

IOBC Newsletter 58

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

OCTOBER 1993

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

IOBC FORUM

Science and Biological Control Regulation

Few global pest management issues are more important than establishing appropriate, science-based regulatory protocols for biological control. Protocols include formal laws and informal implementing procedures of the laws. This is a complicated arena globally, where politics and bureaucracy can dictate outcomes, and objective, efficient, science-based regulation can get lost in the shuffle. Tacit under-regulation, or inhibitory over-regulation can result, both of which delay implementation of sustainable, cost effective, and environmentally-compatible pest management options.

Around the world, countries often regulate biological control from two justifiable perspectives: quarantine, and wildlife protection. In some countries, both perspectives are the responsibility of the same government group; in others, there are two (or more) groups which share the responsibility.

In theory, quarantine procedures act as a sieve by allowing importation of materials (including, for example, germplasm) thought, at the time a decision is made to be acceptably safe and desirable, and trying to exclude materials that might harm agriculture, humans, or the environment. Wildlife protection issues are equally broad; in general, trying to ensure that endangered, threatened or rare species are not further placed at risk. Biological control of pests contributes significantly to this effort.

Therefore, the purposes of biological control regulation are, in part, to provide mechanisms by which a country is protected (to the maximum practical extent) from deliberate release of potentially-detrimental organisms, and benefited by using the best available science to provide the best pest management options.

There is a continuum in development and refinement of regulatory protocols for biological control in the world today. I describe below two diametrically-opposed paradigms: command-and-control; and empowerment.

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Treasurer: E. Hoebaus, Ministry of Agriculture and Forestry, Abt. II C12, Stubenring 1, 1010 Vienna, Austria Fax 711 006 507

Past-President: J.R. Coulson, Inst. Biocontrol Lab., USDA/ARS, BARC East BD. 476, Beltsville MD 20705, USA

The command-and-control paradigm: Resisting change and fomenting suspicion

Regulatory protocols developed under the command-and-control paradigm tend to be closed, subjective, ad hoc, inconsistent, inflexible, unresponsive, slow to change, turf-oriented, antagonistic, indefensible, non-scientific (or pseudoscientific), and characterized by suspicion and disrespect between regulators and regulated.

Turf-oriented, illogical rationalizations are given for regulating biological control under this paradigm: "we don't trust researchers to be honest," "we have the authority to regulate, so we will do it," "we have such a large group of people that we don't need to involve customers in development of protocols," "we've always done it this way," or "if we don't do it, someone else will."

Such systems can be so closed that partnerships are neither encouraged nor tolerated. Input is not sought or allowed in development of protocols, even when stakeholders take the initiative and offer help. Changes in the protocols are resisted, eventually undertaken in secret, and "announced" in the context of a decision making process.

Pseudoscience is practiced, often with the best of intentions. Agents are "guilty until proven innocent," requiring applicants to attempt to prove negatives; i.e., "prove to me that the agent you want to release will not attack 3 given, non-target species" (which is often arbitrarily-chosen). No clear data requirement guidelines or standards are provided. The pre-decision analysis does not involve constructing and evaluating overlapping data matrices, and absolute, unattainable, guarantees are sought.

The empowerment paradigm: Reinventing regulations using partnerships

This paradigm is characterized by open, cooperative behavior, where the group(s) responsible for regulating biological control recognizes the necessity of developing science-based systems, and seeks meaningful and consistent input from researchers and others with a stake in the process. Turf-oriented arguments are minimized.

Partnerships are encouraged between regulators and regulated. This paradigm results in regulations which facilitate efficient approval for importation and release into the environment of safe biological control agents. Protocols developed under this paradigm tend to be relatively objective, consistent, flexible, effective, and defensible. Scientific advances are incorporated into the regulatory process, and there is mutual respect between the regulators and the regulated.

Protocols are developed within a legal framework, of course, but use science to the fullest extent possible. The critical differences between the physiological and the ecological host ranges are appreciated; biological control researchers are asked to prove positives, not negatives; and thus agents are "innocent until proven guilty." Protocols are reviewed frequently and cooperatively. This visioning of current and future needs results in the best possible system.

Clear, objective data standards are developed in partnership with the regulated community. These data are used to construct overlapping matrices to aid the predecision analysis; it is an n-dimensional puzzle. Such data matrices include: *the physiological host range* (determined, when appropriate, through artificial testing in the laboratory or field); *the ecological host range* (the field host range of the agent); the difference between classical and augmentative agents; *pest-risk information* from the home range of

the agent (e.g., records of pests that attack crops in the region, which confirm if the agent has been recorded as a pest); *eco-climatic information* (indicates the agent's preferred and tolerated limits of temperature, light, relative humidity, soil pH, rainfall, and other critical factors); phenodiagrams (indicates if species in the physiological host range are present in the field at the same time as the agent); dispersal mechanisms of the agent (if wind-borne, for example, non-target species that may be at risk because they are in the physiological host range and in the path of normal wind patterns are studied); and many other factors.

The final decision to allow release of an agent is made on the best available science, in a risk assessment context. There is acknowledgment that the probability of attack of a non-target species is estimated in this process (i.e., that absolute guarantees are neither attainable nor necessary), and that there are temporal and spatial sequences of events which all must be met if a non-target species which is in the physiological host range will be attacked in the field. Probability of attack is thus conditional, and major break in the sequences means that the non-target species is not at risk.

Conclusion

No regulatory system is as good as the best empowerment paradigm, or as bad as the worst command-and-control paradigm.

Few biological control researchers argue with the need for appropriate protocols for regulating biological control. The decision to release an exotic organism as part of a classical biological control program, for example, can result in establishment of a novel species, and can be irreversible. Unregulated movement of augmentative or commercial biological control agents can result in establishment of hyperparasites or diseases, particularly if quality control of the production process is flawed.

Appropriate biological control regulation is underpinned by regulatory protocols that facilitate introduction of beneficial species, and exclude potentially harmful species. Decisions (including political decisions) not supported by the best available science increase significantly the chance that safe agents will be rejected or that damaging species will be approved.

The overall safety record of biological control over the last 100 years cannot be disputed on scientific grounds. Documented major negative side-effects are few, and historical. This historical perspective is useful to help researchers and regulators determine how biological control should be regulated. Ultimately, objective evaluations of past introductions of biological control agents overwhelmingly support increasing the level of activity in biological control. Only science-based regulations will facilitate safe, sustainable and environmentally-favorable pest management, and reduce pesticide use.

E.S. Delfosse
President IOBC Global

IOBC briefly: how it developed and how it functions

During the last few months, a number of IOBC members asked for more information about our organization. On my request, V. Delucchi, who is one of the "insiders" of IOBC, is summarizing the history and the structure of IOBC in this article.

