



IOBC

Global

International Organization
for Biological Control



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Message from the President

Interdisciplinary biological control

The term biological control encompasses a broad range of phenomena and activities. I often like to say that biological control is simultaneously a natural phenomenon, a pest management strategy and a scientific discipline. So there is breadth in the way that we conceptualize biological control as well. But perhaps the source of the most breadth in biological control is taxonomic. The sheer number of species involved in biological control is truly staggering – both as targets and as agents - ranging from bacteria to invertebrate and vertebrate animals and plants of all kinds. Even viruses play a prominent role and they are not even technically living organisms! Taken together, all of these sources of breadth can be found in association with biological control make it a truly interdisciplinary science. It spans the realms of plant pathology, entomology, plant sciences, ecology, evolutionary biology and conservation biology among other disciplines.



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While this breadth of disciplines is exciting and draws many of us to the field, it poses challenges as well. Foremost among these is that many biological control scientists may be specialized in their sub-discipline and remain relatively unaware of what is going on in other areas. This is illustrated by the many wonderful and periodic biological control conferences that are relatively specialized. I would never argue against such meetings because of how important it is for all of us to become experts in our sub-disciplines, but in the long run we can also greatly benefit from an awareness of what is going on in other areas of biological control. And I think that we are all aware that collaborations across disciplinary boundaries can lead to some of the best and most influential scientific insights and breakthroughs.

So how do we increase cross-disciplinary work in biological control? I think the first step is recognizing that some of the issues that we are interested in occur across multiple spatial and taxonomic scales. For instance, entomologists working on complex interactions such as intraguild predation and apparent competition among pests, natural enemies and alternative prey species can probably learn a lot from soil micro-organisms that engage in similar interactions (and vice-versa). It can also be informative to find links between different disciplines in biological control. For instance the parasitoid *Aphytis melinus* is one of the most celebrated importation (classical) biological control agents but is also sold commercially as an augmentative biological control agent. Studying this case study can therefore lead to insights in both importation and augmentative biological control. And as I noted above, collaborating across disciplines can be very fruitful. For instance, the recent increase in importation biological control of invasive insects and plants in natural areas has benefitted greatly from collaboration among entomologists and conservation biologists.

Another way to promote interdisciplinary activities in biological control is to create ways for biological control scientists with different areas of expertise to interact. This can include workshops, educational events, and conferences, among others. Along these lines, IOBC is participating in the organization of what will be the **First International Congress of Biological Control, to be held in Beijing in May of 2018**. This will be an opportunity for biological control scientists from various disciplines to get together and share ideas. The plan is to hold one of these at a different site every 3-4 years to initiate a continuous dialogue across disciplines in our very diverse field of study.

George Heimpel



Website Refresh Launch: Mobile-Compatible

Our Webmaster Madeleine Bühler explains the new design



In Brief

- Since April 2015 Google has expanded the use of mobile device friendliness as a search ranking signal
- Mobile device web surfing is growing at an astronomical pace
- Mobile devices are constrained by display size and therefore require a responsive website design approach in how content is presented on screen
- IOBC-Global decided to invest in the future and updated the website accordingly
- The Newly designed website was launched in April 2017

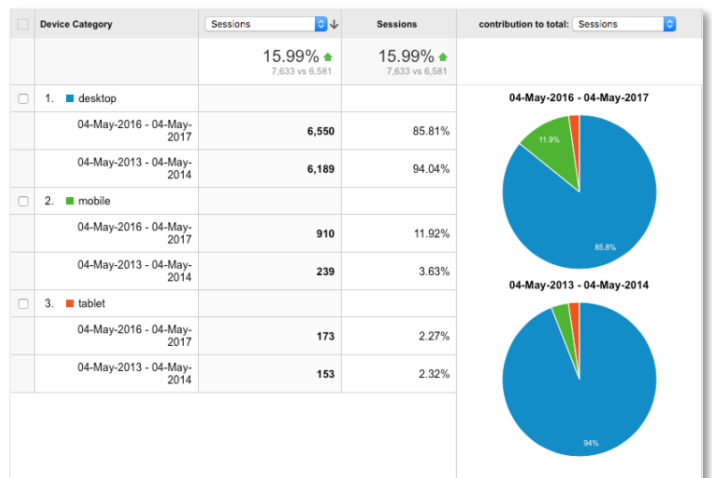
Have you already checked out?

New mobile device friendly responsive website design

Announcing the launch of the newly re-designed IOBC-Global website: Fully responsive layout optimized for mobile and tablet browsing.

If you're a regular or occasional visitor to the site, you've probably noticed that something looks different since April 2017. The same useful content is all still here, but it's presented in a fresh, streamlined design, making everything easier to find, whether you're accessing the site from a desktop computer, laptop, tablet or smartphone. All the pages of the site now automatically resize to fit all computer and mobile-device screens.

Comparison of IOBC-Global website usage shows use on mobile phones in 2016/2017 (top chart) increased 8% in comparison to 2013/2014 (bottom chart). Tablet usage of IOBC website remained practically unchanged, and at a relatively low level, and desktop use has gone up a bit, but not as much as the growth in mobile phone use. These figures show that the main growth in usage comes from mobile phones, (Google Analytics), so it was timely that the website became more Mobile-friendly.

