International Organisation for Biological Control (IOBC)
Organisation Internationale de Lutte Biologique (OILB)

IOBC Global Newsletter Issue 108 December - January 2020-2021

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

Dear IOBC members,

This is a rather soberly illustrated newsletter, but contains a lot of news and I wanted to have it distributed before the end of January 2021. As we could not have our usual General Assembly meeting planned during the International Congress of Entomology in Helsinki last year, this newsletter will provide information we usually present at this meeting. Due to all uncertainties related to the current pandemic, we have not decided yet when and where we may get together for the General Assembly.

Joop C. van Lenteren, Secretary General IOBC Global

Contents

Message from the President

It gives me great pleasure to pen my first column as the President of this most auspicious organization. My election to this position came as a surprise when my dear friend and colleague Jianqing Ding asked me out of the blue if I would be prepared to be nominated as President. I am very fortunate that there is an excellent team on the executive of the IOBC Global, with Ronny Groenteman and Yulin Gao as Vice Presidents, Alejandro Tena in the position of Treasurer, Joop van Lenteren as Secretary-General and George Hempel staying on for another term as the outgoing President. I believe strongly that continuity and institutional knowledge are really important to organizations of this nature and thus I will be seeking guidance from the wealth of experience that sits on this committee. I would like to thank George and his outgoing committee of Vanda Bueno and Jianqing Ding (Vice Presidents), Josep Jacques (Treasurer) and Barbara Barratt (Past President), who have left the IOBC Global in a very strong position, and I would like to make special mention of Barbara who served 12 years on this committee.

Although there are a number of global working groups that tackle issues of insect and weed biological control and there a many members in the regions who come from both facets of the discipline of biological control, I was surprised to learn that I am the first president of the IOBC Global from a weed biological control background, although in recent years I have found myself doing more work in the field of insect biological control, mainly in citrus. I feel that this really affords us the opportunity to bring the two areas closer together. To my mind, our challenges as biological control scientists and practitioners is to ensure that the science we do is held to a high ethical standard, the outcomes of our research are implemented, and that we build capacity to ensure succession in this discipline. One of my goals for my term is to increase capacity in both insect and weed biological control in the developing world as this is where this technology can have its biggest impact, not only in food security, but also the environment.

In these uncertain times I am pleased to announce that we have successfully negotiated a new four-year contract with Springer to publish our journal BioControl. I would like to thank Ronny, George and Eric Wajnberg for taking their time to ensure that we were happy with the contract and that it protects the integrity of the journal. Uli and Heike Kuhlmann are continuing with their organization of the 2nd International Congress of Biological Control in Davos, Switzerland, at the end of April 2021. There has been considerable debate within the executive committee with the conference conveners whether this conference should go ahead, or should it be postponed, and what format it should take. We have taken the decision that this is a really important global meeting and we should go ahead. At this stage it is likely to be a virtual conference and this will bring some challenges, but in being virtual it may well make the conference more inclusive to people and organizations that might not have had the resources to attend in person.

The IOBC Global is really in an excellent place right now, largely due to the dedicated individuals who have served on this committee before me. However, 2020 has changed the

world and one of the positives that has come out of it is that an organization such as this one needs to be nimble and thus be able to respond quickly to the changing environment.

Martin Hill

2nd International Congress of Biological Control goes 100% virtual

The COVID-19 situation is unrelenting and very dynamic, and the vaccination campaigns worldwide will require significant time. This requires a decision on how to proceed with the 2nd International Congress of Biological Control (ICBC2). At the end of January 2021, the IOBC and CABI, as the organizers of this congress, concluded that a hybrid meeting is no longer feasible and therefore ICBC2 will go 100% virtual!. Despite the obvious disadvantages of not having a face-to-face scientific meeting in Davos, Switzerland, there are a number of obvious advantages, such as saving on travel, food and accommodation costs and not having to deal with visa issues. We could discuss arguments back and forth on what kind of format is best but it is also clear that such a virtual format increases accessibility and inclusion by reducing barriers to participation around the globe.

As ICBC2 is a truly international meeting, the different time zones remain a challenge but we feel that we have developed a concept which will satisfy a large number of participants. It will enable contributors and observers to attend the virtual scientific session (posters and talks) and panel discussions in real time when they are live-streamed. All scientific sessions and panels will be recorded too, so that everyone will have the opportunity to pick and choose as they like.

We are truly thankful to you all in terms of your ongoing interest, support and commitment to make ICBC2 a success through the encouraging number of early registrations and the submission of papers and posters. We have now closed the submission process and have analyzed the final submission results. We can already say that the final submission results look great as it will enable us to compile a strong scientific programme with approximately 22 scientific sessions and a number of very interesting panel discussions.

It is foreseeable that the registration fee will be in the range of approximately CHF 350. Please check out further developments under www.IOBC-ICBC.com or send an e-mail to info@IOBC-ICBC.com.

We are looking forward to arranging a stimulating ICBC2 with your strong support and active participation! Stay safe and best wishes,

Ulli Kuhlmann (CABI), Martin Hill & George Heimpel (IOBC Global)

ICE2020 postponed to 2022 and preparations for ICE2024 started

ICE2020

Prof.dr. Heikki Hokkanen, the President of the **XXVI ICE Helsinki** Organizing Committee informed us that the meeting will be postponed to 18-23 July 2022. For the latest information, please check the congress website at www.ICE2020Helsinki.fi. ***Registrations and proposals for symposia are still possible. Some 1800 persons have already registered.***

ICE2024

Japan will host the **XXVII International Congress of Entomology** from August 25 – 30, 2024, in Kyoto, Japan.

Upcoming Events

Please see the list of upcoming events at the website of IOBC Global: www.IOBC-Global.org

Report of activities by the outgoing Secretary-General

What did we achieve in the past 4 years? Key activities of the IOBC-Global Executive Committee 2016-2020

At the start of our term we identified key points guided our activities and decisions alongside IOBC Mission. You can see them weaved through the highlights from the past four years:

- Maintaining & increasing the relevance of IOBC to our members
- Appeal to early career biocontrol scientists
- Improve visibility of IOBC

In the past four years we welcomed one new Global Working Group (Crop Protection and Pollination), one new Global Study Group (Classical Weed Biological Control) and one new regional Working Group on Parasitoids of the Neotropical Region. It has been wonderful to see the Afrotropical Regional Section (ATRS) building momentum.

We have established a programme to **support hands-on training courses**. Education and training in biocontrol have been on IOBC-Global agenda for a long time. But being the

organisers of hands-on training has been a stumbling block. When Kris Wyckhuys approached us to support the training course he was organising we realised this model could work well: IOBC can support champions on the ground who have great initiative and a plan to organise an international training course. We have since established the annual call for training initiative, and have supported five such courses before COVID-19 put a lid on international travel.

We have **strengthened our relationships with IUBS** (International Union of Biological Sciences), which we are affiliated with. IOBC was represented in the 100th General Assembly of IUBS and put forward a proposal for a new project on Biological Control and the Protection of Biodiversity. This proposal was accepted by the General Assembly as the first new initiative in the new century of IUBS. The proposal will be further developed into a project.

We have embarked on **updating our Statutes and Bylaws** to reflect changes in our membership and its needs in the 21st Century. The proposed changes have been through one round of comments from the Regional Sections, and we are still working on some key questions that have been raised by the membership.

IOBC-Global is now **more digital-friendly**. We have updated our website to resize in response to mobile devices screen size. We have updated our privacy compliance. And we have set up a Tweeter account (@IOBC_Global).

Our **contract with Springer for the publication of BioControl** came up for renewal and has taken some negotiations to reach an agreement. Springer Team have been helpful and forthcoming during the negotiations. Nevertheless, like other scientific societies we feel the pressure from publishers to take the journal towards fully open access. Such a move has implications for authors who struggle to pay for publishing. Springer have committed to support us through this transition. How this support will portray itself is not yet clear, and we would like to have our say in designing it. It would be good to hear from you, our members, what might be the barriers for you to publish open access. This will inform our future discussions with Springer. On a positive note, we have negotiated a new members benefit with Springer: From 2021 members can subscribe to the journal for an online-only access for a discounted fee of 40 Euro (plus country taxes). This is also a great opportunity to thank Eric Wajnberg, Editor in Chief of BioControl and the team of editors for the excellent work they are doing to keep growing the impact and success of the journal year on year.

Finally, a highlight for the outgoing Executive Committee has been the successful **International Congress for Biological Control, ICBC**. The 2018 event in China brought various sub-disciplines of biocontrol together in a format that does not exist in other international meetings, which tend to be more specialised. The appetite to repeat this format as an ongoing home for biocontrol at large saw this congress become the first, with future ICBC to come. The planning for ICBC2 in Davos was well underway, but had to change with COVID-19 throwing much uncertainty.

It has been a privilege to work with the IOBC-Global Committee. I feel we progressed matters that are important to our members, but of course the work is not over.

Welcome, the new Committee for 2020-2024!