The editor

How it developed

At the 8th International Congress of Entomology, held in Stockholm (Sweden) in 1948, eleven entomologists from Italy, France, Switzerland, Belgium, Holland, Spain, USA, New Zealand and Australia met under the auspices of the International Union of Biological Sciences (IUBS) to exchange ideas about the possibility of establishing an organism able to coordinate biological control activities on an interna-

tional basis, especially in Europe, Africa, Near and Middle East. This organism was created 2 years later as a commission of the Animal Biology Division of IMBS and named "Commission Internationale de Lutte Biologique" (CILB). Its statutes were ratified by the 12th General Assembly of IUBS, held in Rome in April 1955. The Entomology Dept. of the Swiss Federal Institute of Technology, Zurich, was selected as the Headquarters of the Commission. The CILB statutes were deposited in the Swiss Federal Archives in Bern. The journal "Entomophaga" was first published in July 1956. At the same time 2 services were established: the Documentation Service (to provide the necessary information on biological control publications and on natural enemies/host relationship) and the Identification Service for entomophagous insects. The first international Working Groups were also created in 1956. On the second and third pages of the cover of the first issue (and in the following issues) of "Entomophaga" there is a list of persons who were primarily involved in starting CILB activities.

At the 3rd General Assembly of CILB, held in Montreux (Switzerland) in 1965, the name of "International Organization of Biological Control of noxious animals and plants" (IOBC, in French OILB) was adopted. At the same time, the Working Groups of general interest and of permanent character became "Commissions" (for instance "Integrated pest control", "Pathology and microbial control", "Intertropical problems", "Documentation", and "Publications"). In 1967 IOBC changed its consultative status with the "Food and Agriculture Organi-

A Proposal for "THE IOBC FORUM"

Many IOBC members (and non-members) have expressed strong support for the editorial in IOBC Newsletter 57, and have suggested we need a mechanism for members to air such views in future newsletters. The Executive Council would like to hear from a wider group of IOBC members about this suggestion.

We propose that each future newsletter would contain a short (1-2 page) lead article about an issue of concern to biological control and integrated pest management, in a new section to our newsletter entitled "The IOBC Forum." I have contributed an

example of the type of issue that might be considered in the Forum in this issue. Alternate views could be presented to Forum editorials in the following newsletters. We could even consider a "Point-Counterpoint" format for issues that have opposing scientific viewpoints.

Members wishing to express a view on this proposal should fax (preferably) or write to me soon. I will summarize these views in the next newsletter.

E.S. DELFOSSE
President IOBC Global

zation of the United Nations" (FAO) in a liaison status.

The 5th General Assembly of IOBC, held in Rome in March 1971, decided to expand its activities to cover the whole world and adopted new statutes (published in PANS, vol. 17, 401-407). The initiative in promoting this development was taken by IUBS (of which IOBC remains an affiliated commission) in November 1969. Under the auspices of the global organization, biogeographically based **Regional Sections** were defined. The members of the former IOBC (without Subsaharan Africa) formed the core of the West Palearctic Regional Section (WPRS, in French SROP). In Rome, two new Sections were established: the Western Hemisphere Regional Section (North, Central and South America) (WHRS) and the South and East Asian Regional Section (SEARS) (approved in 1972) Commissions and Working Groups dealing with problems of world wide interest were placed under the responsibility of the global Organization. In March 1972 the Organization published the first Newsletter.

At the 6th General Assembly of IOBC, held in Canberra (Australia) in August 1972, the "Tropical African Regional Section" (TARS) (excluding South African Countries) and two years later the "Pacific Regional Section" (PRS) were established. In 1977 it was possible to create the "East Palearctic Regional Section" (EPRS) incl. the European eastern countries and the former Soviet Union. As by 1982 TARS had not yet presented the statutes for approval and very few African natives were members, it was withdrawn. The WHRS appeared to have some difficulties in coordinating activities over the whole American continent, so that efforts were made to create an autonomous "Latin American Regional Section" (LARS), which initiated its activities in 1984. At the same time, the WHRS changed its name and became the "Nearctic Regional Section" (NRS).

List of Presidents (P), Secretary Generals (S) and Treasurers (T) since 1955

	P	S	T
1955-68	A.S. Balachowsky	P. Grison	P. Bovey
1968-71	E. Billiotti	V. Delucchi	G. Mathys
1971-72	P. DeBach	V. Delucchi	F.J. Simmonds
1972-76	C.B. Huffaker	V. Delucchi	F.J. Simmonds
1976-80	E. Billiotti (1976-78) C.B. Huffaker (1978-80)	G. Mathys	V. Delucchi
1980-84	K.S. Hagen	G. Mathys	F. D. Bennet
1984-88	V. Delucchi	J.-P. Aeschlimann	K. Carl
1988-92	J.R. Coulson	J.-P. Aeschlimann	J. Freuler
1992-96	E.S. Delfosse	F. Bigler	E. Hoebaus

As LARS was unable to operate, new statutes were submitted in 1989 and the section received a new name: "Neotropical Regional Section" (NTRS). A tentative to re-establish an African section was made at the end of 1988 and during 1989. A proposal for an "Afrotropical Regional Section" (ATRS) was presented in 1989 following the establishment of a Biological Control Research Centre at the International Institute of Tropical Agriculture (IITA) at Cotonou (Rep. of Benin).

How it is structured and its functions

Structure and function are best described in the statutes and additional details are mentioned in the by-laws. Each member of IOBC should know both of them. IOBC is headed by a Council (CN) which consists of an Executive Committee (EC) and one representative of each Regional Section. The CN is responsible for the Organization as a whole and for the relations with international bodies concerned with biological control research and application. The CN is the ultimate authority within the Organization and gives approval for the formation of new Regional Sections and to the terms of their statutes. The General Assembly (GA), which is convened every 4 years, decides on any

modifications to the statutes. **Any member of a Regional Section is automatically a member of the global Organization** (and participates in the GA). Individuals or institutions located in zones which are not covered by any Regional Section are members of IOBC Global. Regional Sections are virtually autonomous. However, their statutes must be compatible with those of the global body. Each Regional Section is concerned with the pest problems of the region and with the development of cooperative actions within the Section and with other Sections.

In the global Organization there are 4 categories of members: individual (IM), institutional (TM), supporting (SM) and honorary (HM) members. Except for the HM, who do not pay fees, the other members have to pay annual fees, which are low for IM, higher for TM and still higher for SM. The level of the fees is revised from time to time. At present it is of 20, 170 and 900 US dollars (or equivalent) for IM, TM, and SM respectively. The privileges of membership include the "Entomophaga" journal at low cost (for TM and SM), the Newsletters, and the opportunity to participate in biological control activities on an international basis. For a member of a Section, membership may involve additional privileges.

An example: Since the beginning, CILB requested very high minimum fees, of the order of Swiss Francs 2000 each (in 1955 equivalent to about US\$ 450 - today the fee is SF 3000 equivalent to about US\$ 2000). Membership is open to everybody interested or active in biological control, but only governmental institutions, like Ministries, were and are willing to pay them. Some Ministries of Agriculture subscribed several annual fees (up to 10). Nothing changed when CILB expanded in 1971 to become a global Organization. WPRS endorsed the previous CILB system. The global

Organization requested a membership fee of US\$ 150 for each institution and this amount had to be paid annually by WPRS (formerly CILB) for each of its members, independent of the number of fees subscribed by them. Because of the very high fee system, WPRS established the individual membership with a reduced fee in 1989. Presently, all Regional Sections have different membership categories including in general individual, institutional and supporting members. Annual fees are fixed by each Regional Section.

The high fee system of WPRS has the advantage that funds are available every year for the activities of its Commissions and Working Groups. Sections with a low fee system have a lot of difficulties to keep them existing. At the end of this century, with the necessity of maintaining or improving the quality of our environment, it should be easier than in the Fifties (when everybody believed in pesticides) to adopt the WPRS model.