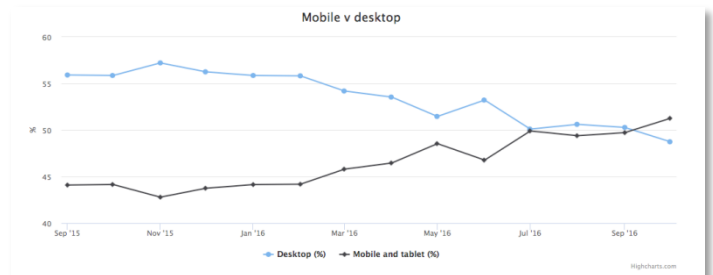


Mobile internet usage: global trends

User behavior has changed dramatically since the launch of the first smartphone in 2007. With the global triumphal march of such smartphones, we got used to surf on the internet everywhere and anytime on those small screens – usually navigating with our fingers.

Mobile web usage overtakes desktop for first time in July 2016 (<http://www.telegraph.co.uk/technology/2016/11/01/mobile-web-usage-overtakes-desktop-for-first-time>)

Statistics for IOBC-Global website doesn't show this trend as dramatically as in the figure, however there is a clear trend towards mobile usage.

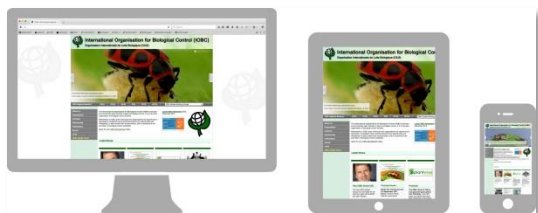


In April 2015 Google officially announced that mobile device friendliness would be rated as a search ranking signal. This update improved rankings for sites that provide a mobile-friendly experience, and, by association, demotes sites that do not. Consequently, IOBC-Global Executive committee voted to update the website into a responsive design. This investment in the future enhances search engine ranking and – not least – keeps track with and reaches young audience.

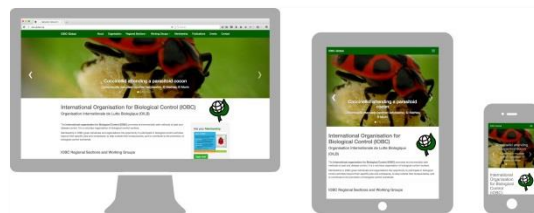
What is responsive website design?

Responsive website design provides the optimal viewing experience across a wide range of devices. From mobile phones to desktop computer monitors responsive design places top priority on navigation and easy reading with the least amount of re-sizing, scrolling, and panning.

Before



After



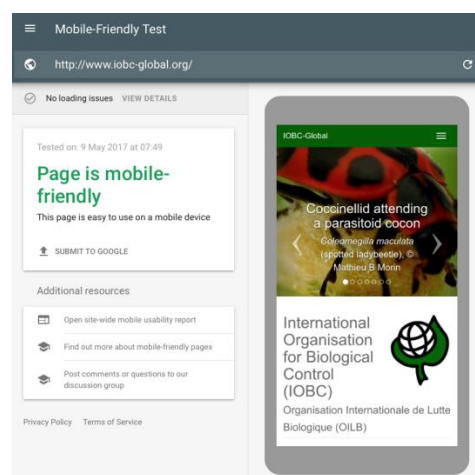
Before and after the re-design: The new design has streamlined menus, clear navigation, and a responsive layout for all platforms.

A responsive website adapts the layout to the viewing environment by using fluid, proportion-based grids, flexible images, and CSS3 media queries.

Explore the site on different tools for yourself! ...and, we do love feedback: [Write us](#) your comments, questions or concerns.

Figure: Google Mobile-Friendly Test

(<https://search.google.com/search-console/mobile-friendly>) confirms that the re-designed website is easy to use on a mobile device



About me:

I got my PhD in Natural Science at the Swiss Federal Institute of Technology in Zurich in 1995 in the plant pathology group of Prof. Cesare Gessler, a former IOBC-WPRS treasurer (1997 to 2005). In 1999 I have founded my web-design company e-maintenance as a private company. Currently I'm working part time as a web designer (around 30 %) and as a marketing campaign manager for Mettler-Toledo GmbH, a global provider of precision instruments and especially lab balances. I have long-term experience in web design, marketing, product management and as executive assistant in different companies.

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Feature Article

Integrated approaches to manage the invasive alien weed *Parthenium* in Northern Sri Lanka

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Family Asteraceae member *Parthenium hysterophorus* is one of the noxious alien weeds to Sri Lanka, invaded from India and spread from Vavuniya to all over the country within a short period of time using its own biological power. *Parthenium* weed is a resilient plant; therefore it can grow in wide range of soils and climatic conditions. It can grow in wastelands, agricultural areas, shrub lands, urban areas, overgrazed pastures and along roadsides, industrial areas, playgrounds, railway tracks and residential developments.

Individual plants can produce up to 100,000 seeds each in their lifetime and seeds germinate anytime moisture is available. Seeds can disperse over long distance through wind, machinery, livestock, livestock feed, vehicles movement and water currents. This noxious weed has the potential to cause serious economic loss in crop production and environmental human health hazards issues such as, dermatitis, asthma and bronchitis.

In Northern Sri Lanka, It has been reported that *Parthenium* invaded nearly 137,225 ha in Jaffna peninsula alone (Fig. 1). Due its problem, post-risk assessment recommended that this weed should be considered as “Weed of National Significance” by Sri Lanka Council for Agricultural Research Policy (SLCARP) and research priorities to control this weed have been implemented through Faculties of Agriculture and Department of Agriculture in Sri Lanka since 2009.

