



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

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ORGANISATION INTERNATIONALE DE LUTTE BIOLOGIQUE
CONTRE LES ANIMAUX ET LES PLANTES NUISIBLES (OILB)

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as the Section of Biological Control of the International Union of Biological Sciences (IUBS)

EDITORIAL

Biological control and transgenic plants

Few developments in pest management and biological control have attracted more attention in the past year than the development of transgenic crops, particularly the use of genes from *Bacillus thuringiensis* (Bt) to protect crops against lepidopterous pests. Most new crop protection methods, such as pesticides, have a period of open discussion and field experimentation in which scientists from governments, universities and international research institutions participate in refining and adapting technologies to crop protection systems. Transgenic crops, by contrast, have been developed with relatively little involvement of this crop protection community and are now being deployed so rapidly as to make such research difficult. The reasons for this are various, but reflect the novelty of this technology and its deployment as seeds rather than crop protection products.

If these transgenic crops are to realise their full potential in crop protection, there is a need to treat

them as components of integrated pest management (IPM) systems and to engage the scientists working in these systems. Anyone experienced in crop protection today will be concerned about the presentation of new technologies as stand alone solutions to problems, and in this context transgenic crops are no different than chemical pesticides or resistant crop varieties.

The risk of resistance development to transgenic crops has already been the subject of some discussion. Other areas deserving research, which have recently come to light, are the impact of transgenic crops on the natural enemies of pests, their effect on changing the pest complex on crops (and the emergence of new pest problems requiring IPM solutions), and their overall impact and value in IPM systems on crops like rice, cotton and maize.

IOBC is in a unique position to help new, transgenic crops for crop protection find useful application in agriculture. As an authoritative, impartial and international body of experts on biological control and integrated pest management, IOBC can help small and widely scattered

President: Dr. J.K. Waage, International Institute of Biological Control, Silwood Park, Buckhurst Road, Ascot, Berkshire, SL5 7TA UK. Tel: 00-441-344-872-999, Fax: 00-441-344-875-007, e-mail: J.WAAGE@cabi.org.

Vice-President: Dr. Y. Hirose, Faculty of Agriculture, Kyushu University, Fukuoka 812-81, Japan. Tel: 00-81-92-642-3036, Fax: 00-81-92-642-3040, e-mail: hirose@grt.kyushu-u.ac.jp.

Vice-President: Dr. L. Knutson, U.S. Dept Agriculture, retired, 4, rue des Erables, 34830 Clapiers, France. Tel: 00-33-04-67-59-42-34, e-mail :lvknutson@wanadoo.fr

General Secretary: Dr. E. Wajnberg, INRA, Unité de Biologie des Populations, 37 Blvd. du Cap, 06600 Antibes, France. Tel: 00-33-04-93-67-88-92, Fax:00-04-33-93-67-88-97, e-mail: wajnberg@antibes.inra.fr.

Treasurer: Dr. H.K. Berger, Federal Office and Research Center for Agriculture, Institute for Phytomedicine, Spargelfeldstr. 191, P.O.B. 400, 1226 Vienna, Austria, Tel : 00-43-1-732 16-2109, Fax: 00-43-1-732 16-2205, e-mail: hberger@bfl.at

Past-President: Dr. E.S. Delfosse, National Biological Control Institute, USDA APHIS, 4700 River Road, Unit 5, Riverdale, MD 20737-1229, USA. Tel: 00-1-301-734-4329, Fax: 00-1-301-734-7823 e-mail: edelfoss@aphis.usda.gov.

research initiatives to communicate, to share information and to develop

common methods and approaches. It can encourage new research initiatives, and help to form links between researchers in developed and developing countries and between the public and private sector. IOBC

members from a number of Regional Sections are presently discussing the development of a Global Working Group on Transgenic Crops in IPM, the objective of which would be to promote and progress

scientific research on the impact and role of transgenic crops for crop protection as components of IPM systems around the world.

J.K. Waage, President IOBC Global

BIOCONTROL

The publication of ENTOMOPHAGA is now over. All subscribers have now received all the issues of Volume 42 (1997).

BioControl has now received about 80 manuscripts that have been submitted for eventual publication. Only ten papers so far have been fully accepted, 25 have been rejected, and the remaining about 45 manuscripts are under various stages of evaluation. It is believed that of those 45, about 20 papers at least will be found suitable for BioControl (10 have already been conditionally accepted, subject to satisfactory revision). Thus, enough good papers are available to fill the first two-three issues.

The Associate Editors have done an excellent job and have produced a quite even distribution of acceptable manuscripts: of the papers which have been fully or conditionally accepted, there are four papers each for parasitoids, predators and pathogens; two papers on nematodes, weeds and IPM; and one paper on biocontrol of plant pathogens. However, there is a real shortage of papers on the subject area of semiochemicals. This is largely reflected in the submissions (papers received by subject area).

So far, the overall ratio between accepted and rejected manuscripts is 29% vs. 71% , which is pretty hard, but the quality of the submissions has clearly risen during the past months. Maybe this simply means that more and more biocontrol scientists are discovering this new opportunity to publish good research.

Examples of articles which the first two issues of BioControl will include:

- Hilbeck A., C. Eckel & G.G. Kennedy - Impact of *Bacillus thuringiensis*-insecticides on population dynamics and egg mortality of the Colorado potato beetle in North Carolina potato plantings.
- Hajek A.E., L. Bauer, M.L. McManus & M.M. Wheeler - Distribution of resting spores of the *Lymantria dispar* pathogen *Entomophaga maimaiga* in soil and on bark.
- Madeira N.G. - Persistence of conidia of *Entomophthora muscae* in relation to age, temperature and humidity.
- Ehlers R.-U., S. Lunau, K. Krasomil-Osterfeld & K.H. Osterfeld - Liquid culture of the entomopathogenic nematode-bacterium complex *Heterorhabditis megidis/Photorhabdus luminescens*.
- Scheepmaker J.W.A., F.P. Geels, L.J.L.D. van Griensven & P.H. Smits - Susceptibility of larvae of the mushroom fly *Megaselia halterata* (Diptera: Phoridae) to the entomopathogenic nematode *Steinernema feltiae* (Rhabditida: Steinernematidae) in bioassays.
- Villanueva-Jiminez J.A. & M.A. Hoy - Toxicity of pesticides to the citrus leafminer and its parasitoid *Ageniaspis citricola* evaluated to assess their suitability for an IPM program in citrus nurseries.
- Theunissen J. & G. Schelling -

Infestation of leek by *Thrips tabaci* (Thysanoptera: Thripidae) as related to spatial and temporal patterns of undersowing.

- Hu J.S., D.B. Gelman, R.A. Bell & M.J. Loeb - *In vitro* rearing of *Edovum puttleri*, an egg parasitoid of the Colorado potato beetle.
- Coll M. & S. Abd-Rabou - Effect of oil emulsion sprays on parasitoids of the black parlatoria, *Parlatoria ziziphi*, in grapefruit.
- Ferran A., L. Giuge, R. Tourniaire, J. Gambier & D. Fournier - An artificial non-flying mutation to improve the efficiency of the ladybird *Harmonia axyridis* in biological control of aphids.
- Riedel W. & T. Steenberg - Adult polyphagous coleopterans overwintering in cereal boundaries: winter mortality and susceptibility to the entomopathogenic fungus *Beauveria bassiana*.
- Ponsonby D.J. & M.J.W. Copland - Environmental influences on fecundity, egg viability and egg cannibalism in the scale insect predator, *Chilocorus nigritus*.
- Mohaghegh J., P. De Clercq & L. Tirry - Maternal age and egg weight affect offspring performance in the predatory stink bug *Podisus nigrispinus*.
- Uygun N. & N.Z. Elekcioglu - Laboratory studies on the effect of three Diaspididae species as prey on development and fecundity of *Chilocorus bipustulatus* (L.) (Coleoptera: Coccinellidae).

- Hill M.P. - Life history and laboratory host range of *Stenopelmus rufinasus* Gyllenhal (Coleoptera: Curculionidae), a natural enemy for *Azolla filiculoides* Lamarck (Azollaceae) in South Africa.
- Bryk H., B. Dyki & P. Sobiczewski - Antagonistic effect of *Erwinia herbicola* on *in vitro* spore germination and spore tube elongation of *Botrytis cinerea* and *Penicillium expansum*.

The first issue should be available in August, and the following issues at about two-month intervals thereafter.

In 1999 a regular pattern should be established with the journal being published in February, May, August, and November. To be successful we need, however, a steady flow of high-quality manuscripts in all subject areas of the IOBC. We therefore urge all researchers in biological and integrated control - and IOBC members in particular - to send their best manuscripts to BioControl: only then can our journal become as influential and respected as it deserves.

H.M.T. Hokkanen, Editor in Chief of BioControl

We remind you that BioControl has now its home page on the Internet at the following address: <http://www.wkap.nl/journalhome.htm/1386-6141>. You will find there all the information necessary for publication: aims and scope, submission information, instructions for contributors, etc. Since the subscription rate for BioControl is much lower for our members than for non-members, and that this subscription rate is low compared to other journal in the same field area, I strongly recommend all of you to subscribe to the journal if you did not already decided to do so.

E. Wajnberg

CONFERENCE ON NON-TARGET EFFECTS IN BIOCONTROL

Following the successful IOBC Conference, the IOBC Executive is planning another international meeting to address key issues in biological control of importance to IOBC members. After consultation with Regional Sections, we have agreed to organise a workshop in Autumn 1999 on the issue of «non-target effects in biological control». This subject was seen as important to the future of both classical and commercial biological control, and a need was seen to move beyond analysis of what has or

has not been done in the past to what should be done in the future. Therefore, the workshop would focus on the development of scientific approaches to understanding non-target effects of introduction or release of microbial and microbial agents. The workshop will be held in Montpellier, France, and organised with the assistance of the IOBC Permanent Secretariat and scientific institutions in the Agropolis complex. Please note that, unlike the last IOBC

Conference in Montpellier, this workshop will not be the occasion of an IOBC General Assembly. The IOBC General Assembly will be held at the International Congress of Entomology in Brazil in August 2000. For any further information, please contact the IOBC Permanent Secretariat, AGROPOLIS, Ave. AGROPOLIS, 34394 Montpellier Cedex 5, France.
Tel: 00-33-04-67-04-75-30
Fax: 00-33-04-67-04-75-99
e-mail: IOBC@agropolis.fr.