V. Delucchi

ENTOMOPHAGA

Report of the management committee meeting, held in Avignon-Montfavet, France, April 15, 1993.

Members present: J.M. Rabasse, Editor in-Chief, F. Bigler, Secretary-General IOBC Global, R. Cavalloro, President IOBC/WPRS, S. Poitout, Secretary-General IOBC/WPRS, L.A. Lacey, USDA/ARS/EBCL Montpellier (representing IOBC/NRS).

The Editor in-Chief, J.M. Rabasse, opened the meeting with a report giving a number of statistics. The data included figures from 1989 to 1992:

- The total number of papers and pages per volume from 1989 (vol. 34) to 1992 (vol. 37) varied between 61 and 73 and 598 and 669 respectively.
- Percentage of papers by language: English 81-90 %, French 7-18 %, German and Spanish 0-3 %.
- Rejection rate 14 % (1990) - 44 % (1991)
- Number of articles dealing with biocontrol compared to other international journals: With 68 articles in 1992, Entomophaga

was still the leader worldwide.

- Articles per volume separated by number and percentage by countries. For example 33-35 % of the papers published were from USA and Canada, 23-35 % from Western Europe, 10-16 % from Australia, New Zealand and South Africa. Extremely few papers came from Asia and South and Central America.
- Percentage of papers per field of biocontrol. Entomophagous organisms: 65-74 %, pathogens of arthropods: 6-17 %, weeds and coprophagous insects: 8-18 % and integrated control: 3-5 %.
- Time from submittance to acceptance for 1991 was 5.7 ± 2.9 months. Data on theoretical and real printing time were also presented.

Information on the processing of the manuscripts were presented and a scheme of organization was discussed. The relatively long printing time is caused mainly by slow response of reviewers, slow response of the authors themselves and a few problems with the publisher.

The financial statement for 1992 showed a deficit of FF 9040.- (ap-

prox. US\$ 1600.-) that was covered by IOBC Global.

J.M. Rabasse reviewed the instructions to authors and the subjects covered by Entomophaga.

The following conclusions and recommendations were drawn by the committee.

- The number of submitted manuscripts will probably be reduced in future because of two other new revues (Biological control and Biocontrol science and technology) which were issued recently. As a consequence, the real publication time will be shortened.
- The impact factor should be increased to 0.7.
- English will be the recommended language, French is still accepted, manuscripts in German and Spanish will not be accepted anymore.
- Authors from South/Central America and Asia will be encouraged to submit more articles (in English or French)
- Authors, working in subject areas which make up a small percentage of the papers published, are stimulated to submit more articles. The committee decided

that a series of invited papers on microbial control of insects and weeds will be published. This action is considered as being one mechanism for generating more interest in the journal.

Several invitees were suggested by the committee and will be contacted by specific members.

- Previous proposals for a new title of the journal (see Newsletters 56 IOBC Global) were rejected. Even though a long discussion brought up new ideas, there was no unanimous acceptance. It was decided to leave the present title unchanged. New proposals will be presented till the next management committee meeting.
- Page charges for non-IOBC members will be increased from presently US\$ 20.- to US\$ 30.- per printed page.
- Contributions classified as "short notes" will be limited to 3 pages maximum.

- "Opinion" articles are welcome and will be stimulated in future. No page charges for non-IOBC members.

- More support of the Editor-in-Chief will be needed in future, especially if more articles of subject areas which make up a small percentage till now will be published. Details and consequences for IOBC were not discussed and will need to be developed in future.

- The new instructions for authors were accepted after revision of a few points.

- It is suggested to contact the publisher of Entomophaga (Lavoisier, Paris) and discuss possible agreements and special prices for publications of proceedings of symposia organized by IOBC.

- The committee decided to renew the contract with the publisher (Lavoisier) for 1994-97). The Secretary-General of IOBC Global will enter negotiations.

F. Bigler

Notes from the publisher of ENTOMOPHAGA (Lavoisier, Paris)

1. According to information from the publisher, printing costs of Entomophaga have increased considerably because of major corrections of proofs by authors. Authors are urged to submit their final versions of manuscripts in such a way that only printing errors need corrections in the proof.

2. IOBC members profit from publishing annually 8 pages free of charge in Entomophaga. Fifty reprints per article are provided free. Additional pages and reprints are charged by Lavoisier to the author. Lavoisier complained recently because a number of authors publishing articles longer than 8 pages and/or ordering additional reprints, do not pay. This is not only unfair and causes a lot of troubles but it increases also the overall costs of Entomophaga and results in an increase of the subscription rate.

F. Bigler

President Clinton and biocontrol

New U.S. Commitment to Reduce Pesticides

In IOBC Newsletter 57 I talked about the importance of having organizational philosophies in place that support biological control and integrated pest management, and used the recently-approved Biological Control Philosophy of the Animal and Plant Health Inspection Service (USDA) as an example.

I felt that commitment to increased use of biological control and other ecologically based pest management strategies would only follow if organizations were committed to a philosophical basis which supported this decision.

A philosophical statement supporting biological and cultural control, sustainable agriculture, and integrated pest management has now been approved by the U.S. government.

Three U.S. groups--the Department of Agriculture, Food and Drug Administration, and Environmental Protection Agency--have announced their commitment to reduce the use of pesticides and to promote sustainable agriculture.

The press release about this important announcement said, in part:

"The principles that will guide our legislative and regulatory proposals include the following:

The Clinton Administration is committed to reducing the risks to people and the environment that are associated with pesticides while ensuring the availability of cost-effective pest management tools for agriculture and other pesticide users.

We will intensify our effort to reduce the use of higher-risk pesticides and to promote integrated pest management, INCLUDING BIOLOGICAL AND CULTURAL CONTROL SYSTEMS [emphasis added] and other sustainable agricultural practices, under the leadership of the USDA."

E.S. DELFOSSE
President IOBC Global

WORKING GROUPS

WG FRUIT FLIES OF ECONOMIC IMPORTANCE

Chairman: P. Liedo Fernandez, CIES, Apdo Postal 36, Tapachula Chiapas 30700 Mexico Fax 962 60'815.

Co-chairmen: M. Aluja, Inst. Ecol., A.C. Apdo Post. 63, Xalapa, Veracruz 91000, Mexico Fax. 281 86'910 J. Piedade-Guerreiro, Div. Luta Biol., Inst. Invest. Cient. Trop., Junqueira 14, 1300 Lisboa, Portugal, Fax 364 20 08.

"Fourth International Symposium on Fruit Flies of Economic Importance" Sand Key, Florida, USA, 5-10 June 1994. Contact Dr. J. Hendrichs, IAEA Laboratories, A-2444 Seibersdorf, Austria. Tel. 43- 222-2360, Fax 43-1234'564; or Dr. P. Greany, USDA / ARS, 1700 SW 23rd Drive, Gainesville, FL 32608, USA. Fax 904 374-5781.

WG ECOLOGY OF WG ECOLOGY OF APHIDOPHAGA

Chairman: D. Horn, Dept. Entom., Ohio State Univ., 1735 Neil Ave., Columbus OH 43210-1220, USA.

Co-chairmen: R. Chambers, Entom., AFRC Inst. Hort. Res., Worthing Rd. Littlehampton W. Sussex BN17 6LP, UK.