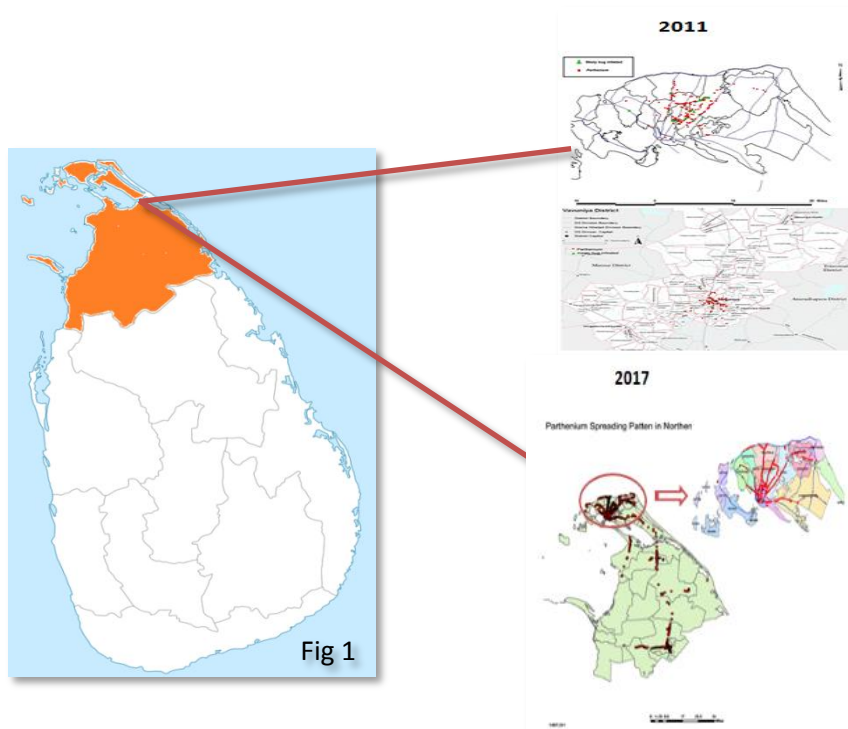


Figure 1: Spread of *Parthenium* weed by 2011 and 2017

Spread of *Parthenium* weed by 2011 and 2017

Parthenium weed was initially only found in Northern part of Sri Lanka (Fig. 1). In 2011, this weed was found in Jaffna and Vavuniya Districts. But by 2017, *Parthenium* weed has spread into Killinochchi, Mullaithevu and Mannar Districts in the Northern Province of Sri Lanka. The weed was perhaps in its initial stages of invasion in 2011, and little attention was paid to its existence. *Parthenium* weed has now spread across the Northern Province.

There is an urgent need for controlling this weed from further invasion. Many weed management techniques implemented were not successful to control this weed fully because of lack of awareness among the farmers and citizens of Sri Lanka as well of its resistance to herbicide, high regeneration capacity, production of huge amount of seeds, high seed germinability and extreme adaptability to a wide range of ecosystems.

Biological control has many advantages and in India this weed was satisfactorily biocontrolled by the Chrysomelid beetle *Zygogramma bicolorata*. *Z. bicolorata* alone may not be sufficient to manage this weed in Sri Lanka. In the past, several biocontrol agents (insects and pathogens) including *Z. bicolorata* (leaf feeding beetle), *Epiblema strenuana* (stem galling moth), *Listronotus setosipennis* (stem boring weevil), *Semicronyx lutulentus* (seed feeding weevil), *Bucculatrix parthenica* (leaf mining moth), *Platphalonidia mystica* (stem boring moth), *Conotrachelus albocinereus* (stem galling weevil) and *Carmenta ithacae* (root boring moth) have been used in other countries to manage *parthenium* weed without success. In the Northern Province of Sri Lanka, there are reports of a mealybug infestation and mycoplasma-like infection on the inflorescence of the *Parthenium* plants.

In initiatives taken by the Ministry of Agriculture, Northern Province, manpower is being used to eradicate this noxious weed. Utilising manpower for the *Parthinium* eradication programme has proved to be effective and efficient in comparison to usage of other biological organism because of following reasons:

1. **No environmental influence:** Failure of many biological control programme due to poor adaptability of bio-control agents to the targeted regions. But human force from targeted area are well adapted
2. **Availability of cheap labour force:** Sri Lanka as developing small country has lots of labourforce without employment or with seasonal employment. If we use this cheap labour, we can create short-term employment for jobless people or can create regular income for seasonal workers.
3. **Very quick:** If we can use human labour to abolish the weed within shorter period and any time of the year as well as any stage of the weed
4. **Easy monitoring and creating awareness:** When we use local labourers it will create awareness among the residents as well as can get more benefit from citizens as well. Data regarding distribution can be generated by agricultural extension workers and researchers to map the distribution pattern for future purposes
5. **No non-target effect:** Human labourers with protective equipment can target only particular weed while still enabling use of chemical spray for other pests in the crop field, while use of other biological agents limits the use of chemicals for other pest control if needed.

There is also a research study aimed to identify and select plants-derived products to suppress the growth and spread of *P. hysterophorus* in the northern region of Sri Lanka. The use of botanicals should possibly replace the environmentally harmful synthetic herbicides and is fast becoming important to control noxious weeds. Among the natural plant products, volatile essential oils and their constituents have attracted much attention due to their phytotoxicity (allelopathic properties) and relatively quick degradation in the environment. The volatile substances present in the leaves, released as vapours into the surroundings. Their partial vapour pressure is higher than air pressure; hence, they get adsorbed into soil particles and affect the germinating seeds and seedlings growth.