MEMBERSHIP FEES

It is IOBC policy that Regional Sections can set membership fees at any level they choose. However, each Regional Section

has in turn to provide a yearly minimal contribution to Global. This year, this minimal contribution, for each member,

was decided to be the same as the one used for 1997. Minimal contributions for 1998 are the following ones:

Individual members <i>without</i> BioControl	10 US\$
Individual members <i>with</i> BioControl (one copy)	100 US\$
Supporting members (including one copy of BioControl)	150 US\$
Institutional members (including one copy of BioControl)	200 US\$

IOBC members (1) automatically receive the IOBC Global Newslet-

ter (twice a year), (2) receive any kind of printed information pro-

duced by their own Regional Section or even by other Re-

gional Sections (Newsletters, etc.), (3) can participate to each of the Global or Regional Section Working Groups (and, as such, will receive any kind of

relevant information), and (4) Have a reduced subscription rate for BioControl (see above). If you did not already renew your membership, please do it promptly, and encourage your colleagues to join our Organization. For this, please contact your Regional Section, or the IOBC Permanent Secretariat at the following address:

IOBC Permanent Secretariat,
AGROPOLIS, Ave. AGROPOLIS,
34394 Montpellier Cedex 5,
France.
Tel: 00-33-04-67-04-75-30,
Fax: 00-33-04-67-04-75-99
e-mail: IOBC@agropolis.fr.

E. Wajnberg

REGIONAL SECTIONS

SOUTH EAST ASIAN REGIONAL SECTION (SEARS)



President: Rachel E. McFadyen, Alan Fletcher Research Station, PO Box 36, Sherwood Q 4075, Australia.

Fax: 00-61-7-3375-0777

e-mail:

mcfadyenre@dnr.qld.gov.au.

Vice Presidents: Dr. R. Wang (China) and Dr. Md.Y. Hussein (Malaysia).

Secretary/Treasurer: Dr. D. Holdom, CRC for Tropical Pest Management, Gehrman Laboratories, University of Queensland, St Lucia, Qld 4072, Australia.

Tel: 00-61-7-3896-9397

Fax: 00-61-7-3365-1855

e-mail:

d.holdom@mailbox.uq.edu.au.

Past President: R. Muniappan, Agricultural Experimental Station, University of Guam, Mangilao, Guam 96923 USA.

Fax: 00-1-671-734-6842

e-mail: rmuni@uog9.uog.edu.

Chinese section of IOBC/SEARS established

Following a visit to China by the IOBC President Dr. J. Waage in June 1997, it was agreed to appoint a Chinese scientist as co-ordinator for IOBC/SEARS in China, to collect membership fees, change these into

Share your information: Activities and events within IOBC Regional Sections do interest your colleagues outside the Sections as well. They will most probably not be informed if you do not tell them. You may share information by sending any kind of news to the Secretary General (address on first page).

US\$ and transfer them to the SEARS treasurer (currently Dr. D. Holdom in Brisbane, Australia). Dr. Wan Fang-Hao of the Institute of Biological Control, Chinese Academy of Agricultural Science in Beijing, agreed to act as co-ordinator, and has already signed up 35 members, 8 of which are subscribing to the IOBC journal BioControl. This is a very welcome increase at a time when the SEARS regional section is being seriously affected by the Asian financial crisis, which has threatened members' ability to continue paying subscription fees in US\$. As part of this initiative, articles on the IOBC, its Working Groups and Regional Sections, have been written by Dr. Waage, Dr. McFadyen (President of SEARS) and Dr. Wan Fang-Hao and published in the Chinese Journal of Biological Control, Vol. 14 No. 2 Issue in 1998.

Eradication of Papaya fruit fly in north Queensland, Australia

The papaya fruit fly (*Bactrocera papayae*) was discovered at Cairns, North Queensland, in 1994 and an immediate campaign started to eradicate the pest. Queensland has several indigenous fruit flies, one of which, the Queensland fruit fly *Bactrocera tryoni*, is a major pest, but the papaya fruit fly attacks

a wider range of fruits and threatened to cause significant losses to the horticultural industry in north Queensland. The Cairns area was placed under quarantine, and all movement of fruit in and out of the area was banned. The campaign used bait in sprays and traps, and traps were set throughout the rain forest area to determine if flies were moving into the rainforest to utilize native fruits. Fortunately, none were found. No flies have been found in traps for 12 months and the eradication campaign has been declared successful. The quarantine will now be lifted, though the monitoring campaign using traps will continue.

International Conference on IPM - Theory and Practice, developing sustainable agriculture

This conference was held in Guangzhou, China, from 15 to 20 June this year. The conference was attended by over 360 delegates. There were 24 delegates from the USA and 13 from Australia, with representatives from 21 other countries as well as 294 from the People's Republic of China. There were 5 plenary speakers on the first day, and submitted papers were presented in Symposia arranged in 11 concurrent Sections on the next two days. Talks covered a wide range of IPM topics, from the use of transgenic crops and other

modern biotechnology, to the role of Farmer Field Schools and farmer participation in action research. The section on Rodent Control had to be cancelled due to lack of interest, and there were only 6 papers presented in the Weed Control section, reflecting the unfortunately too-general view that herbicide control of weeds is adequate and other methods are not required. Visits to entomological institutes and laboratories, and to an ecological farm and a forestry area were organised for the last two days. Abstracts and plenary talks have been published in the Proceedings which can be obtained from the Guangdong Association for International Science and Technology Cooperation and the Guangdong Entomological Society, e-mail: gzgeii@public1.guangzhou.gd.cn.

6th Australasian Applied Entomological Research Conference « Pest Management - Future Challenges »

This Conference will be held in Brisbane, Australia, from Sept. 29 to Oct. 2 1998, and will be followed on Oct. 3 by an one-day Workshop on Host Specificity Testing for Biological Control Agents. Details can be obtained on the web site <http://www.ctpm.uq.edu.au/Education/AppliedEnto.html> or from the AAERC Conference Secretariat, ICTE Conferences, The Univ. of Qld, Brisbane, Qld 4072, Australia. Fax: 00-61-7-3365-7099 e-mail:

sally.brown@mailbox.uq.edu.au.
Dr. R. McFadyen, President IOBC/SEARS

Meeting of SEARS/IOBC Working Group on IPM in Glasshouse/Protected Crops

« Natural Enemy to Biological Control Agent: Evaluating the Process ». 25-28 January 1999, Sydney, Australia. Seven symposia are planned in the meeting. The topics of these symposia are: (1) survey for natural enemies, (2) improving natural enemies - regulatory and environmental issues, (3) developing rearing methods - small and

large scales, (4) quality control in research cultures and in commercial production, (5) selective criteria for evaluating efficacy and potential of native natural enemies in the laboratory and field, (6) marketing and distributing new biological control agents, and (7) fitting biological control agents into an IPM program. In addition to the keynote papers that will be presented in each symposium, contributed papers are also invited on any of the symposium topics. For further information, contact: Dr. S. Goodwin, Horticultural Research & Advisory Station, NSW Agriculture, PO Box 581, Gosford NSW 2250, Australia. Tel: 00-61-43-481900 Fax: 00-61-43-481910 e-mail: goodwis@agric.nsw.gov.au.

Meetings organised on Biological Control

The International Workshop on « Biological Invasions of Ecosystem by Pests and Beneficial Organisms » was held in Tsukuba, Japan, on February 25-28, 1997. Speakers of this workshop were invited from USA, UK, New Zealand and Japan. Biological control of pests was treated in at least 6 of 27 papers presented at the workshop. Within a year, most of the 27 papers will be published as a book written in English.

As previously reported, the International Symposium on « Biological Control of Insect Pests » was held in Suwon, Korea, on November 13-14, 1997. The proceedings - 184 pages for 16 papers written in English - were published by the Korean Society of Applied Entomology in December 1997. Please ask Dr. K.S. Boo for copies at the following address: Insect Physiology Laboratory, Division of Applied Biology and Chemistry, College of Agriculture and Life Sciences, Seoul National University, Suwon 441-744, Korea.

The 3rd Asia-Pacific Conference of Entomology was held in Taichung, Taiwan, ROC on November 16-22, 1997. Over 10 members of IOBC/SEARS were present. One of

the six symposia held within the meeting was on biological control of whitefly. In addition to the 13 papers of this symposium, more than 50 papers on biological control and IPM in Asia-Pacific region were presented in the meeting.

The 7th Meeting of the Group of Use of Biological Control Agents in Japan was held in Sendai, Japan on December 9-10, 1997. There were 220 participants including researchers, extension entomologists, bio-control practitioners, and producers of biological control agents. 17 papers were presented. This group was organised for the promotion of the practical use of biological control agents in Japan and has an annual meeting in different places in Japan.

Dr. Y. Hirose, IOBC/SEARS

A new journal on Entomology

A new journal entitled « Journal of Asia-Pacific Entomology » was launched by the Korean Society of Applied Entomology in March 1998. This journal is published biannually in English. Most of the 13 papers published in Vol. 1, No. 1 were on pheromone and its use. The next issue should publish papers on biological control in the Asia-Pacific region.

Dr. Y. Hirose, IOBC/SEARS

AFROTROPICAL REGIONAL SECTION (ATRS)



President: Dr. H.G. Zimmermann, Agricultural Research Council, Plant Protection Research Centre, Weeds Research Division, Private Bag X134, Pretoria 0001, South Africa.

Tel: 00-27-12329-3276

Fax: 00-27-12329-3278

e-mail:

RIETHGZ@PLANT2.AGRIC.ZA.

Vice-President: Dr. Ouayagode-Bakary, DPR, MESRS, B.P. V151, Abidjan, Ivory Coast.

General Secretary: Dr. G. Bani, B.P. 2499, DGRST, Brazzaville, Congo. Fax: 00-242-831337.

Treasurer: Dr. A. Paraiso, B.P. 12625, Niamey, Niger, Fax: 00-227-73-22-37.

The article VII of the statutes of the IOBC/ATRS specifies that the term of office of the Executive Committee is 4 years. Therefore, the term of the current officers will thus be over by March 1999. Dr. H. Zimmermann will not be available for a second term. Therefore we are kindly requesting anyone interesting in standing as a candidate for the elections to contact Dr. H. Zimmermann. The vote will be by postal ballot.

The forthcoming IOBC Water Hyacinth Working Group Meeting in Harare, Zimbabwe, to be held 16-19 November 1998 (see below) should likely be the place for the next general assembly of the Regional Section.

Dr. H. Zimmermann, President IOBC/ARS

NEARTIC REGIONAL SECTION (NRS)



President: Dr. T. Kring, Department of Entomology, Agric. Bldg. 321, University of Arkansas, Fayetteville, AR 72701, USA.

e-mail: tkring@comp.uark.edu.

Vice President: Dr. R. O'Neil, Department of Entomology, Purdue University, West Lafayette, IN 47907-1185, USA.

e-mail:

bob_oneil@entm.purdue.edu.

