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**International Organisation for Biological Control (IOBC)**

Organisation Internationale de Lutte Biologique (OILB)



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

## **IOBC Global Newsletter Issue 110 December 2021 - January 2022**

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### **General Assembly IOBC Global during ICE2022**

We intend to organize the General Assembly of IOBC Global during the International Congress of Entomology in Helsinki in 2022. We plan to prepare an extra newsletter later this year to provide more details about this meeting.

## Message from the President



When I first took office, I made the statement that one of my goals for my term as president of the IOBC Global was 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. Thus, it is very encouraging to read the report on the biological control course held in Ecuador in November last year hosted by Drs. Carmen Castillo, Julia Prado and Antonio León. IOBC Global supported participation of more than 60 young biocontrol students and scientists, and what was really refreshing to see was

that 61% were woman. I would like to congratulate the organizers on an excellent course that will ensure the future of biological control in that region. Further, in this newsletter, there is a call for biological control practitioners to provide information on educational or training activities in the discipline. This is because we would like to disseminate information about these activities, and where possible play a facilitatory role in these initiatives.

2022 will hopefully see the return to face to face or physical meetings, COVID willing, and the most significant one for the IOBC is the XXVI International Congress of Entomology to be held in Helsinki from 17-22 July 2022. IOBC Global will be sponsoring four symposia during the meeting and importantly holding the General Assembly of the IOBC to which we urge all members to attend. There are four other IOBG Global workshops planned for the year and a number of other important meetings will take place. I am sure that everyone is keen to meet up in person, after two years of virtual meetings, but we must be mindful of the fact that the world is still grappling with the COVID pandemic and there is still the need for virtual and hybrid meetings. I have been amazed at how the quality of these technology for these meetings has improved over the last year and how they have promoted inclusivity. It also appears as though the biological control community has been busy writing and there are a number of new books and other texts that will contribute to the already extensive body of scholarly outputs on the discipline.

Finally, given what we have been through over the last two years with the challenges of the COVID pandemic, I would like to wish everyone a perfectly normal 2022 during which everyone is safe, happy and productive.

Martin Hill

## IOBC needs your help

### Worldwide education in biological control

IOBC Global often receives questions about education and training possibilities for biological control. With the help of our Regional Sections and Working Groups, we are frequently able to help finding answers, but it is not always an easy and quick procedure. **Therefore, we ask you to provide information about education and training opportunities.** We will summarize this information and publish it on the Global website. Please present the information to [secretary-general@iobc-global.org](mailto:secretary-general@iobc-global.org) as follows:

Name of course / training:

Institute / organization providing this course:

Course period and length of course in days:

Costs of course:

Entrance requirements:

### How did you become a biological control practitioner?

Another question IOBC regularly receive is what a person has to study to become a biocontrol practitioner. There is no straightforward answers to this questions as there are many roads to obtain a position in biological control. However, it might be helpful to collect a number of examples of careers of biological control experts and present these on the Global website. A few sentences - 150 words and a picture with you at work - will suffice. The first > 30 career paths can be seen at the IOBC Global website: [https://www.iobc-global.org/news\\_careers\\_biocontrol\\_practitioner.html](https://www.iobc-global.org/news_careers_biocontrol_practitioner.html).

***If you are willing to share your career path with those interested in becoming a biocontrol practioner, please send your information to [secretary-general@iobc-global.org](mailto:secretary-general@iobc-global.org)***

## Upcoming Events

### IOBC Global activities:



#### General Assembly and symposia during ICE2022

We intend to organize the General Assembly of IOBC Global during the International Congress of Entomology in Helsinki in 2022. We plan to prepare an extra newsletter later this year to provide more details about this meeting.

The following IOBC symposia will be presented at XXVI International Congress of Entomology in Helsinki from 17-22 July 2022:

1. Essential and useless ecological knowledge for applied biological control.
2. Revisiting the biosafety of exotic generalist arthropod biological control agents.
3. Omnivorous predators in augmentative biological control: blessing or nightmare?
4. Access and Benefit Sharing and Biological Control Genetic Resources



#### 15th Workshop of the IOBC Global WG on Mass Rearing & Quality Assurance (MRQA) – Bologna, Italy, 5-9 September 2022

The workshop, entitled “**Delivering on the Increasing Demand for High Quality Invertebrates**” will be organized jointly with the Association of Natural Biocontrol Producers (ANBP) and the International Biocontrol Manufacturers’ Association (IBMA).

The workshop objective is to explore opportunities for advancing the rearing of high quality entomophagous and phytophagous insects and mites, entomopathogenic nematodes, and other invertebrates for plant and animal pest management, human and animal food, and a variety of other uses. The program will consist of symposia on current “Hot topics,” invited and submitted presentations, and posters on selected aspects of invertebrate rearing and quality assurance as they relate to production and quality control. Presentations will serve as a basis for discussion and exchange, with the final aim of improving collaboration among scientists and practitioners. For more info, see: <https://www.mrqa.eu/workshop2022/> Maria Luisa Dindo and Rose Buitenhuis, Co-convenors of the IOBC Global Mass Rearing and Quality Assurance (MRQA) Working Group

### Other biocontrol related events

**Please see the complete lists of upcoming events related to biocontrol activities at the website of IOBC Global: [www.IOBC-Global.org](http://www.IOBC-Global.org), and of IOBC-WPRS: <https://www.iobc-wprs.org/events/index.html#20210908>**



#### **6<sup>th</sup> Meeting of the International Society for the Biological Control of Arthropods (ISBCA) - British Columbia, Canada (Virtually), March 15-17 and 22-24, 2022**

**Save the dates!** The 6<sup>th</sup> meeting of the ISBCA will be held virtually over two weeks in March 2022. Registration will open August 1, 2021. A virtual meeting format with sessions staggered among time zones and a mix of live and on-demand content will allow the

affordable participation of the biological control community from around the globe from the comfort of their homes or workplaces, without concerns about travel restrictions. The meeting will be held over six days spread out over two weeks to allow attendees to attend to personal and professional responsibilities on non-meeting days. In addition to the scientific sessions we plan to have a series of 15 minute virtual bus tours available. These will include places you may want to put on your bucket list and biocontrol activities from around the world. Start taking your videos of experimental setups, long-term trials, biocontrol production facilities, eureka discoveries and more.

*Local Organizing Committee: Paul Abram, Chandra Moffat, Brian Spencer, Dave Gillespie*



#### **ICE2022**

ICE2022 will be held from 17-22 July 2022 in Helsinki, Finland. For the latest information, please check the congress website at [www.ICE2020Helsinki.fi](http://www.ICE2020Helsinki.fi). **Registrations and proposals for symposia are still possible. Some 1800 persons have already registered.**

**IOBC-sponsored symposia during ICE2022:**

1. Essential and useless ecological knowledge for applied biological control.
2. Revisiting the biosafety of exotic generalist arthropod biological control agents.
3. Omnivorous predators in augmentative biological control: blessing or nightmare?
4. Access and Benefit Sharing and Biological Control Genetic Resources

**ICE2024**

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

**SIP 2022 Meeting in Nelson Mandela Bay, South Africa, 31 July to 4 August 2022**

The 2022 International Congress of Invertebrate Pathology and Microbial Control and the 54th Annual Meeting of the Society for Invertebrate Pathology (SIP) will be held from 31 July to 4

August 2022 at the Boardwalk Hotel and Conference Centre in Gqeberha (Port Elizabeth), South Africa. This is a first for Africa! The world appears to be adapting to life with Covid 19 and we are thus positive about hosting an in-person on-site meeting next year.

