INTERNATIONAL ORGANIZATION FOR BIOLOGICAL CONTROL
OF NOXIOUS ANIMALS AND PLANTS (IOBC)

IOBC NEWSLETTER 79

WWW.IOBC-GLOBAL.ORG

IOBC is affiliated with the International Council of Scientific Unions (ICSU)
as the Section of Biological Control of the International Union of Biological Sciences (IUBS)

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WE ARE PREPARING AN OVERVIEW OF AVAILABLE BIOLOGICAL CONTROL BOOKS IN YOUR NATIONAL LANGUAGE. See the appendix of the IOBC Internet Book of Biological Control. Ah, you miss your country's biocontrol book? Send us a short summary and a jpeg file of the first page and the book will be added to the list.

THIRD EDITION of IOBC INTERNET BOOK OF BIOLOGICAL CONTROL IS OUT: see IOBC-Global.org

PDF files of previous newsletters can be found at www.iobc-global.org

1. EDITORIAL: BIOLOGICAL CONTROL IS RELIABLE, SUSTAINABLE AND SAFE

It is surprising and frustrating how often biological control workers are confronted with negative and unjustified remarks about the effectiveness of biological control. We, as biocontrol specialists, are apparently not able to make clear how good biological control is, on what enormous areas it is applied for decades or even hundreds of years, and how positive the benefit-cost ratios are. This is all in great contrast with the attitude of and stories told by the pesticide and gmo industry.

I have experienced a negative attituted towards biological control by misinformed persons in Ministries of Agriculture over and again. On the other hand, most consumers are usually very positive about the contribution of biological control to clean food production and improvement of the environment.

Particularly for meetings with Ministries of Agriculture, politicians, policy makers and the pesticide industry, I have prepared material that I show and explain at first contact. Part of this material is presented in the IOBC Internet Book of Biological Control. Below is an example of what I use to illustrate the benefits of biological control.

Table 1.1. Comparison of data on performance of chemical and biological control (after Lenteren, J.C. van, 1997. From *Homo economicus* to *Homo ecologicus*: towards environmentally safe pest control. In: Modern Agriculture and the Environment, D. Rosen, E. Tel-Or, Y. Hadar, Y. Chen, eds., Kluwer Acadamic Publishers, Dordrecht: 17-31.)

	Chemical control*	Biological control
Number of ingredients tested	> 1 million	2,000
Success ratio	1 : 200,000	1 : 10
Developmental costs	400 million US$	2 million US$
Developmental time	10 years	10 years
Benefit / cost ratio	2 : 1	20 : 1
Risks of resistance	large	small
Specificity	very small	very large
Harmful side-effects	many	nil/few

*Data for chemical control originate from material provided by the pesticide industry

Help biological control to get its full role realized by correcting mistakes and explaining its benefits!

Joop C. van Lenteren,

President IOBC-Global

2. RELATIONSHIIPS WITH OTHER ORGANIZATIONS

IOBC-Global has several long standing relationships with other organizations like the International Union of Biological Sciences (IUBS) of the International Council of Scientific Unions (ICSU), the Food and Agricultural Organization of the United Nations (FAO) and the Society for Invertebrate Pathology (SIP). Recently, contacts were made with the Insect Pest Control Section of the joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture to discuss collaboration in the field of area wide IPM programmes (see elsewhere in this newsletter). An FAO project on IPM in various crops in Asia is of particular interest to IOBC, as it includes important elements of biological control. The same holds for several FAO Farmers Field Schools Projects in Asia and Africa.

IOBC Global has contacted several large national biological control organizations in the Americas and we are working on joint meetings with some of these organizations. We hope to report on this in our next newsletter.

IOBC Global has also contacted the Organizing Committee of the International Congress of Entomology (2008, Durban, South Africa) for the joint organization of one or more symposia and we received a positive response.

Also, IOBC is collaborating with the European branch of FAO, EPPO, on environmental risk analysis, regulation of import of natural enemies, and "white lists" of natural enemies used for augmentative releases.

3. Books on Biological Control: How many are there?

IOBC Global is preparing an overview of available biological control books in national languages. See the appendix of the IOBC Internet Book of Biological Control for the first listing. Ah, you miss your country's biocontrol book? Send us a short summary and a jpeg file of the first page and the book will be added to the list. The Third Edition of the IOBC INTERNET BOOK OF BIOLOGICAL CONTROL is out, and contains the appendix with biocontrol books: see IOBC-Global.org

4. New Website: www.IOBC-GLOBAL.org

Our website is currently managed by our Secretary General, Stefano Colazza. Check the site regularly as we are now feeding it with new information! Any suggestions for improvement are welcome at colazza@unipa.it.

5. Financial situation IOBC-Global

The financial situation of IOBC Global is STRONGLY improving after several years with decreasing assets. Due to the new way of paying membership via creditcard and appointments with the publisher of BioControl, we will reach a stable situation this year, and even a slight increase of assets during the coming years. ***You can help us to improve the financial situation by paying on time and by acquiring new members: see membership application and payment form on the IOBC-Global website.***

Two new members for the auditing committee have been appointed: Prof.dr. J. Eilenberg (Denmark) and Dr. W. Rossing (The Netherlands) for the period 2005-2008. We thank them for accepting this task. We plan to have an annual audit of the finances of IOBC Global. The first audit will be in the spring of 2006.

6. Membership Fee System and Payment of Fees*

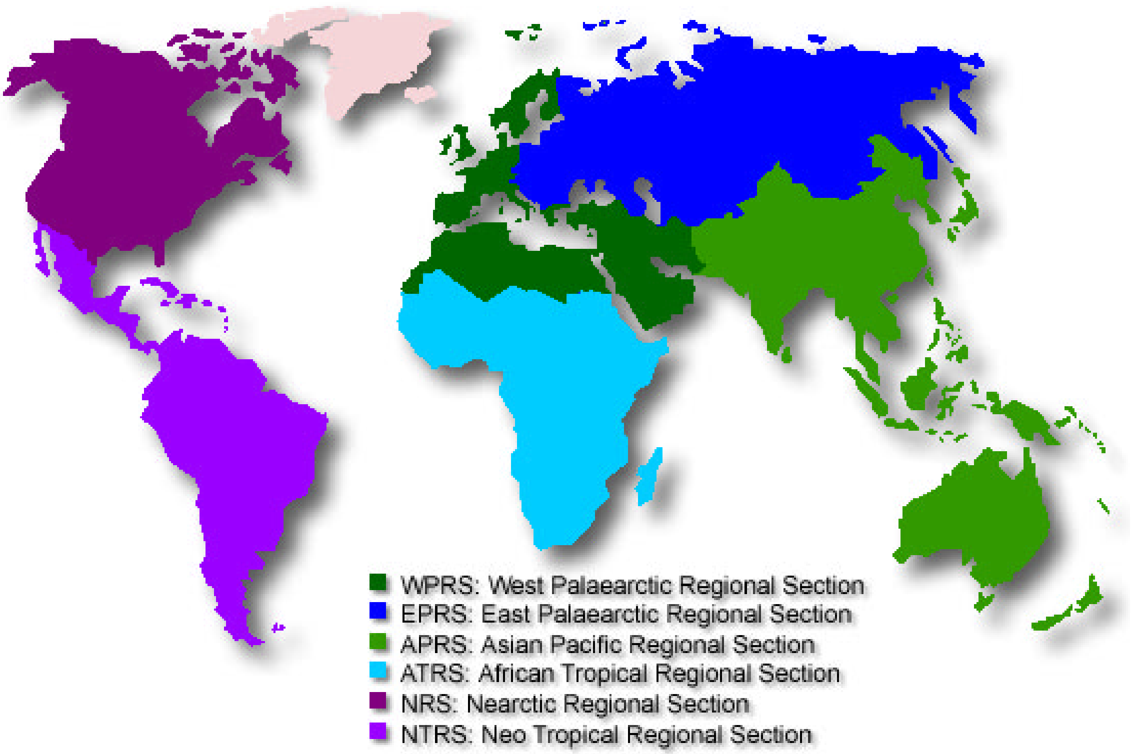
Membership fees for 2006 are the same as for 2005

1. Individual membership fee (country listing can be found on www.iobc-global.org)*:
   Group C countries: 20 Euro (50% for Region, 50% for Global)
   Group B countries: 8 Euro (50% for Region, 50% for Global)
   Group A countries: no fee to be paid
   Student membership (upon proof of student status): 12 Euro (33% for Region, 67% for Global)
2. Individual membership + Journal of BioControl (normal price 400 Euro/year)
   Group C countries: 114 Euro (94 Euro for BioControl)
   Group B countries: 102 Euro (94 Euro for BioControl)
   Group A countries: 94 Euro (94 Euro for BioControl)
   Student membership: 106 Euro (94 Euro for BioControl)
3. Supporting and institutional membership; we propose to keep the various regional systems as they are used now, in case of doubt contact Joop.vanLenteren@wur.nl

4. Fees will be adjusted annually according to changes in exchange rate. IOBC Global will propose adjusted fees to the regional sections each year in November and publish this information on our website. **The membership fees for 2006 will be the same as for 2005.**
5. Payments can now be made by credit card (Visa and Mastercard) to the treasurer of IOBC Global. We propose that from now on all payments are made directly to IOBC Global. Forms for payment can be found on www.iobc-global.org. ON THESE FORMS, THE FEES ARE MENTIONED IN EURO.
6. The treasurer will transfer the contribution for regions to each regional treasurer. The global treasurer will contact the regional treasurers in due time to discuss details of checking membership, BioControl subscriptions and transfers of money; the treasurer will provide the regions with a clear schedule defining actions of Global and the Regions.

* This proposal does not concern the Regional Sections WPRS and NRS as these sections apply higher fees

7. State of affairs of Regional Sections of IOBC



Short information of all the Regional Sections, with a link to their websites, can be found on www.IOBC-Global.org and at the end this newsletter. We are collecting the statutes/regulations of all regional sections and hope to publish these on the website soon.

During the past months, relationships with the NeoTropical Regional Section (NTRS) and the East Palaerctic Section (EPRS) have been intensified. One of the result of this better relationships is an increasing number of members in the NTRS region. This year, two IOBC meetings will be organized in this region, one in Colombia and another in Brazil. Also activities in the EPRS have increased. A new Executive Committee has been elected in June 2005, during the General Assembly of EPRS in Budapest, Hungary.

In the other regions, the situation is similar to what was written in previous newsletters.

8. State of affairs Working Groups IOBC-Global

Short information of all the Global Working Groups, with a link to their websites, can be found on www.IOBC-Global.org. at the end of this newsletter.

Most of the 10 IOBC Global working groups are active and have planned meetings in the near future. We have received several proposals for new working groups, and these will be discussed during our next EC meeting. Proposals include: (1) Environmental benefits and costs of releasing exotic natural enemies, (2) Designing agroecosystems that nurture biological control, (3) Unisex (pure female lines) and biological control. We invite you to send other proposals to the Secretary General.