President Elect: Dr. L. Charlet, USDA-ARS, Northern Crop Science Laboratory, Box 5677, State University Station, Fargo, ND 58105-5677, USA.

e-mail:

CHARLETL@fargo.ars.usda.gov.

Secretary-Treasurer: Dr. R. Wiedenmann, Center for Economic Entomology, Illinois Natural His-

tory Survey, 607 East Peabody, Champaign, IL 61820, USA.

e-mail: r-wiede@uiuc.edu.

Corresponding Secretary: Dr. L. Milbrath, Department of Entomology, 123 Waters Hall, Kansas State University, Manhattan, KS 66506-4004, USA.

e-mail:

milbrath@prairie.nodak.edu.

Past President: Dr. J. Obrycki, Department of Entomology, 10 Insectary Building, Iowa State University, Ames, IA 50011-3140, USA.

e-mail: jobrycki@iastate.edu.

1998 Midwest Institute for Biological Control

The 1998 Midwest Institute for Biological Control was held at Kellogg Biological Station, Michigan, June 22-25, 1998. It was organized by Dr. J. Obrycki (Iowa State University, USA) and Dr. D. Landis (Michigan State University, USA). The topics for this year's Institute were habitat management and biological control, and biological control in annual crop habitats. Eight instructors and 22 students participated. Students were primarily graduate students and extension personnel from the Midwestern US, and staff from the Kellogg Biological Station. The Institute was a combination of lectures and structured discussions on several topics generated by the students.

Position Available

Senior Research Toxicologist, Dept. of Ecotoxicology, American Cyanamid. Responsible for designing, monitoring and reviewing terrestrial ecotoxicology studies to support registration of crop protection and animal health products. Conduct ecological risk assessments based on studies, design ecotoxicology studies based on product use patterns and regulatory requirements. This will be working with labs in Europe, for registering pesticides in Europe. Studies will include testing non-target effects on biological control agents and other beneficial arthropods. Requirements: PhD in

either Toxicology, Environmental Sciences, Entomology or related field. Working knowledge of FIFRA, FDA and OECD testing guidelines and GLP standards highly desirable. For more information, contact: Dr. J. Wisk, Am Cyanamid
Tel: 00-1-609-716-2781

URL:

<http://www.pt.cyanamid.com/carc/jobs/0359.html>

NEOTROPICAL REGIONAL SECTION (NTRS)



In Lima, Peru, May 21st, 1998 the Regional Section organised its last General Assembly of the IOBC/NTRS within the 2nd International conference on « Contribution of Biological Control in Sustainable Agriculture », and the 1st Latin-American Congress on Biological Control. On this occasion a new council was elected:

President: Dr. R. Alatorre Rosas, Colegio de Postgraduados, Instituto de Fitosanidad, Km. 36.5 Carretera, Mexico-Textcoco, Montecillo, Textcoco, Mexico 56230.

Tel-Fax: 00-52-1-595-

10220/11580/11587

e-mail: alatoros@colpos.colpos.mx.

Secretary: Dr. H. Arredondo Bernal, Centro Nacional de Referencia en Control Biologico DGSV-SAGAR Apartado postal 133, 28120 Tecoman, Colima, Mexico Fax: 00-52-332-42773.

e-mail:

hcesar@tecoman.ucol.mx

Treasurer: Dr. J. Francisco Barrera Gaytan, Division de Tecnología Agropecuaria, El Colegio de la Frontera Sur Carretera Antiguo Aeropuerto, Km 2.5, Apartado Postal 36, 30700 Tapachula, Chiapas, Mexico.

Tel: 00-52-962-81077

Fax: 00-52-962-81015

e-mail: jbarrera@tap.ecosur.mx.

Vice Presidents: (1) Dr. R. Vergara, Universidad Nacional de Colombia, Facultad de Ciencias Ag-

ropecuarias, Seccional de Medellin, Apdo. 1779, Medellin, Colombia.

Fax: 00-57-4-2300-420;

(2) Ing. J. Jimenez, Productos Biologicos Perkins Ltda., Carrera 29 N° 53-51, Apdo. 1015, Palmira, Valle, Colombia.

Fax: 00-57-2-27-33719

and (3) Dr. E. Botto, Insectario de Investigaciones para Lucha Biologica, IMYZA-CICA-INTA, Castelar (1712), CC 25, Buenos Aires, Argentina.

Fax: 00-54-1-481-1316

e-mail:

postmaster@ebotto.inta.gov.ar.

Due to an outstanding career, both as a scientist and as a professor, the new President of the IOBC/NTRS, Dr. R. Alatorre Rosas, is a well-known scientist in Latin America. She is involved in different institutional responsibilities in all the countries of South America. She always played an important and enthusiastic part in the Mexican Society of Biological Control where she holds several positions within the council. She also intensively contributed to the publication of « EL ENTOMOFAGO », the bulletin of the Society.

After the discussion that was held within the new council of the IOBC/NTRS, the main goals of the new council is to increase the number of IOBC members coming from different countries, and also to create a permanent « direction ». Already existing or new coming working groups will also be promoted.

IOBC welcomes the new officers of NTRS. We hope that the new duties will give you satisfaction and success.

Contribution of biological control to sustainable agriculture and 1st Latin-American Congress of the IOBC/NTRS

These two jointed meetings were held in Lima, Peru, 18-22 May, 1998. On this occasion, different important issues related to biological control and IPM were discussed. The goals were in accordance to the declaration made in Lima, Peru in

1993: sustainable agriculture systems based on ecological equilibrium without chemical pesticides and the use of biological control methods.

Due to the fact that we need to have less and less noxious agricultural products and that natural equilibrium should be maintained as much as possible, the summary of the actions that have to be done are:

- Effort in classical biological control through the introduction of exotic beneficials should be maintained. A good example in the introduction, with the help of the SENASA in Peru, of the parasitoid *Aegeniaspis citricola* for controlling the citrus pest *Phyllosticta citrella*. Such a classical pest control method usually gives good results, and in Peru, among the 98 species introduced, 13 successfully established, resulting in a full pest control leading to save 60 millions US\$. Biological control through the augmentation of parasitoids or predators, along with a massive use of entomopathogen organisms, already led to tremendous profits. In Brazil, more than a million of hectares were successfully protected these last years with the help of a baculovirus against *Anticarsia gemmatallis*, a lepidopterous pest attacking soybean. Also, an entomopathogen fungi, *Metarhizium anisopilae* was successfully used to control the « salivazo » of the sugar cane and pasture land.
- Biological control with the use of entomopathogen organisms offers a wide range of possibilities in several Latin-American countries (Cuba, Brazil, Colombia, etc.). This should stimulate the continuity of the different IPM programmes already supported.
- The importance and reality of biological control as a component of IPM programmes should be recognised in Latin America. Despite this, in some particular

cases, a stagnation can be observed for some biological control programmes. This seems to be the case for the IPM programmes developed to protect cotton in Venezuela and in Colombia.

- It is important to convince plant growers to participate more actively to IPM programmes. For this, some strategic agreements have to be promoted between producers in order to facilitate economic and technical decision making processes.
- There is a lack of biological control programmes in some countries where heavy pest damages can be observed. This have to be solved, likely by promoting political decisions in favour of biological control or IPM programmes.
- The efficacy of biological control was already demonstrated in intensive cultures like rice, soybean, corn and sorrogo.
- Participants of the congress ratify the rejection of the uncontrolled use of pesticides because of their noxious effects on the agrosystem. They recommend to use them only when all other alternatives were proven to be unsuccessful.
- It is of prime importance to accurately prepare the technicians involved in IPM programmes. It also appears necessary to teach plant growers in order for them to accept biological control methods.
- Qualified people are already available in Latin American countries in order to help in developing biological control programmes. Such a development already exist, as can be seen through an increasing proportion of presentations dealing with biological control or IPM programmes in American congresses on entomology.
- There is however a lack of financial support for biological control programmes especially when compared with what is going on for the development of chemical pesticides. In some

countries, some laboratory working on biological control methods were successfully established. However, we are still missing an accurate market research for biological products.

- Up to now, it has to be admitted that the developments in biological control in different countries were not sufficiently popularised among the different potential users.
- The market for biological products in different countries has not yet been sufficiently analysed. This currently represents one of the main problems for convincing plant growers to use biological control methods.
- The lack of quality control methods for biological products in some Latin American countries brings somehow biological control into disrepute. Governments should thus be more involved in defining the corresponding guidelines.
- There is no communication or agreements between producers of biological products in Latin America.
- There is a need for educative programmes in agricultural institutes in order to develop knowledge in biological control and IPM.
- There is a lack in scientific publications on biological control and organisations like the IOBC/NTRS have to promote the popularisation of scientific results in this area.
- Exchanges of beneficials between countries should be promoted through the definition of norms and laws all over the Latin American countries. As an example, such laws were already established in Mexico in order to manipulate biological material more easily.
- National centres for biological control should be created in countries where they are not already existing. These centres will aim to facilitate the use of biological control methods by providing some help to private

companies. Such centres are already active in Colombia.

- There is a drastic lack of expertise in systematic and taxonomy. This can represent a strong problem in developing efficient biological control programmes.
- A database, or at least a directory, listing all the entomologists involved in biological control should be developed. Their field of expertise should also be stipulated. IOBC/NTRS could manage this through a network.
- Public events organised in order to popularise biological control should be promoted. This could be done through IOBC working groups and with the help of the national organisms involved in the different countries.
- Biotechnology appears to be an efficient option. However, some points still remain to be solved in order to avoid inflicting any kind of injury to the environment. These days, scientific knowledge in this area is so large that a lot of problems can now be solved providing that the right method is used. The optimal method should be the one that lead to the better results without any reduction in the quality of the environment.
- An ethical point is raised by the farmer J. Lima, this point should be taken into account: The whole problem is not necessarily totally economical. Consumer's right should also be considered, along with the quality of the environment for the future generations.
- All these points were thoroughly discussed and it was unanimously decided to emphasise information and knowledge transfer on biological control and IPM all over the Latin American countries and in the Caribbean. The aim is to generalise the use of biological control methods. The final recommendations were that the weak points of biological control and IPM practices have to be solved with the help of national, international and private organisms.

Dr. F. Ferrer, Past President IOBC/NTRS (Translated from Spanish)

National Programme in Biological Control in Peru

The National Service for Agrarian Health (SENSA) was created in Peru on November 27th, 1992. The goal of this public service, belonging to the Ministry of Agriculture, is to improve for a lasting period agriculture health and breeding with the help of private companies. Its two main missions are: (1) to increase the security level in the national agrarian activity, and (2) to contribute to a lasting development.

Three national programmes were created during October 1995, one of those was the use of biological control methods. Biological control was used in Peru for the first time in 1904, but its main development happened in 1960 with the creation of the Centre for Beneficial Insects Introduction and Rearing (CICIU), an organism developing research and application programmes on biological control.