Twenty plant species were selected for this study and their phytotoxicity was measured at different concentrations (5g/ml, 15g/ml, 25g/ml, 35g/ml and 50g/ml). Fresh, mature healthy leaves were collected. Finely-ground plant leaves were then immersed in cow urine (195 ml) supplemented with soap solution (5 ml) and allowed ferment for one week. Soap solution was used as a surfactant. To evaluate the bio control effect of each plant species, a preliminary pot experiment was done to study the herbicidal activity of plant extracts, against 4-wks-old plants of *P. hysterophorus* under controlled conditions. The extracts were applied on the *P. hysterophorus* plants as foliar application. In this study, *Eucalyptus camaldulensis*, *Allium sativum*, *Piper betle*, *Cassia tora*, *Ricinus communis* and *Tephrosia purpurea* were identified as the most efficient growth suppressing plants at 35 to 50 mg/l concentrations. Using this concentration, weeds were dead in one day from application.

According to the experiment the extracts from tested plant species reduced the growth of *P. hysterophorus*. However, response was varied with plant species and concentrations. *Cassia tora*, *Ricinus communis* had significant inhibitory effect on *P. hysterophorus* than others. As the concentrations of extract increased, more dead *P. hysterophorus* plants were found as compared to control. In the case of six allelopathic plants, complete death of the *Parthenium* (100% of plants) was observed at 35 to 50 mg/L concentration.

The 35 mg/l and 50 mg/l doses of *Eucalyptus camaldulensis*, *Allium sativum*, *Piper betle*, *cassia tora*, *Ricinus communis* and *Tephrosia purpurea* were again formulated (195 ml cow urine + plant extract + 5ml surfactant to enhance dispersion, penetration of the plant extract, and to promote residual effects) as above and were tested in a field experiment. The formulated doses were applied on *P. hysterophorus* plants using a hand sprayer early in the morning on a clear day. The plants were carefully observed. Wilting and necrosis of leaves started two days after application but mortality was only seen after 4 days. 50mg/l doses has 90% mortality of *P. hysterophorus*, thus these selective bio-herbicides, are effective in killing of *P.hysterophorus* but *Cassia tora* and *Ricinus communis* are comparatively more effective as compared to other plant extracts.

Recent observation on integrated control of *P. hysterophorus* as in Northern Sri Lanka could become an effective, cost-effective and compatible practice, applicable to any other similar country(s).



Parthenium

Photo by Ethel Aardvark

Zygogramma bicolorata

Source: [International Association for the Plant Protection Sciences](#)



Global Working Groups & Commission Reports

Successful 26th IWGO Conference in Beijing, China

Ulli Kuhlmann, CABI, Delémont, Switzerland

The 26th IWGO conference successfully took place in the National Agricultural Library of the Chinese Academy of Agricultural Sciences (CAAS) in Beijing from 10-12 April 2017. It was organized by the IWGO Co-Convenor Dr Wang Zhenying from the Institute of Plant Protection (IPP) of CAAS. Overall, 98 experts from 11 countries participated – a similar attendance to the last IWGO meeting in Chicago, U.S.A., which was locally organized by the Co-Convenor, Dr Tom Sappington, USDA-ARS, Ames, Iowa. Eight of the participants were young researchers who received the IOBC Global Travel Award and each of them presented excellent overviews of their research.

IWGO convenor, Dr Ulrich Kuhlmann, gave a welcome address as did Dewen Qiu, Deputy Director General of IPP-CAAS and Dongxing Feng, Director General, Department of International Collaboration of CAAS. The programme featured 11 scientific sessions with 52 oral presentations and 9 poster presentations covering a range of interrelated topics. Many of the presentations were given by leading experts in the field, many of whom were Chinese, which further fostered collaboration opportunities. “Maize pests are a serious problem for farmers across the world and IWGO has contributed through its members to finding solutions to these problems for many years, particularly through promoting biologically-based integrated management options,” said Dr Kuhlmann in his opening remarks. “We were therefore pleased to have this year’s conference in China and were delighted with the exciting line up of presentations,” he added. “These set the scene for some interesting and valuable discussions. Sharing knowledge in this way helps the agricultural research community to address both current and future pest problems. For example, it is essential that we share our research results if we are to effectively address the problem of fall armyworm, a devastating maize pest which is currently spreading across Africa.”

Victor Clotey from CABI, Ghana, was invited by the IWGO conference organizers to deliver a keynote presentation about the current spread and limited number of management options for the fall armyworm. In response, the IOBC global working group launched a subgroup under IWGO focussing on the fall armyworm, the new invader in Africa – similar to the response to the western corn rootworm invasion in Europe in the 1990s. The overall objective of this new subgroup is to establish an independent,



26th IWGO Conference participants from North America, Europe, Asia, South America and Africa, with above-average attendance by scientists from China

internationally recognized platform for the exchange of research results, experiences and ideas on the integrated pest management of fall armyworm. As a first action, the first subgroup meeting will be organized in Ghana or Kenya in early spring 2018 with strong regional participation. IWGO will recruit fall armyworm experts who have been dealing with this pest for many years in other parts of the world to attend and share existing pest management knowledge.

In accord with a longstanding tradition, the Journal of Applied Entomology has again offered the opportunity to publish manuscripts on selected presentations during the 26th IWGO Conference in a special issue. A printed version will be available in mid-2018 as long as deadlines are met. This would also nicely mark the 50th anniversary of IWGO!

The 27th IWGO conference will be hosted in Switzerland in September/October 2019.



