigidum</i> found in Chile	397
J.P. Ruiz-Santaella, A.J. Fisher & R. De Prado Alternative control of two biotypes of <i>Echinochloa phyllopogon</i> susceptible and resistant to fenoxypop-ethyl	403
R. Santiago, R. De Prado & A.R. Franco Biodegradation of simazine in olive seeds	409
M.J. Martinez-Cordon, A. Yra, V. Pot & P. Benoit Evaluating non-equilibrium herbicides transport in undisturbed grassed buffer strips soil columns	415
J.P. Ruiz-Santaella, A. Pujadas & R. De Prado Botanical identification of several <i>Echinochloa</i> biotypes collected in Spanish rice fields with control failures of cyhalofop-butyl	421
A. Maataoui, A. Talouizte, M. Benbella & M. Bouhache	

XI

- Desherbage chimique du colza (*Brassica napus* L.) au Maroc 425
- A. Maataoui, A. Talouizte, M. Benbella & M. Bouhache**
Effect of water stress on the agressiveness of oilseed rape (*Brassica napus* L.) and two mustards (*Sinapis alba* L. and *S. arvensis* L.) 433
- M. Dobozi, E. Lehoczky & S. Horvath**
Investigation of the effect of soil herbicides on the growth and nutrient uptake of potato 441
- E. Lehoczky, E. Nádasy, I. Béres & G. Kainczi**
Changes in nutrient content of *Cirsium arvense* (L.) Scop. during the vegetation period 449

CONTENTS Vol 68(4b) 457-912 (2003)

Section 4 – Biological and integrated control of plant diseases	455
M. Maes & S. Baeyen	
Experiences and perspectives for the use of a <i>Paenibacillus</i> strain as a plant protectant	457
H.T.T. Le, L.L. Black & R.A. Sikora	
Evaluation of <i>Trichoderma</i> spp. for biocontrol of tomato sudden caused by <i>Pythium aphanidermatum</i> following flooding in tropical hot season	463
A.J. Dik, D.J. van der Gaag & M.A. van Slooten	
Efficacy of salts against fungal diseases in glasshouse crops	475
M. Montanari, M. Ventura, M.A. Sabatini & G. Innocenti	
Establishment of a <i>Trichoderma atroviride</i> strain in some organic products	487
P.F.J. Wolf & J.-A. Verreet	
Inovative combination of IPM (Integrated Pest Management) tools – the IPM sugar beet model	491
J.A. Verreet, M. Heger, E. Oerke, H.W. Dehne, I. Finger, C. Busse & H. Klink	
The IPM wheat model – results of a three-year study in North Rhine-Westfalia, Lower Saxony and Schleswig-Holstein	499
M. Mocioni, P. Titone, A. Garibaldi & M.L. Gullino	
Efficacy of different fungicides against <i>Rhizoctonia</i> brown patch and <i>Pythium</i> blight on turfgrass in Italy	511
O. Amand, F. Calay, L. Coquillart, T. Legat, B. Bodson, J-M. Moreau & H. Maraite	
First detection of resistance to QoI fungicides in <i>Mycosphaerella graminicola</i> on winter wheat in Belgium	519
S.M. Okhovvat & Z. Zakeri	
Indentification of fungal diseases associated with imported wheat in Iranian soils	533

- M. Mohammadi, V. Kane, A. Ng, M.A. Zaidi, I. Altosaar, F. Ni & M. Tanchak**
Cloning and expression of pinB gene from *Triticum monococum* weeds 537
- A. Sharifi Tehrani & M. Ramezani**
Biological control of *Fusarium oxysporum*, the causal agent of onion wilt by antagonistic bacteria 543
- M. Salari, S.M. Okhovat, A. Sharifi-Tehrani, Gh.A. Hedjaroude, S.J. Zad & M. Mohammadi**
Identification of physiological races of *Blumeria graminis* f.sp. *tritici* and evaluation of powdery mildew resistance in wheat cultivars in Sistan province, Iran 549
- G. Kazinczi, J. Kovacs, A.P. Takacs, J. Horvath & R. Gaborjanyi**
Susceptibility of *Capsicum* breeding lines to NTN strains of Potato Virus Y (PVY^{NTN}) and Obuda Pepper Virus (OBPV) 555
- A.P. Takacs, G. Kazinczi, J. Horvath & Gaborjanyi**
Reaction of *Lycopersicon* species and varieties to Potato Virus Y (PVY^{NTN}) and Tomato Mosaic Virus (ToMV) 561
- Section 5 – Plant Diseases** 567
- B. Lievens, M. Brouwer, A.C.R.C. Vanachter, B.P.A. Cammue & B.P.H.J. Thomma**
Rapid detection and identification of tomato vascular wilt pathogens using a DNA array 569
- J.C. Tu & B. Harwood**
An ultrastructural investigation of the ‘Microsclerotia’ formed in single cells of root cortical cells associated with corky root rot of tomato 583
- K. Heungens, C. Crepel, S. Inghelbrecht & M. Maes**
Phytophthora ramorum in Belgium: 2002 survey results and research efforts 589
- D.A. Fontem & M.O. Olanya**
Pathogenicity of *Phytophthora infestans* on solanaceous and asteraceous plant species in Cameroon 599