Thanks to the experience acquired by the people that worked at the CICIU, a national programme on biological control was proposed. Its aim was to promote the creation of private companies producing and distributing beneficials within the three natural regions of the country. Agreements were then proposed to potential producers. In turn, in order to create their private companies, these producers were financially helped by providing them (through renewable one-year loan) the equipment needed to produce the beneficials. An initial 30-days instruction for the people working within the CICIU laboratory was also provided.

The initial input was 1,556,443 US\$ for buying the necessary equipment and for starting the programme the first year. Today, there are 75 laboratories working on beneficial insects, and 28 entomopathogens are distributed over 22 out of the 24 existing departments in Peru.

The goal of the programme is clearly to push everyone to use biological control against pest for protecting important crops, and to avoid that way the use of chemical pesticides.

From 1997 onwards, a new programme is proposed. It proposes the use of biological control for protecting 227,000 ha over 5 years. Its estimated cost is about 6 millions of US\$. The principal crops that should be protected are: cotton, citrus trees, sugar cane, corn, rice and coffee. The project already started for some of these crops.

Translated from IOBC/NTRS Newsletter number 10

Proposal for association or for sale of a biological control company in Venezuela

The biological control laboratories of the « Servicio Biológico C.A. », located in Venezuela (State Lara), proposes the possibility for an Association, Sale or any other offer to all the interested private or public international organizations. The « Servicio Biológico, C.A. », was founded in 1977. It is a Company associated with PALMAVEN, a filial of PDVSA (Petroleos de Venezuela), and is well recognized in Latin-America as one of the pioneers in the transfer of technology in biological control, due to the great benefits obtained in different crops. This company worked for 20 years giving services in biological control on Sugar Cane, Corn, sorghum, potatoes and vegetable crops. Additionally, it has initiated the production of parasitoids for controlling common flies. It is present in two different areas. The first one is located in the City of Barquisimeto, with an area of 5,000 m² and with almost 1,000 m² of buildings. These buildings are equipped with 25 laboratory rooms for the production of *Metagonistylum minense* (Dip.: Tachinidae) and *Cotesia flavipes* (Hym.: Braconidae), for controlling the sugarcane borer, with an actual production sufficient for pro-



ducting 40,000 ha. In the near future, almost 100,000 ha could be protected that way. Beside this, there is also a potentiality of controlling the armyworm over a surface area of 10,000 ha by means of the parasitoid wasp *Telenomus remus* (Hym.: Scelionidae). For the moment, this parasitoid has been used with successes over almost 5,000 ha. A production of a Chrysopid (Neu.: Chrysopidea), and *Podisus* (Hem.: Pentatomidae), has been started for controlling different pests: *Copidosoma* for the potato tuber worm, and *Muscidifurax* and *Spalangia* (Hym.: Pteromalidae) for controlling common flies.

The second area is located in the locality of Sanare. It covers 42,000 m² with a building of 2,000 m², for the production of *Trichogramma* on the moth *Sitotroga cerealella*. For this, there are almost 700 units of production of 20 kg of wheat. With a sufficient amount of space, this production could be increased three fold.

The City of Barquisimeto has an average temperature of 26°C and is located 400 m asl. The locality of Sanare has an average temperature of 20°C and is 1,750 m asl. Such a climate is favorable for high production of *Sitotroga* eggs. The laboratory of Barquisimeto is well equipped (3 vehicles, 1 central and 15 conditioned airs, 4 microscopes, adaptations for controlling humidity and temperature, etc.). 25 peoples are working there, including technical personnel and trained workers.

The proposal is related to the fact that biological control is developing very fast in the different countries of America, and there is an increasing claim for agricultural products free of contaminants. Besides this, the popularity of commercial biological control is currently increasing and the production of these laboratories would be oriented towards different countries.

Additionally, the production costs of the « Servicio Biológico » are very low compared to other laboratories in the world. It is estimated that the value of the Company is around US\$ 700,000, and the inter-

ested groups may propose a total purchase or may increase the capital to at least the 50%. Other possibilities will also be considered. For any further information, please contact: Dr. F. Ferrer, Carrera 5 N°4-76, Urbanizacion del Este, Barquisimeto, Venezuela.

Tel-fax: 00-58-51-316253

e-mail: fferrer@telcel.net.

(Translated from Spanish)

EAST PALAEAR- TIC REGIONAL SECTION (EPRS)



President: Dr. A.I. Smetnik, All-Russian Institute for Plant Quarantine, Pogranichnaya 32, reg. Bikovo, Moscow Region, 140150, Russia. Fax: 00-95-975-3971.

Vice President: Dr. S. Pruszyński, Plant Protection Institute, 60-138 Poznan, Miczurina Str. 20, Poland. Tel: 00-48-61-679-222

Fax: 00-48-61-676-301

e-mail: tjk@ior.poznan.pl.

Secretary General: Dr. A. Orlinski, Present address: EPPO, 1, rue Lenotre, 75016 Paris, France.

Tel: 00-01-45-20-78-09

Fax: 00-01-42-24-89-43

e-mail: orlinski@epo.fr

IOBC/EPRS Meetings :

Integrated protection of stone-fruit culture (together with West-Palaearctic Section) 18 to 22 August 1998, Gödöllő, Hungary.

Integrated protection of field crops (under the IV Yugoslavian Plant Protection Congress) 21 to 26 September 1998, Yugoslavia.

For more information, please contact Dr. Andrei Orlinski, Scientific Assistant of EPPO, General Secretary of IOBC/EPRS (see address above).

WEST PALAEARTIC REGIONAL

SECTION (WPRS)

President: Dr. P. Esbjerg, Royal Veterinary and Agricultural University, Department of Zoology, Bülowsvej 13, 1870 Frederiksberg C., Denmark.

e-mail: peter.esbjerg@ecol.kvl.dk.

Vice Presidents: Dr. J. Huber, Institute for Biological Pest Control, Heinrichstr. 243, 62287 Darmstadt, Germany.

Fax: 00-61-51-40-7290

e-mail: j.huber.biocontrol.bba@t-online.de, and Dr. A.M.P. Lavadinho, Instituto de Protecção da Produção Agro-alimentar, Centro Nacional de Protecção da Produção agrícola, Quinta do Marquês, 2780 Oeiras, Portugal.

Tel: 00-351-01-443-05-27

Fax: 00-351-01-442-06-16.

Secretary General: Dr. C. Alabouvette. INRA, Laboratoire de recherches sur la Flore pathogène du Sol, 17, rue Sully, BP 1540, 21034 Dijon Cedex, France.

Tel: 00-03-80-63-30-41

Fax: 00-03-80-63-32-26

e-mail:

Claude.Alabouvette@dijon.inra.fr.

Treasurer: Dr. C. Gessler, Ecole Polytechnique Fédérale de Zurich, Phytomedizin Pathologie, ETH Zentrum/LFW, Universitätsstr. 2, 8092 Zurich, Switzerland.

e-mail:

cesare.gessler@ipw.agrl.ethz.ch

Recent IOBC/WPRS Bulletins

Guidelines for integrated Production of Arable Crops in Europe. Technical Guideline III - 1997 - Boller E.F., C. Malavolta & E. Jörg. (eds.). Vol. 20(5). 115 pp. With this volume, the first follow up on arable crops has been made since general publication on IP Guidelines from 1992. The guidelines are given in 6 languages and the crops involved are: Winter cereals: wheat, barley, oats, rye, triticale, Spring cereals (not specified), Winter and Spring Oilseed Rape, Sugar Beet, Potatoes, Maize, Dry Peas, Faba-Beans, Soybeans, Sorghum (Grain and fodder), Alfalfa and Fodder Crops (legumes, grass). Aspects to mention are for instance the many specifications on crop rotation often deviating from the general rule of a 4-year rotation. There is a demand for local guidelines for irrigation, which is further linked to soil protection requirements.

Integrated Plant protection in Stone Fruit - 1997 - Cravedi P., C. Hartfield & E. Mazzoni (eds.). Vol. 20(6). 115 pp. This is a proceedings volume from a WG meeting held in Zaragoza, Spain, 24-26 September 1996. The content is very mixed and covers areas as Pests, Viruses and phytoplasmas transmitted by

insects, Pheromones, Integrated fruit production programmes, Resistance to insecticides, Diseases, Natural enemies in stone fruit ecosystems and Phytosanitary situation in new countries.

Integrated Control in Citrus Fruit Crops - 1997 Vacante V. (ed.). Vol. 20(7). 106 pp. This is a proceedings volume from a WG meeting held in Florence, Italy, 29. August 1996. The whole volume is entomologically oriented and the vast majority of presentations are on the citrus leaf miner (*Phyllocnistis citrella*, Lep. Gracillariidae) with the focus on biological control.

Integrated Production in Europe: 20 years after the declaration of Orrannaz - 1998 - Boller E., J. Avilla, J.P. Gendrier, E. Jörg & C. Malavolta (eds.). Vol. 21(1). 41 pp. As indicated by the subtitle, this volume is a follow-up of the monumental concept publication by H. Steiner *et al.* 20 years ago. Apart from short historical overviews by WPRS members with a perennial background the focus of the publication is on IP as part of sustainable farming. Also the importance of market trends and the need for credibility through inspection according to the « IP-declarations » are stressed.

Integrated Control in Viticulture - 1998 - Blaise P. (ed.). Vol. 21(2). 109 pp. This is a proceedings volume from a WG meeting held at Gödöllő, Hungary, 4-6 March, 1997. The content is approximately equally distributed on diseases and pests. Among the presentations on diseases, almost half are on *Plasmopara viticola*, while the grape berry moth (*Lobesia botrana*) was dealt with in half of the presentations on pest insects. Agrometeorological aspects have been presented within both areas, while attempts towards Integrated Production are mainly carried by the entomological presentations.

WORKING GROUPS (WG)

WG QUALITY CONTROL of MASS-REARED ARTHROPODS

Chairman: Dr. N.C. Leppla, University of Florida, Institute of Food and Agricultural Sciences, 2807 Binion Road, Apopka FL 32703, USA.

Tel: 00-1-407-884-2034,

Fax :00-1-352-392-9359

e-mail: NCL@icon.apk.ufl.edu.

Co-chairman: Dr. M. Benuzzi, INTRACHEM Italia SRL., Via XXV Aprile 44, 24050 Grassobio (Bergamo), Italy.

Fax: 00-39-35-33-53-34.

A meeting of the Working Group on Quality Control of Mass-Reared Arthropods (WGQC) was held at the International Center for Tropical Agriculture (CIAT) near Cali, Colombia on March 1-7, 1998. The venue was ideal with superb meeting rooms, simultaneous English/Spanish translation, lodging on site and agricultural excursions to see augmentation biological control practiced by local growers. About 50 participants registered, representing 14 countries. The session topics were introduced by the leaders, followed by submitted papers, and concluded with group discussions. The goal was to capture the consensus of the group relative to the status, needs and action on each topic.