Ronny Groenteman, outgoing Secretary-General IOBC Global

Financial situation of IOBC Global during 2016-2020

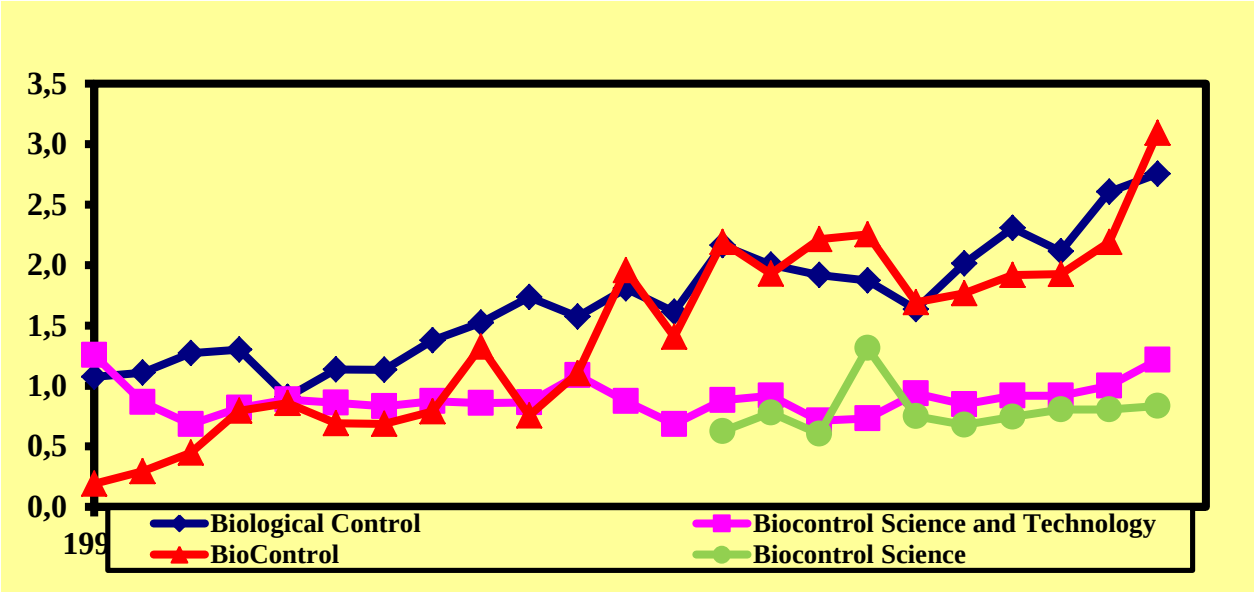
The treasurer for the period 2016-2020, Dr. Josep A. Jaques provided the new Executive Committee with an overview of the financial situation of IOBC Global. It is very satisfying to be able to conclude that the financial situation looks healthy. IOBC Global has been able to support its working group meetings and several biological control meetings, the editorial board of the journal of BioControl, and a biocontrol training course during its 2016-2020 term. The current Executive Committee thanks Josep Jaques for all his careful work as treasurer.

BioControl, the Official Journal of IOBC

BioControl status report 2020 by Eric Wajnberg, Editor-in-Chief

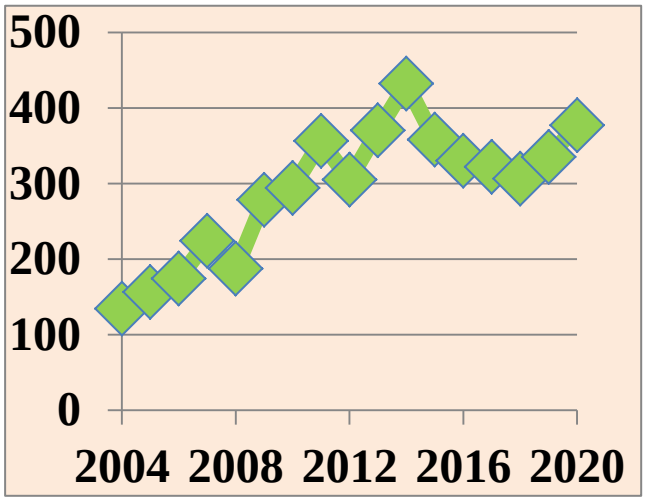
Impact factor

Impact Factors give relevant, synthetic information about the health of a journal. Over the last 15 years, the Impact Factor of BioControl regularly increased. This year, the journal passed the "symbolic" 3.0 threshold, and remains above its competitors (i.e., Biological Control, Biocontrol Science and Technology, and Biocontrol Science). The evolution of the Impact Factors for these journals over the last 23 years are shown on the graph:



Manuscript flow

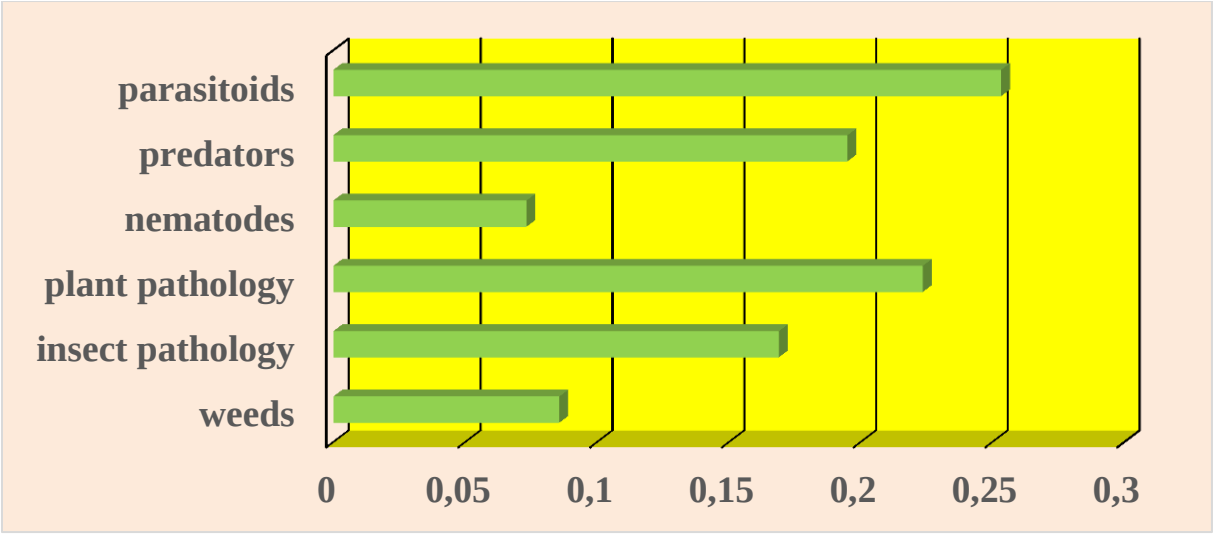
BioControl receives an increased number of MS per year from all over the world since 2004 and up to 2014. Then, the number of MS oscillates between 300 and 400. This also indicates that BioControl remains an important media attracting authors to submit their original work. The current increase in Impact Factor will most likely mechanically lead soon to an increase in the number of MS submitted to BioControl, which is also an important feature of the good health of the journal.



During the last four years (2017-2020), BioControl received 1340 manuscripts (MS), leading to about 28 MS per month, on average. Although this can still be improved, such a MS submission rate looks really good and provides sufficient material to fill the 6 issues (about 720 pages) published each year.

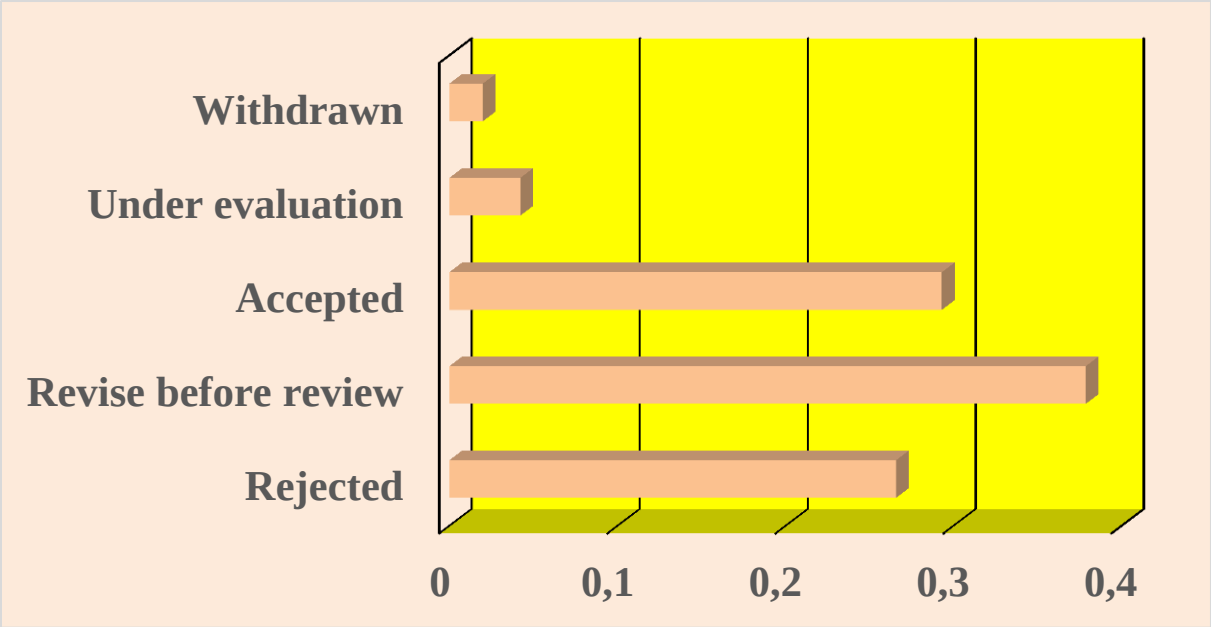
Scientific topics addressed

BioControl publishes original articles on parasitoids, predators, nematodes, plant pathology, insect pathology and weed biological control. The distribution of the MS submitted among these different topics remains stable over the years, and shown below.