I. Hodek, Inst. of Entomology, Czech Academy of Sciences, Branisovska 31, 37005 Ceské Budejovice, Czech. Republic.

Reports of the 5th symposium held in Colle-sur-Loup, France, September 6-10, 1993 are available from the chairman. The contributions to the section "Augmentation and Enhancement of Aphidophagous Insects" will be published in "Agriculture, Ecosystems and Environment". Papers of the section "Behavioural Ecology of Aphidophagous Insects" will be published in the "European Journal of Ento-

mology, Vol. 90, No. 4, 1993. Orders to Inst. Entomology, Czech. Acad. Sci. Branisovska 31, 37005 C. Budejovice, Czech Republic.

WG OSTRINIA NUBILALIS

Chairman: P. Anglade, INRA Station de Zool., B.P. 81, 33843 Villeneuve d'Ornon Cedex France.

WG QUALITY CONTROL OF MASS-REARED ARTHROPODS

Chairman: N.C. Leppla, ASDA/APHIS, Fed. Bd., 6515 Belcrest Road, Hyattsville MD 20782 USA. Fax 301 436 6013.

Co-Chairman: M. Benuzzi, Biolab, Via Masiera 1, 1191, 47020 Martorano-Cesena, Italy. Fax 547 380795.

Reports of the 7th meeting held in Rimini, Italy, September 12-16, 1993 will be available from M. Benuzzi and N. Leppla (after December 1993).

WG CHROMOLAENA ODORATA

IOBC Global plans to establish a new WG on *Chromolaena odorata* during the 3rd International Workshop on Biological Control and Management of *C. odorata* in Abidjan, Ivory Coast, November 15-19, 1993. This new WG will be the first one of IOBC devoted to weed control. For more information contact R. Muniappan, Agric. Experiment Station, University of Guam, Mangilao, Guam 96923, USA. Fax 671 734 6842.

More information on aims and programme of the WG will be presented in the next Newsletter.

WG TRICHOGRAMMA AND OTHER EGG PARASITIDS

Co-chairmen: S.A. Hassan, Inst. Biol. Pest Control, Heinrichstr. 243, 6100 Darmstadt Germany. Fax 6151 40 790

E. Wajnberg, INRA Station Zool., 37bv. du Cap, B.P. 2078, 06606 Antibes Cedex France. Fax 93 67 88 25

1. The WG is organizing the 4th International Symposium in Cairo, Egypt, October 3-7, 1994, under the sponsorship of the Ministry of Agriculture, Egypt and IOBC. The publication of papers in "Les Colloques de l'I.N.R.A." is planned. Members are urged to attend and give a presentation on their research work. Topics of interest: biosystematics and genetics, host relation and biology, physiology and behaviour, ecology and population dynamics, rearing (in vivo & in vitro), production and release, compatibility (environmental, biological, chemical), effectiveness and assessment.

A book on "Biological control with egg parasitoids" is being prepared under the leadership of the two chairmen. The content will be: taxonomy, distribution, use, mass production, artificial diet, quality control, release methods, behaviour, physiology and interactions with their hosts, overwintering strategies, genetic variation in *Trichogramma*. (Contact E. Wajnberg for more information)

WG BIOLOGICAL CONTROL OF PLUTELLA

Chairman: N.S. Talekar, AVRDS, P.O. Box 42, Shanhuia Tainan 74199, Taiwan

Co-chairman: J.K. Waage, CABI/IIBC, Buckhurst Road, Silwood Park, Ascot, Berks SL5 7TA UK. Tel. 344 872 999, Fax 344 875 007.

The second issue of the Newsletter of the Working Group (1992) was despatched to Working Group members in September. It contains updates on current work around the world, information on new natural enemies of *Plutella*, addresses of Working Group members, and recent abstracts (from CAB Abstracts) on the subject. If you would like to receive this, please contact Dr. Talekar.

The third international workshop on *Plutella* is presently scheduled for Autumn 1995 in Japan.

I would like to ask the chairmen to put my name on their mailing lists and send me all information on activities of their WG.

Secretary General IOBC Global

WG BIOLOGICAL CONTROL OF BRUCHIDS

Chairman: A. van Huis, Agric. Univ.,
Dept. Entom., P.O. Box 8031,
6700 EH Wageningen, NL

Co-chairman: J.P. Monge, Inst. Bioc.
Exp., Univ. Rabelais, Fac. Sci.,
Parc Grandmont, 37200 Tours
France.

Reaction to the Proposal for a New IOBC Global Working Group on "Training, Information and Education in Biological Control"

There has been a unanimous, positive reaction to formation of a new Global IOBC Working Group on "Training, Information and Education in Biological Control". There was agreement that we must do a better job of informing our stakeholders about the realities and benefits of biological control, and that a global IOBC WG would be a good way to begin to fill the need. Many members were so enthusiastic that they sent reprints or videos of projects already completed, and offered to serve on the WG.

Therefore, I have proposed formally to the IOBC Council that this new WG be approved. If approved, as expected, I will write to all Regional Section Presidents to ask for an interested member who will coordinate material from that region. I will also write to all IOBC members who expressed support for the WG, for additional input. I would like to thank the many IOBC members who contacted me about this WG. As I suggested in IOBC Newsletter 57, this is a very large task, with long-term gains as enormous as the risks. However, based on the enthusiasm and support for this project that was expressed by IOBC members, I am confident that the project can be done collaboratively on a global basis.

Further information, suggestions, ideas etc. can be addressed to E.S. Delfosse, (address page 1).

REGIONAL SECTIONS

WPRS WEST PALAEARCTIC REGIONAL SECTION

President: D. J. Royle University of Bristol, Long Ashton Research Station, Bristol BS18 9AF, UK. Fax 275 39 4007

Secretary General: S. Poitout, INRA Stat. Zool., B.P. 91, F- 84143 Montfavet Cedex, France. Fax 90 31 62 70

Treasurer: J. Huber Institute for Biological Pest Control Heinrichstr. 243 62287 Darmstadt, Germany. Fax 6151 40790

The 7th General Assembly was held in Lisbon, Portugal, October 19 and 20, 1993. A report will be included in the next Newsletter.

Commission "Integrated Production, Guidelines and Endorsement"

The Commission has initiated various activities in 1992. Most important was the establishment and finalization of the document on "Definition, Principles, Guidelines and Endorsement Procedure for Integrated Production/Integrated Farming". An international Panel consisting of 12 experts, representing the IOBC/WPRS Council, and the crop-oriented Working Groups came together with members of the Commission at Wädenswil, Switzerland, from 4-6 March 1992, to discuss the proposals put forward by the Commission.

Conceptual and pragmatic aspects were intensively discussed in the light of the general IOBC/WPRS strategy. The final documents were agreed by the Executive Committee during its last meeting in November 1992. They are a result of multi-national inputs and interests. They are now considered as the official IOBC/WPRS version to which all its members have committed themselves as well as the organizations and authorities collaborating with IOBC/WPRS. Any organization wishing to obtain IOBC/WPRS endorsement has to fulfill the minimum requirements specified in the documents.

The Executive Committee decided in May 1992 to enlarge the Com-

mission by including three more members: Prof. G. Briolini (Italy), Dr. S. Finch (UK) and Dr. J. Avilla (Spain). This became necessary to cover a wider range of expertise.