**The Society for Invertebrate Pathology - SIP:** SIP is the foremost global scientific society, focussed on insect pathogens, including microbial control and biopesticide development. The society meets once a year in a different part of the world and attracts the world's leading scientists in invertebrate pathology and microbial control. This will be an excellent opportunity (and for many a unique opportunity) to hear and to meet with the world's leading scientists in these disciplines. Apart from the scientific sessions, the meeting has a strong social programme, which gives delegates plenty of time to network. This is a fantastic opportunity for scientists and biopesticide developers to explore collaborative relationships with the world leaders in the field.

**Scientific Programme:** A full scientific programme is being organised, starting with a plenary session on Monday morning that will be specifically appropriate to this unique meeting. Each division in the society (viruses, fungi, nematodes, bacteria, microbial control, microsporidia, diseases of beneficial invertebrates) will organise a topical symposium, with at least one cross-divisional symposium also on the cards. Furthermore, there will be three to four concurrent sessions, consisting of contributed papers within the various disciplines. The meeting website ([www.sip2022.com](http://www.sip2022.com)) should be launched by the time this notice goes out. Registration and abstract submission will open in February.

Remember to diarise and budget for 31 July to 4 August 2022 in Gqeberha, South Africa. For any queries, please contact the local organisers via the “Contact us” option on the website or at [info@sip2022.com](mailto:info@sip2022.com).

We really hope to see a large contingent of international delegates in Nelson Mandela Bay, along with many new participants from South Africa and the African continent as a whole!

## Hundreds of participants attended Ecuadorian biocontrol training course



The training course “Biological control and the production of arthropods as natural enemies for pest management in agriculture”, organized by the National Institute of Agricultural Research (INIAP, Dr. Carmen Castillo), Technical University of the North (UTN, Dra. Julia Prado) and the San Francisco de Quito University (USFQ, Dr. Antonio León) of Ecuador, was held from 8-12 November 2021. The objective of the course was to train young people, involved in agronomy or biology studies in the field of biocontrol, in the use of arthropods as biological control agents, both predators and parasitoids of agricultural pests. This event is an important training tool to strengthen the use of biocontrol in agriculture in Ecuador and the South American region, especially on multiplication methodologies, research-experimentation and application of biocontrol programs. IOBC Global supported participation of more than 60 young biocontrol students and scientists. Among the granted students and young professionals, 61% were woman and 39% were man. The McKnight Foundation, with its Collaborative Crop Research Program, sponsored the event with the digital platform and simultaneous translation of the English talks. In addition, its website will host the lectures of this course. More than 450 persons attended each day of the online course and more than 2200 enrolled in the course (see table). The 25 instructors came from Colombia, Peru, Uruguay, Chile, Argentina, Brazil, Mexico, Spain, Italy, the Netherlands, and Ecuador. In addition, for the opening and closing we had the presence of the current president of IOBC, Dr. Martin Hill (Rhodes University, South Africa), the previous president Dr. George Heimpel (University of Minnesota, United States) and the president of the neotropical regional section (NTRS) of IOBC Dr. Germán Vargas (Cenicaña, Colombia).

Pais	No. Inscritos
Andorra	1
Argentina	78
Bolivia	150
Brasil	8
Canadá	2
Chile	9
Colombia	163
Costa Rica	23
Cuba	2
Ecuador	1277
El Salvador	5
España	4
Guatemala	70
Honduras	11
Mexico	160
Mozambique	1
Holanda	1
Nicaragua	12
Panamá	2
Paraguay	2
Perú	224
República Dominicana	4
Tunisia	1
Uruguay	22
USA	2
Venezuela	4
<b>Total</b>	<b>2238</b>

During the first day, a survey on general knowledge about biological control was carried out with ten questions in which 498 course attendees participated. During the final two days, participants were asked to answer the same questionnaire, in which 300 people participated. The results were analyzed and presented by Dr. Julia Prado from the UTN.

## A selection of reactions from early career biological control students and scientists who attended the Ecuador training course



**Candela Barakat, PhD student at CONICET (Centro de Estudios Parasitológicos y de Vectores, CEPAVE), Universidad Nacional de La Plata, Argentina:** “I really liked the course. I found the experience of being able to listen to speakers from other parts of the world, but especially from different Latin American countries, super nutritious. I was not particularly aware that there were so many successful biological control programs applied in our continent, and it was very encouraging to me. I also consider that it is vitally important to know what the situation in other Latin American countries is and to keep up to date on this, since there are issues of distribution and pest management (which can be shared), which we must know and keep in mind. . Therefore, getting in touch with peers, whether in the interior or abroad of the country, is something that we should not stop doing and this course was perfect for it. Thanks a lot”



**Nereyda Ruíz, undergrad. Universidad Técnica de Ambato, Tungurahua, Ecuador:** “The course seemed very interesting and important to me to strengthen the knowledge we have on this subject, the focus and importance given to biological control really catches my attention since nowadays the use of chemicals is prioritized in crops, but these have adverse effects on both human health and the farmer's economy since the prices of chemicals are increasingly higher and do not generate profitability. For this, the use of biological controls to care the crop is very effective and less expensive. The course was very well organized and run normally. I am very satisfied with the course I have received. Additionally, it is very important that these types of courses continue to be carried out since it helps us as students a lot in the reinforcement of knowledge and teaches us new techniques of pest management and control of which many times we are not aware of. Thanks to IOBC for the book”



**Anahí Mejía, undergraduate student. Universidad Central del Ecuador, Quito.**

“I thank the IOBC for the excellent training and delivery the book, I consider that interesting topics were planned, each of the talks contributed with different knowledge that will help me throughout my professional career. It was an interesting training, having speakers from different places the knowledge provided was expanded considerably. Trainings such as biological control are important and necessary to disseminate this topic which is interested by a large number of people. I hope to be able to participate in more courses, without more to say,

thank you very much”. Picture: Luis Felipe Jácome, Anahí Maylin Mejía, Luis Fernando Quishpi and Roberto Isaac Cesén. Universidad Central del Ecuador, Quito



**Diego Mina, young professional, Master's student. Pontificia Universidad Católica del Ecuador.**

"Personally I think the course had a good level starting with a variety of content. Current issues were addressed and the dynamics of having national and international experts was very interesting. I think it was a fairly complete package since topics such as the use of parasitoids, predators, plants and other controlling pathogens were discussed, as well as talks that focused on opportunities and challenges to establish biological control in Latin America.