Editorial outputs

For the 1340 MS received over the last 4 years, the distribution of the editorial decisions that have been taken is as follows:



This gives an overall rejection rate of 64.47 %, which remains stable over the years. An important number of MS are rejected before entering the editorial process, because they are either off the scope of the journal, and/or that are poorly prepared and written.

Editorial boards

BioControl currently has both a board of 12 Associated Editors, that are in charge of handling the MS submitted to the journal, and an editorial board composed of 21 renown international scientific personalities. The IOBC Global provides some yearly financial compensation for the large amount of work the Associate Editors are doing for the journal. For composition of the boards of editors see: https://www.springer.com/journal/10526

Improvements of the last years

First of all, the MS waiting time (i.e., "handling time") from submission to the first decision was drastically reduced from about 150 days in 2004 to about 20 days now. Also, a double-blind reviewing system has been installed, in which referees do not know the names and affiliations of the authors, and authors are also not aware of the identity of the referees. In 2008, BioControl changed to a two-column layout and all issues started to be published with a full-coloured cover. Finally, Associated Editors are now explicitly acknowledged for their work by mentioning their name on each published article.

Special issues of BioControl

Several Special Issues were published on a regular basis

"From biological control to invasion: The ladybird Harmonia axyridis as a model species". Guest editors: HELEN ROY & ERIC WAJNBERG. Published in issue 1 of volume 53 (2008).

"Invasive alien arthropod predators and parasitoids: An ecological approach". Guest editors: HELEN ROY, PATRICK DE CLERCQ, LORI-JAYNE LAWSON HANDLEY, JOHN SLOGGETT, REMY POLAND & ERIC WAJNBERG. Published in issue 4 of volume 56 (2011).

"Conserving nature with biological control". Guest editors: ROY VAN DRIESCHE, TED CENTER, KEVIN HEINZ & MARK HODDLE. Published in issue 2 of volume 57 (2012).

"Biological control of tree diseases". Guest editors: JESÚS MERCADO-BLANCO & FRANCISCO M. CARZOLA. Published in issue 3 of volume 61 (2016).

"Unravelling the ecology of an invasive ladybird, Harmonia axyridis: From populations to communities". Guest editors: PETER BROWN, LORI-JAYNE LAWSON-HANDLEY, OLDRICH NEDVED, PaTRICK DE CLERCQ & HELEN ROY. Published in issue 3 of volume 62 (2017).

"Biological control: Achievements and opportunities". Guest editors: JACQUES BRODEUR & RUSELL MESSING. Published in issue 1 of volume 63 (2018).

"Perspectives on progress in classical biological control of weeds". Guest editors: MARK SCHWARZLÄNDER, CLIFF MORAN & SATHYMURTHY RAGHU. Published in issue 3 of volume 63 (2018).

"Revisiting the biosafety of exotic generalist arthropod biological control agents". Guest editors: DAVID ANDOW, BARBARA BARRATT, ROBERT PFANNESTIEL, DÉBORA PIRES PAULA. Published in issue 1 of volume 66 (2021).

Obituary Robert F. Luck

In Memoriam Robert F. Luck
Professor of Entomology, Honorary Member of IOBC Global
May 29th 1941- September 6th 2020

Robert F. Luck, internationally known for his research on biological control of citrus pests and the basic science underpinning biological control, passed away on September 6th 2020. His leadership and pioneering research in citrus pest management were based on an in-depth understanding of the ecology and behavior of pest insects and their natural enemies. He stressed the importance of observing insects in the field and often disappeared from campus exclaiming, "Somebody has to do the field work!" The results from his research enabled him to make informed decisions about optimizing pest management strategies. Consequently, his advice and collaboration were sought constantly by colleagues, students, and agricultural producers eager to apply the principles that he had discovered. Professor Luck had the valuable ability to operate as both a fundamental and practical scientist, delving into the causes as well as consequences of pest outbreaks.

Bob Luck attended the University of California, Berkeley (UCB), earning a B.S. degree in Forestry in 1964. Under the direction of Professor Don Dahlsten at UCB, he completed a Master's degree in Entomology in 1966. Bob obtained his Ph.D. in Entomology with Professor Dahlsten at UCB, working on various species of scale insects in the pine forests of California's Lake Tahoe area. Shortly after completing his Ph.D. in April 1973, he accepted a position in the Department of Entomology, Division of Biological Control, University of California-Riverside (UCR). There he continued his work on forest pests until the 1980s, when he initiated studies on insect pests of citrus.

During the next decade, Professor Luck conducted detailed laboratory and field studies on various parasitoids that attacked different scale insect species in citrus. This work shed light on the relationship between the size of a parasitoid's host and the sex ratio of the

parasitoid's offspring, and between female wasp size and their effectiveness in biological control, along with numerous other host-parasitoid relationships that affected the ability of parasitoid wasps to suppress pest populations. He became an expert in designing experiments to determine optimal parasitoid release rates, and to monitor the impacts of parasitoids and predators. He applied this fundamental knowledge to develop integrated biological control systems for citrus production in California's Central Valley. His novel management methods were used to control a suite of citrus pests with natural enemies.
In 1992, Bob hosted Professor Joop van Lenteren from Wageningen University in the Netherlands for a sabbatical. Joop still remembers how Bob explained to growers in clear and straightforward terms how biocontrol works, and how he spoke very effectively about biocontrol and IPM at grower meetings, emphasizing the negative effects of most insecticides on natural enemies. He initially received a rather lukewarm response, with comments like "biocontrol was kind of a religion and did not really work". At one meeting, a rather aggressive grower strongly advocated the need for extensive use of pesticides, but surprisingly, allowed Bob to conduct a biocontrol and IPM experiment in his fields. The experiment was successful, converting the grower into an enthusiastic user and promoter of IPM practices. When Joop accompanied Bob on a visit to the grower, the convert immediately started telling this supposedly naïve guest from Holland how important Bob's work was for the growers in California and worldwide! Overall, Bob impressed Joop with his careful, friendly, and personal approach to working with growers and extension agents in developing a citrus IPM system that was both ecologically sound and economically feasible. Professor Luck continued this important work during the 2000s, enhancing the biocontrol system by studying additional pests, such as soft scales, that are common in Central Valley citrus. In appreciation of his contributions, the California Citrus Quality Council presented him with the prestigious Albert G. Salter Memorial Award in recognition of his significant discoveries that benefited California citrus growers and the Citrus Research Board over several decades. For his advances in the basic science of biological control, he was named Distinguished Scientist for the Year in 2003 by the International Organization of Biological Control (IOBC)-Nearctic Regional Section, and elected as an Honorary Member of IOBC Global in 2005.

Professor Luck's pioneering work on the practical use of natural enemies in augmentative biological control led to collaborations with several other scientists who wanted to increase the long-term effectiveness of natural enemies. His colleague William Murdoch of the University of California, Santa Barbara, showed that the coexistence of scale insect populations with their parasitoid complexes was partially driven by the existence of habitat refuges where scales were not attacked by their parasitoids. Allied to his applied research, he conducted fundamental studies on the determination of parasitoid offspring sex ratios, using Aphytis and Trichogramma spp. wasps as models. Several important fundamental discoveries in collaboration with Professor Len Nunney at UCR resulted in extension of the local mate competition theory. Involvement of bacteria in causing parthenogenetic reproduction in parasitoid wasps was elucidated with his Ph.D. student Richard Stouthamer. Elegant field experiments with another graduate student, David Kazmer, demonstrated the importance of size in determining the fitness of male and female wasps in the field.

Professor Luck's talent and leadership in biological control was recognized both in the U.S. and globally. In 1989, he co-organized the "Vedalia Symposium of Biological Control: A Century of Success" at Riverside, California, the "International Entomophagous Insects

Workshop" at Lake Arrowhead, California and the "International Symposium on Biological Control Implementation" at McAllen, Texas. He also assisted in establishing the USDA, APHIS National Biological Control Institute in Washington, DC that year, and served on the first User Advisory Panel. He was invited in 1995 to co-chair the biannual meeting of the International Organization for Biological Control Working Group on Quality Control of Mass-Reared Arthropods at Santa Barbara, California. He also traveled widely to expand his research in classical biological control, collecting natural enemies in Pakistan and China, and engaged in highly productive sabbaticals in Australia, and with Professor van Lenteren at the University of Leiden and at Wageningen University in The Netherlands. Professor Luck also maintained long-term collaborations with Professor David Rosen in Israel, Professor Masami Tagaki in Japan, and, at the end of his career, with Dr. Alejandro Tena working to improve biological control of citrus pests in Spain and, at the end of his career, with Dr. Alejandro Tena working to improve biological control of citrus pests in Spain.