In accordance with the European norm, the Commission is now establishing the necessary steps to achieve a legally, internationally accepted endorsement procedure. The commission intends to create an IOBC/WPRS International Board, which will have the task to evaluate whether submitted requests of endorsement are in line with the WPRS guidelines. Members of the International Board will be recruited from the Working Groups which cover the various production areas. These evaluations will start in the course of 1993.

The finalized documentation concerning the guidelines has been written in three languages: english, french and german and has appeared in February 1993 as IOBC/WPRS Bulletin, Vol.16(1). It will be sent round on a large scale. Those who want to receive a copy should ask the chairman of the Commission:

Dr. A. El-Titi, Landesanstalt für Pflanzenschutz, Reinsburgstrasse 107, D-7000 STUTTGART, Germany (Fax: 49 711 616974)

Profile Nr. 16, 1993

STING 13, Newsletter on Biological Control in Greenhouses

The 13th Issue of Sting (July 1993) contains extensive summaries (appr. 15 pages) of two meetings which were organized by the IOBC/WPRS working group "Integrated Control in Glasshouses". One was held in Cambridge, UK (September 1992) and dealt with IPM of pests in ornamentals. The other meeting was a combined session of the American and European greenhouse IPM groups at Asilomar, California, USA (April 1993). Activities of the *Bemisia tabaci* subgroup are also reported in this volume of Sting. Further it provides information on biological control of spider mites in Australia

(copies available, contact J.C. van Lenteren, Department of Entomology, POBox 8031, 6700 EH, The Netherlands)

J. C. van Lenteren

EPRS EAST PALAEARCTIC REGIONAL SECTION

President: A.I. Smetnik IOBC/EPRS Secretariat, 25 Volodarskogostr. 109172 Moscow, Russia. Fax 95 924 66 55

Report of the General Assembly held in Bratislava (Rep. of Slovakia), April 5-9, 1993

It was the first General Assembly of IOBC/EPRS after the desintegration of the Soviet Union and thus, the members were faced to a new situation. More than 40 representatives of 9 member countries attended (Bulgaria, Belorussia, Hungary, Kasachstan, Poland, Russia, Romania, Slovakia and Ukraina).

Activity reports of working groups and commissions were presented and an activity programme for 1993-95 was drafted. Four new working groups were established as well. A new executive committee, and new council members for 1993-95 were elected.

Discussions showed clearly that IOBC/EPRS has gained increasing importance under the new political and economical situation. Institutes and scientists are not only faced to enormous financial problems but also cooperation between institutes in the newly formed countries is very difficult because of still lacking agreements. Scientific contacts and exchanges are often hampered and the formerly well established scientific organizations, supported by the governments are restructured and will be functional after a while only. IOBC/EPRS is one of the non-governmental organizations which could fill this gap in the area of biocontrol and it has been strengthened by the General Assembly

that IOBC/EPRS is an extremely important link between scientists and institutes in this geographic area.

More cooperation and exchange of information with other IOBC Regional Sections, especially the WPRS, will be crucial at the present time. New ideas on how to finance the bulletins and proceedings of working groups were discussed and presented afterwards by the Secretary-General of IOBC Global to the Executive Committee of IOBC/WPRS for consideration.

F. Bigler

NRS NEARCTIC REGIONAL SECTION

President: G.R. Buckingham, USDA/ARS, P.O. Box 147100, Gainesville, Florida 32614. Fax 904 374 6801

Secretary-Treasurer: J.M. Nechols, Department of Entomology, Kansas State University, Manhattan, KS 66505. Fax 913 532 62 32

Corresponding Secretary: R. van Driesche, Department of Entomology, University of Massachusetts, Amherst MA 01003. Fax 413 545 2115

Newsletters Volume 15, has been released in 1993 and is still available from R. van Driesche

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 don't tell them. You may share information by sending any kind of NEWS to me.

F. Bigler, Editor

SEARS SOUTH EAST ASIAN REGIONAL SECTION

President: R. Muniappan, Agricultural, Experiment Station, University of Guam, Mangilao, Guam 96923 USA. Fax 671 734 6842

Secretary-Treasurer: M. Marutani (same address as R. Muniappan)

SEARS is now releasing Newsletters for their members. I would like to ask members of IOBC/SEARS to support this new activity by sending information, reports, news etc. to the President or Secretary of SEARS.

NTRS NEOTROPICAL REGIONAL SECTION

President: M. Zapater, Catedra de Genetica Facultad de Agronomia Av. San Martin 4453 1417 Buenos Aires, Argentina. Fax 541 743 64 61

Secretary-General: P.S. Baker IIBC Gordon Str. Curepe, Trinidad, W. Indies

Treasurer: E.N. Botto IMYZA-CICA INTA C.C. 25. Castelar 1712 Buenos Aires, Argentina

ATRS AFROTROPICAL REGIONAL SECTION

President: J. Boussienguet, Prog. Nat. Lutte Biol., B.P. 1886, Univ. O. Bongo, Libreville, Gabon

Secretary: N.T.C. Echendu, Nat. Root Crops Res. Inst., Biocontrol, Umudike, Umuhia, Nigeria.

The next General Assembly will be organized during the 3rd International Conference on Biological Control of *Chromolaena odorata* Abidjan, November 15-19, 1993.

PEOPLE

ADWARDS

The following IOBC members were honoured by awards:

J.C. van Lenteren, University of Wageningen, The Netherlands, obtained in 1992 the first award of the Netherlands Institute of Biologists for a Dutch biologist with important public merits. Later last year he received the H.S. Smith Award for a distinguished scientist in biological control. Van Lenteren was the third scientist so recognized since initiation of this award in 1969.

E.G. King, USDA/ARS, Weslaco, Texas, USA has received a USDA award this September as one of the U.S. Department of Agriculture's "Outstanding Research Scientists of the Year".

IOBC congratulates the winners!

NEW ASSISTANT DIRECTOR AT IIBC

Dr. Ren Wang, formerly of the Biological Control Institute, Chinese Academy of Agricultural Sciences,

has been appointed to the International Institute of Biological Control (IIBC) as Assistant Director, Programme Development. He joins Jeff Waage (Director) Matthew Cock (Assistant Director, Operations) and Mark Affonso (Administrator) on the IIBC management team. Ren will be in charge of IIBC's Training, Information and Policy Support unit (IIBC TIPS), and will be answering queries regarding IIBC's activities.

POSITIONS

National Biological Control Institute (NBCI) Postdoctoral Fellowships in Systematics Program Announced

To begin to address the critical global shortage of trained systematists for taxa of importance to biological control, the NBCI (U.S. Department of Agriculture, Animal and Plant Health Inspection Service) announced in July 1993 the first round of NBCI Postdoctoral Fellowships in Systematics.

NBCI will provide support for two Postdoctoral Fellowships to conduct

research in systematics of any group of organisms of critical importance to biological control. It is important to note that the fellowships are not limited to study of arthropod taxa, and that NBCI has not predetermined that any particular taxon has a high priority for support.

The applications will be evaluated by scientists who are familiar with the needs, which will ensure that the scientific community will have significant input to the decision. The quality and merit of the research proposals will form the basis from which NBCI will ultimately decide awards.

A fellowship may be awarded in two ways: a principal investigator may apply to establish, recruit, and fill a postdoctoral position; or a postdoctoral candidate may apply directly to NBCI after securing approval and support from an appropriate supervisor and a host institution.