Additionally, the evaluations carried out helped the attendees' reflection. Finally, I think it was important to include local universities as organizers of the event, this stimulates students who are interested in this branch of agronomy"



**Marjory León, undergrad. Universidad Nacional de Loja (UNL). Loja, Loja, Ecuador**

"First of all I want to thank in a special way the International Organization for Biological Control for the webinar called " biological control and the production of arthropods as natural enemies for pest management in agriculture ", since this control method encourages us to use new natural techniques taking preventive measures for pests and diseases. In this way over time it will be obtained good results avoiding environmental impact. It must be added the greater environmental awareness that citizens have and that, as consumers, demand quality products without chemical residues that harmful health. Thank you. The course

seemed very good to me since as future professionals it is important to know how to do good control of pests and diseases in crops. As a control method, biological control has many advantages since it does not harm crops, the environment and humans. On the contrary, the use of this method helps agriculture to reduce the use of chemical products"



**Milena Ladines, undergrad student. Universidad Regional Amazónica Ikiam.**

"The biological control course was very enriching for me because using sustainable and ecological management techniques in the biological control of pests is part of an ecological agriculture such as Agroecology. The diversity of topics that were presented were very well explained in a language that was very understandable to me, which made it easier for me to learn many new terms. In addition, each topic was complemented by the experience of each researcher

or producer. The experience of having participated as a listener within the course gave me a broad knowledge of concepts and terms that are helpful in my pest and disease management class, as well as in my agricultural entomology class that I am studying in this semester. Therefore, not only I was part of the course, but also it served as a complement in my professional training within my field of study, Agroecology. I am grateful for having had the opportunity to participate in this great course"





**Jorge Luis Espinoza Loor, undergrad student. Universidad Técnica Estatal de Quevedo (UTEQ). Quevedo, Los Ríos, Ecuador**

"Over the years, I have been able to participate in various congresses as a spectator, but the event held by the IOBC-NTRS in terms of the organization level, the themes and trainers, for me, it was one of the best I have been able to appreciate. I congratulate the organizers and

experts of the event, hoping in the future to be able to learn more from this sea of knowledge. Knowledge that is gathered in a single moment. I hope to be able to learn more and be more productive in our long journey that awaits us as future professionals. I am infinitely grateful for having been able to participate in such a beautiful event. Greetings from Quevedo-Ecuador"



**Marcia Alexandra Vaca, undergrad student. Universidad Estatal Amazónica (UEA), Puyo, Pastaza, Ecuador**

" I work with invertebrates and interests led me to take the course of biological control and production of arthropods as natural enemies for the management of pests in agriculture that was carried out from November 8<sup>th</sup> to the 12<sup>th</sup> of this year. It has been an extremely interesting experience. In this course, we had access to works of renowned researchers who have dedicated themselves to studying specific pests for

their integrated management in large areas of cultivation. For some of us, who live in areas where agriculture is the the main source of income, it has been very valuable information presented during the course. I have been able to learn interesting facts about specific pests in crops in tropical areas. I am very grateful to the organizers of this event and hopefully more of these initiatives will come to generate knowledge about pests and biological control. In these difficult times this is necessary for a sustainable agricultural production"



**Luis Fernando Chuquiana, undergrad student. Escuela Politécnica de Chimborazo (ESPOCH), Riobamba, Chimborazo, Ecuador**

"Although biological control has been used in agriculture for millennia, it is a relatively new practice in modern agriculture. These courses nourish us with knowledge and encourage us to be more aware with the use of pesticides and give this alternative of healthy management to farmers. The same natural enemies, so many parasitoids, predators, etc., keep pest populations in balance. It caught my attention how they carried out the massive rearing of natural enemies of some pests, since for each pest insect there are one or more insects as natural enemies.

Very grateful to the IOBC for the course, for the biological control book and the knowledge that I will acquire every day"

This year, also a training course was organized in Pakistan and IOBC Global supported participation of seven young biocontrol students / scientists. For a report of a similar training course given in 2020, I refer to the IOBC Global Newsletter 108 - December 2020



## BioControl, the Official Journal of IOBC

Eric Wajnberg, Editor-in-Chief

New, strongly increased Impact Factor for BioControl is 3.571  
Congratulations editorial committee!!

For more information, see:

<https://www.springer.com/journal/10526>

## New Books /Publications on Biological Control and IPM

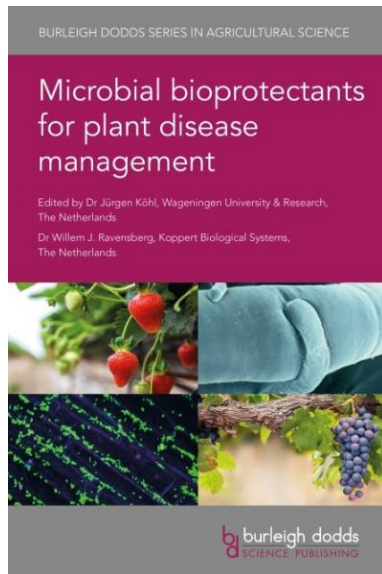


### African Entomology Special Issue on the Biological Control of Weeds in South Africa

Paterson, I.D., Den Breeyen, A., Martin, G.D., Olckers, T. 2021. Biological control of Invasive Alien Plants in South Africa. African Entomology. 29(3).

South Africa has a large and active weed biological control community that has thrived over the last ten years in terms of both research and implementation. A recently published special issue on Biological Control of Invasive Alien Plants in South Africa (2011-2020) in the journal African Entomology (Volume 29; Issue 3) summarizes and reviews progress of all the weed biocontrol programmes that have been active in South Africa over the last decade, as well as other important developments and issues related to weed

biocontrol in the country. The special issue consists of 24 papers covering 72 target weed species. The editors and authors of the papers in the special issue hope that it will be a beneficial resource for the global biocontrol community.



## Microbial bioprotectants for plant disease management

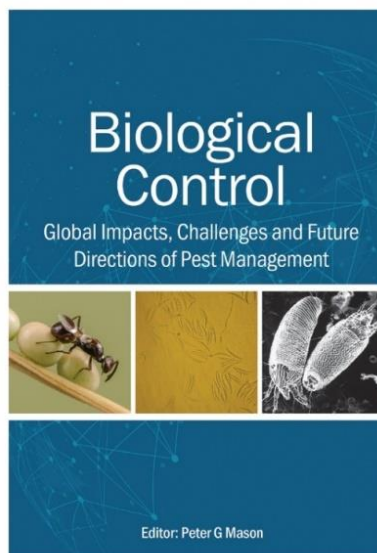
**Edited by Dr Jürgen Köhl**, Wageningen University & Research, The Netherlands and **Dr Willem J. Ravensberg**, Koppert Biological Systems, The Netherlands. Burleigh Dodds Science Publishing.

The book provides a comprehensive coverage of the recent advances in the development of more ecologically balanced biological methods to control plant diseases. It offers a focussed review on the availability and use of bacterial, fungal and viral bioprotectants, as well as the issues that arise with their development and use.

Find out more about the new title [here](#).

### \*Special Offer for readers of this newsletter\*

Receive **20%** off your purchase of the book using code **IOBC20** via the [BDS Website](#). Discount code expires 31<sup>st</sup> January 2022.



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

**Edited by Peter G. Mason**

The book 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* is an invaluable resource for conservation specialists, pest management practitioners and those who research invasive species, as well as students studying pest management science.