Professor Luck was an exceptionally engaged and approachable research program leader, and well known as an enthusiastic educator and mentor of graduate students. During his career, he graduated five M.S. and nine Ph.D. students, and mentored numerous postdoctoral scholars and visiting students from all over the world. He often interjected a good pun or joke to make his instruction informal. He always imparted his knowledge to graduate students without condescension and was willing to discuss virtually any subject, but his favorite was any aspect of biological control. He often stayed in touch with graduate students long after they completed their degrees, and even periodically contributed to their work. Over the years, he supported 20 of Professor Stouthamer's M.S. students from Wageningen University when they came to conduct field studies on parasitoid wasps in the Mojave Desert. Professor Luck's M.S. students included Susan Opp, David Goodward, Bai Baorung, Jeff Honda, and Shannon Kirshtner and his Ph.D. students were Devin Carroll, Hannah Nadel, Thomas Unruh, Dicky S. Yu, Richard Stouthamer, David Kazmer, Jeff Honda, Celso Hohmann, and Apostolis Kapranas. He authored 97 scientific journal articles and 17 book chapters from 1967 to 2012. Often, the illustrations in these papers were created by his wife, Nancy, who was a technical illustrator at UCR. Bob is survived by his wife Nancy, their two daughters, Stephanie and Andrea, his son-in-law Philippe and two grandchildren, Antoine and Sylvie.

Mashall Johnson, Lynn LeBeck, Norm Leppla, Jocelyn Millar, Richard Stouthamer and Joop C. van Lenteren, September 2020

New Books on Biological Control

Biological Control: Global Impacts, Challenges and Future Directions of Pest Management

Edited by Peter G. Mason

Due for publication in late 2021, **Biological Control: Global Impacts, Challenges and Future Directions of Pest Management** provides a historical summary of organisms and main strategies used in biological control, as well as the key challenges confronting biological control in the 21st century.

Biological control has been implemented for millennia, initially practised by growers moving beneficial species from one local area to another. Today, biological control has evolved into a formal science that provides ecosystem services to protect the environment and the resources used by humanity. With contributions from dedicated scientists and practitioners from around the world, this comprehensive book highlights important successes, failures and challenges in biological control efforts. It advocates that biological control must be viewed as a global endeavour and provides suggestions to move practices forward in a changing world.

Biological Control will be an invaluable resource for conservation specialists, pest management practitioners and those who research invasive species, as well as students studying pest management science. It will be available for customers in Australia and New Zealand from CSIRO Publishing and elsewhere from CRC Press.

Biological Control in Latin America and the Caribbean appeared in 2020, Spanish version to appear in 2021

Edited by Joop C. van Lenteren, Vanda H.P. Bueno, M. Gabriela Luna and Yelitza C. Colmenarez

Few publications have provided historical detail on biological control of pests, weeds and diseases in Latin America and the Caribbean, and so data has been fragmented until now. By bringing this important information together in this book, a more complete picture is offered of significant developments in biological control on the South American continent and the Caribbean islands. For each country, a wealth of text, tables and references are provided on the history of such projects. With details of successes and failures, this can help in the planning of future biocontrol projects. An overview is provided of the current practical biological control situation in Latin American and Caribbean countries, revealing that an astonishing level is being applied in the region, making it the largest area under biological control worldwide. In conclusion, the book describes new developments and speculates about the future of biological control in Latin America and the Caribbean.

Key features:

- Complete and documented overview of biocontrol in Latin America and the Caribbean, together with records of invasive and native pests.
- Unique examples of natural, classical, augmentative and conservation biocontrol.
- Thirty country specific chapters written by national specialists.
- Reveals many internationally unknown cases of biocontrol and their research history.
- The first serious attempt to estimate crops and areas under different types of biocontrol.
-

CABI BioProtection Portal: A new decision support tool for advisory service providers and growers

As part of the continuing global effort to reduce the use of highly hazardous pest control products in agricultural production, CABI has launched an open-access CABI BioProtection Portal (www.bioprotectionportal.com). Targeted primarily at growers and advisors, and available in multiple languages, the CABI BioProtection Portal offers a free- and simple-to-use central reference point for all information related to nationally registered biological control and biopesticide products. The portal was launched in Kenya in February 2020 and has since grown to cover 12 countries: Peru, Chile, Colombia, Brazil, Canada, Spain, Morocco, Jordan, Bangladesh, Kenya, Ghana and Uganda, with more countries are in the pipeline.

Although the CABI BioProtection Portal is targeted primarily at growers and advisors, it also provides potential benefits to national regulators as it enables them to ensure that information about their registered biological control and biopesticide products is readily available, up-to-date and easily searchable for all key national stakeholders that require it, including growers, advisors, agro-input suppliers, academics, retailers, etc. International stakeholders (e.g. supermarkets, certification boards, etc.) who need to know the regulatory status and availability of various biological control and biopesticide products will also find value in the portal as it means they only need to look in one place for the information they require rather than going to multiple national sites.

The CABI BioProtection Portal has a number of partner biocontrol manufacturers (Koppert Biological Systems, Syngenta, e-nema, Oro Agri and Idai Nature), sponsors (Nespresso) and donors (the Ministry of Foreign Affairs of the Netherlands, the Swiss Agency for Development and Cooperation, African Development Bank, the UK Foreign, Commonwealth and Development Office (FCDO) and the European Commission's Directorate-General for International Cooperation and Development), who provide invaluable support in the form of funding, strategic guidance and technical inputs. CABI has also signed a Memorandum of Understanding with BioProtection Global - a worldwide group of biocontrol and biopesticides industry associations – who agreed to promote use and partnership with the CABI BioProtection Portal among its member associations.

The CABI BioProtection Portal is also analysing traffic to the site and user behaviour in order to generate detailed live market intelligence dashboards for its industry partners. To date the portal has welcomed close to 300,000 users to the site and we anticipate this number growing exponentially as the number of countries covered by the portal increases and the site is enriched with information resources and training material to aid a better understanding and awareness of biological control, and how it can be integrated into farming systems, among growers and advisors.

Please contact Dr Ulli Kuhlmann (u.kuhlmann@cabi.org) if you have any feedback or would like to find out more.

Initiative to develop a New Global WG on Biological control of insect pests of Solanaceous Crops (IOBC-BiCoSol)

Dr. Yulin Gao of the Institute of Plant Protection, Chinese Academy of Agricultural Sciences, China, and Dr. Wenwu Zhou, Institute of Insect Sciences, Zhejiang University, China proposed to the Executive Committee of IOBC Global for form a working group on Biological control of insect pests of Solanaceous Crops (IOBC-BiCoSol). The aims of this WG would be:
(1) Establishing an international platform for scientists working on biological control and ecological management of solanaceous pests;
(2) Promoting knowledge exchange, joint project building, and research collaboration between scientists;
(3) Promoting the application biological control strategies in the management of solanaceous pests worldwide.

The proposal describing the field of work and activities of this new WG was circulated among the Executive Committee and then sent to the Regional Sections and Global Working Groups of IOBC Global for comments on this initiative. Reactions were positive, some suggested to include biocontrol of diseases, others indicated there might be potential overlap with activities of two greenhouse IPM working groups, and several IOBC Global WGs said they were happy to collaborate with this new WG. All comments have been considered, the proposal was adapted and the Executive Committee of IOBC Global proposed to the convenors to start with a Study Group, which might obtain the status of working group after its first meeting.

Call for Biocontrol Training Initiatives

Keen to organise a practical training courses in biological control? IOBC-Global is providing financial support!

IOBC Global offers financial assistance to support participation of early-career practitioners/researchers in practical biocontrol training courses. If you have an idea for a training course for 2022, please contact secretary-general@iobc-global.org no later than 30 Novermber 2021.

Summary report of Three Days Bio-Control Training Course

From 20-22 of August 2020, the Department of Zoology organized three days biocontrol training course which was financially supported by the International Organisation for Biological Control (IOBC Global). The course was held at the Business Incubation Centre and Applied Entomology Laboratory, of the GC University Lahore, Pakistan, with as principal organizer Dr. Muhammad Tahir of the same university. The course was aimed at the transfer of knowledge, techniques and novel research in the field of biological control with national and international scientists and scholars. Participants got updated and useful information on Biological Control and IPM, regarding the use of viable IPM strategies to control the pest population in the different parts of the country. In particular, participants explored and discussed the experience regarding the IPM and Biological control and the current opportunities and challenges in mass production and utilization of long lasting bio-control agents. The work-

shop was open to national and international students, scholars and scientists. After the presentations, there was a question answer session for participants.

Day 1

- Opening remarks and introduction of IOBC by Ms. Sehrish Ashraf, Ph.D. Scholar.
- Introduction of the training course and speakers/Instructors by Dr. Hafiz Muhammad Tahir, GC University Lahore. He emphasized the role and contribution of IOBC in this particular course.
- Welcome note by Dr. Atif Yaqub, Chairperson Department of Zoology
- Lecture on natural predators by Dr. Stephanie Loria, University of Hamburg, Germany.
- Lecture on Biological control and its applications for insect pest control in Pakistan by Prof. Dr. Farkhanda Manzoor, Chairperson, Department of Zoology, Lahore College For Women University Lahore.
- Lecture on Biological control: A sustainable and ecofriendly IPM approach by Dr. Azhar Abbas Khan, of the BZU Layyah Campus.
- Lecture on IPM as sustainable approach for pest management by Dr. Shahbaz Ahmad, IAGS, University of the Punjab, Lahore
- Lecture on Impact of insecticide resistance on Biological Control by Prof. Dr. SHP Parakrama Karunaratne, Dr. Priyanka de Silva and Dr. Thilini Weeraratne, University of Peradeniya, Peradeniya, Sri Lanka.
- Dr. Rafiq Shahid, Cotton Research Institute Khanpur, RYK. lectured about Major insect pests of cotton crop in Punjab, Pakistan and their control, which was followed by a practical demonstration of insect pests and predators to physically present participents. Students with online presence were provided with the data of pests and predators demonstrated.