Fellowships are limited to U.S. citizens. They will carry two-year terms, with the possibility of renewal. Awards will range from \$30,000 to \$50,000 per year, based on qualifications of candidates and cost factors associated with the site of research.

E.S. DELFOSSE
President IOBC Global

IIBC Pakistan Station

Dr. A. I. Mohyuddin, Vice-President of the South and East Asian Regional Section of IOBC, and Scientist-in-charge of the Pakistan Station of IIBC will be retiring from IIBC in 1994. IIBC will be seeking a replacement for Dr. Mohyuddin in 1994, to manage the Station which is jointly operated with the Pakistan Agricultural Research Council. Current projects at the Station include IPM programmes on cotton, vegetable fruit, sugarcane and other crops. IIBC will be seeking candidates for this position; if you are interested, please write to the Director, IIBC (Silwood Park, Ascot, Berks SL5 7TA, UK). Enquiries from Pakistani scientists are particularly welcome.

REQUESTS AND OFFERS

Yellow Sugarcane Aphid

The University of Hawaii has recently begun a project concerning biological control of the yellow sugarcane aphid (*Sipha flava* Forbes). The aphid, accidentally introduced into Hawaii several years ago, is killing thousands of acres of rangeland grasses throughout the islands. One parasitoid (*Adialytis ambiguous* ex. *Sipha maidis*) has been imported, but it is not successfully attacking *S. flava* in the field.

I would greatly appreciate any information, ideas or suggestions, regarding:

A. parasitoids of any *Sipha* species (or of *Atheroides*, *Chaetosiphella*, *Rungsia*) that may be candidates for importation to Hawaii,

B. host range, specificity, or efficacy

of aphid predators in the genus *Leucopis* (Diptera: Chamaemyiidae).

Russel H. Messing, University of Hawaii, 7370 Kuamoo Rd., Kapaa, Hawaii, USA 9-646 Phone: 808-822-4984; FAX: 808-822-2190; email: messing@uhunix

Nematodes biocontrol agents

Biological control (BC) is a research field of growing interest in nematology. The most promising candidate for nematodes BC is the actinomycete *Pasteuria penetrans*, which includes a group of highly specific obligate pathogens, characterized by a wide range of morphometric diversity. We believe that a collection of different *P. penetrans* isolates and pathotypes would be a valuable tool in future scientific activities on this topic. This is due to the *P. penetrans* poorly known taxonomy, the suspect occurrence of resistance to a single pathotype progeny and the potential practical implications in BC. We collect *P.*

penetrans at Bari, in order to establish a germplasm collection composed by dry, pasteurised soils from which extracted nematodes were found encumbered with spores. Three *P. penetrans* infested soils are available thus far. The pathotypes proceed from the citrus nematode, *Tylenchulus semipenetrans* the virus vectoring nematode, and the free living *Cylindrolaimus communis*. Associated data include the mapping of the original places in which the *P. penetrans* and the nematode populations were found. Slides of *P. penetrans* parasitised or infested nematodes are also available for loan upon request. Scientists interested in **exchanging or receiving** the pathotypes or loaning slides are invited to call or fax. This proposal is intended only for scientific purposes under the receiver responsibility. Please refer to IOBC Newsletter 57, march 1993 for FAO guidelines for importations.

Contact: Aurelio Ciancio, Istituto di Nematologia Agraria A. V., C.N.R., Via Amendola 165/A 70126 Bari - ITALY. Tel.: 00-39-80-484189; Fax : 00-39-80-484165.

REPORTS ON BIO- CONTROL ACTIVITIES

Quality control of beneficial insects

The IOBC/WPRS working group "Integrated Control in Glasshouses" has developed stronger relationships with producers of natural enemies. An important reason for this is the need to set up quality control systems for natural enemies. In cooperation with the IOBC global working group "Quality control of Mass Reared arthropods" and the European Community, a programme was started entitled "Designing and implementing quality control of beneficial

insects: towards more reliable biological pest control". Respect for biological control can be improved considerably when standards for acceptable quality could be developed for all marketed natural enemies. Quality standards and efficacy data are also essential to obtain registration of natural enemies in several European countries, such as France, Switzerland, Austria and Hungary. Scientists in Europe and North America have worked on quality control methods and natural enemy producers are starting to apply these quality control methods on a regular

basis to be able to check and guarantee the effectiveness of their natural enemies. A first meeting of European scientists and commercial producers took place in Wageningen, the Netherlands, in 1991. The participants concluded that in a united Europe, it would be highly requested to have uniform quality standards to be applied by all mass production companies. At the same meeting 8 provisional quality tests were designed. At the second meeting in Horsholm, Denmark, in 1992, results obtained with the provisional tests were discussed, tests were modified and 3 additional tests were designed. Because of the urgency to develop a full set of quality tests, the EC was asked to financially support a number of workshops. In May 1993 the EC has approved a grant proposal with the following objectives:

1. Develop realistic, simple and reliable quality control methods at research laboratories for the natural enemies which are widely used in biological pest control in Europe today.
2. Test quality control methods under commercial conditions.
3. Evaluate outcome of different quality control tests and improve the methods for practical use.
4. Implement quality control methods at mass production companies in Europe, develop proposal for EC standard.
5. Design training material for short courses for those who (will) work on quality control at production companies.

More than 20 participants from 10 EC and 3 non-EC countries cooperate in this project. All activities will take place under the umbrella of the IOBC global working group to guarantee exchange of information on a world-wide basis. The quality control tests for 10 natural enemies used in glasshouse biological control are published in IOBC/WPRS Bulletin Vol. 16(2) 1993 (a limited number of copies is still available, contact J.C. van Lenteren, Department of Entomology, PO Box 8031, 6700 EH, The Netherlands)

Biological Control of Weeds in Europe

Up to now, most European researchers in the field of biological control of weeds have been involved in projects against plants of European origin, that have become problems elsewhere ("classical" or inoculative approach). Very few and only regional projects have been set up to study the potential for biological control of weeds in Europe. Hence, a great interest has been expressed repeatedly in coordinating activities on biological weed control in Europe by members of the Working Group on "Biological Control of Weeds", a Main Subject Area of the "European Weed Research Society" (EWRS). In order to gather European institutions which intend to cooperate in investigating the potential of biological weed control in European crops, a Swiss proposal for a new COST-project (European Cooperation in the field of scientific and technical research) was submitted in summer 1992. The proposal recently has been approved and is now awaiting the formal signatures of the participating countries. Below, the objectives and the present status of the project are briefly summarized:

Biological control of weeds in European crops: a new COST action

A proposal of a new COST action on "Biological Control of Weeds in European Crops" was submitted in 1992 to the COST committee of Senior officials, COST Secretariat, Council of the European Communities, Brussels). In July 1993, the project was approved. The aim of this action is to 1) coordinate present national and European activities in the field of biological weed control, 2) initiate new research projects and evaluate their potential in Europe, 3) elaborate a general protocol for biological weed control in Europe, 4) strengthen basic research for a better understanding of herbivore/ pathogen-weed interactions, and 5) propose realistic solutions for the biological

control of target weed species of economic importance. Four principal weed species in European crops, which are economically important and suitable targets for biological control, have been selected for detailed studies. These are 1) *Amaranthus* species (*Amaranthaceae*) (*A. retroflexus* L., *A. hybridus* L., *A. cruentus* L. and *A. bouchonii* Thell.), 2) *Chenopodium album* L. (*Chenopodiaceae*), 3) *Convolvulus* spp. (*C. arvensis sepium* L.) (*Convolvulaceae*) and 4) *Senecio vulgaris* L. (*Asteraceae*). By the end of June 1993, 8 countries (Switzerland, France, Italy, the Netherlands, Sweden, the United Kingdom, Poland and Germany) involving over 20 institutions have confirmed their participation, and an additional 4 countries (Belgium, Turkey, Hungary and Croatia) had expressed their firm interest. After the formal signatures of the "Memorandum of Understanding" - which is the legal basis of the project - by at least four participating COST states, we hope to start the project by late 1993. The initial project will extend over a 5 year period with a planned budget of 10 Mio ECU.