For more information and contents of the book, see:

<https://www.publish.csiro.au/book/7821/>

Hard copies of the book are available from CSIRO (Australia and New Zealand;

<https://www.publish.csiro.au/book/7821/>) and CRC Press (all other countries;

[https://www.routledge.com/Biological-Control-A-Global-](https://www.routledge.com/Biological-Control-A-Global-Endeavour/Mason/p/book/9781032109275)

[Endeavour/Mason/p/book/9781032109275](https://www.routledge.com/Biological-Control-A-Global-Endeavour/Mason/p/book/9781032109275)) and the links are provided below. The eBook version will be available from more than 30 eRetailers, such as Amazon, Kobo, Google Books and eBooks.com.



## El Control Biológico en América Latina y el Caribe: Su Rica Historia y Su Brillante Futuro

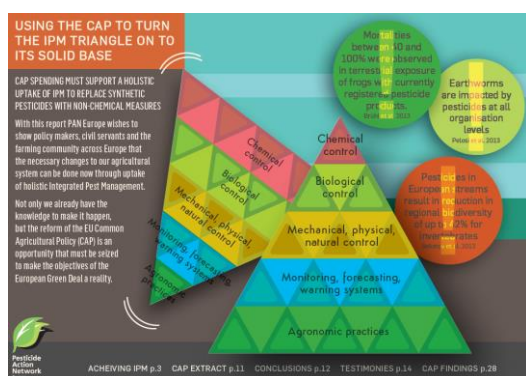
Editado por Joop C van Lenteren, Vanda H P Bueno, María Gabriela Luna and Yelitza C Colmenarez. Editorial Acribia, Zaragoza, España, 542 pp., ISBN: 978-84-200-1265-0

Hard copies (42 Euro + costs of shipping) or eBooks (42 Euro) can be obtained at Acribia (Editorial Acribia <[acribia@editorialacribia.com](mailto:acribia@editorialacribia.com)>). The English version of the book (hard copy 175 Euro) can be obtained at CABI (<https://www.cabi.org/bookshop/book/9781789242430/>)

Pocas publicaciones han proporcionado detalles históricos sobre el control biológico de plagas, malezas y enfermedades en América Latina y el Caribe, y los datos han estado fragmentados hasta ahora. Al reunir esta importante información en este libro, se ofrece una visión completa de los avances significativos en control biológico en el Continente suramericano e islas del Caribe. Para cada país, se proporciona una gran cantidad de texto, tablas y referencias sobre la historia de dichos proyectos. Con detalles sobre los éxitos y fracasos, lo cual puede ayudar en la planificación de futuros proyectos de control biológico. El libro proporciona una descripción general de las prácticas actuales de control biológico, revelando un alto nivel de utilización, lo que convierte a la región en la mayor área tratada con control biológico a nivel mundial. En conclusión, el libro describe nuevos desarrollos y especula sobre el futuro del control biológico en América Latina y el Caribe.

### Contenido clave:

- Resumen completo y documentado del control biológico en América Latina y el Caribe, junto con registros de plagas invasoras y nativas.
  - Ejemplos únicos de control biológico por conservación, control biológico natural, control biológico clásico y control biológico aumentativo.
  - Treinta capítulos específicos de países redactados por especialistas nacionales.
  - Revela muchos casos de control biológico desconocidos internacionalmente y su investigación histórica.
  - El primer intento serio de estimar cultivos y áreas bajo diferentes tipos de biocontrol.
- Adecuado para estudiantes y profesionales que trabajan en el campo del control biológico, manejo de plagas, biología de invasiones, ecología y comportamiento, MIP y agricultura sustentable.



## Biological control in an IPM setting: interesting report produced by Pesticide Action Network Europe

The report can be downloaded by using the following link:

<https://www.pan-europe.info/resources/reports/2021/04/using-cap-turn-ipm-triangle-its-solid-base>

**Please send information concerning new books on biocontrol or IPM that have appeared in your country or region to [secretary-general@iobc-global.org](mailto:secretary-general@iobc-global.org)**

## Call for Biocontrol Training Initiatives

### Keen to organise a practical training course in biological control? IOBC-Global may provide financial support

IOBC-Global may financially support participation of young career biological control scientist (< 35 years) who are paying member of one of the Regional Sections of IOBC, so they can take part in a training course. Applications for training courses with participation by young career biocontrol workers should be send to [secretary-general@iobc-global.org](mailto:secretary-general@iobc-global.org) who will inform you about guidelines and conditions for funding.

For an example of a recent training course, see the report presented in this newsletter about the biocontrol course given in Ecuador in November 2021.

## Obituary

### PROFESSOR STEFAN NESER (16 April 1942 - 17 February 2021)



Stefan Nesper will be remembered by his colleagues for his humble nature, enquiring mind and outstanding skill as a field entomologist. During 60 years as a professional entomologist he accumulated an almost unparalleled knowledge of the complex interactions between arthropods and their respective host plants. From this knowledge and experience he mentored a generation of South African weed biocontrol practitioners and contributed greatly to our understanding of seed-destroying insects and gall-inducing eriophyid mites.

Stefan started his career as a regional entomologist for the Department of Agriculture in 1961. After working initially on pests of commercial crops, he moved into weed biological control research at the Agricultural Research Council - Plant Health and Protection in 1964, where he remained until his retirement in 2007. During his time at the institute he initiated, supervised and guided almost 30 weed biological control projects, served as Assistant Director and Programme Manager of the Weeds Research Division, and was promoted to Senior Specialist Research Scientist. One of Stefan's greatest contributions to weed biological control was through his numerous overseas surveys for, and collection of natural enemies of weeds in their country of origin. During these often-difficult trips, Stefan demonstrated an amazing ability to locate both the right target weeds, as well

as promising candidate biological control agents. The majority of the weed biological control programmes undertaken in South Africa over the last 50 years have likely been founded on or have benefitted directly by his exploratory work. Stefan was highly respected amongst the international biological control community and his abilities as a field entomologist saw him assist numerous foreign scientists surveying for natural enemies of both invasive plants and insect pests. He assisted institutions in Australia, Cuba, Israel and the USA, with many of these projects continuing after his retirement.

During his career Stefan received a number of prestigious awards for his substantial contributions to biological science and entomology. In 1986, he was awarded the 'Dave Annecke Award' from the South African Weed Science Society, and in 1994 the 'Senior Captain Scott Medal' by the South African Academy of Arts and Science for distinguished and sustained contributions to biological sciences in South Africa. Through both formal research and informal curiosity, Stefan collected scores of new species and genera of plant-feeding insects and pathogens and discovered more than 100 new species of mites. Four insect species, one mite genus and two mite species were named after him.

Following his retirement from the ARC - PHP, Stefan became formally associated with the Forestry and Agricultural Biotechnology Institute at the University of Pretoria where he was appointed as Extraordinary Professor. Stefan played a fundamental role in assisting the institute in developing biological control programmes against a number of forestry pests in South Africa. During his time there he was responsible for numerous first reports and important observations relating to insect and fungal pests of plantation trees.