The opening session included welcome addresses by representatives from CIAT, the Corporacion Colombiana de Investigacion Agropecuaria (CORPOICA), Universidad Nacional de Colombia - Sede Medellin and Sede Palmira, Comercializador a Internacional de Insumos Biologicos (COINBIOL). This was followed by an introduction to the QC workshop, « Roots and Traditions of the IOBC Global Working Group on Quality Control of Mass-Reared Arthropods », by Dr. N.C. Leppla. He emphasised three current goals for the WGQC:

(1) institutionalise QC in arthropod mass rearing, (2) provide workable regulations for commercial natural enemies, and (3) assure the efficacy of artificially-reared natural enemies.

Session I was « Quality Control in Sterile Insect Technique Programmes » conducted by Dr. T.R. Ashley and Dr. R. Nguyen. They emphasised quality control monitoring and decision-making to improve rearing processes, particularly a team approach with participation by top management. Important new data were presented on significantly increased control of the Mediterranean fruit fly, *Ceratitis capitata* (Wied.), that resulted from releasing only sterile males. Session II was « Biological Control in Protected Cultures, New Markets for Efficacious Natural Enemies », led by Dr. L.S. Osborne. He presented a paper, « Biological Control of Pests Attacking Ornamental Foliage in Florida », described the importance of pesticide resistance management in the use of natural enemies, and emphasised the need for practical biological control technologies for growers. Since, natural enemies often do not achieve the expected level of control, particularly if there is a shipping problem, more parasites and predators should be available locally and standards should be established for their quality. Session III was « Quality Control in *in vitro*-Reared Natural Enemies » co-chaired by Dr. P.D. Greany and Dr. S. Grenier. They discussed the importance of basic research, particularly the development of artificial diets to reduce production costs. Fecundity must be increased with no reduction in searching for natural prey. During this session, a proposal was approved by the participants to amalgamate the WGQC with an emerging group that is promoting

the development of *in vitro* rearing techniques for parasitoids and predators. The combined group will emphasise both the rearing of arthropods and associated quality control. The working group will shift from regulatory issues back to research, and link quality control more directly to the underlying rearing techniques. Everyone will benefit by combining resources to achieve mutual goals. Dr. D.A. Nordlund chaired Session IV, « Quality Control for *Trichogramma* and Other Parasites and Predators », that was designed to make a transition from the WGQC sessions to the Working Group on Egg parasitoids. Considerable new information was contributed by the participants on taxonomy, colony establishment, host preference, searching behaviour, temperature tolerance, and parameters associated with quality.

Many very generous sponsors and other colleagues helped to make the workshop a tremendous success. The organisers and participants especially thank CORPOICA, CIAT, the Universidad Nacional de Colombia - Sede Medellin and Sede Palmira, COINBIOL, the (German) Federal Biological Research Centre for Agriculture and Forestry, the USDA and its National Biological Control Institute, the University of Florida, and Dr. F. Garcia Roa and her local arrangements committee. The papers from the Cali workshop will be published in a special Bulletin of the Biological Research Centre, Germany.

Dr. N.C. Leppla

WG BIOLOGICAL CONTROL of PLUTELLA

Co-chairman: Dr. A.M. Shelton, Department of Entomology, Cornell University, New York State Agricultural Experimental Station, 416 Barton Lab Geneva, NY 14456, USA.

Tel: 00-1-315-787-2352,

Fax: 00-1-315-787-2326

e-mail: ams5@cornell.edu.

Co-chairman: Dr. A. Sivapragasam, Strategic, Environment and Natural Resources Centre, MARDI, GPO Box 12301, 50774, Kuala Lumpur, Malaysia.

Fax: 00-60-3-948-7639

e-mail: sivasam@mardi.my.

Co-chairman: Dr. D.J. Wright, Department of Biology, Imperial College at Silwood Park, Ascot, Berkshire SL5 7PY, UK.

Fax: 00-441-34-429-4339

e-mail d.wright@ic.ac.uk.

The discussion within the WG is regularly done using a mailing list for biological control activities of *Plutella* and more than a hundred people are participating. There is a list-serve for *Plutella* (plutella@uidaho.edu) and the construction of a web is under discussion. This web site could contain annual, brief updates on activities and a list of recent publications. It could also contain names and addresses of people working on biological control of *Plutella*. For any comments or question on this, please contact Dr. A.M. Shelton.

Using the mailing list, several participants suggested that a questionnaire can be prepared in order to allow all participants to better understand who is working on what, as well as what are the critical questions on biological control of *Plutella*. Included in this could be a request for an inventory of natural enemies (who has what species) as well as what research and extension activities are underway. The development of this questionnaire will be one of our upcoming activities of the WG. Please contact A.M. Shelton for any idea on this.

The proceedings of the last *Plutella* workshop which was held in Malaysia in October 1996 have been published. For receiving a copy, contact

Dr. Sivapragasam (sivasam@mardi.my). During a symposium on biological control that will be held in Malaysia in March 1999 (see <http://www.cabi.org/> for further details on the symposium), Dr. Siva is planning to convene a small meeting of the WG on *Plutella* to capitalise on the presence of Dr. J. Waage, president of the IOBC who will be keynote speaker at the symposium. The meeting will be useful to gauge interest and discuss activities relevant to the tropics.

A.M. Shelton

The REDCAHOR (Red Colaborativa para el Desarrollo e Investigacion de Hortalizas en America Central, Panama y Republica Dominicana) is financing a project at Zamorano to study reproductive crosses between *Diadegma insulare* and *Diadegma semiclausum*. These studies are preliminary to the possible release of the exotic *D. semiclausum* in Central America, Panama and the Dominican Republic in order to predict any possible negative effects of the release of the parasitoid on populations of the native *D. insulare*. Additional studies of the project will compare electrophoretic banding patterns for the two species so as to definitively identify field-collected individuals (should *D. semiclausum* be released) which are difficult to distinguish morphologically or detect possible hybridisation.

R. Cave, Zamorano, Honduras

A project is organised by GTZ IPM Horticulture Project. This project concerns DBM activities and collaborative studies with NRIS on seasonality of DBM and an inventory of its natural enemies were

carried out in Kenya, Malawi, Mozambique, Tanzania, Uganda and Zimbabwe in 1995-1997. Several species of natural enemies were recorded but their potential efficiency is yet to be determined. In addition, collected *Diadegma* cannot be classified to species level due to inadequate knowledge of the genus. GTZ IPM/ICIPE have submitted a proposal to study functional agrobiodiversity of DBM natural enemies in Eastern and Southern Africa. It includes knowledge of the biodiversity of the natural enemy complex, taxonomy of *Diadegma* sp., comparative fitness of indigenous/exotic species, and possible biocontrol of DBM.

Dr. A.A. Seif

A DBM research project in Japan is currently financed by the division of plant protection, Ministry of Agriculture, Forestry, and Fisheries. Biocontrol of DBM with *Trichogramma* parasitoids is being performed, but there are high costs for mass production. Additionally, other crucifer pests like *Pieris rapae*, which is not heavily parasitized by *Trichogramma*, cause problems even when DBM can be controlled. Currently, use of Bt seems to be the most reliable control tactic, but there is concern about the build-up of resistance.

Dr. Kazuo Hirai, Japan

An article has been recently published on the origin of DBM based on its associated parasites (*Annals of the Ent. Soc. of America*, Vol. 91, No. 2). studies are still underway to determine crop preference, seasonality, incidence of parasitism and relative abundance of the various parasitoids, the effect of parasitism on DBM populations, economic threshold levels, and tritrophic interactions between the crucifer plants, DBM and parasitoids.

Dr. R. Kfir, South Africa

Chinese are currently working on interspecific interactions between *Cotesia plutella* and *Oomyzus sokolowskii*. They have determined that

Oomyzus very rarely parasitizes DBM larvae already attacked by *Cotesia*, when the latter is in the egg to early larval stages. However, old and mature larvae of *Cotesia* inside DBM larvae can be parasitized by *Oomyzus*, and the older the braconid larva, the higher the probability of the larva will be parasitized. Thus, *Oomyzus* is a facultative hyperparasitoid of DBM. Wasps of *Oomyzus* have also frequently been reared out of cocoons of *Cotesia* collected from the field in Hangzhou, China. In a joint study supported by the Australian Centre for International Agricultural Research, Liu Shu-sheng (Zhejiang Agricultural University, China), R. Llewellyn (BioResources, Toowoomba, Australia), and J. Duff (CRC for Tropical Pest management, Australia) recently demonstrated that *Trichogramma pretiosum*, which was introduced from the States in the 70's, is now well established in Queensland, Australia, and seems to contribute significantly to the mortality of DBM eggs. In a 4-hr laboratory test, one strain of *T. pretiosum*, two strains of *Trichogrammatoidea bactrae*, all collected from Australia, parasitized on average 20.5, 19.7, 20.5 DBM eggs per female wasp, respectively. These results suggest that all three parasitoid strains can parasitize large number of DBM eggs under suitable conditions and should be evaluated further for their potential as biocontrol of DBM.

Dr. Liu, China

WG FRUIT FLIES of ECONOMIC IMPORTANCE

Chairman: Dr. M. Aluja, Instituto de Ecología, A.C., Departamento de Ecología y Comportamiento Animal, Apartado Postal 63, Xalapa, Veracruz, Mexico 91000.
Tel: 00-52-28-186000
Fax: 00-52-28-121897
e-mail: aljam@sun.ieco.conacyt.mx.
Co-chairman: J. Piedade Guerreiro, Div. Luta Biol., Inst. Invest. Cient.

Trop., Junqueira 14, 1300 Lisboa, Portugal.

Fax: 00-351-364-20-08.

Co-chairman: B.A. McPheron, Dept. Entomology, 501 ASI Bldg, Pennsylvania State University, Univ. Park, PA 16802, USA.

Tel: 00-1-814-865-3088

Fax: 00-1-814-856-3048

e-mail: bam10@psu.edu.

Dr. M. Aluja decided to quit as a Chairman of the WG. The new chairman will now be Dr. B.A. McPheron. Dr. Aluja was very active in the WG. IOBC wants to thank him and wishes all the best for his future activity. We also want to welcome Dr. B.A. McPheron as the new chairman and hope that the new duties will bring him satisfaction and success.