Day 2

- Lecture on the Current status of Biological Control in Pakistan and Common predators being used in the biological control in Pakistan by Dr. Sher Muhammad Sherawat, Director Agriculture Extension, Lahore Division.
- Lecture on Habitat Management to Conserve Natural Enemies of Insect Pests by Dr. Muhammad Khalid Mukhatar, University of Sargodha, Sargodha.
- Lecture on Types of Biological Control and spiders as model predator in agroecosystems by Dr. Hafiz Muhammad Tahir.
- A practical demonstration on Major insect pests and predators of Maize crops was given by Mr. Naveed Ahmed, Govt. College Pattoki, Kasur
- A practical demonstration on Major insect pests and predators of agro-ecosystems was given by Mr. Amir Nadeem, Govt. M.A.O College Lahore and Ms. Sana Mehmood, Aspire College Jehlum. Students with online presence were provided with the data of pests and predators demonstrated.

Day 3

- A field visit to agricultural forms in Qasur and vicinity was arranged. Purpose of field visit was to provide opportunity to selected physically present participants to observe different insect pests and predators directly in the field.

All participants enjoyed three day biocontrol course especially practical sessions and field visit. Five instructors were physically present, eight took part online. Twenty individuals took physically part in the course, while 77 followed the lectures online.

Students Response

Student appreciated the organizers of this training course which enable them to learn about latest development in the field of insect pest management and especially in biological control. They have appreciated the practical demonstration and field visit. They received training in identifying different pests and their predators both in lab and field conditions. Most of the students were considering all the insects present in agricultural fields as pests but in this course they have learned that many of them are predators of economically important pests and farmer friendly. They have recognized the fact that we can control pest population by using biological control tools and avoid the excess use of pesticides.

Challenges Faced: The main challenge was that most of the students were interested to attend this course physically but they were not able to join because of Corona Pandemic in Pakistan. Field visit was arranged for selective students and participants only. There were also some connectivity issues, reported by students. Furthermore, during the course days there were heavy rains in the city due to which we have cancelled our city tour and limited our field visit.

Message by students and Organizers: Students left the message for IOBC that they are thankful of the organization for providing them the chance to attend the course and paying their registration fee. As most of the students were not able to join physically and they wished that this activity may be held again next year so that they can join physically. Those students who were not able to perform practical work in Lab and field were provided slides of major pest and predators and relevant material. Course facilitator responded to their online question answer session on day 2.

Dr. Hafiz Muhammad Tahir, principal organizer of the event especially thanked IOBC for support to organize this event.

News from the regional sections

APRS

Asia-Pacific Regional Section (APRS)
Contact: Dr. Toni Withers; E-mail:
toni.withers@scionresearch.com

ATRS

Afrotropical Regional Section (ATRS)
Contact: Dr. Désiré Gnanvossou,; E-mail:
D.Gnanvossou@cgiar.org

EPRS

East Palearctic Regional Section (EPRS)
Contact: Eduard A. Sadomov, Moscow, Russia; E-mail:
o.krivchenko87@yandex.ru

Report on EPRS/IOBC activities over 2017-2020.

At the 12th meeting of General Assembly on 24-27 April 2017 in St. Petersburg (Russia) a new Executive Committee has been selected for a period 2017-2020.

New Executive Committee:

- President: Prof. Dr Victor Dolzhenko, St. Petersburg, Russia
- Vice Presidents: Emilia I. Kolomiec, Minsk, Belarus
  S.D. Karakotov, Russia
  Danuta Sosnowska, Poznań, Poland
- Secretary General: Eduard A. Sodomov, Moscow, Russia

At present, there are 10 Standing Committees in the EPRS:

- Editorial and publishing
- Integrated Plant Protection
- Industrial production technology of biological plant protection products
- Entomophagous and phytophagous of weeds
- Selective methods of plant protection
- Genetic engineering modified plants
- Innovations in biological plant protection
- Microbiological plant protection products
- Biological control of forests
- Biological plant protection against plant diseases.

Current members of EPRS:

- Russia – 19 persons and institutions
- Poland – Institute of Plant Protection – National Research Institute, Poznań, Poland
- Belarus – 2 institutions
- Georgia – 1 institution
- Kazakhstan – 1 institution
- Hungary – 1 institution
- Serbia – 2 institutions

EPRS during the period 2017-2020 organized the following conferences and congresses:

1. Symposium "Biological protection of forests and green plantings against pests and diseases", February 2018, April 2019, Moscow, Russia.
2. Working Group "Biological control of forests" organized meeting in honour of the great Russian scientist of forest control A.I. Ilinsky, 2018, Pushkino/near Moscow, Russia.
3. International conference "Biological control – the basis for the stabilization of agroecosystems", September 2018, Soczi, Russia.
4. International conference in Phytopathology Institute "60 years of research of the Phytopathology Institute: theory and practice", 2018, Great Viazmy/near Moscow, Russia.
5. International conference "Biological control of plants – achievements and prospects", October 2018, Odessa, Ukraine. The conference was attended by members of WPRS from Italy.
6. International conference "Microbial biotechnology – basic and practical aspects", June 2019, Minsk, Belarus.
7. International conference and 90th anniversary of the All Russian Institute of Plant Protection in St. Petersburg, Russia. 2019. The conference was attended by representatives of many countries from EPRS members from: Russia, Belarus, Kazakhstan, Hungary, Poland and many others.
8. 8th Congress on plant protection "Integrated plant protection an integral part of obtaining clean agricultural and forestry production", November 2019, Zlatibor, Serbia. The Congress was under the patronage of the Serbian Plant Protection Society and EPRS. The presentations were published in the materials.
9. 6th scientific conference "Biological and ecological bases of plant selection, seed production and breeding". September 2020, Jalta, Russia.

EPRS continued research related to modern plant protection requirements. The works concerned on the development of new biological preparations for the protection of plants against pests and diseases. Research into methods of protection against invasive organisms is being expanded in all countries of EPRS members.

EPRS publications:

1) "Rapid spread and potential host range of the invasive oak lace bug (*Corythucha arcuate* Say, 1832 – Heteroptera: Tingidae in Eurasia", Agricultural and Forest Entomology, 2019, v. 22.
2) Monograph: Gninenko Ju. I. (Russia), Telegina O.S. (Kazakhstan): "Phytophaga of coniferous introducers in northern Kazakhstan", Puskino, 2019, 129 pp.
3) Monograph: "Invasive dendrophilous organisms: challenges and protection operations", Pushkino, VNIILM, 2019, 120 pp. In the monograph the results of studies carried out in Russia, Serbia, Croatia, Montenegro, Greece, Slovenia and Slovakia are presented. The research concerned the most dangerous pests such are: *Corythucha amitinus*, *Cydalima perspectalis*, *Polygraphus proximus* and others.

NRS

Nearctic Regional Section (NRS)

Contact: Ricky Lara; E-mail: jlara007@ucr.edu

NTRS

Neotropical Regional Section (NTRS)
Contact: M. Fernanda Cingolani; E-mail: fernandacingolani@cepave.edu.ar

Activities ff the Neotropical Regional Section (NTRS)

After having a new governing board of the IOBC-NTRS in 2018 whose proposal was mainly getting more access to Entomological societies and therein interact with them, at a broader scale during the last years, many members of IOBC-NTRS have participated on important scientific events in the region, coordinating also several symposiums such as in the II Congress of Applied Biological Control (Ecuador), the 47th Congress of the Colombian Society of Entomology – SOCOLEN, the 4th Chilean and the 1st Latin-American Biological Control Symposium, the XVII Congress of the Panamanian Association for the Advancement of Science (APANAC, by its acronym in Spanish) and the 16th Symposium on Biological Control (SICONBIOL) promoted by the Entomological Society of Brazil.

Another remarkable action carried out in the last years by members of NTRS was the development of the book "Biological Control in Latin America and the Caribbean: Its Rich History and Bright Future". The book, edited by Joop van Lenteren, Vanda Bueno, María Gabriela Luna and Yelitza Colmenarez, was launched at the beginning of 2020. It was written mainly by IOBC-NTRS authors, and brings detailed information on biological control of pests, weeds and diseases in Latin America and the Caribbean. The book offers unique examples of natural, classical, augmentative and conservation biocontrol, together with records of invasive and native pests. The book consists of a compilation ox experiences in thirty countries on specific chapters written by national specialists revealing many cases of biocontrol and their research history.

Regarding NTRS Working Groups (WG), the WG on Parasitoids of the Neotropical Region organized its 2nd Symposium, which was held during the XXVI Brazilian and IX Latin American Congress of Entomology (Meceió, Brasil – 13-17 March 2016). The Symposium was organized by Marcus Vinicius Sampaio, Adriana Salvo, Simone Mundstock Janke,Daniell Rodrigo Rodrigues Fernandes and Alexandre José Ferreira Diniz (some of them are

on the photo). There were two round table conferences with invited speakers on taxonomy and use of parasitoids in biological control programs, and two other round table conferences in which members of the WG presented their works.