Because of our earlier poor financial situation, we had to reduce the support for working groups. However, if a group succeeds in making a good number of new IOBC members, we will be able to support them with the full amount. Most working groups attract many participants to their meetings, but a rather low percentage of the participants is member of IOBC. We would appreciate working groups to motivate participants to apply for membership!

9. IOBC-Global Scientific meetings and celebration of 50th anniversary

50th Anniversary of IOBC: An historic review. Ernst F. Boller. Swiss Federal Research Station of Horticulture, CH-8820 Wädenswil, Switzerland (www.iobc.ch).

Six historic landmarks demonstrate best the development of IOBC as a powerful global organisation: **1948** (First idea to create an international commission on biological control); **1955** (International Union of Biological Sciences ratifies the new statutes of CILB, the future “Commission Internationale de Lutte Biologique”); **1956** (First official meeting of CILB takes place at Antibes, France; see photograph of this meeting on the last page of this newsletter); **1965** (CILB changes its name from Commission to Organisation becoming OILB/IOBC); **1969** (Agreement to merge partly competing international organisations active in biological control into a single international organisation carrying the name of IOBC); and **1971** (Official establishment of Global IOBC in Rome).

Whereas biological control has remained the main field of competence of IOBC and contributed to its international reputation, the concepts of Integrated Plant Protection (IPP, IPM) and ultimately of Integrated Production (IP) have been developed in parallel (especially by the WPRS). They provide not only conceptual umbrellas for biological control but facilitate also the knowledge transfer. Recent topics addressed by WPRS working units are e.g. Functional Biodiversity (in the context of Conservation Biological Control and habitat management), assessment of potential impacts of pesticides and GMOs, induced resistance in plants against pests and diseases, as well as crop specific guidelines for the implementation of Integrated Production programs. An international endorsement service established by IOBC in 1996 and an IOBC tool-box established in 2001 are useful in making IOBC concepts and scientific wisdom available to the farming community world-wide.

The full text of Dr. Boller’s historic review will soon be published by IOBC Global

Fifty Years of IOBC in West Europe and the Mediterranean: Dijon, France, 17-21 September 2005.

The region where IOBC was founded, West Europe, has held an anniversary meeting in conjunction with the General Assembly of WPRS in Dijon, France from 17-21 September 2005. See the bulletin of this meeting for a report

Fifty Years IOBC in Latin America: August 2006.

IOBC-Global has started discussions with members of the Latin American Region (NTRS) to organize a symposium in August 2006 concurrent with another Latin American meeting that is attended by many biocontrol workers. The aims of this symposium will be (1) to discuss successful cases of biological control in this region, (2) to evaluate the current situation, and (3) to develop a strategy for improvement of research collaboration.

Fifty Years IOBC in Africa and Worldwide: Summer 2008.
In collaboration with the Organization Committee of the 22nd International Congress of Entomology, IOBC-Global will organize a one or more day symposium. The aims of this symposium will be: (1) to give an overview of successful cases of biological control in Africa, (2) to discuss scientific and applied aspects of biological control research.

Honorary members:

EPRS
During the June 2005 General Assembly in Budapest, Hungary, Prof.dr. Stefan Pruszynski (Institute of Plant Protection, Department of Ecology and Protection of Agricultural Environment, Poznan) was appointed honorary member of the section EPRS for his long term contributions to this section. In 2001, Prof.dr. J.J. Lipa was appointed honorary member of the same section. See also newsletter 78.

NRS
Dr. Robert "Bob" Luck is the first recipient of the an honorary IOBC NRS membership, which was announced at the IOBC NRS meeting in Magog, Canada, May 2005. Earlier, Bob was the recipient of the NRS 2003 Distinguished Scientist Award. He was honored for his achievements in biological control in a ceremony during the IOBC-NRS annual meeting held with the Entomological Society of America meeting in Cincinnati, Ohio in October 2003. See also newsletter 78.

WPRS

WPRS elected Prof.dr. Vittorio Delucchi was elected honorary member of WPRS in 2001. During the General Assembly of WPRS in September 2005, Dr. Ernst Boller was elected honorary member for his many years contributions to IOBC WPRS, and in particular for his excellent work in developing the guidelines for Integrated Production.

Global

Until 2005, there was only one honorary member of IOBC Global, Prof.dr. Vittorio Delucchi (born on 21 May, 1925 in Switzerland). Prof. Delucchi was one of the main players in the early years of IOBC, and had several long term positions in several Executive Committees. Currently we have two Global honorary members, Prof. Delucchi and Prof. Luck.

Candidates for honorary membership

In 2005 - 2008 several festivities are organized to commemorate the start of IOBC 50 years ago. We intend to select and appoint an honorary member for each Regional Section. If you have a good suggestion, please mail the name of the person with a short motivation to the Secretary General (colazza@unipa.it). We prefer to honour “older” persons that have done much work for IOBC and biological control.

10. CANADIAN BIOCONTROL NETWORK

During the May 2005 meeting of the Canadian BioControl network together with IOBC NRS, various Symposia were organized. Some of the abstracts are presented below. For full information on the meeting, please contact Lucie Levesque (network coordinator) at biocontrol-network@umontreal.ca.

The Canadian Biocontrol Network initiative – why and how?

Jean-Louis Schwartz and Raynald Laprade, Université de Montréal, Montreal, Quebec, Canada.

Canada has a long tradition of research and development in biocontrol science. Hundreds of excellent scientists have spent considerable efforts for decades to discover, understand and implement biological alternatives to the use of chemical pesticides for the protection of Canadian agricultural crops and forests against insects, weeds and diseases. In the mid nineties, it was realized that there was a need, in Canada, for a comprehensive effort, supported by additional financial resources, to regroup under a highly integrated initiative the diverse expertise available across the country, to address identified priorities in the area of pest management alternatives and to train young biocontrol scientists in a network-like environment so that a new culture will emerge and impact significantly the science and applications of biologically-based pest management. The Biocontrol Network was created in 2001 to fulfill this need. It regroups 51 researchers from 15 Canadian universities, one college, 14 government research agencies and two non-profit research organisations, and 82 postdoctoral fellows, students and technical assistants are being trained by the Network. Financial support is provided by Canada's Natural Sciences and Engineering Research Council through a programme that supports complex research collaborations between private and public sector partners working on common research themes where networking provides demonstrable added advantages.

“Strategic” Research in Biological Control informs Basic Disciplines

Martha S. Hunter, Department of Entomology, 410 Forbes Bldg, The University of Arizona, Tucson, AZ, USA.

Most research defies pigeon-holing. Research may be placed on the applied-basic continuum by the expectation of how soon the results may be applied to solve problems, yet our expectations are frequently upset; problem-solving research may yield insight into a fundamental process and basic research may provide solutions to problems. “Strategic” research in biological control uses organisms of economic importance and seeks to understand fundamental aspects of their biology. Biological control ecologists have been doing strategic research from the start, and the outcomes of these efforts have been diverse and have contributed to both basic disciplines and biological control practice. I will highlight a few examples from the recent literature, here with less emphasis on trophic interactions (the focus of other talks) and more emphasis on topics such as physiological ecology of natural enemies, the role of symbiotic partners, the evolution of host range, or population genetics in biological control systems.

How does the general public perceive biological control as a management practice?

Jeremy N. McNeil, Department of Biology, University of Western Ontario, London, ON., Canada, N6A 5B7

There is no doubt that everyone present at this meeting believes that biological control is both a desirable and acceptable avenue of pest control. However, the current debate on GMOs clearly shows that the general public may have quite different opinions to many within the scientific community. Therefore, the Biocontrol Network conducted a trans-Canadian telephone poll between 21 January and 14 February, 2005 to determine to what extent the general public understands and accepts the idea of using biological control agents as a viable pest management practice. The results of this study, taking into consideration parameters such as age, gender, level of education and place of residence, will be presented. Furthermore, the use of these finding to seek continued funding for biological control research will be discussed.

Biological control to support biodiversity: how can IOBC Global help ?

J.C. van Lenteren. President of IOBC Global. Laboratory of Entomology, Wageningen Univeristy, P.O. Box 8031, 6700 EH, Wageningen, The Netherlands.

Biological control is the most successful, most cost effective and environmentally safest way of pest management. Biological control is one of the main ecosystem functions helping man to produce food in a sustainable manner. Due to the facts that (1) earth will have to feed about 11 billion human beings, (2) fossil energy is running out, and thus are conventional synthetic pesticides, (3) man cannot continue to pollute the environment and reduce biodiversity at the same dramatic rate as during the past 100 years, agricultural research is being redirected to a systems approach. In this approach, pest management is a guiding theme instead of being the marginal issue it was during the past 60 years. Guiding, because methods to prevent or reduce pests influence all agronomic methods from the design of cropping systems to the harvest of crops. Modern pest management will strongly depend on biological control. Factors that may seem to frustrate development of biological control will be illustrated, like quality control, environmental risk assessment and registration of natural enemies. Contributions from fundamental research, functional biodiversity, GMOs, high tech agriculture, and mass production expected to result in increased use of biological control will be discussed.

Biological control for everyman – public participation in a weed project

Robert N. Wiedenmann, Susan L. Post and Michael R. Jeffords . Center for Ecological Entomology, Illinois Natural History Survey, 607 E. Peabody Drive, Champaign, IL 61820 USA

Since 1994, we have reared and distributed *Galerucella* (Coleoptera: Chrysomelidae) beetles for control of purple loosestrife in Illinois wetlands. Adult beetles have been distributed to cooperators throughout the state, and released at > 230 wetland sites. Success at numerous sites has shown reduction of loosestrife flowering and densities, and many sites have shown sufficient regeneration of native flora to keep loosestrife at low densities. Even more important is that we have implemented an education and outreach program to have public participation in the biological control project. We have trained nearly 400 educators about wetlands, native biodiversity, invasive species and biological control, using purple loosestrife as a model. Educators have been given all supplies to grow loosestrife and *Galerucella* beetles in classrooms, with the release of beetles by students into nearby wetlands. As an offshoot of the education program, we developed methods for homeowners and others in the public to rear their own *Galerucella* beetles for release on their own properties. Moving the implementation of biological control into the public and classroom has led to increased awareness and acceptance of biological control, which will be necessary as other weeds of natural areas are targeted in the future.