Stefan contributed greatly to the ESSA throughout his career. He was a member for over 50 years, was President of the society from 1993-1995, and Vice-president from 1979-1981, 1987-1988 and again from 1995-1997. He was also a regular attendee at ESSA conferences, as well as annual general meetings even after his retirement. In light of his long-standing association with the ESSA and ongoing contribution to the field of entomology in South Africa and abroad, he was made an honorary life member of the society in 2016. Stefan was passionate about and dedicated to his work and always sought to nurture the same in his colleagues. In so doing he had a profound effect on those who had the privilege to work with him. His knowledge, experience, advice, kindness, humour and friendship will be sorely missed. Stefan passed away on Wednesday, 17 February 2021. Our thoughts are with his wife Otilie, and his children, grandchildren, and many close friends and colleagues.

*Anthony King, Plant Health Protection, Agricultural Research Council of South Africa  
Photographs kindly provided by Dr K. Dhileepan*

## Regional sections of IOBC Global



### **APRS**

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## IOBC Global Working Group Contacts and Reports



### Mass Rearing and Quality Assurance ([MRQA](#))

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### *Next MRQA workshop*

Delivering on the increasing demand for high quality invertebrates, 15th IOBC-MRQA Workshop – Bologna, September 5-9, 2022. We are working on the logistics to receive you at a wonderful historic location in the heart of the city of Bologna. For the most recent information, see our website.



International Symposium  
**Ecology of  
Aphidophaga 15**  
Lleida 2022

### Ecology of Aphidophaga

Contact: J.P. Michaud; Email: [jpmi@ksu.edu](mailto:jpmi@ksu.edu)

We are in the process of organizing Ecology of Aphidophaga 15 in Lleida, Catalonia, which will convene September 19-23, 2022. The first circular has been distributed, and we expect the website to



be operational in early February.

Aphidophaga is a meeting focused on the ecology of arthropods that have evolved feeding relationships with aphids, many of which provide ecological services as biological control agents of pests in agricultural, forest and urban ecosystems. At the Symposium, senior and junior researchers from around the world, graduate students and post-docs, meet to present scientific advances and ideas in a friendly and convivial atmosphere. The Symposium fosters a variety of perspectives on aphid biological control and creates opportunities for multinational collaborations among participants.

*Steering Committee, Ecology of Aphidophaga:*

*J.P Michaud (Chair and IOBC liason), Xavier Pons (Host and local Arrangements Chair, Aphidophaga 15), Kris Giles, Nickolas Kavallieratos, Wolfgang Weisser, Eric Lucas*



### 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)

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**INTERNATIONAL  
PARTHENIUM  
NEWS**

Number 16, 2021

**Editorial team:**  
Dr. Asad Shabbir (Editor in chief)  
Prof. Steve W Adkins

**Produced by:**  
Tropical & Sub-Tropical Weed  
Research Unit, The University of  
Queensland, Australia.

In collaboration with IOBC  
working group on biological  
control and management of  
parthenium weed.

**First case of Parthenium  
hysterophorus L. in the  
southern fringes of the  
Okavango Delta, northern  
Botswana**

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Parthenium weed (*Parthenium hysterophorus* L.), an  
Asteraceae annual plant that has successfully escaped  
from its native range in Central and South America and  
is now globally spread in many tropical and subtropical  
regions of the world. It is now recognized globally as a  
major threat to biodiversity, the environment, agro-  
ecosystems, and human health as it is known to cause  
dermatitis, asthma, hay fever and bronchitis. In crop  
production yield losses of up to 40% have been reported.  
Parthenium weed possess a suite of attributes that  
confer its invasiveness, and include

rapid growth, allelopathy, prolific seed production, persistence of seeds in soil seed bank and tolerance to drought. In the early stages of its invasion, it is mainly found in disturbed habitats such as roadsides, along railway tracks, and agricultural farms, probably due to lack of interspecific competition. In its later stages of invasion, the plant moves from these locations into the agro- and natural ecosystems.

Latest reports indicate parthenium weed is now invasive in 49 countries, including Botswana. The first case in Botswana was reported in 2010 in Tlokweng, south eastern Botswana. The second invasion is the one currently discussed in this report and is many km from the first invasion site. It appears these two occurrences are unrelated. In Africa, it is reported widely dispersed in East Africa, and in some parts of Northern and Southern Africa. Of concern to Botswana is its reported presence in neighbouring South Africa in the provinces of Limpopo, KwaZulu-Natal, Mpumalanga and North-West. South Africa shares 1 569 km long border with Botswana. Furthermore, Botswana reports 90% of its cereal grains and some horticultural crops from South Africa, putting it at risk of further accidental introduction of parthenium weed seed as a contaminant of those imported grains and horticultural produce, or by vehicle traffic over the border.

Parthenium weed has recently been recorded from the seasonal floodplains of the Okavango Delta (Figures 1 and 2), on the southern fringes of the Okavango Delta, and many km from its original introduction. In this new infestation it was found to be growing in association with another invasive plant, cocklebur (*Xanthium strumarium* L.). The presence of parthenium weed close to the Okavango Delta, a Ramsar and World Heritage site is of great concern. Communities that live on the fringes of the Delta derive their livelihood through fishing and tourism-related activities. Additionally, flood recession farming, a traditional practice in which farmers growing crops on the residual moisture retained within the seasonal floodplains is also an important livelihood activity for these riparian communities. These livelihood activities are under threat due to the 'arrival' of parthenium weed.

### Biological Control and Management of Parthenium Weed

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

### International Parthenium News newsletter

The International Parthenium News newsletter was first published in 2010, with the intention to share news, reports, research findings and recent activities on *Parthenium hysterophorus* L. (Asteraceae; parthenium weed) for the International Parthenium Weed Network (IPaWN). This network had been established in 2009, with members from countries around the globe affected by the severe terrestrial invasive herb *Parthenium hys-*

*terophorus*. An initiative of the Tropical and Sub-tropical Weed Research Unit (TSWRU), at The University of Queensland, Australia, the IPaWN aimed to create awareness about the threat of parthenium weed and to share information on management methods to reduce its adverse impacts.

The IOBC Working Group on Biological Control and Management of Parthenium Weed, which was founded later in 2009, formed a collaboration with the International Parthenium Weed Network to jointly utilise this newsletter for reports on research and activities related to the biological control and management of parthenium weed. This exchange of information has benefitted the IPaWN and the IOBC Working Group on Parthenium Weed. The IOBC Working Group on Parthenium Weed aims to promote the use of sustainable, environmentally safe, economically feasible, and socially acceptable control methods, including biological control, of *Parthenium hysterophorus* in countries where the plant has invaded.

Circulation of news on parthenium weed was maintained through an online discussion group, prior to the formation of the IPaWN, but was strengthened after this network had been launched. Over 100 members from 26 countries initially joined the group, which has grown into a much broader community since 2010. The threat of parthenium weed has urged this community of researchers and implementers to remain active throughout the last decade. During this period, about one hundred articles have been published in the International Parthenium News newsletter since its inception, with contributions from about 30 countries, particularly Pakistan, Australia, South Africa, India, Ethiopia, Nepal, in addition to at least one or more reports from another 23 countries. The biannual publication of the newsletter was maintained until 2015; later it was published annually. Growing attention on parthenium weed in recent journal publications has suggested that it would be beneficial for the newsletter to revert to biannual production again; so, the newly appointed editorial team are working hard to achieve this goal.