Besides, in 2019 a new WG on Conservation Biological Control was created, with Simone Mundstock Jahnke, Yelitza Colmenarez, Germán Vargas and Leonardo Rivera as Convenors. Research on Conservation Biological Control in Europe has a long history and many advances, however in the Neotropical region studies are more recent and many aspects related to agroecosystem management seeking pest suppression still need to be elucidated. The aim of this Working Group is to enhance knowledge of the influence of native or implanted biodiversity and of habitat management aspects and agricultural practices that extend biological control in addition to other ecosystem services in agricultural areas. In December 2020, was implemented a 2 weeks training course on Conservation Biological Control, organized by Dr. Luis Garcia, Dr. Simone Mundstock Jahnke and Dr. Yelitza Colmenarez as part of the WG activities, with the participation of 24 students and specialists from Uruguay, Brazil and Colombia.

Lately, during the challenging 2020, the Neotropical regional section implemented a series of webinars with the aim of letting their members get together, although separated because of lockdown imposed due to the COVID-19 pandemic. The first webinar was held with the presence of Local Representatives of IOBC-NTRS in each one of the countries of this large region. The main objective was to coordinate baselines for organizing the activities of the Organization in each country. Presidents of three National Entomological Societies of the region (Argentina, Brazil and Colombia) were also present and committed their support for the objectives of IOBC-NTRS.

During eleven webinars the average number of participants was around 80 people in each one, from more than ten countries (Argentina, Brazil, Bolivia, Chile, Colombia, Costa Rica, Ecuador, Honduras, Mexico, Nicaragua, Panama, Peru and Uruguay). The webinars have been very fruitful promoting rapprochement of members and allowing the exchange of enriching experiences in the implementation of Biological Control programs in Latin-America.

This series of webinars initiative have resulted in a very appealing approach, since many of the attendees are not yet members of IOBC, and they are now expressing their interest in becoming part of the organization! These webinars also served as a mechanism for students for several Latin-American Universities to get credits for their graduate careers, helping to solve difficulties to attend internships due to pandemic.

Undoubtedly, a transcendent novelty is that during 2020 we extended our coverage in the Region stablishing new contacts with colleagues of countries from which participation was not numerous, such as Peru, Bolivia, Costa Rica and Nicaragua, the Entomological Societies of Argentina and Mexico, and FELA (Latin-American Entomology Federation, by its acronym in Spanish). We hope this new contacts will contribute to our mission of promoting the development and utilization of biological control in this vast region.

Furthermore, during the last year some members of IOBC-NTRS are engaged in organizing two important international events, the XI Argentinian and XII Latin-American Congress of Entomology (XICAE – XIICLE) and the 7th International Entomophagous Insects Conference (7IEIC), both of which will be held in 2021 in Buenos Aires (Argentina).

Also some members of the Executive Committee of IOBC-NTRS are working as part of the Scientific Committee of the 2nd International Congress of Biological Control (ICBC2) planned to occur in Davos in 2021.

All the activities undertaken together with those planned for the future, evidence the commitment and great potential of the specialists of this thriving region.

WPRS

West Palearctic Regional Section (WPRS)
Contact: Dr. Gerben Messelink; E-mail: Gerben.Messelink@wur.nl

IOBC Global Working Group Contacts and Reports

Mass Rearing and Quality Assurance (MRQA)

Contacts: Maria Luisa Dindo; Email: marialuisa.dindo@unibo.it; Rose Buitenhuis; Email: Rose.Buitenhuis@vinelandresearch.com

IOBC-MRQA website:the new address of the IOBC-MRQA website is: https://www.mrqa.eu

Summary of activities of Mass Rearing and Quality Assurance Working (MRQA) Group of IOBC Global

MRQA Workshop 2017

The 14th workshop of the IOBC Global WG on Mass Rearing & Quality Assurance (MRQA) was held in Merida, Yucatán, Mexico in November 2017, on the theme "Mass Rearing High Quality Invertebrates for Multiple Purposes". It was a joint meeting of IOBC-MRQA, the Mexican Society of Biological Control (SMCB), the Association of Natural Bio-control Producers (ANBP), the International Biocontrol Manufacturers Association (IBMA) (Invertebrate Biocontrol Agents Group) and was hosted by SMCB.

About 60 attendees from 18 countries participated in the event. The objective was to explore the opportunities for advancing the rearing of high quality entomophagous and phytophagous insects, mites, and other invertebrates for plant and animal pest management, human and animal food, and a variety of other uses.

Seven symposia, including oral presentations, posters and a Panel discussion, dealt with different aspects of arthropod rearing and quality assurance:

1. Mass rearing invertebrates for management of arthropod crop pests
2. Mass rearing for veterinary and medical applications
3. Mass rearing insects for feed and food
4. Development & validation of protocols for invertebrate mass rearing and quality assurance
5. Breeding of beneficial arthropods
6. Networking and instruction on arthropod rearing
7. Legal and ethical issues associated with mass rearing invertebrates

Discussions were aimed at expanding knowledge on the different methods and applications involving the mass rearing of invertebrates and their quality control, promoting worldwide collaboration among scientists and practitioners.

The workshop included a visit to the " Laboratorio de reproducción masiva de Tamarixia radiata del Sureste", where the parasitoid *Tamarixia radiata*, a major antagonist of the Asian citrus psyllid *Diaphorina citri*, is mass produced. A tour to the Uxmal archaeological site was also organized. Abstracts from the Merida meeting were published on the MRQA website under "Proceedings". During the business meeting, Prof. Maria Luisa Dindo and Dr. Rose Buitenhuis were chosen to replace Prof. Patrick DeClercq and Dr. Tom Coudron as co-convenors of the working group.

Participants at the 14th workshop of the IOBC Global WG on Mass Rearing & Quality Assurance (MRQA) held in Merida, Yucatán, Mexico, November 2017

IOBC guidelines to determine the quality of biocontrol agents.

Quality Control is a long standing priority of our working group. Thanks to the efforts of MRQA members, universal and publicly available QC guidelines were developed for multiple biocontrol agents, collected in the publication "IOBC Quality Control Guidelines for natural enemies" (van Lenteren, 2003) and made available on the MRQA website. As the industry evolves, the QC guidelines have to keep up with the expanding assortment of natural enemies and advancing technology. There have been requests from several groups, ranging from biocontrol producers, researchers, all the way to growers and IPM consultants, for updated QC guidelines. A small steering committee has been established to review the currently available protocols and to determine user groups and priorities for updated QC

guidelines. Based on this review, a plan will be developed to update, change and/or add protocols. The steering committee will report back to all groups involved to get as much consensus as possible.

Special Collection of publications on "Mass Rearing of High-Quality Insects"

This special collection was published in the Journal of Insect Science (Volume 19, Issue 2, March 2019, 7, https://academic.oup.com/jinsectscience/article/19/2/7/5368161) It was partially based on the works presented in the MRQA Workshop held in Merida in 2017, and also includes a history of the MRQA working group (Leppla, N.C. and Clercq, P.D. "History of the international organization for biological control global working group on mass rearing and quality assurance"

Next MRQA workshop

The next MRQA worshop was originally planned to be held September 2021 in Bologna Italy, but needed to be postponed to 1-5 September 2022. We are already working on the logistics to receive you at a wonderful historic location in the heart of the city of Bologna.

MRQA symposium at ICBC2 2021

To bridge the gap between the last and the upcoming workshop, MRQA co-convenors Maria Luisa Dindo and Rose Buitenhuis have submitted a symposium proposal entitled "Quantity AND quality: Responding to the challenge of increased demand for biocontrol agents" to the Second International Congress of Biological Control, that is planned to be held April 26-30, 2021, in Davos, Switzerland

Ecology of Aphidophaga

Contact: J.P. Michaud; Email: jpmi@ksu.edu

Summary of activities 2016-2020

The 14th Congress "Ecology of Aphidophaga" was held at the Universite de Quebec a Montreal, September 7 through 11, 2019. The meeting was dedicated to Ivo Hodek, one of the original founders of Aphidophaga, and was attended by 80 participants from 17 countries. There were 42 oral presentations, including 6 plenary lectures, 14 posters, and plenty of interested and animated discussions. The local organizing committee, headed by Eric Lucas, did a fabulous job in staging the meeting. Participants enjoyed an evening outing to Montreal Botanical Gardens, a full day trip to historical and scenic venues in the Laurentian mountains with a sumptuous lunch, and an evening banquet in Old Montreal with live music and dancing. In addition, lunches were provided every day of the meeting, and these were truly excellent, consisting of many healthy food choices, and a lot of delicious items that appeared to be homemade by the 'food team' themselves. All in all, there were many social opportunities for old friends to reconnect, younger scientists to 'network', and earlier career scientists to make new connections.

A selection of pictures from the event can be viewed at here: https://drive.google.com/drive/folders/1Tog8iYxjfomfJyZTtvBphs5uwUNfp5zg

The next Congress, Aphidophaga XV will be held at the University of Lleida in Lleida, Spain, in the fall of 2022.