Winter survival of the multicolored Asian ladybeetle *Harmonia axyridis* in Quebec (Canada)

Geneviève Labrie[1], Éric Lucas[1] and Daniel Coderre[2] [1] Université du Québec à Montréal, Dep.des sciences biologiques, Succursale Centre-ville, C.P.8888, Montréal (Qc) Canada H3C 3P8 [2] Université du Québec, 475 rue de l'Église, Québec (Qc) Canada G1K 9H7

The selection of an hibernation site for a coccinellid predator is of great importance for surviving to cold temperatures, to drowning risk, and for avoiding parasitism or infection by entomopathogens. The Multicolored Asian ladybeetle *Harmonia axyridis*, an introduced species that spread in North America since 1988, arrived in Quebec (Canada) in 1994. This ladybeetle hibernates mainly inside human habitations in this country, but some individuals used hibernation site of the indigenous ladybeetle species *Coleomegilla maculata* in the field. The objective of this study was to evaluate winter survival of *H. axyridis* compared to *C. maculata* outside and inside human habitations. We formulate the hypothesis that *H. axyridis* will not survive outside. Four experiments were conducted during winter 2003-2004 to evaluate survival inside and outside houses for both species. Lipids weight of the two species were also measured in both conditions. Survival of *H. axyridis* ranged from 25% to 46% inside houses whereas no survival was recorded outside. *Coleomegilla maculata* did not survived inside houses, but survived at 12.5% outside. The selection of human habitations as hibernating site by the Asian ladybeetle constitutes a highly adaptive behavior which may explain its great invasive success in this northern part of the continent.

Evaluation of different biofungicides for the control of stem canker caused by *Botrytis cinerea* in greenhouse tomatoes

JoëlleVenne[1], Johanne Caron[2], Lucie Laverdière[2] and Richard R. Bélanger[1] [1] Centre de recherche en horticulture, Université Laval [2] Horti-Protection Inc.

Stem canker caused by *Botrytis cinerea* is an important disease in greenhouse tomatoes which requires several chemical treatments for its control. Fungicides are sprayed regularly as a preventive treatment or applied directly on canker wounds as a curative treatment. Unfortunately, *B. cinerea* populations have already developed resistance against many active ingredients. In this context, biofungicides can become a complementary or alternative method to chemicals. *Trichoderma* spp. and *Gliocladium* spp. are well known fungal antagonists to many plant pathogens. Several *Trichoderma*- and *Gliocladium*-based products like Prestop®, RootShield® and MAUL-20 have been developed. Our hypothesis was that it is possible to control stem canker caused by *Botrytis cinerea* in greenhouse tomatoes with biofungicides with an efficacy similar to fungicides. Two trials were conducted in an experimental greenhouse. Treatments in pulverization were 1) fungicides; 2) Prestop; 3) MAUL-20 and 4) RootShield. Treatments in distempering were acetic acid and biofungicides. In both trials, the biofungicides performed as well as the fungicides when efficacy and yield were mesured. When treatments were compared, some repeated trends indicated that some biofungicides could outperform chemicals.

11. IOBC Global Journal BioControl

Over the past years *BioControl* has firmly established itself among the top scientific journals in our discipline and during the past year the impact factor has increased again. This has been achieved through a team effort involving biocontrol scientists submitting excellent manuscripts to their own journal – the IOBC official journal –, the superb devotion of our Editor in Chief (Prof.dr. Heiki Hokkanen), the Associate Editors and all the reviewers in assuring the quality of published papers, as well as a highly professional and supportive publisher (Springer, previously Kluwer).

During the past months there have been several meetings with the publisher concerning the journal. We have reported in the previous newsletter that the number of pages of this year's issue of BioControl will be increased in order to shorten the interval between acceptance and publication. Also, the publisher will put an accepted and corrected paper immediately on its website.

A new contract with the publisher has been signed in July 2005.

12. IOBC INTERNET BOOK ON BIOLOGICAL CONTROL

The THIRD EDITION of the IOBC INTERNET BOOK OF BIOCONTROL IS OUT: see IOBC-Global.org

IOBC Internet Book of Biological Control

Aim: to present the history, the current state of affairs and the future of biological control in order to show that this control method is sound, safe and sustainable

The third edition of the book (March 2006) of more than 100 pages with information about biocontrol is available for free on our website.

We ask you to support the preparation of this book. The first priority is to receive summaries of the actual application of biological control in each country or region. The second priority is to document the history of biological control in each country, including some key references, so that it will be easier for all biocontrol workers worldwide to know what has been done and what is going on at this moment. This will help us to make clear **how important biological control is**.

13. AVAILABILITY OF PROCEEDINGS/BULLETINS IOBC-WPRS WORKING GROUPS

The working groups of WPRS are producing each year 10-20 bulletins containing the proceedings of their meetings. Bulletins that have appeared since 1993 are listed on the WPRS website, and copies of these bulletins can be ordered with a form available on this website (via www.IOBC-Global.org to WPRS, go to publications etc.). Summaries of the contents of WPRS bulletins can also be found on the WPRS website and in Profile, the newsletter of WPRS.

14. IOBC-GLOBAL WRITING PARTNERSHIP

Since the start of the IOBC writing partnership programme, IOBC assisted in preparing about 30 manuscripts for several refereed biological control and entomological journals.

There were quite a number of applications for this service from non-IOBC members, but we had to inform the applicants that we can only do this very time consuming work for our members.

You can apply for a writing partnership if you are from a non-English speaking developing country and member of IOBC. See our website, IOBC-Global.org, for more details and an application form.

15. NEXT MEETINGS OF EXECUTIVE COMMITTEE IOBC-GLOBAL

Next meeting: May 2006, Rome, Italy

The agenda of the Executive Committee meeting will be published soon on our website www.IOBC-Global.org, ***and we appreciate input from members!***

16. 2nd INT. SYMP. ON BIOLOGICAL CONTROL OF ARTHROPODS, Davos, Sept. 2005

The Second International Symposium on the Biological Control of Arthropods (ISBCA II) was held in Davos Switzerland on 12–16 September 2005.

In our previous newsletter, we reported about this meeting. In this newsletter you find a number of abstracts of papers that were presented at this meeting. The memory of the meeting has been captured in the ISBCA II conference proceedings. The printed ISBCA II proceedings are large, two volumes totalling 734 pages, representing the wealth of information presented at this meeting. The two-volume proceedings include only the articles prepared by invited speakers. The accompanying CD is an electronic version of the conference proceedings and the abstracts of approximately 116 posters that were presented at the meeting which were perused by over 200 meeting attendees representing the international biological control community. The conference proceedings and CD are available free of charge by contacting Dr Richard Reardon at the USDA Forest Service (rreardon@fs.fed.us).

A first selection of abstracts of the Davos meeting, a second set will be published in next newsletter:

Biological control in the Neotropics with an emphasis on cassava as a case study. Anthony C. BELLOTTI. International Centre for Tropical Agriculture (CIAT), Apartado Aereo 6713, Cali, Columbia; a.bellotti@cgiar.org. Biological control is a key component in an integrated pest management program. This is especially applicable in the tropics, where continuous overlapping crop cycles and favorable environmental conditions can result in high pest populations, frequent outbreaks, shortened biological cycles and, consequently, pesticide resistance pest strains. However, the high degree of biodiversity in tropical systems and less interruption of populations by changing seasons favors the use of biological control to stabilize pest populations. Surveys throughout the neotropics in cassava agro-ecosystems reveal a species richness of natural enemies associated with several of the major pests of cassava, such as mites, mealybugs, whiteflies and hornworms. The knowledge and understanding of the interactions in this system has led to successful implementation of biological control. Research in biological control in the neotropics has increased in recent years, especially in countries like Brazil, Mexico, Colombia, Peru and Chile. The most frequently studied taxa are parasitic Hymenoptera, while citrus, fruits and sugarcane are crops frequently cited with successful biological control projects. In recent years, the use of entomopathogens appears to have increased although this is often difficult to document. The link between basic research, governmental institutions and private industry needs to be reinforced for a sustainable implementation of the integrated management of agricultural pests.

Attempts to harmonise regulation of invertebrate biological control agents in Europe. Franz BIGLER[1], Antoon LOOMANS[2] & Joop VAN LENTEREN[3]. [1] Agroscope FAL, Swiss Federal Research Station for Agroecology and Agriculture, 8046 Zürich, Switzerland, franz.bigler@fal.admin.ch; [2]Plant Protection Service, P.O.Box 9012, 6700 HG Wageningen, The Netherlands, a.j.m.loomans@minlnv.nl; [3] Wageningen Agricultural Research Center, Laboratory of Entomology, P.O.Box 8031, 6700 Wageningen, The Netherlands, Joop.vanLenteren@wur.nl. The regulation of import and release of Invertebrate Biological Control Agents (IBCAs) is not harmonised yet in Europe. Each country has its own regulatory system in place that is legally based in most cases on either the nature protection or/and the plant protection act. This is in contrast to the regulation of micro-organisms incl. viruses for biological control which are registered in the European Union (EU) under uniform principles (Council Directive 91/414/EEC). The publication of the FAO Code of Conduct in 1996 (CoC) for import and release of exotic biological control agents was the turning point for the activities related to the import and release of IBCAs. Two non-government organisations, the European and Mediterranean Plant Protection Organisation EPPO and CABI Bioscience organised a meeting in 1997 with the objective to substantiate the recommendations of the CoC. An EPPO expert panel developed between 1998 and 2002 two guidelines on the safe use of biological control and established a list of biological control agents widely used in the EPPO region. Under the European Commission's research programme FAIR, a project with the goal to develop scientific methods for evaluating environmental risks of biological control introductions into Europe (ERBIC) was conducted from 1998 to 2002. In 1999, the Organisation for Economic Co-operation and Development (OECD) has initiated a working group with the aim to develop a guidance document on appropriate regulation of IBCAs to ensure consideration of environmental risks posed by IBCAs, to promote the use of safe biological control and to ensure efficacy of IBCAs. This document has been published in 2003. It proposes general guidance on information requirements with respect to: 1. Characterisation and identification, 2. Safety and effects on human health, 3. Environmental risks and 4. Efficacy. Although this document provides a list of information requirements, it gives no specific guidance on how to produce the data (methods) and how to apply this information by national authorities in the risk assessment. Biological control industry was much concerned when the OECD guidance document was published as the information requirements were considered to be too stringent and industry feared that each national authority in Europe would establish their own regulatory system based on the OECD guidance. As a consequence, the International Biocontrol Manufacturer Association (IBMA) asked the International Organisation for Biological Control (IOBC/WPRS) to co-ordinate harmonisation among the European regulatory authorities. A commission of the IOBC/WPRS was put in place in 2003, and a first meeting with scientists, regulators and industry from 15 European countries was organised by the Commission in 2004. It was in October 2004 that the Directorate-General for Research of the European Commission released a call for project applications with the aim to develop a balanced system for registration of biological control agents for the EU. This is the first time that the EU intends to harmonise the regulation of Invertebrate Biological Control Agents in Europe, and it can be expected that in a few years from now, the EU members countries and other European countries will regulate IBCAs under uniform principles.