All 16 back issues of the International Parthenium News newsletter are available on the Asian-Pacific Weed Science Society website (<http://apwss.org.in/apwss-ipawn.htm>). Requests for addition to the newsletter mailing list can be directed to Prof Steve Adkins (e-mail [s.adkins@uq.edu.au](mailto:s.adkins@uq.edu.au)).

*Editor-in-Chief Dr Runping Mao; E-mail:r.mao@uq.net.au*

### **Stem-boring weevil *Listronotus setosipennis* approved for release against parthenium weed in Pakistan**

CAB International (CABI) under its “Action on Invasives” programme initiated the biological control against parthenium in Pakistan, with the approval of Pakistan Agricultural Research Council (PARC) and Department of Plant Protection (DPP). The first agent to be assessed for environmental safety was the weevil *Listronotus setosipennis*. To accomplish the task CABI constructed a biosafety level 2 quarantine facility at its Rawalpindi centre, approved by DPP to conduct host range testing safely in a Pakistani context, following the International Plant Protection Convention (IPPC) guidelines. The importation and research into the host range of *L. setosipennis* would not have been possible without the help of the Agricultural Research Council – Plant Health and Protection, South Africa.

A committee of experts was formed by the PARC to review the host range testing results and application for field release. CABI submitted the final release application to the competent authority and committee of experts in March 2021. Based on this application, the authority at PARC planned a review workshop to address the application for the introduction

of an insect biocontrol agent for the management of *P. hysterophorus* in Pakistan. For this workshop, all concerned authorities from Provincial Agriculture Research and extension departments, the Department of Plant Protection, and academia from various agricultural universities were invited to participate.



The national workshop (photo above) was held on 11 October 2021, in Islamabad. The deliberations of the host range results and environmental safety of *L. setosipennis* in Pakistan were thoroughly discussed among participants and the forum took decisions. However, to comply with the legal requirements to grant permission for the release of *L. setosipennis* against parthenium weed in Pakistan, a formal written endorsement was necessary from departments of all Provincial Agriculture Research and extension departments and the Department of Plant Protection of Pakistan.

PARC obtained formal endorsement in writing on 25 November 2021, granting CABI permission to release *L. setosipennis* against parthenium weed in Pakistan, with the limitation of doing such in phases. During the first phase, the weevil will be released in areas away from major cropping regions of the country. The second phase consists of scientific research to monitor and evaluate impact of *L. setosipennis* on the target as well as non-target plant species, before spreading it further afield within the country. CABI is currently in the process of mass-rearing the weevil for planned releases in spring 2023. It is hoped that the introduction of *L. setosipennis* will help sustainably manage the spread of parthenium weed, without the use of chemicals or machinery that can negatively impact the environment.

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Philip Weyl, CABI Switzerland, E-mail: [P.Weyl@cabi.org](mailto:P.Weyl@cabi.org)

### **ICAR–NBAIR joins hands with international experts to manage the parthenium weed menace in India**

The Indian Council of Agricultural Research – National Bureau of Agricultural Insect Resources (ICAR–NBAIR), Bengaluru, India organised a virtual meeting on 12 May 2021 to discuss with international experts a project pre-proposal for the management of *Parthenium hysterophorus* (parthenium weed) in India. The purpose of the meeting was to establish strong international collaboration with scientists in countries such as Australia, South Africa and the USA, who have been actively managing or assisting management of parthenium weed, to develop a project model for India. Discussions were also held regarding the supply

of potential biological control agents from India for *Ziziphus mauritiana* (Rhamnaceae) in Australia. The meeting was attended by three international scientists, namely Dr R. Muniappan (Innovation Lab for Integrated Pest Management, Virginia Tech, USA), Dr K. Dhileepan (Dep. of Agriculture and Fisheries, Brisbane, Australia) and Ms L. Strathie (Agricultural Research Council - Plant Health and Protection, South Africa), as well as the Acting Director Dr N. Bakthavatsalam and three scientists from ICAR-NBAIR, and another from ICAR-Directorate of Weed Research (DWR), Jabalpur.

The importance of international collaboration was emphasised as it aligns with the ICAR-NBAIR's mandate to import organisms for the management of parthenium weed in India. International collaborative projects will facilitate the importation of insect agents and information sharing, as the need arises. The potential and process of importation of additional biocontrol agents for parthenium weed into India, research collaboration for the management of *Ziziphus mauritiana*, and the establishment of a forum for the exchange of information were discussed. Based on the meeting outcome, ICAR-NBAIR are seeking mandatory permission from ICAR to undertake this flagship programme and to develop a concept note on biological control of parthenium weed in India, partnering with the international institutes and national institute (ICAR-DWR).

*M. Sampathkumar\**, *Prakya Sreerama Kumar* and *A.N. Shylesha*, ICAR-NBAIR, P.O. Box 2491, H.A. Farm Post, Bengaluru 560 024, India. E-mail: [m.kumar1@icar.gov.in](mailto:m.kumar1@icar.gov.in)

### **Biological control of the invasive weed parthenium (*Parthenium hysterophorus* L.) in Ethiopia**

The invasive weed parthenium, known in Ethiopia as 'kinche arem' in Amharic, or 'farmasis-sa' (meaning 'sign-away your land') in Afan Oromiffa, continues to adversely affect agriculture by reducing yields of major food crops such as teff and sorghum. Parthenium also invades pasture lands, displacing valuable grass species and thereby negatively impacting livestock production. In the absence of grass, livestock are forced to forage on parthenium, as it is the only green plant in the field during the dry period in many areas. Cows that feed on parthenium produce tainted milk that fetches a lower price at the market. In addition, the tainted milk is rejected by children, and locals believe that it has negative health effects on babies. The weed's ability to release allelopathic compounds enables it to displace native plants, thereby making it a threat to biodiversity. It is not uncommon to find dense, monospecific stands of parthenium in fields in Ethiopia as it has spread to all corners of the country since its introduction, believed to have occurred in the late 1970s.

Currently, hand weeding is the major method of control deployed against parthenium in field crops in Ethiopia. However, this method has serious limitations including unavailability of labour during the peak crop-growing season, adverse impacts on workers' health, and the ability of parthenium to emerge throughout the wet season and thereby require repeated weeding. As demonstrated in Australia, the use of multiple natural enemies is the most effective and economical method of managing parthenium. Ethiopia has introduced two biological control agents, the leaf-feeding beetle (*Zygogramma bicolorata*) and the stem-boring weevil (*Listronotus setosipennis*), from laboratory-reared colonies in South Africa to control this weed. This introduction was made possible by a project led by Virginia State University, U.S.A. and funded by USAID through the Integrated Pest Management Innovation Lab program at Virginia Tech. After demonstrating the host specificity of the biocontrol agents and acquiring permission for their release, the project began releasing them in 2014 in Ethiopia. Implementation efforts were intensified from 2018



*Parthenium hysterophorus* at a farm in Arba Minch, Ethiopia, during release of 5,800 *Zygogramma bicolorata* adults in July 2019 (left) and defoliated, senesced plants by October 2019 (right). Photos: Wondi Mersie, Virginia State University, USA.

onwards, when three mass-rearing facilities were established in central, western and southern parts of Ethiopia. During 2020, 66,000 *Z. bicolorata* adults were reared and released in different parts of Ethiopia was 66,000, as well as 5,530 *L. setosipennis*. The leaf-feeding beetle was released in large numbers in areas with relatively high rainfall, while drier areas were targeted for release of the stem-boring weevil. *Zygogramma bicolorata* is establishing in southern Ethiopia, around Arba Minch, and causing substantial damage to parthenium, while *L. setosipennis* is having an impact on the weed in the central part of the country. Release and monitoring efforts are continuing.