International Symposium on Phylogeny and Evolution of Fruit Fly (Diptera: Tephritidae) Behaviour

The meeting took place in Xalapa, Veracruz, Mexico at the Headquarters of the Instituto de Ecología, A.C. from February 16 to 21, 1998. M. Aluja and A. Norrbom were the convenors. The meeting was sponsored by the IOBC, the Mexican Campaign against Fruit Flies, the U.S. Department of Agriculture - Office of International Cooperation and Development (USDA-OICD), the Mexican Academy of Sciences, the Mexican Council on Science and Technology (CONACYT) and the Instituto de Ecología, A.C. 34 participants came from 12 countries (Australia, Austria, Brazil, Costa Rica, Belgium, England, Israel, Korea, Mexico, Switzerland, Ukraine, USA), and all of them (singly or in groups) will contribute to a chapter for a book to be published by CRC Press during 1999 (see below).

Given their economic importance, the study of fruit flies (Diptera: Tephritidae) has been traditionally biased towards applied aspects (*e.g.*, management, monitoring, mass rearing). Nevertheless, their ecological and behavioural plasticity render them ideal study objects to

address basic biological and evolutionary questions of general interest to a wide audience. Fruit flies have been used as models for the development of general theories on, for example, speciation processes, mating behaviour and demography. This symposium represented the first attempt ever to formally discuss the evolution of fruit fly behaviour and at the same time review the state of the art in the areas of phylogeny and behaviour. Such an approach (*i.e.*, use of phylogenetic tools to understand behaviour) is becoming widely accepted in the study of animal behaviour. We are therefore confident that this meeting and the resulting book will both bridge an important information gap in a highly visible group of insects and also serve as a blueprint for basic and applied behavioural research on fruit flies and other organisms in the coming years.

As a result of the meeting a book will be published by CRC Press during 1999. The book is intended to become a general reference and will thus review past and present work and, at the same time, place special emphasis on future directions of research. Authors have been asked to make an effort to present novel, unpublished results and to try to foster the conceptual advancement of the field. It will be divided into an introduction and eight sections. Since we will be truly covering new ground, we have invited Dr. K. Kaneshiro to write an introduction summarising the work on an unrelated group of flies (*Drosophila*), in which phylogenetic relationships are better established and the evolution of behaviour fairly well understood. Dr. Kaneshiro has also had ample experience with tephritid flies (true fruit flies) and this makes him the ideal person to lead the way for all other authors with a « worked-out » example of what can be done. Section I is intended to serve as a general conceptual and methodological reference source. Chapters here will provide overviews on the classification, morphology, phylogeny, evolution and behaviour of the Tephritidae.

Importantly, authors will attempt to standardise terminology (an urgent need) and provide glossaries of terminology that should be used in the study of fruit fly behaviour. Section I will also contain a stage-setting chapter by S. Berlocher, bridging the gap between genes, behaviour and speciation. Finally, this section also contains a chapter by Dr. R. Heath of great basic and applied interest: Sexual pheromones in tephritid flies. Dr. Heath has been generating very interesting information on the chemical characterisation of the sexual pheromones of several species in the genus *Anastrepha*. This information, coupled with the previous reports on a few species of the same genus and other genera, could become a key element to support our efforts at elucidating phylogenetic relationships in fruit flies. The fact that it will be published for the first time in this book will no doubt render this chapter one of the most cited pieces of work on fruit fly chemical ecology. The remainder of the book will be subdivided into seven sections, each covering an important group of flies, and a final section covering the evolution of behaviour of fruit flies. Sections II to VII cover the phylogeny and behaviour of the Phyltalmiinae (e.g., *Phyltalmia*, *Blepharoneura*), Toxotrypanini (e.g., *Anastrepha*, *Toxotrypana*), Carpomyina (e.g., *Rhagoletis*, *Carpomya*, *Zonosemata*), Dacini (e.g., *Monacrostichus*, *Bactrocera*, *Dacus*, *Ceratitidis*), Trypetini, and the Tephritinae. The subdivision into these groups follows the most recent classification by Norrbom *et al.* (in press, 1998) and lends itself to a well organised treatment of the main topic. We note that all the chapters in these sections will be written by highly renowned researchers, most of whom have a very broad understanding of evolutionary biology. We also note that no phylogenies have previously been published for most of these groups (which include the economically important genera *Anastrepha*, *Bactrocera*, *Ceratitidis* and *Toxotrypana*). The book will end with

chapters on the evolution of feeding, oviposition and mating behaviours (Section VIII) and a chapter by Dr. P. Cayol addressing a highly applied aspect of fruit fly behaviour: the changes in behaviour generated by inadvertent artificial selection during mass rearing of certain economically important species (e.g., *Ceratitidis capitata*, *Bactrocera cucurbitae*, *Bactrocera dorsalis*, *Anastrepha ludens*). Framing such findings within an evolutionary perspective will be of great value to action programmes whose technical personnel usually lack the proper theoretical background to understand the underlying mechanisms behind such a phenomenon, and to allow them to design proper schemes to monitor and avoid it.

Dr. M.S. Aluja

5th International Symposium on Fruit Flies of Economic Importance

This meeting was held 1-5 June, 1998, in Penang, Malaysia. The theme was « Current Global Scenario » and attracted over 200 scientists from over 40 countries. The fact that the first two days of the symposium overlapped with an FAO/IAEA-sponsored « International Conference on Area-Wide Control of Insect Pests Integrating the Sterile Insect and Related Nuclear and Other Techniques » increased the exchange of information beyond just the fruit fly community. Each day consisted of a mix of platform presentations providing overviews of recent advances in the major areas of fruit fly research and action programs with poster presentations on related topics. Although the days were full, there was ample opportunity for interaction with colleagues on areas of mutual interest. Important advances on several topics were discussed at this symposium. Among the more significant new research was information on traps and attractants, a description of advances in genetic understanding of fruit flies, both for manipulating the genome of tephritids and for understanding population structure,

and vital studies of basic biology of pest fruit flies. The use of genetic sexing strains of Mediterranean fruit fly in field situations was also discussed during the meeting. In all, the amount of new information presented was quite exciting. If research continues at the present pace, then the 6th Symposium, to be held in 2002 in South Africa, should be a very useful meeting.

Dr. B.A. McPherson, New chairman of the WG

WG ECOLOGY of APHIDOPHAGA

Chairman: Dr. D.J. Horn, Department of Entomology, Ohio State University, 1735 Neil Ave., Columbus OH 43210, USA.

Fax: 00-1-614-292-2180

e-mail: horn.1@osu.edu.

Co-chairman: Dr. J.-L. Hemptinne, Faculté Univ. des sciences agronomiques, Zoologie générale et appliquée, Passage des Déportés, 2, B-5030 Gembloux, Belgium.

Co-chairman: Dr. P. Wellings, CSIRO Division of Entomology, GPO Box 1700, Canberra, ACT 2601, Australia.

Dr. J.-L. Hemptinne & P. Wellings have been designated as new co-chairmen for the WG. IOBC welcomes them, and we hope that the new duties will give you satisfaction and success.

« Aphidophaga VII »

The next International Congress, « Aphidophaga VII », will be organised in Montreal, Canada, August 31st - September 4th, 1999. Sessions are being organised to cover different issues of the ecology of aphid predators and parasitoids and their utilisation in Biological Control programmes. Invited world authorities will discuss the functional ecology of parasitoids (Symposium I) and the ecology of coccinellids (Symposium II). Platform

and poster papers will be presented in one of the three following sessions: (1) Ecology of aphid parasitoids, (2) Ecology of aphid predators, and (3) Biological control of aphids.

The conference will be held at the Ecological Center of Université du Québec à Montréal, situated 200 km North of Montréal, in the boreal forest, on the shore of a beautiful Laurentian lake. Conference room, modern facilities, restaurant and sport activities will be available on the site. Because the closest village is 30 km from the Center and the neighbours generally run on four legs or fly, casual clothes should be favoured. Lodging, meals and conference activities will all take place at the Center. Facilities can be offered to a maximum of 120 participants.

Regularly updated details about the conference will be available on the Web, beginning August 15th, 1998 at the following web site: <http://www.er.uqam.ca/nobel/labsce/nv/aphidophaga.htm>. Only participants specifically requesting further conventional mail correspondence will receive the second announcement by mail, all others are asked to visit the Web site. As places are limited to 120 participants, priority will be given to members of the IOBC authors or co-authors of a paper.

Those interested in offering a paper should complete the « Offer of a paper » form on the web page and return it as soon as possible. Alternatively, papers can be offer

electronically by e-mail at: coderre.daniel@uqam.ca.

Authors must provide an informative provisional title, should indicate the session to which they are offering their paper and also whether it is proposed as a platform or poster presentation. Forms should be sent to the Conference secretariat before October 31st, 1998.

The detailed provisional programme, accompanied by full registration details, will be available in January 1999. For further information, please contact: Dr D. Coderre, Aphidophaga VII, Département des sciences biologiques, Université du Québec à Montréal, C.P. 8888 Succ. Centre-ville, Montreal, Quebec, Canada H3C 3P8.

Fax: 00-1-514-987-4647

e-mail: coderre.daniel@uqam.ca

D. Coderre, Université du Québec à Montréal

WG CHROMOLAENA ODORATA

Chairman: Dr. R. Muniappan, Agricultural Experimental Station, University of Guam, Mangilao, Guam 96923 USA.

Fax: 00-1-671-734-6842

e-mail: rmuni@uog9.uog.edu.

The Working Group held the 4th International Workshop on Biological Control and Management of *Chromolaena odorata* in Bangalore, India, in October 1996. The proceedings, with full text of all papers, recommendations, country reports and technical sessions, edited by P. Ferrar, R. Muniappan & K.P. Jayanth, can be obtained from Dr. A. Krishnamurthy, Indian Institute of Horticultural Research, Hesaraghatta Lake Post, Bangalore 560089, India e-mail: IIHR@x400.NICGW.NIC.IN), at \$15.00 per copy.

Chromolaena odorata Newsletter # 12 (1998). For copies, please contact: Dr. R. Muniappan (see address above).

The fifth International workshop on *Chromolaena odorata* is scheduled to be held in South Africa in 2000.

R. Muniappan

WG EGG PARASITIDS

Chairman: Dr. F. Bin, Agricultural Entomology Institute, University of Perugia, Borgo XX Giugno, 06121 Perugia, Italy.

Tel: 00-39-75-585-6030

Fax: 00-39-75-585-6039

e-mail: fbin@ege.unipg.it.

Co-Chairman: Dr. E. Wajnberg, INRA, Unité de Biologie des Populations, 37 Blvd. du Cap, 06600 Antibes, France.

Tel: 00-33-04-93-67-88-92

Fax: 00-33-04-93-67-88-97

e-mail: wajnberg@antibes.inra.fr.

Co-Chairman: Dr. S.A. Hassan, Institute for Biological Pest Control, Heinrichstr. 243, 64287 Darmstadt, Germany.