Biological Control and Management of Eupatorieae Weeds

Contact: Michael Day; Email: Michael.Day@daff.qld.gov.au

Benefits and Risks Associated with Exotic Biological Control Agents

Contact: George Heimpel; Email: heimp001@umn.edu

International Working Group on *Ostrinia* and other maize pests (IWGO)

Contact: Ulli kuhlmann; Email: u.kuhlmann@cabi.org

Report from the IWGO Convenor to IOBC Global Secretary about IWGO Activities from 2016-2020

The International Working Group on *Ostrinia* and other Maize Pests (IWGO) is a well-established, large Global-IOBC Working Group, which deals with integrated pest management options for all maize insect pests and pest resistance problems. The working group has been meeting since 1968 also to see how science can help protect maize – a staple food source for 900 million people in developing countries who earn less than USD 2 a day.

Convenors during the period 2016-2020

- Dr Ulrich Kuhlmann, CABI, Delémont, Switzerland (Convenor since 2005).
- Dr Tom Sappington, USDA-ARS, Corn Insects & Crop Genetics Research Unit, Ames, Iowa, USA (Co-Convenor since 2011)
- Prof. Wang Zhenying, Institute for Plant Protection of the Chinese Academy of Agricultural Sciences, Beijing, China (Co-Convenor since 2009)

Publications

- 26t^{h} IWGO Conference Scientific Programme & Abstract Booklet, 2017 (PDF available on www.iwgo.org)
- 27th IWGO Conference Scientific Programme & Abstract Booklet, 2019 (PDF available on www.iwgo.org)

Achievements 2016-2020

- The 26th IWGO conference successfully took place in the National Agricultural Library of the Chinese Academy of Agricultural Sciences (CAAS) in Beijing, China, from 10-12 April 2017. Overall, 98 experts from 11 countries participated – a similar attendance to the previous IWGO meeting in Chicago, U.S.A. in 2014. Eight of the participants were young researchers who received the IOBC Global Travel Award and each of them presented excellent overviews of their research.
- The 27th IWGO conference was held from 14-17 October 2019 in Engelberg, Switzerland. Ninety-three scientists from Australia, China, the USA and various countries in

Europe, Africa and South America, gathered to present their research and recommendations on how to tackle maize insect pests – including corn borers, rootworms, bollworms and fall armyworm – that threaten global food security. A number of young scientists attended the conference and presented their research topics, and six of them received the IOBC Global Travel Award.

At this 26th IWGO conference, a sub-group on Fall Armyworm (FAW) was launched for Africa. The overall objective of the sub-group was to establish an independent, internationally recognized platform for the exchange of research results, experiences and ideas on the biological control-based management of fall armyworm. The rapid spread of FAW meant that the sub-group rapidly became of global relevance, and at the 27th IWGO meeting in Engelberg in 2019, special sessions on FAW were attended by delegates from many countries in the Americas, Africa and Asia. It was decided that the FAW sub-group should be global, and that virtual or face-to-face meetings would be organised, as well as other scientific activities to facilitate the coordination of current international and national research efforts in the field of augmentative, conservation and classical biological control of FAW. A survey of IWGO members indicated substantial interest in the FAW sub-group. The group will also closely collaborate with the FAO working group on biological control of FAW.

27th IOBC-Global IWGO conference, 14-17 October 2019, Engelberg, Switzerland ©KCS Convention Service

27th IOBC-Global IWGO conference, 14-17 October 2019, Engelberg, Switzerland ©KCS Convention Service

Biological Control and Management of Parthenium Weed

Contact: Lorraine Strathie; Email: strathiel@arc.agric.za

Biological Control of Diamondback Moth & other Crucifer Insects

Contact: R. Srinivasan; Email: srini.ramasamy@worldveg.org

IOBC Global Cactus Working Group

Contact: Iain Paterson; Email: i.paterson@ru.ac.za; website:

www.ru.ac.za/centreforbiologicalcontrol/globalcactusworkinggroupgcwg/nextmeeting

The International Organisation for Biological Control (IOBC) Global Cactus Working Group (GCWG) 2016-2020 update

The IOBC GCWG aims to promote the use of biological control to safely and effectively reduce cactus invasions. The group consists of 50 members from 11 countries and has been convened by Prof Iain Paterson from the Centre for Biological Control, Rhodes University, South Africa since 2018. The second ever meeting of the group was schedule for April 2020, but had to be postponed due to the COVID-19 outbreak. The meeting will now take place at the Arebbusch Travel Lodge in Windhoek, Namibia, from 21-23 September 2021. Namibia is an excellent venue for the meeting because biological control of cactus weeds has only recently been initiated in 2018, so it is an opportunity to see the biological control agents in action before all the cactus weeds are killed.

Over 30 people from eight different countries had committed to attending the meeting before it was cancelled just weeks before the event was scheduled to take place. Hopefully it will be possible to hold in the meeting in September 2021 and even more members will be able to attend.

The aims of the meeting are to:

- Raise awareness about the threat of invasive alien Cactaceae to natural and agricultural ecosystems
- Highlight recent research and developments in cactus biological control
- Encourage collaboration on common problems and the sharing of effective biological control agents with countries that need them
- Developing an early warning network for new species that do not have effective biological control agents
- Standardize techniques to control and evaluate the negative impacts of cactus and the efficacy/success of biological control.

CroProPol - Using Managed Pollinators to Disseminate Biological Control Agents & Natural Products

Contact: Peter Kevan; Email: pkevan@uoguelph.ca

Study Group: Classical Weed Biological Control (CWBC)

Contact: Harriet Hinz (CABI, Switzerland), h.hinz@cabi.org
Website: https://www.iobc-global.org/global_sg_Classical_Weed_BC.html

Summary of activities of the Study Group on Classical Weed Biological Control (CWBC)

During the last International Symposium on Biological Control of Weeds (ISBCW) in Engelberg, Switzerland, George Heimpel and Barbara Barratt gave a presentation on the general structure of IOBC Global and potential advantages of forming a CWBC Working Group under the auspices of the IOBC. This was positively received by participants and in December 2019, a survey was conducted among the international weed biocontrol community. Of 102 re-

sponses received, 101 were in favour of the formation of such a Working Group. The key priorities for the group, as determined by the respondents were:
- Provide a forum for regular engagement of CWBC scientists, especially between the quadrennial ISBCW meetings
- Facilitate active contributions to global discussions on regulations governing and impacting CWBC
- Promote CWBC globally, particularly through supporting early career scientists and developing country collaborations
- Facilitate satellite/regional meetings in CWBC between and/or during the ISBCW meetings

A Study Group on Weed Biocontrol was officially formed in March 2020, which will be converted into an actual Working Group after the next ISBCW, taking place in Argentina/Brazil. The following convenors, covering different geographic regions are currently involved: Guillermo Cabrera Walsh (FuEDEI, Argentina), Raghu Sathyamurthy (CSIRO, Australia), Rob Bourchier (Agriculture and Agri-Food Canada), Seona Casonato (Lincoln University/Landcare Research, New Zealand), Martin Hill (Centre for Biological Control, South Africa), Hariet L. Hinz (CABI, Switzerland), Richard Shaw (CABI, UK), Bernd Blossey (Cornell University, USA) and Paul Pratt (USDA, USA).

IOBC Global Commission on Biological Control and Access and Benefit Sharing

Contact: Peter Mason; Email: peter.mason@agr.gc.ca

Activities of the IOBC Global Commission on Access and Benefit-Sharing 2016- 2020

Background

The *Nagoya Protocol* entered into force on October 12, 2014. The First Meeting of the Parties (MOP1) took place from October 13 to 17, 2014 in conjunction with the Twelfth Conference of the Parties (COP12) of the Convention on Biological Diversity in Pyeongchang, Republic of Korea. The Second Meeting of the Parties (MOP2) took place from December 4 to 17, 2016 in Los Cabos, Mexico. Countries that are party to the *Nagoya Protocol* may require Prior Informed Consent (PIC) for access to, and establish mutually agreed terms (MAT) for the use of genetic resources. They may rely on existing licensing, permitting and other policies. The MAT maybe monetary or non-monetary benefits. Countries that are party to the *Nagoya Protocol* may designate Competent National Authorities which are responsible for providing PIC for the genetic resources being accessed. These can be Federal departments and agencies, States, Provinces, Territories or Aboriginal communities. Countries that are party to the *Nagoya Protocol* need to establish a National Focal Point to inform potential users of genetic resources and associated Traditional Knowledge on ABS requirements in that country, as well as provide information on Competent National Authorities. The National Focal Point will also liaise with the International Clearing House. Countries that are party to the *Nagoya Protocol* need to take measures to provide that genetic resources that are acquired in other countries and being utilized in their country are accessed according to the other country's laws.

In a country that has measures regarding access to genetic resources in place, a user (researcher, company, etc.) wanting to access genetic resources for the purposes of performing research and development on the genetic resource would need to:

i. Gain permission to access the genetic resources;
ii. Enter into a contract (negotiate Mutually Agreed Terms) for the use of the genetic resource, where the provider requires such an arrangement;
iii. Abide by the conditions (monetary or non-monetary) in the Mutually Agreed Terms when using the genetic resource.

2018–2019 Actions

Several members of the Commission attended the International Symposium on Biological Control of Weeds in Engelberg, Switzerland 26-31 August 2018. Several talks touched on Access and Benefit-sharing (see Hinz et al. 2019; Mason 2019; Silvestri et al. 2019), and a workshop "The Nagoya Protocol and its implications for classical weed biological control" was held. Outcomes of the workshop included interest by several attendees to participate in the IOBC Global Commission on ABS and further actions. One follow up was the publication of a paper led by Luciana Silvestri (Instituto de Ciencias Humanas, Argentina) describing the experiences of providers and recipients of biological control genetic resources (Silvestri et al. 2020).