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#### **Initiation of Biological Control of *Parthenium hysterophorus* in Uganda**

*Parthenium hysterophorus* is an invasive weed of great significance in Uganda due to its impacts in agricultural and natural ecosystems, biodiversity and on animal and human health. The first report of its occurrence was in 2009, in various districts along major trade routes from Busia district in eastern Uganda, to Kasese in the western region, and Koboko in north-western Uganda. By 2011, the weed had been reported in 14 districts, and by 2018 it occurred in 20 districts. Parthenium is spreading rapidly and it is now dominant in terrestrial ecosystems including game parks, crop and grazing land, homesteads and school compounds, as well as along river banks and roadsides. In Queen Elizabeth game park (QEGP), the weed has invaded the shores of Lake George and Kazinga channel, displacing grazing grasses for hippos. Also in the park, parthenium occurs at some areas of cleared bush, where a recent mechanical removal programme was effected on other invasive plant species, particularly *Dichrostachys cinerea* (sickle bush), highlighting widespread occurrence of parthenium, high seed banks and dormancy in soils. The hotspots of parthenium are in Pader and Agago in northern Uganda, and these districts are considered to be sources of spread to neighboring districts which have become infested by the weed.

In efforts to control the weed, two species of biological control agents, namely the leaf-feeding beetle, *Zygogramma bicolorata* and the stem-boring weevil, *Listronotus setosipennis* were imported from laboratory-reared stock in South Africa to Uganda in 2018. A total of 1,000 adult *L. setosipennis*, and 780 adults and 220 larval instars of *Z. bicolorata* were shipped. Since then, the biocontrol agents have been mass-reared and released in the

field. Through modifications to rearing protocols in the screen house, the highest numbers of the biocontrol agents mass produced were achieved during 2020 and 2021, in which a total of 24,012 *Z. bicolorata* and 8,127 *L. setosipennis* were produced. To date, a total of 64,122 *Z. bicolorata* and 12,913 *L. setosipennis* have been released in 20 districts affected by parthenium. The number released varied with location. For instance, in QEGP, one batch comprised of 2,000 adult beetles was released at four parthenium-invaded sites in March 2019.

During the monitoring of establishment of previously released biocontrol agents in the field during 2019, *Z. bicolorata* was recovered from two fields in central and mid-western regions out of six release sites that were surveyed. Meanwhile, *L. setosipennis* was not detected in five release sites that were surveyed in eastern, mid-western and central Uganda. In surveys conducted in November 2020 and February 2021 in areas where previous releases were made in northern, mid-western and central regions, *Z. bicolorata* was recovered at five sites, while *L. setosipennis* occurred in four of 11 sites assessed across various regions. Our findings indicated that there were inconsistencies in recoveries of the parthenium biocontrol agents in the field in some locations. Field monitoring since 2019 also showed consistent recoveries of *Z. bicolorata* in some fields, confirming their establishment. *Richard Molo, National Agricultural Research Organization (NARO), Uganda. E-mail: [richardmolo7@gmail.com](mailto:richardmolo7@gmail.com)*

### **Steps towards biological control of *Parthenium hysterophorus* in Kenya**

*Parthenium hysterophorus* is an invasive weed in Kenya, introduced during the 1970s, in coffee plantations in Kiambu. The weed is spreading at an alarming rate and threatens to have dire consequences if left unchecked. It is distributed from the coast through to the west, and currently occurring in all 47 counties. The mode of spread has been associated with human and wildlife activities which include movement, human settlements, urban and protected areas, construction as well as farming. Infestations cause harm to humans and livestock through allergic reactions, and result in the loss of quality grazing and agricultural land. The Kenyan Government declared parthenium weed as a noxious weed in April 2010, and a threat to biodiversity, agriculture and human health, yet little has been achieved to curb its spread.

Efforts were initiated to import biological control agents for parthenium weed into Kenya, when an application was made to the Kenya Plant Health Inspectorate Services (KEPHIS) in 2018 for the importation of two biological control agents, *Zygogramma bicolorata* (Coleoptera: Chrysomelidae), which feeds on the leaves of parthenium weed, and the stem-boring weevil *Listronotus setosipennis* (Coleoptera: Curculionidae). An import permit was issued in 2019 but additional requirements for shipping and Covid-19 travel restrictions during 2020 delayed the shipment. The biocontrol agents were imported into Kenya in December 2020, from laboratory reared colonies at the Agricultural Research Council – Plant Health and Protection, South Africa. Some 500 *L. setosipennis* and 1000 *Z. bicolorata* adults were imported into Kenya, and housed at the KALRO National Sericulture Research Centre, situated at the National Horticulture Research Institute in Thika. This confirmed Kenya's dedication to the management of parthenium weed. However, efforts to establish breeding cultures of the biocontrol agents failed at these facilities, possibly due to escapes within the shadehouse and chemical control of mites and stem rust fungus.

In April 2021 the project was relocated to the KALRO - Katumani research station. A field was allocated to establish the project infrastructure to rear the insect agents, and

construction of a greenhouse for insect rearing is proposed. A nursery for plant production has been established, techniques to cultivate the weed are better understood, and plants have been propagated from field collected seed, in preparation for insect rearing. Staggered planting ensures a continuous supply of actively growing plants at different stages, depending on requirements. Currently there are several growth stages of the weed being maintained while awaiting another importation of the biocontrol agents. The biocontrol agents may be supplied from Ethiopia, Uganda or South Africa during 2022 once the import documentation has been renewed, and facilities and equipment are prepared.

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### **Biological control of *Parthenium hysterophorus* in South Africa**

In South Africa, biological and chemical control methods are utilised to tackle management of the severe invader *Parthenium hysterophorus*. Dense infestations of this weed have formed during the past four decades, invading KwaZulu-Natal, Mpumalanga, North-West and Limpopo provinces. Considerable impacts on crop and animal production, biodiversity conservation and the health of humans and animals are evident. Registered herbicides are used in chemical clearing operations in areas guided by a national management strategy that was developed in 2014 and recently revised. As the areas invaded by parthenium weed are extensive and repeated applications of herbicides are required, biological control is deemed critical for sustainable, long-term weed management. Five introduced natural enemies in the form of two rust fungi and three insect agents are utilised currently in South Africa, while other insect agents under investigation for introduction. A suite of natural enemies are required for optimal control of the weed under the different conditions and areas invaded.