Tel: 00-49-6151-407223

Fax: 00-49-6151-407290

e-mail :

s.hassan.biocontrol.bba@tonline.de.

5th International Symposium on « Egg Parasitoids »

The symposium was held at the « Centro Internacional de Agricultura - CIAT » in Cali, Colombia, March 4 to 7, 1998, under the Sponsorship of: (1) CORPOICA - Corporacion Colombiana de Investigacion Agropecuaria, Dr. Fulvia Garcia Roa led the organisation committee, (2) Universidad Nacional de Colombia - Sede Medellin, (3) Universidad Nacional de Colombia - Sede Palmira, (4) COINBIOL - Comercializadora Internacional de Insumos Biológicos, and (5) Smurfit Carton de Colombia.

Colombia is one of the leading countries for the mass production and utilisation of *Trichogramma*. Visits to several commercial egg parasitoid producers and releasing sites supported the scientific programme of the Symposium. The IOBC Working Group « Quality Control of Mass-Reared Arthropods », chaired by Dr. N. Leppla, held its workshop at the same location in March 2 to 4, 1998. A joint section on the quality control of mass-reared egg parasitoids pro-

vided opportunity for information exchange between members of the two groups.

Simultaneous translation provided excellent opportunity to exchange ideas between Spanish and English speaking colleagues. With 64 participants from 21 countries, the meeting included oral contributions of high scientific value. Sections on the following topics were held: (1) Biosystematics & genetics, (2) Host relation & biology, (3) Physiology & behaviour, (4) Ecology & population dynamics, (5) Rearing (*in vivo* & *in vitro*), production & release, (6) Compatibility (environmental, biological, chemical), (7) Effectiveness & assessment.

Thanks to the efforts of the organisation committee, the meeting was successful and pleasant. The conference hall at CIAT, equipped with modern facilities, the accommodation, restaurants and swimming pool, all in one, at CIAT were excellent and provided needed comfort.

The proceedings are now under preparation. They will be published this year in Germany in « Mitt. Biol. Bundesanst. Land-Forstwirtschaft. », Berlin-Dahlem (Vol. # 356). They should be released before the end of the year. Then, they can be ordered from any book store. Participants of the Symposium will receive a free copy.

« Egg Parasitoids News »

The 10th issue has been distributed in July 1998. It includes events, abstract of current research, news in 30 words, scientific problems, commercial use, natural distribution of egg parasitoids, list of recent publications and list of members. The electronic version will be distributed in the future on a Web site.

Dr. S.A. Hassan

Next International Symposium on « Egg Parasitoids » in 2000 in Brazil

A proposal for a Symposium on « Egg Parasitoids » has been sent to the organisers of the next (XXIst) International Congress of Entomology that will be organised in Foz do Iguaçu, Brazil, in 2000. This pro-

posal has been taken into account and the Symposium will likely be included, together with 13 other Symposia, in Session 8 entitled « Entomophagous Insects and Biological Control ». More information on this will be provided within the next IOBC Global Newsletter.

Dr. F. Bin

WG IWGO - OSTRINIA AND OTHER MAIZE PESTS

Chairman: Dr. H.K. Berger, Federal Office and Research Center for Agriculture, Institute for Phytomedicine, Spargelfeldstr. 191, P.O.B. 400, 1226 Vienna, Austria. Fax: 00-43-1-28816-5225 e-mail: hberger@relay.bfl.gv.at.

Meetings, workshops

Since the last meeting in Turda, September 1995, the following meetings took place:

September 1997: XIXth IWGO Meeting in Braga (Guimaraes), Portugal. The meeting was attended by about 40 participants from more than 16 countries (world-wide). It was honoured by the presence of the Deputy Minister for Agriculture of Portugal. October 1997: Meeting of the IWGO Subgroup « *Diabrotica* » in Goedoelloe, Hungary (together with FAO and EPP0). Altogether, about 80 participants from 9 countries were present.

Publications

The Working Group released several publications, partly with the support of Global IOBC:

The following issues of the IWGO-Newsletter were released: XVII-1-2, October 1997; and XVIII-1, May 1998. Moreover, the following abstracts or proceedings were (or will be) edited:

Abstracts and Proceedings of the XIXth IWGO Meeting in Braga (Guimaraes), Portugal.

Abstracts of the Subgroup Meeting « *Diabrotica* » in Goedoelloe, Hungary. Papers presented at this Subgroup Meeting are currently in press

in a special issue of « Pflanzenschutzberichte ».

Major results - Progress achieved

The FAO - research programme, together with the IWGO and EPP0, is still running this year. *Diabrotica* monitoring will take place in Hungary, Croatia, Bosnia & Herzegovina, Romania, Bulgaria and for the first time also in Austria and Slovakia. Together with IIBC, biological possibilities of control will be checked and evaluated.

The next meetings of the IWGO (*Diabrotica* - Subgroup) will take place in October 28-29, 1998, in Rogaska Slatina, Slovenia. The general IWGO meeting will be in September 4-9, 1999 in Adana, Turkey.

Dr. H.K. Berger

WG WATER HYACINTH

Chairman: Dr. H.G. Zimmermann, Agricultural Research Council, Plant Protection Research Centre, Weeds Research Division, Private Bag X134, Pretoria 0001, South Africa.

Tel: 00-27-12329-3276

Fax: 00-27-12329-3278

e-mail:

RIETHGZ@PLANT2.AGRIC.ZA.

Meeting for the biological and integrated control of water hyacinth

Water hyacinth is the world's worst aquatic weed in all tropical and subtropical regions with Africa most severely affected. Millions of dollars are spent annually for its control. The purpose of this workshop is to collate and help disseminate information on the weed, its biological and integrated control and most of all, to identify areas of research that may lead to improved control. Everyone is thus invited to participate to the meeting that will be held in Harare, Zimbabwe, 16-19 November 1998.

Delegated who intend to participate in the workshop must please send

their titles and abstracts in English or French not later than 31 July 1998 to: Dr. M. Hill, Plant Protection Research Institute, Private Bag X 134, Pretoria 0001, South Africa, Fax: 00-27-12-329-3278

e-mail:

RIETMH@PLANT2.AGRIC.Z.

Titles and abstracts will appear in the workshop programme.

The abstract (including the title, author(s) and affiliation(s)) should not exceed 250 words and should be sent electronically, preferably in MSWord format. If the necessary facilities are not available a typed version can be faxed or posted to the above address.

The registration allows attendance of the workshop and will include three lunches and teas, a workshop

programme, the published proceedings and an excursion to Lake Chivero. It does not include accommodation and transport to and from the airport/hotel. Deadline for registration is 31 July 1998. The Registration fee is US\$ 130 and should reach the organisers not later than 31 August 1998. Registration fees should be sent to: IOBC WH Workshop. REF B19942, Plant Protection Research Institute, Private Bag X134, Pretoria 0001, South Africa, Standard Bank. Arcadia, branch 0845; acc 011 290692.

Delegates are encouraged to stay in the St Lucia Park Hotel in Crichton Ave, Marlborough, Harare, which will also be the venue for the workshop meeting. The special discount rate for delegates attending the workshop is US\$ 46 p.p for B & B and US\$ 40 p.p when sharing.

Please make your own reservation at: Tel: 00-263-4-301895, Fax: 00-263-4-301989. A 50% deposit is required to confirm your booking.

For help and further information contact: Mr. G. Chikwenhere, Plant Protection Research Institute, P.O. Box CY 550, Causeway Harare. Fax: 00-263-4-700339,

Tel: 00-263-4-706650, e-mail: plantpro@harare.iafrica.com

Transport from and to the airport/hotel is offered by the hotel at US\$ 10 p.p (one way) sharing and should be arranged in advance with the hotel management or with Mr. Chikwenhere.

Provisions are made for oral contributions and posters in the language of your choice but preferably English. Ample time will be available for discussions. The discussions will also be minuted. Contributions on the following topics are welcome: (1) biological control (new agents, rearing and releasing techniques, post release evaluation, biology and ecology of biocontrol agents, mycoherbicides), (2) integrated control, (3) management plans, (4) threshold levels, (5) technology transfer and (6) community involvement.

Participants will be requested to hand in copies of their contributions to the editor of the proceedings, Dr. M. Hill, at the workshop. For guidelines for the presentations and instructions to authors for submission of manuscripts, please contact: Dr. H. Zimmermann (Organiser), (see address above).

Dr. H. Zimmermann

SCIENTIFIC EVENTS

« **XXV International Horticultural Congress** ». 2-7 August 1998, Brussels, Belgium. Organised by the International Society for Horticultural Science (ISHS) and the Benelux. Four major themes will be treated: (1) Cultural techniques, with emphasis on environmental implications (with sub-themes: « Sustainable disease and pest control » and « Integrated and biological production methods »), (2) Quality of horticultural products, (3) computer and automation, and (4) Application of biotechnology and molecular biology. For information, contact: Mr. H. Wilcox, Secretary

25th IHC, c/o Ministry of SME and Agriculture, Bolwerklaan 21, 15th floor, B-1210 Brussels, Belgium. Fax: 00-32-2-206-7209 e-mail: 25ihc@tornado.be.

« **IV International Bioherbicide Workshop** ». August 6-7, 1998. University of Strathclyde, Glasgow, Scotland, UK. Organised as a satellite meeting to the 7th International Congress of Plant Pathology in Edinburgh (9-16 August 1998, see below). The workshop will be held at the campus of the University of Strathclyde in Glasgow. For information, contact: Dr. M. Burge,

Department of Bioscience & Biotechnology, University of Strathclyde, The Todd Centre, Taylor Street, Glasgow G4 0NR, UK, Tel: 00-44-141-548-3626, Fax: 00-44-141-553-4115 e-mail: m.n.burge@strath.ac.uk.

« **7th International Congress of Plant Pathology** ». August 9-16, 1998. Edinburgh, UK. The radical new program structure has been designed to match new perception of modern plant pathology. It has just five themes: (1) understanding plant-pathogen interactions, (2) population biology, ecology and epidemiology (including ecological

basis of biological control), (3) plant pathology in practice (including molecular approach to biological control strategies), (4) global perspectives, and (5) new control options (including biological control, genetic manipulation and novel approaches to the use of pesticides). Deadline for registration: April 30, 1998. For information, contact: C. Goff, S. Ure, Congress Secretariat, 7th International Congress of Plant Pathology, c/o Meeting Makers Ltd, 50 George Street, Glasgow G1 1QE, Scotland, UK, Tel: 00-44-141-553-1930 Fax: 00-44-141-552-0511 e-mail: iccp98@meetingmakers.co.uk, <http://www.bspp.org.uk/icpp98>.