For further informations, as well as for co-ordinating activities between IOBC/EWRS please contact

Heinz Muller-Scharer, Secretary of the EWRS working group on "Biological Control of Weeds" Swiss Federal Research Station for Fruit-growing, Viticulture and Horticulture, CH-8820 Wädenswil, Switzerland; Tel 41 1 783 63 25, Fax 41 1 780 63 41.

Integrated Control of Pests and Diseases in Protected Crops and Greenhouses

SCI Pesticides Group, 19-20 May 1992, "De Leeuwenhorst", Noordwijkerhout, The Netherlands

The Society of Chemical Industries' Pesticides Group organized a symposium on "Integrated Control

of Pests and Diseases in Protected Crops and Greenhouses", where papers were presented which evaluated the current IPM situation and which speculated about future strategies. The timing of the symposium was very appropriate as many national governments in Europe, as well as the EC, aim at reduction of pesticide usage and increased use of nonchemical crop protection methods. Such developments are particularly important for pest and disease control in greenhouses, where high spray frequencies are no exception and, as a result, resistance to pesticides has often developed.

In greenhouses, use of biological control agents to control pests is a common practice for more than 20 years now. Currently, 15 species of natural enemies are commercially produced and distributed for the control of 18 pests. These developments were coordinated and stimulated by the IOBC/WPRS working groups "Integrated Control in Glasshouses". Two other IOBC groups were crucial for developing IPM programmes: the "Pesticides and Beneficial Arthropods" and the "Breeding for Resistance to Insects and Mites" working groups. During the past decade, several initiatives have led to research in non-chemical control of nematodes and fungi, e.g. studies of soil solarization, of antagonistic leaf fungi and of bacteria producing antibiotics against soil borne plant diseases. Results of these studies were presented at this meeting. Also, the possibility for developing IPM for ornamentals was discussed extensively. Further, extension aspects, growers perceptions of IPM and economics of IPM were addressed.

The papers of this meeting have been published in *Pesticide Science*, Vol. 36, 4, 1992, 319-400.

J.C. van Lenteren

Research News from Long Ashton Research Station, UK

1) A nematode parasite for biocontrol of slugs

Slugs are important pests of a wide range of crops, but are relatively poorly controlled by current chemical methods. However, it is unlikely that any of the natural enemies described in the literature has the potential to be developed as a commercial molluscicide.

In a project funded by the Agricultural Genetics Company (AGC), the rhabditid nematode *Phasmarhabditis hermaphrodita* was found parasitising field slugs (*Deroceras reticulatum*) collected at Long Ashton in 1988. This nematode had previously been recorded associated with slugs, but it was not considered to be a parasite capable of killing slugs. We have shown that *P. hermaphrodita* is a parasite which is capable of killing all pest species of slugs, as well as one species of snail which we have tested. Other tests have shown that *Lymnaea stagnalis* snails (vector of liver fluke) are also susceptible. However, earthworms (*Lumbricus terrestris*) and carabid beetles (*Pterostichus melanarius*) are not affected by the nematode.

The nematode, like the insect-parasitic nematodes *Steinernema* spp. *Heterorhabditis* spp., produces non-feeding 3rd stage infective larvae ("Dauerlarvae"), which are encased in the retained cuticle of the 2nd stage larvae. These live freely in the soil and infect slugs by entering the mantle cavity, where they grow and reproduce, causing a characteristic swelling of the mantle. Slugs are inhibited from feeding after a few days, thus protecting crop damage. The slug dies eventually once again producing dauerlarvae, which move into the soil, ready to infect new slugs. We have recorded natural levels of parasitism of 30-50% of slug populations at LARS. In

view of these levels of natural infection it is likely that birds and mammals such as hedgehogs, badgers etc., which regularly feed on slugs, must frequently consume nematode-infected slugs without harm.

The nematode is well adapted to soil temperatures at which slugs are active and we have found that it is capable of infecting slugs at temperatures as low as 5°C (the lowest temperature we have tested). The nematode is a bacterial feeder and species of bacteria have been selected which support good growth of the nematode in foam-chips and liquid cultures, and which produce nematodes capable of killing slugs. As a result, *P. hermaphrodita* is now produced by AGC in liquid fermenters in a pilot plant at Horticulture Research International, Littlehampton. Third-stage infective larvae are harvested and formulated by AGC in a friable clay.

Field experiments in Chinese cabbage, lettuce and winter wheat show that the nematode is capable of protecting these crops from slug damage. In these experiments, the nematodes were applied as a liquid suspension, using either a watering can or standard spraying equipment. Methiocarb pellets were included as a standard control measure in all our field trials and the nematode has been at least as effective as, or significantly better than methiocarb. The nematode is capable of persisting for several weeks in soil but its effects on slug populations probably last for a matter of weeks, or a few months at most.

AGC have applied for a patent of use, which has just been published as International Patent No. WO 93/00816. (M.J. Wilson & D.M. Glen)

2) Biological control of willow rusts with a hyperparasite

Rusts (*Melampsora* spp.) are serious fungal pathogens of willows (*Salix* spp.) when grown in short rotation coppice for the production of biomass for energy uses. These

diseases can be so severe as to threaten the establishment of a renewable energy industry based on fast growing woody trees. Their control is not practically nor economically feasible with fungicides.

In research, funded by the Department of Trade and Industry, natural populations of the fungal hyperparasite *Sphaerellopsis (Daruca) filum* have been observed within willow plantations around the UK, including Northern Ireland. The hyperparasite colonises rust pustules profoundly reducing their ability to generate spores. Within an established plantation at Long Ashton the hyperparasite has maintained a natural population on the willow clone *Salix viminalis* Bowles Hybrid with a stem-infecting form of the rust *Melampsora epitea*. As a result the magnitude of rust epidemics has been substantially reduced over a period of at least three years without intervention of any kind. The factors regulating this natural biocontrol process are being investigated in order to be able to exploit the phenomenon for commercial biocontrol. (R.A.C. Morris & D.J. Royle).

Profile, Nr. 16, 1993

Biological Control of Weevil

Augmentative releases of the parasite *Catolaccus grandis* provided highly effective suppression of boll weevil life stages (third instars and pupae) exceeded 96% in release sites, but averaged less than 10% in control plot levels of parasites. Effective suppression of boll weevil densities was accompanied by a substantial decreases in the incidence of plant damage. Surveys conducted at the time parasite releases were terminated (late June) revealed an average of 43-48 undamaged green bolls/m² in release sites, compared to approximately 13 undamaged bolls/m² in the respective controls. (K.R. Summy, J.A. Morales, E.G. King, USDA/ARS SURL).