Removal of a predatory bug from a biological control package facilitated an augmentative program in Israeli strawberry. **Moshe COLL[1], Inbar SHOUSTER[1] & Shimon STEINBERG[2]. [1]Department of Entomology, the Hebrew University of Jerusalem, Rehovot 76100, Israel, coll@agri.huji.ac.il, inbars@bio-bee.com; [2]Bio-Bee Biological Systems, Kibbutz Sde Eliyahu, Beit Shean Valley 10810, Israel, S_stein@bio-bee.com.** Demands of export and domestic markets forced growers to adopt a biological control-based, integrated pest management program in low-tunnels strawberry fields in Israel. The program consists of the mass release of the predatory *Phytoseiulus persimilis* Athias-Henriot (Acarina: Phytoseiidae) against red spider mites and the parasitic wasp *Aphidius colemani* Viereck (Hymenoptera: Aphidiidae) against the cotton aphid. A study was launched to assess the potential use of *Orius laevigatus* (Fieber) (Heteroptera: Anthocoridae) to control the western flower thrips (WFT), *Frankliniella occidentalis* (Pergande) (Thysanoptera: thripidae), in strawberry. We investigated (i) the ability of *O. laevigatus* to reproduce on vegetative and reproductive plant parts, (ii) the potential damaging effect of *O. laevigatus* feeding and oviposition to the fruits, and (iii) the composition of naturally-occurring WFT predators in strawberry fields. *Orius* reproduction. Laboratory experiments show that *O. leavigatus* females preferentially deposit most of their eggs into tissues in reproductive parts of strawberry plants. These parts include flowers, green, white and ripened fruits, as well as their petioles. Inspection of strawberry plants that were collected from commercial fields revealed a similar distribution pattern of *Orius* eggs. This egg deposition pattern is apparently typical for *Orius* species because *O. albidipennis* and *O. niger* are the dominant species in strawberry fields (see below). Female egg deposition pattern corresponded with egg hatch; a significantly higher proportion of the eggs hatched in flower than leaf tissues. *Orius*-inflicted damage. To test whether *Orius* feeding and oviposition may damage strawberry fruits, we confined 10 female *O. laevigatus* onto intact flowers, green fruits and white fruits for 72 hrs. After female removal, we allowed the fruits to develop and then recorded the quality of the harvested fruits. Inspection of the flowers and fruits revealed extremely high density of *Orius* eggs imbedded in plant tissues. Nonetheless, no *Orius*-inflicted damage was recorded in the harvested fruits compared to control fruits. Thus, *Orius* feeding and oviposition do not inflict appreciable damage to strawberry fruits even under extremely high and un-realistic female densities. *Predator populations in strawberry fields*. The predominant WFT predators found in strawberry flowers were *O. albidipennis*, *O. niger* and predaceous thrips of the genus *Aeolothrips*. Both *Orius* species were often present simultaneously on the same flower. *O. niger* was the first to appear in the field in early spring, followed by *O. albidipennis* as the hot season commenced. The sex ratio of all O*rius* species was female-biased during most of the season; females appeared in the field earlier in the season than males. *Orius* colonization of strawberry fields coincided with that of WFT. *Conclusions.* The natural abundance of *Orius* predators in strawberry fields in Israel, their spatial and temporal co-occurrence with WFT, and their ability to reproduce successfully in this crop, allowed us to exclude this natural enemy from the commercial biological control package. This step had made the package much more economically attractive to growers and accelerated its adoption so that more than 80% of the strawberry acreage in Israel is now under a biologically-based integrated management program.

The successful control of *Orthezia insignis* on St Helena Island saves the natural populations of the endemic gumwood trees, *Commidendrum robustum*. **Simon V. FOWLER. Landcare Research, PO Box 69, Lincoln, New Zealand, FowlerS@landcareresearch.co.nz.** The small South Atlantic island of St Helena has a highly degraded but internationally significant terrestrial flora, now covering only 1% of its land area. The 2500 gumwood trees, *Commidendrum robustum*, in the last two natural stands, are an important part of this remnant flora. In 1991, a scale insect infesting the gumwoods was identified as *Orthezia insignis*. This South American pest is widespread in the tropics, but this was the first record from St Helena. By 1993, there were severe patches of infestation of the scale, and over 100 gumwood trees were dead. If the exponential increase in the number of dead trees had continued, all 2500 trees would have been killed by 1995. This was a likely outcome given the lack of natural enemies, and abundance of alternative hostplant species, of the scale. Control of *O. insignis* using insecticides was not an option because of the steep terrain, strong winds and risk to indigenous insects. Fortunately, *O. insignis* had a history of successful biological control in Hawaii, and several African countries, through the introduction between 1908 and 1959 of the predatory South American coccinellid beetle, *Hyperaspis pantherina*. The life history, taxonomy and environmental safety of the predator were studied in quarantine in the UK, and in 1993 the St Helena government gave permission for its introduction onto the island. In May 1993, 80 *H. pantherina* survived the 6-day journey to St Helena, and were used to establish a laboratory colony, from which over 5000 beetles were released from June 1993 to February 1994. Monitoring was undertaken using visual counts of *O. insignis* and *H. pantherina* on 300 labelled branchlets on the gumwood trees. Although the cause of tree death was visually obvious, monitoring demonstrated significant correlations between the levels of attack by the scale and tree mortality. *H. pantherina* was detected on the labelled shoots in February 1994, and numbers then increased, coinciding with a 30× decrease in mean scale numbers. This measured reduction is conservative, because the number of live scales tended to be overestimated when debris from recent feeding by the coccinellid was present. There have been no further problems reported with the scale on St Helena since 1995. Laboratory rearing of *H. pantherina* was discontinued in July 1995 because insufficient *O. insignis* could be found anywhere on the island. Biological control of *O. insignis* was successful, but the extensive blackening from sooty moulds on all surviving gumwood trees in February 1995, suggested that the predator was effective only just in time to prevent most of the trees being killed. Experimental transfers of *O. insignis* showed that the other three members of the endemic genus *Commidendrum* could also be at risk from the scale. The deliberate introduction of *H. pantherina* into St Helena is an early example of biological control being initiated solely for conservation of indigenous biodiversity. It appears that this successful programme has saved the field population of a rare endemic plant from extinction.

Case study: knowledge transfer in cabbage IPM through farmer participatory training in DPR Korea. **Manfred GROSSRIEDER[1], Beate KIEFER[1], Song Il KANG[2], Chong Song HAN[2] & Ulrich KUHLMANN[1]. [1]CABI Bioscience Switzerland Centre, Rue des Grillons, 2800 Delémont, Switzerland m.grossieder@cabi.org; [2]Plant Protection Institute, Academy of Agricultural Sciences, Pyongyang, DPR Korea.** Cabbage crops are of high importance in the traditional diet of DPR Korea. Particularly during winter, it is an important food source, as it is made into *Kimchi*, a long lasting pickle. Large areas are used for continuous cabbage cultivation, which results in difficulties such as decreasing soil fertility, the build-up of soil borne diseases and pest insect outbreaks. Especially the diamondback moth and small white butterfly cause serious yield losses in DPR Korean cabbage production. Traditionally used chemical pesticides show only a limited impact on the pest species, and diamondback moth has developed pesticide resistance. A new pest management concept was therefore needed. In order to improve DPR Korean cabbage production and thereby food security, an IPM strategy adapted to Korean context was designed. Besides other measures, replacing chemical pesticides with bio-pesticides and thereby enhancing the impact of the natural enemy community, as well as releasing natural enemies, play a key role within this concept. Knowledge transfer in IPM is essential for its implementation. Therefore in a first step, scientists of the Plant Protection Institute Pyongyang were trained as IPM trainers. Topics included cultural methods, monitoring and damage threshold models, the application of selective bio-pesticides as well as the rearing and releases of natural enemies. In a second step, these trainers involved in a Farmer Participatory Training (FPT) aimed at building farmers capacity to improve their crop management, based on a better understanding of the agro-ecology in their fields. When the Farmer Participatory Training was designed, the socio-political context and farm structure in DPR Korea had to be considered: the traditional top-down approach in knowledge transfer from work team leaders to sub work team leaders, or the limited access to Co-Farms. The focus of the Farmer Participatory Training was put on the recognition and understanding of cabbage insect pests and the natural enemy complex controlling them. Important objectives of this training were the identification of "good" and "bad" insects, direct observations of predators killing pests, observation of parasitoids attacking their host, as well as the effect of both conventional and bio-pesticides (*Bt*) on pests and natural enemies respectively. Participants showed high interest and commitment during the training. It became clear that awareness creation and a vital support for IPM were induced. In 2005 newly established extension services are trained in both IPM and participatory extension methods in order to reach more cooperative farms with this concept. For this purpose, "A Farmer's Manual for cabbage IPM in DPRK" was jointly developed, containing participatory exercises evaluated on at Co-Farm level and intended to support the dissemination process.

Cultural manipulations to enhance biological control in Australia and New Zealand: progress and prospects. **Geoff GURR[1], Steve WRATTEN[2] & Patrick KEHRLI[2.] [1]Faculty of Rural management, The University of Sydney, Orange, PO Box 883, Orange, New South Wales 2800, Australia, ggurr@orange.usyd.edu.au; [2] Bio-Protection and Ecology Division, PO Box 84, Lincoln University, Canterbury, New Zealand, Wrattens@lincoln.ac.nz, kehrlip@lincoln.ac.nz.**
Increasing social and government awareness of ecosystem services has facilitated a significant increase in conservation biological control research in Australia. Funding agencies are supporting such work in vegetable and agroforestry systems, whilst broadacre cropping research is supported by state and federal government organizations. Industry has become an important supporter of such work in New Zealand. This paper will review conservation biological control work in Australasia. A range of New Zealand studies will be reviewed including work in vineyards. Two major Australian projects will be reviewed. The first of these concerns the use of predators (principally Hippodamia variegata and Micromus tasmaniae) in brassica and other vegetable crops to control pests. The second major project is examining the importance of 'shelterbelts' of trees for enhancement of arthropod and vertebrate natural enemies of pests. This project has the overarching hypothesis that vegetational diversity of the shelterbelt improves habitat quality for vertebrate and arthropod natural enemies. Species richness of insectivorous birds and bats as well as parasitoid and predatory arthropods is being measured in a large scale survey of established shelterbelts that range from low to high botanical diversity. Analysis of arthropod remains in faecal samples from bats and birds is revealing dietary information for vertebrates. Predator and parasitoid activity and the extent of trophic cascading in this system is being measured in a second component of the study consisting of a designed experiment with three levels of botanical diversity imposed on newly planted Eucalyptus plots. Other recent and current projects will also be summarized. Prospects for wider adoption of conservation biological control will be explored, especial in relation to the likely expansion of genetically modified crops that offer potential benefits as well as challenges for natural enemies.