Individually, the biocontrol agents cause considerable direct and indirect impacts on parthenium weed, reducing its vegetative and reproductive vigour. The summer rust fungus *Puccinia xanthii* var. *parthenii-hysterophorae* (Pucciniaceae) established and dispersed readily, prevalent during the hot, wet summers when parthenium weed is actively growing. The winter rust fungus *Puccinia abrupta* var. *partheniicola*, (Pucciniaceae) which was the only agent that was not deliberately introduced, is observed mainly during cooler periods so is considered less effective. The stem-boring weevil *Listronotus setosipennis* (Curculionidae) is hardy, drought-tolerant, established readily, although it is localised near release sites due to its slow dispersal. Field studies are underway to better understand the seasonal fluctuations and impact of *L. setosipennis* populations. Released about the same time in 2013 but in contrast to *L. setosipennis*, the leaf-feeding beetle *Zygogramma bicolorata* (Chrysomelidae) established poorly, hampered by extreme temperatures and drought conditions, and has been absent in recent years. Areas or periods with higher rainfall are more conducive to persistence of this beetle. Improved occurrence of the seed-feeding weevil *Smicronyx lutulentus* (Curculionidae), first released in 2015, was recorded in 2021, particularly in Mpumalanga province. Recent studies have demonstrated impact of the weevil on seed production, both through direct destruction of maturing seeds within which the larvae develop, as well as indirectly through resultant seed abortion within the flowerhead. Parthenium weed cover was significantly reduced when the summer rust fungus and three insect agents were applied, indicating their effective combination.

Rearing and releases of the insect agents are continuing, to ensure their widespread release in South Africa, although temporarily constrained by recent funding constraints. The damaging stem-galling moth *Epiblema strenuana* (Tortricidae) is under investigation in the

ARC-PHP Cedara quarantine facility to assess its host specificity in relation to South African Asteraceae. Additional importations of the root-crown boring moth *Carmenta* sp. nr. *ithacae* (Sesiidae) are required following rearing difficulties to sustain laboratory-reared cultures. Starter cultures of insect agents, technical guidance and support on biological control of parthenium weed have been provided by South Africa to countries in East Africa, Middle East and Asia. The past decade of research and implementation efforts on the biological control of parthenium weed in South Africa have been documented in a recent review.

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### **Parthenium Weed Management Activities in Dhofar Governorate, Sultanate of Oman**

In Dhofar, Sultanate of Oman, *Parthenium hysterophorus* is considered noxious as it grows in a wide variety of habitats in the entire governorate. For the affected residents, manual uprooting of parthenium weed before flowering and seed setting is currently the most widely utilised management method. They have achieved success by ploughing parthenium weed at the rosette stage before it seeds, followed by direct seeding of perennial pasture species in Dhofar Governorate and sowing of a crop in farms in some of the other Omani governorates. This process involves hand weeding; although unpleasant, hazardous to health, and time-consuming, these methods were preferred since the areas where parthenium could potentially invade could be monitored, to replace them with native pasture. Fire was also utilised by burning the uprooted, dried plants in open areas, especially at municipal dumpsites. Due to the lack of biological control expertise and introduced agents, this method has not been pursued yet and efforts have instead focussed on physical control methods.

Parthenium weed management is currently the foremost environmental concern of the government. The Minister of State and Governor of Dhofar issued a Ministerial Decision in 2020 and formed a joint working group to deal with parthenium weed in the entire governorate. A team is undertaking research on the weed and the most suitable mechanisms for its management. Actions have been formulated to coordinate with the local communities and private sectors, to ensure the integration of community efforts. For nearly two years, especially during the monsoon season (June-September), this team has coordinated a community response and has conducted a second campaign on uprooting and removal of parthenium weed. Additionally, The Research Council Oman (TRC) has allocated sufficient funds to investigate, manage and control this notorious weed. Dr Shammas of Dhofar University is taking the lead and is the principal investigator of this environmental concern project entitled “Survey to Document the Spread of Parthenium Weed and its Effects on Native Plant Biodiversity and Climate Change in Dhofar Governorate, Sultanate of Oman”. Mahaad Issa Shammas, Department of Civil and Environmental Engineering, Dhofar University, Salalah, Sultanate of Oman, E-mail: [mahad@du.edu.om](mailto:mahad@du.edu.om)



### **Biological Control of Diamondback Moth & other Crucifer Insects**

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The Proceedings of the VIII International Conference on Management of the Diamondback Moth and other Crucifer



Insect Pests (held during March 4-8, 2019) has been published. Twenty four articles presented as oral and poster presentations in the conference in seven scientific sessions, viz., Diamondback moth and other crucifer pest: the global challenge in a changing climate, Biology, Ecology and Behavior of Diamondback Moth and Other Crucifer Pests, Biological and non-chemical methods of management of crucifer pests (including organic agriculture), Insect Plant Interactions, Host Plant Resistance, and Chemical Ecology of Crucifer Pests, Insecticide Resistance and Management in Crucifer Pests, Genetic approaches to manage crucifer pests, and At the Farm and Landscape Level: Barriers to and Innovations for Management of Crucifer Pests have been published in the proceedings, which can be accessed at <https://worldveg.tind.io/record/74465/files/eb0521.pdf>



### IOBC Global Cactus Working Group

Contact: Iain Paterson; Email: [i.paterson@ru.ac.za](mailto:i.paterson@ru.ac.za); website:

[www.ru.ac.za/centreforbiologicalcontrol/globalcactusworkinggroupgcwg/nextmeeting](http://www.ru.ac.za/centreforbiologicalcontrol/globalcactusworkinggroupgcwg/nextmeeting)

The 2nd International Organization for Biological Control (IOBC) Global Cactus Working Group (GCWG) Meeting will be taking place at the Arebbusch Travel Lodge in Windhoek, Namibia (<https://www.arebbusch.com/>), September 2022. Due to COVID-19 we have had to postpone it by two years.

#### Aims of the meeting

- 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
- Increase communication between biocontrol of cactus pests and biocontrol of the pests of cactus crops

<https://www.ru.ac.za/centreforbiologicalcontrol/globalcactusworkinggroupgcwg/nextmeeting/>



### 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](https://www.iobc-global.org/global_sg_Classical_Weed_BC.html)



### Study Group: Biological control of insect pests of Solanaceous Crops (IOBC-BiCoSol)

Contact: Yulin Goa (Institute of Plant Protection, Chinese Academy of Agricultural Sciences) gaoyulin@caas.cn



### IOBC Global Commission on Biological Control and Access and Benefit Sharing

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

**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.

**IOBC Global Executive Committee**

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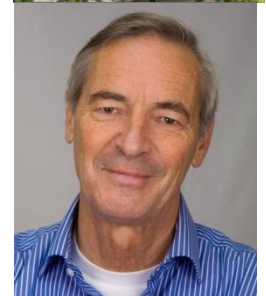
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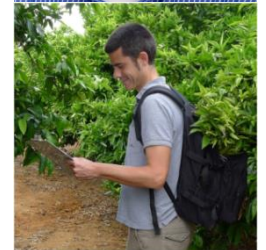
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## Join IOBC

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>**