Included in the Silvestri et al. (2020) paper were the results of a four question questionnaire intended to gauge the level of understanding and perception biocontrol researchers and practitioners of impacts of the ABS rules on the practice of biological control. Results of the survey of 20 scientists attending the 2019 annual meeting of the USDA-APHIS Technical Advisory Group (TAG) on weed biological control indicated the knowledge level of ABS was moderate (in the middle of a five-point scale), and basically half (56%) expressed serious concern that the new ABS rules were negatively impacting their work in other countries. Respondents identified 14 countries where they either had current classical biological control of weeds (CBCW) projects or did not have projects due to concerns about ABS. Countries where scientists had interest in a CBCW project but were not proceeding because of ABS concerns included Argentina, Brazil, India, Iran and Turkey. Others had knowledge about ABS but were not concerned about conducting projects in Argentina, Brazil, and India. Argentina and Turkey were the countries most cited as places to not conduct projects due to ABS concerns; South Africa, Australia, and China were identified as countries where ABS concerns did not block work on CBCW; and Brazil was a concern for some but still a country to conduct CBCW by the majority.

The FAO Commission on Genetic resources for Food and Agriculture Team of Technical and Legal Experts on Access and Benefit-Sharing (CGRFA-TTLE-ABS) met in Rome 30-31 October 2018. One IOBC Commission member (Peter Mason) participated as one of two North America representatives. The TTLE-ABS was set up by the CGRFA to facilitate the Nagoya Protocol's obligation to consider, in the development and implementation of access and benefit-sharing (ABS) measures, the importance of genetic resources for food and agriculture (GRFA) and their special role for food security. The TTLE-ABS produced a document, *ABS Elements*, with the aim to assist governments considering developing, adapting or implementing ABS measures to take into account the importance of GRFA, their special role for food security and the distinctive features of the different subsectors of GRFA, while complying, as applicable, with international ABS instruments. Subsequently it was determined that there was a need to provide clarity on the distinctive features of the different subsectors of genetic resources for food and agriculture and explanatory notes were drafted describing these.

The main task of participants at the October 2018 meeting was to review the *Draft explanatory notes describing, within the context of the ABS Elements, the distinctive features*

of the different subsectors of genetic resources for food and agriculture and revise the *ABS Elements* document. Biological control was one of the main examples used for outlining the distinctive features of the subsector on Micro-organisms and Invertebrates. The *ABS Elements with explanatory notes* (FAO 2019) was endorsed by the CGRFA at its 17th Regular Session in February 2019 (CGRFA 2019) CGRFA-17/19/Report

Work on the *IUCN-CBD IAS Biological control workshop technical report* led by Andy Sheppard of CSIRO was completed in 2019. The report was included as an information document (CBD/COP/14/INF/9) to the Convention on Biodiversity at COP-15 in Egypt, 13-29 November 2018. It is now officially published in the CBD Technical Series, No. 91 (Sheppard et al. 2019).

2020-2022 Actions

A symposium, *Access and Benefit Sharing and Biological Control Genetic Resources*, has been organized by Peter Mason and Barbara Barratt for the International Congress of Entomology in Helsinki, Finland. The symposium was planned to take place on Thursday 23 July 2020 at 08:30h but with the postponement of ICE to 2022 the symposium will take place a year later. Several Commission members will be making presentations. A proposal will be made to BioControl to publish a special issue that will include full papers based on the symposium presentations plus contributions by others.

Future actions

The IOBC Global Commission on Access and Benefit-Sharing needs to review and revise the questionnaire. The revised version will then need to be circulated to the wider IOBC community (via IOBC Global newsletter). Commission members are asked to review and suggest revisions to the questionnaire.

The Commission has also been tasked to document examples of experiences by recipients to access biological control agents from countries with and without ABS legislation. Some of these could be included in the proposed BioControl special issue and Commission members are encouraged to express their interest to contribute.

References

CGRFA (2019) Report of the Seventeenth Regular Session of the Commission on Genetic Resources for Food and Agriculture Rome, 18–22 February 2019. Commission on Genetic resources for Food and Agriculture, Food and Agriculture Organization of the United Nations, Rome. CGRFA-17/19/Report. http://www.fao.org/3/mz618en/mz618en.pdf

FAO (2019) ABS Elements: Elements to Facilitate Domestic Implementation of Access and Benefit-Sharing for Different Subsectors of Genetic Resources for Food and Agriculture with Explanatory Notes. Commission on Genetic resources for Food and Agriculture, Food and Agriculture Organization of the United Nations, Rome. http://www.fao.org/policy-support/resources/resources-details/en/c/1201566/

Hinz H, Weyl P, Smith D, Djeddour D (2019) The Nagoya protocol: implications for classical biological control of invasive plant species. In: Hinz H, Bon M-C, Bourdoˆt G, Cristofaro M, Desurmont G, Kurose D, Mu¨ller-Scha¨rer H, Rafter M, Schaffner U, Seier M, Sforza R, Smith L, Stutz S, Thomas S, Weyl P, Winston R (eds) Proceedings of the XV international symposium on biological control of weeds. Engelberg, Switzerland 26–31 August 2018, pp. 206–211. https://www.ibiocontrol.org/proceedings/.

Mason PG (2019) Biological control of weeds in the Anthropocene: Why has introducing new agents become so challenging? In: HL Hinz, M-C Bon, G Bourdôt, M Cristofaro, G Desurmont, D Kurose, H Müller-Schärer, M Rafter, U Schaffner, M Seier, RFH Sforza, L

Smith, S Stutz, S Thomas, P Weyl, R Winston (eds), *Proceedings of the XV International Symposium on Biological Control of Weeds, Engelberg, Switzerland*, *26–31 August,* pp. 191–199. https://www.ibiocontrol.org/proceedings/.

Sheppard AW, Paynter Q, Mason P, Murphy S, Stoett P, Cowan P, Brodeur J, Warner K, Villegas C, Shaw R, Hinz H, Hill, M and Genovesi P (2019) IUCN SSC Invasive Species Specialist Group. The Application of Biological Control for the Management of Established Invasive Alien Species Causing Environmental Impacts. The Secretariat of the Convention on Biological Diversity Technical Series No. 91. Montreal, Canada 74 pages. https://qcbs.ca/wp-content/uploads/2020/03/CBD-TS91-01-REPORT.pdf

Silvestri L, Sosa A, Mc Kay F, Dino Vitorino M, Hill M, Zachariades C, Hight S (2019) The convention on biological diversity and the Nagoya protocol: implications for classical weed biological control. In: Hinz H, Bon M-C, Bourdôt G, Cristofaro M, Desurmont G, Kurose D, Müller-Schärer H, Rafter M, Schaffner U, Seier M, Sforza R, Smith L, Stutz S, Thomas S, Weyl P and Winston R (eds) *Proceedings of the XV international symposium on biological control of weeds, Engelberg, Switzerland, 26–31 August 2018*, pp. 304–309. https://www.ibiocontrol.org/proceedings/.

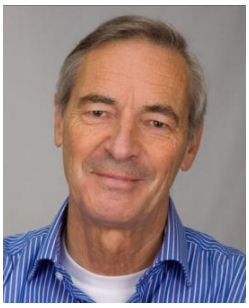
Silvestri L, Sosa A, McKay F, Vitorino MD, Hill M, Zachariades C, Hight SD, Weyl P, Smith D, Djeddour D., Mason PG (2020) Implementation of access and benefit-sharing measures has consequences for classical biological control of weeds. *BioControl* **65**, 121–141. https://doi.org/10.1007/s10526-019-09988-4.

IOBC Global Executive Committee

President Martin Hill
Centre for Biological Control
Rhodes University
Somerset Street, Makhanda 6139, South Africa
Email: m.hill@ru.ac.za

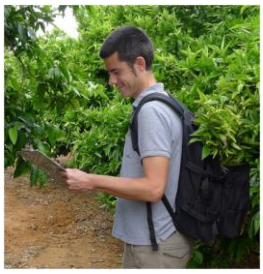
Vice Presidents Yulin Gao
Department of Entomology
Institute of Plant Protection(IPP)
Chinese Academy of Agricultural Sc. (CAAS)
2# West Yuan Ming Yuan Road
Haidian District, Beijing, 100193, P.R, China
Email: gaoyulin@caas.cn

Ronny Groenteman
Landcare Research
Gerald Street, Lincoln 7608, New Zealand
Email: groentemanr@landcareresearch.co.nz



Secretary General Joop C. van Lenteren
Wageningen University
Laboratory of Entomology
PO Box 16, 6700AA Wageningen
The Netherlands
Email: joop.vanlenteren@wur.nl

Treasurer Alejandro Tena
Centro Protección Vegetal y Biotecnología.
Instituto Valenciano de Investigaciones Agrarias (IVIA)
Carretera Moncada-Náquera km 4.5.
46113 Moncada, Valencia
Spain
Email: atena@ivia.es



Past President George Heimpel
Department of Entomology
University of Minnesota
1980 Folwell Ave.
St. Paul, MN 55108
USA
Email: heimp001@umn.edu

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/membership.html