Regulation of the release of biological control agents of arthropods in New Zealand and Australia. **Libby HARRISON[1], A. MOEED[1] & Andy W. SHEPPARD[2]. [1]Environmental Risk Management Authority, P.O. Box 131, Wellington, New Zealand, Libby.Harrison@ermanz.govt.nz; [2] CSIRO European Laboratory, Campus de Baillarguet, 34980 Montferrier-sur-Lez, France, Andy.Sheppard@csiro-europe.org.** Import into containment for efficacy testing and release of biological control agents into the New Zealand environment is regulated under the Hazardous Substances and New Organisms Act 1996 (HSNO) and administered by the Environmental Risk Management Authority. This legislation requires the public notification of all applications to release a new organism into the environment. This may lead to the receipt of submissions and a public hearing. HSNO is strongly focused on the health and safety of people and the environment it also requires decision-makers to take into account the culture and values of indigenous New Zealanders (Māori). Key to decision-making under HSNO is the identification and assessment of significant adverse effects of a release and the weighing up of these against the potential benefits. Only if the benefits outweigh the risks can decision-makers approve biological control agents for release into the environment. Once released biological control agents are no longer regulated. In Australia the Department of the Environment and Heritage and the Australian Quarantine Inspection Service (AQIS) jointly regulate the import, testing and release of biological control agents under the Quarantine Act 1908, Wildlife Protection (Regulation of Exports and Imports) Act 1982 and Biological Control Act 1984. AQIS largely focuses on threats to primary industries and agriculture while the Department of the Environment and Heritage is responsible for considering the implications for biodiversity and the environment of all proposed biological control programmes. The introduction of a biological control agent in Australia follows a five-step process: deciding on the target pest; finding and identifying natural enemies of the target; importing agents into quarantine for detailed study; deciding which agents it is safe to release; monitoring to ensure released agents are working safely and effectively. In contrast to HSNO affects on cultural values are not assessed. Key to both jurisdictions is the requirement for host-specificity testing. Clearly it is impossible to test a candidate biological control agent against all non-target species, so priorities have to be made. Host-testing lists follow an internationally recognised system built around phylogenetic relatedness to the target, including where appropriate ecologically similar economically important and native species within this framework. This paper describes the policies and practice behind the two regulatory regimes, drawing on case studies by way of illustration.

Winter cover crops and biological control of soybean aphid. **George E. HEIMPEL[1], P. PORTER[2], D.W. RAGSDALE[1] & B. POTTER[3]. [1]Dept. of Entomology, University of Minnesota, St. Paul, MN 55108, U.S.A., heimp001@umn.edu; [2]Dept. of Agronomy and Plant Genetics, University of Minnesota, St. Paul, MN 55108, U.S.A.; [3]University of Minnesota Extension Service, Southwest Research and Outreach Center, Lamberton, MN 56152, U.S.A.** Fall-seeded winter cover crops can reduce erosion, improve soil organic matter, capture excess nutrients, and suppress weeds. Despite these broad-based environmental and agricultural benefits, the adoption rate of fall-seeded cover crops is relatively low among organic farmers in the corn-soybean agroecosystems of the midwestern United States. We are evaluating the ability of a fall-planted winter rye cover crop to provide another benefit: suppression of the soybean aphid, *Aphis glycines*. Indications are that early-season soybean aphid densities are reduced in soybeans drilled into a fall-seeded winter rye cover crop and we are determining whether whole-season suppression of soybean aphids occurs as well. Potential mechanisms for reduced soybean aphid pressure in soybeans following the rye cover crop include reduced colonization by soybean aphids and increased action of soybean aphid natural enemies (predators, parasitoids and pathogens) in the rye-associated soybeans.

Using synthetic herbivore-induced plant volatiles to enhance conservation biological control: field experiments in hops and grapes. **David G. JAMES, Sandra C. CASTLE, Tessa GRASSWITZ & Victor REYNA. Department of Entomology, Washington State University, Irrigated Agriculture Research and Extension Center, 24106 North Bunn Road, Prosser, Washington 99350, U.S.A. david_james@wsu.edu.** The potential of using synthetic herbivore-induced plant volatiles (HIPV) as a cultural tool to enhance conservation biological control of insects and mites is being researched in hops and grapes in Washington State. Results to date indicate that a number of natural enemy species in the families, Chrysopidae, Hemerobiidae, Anthocoridae, Geocoridae, Miridae, Coccinellidae, Syrphidae, Braconidae, Empididae and Mymaridae, are attracted to sticky traps baited with aqueous methyl salicylate (MeSA), hexenyl acetate, farnesene or octyl aldehyde. Hop yards and grape blocks baited with slow release sachet (SRS) dispensers of MeSA recruit larger populations of some insect predators (e.g. *Stethorus punctum picipes* Casey (Coleoptera: Coccinellidae), *Orius tristicolor* White (Hemiptera: Anthocoridae), *Chrysopa nigricornis* Burmeister (Neuroptera: Chrysopidae) than unbaited areas, resulting in some instances, in improved biological control of spider mites and aphids. SRS dispensers of methyl jasmonate and hexenyl acetate increase numbers of an aphelinid parasitoid (*Coccophagus* sp.) in grapes, by apparently 'signalling' to the plants to produce HIPVs. The use of synthetic HIPVs/plant-signalling compounds as 'Herbivore-Induced Plant Protection Odors' (HIPPOs) may provide a novel yet practical strategy for improving the efficacy and reliability of conservation biological control in a variety of agricultural ecosystems.

Opportunities and challenges for biological control in poverty alleviation and conservation of biodiversity. Moses T.K. KAIRO. Center for Biological Control, Florida A&M University, Tallahassee, FL 32307-4100, U.S.A. The role and contribution of biological control to poverty and biodiversity are discussed. The two linked themes are projected to continue to occupying the global development agenda for the foreseeable future. Poverty alleviation efforts have frequently focused on improving agricultural production *inter alia* with a view to provide adequate but safe food to meet local and export demands especially to northern markets. Such markets have increasingly put stringent requirements on minimum acceptable pesticide residue levels. Recent years have also seen a rise in demand for organic food. Implicit in these trends has been the growing need for ecological crop management. From this context, the role of biological control as a tool to manage the large number of native and alien pests is explored. The other area that has received considerable attention is implementation of the Convention on Biological Diversity. One article of interest in the convention is 8h, which focuses on the issue of invasive alien species. Biological control has continued to contribute to this albeit controversially. Using several case studies, the role and impact of biological control interventions within the context of the CBD are also discussed.

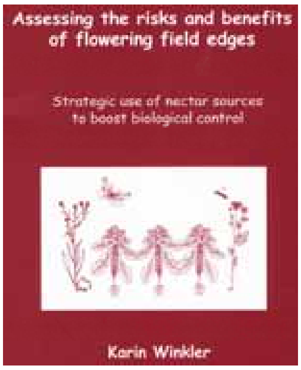
The horse-chestnut leaf miner in Europe – prospects and constraints for biological control. Marc KENIS & Sandrine GIRARDOZ. CABI Bioscience Switzerland Centre, 2800 Delémont, Switzerland, m.kenis@cabi.org; s.girardoz@cabi.org. The horse-chestnut leaf miner, *Cameraria ohridella* Deschka and Dimic (Lepidoptera: Gracillariidae), is a moth of unknown origin that was first observed in Macedonia in the late 1970's. Since then, it has spread over most of Europe. Its main host, the European horse-chestnut is a major urban tree in most of Europe. In most regions where the pest occurs, horse-chestnut trees are severely defoliated, year after year. The trees are not killed, but the aesthetic damage is so severe that municipalities are already replacing this highly valuable tree by other species. The horse-chestnut was originally endemic to the Balkans where the few remaining natural stands are also severely attacked. Studies have shown that, in these areas, the permanent outbreaks hamper the regeneration process, causing concern for the survival of this rare tree species. The reasons for seeking control measures for this pest therefore relate both to the conservation of the remaining natural stands and to minimising the impact on planted ornamentals. Invasive leaf miners are known for their ability to be adopted by native parasitoids, which are often able to reduce damage levels a few years after the introduction of their host. Many European leaf miner parasitoids have been recorded from the horse-chestnut leaf miner, however, parasitism rates remain low and there is no sign of damage reduction, even at the type location, where the month has been present for at least 30 years. *C. ohridella* is potentially a good target for classical biological control. Parasitism is much lower than in other leaf miners, especially in *Cameraria* spp., an Asian and North American genus whose species hardly ever reach outbreak densities. Furthermore, there is presently no other sustainable control option available and, thus, there is a strong demand for the introduction of exotic natural enemies. The main constraint is that the area of origin remains unknown. Methods to locate the area or origin include: (1) surveys in the potential areas of origin, i.e. the Balkans, Asia and North America, with the help of pheromone traps; (2) host tree screening tests; (2) studies on the parasitoid communities of *C. ohridella* and congeneric species; (4) molecular studies on *C. ohridella* and congeneric species. If the area of origin is not found the introduction of parasitoids of congeneric species from Asia or North America could be considered, provided parasitoids specific at genus level are found.

The impact of parasitoids on *Plutella xylostella* populations in South Africa and the successful biological control of the pest on the Island of St Helena. **Rami KFIR. Plant Protection Research Institute, Private Bag X134, Queenswood 0121, Pretoria, South Africa, KfirR@ARC.Agric.ZA.** Diamondback moth, *Plutella xylostella* (Linnaeus) (Lepidoptera: Plutellidae), is the most injurious insect pest of brassica crops throughout the world. In many countries it has developed resistance to almost every synthetic insecticide used against it including *Bt* formulations. In addition to resistance, the destruction of its natural enemies through indiscriminate use of broad-spectrum insecticides is considered responsible for its high pest status. Population studies of *P. xylostella* and its parasitoids in the Eastern Cape, Gauteng and North-West Provinces of South Africa revealed that the pest is naturally controlled if insecticides are not used. A total of 3 egg-larval parasitoids, 8 larval parasitoids, 4 larval-pupal parasitoids, 6 pupal parasitoids and 12 hyperparasitoids have been identified as being associated with *P. xylostella* in South Africa. An insecticide check method was used to assess the impact of parasitoids on levels of infestations by *P. xylostella*. In the sprayed plots parasitism of *P. xylostella* larvae and pupae fluctuated between 5-10% whereas in the untreated plots parasitism peaked above 90%. As a result population levels of *P. xylostella* on the sprayed plants were about five times higher than on the control plants, which is an indication that parasitoids played an important role in controlling the pest populations. *Plutella xylostella* was a severe pest on the Island of St Helena, South Atlantic Ocean. Farmers were heavily depended on chemical control, often spraying cocktails of several insecticides when the required control failed. A survey in brassica crops on St Helena revealed that natural enemies were not an important factor in controlling *P. xylostella* and that the only parasitoid on the Island was the larval-pupal parasitoid *Diadegma mollipla* (Holmgren) (Hymenoptera: Ichneumonidae). Following an agreement between NRInternational and the Plant Protection Research institute (PPRI) of South Africa two consignments of the larval parasitoid, *Cotesia plutellae* (Kurdjumov) (Hymenoptera: Braconidae), and the pupal parasitoid, *Diadromus collaris* Gravenhorst (Hymenoptera: Ichneumonidae), were shipped in 1999 from South Africa to St Helena. The parasitoids were mass reared on the Island and released on 10 different farms across the The parasitoids were mass reared in a facility Island. An early survey of 19 farms (release and non-release sites) in 2000 indicated that both introduced parasitoids became established. *Cotesia plutellae* was found in 15 farms with up to 80% parasitism and *D. collaris* on 5 farms with up to 55% parasitism. Further surveys during 2002 - 2004 indicated very low levels of *P. xylostella* populations. However, *C. plutellae* cocoons were present throughout the Island which is an indication that parasitoids had been the cause for the decline in the pest populations. Farmers in St Helena reported that *P. xylostella* infestations remain low and that no chemical control has been necessary since 2001. This is a strong indication for the success of the biological control of *P. xylostella* on St Helena.