IOBC Global Travel Award Recipients: Left to right: Westen R. Archibald, Julie Peterson, Debora Montezano, Rebecca Schmidt-Jeffris, Pamela Bruno and Geoffrey Jaffuel received the IOBC Global Travel Fund. Not pictured: Yu Chen, and Haicui Xie who also benefited from the IOBC Global Travel Fund



The opening ceremony was chaired by IWGO Co-Convenor Dr Wang Zhenying. Dr Dewen Qiu, Deputy Director General of IPP-CAAS and Dr Dongxing Feng, Director General, Department of International Collaboration of CAAS, gave a welcome address as did IWGO Convenor, Dr Ulrich Kuhlmann. IWGO Co-Convenor Dr Tom Sappington is on the far right

IWGO Convenors Left to right: Ulli Kuhlmann, Victor Clottey, Tom Sappington and Wang Zhenyeng. Victor Clottey will help facilitate the new IWGO subgroup on the fall armyworm until the first meeting takes place in Africa early spring 2018



(photos: KCS, Delémont)

**A New Joint Study/Working Group (WG) for IOBC and ICPPR --
Using Managed Pollinators to Disseminate Biological Control Agents & Natural Products
for Crop Protection and Pollination**

Peter Kevan, School of Environmental Sciences, University of Guelph, Canada

CroProPol



The aim of CroProPol is to bring interested parties together to develop concepts and to conduct Research and Development in using managed pollinators and other flower visitors to disseminate biological control agents and, perhaps, other products, such as botanicals and medicaments, to crops for the suppression of insect pests and crop diseases while simultaneously improving yields and crop quality through pollination. CroProPol will also help the exchange of ideas for testing and developing using control agents that are disseminated by managed pollinators into their nests for suppression of their own pests and diseases. The potential that predators, parasitoids, and macroparasites may also disseminate microbial biological control agents against pests and diseases of crops will also be explored.

CroProPol has been initiated through the co-operative efforts of the International Commission for Plant Pollinator Relations (ICPPR) and the International Organisation for Biological Control (IOBC) under the umbrella of the International Union of Biological Sciences (IUBS <https://www.iubs.org/>). Both ICPPR and IOBC are scientific members of the IUBS. In 2016, IUBS funded (through the Arthur Dobbs Institute in Canada) the three-year programme “Managed pollinators: a case study Ecological Intensification in agroecosystems” which embraces the general concepts shared within CroProPol and the FAO’s (2013) promoting “Ecological Intensification” in agriculture. That IUBS programme boasts collaborations in North, South and Central America, Europe, Africa and Asia. The collaborations include academic and government laboratories, working with private sector companies through various funding sources (public and private) made possible by using the IUBS programme for leverage. In the European Union BICO POLL (www.bicopoll.net) is part of an EU-ERA-NET project "CORE-ORGANIC II", combining the two key ecosystem services: biocontrol and pollination.

An expanding body of literature explains the concepts of the using managed pollinators to disseminate biological control agents and natural products for crop protection and pollination (Kevan et al. 2003, 2007, 2009, Mommaerts & Smagghe 2011, Hokkanen et al. 2015, Kevan & Shipp 2017). The Canadian Pollination Initiative (NSERC-CANPOLIN <http://www.uoguelph.ca/canpolin/>) working with the IUBS produced a webinar on the technology in late 2014 “Using Pollinators to Disseminated Biocontrol Agents” (<https://www.youtube.com/watch?v=QdKbm7EGtfg>).

Proofs of concepts, from the first days of R & D in the late 1980s, are known to apply to soft and tender fruits, orchard crops, oilseed crops, and in greenhouse production for suppression of diseases and pests. Research and development in various countries around the world and in almost all trials have had positive results. The technology is expected to expand into biological protection of managed pollinators and even to embrace the use of arthropods as biological control agents acting as secondary vectors of other biocontrol agents. A major, factual, review is in preparation by Kevan and Shipp. Once that is complete, it will be shared with CroProPol.

Ongoing activities of CroProPol include work within the IUBS-funded programme noted above (www.iubs.org) which plans a course on using managed pollinators to disseminate biological control agents and natural products for crop protection and pollination to be held in Serbia through the University of Belgrade in spring 2018. CroProPol is working closely with the ICPPR to have a first organisational meeting in conjunction with its bee protection and health working group in Valencia, Spain in October 2017 (to register: <http://bpg-meeting.julius-kuehn.de>). The ICPPR is planning its International Pollination Symposium to take place in Berlin in spring, 2018 at which a session on CroProPol is expected. The CroProPol listserv will soon be updated and upgraded as the operations for the ICPPR web site are moved from Canada to the Julius Kühn Institute in Germany (<https://www.julius-kuehn.de/darmstadt/>). From those activities, CroProPol has in mind to prepare a handbook on the technology of using managed pollinators to disseminate biological control agents and natural products for crop protection and pollination. CroProPol will support individuals and organisations in preparation of grant proposals in soliciting private sector funds to further develop the technology.

The **open subscription LISTSERV** to exchange news and ideas, and to seek advice is now operational at CroProPol@listserv.uoguelph.ca. **Please join** by sending an e-mail to listserv@uoguelph.ca with your message “**subscribe CroProPol your name**”.