III

- J.C. Tu & C.S. Tan**
Effect of soil moisture on seed germination, plant growth and root rot severity of Navy bean in *Fusarium solani* infested soil 609
- A. Liptay & J.C. Tu**
Hydroponic chrysanthemum production: cultural and pathological issues 613
- N. Ale-Agha, G.B. Feige, B. Christiaans & A.E. Dündar**
New and remarkable records of microfung from Turkey 619
- N. Ale-Agha, G.B. Feige, B. Nagel & R. Kricke**
Second report of microfungi in Eastern-Westphalia (Sauerland, Northrhine-Westphalia, Germany) 631
- G.B. Feige, N. Ale-Agha, M. Jensen, B. Christiaans & R. Kricke**
New, rare and remarkable microfungi from Macedonia (Greece) 645
- F. Fiume & G. Fiume**
Field response of some *Asparagus* varieties to rust, *Fusarium* crown root rot, and violet root rot 659
- S. Kadlicsko, G. Fischl, S. Hoffmann & Cs. Pinter**
Fungal diseases on winter wheat in transdanubian region 673
- S. Naeimi, S.M. Okhovvat, G.A. Hedjaroude & V. Khosravi**
Sheath of rot rice in Iran 681
- S. Gielen, R. Aerts & B. Seels**
Development of a selective medium for the determination of the spore concentrations of *Botrytis cinerea* in the air 685
- Y. Zhao, B.W.W. Grout & P.C. Crisp**
Identification and characterization of pathogenic fungi causing spot disease on rhubarb (*Rheum raponticum* L.) in the UK 695
- L.B. Orlikowski, T. Oszako & G. Szkuta**
Alder *Phytophthora* in Poland: occurrence and plants colonization 705
- A.T. Wojdyla**
Activity of some chemicals in the control of *Botrytis cinerea* on roses 711

IV

Section 6 – Ecotoxicology and Pesticide Residues	717
A.C. Meijer Minor uses: national and international activities	719
S. Kragten & G.R. De Snoo Benchmarking farmer performance as an incentive for sustainable farming: environmental impacts of pesticides	727
S. Noel, B. Huyghebaert, O. Pigeon, B. Weickmans & O. Mostade The heterogeneity of sprout inhibitor application with chlorpropham	739
E. Brusselman, P. Spanoghe, P. Van der Meeren, D. Gabriels & W. Steurbaut Simulation of drift of pesticides: development and validation of a model	749
Y.Y. Mosleh, S. Paris-Palacios, F. Arnoult, M. Coderchet & G. Ver-net Metallothionein induction in the aquatic oligochaete <i>Tubifex tubifex</i> exposed to the herbicide isoproturon	759
H.A. Mesbah, E.H. Tayeb, A.K. Mourad, L.K. Younis, M.A. El Za-her & M.T.M. Aly Toxicology and histopathology of some rodenticides and palatable food items combinations on the common mice <i>Mus musculus</i> var. <i>al-bus</i> in Egypt	771
K. Talebi & A. Shaikhi Effects of different factors on the residues of heptenophos in cucumber	789
P. Budai, S. Fejes, L. Varnagy, I.M. Somlyay & Z.K. Szabo Teratogenicity test of dimethoate containing insecticide formulation and Cd-sulphate in chicken embryos after administration as a single compounds or in combination	795
S. Fejes, M. Keserü, P. Budai & L. Varnagy Comparing two methods of examination in the interaction study of a pesticide and a heavy metal	799
R. Szabo, P. Budai, S. Fejes, L. Varnagy & M. Keserü Embryonic toxicity of mancozeb containing fungicide formulation and Cu-sulphate in pheasant after individual or combined administration	803

- L. Varnagy, P. Budai, S. Fejes, M. Susan, T. Fancsi, M. Keserü & R. Szabo**
Toxicity and degradation of metolachlor (Dual Gold 960 EC) in chicken embryos 807
- M. Keserü, S. Fejes, P. Budai & L. Varnagy**
Toxicity of a mancozeb containing formulation and Cd-sulphate to chicken embryos after administration as single compounds or in combination 813
- G. Spera, F. Cardone, C. Cherubini & A. Leandri**
Natural specific radioactivity in different soils. Transfer in the soil plant food chain 817
- G. Spera, E. Conte, E. Rossi & W. Perconti**
Copper as indicator of agroenvironmental effects of various crop protection techniques used in Lazio, Italy. Verification in the areas of Maccarese, Terracina and Cisterna of Latina 827
- G. Spera, A. La Torre & S. Alegi**
Organic viticulture: efficacy evaluation of different fungicides against *Plasmopara viticola* 837
- P. Spanoghe & W. Steurbaut**
Methods to reduce the emission of pesticides on farm level 849
- M. van 't Zelfde & G.R. De Snoo**
Atlas of pesticides concentrations in Dutch surface waters: a pilot study 855
- E. Conte, E. Rossi, G. Spera, V. Pompei, F. Carfi, A.R. Spadoni, M. Rosati, M.R. Montereali, L. Donnarumma & W. Perconti**
Presence of plant protection products in three agricultural areas of regione Lazio 865
- A. Leandri, V. Pompei, M. Rosati & C. Pucci**
Residues of trichlorfon and its metabolite dichlorvos in olive, oil, waste water 875
- J.R. Rao, D. Nelson, N. Lafferty, J.E. Moore, B.C. Millar, J. Xu & M. Watabe**
Biohazards and ecotoxicological considerations of landspreading of spent compost wastes 885

Section 7 – Application technology	893
D. Kappel, L. Joergensen & B. Taylor	
Post emergent spraying demands, opportunities and benefits in field crop spraying practice	895
D. Nuyttens, S. Windey, P. Braekman, A. De Moor & B. Sonck	
Optimisation of a vertical spray boom for greenhouse spraying appli- cations	905