Selection of non-target species for host specificity testing of entomophagous biological control agents. **Ulrich KUHLMANN[1], Urs SCHAFFNER[1] & Peter G. MASON[2]. [1]CABI Bioscience Centre, Rue des Grillons 1, 2800 Delémont, Switzerland, u.kuhlmann@cabi.org; u.schaffner@cabi.org; [2]Agriculture and Agri-Food Canada, Research Centre, Central Experimental Farm, Ottawa, Ontario, Canada K1A 0C6, masonp@agr.gc.ca.** Host-specificity testing of invertebrate biological control agents in arthropod biological control has lagged behind that herbivorous biological control agents in weed biological control. So far, concerns about impacts on non-target species were infrequently considered in arthropod biological control. Selection of appropriate species for testing potential impacts of candidate biological control agents is the first critical step in the process once the need for pest suppression is justified and one or more potential agents have been identified. Several recent publications have suggested that the centrifugal phylogenetic method used in weed biological control programmes should be the primary method used for selecting non-target species for testing candidate invertebrate biological control agents. However, it is apparent the criteria used in weed biological control are unlikely to provide the necessary information that would enable development of a meaningful non-target test list for invertebrate biological control agents. Arguments in support of this include: a) arthropods often outnumber plant species in communities by an order of magnitude, b) there is a significant lack of knowledge of arthropod phylogeny, c) natural enemies of arthropod pests respond to two trophic levels, i.e. the host and its host-plant(s), d) disjunct host-ranges appear to be the rule in parasitoids, rather than the exception as in herbivores, and e) the fact that it is much more difficult and time-consuming to rear a large number of test arthropod species than test plant species. In this paper, we will discuss the current practice in developing test plant lists in weed biological control programmes, what determines parasitoid host ranges, and review the approaches taken in recent arthropod biological control programmes. We propose comprehensive recommendations for setting up test species lists for arthropod biological control programmes that are scientifically based and ensure that all aspects of direct potential impacts are considered. It is proposed that a set of categories, including ecological similarities, phylogenetic/taxonomic affinities, and safeguard considerations are applied to ecological host range information to develop an initial test list. This list is then filtered to reduce the number of species to be tested by eliminating those with spatial, temporal and morphological attributes and those species that are not readily obtained, thus unlikely to yield scientifically sound data. The revised test list is used for the actual testing but can (and should) be revised if new information obtained indicates that additional or more appropriate species should be included. Use of the recommendations are illustrated by a case study on the host specificity of a tachinid fly, candidate for use as a biological control agent against the western corn rootworm, *Diabrotica virgifera virgifera* LeConte.

ISBCA III will be held in Christchurch, New Zealand in February–March 2009. The key organizer of ISBCA III is Steve Wratten (Wrattens@lincoln.ac.nz) at Lincoln University. (M. Hoddle & U. Kuhlmann, October 2005)

17. SUMMARIES OF PHD THESES



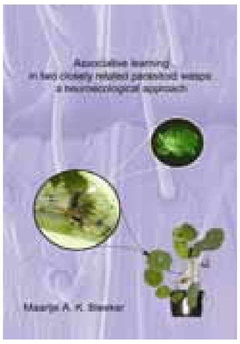
Assessing the risks and benefits of flowering field edges: strategic use of nectar sources to boost biological control. PhD thesis Karin Winkler (Germany), Wageningen University, Laboratory of Entomology, The Netherlands; December 2005.

The intensification of agricultural production systems during the last decades had a enormous impact on the landscape structure in agro-ecosystems. Landscape elements like hedges and vegetational rich fieldmargins dissapeared and crops are cultivated in large monocultures. To let beneficial insects play a role in these ‘ecological deserts’ and to fullfill their food requirements in form of pollen and nectar the establishment of flowering field edges gets increasingly popular.

But not everything that flowers is naturally exclusively positive for beneficial insects. Pest insects can profit from flowering field edges as well. In my PhD research I analysed a number of nectar plants with respect to their potential benefit for cabbage pests and/or their natural enemies. In field studies I observed the attractivity of nectar plants for pest insects and beneficial insects. In the laboratory I studied in how far the plant species differ in their nectar accessibility and their impact on insect longevity. In addition, I examined the impact of different nectar and honeydew sugars on the gustatory response and the longevity of the insects.

Based on the results I found, I conducted field experiments with plants that provide food for either the herbivores or for the beneficial insects. I collected individuals of the diamondback moth *Plutella xylostella* and its parasitoid *Diadegma semiclausum* and tested them for their sugar content. The results indicated food uptake in the field for both species. I also could show in a field experiment, that suitable nectar plants, such as buckwheat, have an enormous positive impact on longevity and fecundity of the parasitoid *D. semiclausum*. In addition, I could demonstrate that nectar plants that selectively are used by herbivores, such as *Centaurea jacea* by the cabbage white *Pieris rapae*, can lead to higher pest densities in adjacent cabbage plantings. My most important conclusion is therefore

that a selective approach and a careful choice of plant species are necessary to achieve improved biological control by flowering field edges.
A pdf version of this thesis can be obtained from karin.winkler@wur.nl



Associative learning in two closely related parasitoid wasps: a neuro-ecological approach. PhD thesis Maartje A.K. Bleeker (The Netherlands), Wageningen University, Laboratory of Entomology, The Netherlands; December 2005.

Insects are useful model organisms to study learning and memory. Their brains are less complex than vertebrate brains, but the basic mechanisms of learning and memory are similar in both taxa. In this thesis I study learning and subsequent memory formation in two parasitoid wasp species that differ in associative learning of the odours of plants on which they have encountered a host caterpillar. After ovipositing in a caterpillar on a certain plant species *C. glomerata* shifts its preference to the experienced plant odour, whereas *C. rubecula* does not shift plant odour preference after a similar experience. This difference in learning between these two closely related wasp species provides an attractive model to study physiological and ecological factors that could influence learning.

As a first step to analyse possible physiological differences that could influence learning, I describe morphological, anatomical and histochemical aspects of the neural pathways that mediate associative learning of odours in these wasps. The two wasp species display a high degree of similarity in morphology of the olfactory pathway at both the level of the sensilla, and the level of the glomeruli, the primary olfactory neuropile. I furthermore identify the octopaminergic neurons that could mediate the reward stimulus in the two wasp species, but the results did not allow us to distinguish possible dissimilarities between the species.

In addition I redefined the difference in preference learning between the two species in terms of associative and non-associative learning and analysed the temporal dynamics of the memory trace. Both wasps display associative learning after an oviposition reward conditioning, but the temporal dynamics differ. *C. glomerata* displays a stable memory for the experienced odour that lasts for at least five days, whereas in *C. rubecula* the memory starts to wane after one day.

Finally, I studied the effect of physiological and ecological traits of hosts as possible factors influencing memory formation. For this I used two geographically disjunct populations of *C. glomerata* that differ in their host use. Both populations only change preference after an oviposition reward on their preferred host species, suggesting that physiological factors exert a major influence on learning in these two populations. I discuss the ultimate factors that could have contributed to a difference in learning in *C. glomerata* and *C. rubecula*.
A pdf version of this thesis can be obtained from maartje.bleeker@wur.nl

For information about the following PhD theses, see Global Newsletters from 75 onwards (pdf files on website):

Biological control of plant bugs, Lygus spp., PhD thesis T. Haye, Department of Zoology, Christian-Albrechts University, Kiel, Germany, 2004. The full version of this thesis can be obtained at: http://e-diss.uni-kiel.de/diss_1133

Chemical ecology and integrated management of the banana weevil Cosmopolites sordidus in Uganda. PhD Thesis of W. Tinzaara (Uganda), Laboratory of Entomology, Wageningen University, February 2005. A pdf copy of this thesis can be obtained from arnold.vanhuis@wur.nl

Extremely selfish B chromosome initiates only male offspring by eliminating a complete genome: Mode of action, origin and structure of the Paternal Sex Ratio chromosome in the parasitoid wasp Trichogramma kaykai. PhD thesis of J.J.F.A. van Vugt (The Netherlands), Laboratory of Entomology, Wageningen University, The Netherlands. A pdf copy of this thesis can be obtained from joke.vandervugt@wur.nl

Evaluation of Orius species for biological control of Frankliniella occidentalis (Pergande) (Thysanoptera: Thripidae). PhD thesis M.G. Tommasini (Italy), Wageningen University, Laboratory of Entomology, The Netherlands; September 2003. A pdf version of this thesis can be obtained from tommasini@crpv.it

Parasitoids as Biological Control Agents of Thrips Pests. PhD thesis A.J.M. Loomans (The Netherlands), Wageningen University, Laboratory of Entomology, The Netherlands; September 2003. A pdf version of this thesis can be obtained from *a.j.m.loomans@minlnv.nl*

Semiochemical relationships in the tritrophic system Leguminous plants, *Nezara viridula* (L.) and *Trissolcus basalis (*Woll.*)*. PhD thesis Alessandro Fucarino, Palermo University, Italy; February 2004. *A pdf version of this thesis can be obtained from elfucaro@hotmail.com*

Semiochemicals used by scale insects and their parasitoids: behavioral and chemical ecology investigations. PhD thesis Paolo Lo Bue, Palermo University, Italy; February 2004. *A pdf version of this thesis can be obtained from paololobue@hotmail.com*

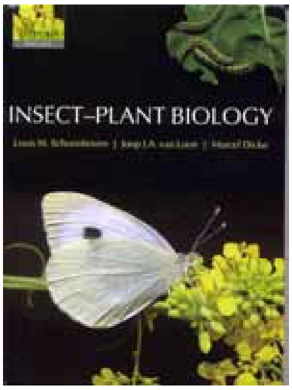
Tailoring complexity: Multitrophic interactions in simple and diversified habitats. PhD thesis T. Bukovinszky (Hungary), Wageningen University, Laboratory of Entomology, The Netherlands; June 2004. A pdf-version of this thesis can be obtained at: *Tibor.Bukovinszky@wur.nl*

The entomopathogenic fungus Metarhizium anisopliae for mosquito control, PhD thesis E-J. Scholte, Laboratory of Entomology, Wageningen University, The Netherlands, November 2004. A pdf version of this thesis can be obtained from ErnstJan.Scholte@wur.nl

Whitefly control potential of Eretmocerus parasitoids with different reproductive modes. PhD Thesis of Mohammad Javad Ardeh (Iran), Laboratory of Entomology, Wageningen University, February 2005. A pdf copy of this thesis can be obtained from mjardeh@gmail.com

18. RECENT PUBLICATIONS AND BOOKS ON BIOLOGICAL CONTROL AND IPM

If you miss important recent books on biological control or IPM, send us (colazza@unipa.it) a jpeg picture of the front page, a short summary and information on how and where the book can be ordered. Also, please send us pdf files or reprints of important new biocontrol publications and they will be mentioned in the next issue of our newsletter.