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News from the International Organisation for Biological Control (IOBC) Global Commission on Biological Control and Access and Benefit Sharing

Peter G. Mason, Agriculture and Agri-Food Canada

The Nagoya Protocol is a supplementary agreement to the Convention on Biological Diversity that provides a framework for the effective implementation of the fair and equitable sharing of benefits arising out of the utilization of genetic resources, including biological control agents. The Protocol came into force on 12 October 2014, and requires signatories and countries acceding to the Protocol to develop a legal framework to ensure access to genetic resources, benefit-sharing and compliance. The biological control community of practice needs to demonstrate due diligence in responding to access and benefit sharing requirements, and to reassure the international community that biological control is a very successful and environmentally safe pest management method based on the use of biological diversity.

The IOBC Global Commission has just published an open access paper, Best practices for the use and exchange of invertebrate biological control genetic resources relevant for food and agriculture <http://link.springer.com/article/10.1007/s10526-017-9810-3> . These guidelines consider invertebrate biological control agents specifically; a similar approach applies to microbial biological control agents, but with some differences, and the IOBC Global Commission intends to develop separate guidelines for these. The guidelines recommend that best practice should include: collaborations to exchange knowledge about what invertebrate biological control agents are available and where they may be obtained; information sharing through freely available databases that document successes; collaborative research to develop capacity in source countries; and technology transfer to provide opportunities for small-scale economic activity.

The paper also provides, as electronic supplementary information, a model concept agreement that can be used for scientific research and non-commercial release into nature where access and benefit sharing regulations exist, and a model policy for provision of invertebrate biological control agents to other parties where access and benefit sharing regulations are not restrictive or do not exist. The IOBC Global Commission provides this guidance with the intent that biological control will be facilitated and not impeded, as new pest challenges arise.

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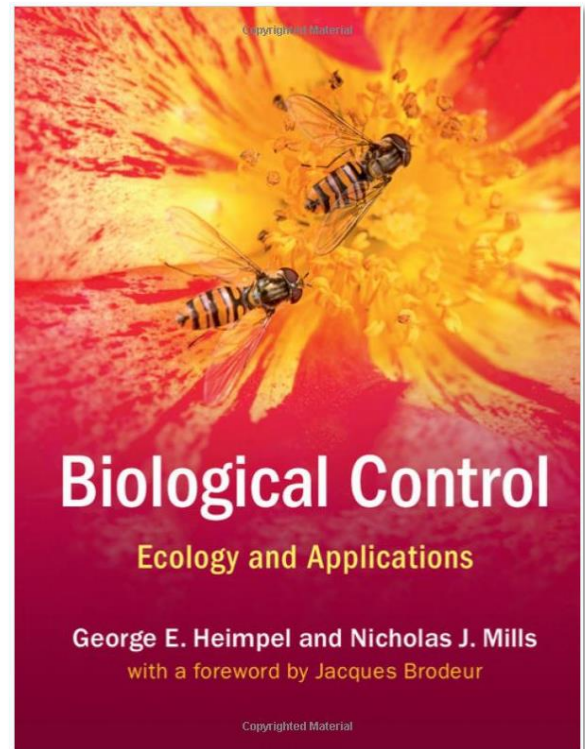
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Book Review

Biological Control – Ecology and Applications By Heimpel G.E. & N.J. Mills Cambridge University Press, New York, 380 pp.

Reviewed by Eric Wajnberg, Editor-in-Chief,
BioControl

Over the last decades, an increasing concern developed in several countries regarding the overall intensive use of chemical pesticides to control noxious animals and weeds. Increasing governmental pressures have progressively promoted the use of alternative pest control strategies that are more respectful to the environment and to human health. In this respect, biological control offers a sound and efficient alternative. An important number of volumes have been regularly published to provide detailed explanation about what are the biological control methods available, with details about terminology definition, advantages, drawbacks, expected impacts, etc.



Most of these volumes were published in English by international publishing companies, but some of them are also available in other languages published locally. In most cases, books on biological control present purely applied aspects, or they address one category of natural enemies, or specific crops to protect, or even ecological side effects, etc. The book written by George Heimpel (Professor at the Department of Entomology at the University of Minnesota, USA) and Nick Mills (Professor at the Department of Environmental Science, Policy and Management at the University of California, Berkeley, USA) decidedly uses another – broader and ambitious goal. In one single volume, most – if not all – of the most important aspects of the use of biological control methods are addressed, tackling in a complementary way applied and academic – including theoretical – issues, ecological and evolutionary consequences, and means to improve such a pest control strategy. Actually, even if biological control exists and has been applied successfully for more than a century, there is still a vast room for improvement. Hence, needless to say that such a book is both timely and more than welcome. It is indeed now fully recognized that there is no way to design an efficient biological control programme without a sound understanding of both the ecological and evolutionary means and consequences of producing and releasing a biocontrol agent. I am not aware of other books presenting such a large and necessary panel of aspects involved in designing efficient biological control programmes.

Throughout the book, applied and academic aspects are intertwined in a constructive way with a lot of examples, and this leads to an interesting, dynamic and convincing text to read. The book is organized in the following logic: After providing several needed definitions of terminology, the different categories of pest control strategies, and the different biocontrol agents that can be used, a first section correctly and interestingly present biological control for what it really is: intentional biological species invasions. Biological invasion has been a very productive scientific topic over the last decades, proposing a large body of concepts and ideas that are here applied to biological control practices. Means of success and how to quantify it, but also potential negative consequences and risk analysis are discussed in details.