Development of Artificial Diets and In Vitro Rearing Systems for Insect Natural Enemies

In vitro diets for internal (*Trichogramma*) and external parasites (*Catolaccus grandis*) of insect pests have been developed. Research has focused primarily on *Trichogramma minutum*, an egg parasitoid of several pest species, and on *Eucelatoria bryani*, a larval parasitoid of *Helicoverpa zea*. The research on *T. minutum* is being conducted cooperatively with the CIBA-Geigy under a Cooperative Research and Development Agreement which limits release of accomplishment details. Research has culminated in the development of an ovipositional stimulant and an artificial diet that have been linked to provide a complete *in vitro* rearing system for *Catolaccus grandis*, an important parasite of the boll weevil. Short-chain saturated hydrocarbons (alkanes) stimulated oviposition in *C. grandis*. This material was placed on Parafilm® and into sterilized cells containing small amounts of the parasite diet. Immature parasite develop readily within these containers and following two consecutive generations show no major differences from parasitoids produced *in vivo*.

(W.C. Nettles, A.A. Guerra
USDA/ARS SURL)

Mass Production of Green Lacewings, *Chrysoperla rufilabris*

New methodology has been developed that allows for more efficient mass production of *Chrysoperla* spp. in commercial insectaries. Accomplishments include the development of a new adult feeding and oviposition unit for *Chrysoperla*

spp. and a hot-wire egg harvesting system that significantly reduces labor requirements while providing eggs relatively free of stalk material. A new encapsulated larval diet was evaluated and a process developed to apply hot glue to construct larval rearing units. The combination of this diet and the new construction technique should allow this rearing system to be automated, making it faster and more efficient for the insectary industry. A Cooperative Research and Development Agreement has been developed with BioFac Inc. to aid in the transfer of some of the above technology to industry.

(USDA/ARS SURL)

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PERIODICALS - PROCEEDINGS

Proceedings "III Mesa Redonda Sobre Control Biologico en el Neotropico" M.C. Zapater (ed.) (IOBC-NTRS/USDA-NBCI) will soon be released. Orders to M.C. Zapater, address on page 9.

Boletín "MIP" No. 33. March 1993. PP 10. Edited by A. Teran, Cirpon, CC. 90, 4000 S.M. De Tucuman, Argentina.

Aportes del Control Biologico en la Agricultura Sostenible - Viabilidad y estrategias de desarrollo. Resumen 1er Seminario Taller Internacional, 24-28 Mayo 1993, Lima, Peru. For information contact M.C. Zapater, address on page 9.

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1993/16 (1). Integrated production. Principles and technical guidelines (in english, french and german), 96 pp.

1993/16 (2). Proc. of the WG "Integrated Control in Glasshouses", workshop held at Pacific Grove, CA, USA, 192 pp.

1993/16 (3). Determination list of entomophagous insects No. 12.

Publication of the Commission "Identification", 56 pp.

1993/16 (4). Proc. of the WG "Integrated protection in fruit orchards" Subgroup "Peaches", workshop held in Rimini, Italy (contributions in english or french), 77 pp.

1993/16 (5). Proc. of the WG "Breeding for resistance to insects and mites", workshop held in Coventry, U.K. (in association with EUCARPIA), 201 pp.

1993/16 (6). List of publications by IOBC/WPRS from 1968-1993, 51 pp.

1993/16 (7). Proc. of the WG "Integrated control in Citrus fruit crops", workshop held at Acireale, Italy, 152 pp.

A few copies of the cited IOBC/WPRS publications may still be available from D. Degheele, University of Gent, Coupure Links 653, B-9000 Gent.

CALENDAR

November 15-19, 1993. 3rd International Workshop on *Chromolaena odorata*, Abidjan, Ivory Coast. Contact R. Muniappan, Agric. Experiment Station, University of Guam, UOG Station, Mangilao, Guam 96923, USA. Fax: (671) 734-6842.

January, 1994. XV Congresso Brasileiro de Entomologia. Lavras City, MG, Brasil. Contact: Dr. A. Ciociola, Departamento de Fitossanidade/Esal, Caixa Postal 37, 37200-000 Lavras, MG, Brasil.

April 18-20, 1994. Field margins: integrating agriculture and conservation. Symposium Organisers: Conference Associates and Services Ltd. FMS, Congress House, 55 New Cavendish Street, London, W1M 7RE, United Kingdom. Tel. 71/486'0531; Fax. 71/935'7559.

May, 94. IV Sinconbiol (Symposium on Biological Control) Gramado City, RS, Brasil. Contact: Dr. Luis Belarmino, Embrapa, Caixa Postal 553, 96001-970 Pelotas, RS, Brasil.

May 2-5, 1994. Vth International Symposium of Neuropterology CAIRO-EGYPT. Contact: Dr. S.A. el Arnaouty, c/o ORSTOM, B.O. 26 Giza code 12211, Cairo, Egypt. Tel./Fax. (202) 703'948.

May 3-6, 1994. International symposium on crop protection, University of Gent, Belgium. Contact: L. Tirry, Agricultural and Applied Biological Sciences, Coupure links 653, 9000, Gent

Belgium. Tel. 32 9 264.61.52; Fax. 32 9 264 62 39 or 264 62 49.

May 24-28, 1994. 7th European Workshop on "Insect Parasitoids". Contact T. Hofsvang, Norwegian Plant Protection Institute, Dep. of Entomology and Nematology, Fellesbygget, N-1432 As, Norway.

September 18-21, 1994. 10th International Entomophagous Insects Workshop, Whistler, British Columbia, Canada. Conference Services, Simon Fraser University, Burnaby, B.C. Canada V5A 1S6. Tel. (604) 291'4910; Fax (604) 291'3420.

October 2-6, 1994. International Conference on modern agriculture and the environment, Rehovot, Israel. Contact: Conference Secretariat, "Agriculture and Environment Conference", Peltours-Te'um Congress Organisers, P.O. Box 8388, Jerusalem 91082, Israel. Tel. 972/2 617 402; Fax. 972/2 637 572.

July 2-7, 1995. 13th International Plant Protection Congress, The Hague, The Netherlands. Contact the XIII International Plant Protection Congress, c/o Holland Organizing Centre, Lange Voorhout 16, 2514 EE The Hague, the Netherlands. Tel. +37-70/365'78'50; Fax. +31-70/361'48'46.

August 25-31, 1996. XX International Congress of Entomology, Florence, Italy. Contact the Organizing Secretariat O.I.C., Via A. La Marmora, 24, 50121 Florence, Italy. Tel. 55'500'06'31; Fax. 55'500'19'12.

Those who wish to propose sectional symposia, workshops, meetings etc. should write to the Congress Organizing Secretariat O.I.C. by the end of 1993.

Membership fees 1993

Did you already pay your IOBC membership fee 1993? If not, please do so at your earliest convenience. You prevent us from wasting money by sending additional invoices. Thank you.

REQUESTED: NEWSLETTER CONTRIBUTIONS

I would like to thank all those members who are taking time to send items for the 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 biocontrol. Take a few minutes and mail or fax items of biological control to the Newsletter editor, so they can be included in the next issue. Deadline for submitting items for the March 1993 issue of IOBC Newsletter is **February 15, 1993**. Send items to F. Bigler (address on page 1).

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