Insect Plant Biologyby Louis M. Schoonhoven, Joop J.A. van Loon & Marcel Dicke. Oxford University Press, Oxford, UK, 421 pp. http://www.oup.co.uk/isbn/0-19-852594-X

Half of all insect species are dependent on living plant tissues, consuming about 10% of plant annual production in natural habitats and an even greater percentage in agricultural systems, despite sophisticated control measures. Plants possess defences that are effective against almost all herbivorous insect species. Host-plant specialization, observed in over 80% of these animals, appears to be the key to breach the defences of a small number of the 300,000 species of higher plants. The mechanisms underlying plant defence to invading herbivores on the one side, and insect adaptations to utilize plants for nutrition, defence and shelter on the other, are the main subjects of this book. For plants exposed to insect herbivores, these mechanisms include the activation of defence systems and the emission of chemical signals which may attract natural enemies of the invading herbivores and may even be exploited by neighbouring plants to induce an early defence. For insects, they include compex behavioural adaptations and their underlying sensory systems (with their implications for learning and nutritional plasticity), as well as the endocrinological aspects of life cycle synchronization with host plant phenology.

Insect-Plant Biology discusses the operation of these mechanisms at the molecular and organismal levels and explicitly puts these in the context of both ecological interactions and evolutionary processes. In doing so, it uncovers the highly intricate antagonistic as well as mutualistic interactions that have evolved between plants and insects. The book concludes with a chapter on the application of our knowledge of insect-plant interactions to agricultural production.

This multidisciplinary approach will appeal to students in biology, agricultural entomology, ecology, and indeed anyone interested in the principles underlying the relationships between the two largest groups of organisms on earth: plants and insects.

Stoll, G., 2005. Natural crop protection in the tropics. Letting information come to life. Margraf Verlag. 2nd edition, 380 pp.; 15 ills. ISBN 3 8236 1317 0.

This book presents practical information on natural crop protection techniques. Recognizing that these techniques, which derive from local, traditional and scientific sources, often have to be verified, adapted or improved, the book includes a section on approaches and methodologies by presenting a number of case studies.

This concept has been chosen in order to link information on natural crop protection with approaches and methodologies. By presenting both technical information and case studies on Farmer Participatory Research the book lets this information come to life and thus supports the application for resource-poor and organic farmers.

The book intends to contribute to providing farmers and their advisors with the experience and confidence needed to make the best use of the resources available to them.

Valuable suggestions are also made for research to further improve engagement in developing natural crop protection practices for resource-poor and organic farmers.

The first edition of Natural Crop Protection was published in 1986 and has met wide acclaim. It has been translated into eight languages.

For information on the publications below: see IOBC Global Newsletters from 75 onward (pdf files on iobc website).

Biological Control in Brazil (in Portuguese). Information about this book can be obtained from the senior editor, Prof. dr. J.R.P. Parra (jrpparra@esalq.usp.br).

Biological Control in IPM Systems in Africa. P. Neuenschwander, C. Borgemeister and J. Langewald (eds.), CABI, Wallingford, UK, Hardback, 448 pp., ISBN 0 85199 639 6

Biological Control in Protected Culture. Editors: Kevin M. Heinz, Roy G. Van Driesche and Michael P. Parrella. Ball Publishing, Batavia, Illinois, Hardbound, ISBN 1-883052-39-4, 552 pp

Biological Control of Invasive Plants in the United States. E. M. Coombs, J. K. Clark, G. L. Piper & A. F. Cofrancesco (Eds). Oregon State Univerity: 476 pp. ISBN 0-87071-029-X. Ordering info at: http://oregonstate.edu/dept/press/a-b/BioControl.html

Biological Pest Control in Chile: History and Future. S. Rojas, 2005. Libros INIA 12, Ministry of Agriculture, Instituto de Investigaciones Agropecuarias, 125 pp. ISBN 956-7016-19-4l ; ISSN 0717-4713. (In Spanish).

Cabbage, Eggplant and Tomato Integrated Pest Management, FAO Inter-country Programme for IPM in Vegetables in South and Southeast Asia. Anonymous, 2000. FAO Regional Office for Asia and the Pacific. Phra Athit Road, Bangkok 10200. Thailand, 205 pp.

Crop protection in biological agriculture in Italy. M. Benuzzi and V. Vacante, in Italian. Information about this book can be obtained from M. Benuzzi (benuzzi@intrachem.it).

Discovery of the Parasitoid Lifestyle. Special feature in Journal of Biological Control Vol 32, No. 1, January 2005

Ecological Infrastructures: Ideabook on Functional Biodiversity at the Farm Level. Boller, E., Häni, F. & Poehling, H.-M., 2004. ISBN 3-906776-07-7. 230 pp.

From farmer field school to community IPM. Ten years of IPM training in Asia. Pontius, J., R. Ditls, A. Bartlett, 2002.FAO Regional Office for Asia and the Pacific. Phra Athit Road, Bangkok 10200. Thailand, 106 pp.

Genetics, Evolution and Biological Control. L.E. Ehler, R. Sforza and T. Mateille (eds.), 2000. CABI, UK, Wallingford, UK, Hardback, 288 pp., ISBN 0 85199 735 X

Insects and their Natural Enemies Associated with Vegetables and Soybean in Southeast Asia. Shepard, B.M., G.R. Carner, A.T. Barrion, P.A.C. Ooi, H. van der Berg, 1999.Quality Printing Company, Orangeburg, South Carolina, USA (ISBN 0-9669073-0-2), 108 pp.

Integrated Pest and Disease Management in Greenhouse Crops. Editors: Ramon Albajes, M. Lodovica Gullino, Joop C. van Lenteren and Yigal Elad. Kluwer Academic Publishers, Dordrecht, Hardbound, ISBN 0-7923-5631-4, 568 pp.

The IPM Practitioner. Annual Directory of Least-Toxic Pest Control Products. For information, contact BIRC, POBox 7414, Berkeley, California, 94707, USA.
Natural Enemies: An Introduction to Biological Control. Ann Hajek. Cambridge University Press, Cambridge, UK, Hardback and Paperback, 378 pp., ISBN 0 521 65295 2
Parasitic Wasps: Evolution, systematics, biodiversity and biological control. G. Melika and C. Thuroczy, eds. Agroinform, Kiado & Nyomda kft, Budapest, 2002: 480 pp.
Quality Control and Mass Production of Natural Enemies. V.H.P. Bueno (ed.), in Portuguese. Information about this book can be obtained from V. H.P. Bueno (vhpbueno@ufla.br).
Quality Control and Production of Biological Control Agents: Theory and Testing Procedures. J C van Lenteren (ed.), CABI, Wallingford, UK, Hardback, 327 pp., ISBN 0 85199 688 4
The Manual of Biocontrol Agents. Third Edition. Editor: L.G. Copping. BCPC, Alton, Hampshire, 2004: 702 pp. ISBN 1 901396355. Info: www.bcpc.org.

19. Regional sections of IOBC

Information provided below about regional sections of IOBC is limited, most information is regularly updated on our website www.IOBC-Global.org.

Asia and the Pacific Regional Section (APRS)

President: Dr. Eizi Yano, National Agricultural Research Center for Western Region, Fukuyama, Hiroshima, 721-8514, Japan. Email: yano@affrc.go.jp
Vice Presidents: Dr. Fang-Hao Wan, Biological Control Institutue,
Chinese Academy of Agricultural Sciences, Beijing, P.R. China. Email: wanfh@cjac.org.cn
Dr. Suasa-Ard, Director of the National Biological Control Research Center (NBCRC), Central Regional Center (CRC) at Kasetsart University, Nakhon Pathom, Thailand. Email:agrwis@ku.ac.th
Secretary/Treasurer: Dr. Takeshi Shimoda, Insect Biocontrol Lab., National Agricultural Research Center, 3-1-1, Kannondai, Tsukuba, Ibaraki, 305-8666 Japan. Tel:+81-29-838-8846, Fax:+81-29 838-8837. Email: oligota@affrc.go.jp
Past President: Dr. Rachel McFadyen, Australia. Email: Rachel.mcfadyen@dnr.qld.gov.au

For a meeting organized by this section, see working group Biological control of aphids and coccids

Afrotropical Regional Section (ATRS)

President: Dr. James A. Ogwang, Biological Control Unit, Namulonge Agricultural Research Institute, Kampala, Uganda. Email: jamesogwang@hotmail.com
Past President: Dr. H.G. Zimmermann, Agricultural Research Council, Plant Protection Research Centre, Weeds Research Division, Pretoria, South Africa. Email: riethgz@plant2.agric.za
Vice-President: Dr. Charles O. Omwega, International Centre of Insect Physiology and Ecology, Nairobi, Kenya. Email: comwega@icipe.org
General Secretary: Dr. M.P. Hill, ARC PPRI, Private Bag X 134, Pretoria 001, South Africa.
Email: riethgz@plant2.agric.za
Treasurer: Dr. J. Ambrose Agona, Post Harvest Program, Kawanda Agricultural Research Institute, Kampala, Uganda. Email: karihave@starcom.co.ug

IOBC Global is organizing a symposium at the next Congress of Entomology in Durban about biocontrol in Africa.

East Palearctic Regional Section (EPRS)

President: Dr. Istvan Eke. Budapest, Hungary. Email: Ekei@posta.fvm.hu; istvan.eke@freemail.hu
Vice Presidents: Dr. Danuta Sosnowska. Institute of Plant Protection, Department of Biocontrol and Quarantine, 60-138 Poznan, Miczurina Str. 20, Poland. Email: D.Sosnowska@ior.poznan.pl

Dr. Vladimir Nadykta (Institute of Biocontrol, Krasnodar, Russia)
General Secretariat: Dr. Yury Gninenko and Dr. E. Sadomov, Russia

A General Assembly of this Region took place from 7-12 June in 2005 Budapest, Hungary. A new Executive Committee was elected and during two days developments in biological control in this region were presented. A full report of the meeting can be found on the IOBC-Global website. **Also the EPRS statutes are now available on the global website under this region**; they will soon be adapted to the new situation. EPRS is organizing a scientific meeting in 2006.