A second section then discusses biological control in terms of population dynamics. This second part obviously presents familiar consumer-resource dynamics (*i.e.*, demographic) models, but especially uses such models to present the importance of ecological features of natural enemies and their efficacy in context of their use as biological control agents. Using several case studies, evolutionary aspects are also presented in this section, including what is happening both during the production process of the natural enemies and after they have been released. A third and last section then discusses the special cases of augmentation biological control (in which mass-produced natural enemies are released periodically) and conservation biological control (in which the habitat of naturally occurring natural enemies is manipulated to favour their pest control efficacy or to reduce potential pesticide-induced harmful effects). The different chapters in this last section address important topics such as how “ideal” naturally enemies must be chosen and how they must be produced and released, including aspects dealing with quality control in mass-production systems (for augmentation biological control programmes), how the habitat can be manipulated (in conservation biological control programmes), etc. Here too, several case studies are presented, and the discussion remains on the importance of the ecology of the natural enemies in different foraging environments.

Overall, reading this volume was definitely a great pleasure. The entire discussion is always based on an important number of sound examples and case studies. Also, the quality of the text layout and graphs is nicely contributing to the ability of the book to deliver a convincing message. Finally, the volume comes with a rich literature, including recent references, and a well-constructed index at the end. This is definitely a book that will interest a large readership, including researchers and both graduate and undergraduate students, but also everyone interested in ecology, evolutionary and invasion biology or environmental management. It will also be of interest to everyone involved in the field of crop and land protection, including obviously biological control practitioners but also agronomists and policymakers.

Biological Control – Ecology and Applications

By Heimpel G.E. & N.J. Mills 2017

[Cambridge University Press](#), New York, 380 pp.

Hard cover \$US 59.99

If you would like to review a book or recommend a book for review please get in touch:
GroentemanR@landcareresearch.co.nz

Notice Board

Important Resolution Accepted with Overwhelming Majority in European Parliament: faster access to the European market for biological low-risk pesticides

In essence, [this decision](#) means that Low Risk Substances, microbial control agents included, will be evaluated quicker and with simplified protocols.

A number of IOBC members have worked relentlessly talking to EU parliamentarians in Brussels to see this important breakthrough in attitude towards biological control in Europe after many, many years. The efforts and perseverance have paid off! Draft Resolution text was first adopted in the Environment Committee on 31 January 2017 with an overwhelming 59-1 vote.

Having noted the safety of correctly tested low-risk biopesticides a senior expert of the UN FAO said: " There always needs to be a risk assessment, but tiered approaches and use of cumulative knowledge can help to accelerate evaluations....". "Biopesticides need incentives to generate greater uptake among users. This does not necessarily mean financial incentives...". A faster approval process as required by the European Parliament will surely increase availability of biopesticides to farmers.

UN Recognition: Food Security Requires Departure from Chemical Pesticides

In January this year, the UN's Human Rights Committee presented to the General Assembly a special report on the right to food. Short on naming biological control, the report nevertheless states that

"The assertion promoted by the agrochemical industry that pesticides are necessary to achieve food security is not only inaccurate, but dangerously misleading." The full report can be found [here](#).

Have Your Say

IOBC-Global Executive Committee will meet in September 2017. If you would like to raise issues you think should go the agenda, please send your request to GroentemanR@landcareresearch.co.nz

Upcoming Meetings

Hands-On Training Course, 2 - 9 September 2017, Beijing, China & Hanoi, Vietnam (concurrent)

The International Organisation for Biological Control - Asia and Pacific Regional Section (IOBC-APRS) and International Center for Tropical Agriculture (CIAT) bring to you

MAXIMIZING OPPORTUNITIES FOR BIOLOGICAL CONTROL IN ASIA'S CHANGING AGRO-LANDSCAPES

This one-week field course will be organized around a number of topics that are of immediate relevance to Asia's agriculture, such as invasive species, ecological intensification, biodiversity loss in agricultural settings, and landscape simplification. The short course will provide a primer to students and young professionals in how biodiversity aspects biological control of pests - within the particular context of Asia's intensified agriculture. The course will use an approach that will pair lecture-style introductions to key topics by world experts with hands-on activities in order to reinforce key concepts. Cross-cutting subject areas that will be covered in this course include: Biodiversity in tropical systems; diversity from landscape to farm-level scales; the importance of diversity & biological control on smallholder farms; and the importance of resource diversity to biological control.

The short course will not only celebrate Asia's historical contributions to the field of arthropod biological control, but equally highlight opportunities and threats for sustained biological control in present-day farming systems. The course will introduce novel concepts, tools and methodological approaches, and plant the seed for invigorated applied research on arthropod biological control in Asia's highly unique yet rapidly changing agro-landscapes.

You can download the course flyer [here](#)



The 5th International Symposium on Biological Control of Arthropods will take place in Langkawi, Malaysia, September 11-15, 2017.

This conference continues the series of international symposia on the biological control of arthropods held every four years. Dr Roy Van Driesche was the founder of the series and held the first meeting in Hawaii in January 2002. The second meeting took place in Davos, Switzerland, in September 2005, the third in Christchurch, New Zealand, in February 2009. The latest one was held in Pucón, Chile, in March 2013. The upcoming 5th symposium will follow the proven format and framework of the previous four symposia, as they have all been very successful and highly appreciated by the participants.

For more information: www.isbca-2017.org

or contact the Secretary: info@isbca-2017.org



VI Argentine Parasitoidologists Meeting “Synergy in the study of parasitoids” [VI Reunión Argentina de Parasitoidólogos “Sinergia en el estudio de los parasitoides”] will be held in La Plata City (Buenos Aires, Argentina), September 18 – 20, 2017

For more information:

E-Mail: viraparasitoidologos@gmail.com

Facebook: “Grupo Argentino de Parasitoidólogos” (@GAParasitoidologos).