« **6th International Mycological Congress** ». August, 23-28, 1998. Jerusalem, Israel. For information, contact: 6th International Mycological Congress, Secretariat, PO Box 50006, Tel Aviv, 61500, Israel.

« **VIIth International Colloquium on Invertebrate Pathology and Microbial Control** » & « **IVth International Conference on *Bacillus thuringiensis*** ». August 23-28, 1998, Therme International Hotel, Sapporo, Hokkaido, Japan. For information, visit the websites: <http://shin.agr.hokudai.ac.jp> or <http://sip.home.ml.org>, or contact: Toshihiko Iizuka. Chair, Local Organising Committee, Faculty of Agriculture, Hokkaido University, Sapporo 060, Japan Tel. & Fax: 00-81-11-706-2423. e-mail: tiizuka@abs.agr.hokudai.ac.jp.

« **1st Argentine Congress on Biological Control of Plant Diseases** ». October 5-8, 1998. Circulos Oficiales de Mar, Sarmiento 1867, Capital Federal, Argentina. Organised by the National Institute of Agricultural Technology (INTA) and the University of Buenos Aires (UBA). Three themes will be discussed: (1) Components of Biological Control in different pathosystems: crops and storage, (2) Development of biological products and

application technology, and (3) Integrated disease management. For more information, contact: Ing. Agr. E.R. Wright, Executive Secretary, 1st Argentine Congress on Biological Control of Plant Diseases, Av. San Martin 4453, (1417) Capital Federal, Republica Argentina.

« **Regional Symposium for Applied Biological Control in Mediterranean Countries** ». October 25-29, 1998. International Center of Agriculture in Cairo Nady El Seid Street, Dokki, Cairo, Egypt. The symposium will include: (1) Opening plenary sessions, (2) Plenary sessions for the presentation and discussion of papers, (3) Poster sessions, (4) Workshops organised by theme, and (5) A closing session for the symposium's conclusions. Organised by the Center of Biological Control, Faculty of Agriculture, Cairo University, and by the Ministry of Agriculture in Egypt. For information, contact: Prof. M.F.S. Tawfik or Dr. S.A. El Arnaourty, Center of Biological Control, Faculty of Agriculture, Cairo University, Giza, Egypt. Tel: 00-20-2-5695686 Fax: 00-20-2-5695686 e-mail: lec@brainy1.ie-eg.com.

« **The 1998 Brighton Conference. Pests & Diseases** ». November 16-19, 1998, Brighton, UK. This year's conference features Pests & Diseases. Over the three days of the conference there will be: (1) 20 platform sessions consisting of invited and offered papers, (2) 10 poster presentation sessions, and (3) two evening sessions. Sessions will cover a range of pest and disease issues, including pest and disease management on temperate, subtropical and tropical crops. The effect of climate change will also be featured, as will advances in biotechnology, resistance and innovative methods of pests and disease management. For more information, contact: The 1998 Brighton Conference Secretariat, 8 Cotswold Mews, Battersea Square, London SW11 3RA, UK. Tel: 00-44-171-228-8034

Fax: 00-44-171-924-1790
e-mail: eventorg@event-org.com,
URL: <http://www.bcpc.org>.

« **XIVth International Plant Protection Congress** ». July 25-30, 1999, Jerusalem, Israel. Plant protection towards the third millennium - Where chemistry meets ecology. The congress will be dedicated to the memory of Prof. D. Rosen. The organising committee in proposing nine main topics: (1) IPM toward the 3rd millenium - Progress in strategies and technologies, (2) IPM implementation programs, difficulties and achievements, (3) Ecological issues in plant protection, (4) Biotechnology in plant protection, (5) Resistance to pesticides: Evolution and management, (6) Innovative approaches in pesticide chemistry and chemical ecology, (7) Technology for optimisation of pesticide application, (8) Regulations and risk assessment, and (9) eco-toxicology and fate of pesticides in the environment. For information, contact: XIVth International Plant Protection Congress, Congress secretariat,, P.O. Box 50006, Tel Aviv 61500, Israel. Tel: 00-972-3-514-0000 Fax: 00-972-3-514-0077 e-mail: IPPC@Kenes.com.

« **XXI International Congress of Entomology, 2000** ». Foz do Iguacu, Brazil. For further information, contact: c/o Dr. D.L. Gazzoni, Caixa Postal 231, 86001-970 Londrina-PR, Brazil. Tel: 00-55-43-3716213 Fax: 00-55-43-3716100 e-mail: gazzoni@cnpsso.embrapa.br. « **Vedalia II** » meeting is being

planned and will try to coincide with the Western Hemisphere Biological Control meeting. Meeting

tentatively planned for 2000 in Bozeman, MT, USA. Contact: Dr. T. Kring, President of the IOBC/NRS, for more information.

BOOKS

« **Microbial Control of Grasshoppers and Locusts** ». M.S. Goettel & D.L. Johnson (eds.). *Memoirs of the Entomological Society of Canada* Volume 171. Release date: November, 1997. This new publication summarises the current state of knowledge on microbial control of locusts and grasshoppers. It presents important research information, and identifies areas for future research. It is an essential reference for students, researchers, and extension workers and consists of 24 chapters comprising some 400 pages written by 51 authors from 11 countries. Seventeen chapters are reviews and eight report research findings. The publication can be obtained by sending a cheque or money order for \$45 Can. (for residents of Canada) or \$45 US. (for residents of USA or elsewhere) to: Entomological Society of Canada, 393 Winston Ave., Ottawa, Ontario, K2A 1Y8. Cheques or money orders should be made payable to the Entomological Society of Canada. Payments can also be made by credit card. Prices include shipping, handling and taxes.

Publication inquiries can be made by phone:
Tel : 00-1-613-725-2619
fax: 00-1613-725-9349 or
e-mail: entsoc.can@sympatico.ca.

« **Ladybeetles of the Russian Far East** ». 1997. V.N. Kuznetsov, Center for Systematic Entomology; Gainesville, Florida USA. *Memoir* 1, 248 pp. ISBN 1-877743-25-5. This book was published in English thanks to a facilitation grant from the National Biological Control Institute, USDA-APHIS. It provides keys, species descriptions, illustrations (drawings), and some information on food and behaviour of the coccinellid species of the Russian Far East. It includes a history of use of these species in biological control. \$58 per copy, \$1.65 postage and handling to USA addresses. For more information, contact: The Treasurer, Center for Systematic Entomology, P.O. Box 147100, Gainesville, FL 32614-7100, USA.

« **Annotated Keys to the General of Nearctic Chalcidoidea (Hymenoptera)** ».

1997. G.A.P. Gibson, J.T. Huber and J.B. Wooley (eds.). National Research Council Canada. Can\$ 64.95 (for residents of Canada) or US\$ 64.95 (elsewhere) Contact: Subscription Office, NRC Research Press, M-55, National Research Council Canada, Ottawa, ON K1A 0R6 Canada.

Tel: 00-1613-993-9084
Fax: 00-1613-952-7656
e-mail: research.journals@nrc.ca.

« **Crop Sciences - Recent advances** ». 1997. A.S. Basra. This book provides insight on the latest advances in basic and applied aspects of crop science research in several different countries, including USA, India, Canada, France, Germany, The Netherlands, China, Argentina and Greece. 312 pages with index. Price: 79.95 US\$ (hard) or 29.95 US\$ (soft). Contact: The Haworth Press, Inc., 10 Alice Street, Binghamton, New York, 13904-1580 USA.

Tel: 00-1-800-429-6784
Fax: 00-1-800-895-0582
e-mail: getinfo@haworth.com.

MISCELLANEOUS

Global invasive species programme

In May 1998, the Conference of Parties to the Convention on Biological Diversity endorsed a new Global Invasive Species Programme (GISP) to address the requirement of the convention that countries prevent, eradicate or control alien species which threaten species, habitats and ecosystems. This programme

has grown out of an initiative on alien species of the Scientific Committee on Problems in the Environment (SCOPE). It will be managed by SCOPE, with help from United Nations agencies, CAB International and the International Union for the Conservation of Nature (IUCN). GISP will draw upon time volunteered by concerned scientists and has the objectives of raising global

awareness regarding the risks of alien invasives, establishing early warning systems and developing toolkits for governments on invasive species issues based on the latest knowledge on prevention and management. It will place particular emphasis on countries which do not have current information or programmes on invasive species management.

Biological control will have a role to play in such future management programmes, although it is quite clear already that it will need to be seen increasingly as part of a management programme and not a single-solution technology, as invasives management will involve finding solutions to problems with invertebrates, vertebrates and plants and focusing as much on restoration of natural ecosystems as on control of invasives. GISP may provide biological control a good opportunity to explore and develop its role in future environmental programmes. For more information on GISP, please contact: V. Plocq Fichélet, SCOPE Secretariat, 51 bd. de

Montmorency, 75016 Paris, France.
Tel: 00-33-01-45-25-04-98
Fax: 00-33-01-42-88-14-66
e-mail: scope@paris7.jussieu.fr.

A common-use documentation center on biological control and population management

The proposal for an International Center for Biological Control, presented during the global IOBC International Conference on biological control in Montpellier, France, September 1996, is taking shape in the form of the « Complexe International de Lutte Biologique Agropolis » (CILBA). The European Biological Control Laboratory of the USDA is now being built next to the existing CSIRO European laboratory of the Entomology Division. The French laboratory (*i.e.*, « Centre de Biologie et de Gestion

des Populations », CBGP) will join all these labs in Autumn 1999 on the same Campus.

These three labs will then provide unique working facilities in the field of biological control of pests, weeds and insects damaging human health, and in population management generally. For example, it was decided to pool their library resources, creating a resource center for all the labs in Montpellier who are members of CILBA.

A new strategic relationship between CILBA and Global IOBC whose permanent secretariat is also established in Montpellier, has also been mooted. The conditions seem favourable, therefore, for developing an international resource center specialising in biological control and population management. For any further information, contact C. Silvy: silvy@ensam.inra.fr.

Newsletter contributions: I would like to thank all those members who are taking time to send items for this IOBC Newsletter. If you have not previously sent anything, please consider doing so. Remember, this is your opportunity to let others know what is going on in biological control. Take a few minutes and mail fax or (even better) e-mail items on biological control to E. Wajnberg (address on first page), so they can be included in the next issue. Deadline for submitting items for the Summer 1998 issue of IOBC Newsletter is 15 November 1998.

Any comments or remarks on this Newsletter are welcomed. Do not hesitate to contact me if there is some information you would like to see here on biological control.

Editor: Eric Wajnberg, General Secretary of the IOBC, with assistance of Mireille Montes de Oca, IOBC Permanent Secretariat - Agropolis - Avenue Agropolis - 34394 Montpellier cedex 5 - France. Tel : (33) 04 67 04 75 30 - Fax : (33) 04 67 04 75 99.

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