NEARCTIC REGIONAL SECTION (NRS)

President: Robert N. Wiedenmann, Center for Economic Entomology, Illinois Natural History Survey, 607 East Peabody, Champaign IL 61820, USA. Email: rwieden@uark.edu
Vice-President: Nick Mills, University of California, Berkeley, CA 94720, USA. Email: nmills@nature.berkeley.edu
Secretary-treasurer : Stefan T. Jaronski, USDA ARS NPARL, 1500 N. Central Ave., Sidney, MT 59270 USA. Email: sjaronski@sidney.ars.usda.gov
Corresponding Secretary: Susan Mahr, Dept. of Entomology, University of Wisconsin, Madison WI 53706, USA. Email: smahr@entomology.wisc.edu
Past-President: Molly S. Hunter, Department of Entomology, University of Arizona, Tucson AZ, USA. Email: mhunter@ag.arizona.edu
Members-At-Large: Jacques Brodeur, Dept de Phytologie, Universite Laval, Sainte-Foy, Quebec, Canada. Email: jacques.brodeur@plg.ulaval.ca; George Heimpel, Department of Entomology, St. Paul, MN 55108, USA. Email: heimp001@tc.umn.edu; Sujaya Rao Department of Entomology, Oregon State University, Corvallis, USA. Email: sujaya@science.oregonstate.edu

réseau biocontrôle biocontrol network

IOBC-NRS and the Canadian BioControl Network had a combined meeting on various aspects of biological control from 8-11 May 2005 in Canada. During the "50 years anniversary IOBC day" the history, current situation and future developments were sketched by IOBC members from Europe and North America. This was followed by two day symposium on "Trophic and Guild Interactions in Biological Control". The symposium provided a critical review of current knowledge and propose fresh perspectives on trophic and guild interactions in the specific context of biological control. For more information see elsewhere in this newsletter and at www.biocontrol.canada, or via IOBC-Global.org to Region NRS.

NEOTROPICAL REGIONAL SECTION (NTRS)

President: Dra Orietta Fernandez-LarreaVega. Instituto de Investigaciones de Sanidd Vegetal. Calle110 #514 E/5ta E y 5ta F Playa, Ciudad La Habana, Cuba. Email: oflarrea@inisav.cu
Secretary: Dr.Luis Vazquez Moreno; same address, Cuba. Email: lvazquez@inisav.cu
Treasurer: Dra Esperanza Rijo Camacho; same address, Cuba. Email: erijo@inisav.cu

During the past months, relationships with the NeoTropical Regional Section have been intensified. One of the result of this better relationships is an increasing number of members in the NTRS region. Several national contacts in Latin America are active in acquiring new members. This year, two IOBC meetings will be organized in this region, one in Colombia and another in Brazil. Dates and agenda's will be published on the IOBC Global website.

The statutes + annexes of this region are now available in Spanish and English on the global website under this regional section.

West Palearctic Regional Section (WPRS)

NEW Executive Committee to be elected in September, see www.IOBC-WPRS.org for information; the information below is preliminary

President: Dr. F. Bigler, Switzerland, email: franz.bigler@fal.admin.ch
Vice Presidents: Prof.dr. Sylvia Blümel (Austria), Dr. Heidrun Vogt (Germany), Prof. Dr. L Tirry, University of Gent, Laboratory of Agrozoology, Department of Crop Protection, Gent, Belgium. Email: luc.tirry@ugent.be
Secretary General: Dr. Philippe Nicot(INRA, Avignon)
Treasurer: Prof. Dr. R. Albajes, Universita de Lleida, Centre Udl-IRTA, Lleida, Spain. Email: ramon.albajes@irta.es

This Section of IOBC has always been one of the most active and has an excellent website with all information on working groups, meetings and bulletins: www.iobc-wprs.org.

20. Working Groups of IOBC GLOBAL

Information provided below about working groups is limited, most information is regularly updated on our website and the websites of the working groups.

WG Arthropod Mass-Rearing and Quality Control

Convenors: Dr. S. Grenier, UMR INRA/INSA de Lyon, Biologie Fonctionnelle, Insectes et Interactions (BF2I), INSA, Bâtiment Louis Pasteur, 20 av. A. Einstein, 69621 Villeurbanne Cedex, France. Tel: +33 (0)4 72 43 79 88. Fax: +33 (0)4 72 43 85 34. Email: sgrenier@jouy.inra.fr. **Dr. N.C. Leppla**, University of Florida, Institute of Food and Agricultural Sciences, Department of Entomology and Nematology, Gainesville, Florida, USA. Email: ncl@gnv.ifas.ufl.edu. **Dr. P. De Clercq**, Laboratory of Agrozoology, Department of Crop Protection, Faculty of Agricultural & Applied Biological Sciences, Ghent, Belgium. Email: Patrick.DeClercq@rug.ac.be

See website for future activities: http://www.amrqc.org

WG Biological Control of Aphids and Coccids

Chairman: **Prof. J.-L. Hemptinne**, Laboratoire d'Agroécologie, Ecole nationale de Formation agronomique, BP 87, 31326 Castanet-Tolosan, France. Email: jean-louis.hemptinne@educagri.fr

This working group recently met in Tsuruoka, Yamagata, Japan (September 25-29, 2005). Selected papers of the symposium will be published in a special issue of Population Ecology in 2006.

WG Biological Control of Chromolaena Odorata (Siam Weed)

Chairman: **Dr. R. Muniappan**, Agricultural Experimental Station, University of Guam, Mangilao, Guam 96923 USA. Fax: +1-671-734-6842. Email: rmuni@uog9.uog.edu

See website for future activities/newsletter: http://www.ehs.cdu.edu.au/chromolaena/siamhome.html

WG Biological Control of Plutella

Convenors: **Dr. A.M. Shelton**, Department of Entomology, Cornell University, New York State Agricultural Experimenta Station, 416 Barton Lab Geneva, NY 14456, USA. Tel: +1-315-787-2352. Fax: +1-315-787-2326. Email: ams5@cornell.edu. **Dr. A. Sivapragasam**, Strategic, Environment and Natural Resources Centre, MARDI, Kuala Lumpur, Malaysia. Email: sivasam@mardi.my. **Dr. D.J.**

Wright, Department of Biology, Imperial College at Silwood Park, Ascot, Berkshire, UK. Email: d.wright@ic.ac.uk

See website for future activities: http://www.nysaes.cornell.edu/ent/dbm/

WG Biological Control of Water Hyacinth

Chairman: **Dr Martin Hill**, Agricultural Research Council, Plant Protection Research Centre, Weeds research Division, Private bag X134, Pretoria 0001, South Africa. Tel:+27 12329-5743. Fax:+27 12329-3278. Email: rietmh@plant2.agric.za

WG Egg Parasitoids

Convenors: **Prof.dr. F. Bin**, Department of Arboriculture and Plant Protection, University of Perugia, Borgo XX Giugno, 06121 Perugia, Italy. Tel: +39-075-585-6030. Fax: +39-075-585-6039. Email: fbin@unipg.it. **Dr. E. Wajnberg**, Ecologie Comportementale, I.N.R.A., Sophia Antipolis, France. Email : wajnberg@antibes.inra.fr. **Dr Guy Boivin**, Research Station, Agriculture Canada, St-Jean-sur-Richelieu, Québec, Canada. Email: boiving@agr.gc.ca

The next meeting of this working group is planned in Brazil during the fall of 2006 and will be organized by Prof.dr. J.R.P. Para (jrpparra@esalq.usp.br).

WG Fruit Flies of Economic Importance

Chairman: Dr. B.A. McPheron, Dept. Entomology, 501 ASI Bldg., Pennsylvania State University, Univ. Park, PA 16802, USA. Tel: +1-814-865-3088. Fax: +1-814-856-3048.Email: bam10@psu.edu

WG IWGO – *Ostrinia* and Other Maize Pests (by H. Berger)

Convenors: Ulrich Kuhlmann; CABI-BioScience; Head Agricultural Pest Research CABI Bioscience Switzerland Centre, Delémont; Switzerland, Email: u.kuhlmann@cabi.org. **C. Richard Edwards**; Purdue University; Dep. of Entomology; Indiana; USA; Email: richedwards@entm.purdue.edu. **Harald K. Berger**; AGES, Spargelfeldstraße 191; 1226 Wien; Austria; Tel.: # 43 /664/56-42-885. Fax: # 43/1/732-16-2106. Email: harald.berger@ages.at.

All relevant data, reports and future meetings are published on the IWGO website: http://www. iwgo.org

Global WG on Transgenic Organisms in IPM and Biocontrol

Convenors: **Dr. Angelika Hilbeck**, Swiss Fed. Inst. of Technology, Geobotanical Institute, Zurichbergstr. 38, CH-8044,Zurich. Tel: +41 (0) 1 632 4322. Fax:+ 41 (0) 1 632 1215. Email: angelika.hilbeck@env.ethz.ch. **Dr. Salvatore Arpaia,** Italy. Email: arpaia@trisaia.enea.it. **Dr. Nick Birch**, UK. Email: n.birch@scri.sari.ac.uk. **Dr Gabor Lovei**, Denmark. Email: gabor.lovei@agrsci.dk;

A workshop with the topic **“Environmenttal Risk Assessment of GM plants: discussion for concensus”** is planned from 6-9 June 2006 in Italy; for information, please contact arpaia@trisaia.enea. Scope**:** A multi-stakeholder forum to discuss options, with associated advantages and disadvantages, of proposals for pre-release risk assessment and post-release monitoring of GM crops. The discussion will be focussed on the scientific bases of risk assessment with the aim of producing a ‘Status Report’ or a position paper about the Environmental Risk Assessment of GM crops, under the supervision of a professional facilitator. The final document will identify areas of consent and disagreement and report on the current status of research in the field. For more information go to: www.gmo-guidelines.info or contact evelyn.underwood@env.ethz.ch.

21. MEETINGS ON BIOLOGICAL CONTROL AND IPM

Please consult www.IOBC-Global under "meetings" for future meetings on biological control and you will be linked to the IOBC-WPRS website (www.iobc-wprs.org) where a list with meetings is kept up to date. The IOBC-WPRS newsletter PROFILE can also be found at this website and contains a lot of information about working group activities and meetings. If you would like to see your biological control or IPM meeting listed on this site, please send us an email with relevant information

First plenerary session of the board of IOBC, 1956, Antibes, France. Front row (left to right): Bovey (CH), Grison (F), Balachowski (F), Caudri (EPPO), Delucchi (CIBC), van den Bruel (B). Back row (left to right): Bouriquet (F), Ferrière (CH), Biliotti (F), Franz (D), Klett (D)

Newsletter contributions: We would like to thank all members who provided items for this edition of the IOBC Newsletter. If you have not previously sent anything, please consider doing so. Remember that this is your opportunity to let others know what is going on in biological control. Take a few minutes and email items concerning biological control to Stefano Colazza (colazza@unipa.it), so they can be included in the next issue.

Any comments on this newsletter are welcome. Do not hesitate to contact us if there is any further information on biological control that you would like to see here.

Editors: Joop C. van Lenteren and Stefano Colazza, IOBC Global, 31 March 2006