Website: <http://virap2017.wixsite.com/virap2017>

14th IOBC-MRQA Workshop Mass Rearing High Quality Invertebrates for Multiple Purposes

Mérida, Mexico
November 14 - 17, 2017

Find up to date information [here](#) and past proceedings [here](#)

Financial Assistance for Young IOBC Members:

IOBC – MRQA has limited funds to award travel assistance to young scientists who are IOBC members and are presenting a paper at the meeting. Application instructions will be included in a second circular.

Contact:

For queries regarding sponsorship or display space, or for any other queries, please contact Dr. Julio Bernal at juliobernal@tamu.edu

General Topics for the Symposia include:

1. Development and validation of protocols for invertebrate mass rearing and quality assurance, with special attention to novel quality control techniques
2. Mass rearing invertebrates for:
 - Management of arthropod pests
 - Veterinary and medical field applications
 - Production of insects for feed and food
3. Breeding of beneficial arthropods
4. Networking and instruction on insect rearing
5. Legal and ethical issues associated with mass rearing invertebrates



Photo David Bjorgen

Announcing ISBCW 2018

Save the date for the XVth International Symposium on Biological Control of Weeds
Switzerland, 27-31 August 2018

More information to come in August 2017.

We are looking forward to arranging a stimulating conference and hope that you will be able to participate. If you have any questions, please contact info@isbcw-2018.org

BioControl, the Official Journal of IOBC

BioControl Impact Factor for 2016 has just been released. Congratulations to the editorial team for continuing to build the upward trend!

BioControl IF 2016: 1.918

BioControl rank in the field of Entomology: 14 of 91

Submit your best work to our journal this year.

Some recent articles of interest:



BioControl
DOI 10.1007/s10526-017-9801-4



Biological control using invertebrates and microorganisms: plenty of new opportunities

Joop C. van Lenteren · Karel Bolckmans · Jürgen Köhl · Willem J. Ravensberg · Alberto Urbaneja

BioControl
DOI 10.1007/s10526-017-9810-3



Best practices for the use and exchange of invertebrate biological control genetic resources relevant for food and agriculture

P. G. Mason · M. J. W. Cock · B. I. P. Barratt · J. N. Klapwijk · J. C. van Lenteren · J. Brodeur · K. A. Hoelmer · G. E. Heimpel

BioControl
DOI 10.1007/s10526-017-9815-y



REVIEW

Biological control of human disease vectors: a perspective on challenges and opportunities

Matthew B. Thomas

Special Issue of *BioControl* just published: Unravelling the ecology of an invasive ladybird, *Harmonia axyridis*: from populations to communities.

Guest Editors: Brown P.M.J., Lawson-Handley L.J., Nedvěd O., de Clercq P., and Roy H.E.

The harlequin ladybird *Harmonia axyridis* continues to generate high profile research. This beetle is now regarded as a model invasive species and considerable research developments have taken place in recent years. The twelve papers in a new special issue of *BioControl* cover a wide range of topics. These include the benefits of *H. axyridis* in crop systems, community ecology and natural enemies, population ecology, risk assessment and novel approaches to monitoring. This special issue is an output of the IOBC Working Group 'Benefits and Risks of Exotic Biological Control Agents', a dynamic group that had its first full meeting in 2009.

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www.iobc-wprs.org

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Mass Rearing and Quality Assurance

www.amrqc.org

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Ecology of Aphidophaga

<http://aphidophaga.de>

Contacts: J. P. Michaud, USA (chair): jpmi@ksu.edu, Kris Giles (USA),
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Wolfgang Weisser, GERMANY



Biological Control and Management of Eupatorieae Weeds

<http://www.arc.agric.za/home.asp?pid=5229>

Contact: Michael Day, AUSTRALIA: michael.day@daf.qld.gov.au



Biological Control of Diamondback Moth & other Crucifer Insects

<http://web.entomology.cornell.edu/shelton/diamondback-moth/>

Contact: Dr. Ramasamy Srinivasan, TAIWAN: srini.ramasamy@worldveg.org



Benefits and Risks Associated with Exotic Biological Control Agents

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Biocontrol of *Ostrinia* and Other Maize Pests

www.iwgo.org

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Biological Control and Management of *Parthenium* Weed

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Management of Cactus Species

Contact: Dr Ana Novoa, SOUTH AFRICA: novoa.perez.ana@gmail.com



Commission on Biological Control and Access & Benefit Sharing

www.iobc-global.org/download/659ABSinBiCoAddMat2009.pdf

Contact: Dr Peter Mason, CANADA: peter.mason@agr.gc.ca



Using Managed Pollinators to Disseminate Biological Control Agents

Contact: Dr Peter Kevan, CANADA: pkevan@uoguelph.ca



Join an IOBC International Working Group.... or propose a new one!
Working groups can operate on the global level, or within a regional section...

Join IOBC...

Membership in IOBC is open to all individuals and all organizations, public or private, who desire to promote the objectives of biological control. There are four categories of membership:

- Individual Membership is open to all individuals engaged or interested in biological control.
- Institutional Membership is open to any institution, including government departments, academies of science, universities, institutes and societies participating in biocontrol activities.
- Supporting Membership is open to any person or institution interested in promoting the objectives of the Organization.
- Honorary Membership may be conferred by the Council to anyone who has made outstanding contributions to biological control.

For more information and application forms:

<http://www.iobc-global.org/member.html>

Biocontrol in Action Corner

Send photos of biocontrol agents or biocontrol practitioners in action to fill this corner of the newsletter. Remember to include a descriptive caption

groentemanr@landcareresearch.co.nz

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