sip

NEWSLETTER

society for invertebrate pathology

VOLUME 35, NUMBER 1
February, 2002

VIII International Colloquium on Invertebrate Pathology and Microbial Control
35th Annual Meeting of the Society for Invertebrate Pathology,
VI International Conference on *Bacillus thuringiensis* (ICBt)
Fos do Iguassu, Brazil

August 18-23, 2002

The local organizers of the VIII ICIPMC, the VI ICBt, and the XXXV Annual Meeting of the SIP are excited about hosting these events in Foz do Iguassu, Brazil. This will be an excellent opportunity for many South American researchers and insect pathologists and microbial control specialists from diverse regions of the world to interact. The great majority of the Latin American researchers working in insect pathology and microbial control have not been able to participate in the SIP meetings due to restriction of funds for participation in meetings abroad. Therefore, it is expected that there will be an unprecedented number of Latin American participants at the SIP meetings in Foz do Iguassu.

The local organizing committee involves members from different institutions, including Embrapa, Fiocruz, several universities and the Entomological Society of Brazil, which are officially supporting the Organizing Committee in many ways.

Location: The city of Foz do Iguassu has approximately 250,000 inhabitants and is located in the southwestern region of the state of Parana at 183 m above sea level, at the border with Argentina and Paraguay.

Its most important attraction, the Iguassu Falls (considered one of the wonders of the world), is located in the Iguassu National Park, a magnificent wildlife reserve of 240,000 hectares (185,000 of which are in Brazilian side and 55,000 in Argentina), consisting mostly of subtropical rainforest and rare tree species.

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Deadline for the next Newsletter is May 1 2002.

SIP Office

Please send all correspondence, membership applications and changes of address to our Executive Secretary, Margaret (Peg) Rotstein at:

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Note: Toll Free numbers for Canada & USA only

Orchids, ferns and philodendrons grow throughout the National Park area, which is also inhabited by a rich fauna of many beautiful butterflies, birds and mammals. The Iguassu Falls consist of 275 falls, some almost 3 kilometers wide, and can be admired from the Brazilian and Argentinian sides. Other attractions include the Itaipu hydroelectric dam, the largest in the world, the Macuco Safari (which includes a breathtaking boat ride close to some of the falls), the Bird Park, the Orchid Park, and others.

Venue. The Hotel Bourbon is a top five-star hotel fully equipped with high-quality conference auditoriums, conference rooms, restaurants, indoor and outdoor recreational facilities, etc. The rooms (single and doubles) are ample and of top quality and are equipped with TV, telephone, air conditioning, and other features of a fine hotel. For the participants staying at this hotel, the room rate will include a fantastic breakfast and an executive, high-quality lunch. The room rates will be approximately US$ 52.00 per person in a double room and US$ 85.00 for a person in a single room (the same size as a double room). If the participants of SIP 2002 occupy at least 250 rooms in the hotel, all the conference facilities used by the SIP events and the coffee breaks, will be free of charge.

Therefore, we recommend to the participants to stay at the Hotel Bourbon, to help reduce the costs of the SIP 2002 organization.

SIP NEWSLETTER
Published by
the Society for Invertebrate Pathology
(SIP Homepage: "http://www.sipweb.org")

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The SIP Newsletter is published 3 times per year and is available on our homepage.

Submissions to the following sections are solicited:

Forum: More substantial articles on current issues of concern, limited to approximately five pages.
Letters to the Editor: Issues of concern can be brought to light here.
Microbial Control News: Information on new discoveries, "News Releases", formation of companies, etc., pertaining to microbial control.

We also depend on our members to supply us with information for the following sections: **Obituaries, Member News** (Retirements, Awards, Promotions), **Members on the Move** (New Addresses), **Positions Available/Wanted, Meeting and Workshop Announcements,** and other **News Items.**

Send all submissions directly to the Editor. Submissions via e-mail or on computer disk (MSWORD, if possible) streamlines publication and saves on costs. Please include a hard copy with any text sent via computer disk.

Deadline for the next Newsletter is May 1, 2002.

Disclaimer: The information contained herein, including any expression of opinion, and any projection or forecast, has been obtained from or is based upon sources believed by us to be reliable but is not guaranteed as to accuracy or completeness. The information is supplied without obligation and on the understanding that any person who acts upon it or otherwise changes his/her position in reliance thereon, does so entirely at his/her risk.

Other Hotels
Special arrangements can be made for students and other participants wishing to stay in less expensive hotels near the event venue. Transportation will be provided to participants staying in other hotels, but they will not be entitled to the free executive lunch at the Bourbon Hotel. However, sandwich packets or tickets for the executive lunch will be available at a reasonable price at the conference main desk. Information about other hotels and room prices will be available soon or can be obtained from PJ Eventos.

Airport Transportation (Transfer)
Free transportation to the hotel will be provided for the participants arriving at the Foz do Iguassu International Airport on August 17 and August 18; and departing from the hotel to this airport on August 23 and August 24. On other dates, participants are advised to take a taxi (about US$15). When your trip itinerary is all set, please communicate your arrival date and fight number to PJEventos (see more details at www. pjeventos.com.br/sip2002). Those arriving at Guarany (Paraguay) or Puerto Iguazu (Argentina) are advised to take a taxi to the hotel at their own expense. Because these airports are more distant from the hotel, a taxi may cost from US$30-50. If you are arriving at airports in Argentina and Paraguay, please check with their foreign authorities regarding legal requirements, even if you will only stay in Brazil.

Weather in Foz do Iguassu
In this region, during August (winter season), the sun rises at 7:00 am and sets at 6:30 pm. August is generally a dry month (rainfall around 10 mm), with mean temperature ranging from a maximum of 25 to 28 ^{o}C in the afternoon to a minimum of 15 ^{o}C during the night. These climatic conditions may vary from year to year. Closer to the SIP 2002, this information will be updated for participants on the event internet site.

The Local Organizing Committee
Chairman: Flavio Moscardi
(moscardi@cnpso.embrapa.br)
Co-Chairman: Sérgio Batista Alves
(sebalves@carpa.ciagri.usp.br)
Secretary: Helena F. Murioka
(sip2002@cnpso.embrapa.br)
Treasurers: João Armelin Filho & Alfredo O.R. de Carvalho
Scientific Program Chair: Bonifácio P. Magalhães
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Subcommittee Coordinators: Fungi – Daniel R. Sosa Gómez (drs38@cornell.edu)
Viruses – Marlinda L. de Souza
(marlinda@cenargen.embrapa.br)
Bactéria – Olívia Arantes (arantes@uel.br)
Nematodes – Marineide Aguillera
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& Elisabeth De Nardo
Microsporidia – Armando Castelo Branco
(abranco@mii.zas.com.br)
Microbial Control – Pedro M.J.O. Neves
(pmjoneve@uel.br)
Fund Raising Committee: Flavio Moscardi, José M. das Graças Andrade, Leon Rabinovitch, Myrian Tigano, Sebastião Barbosa, and PJEventos
Social Program Committee: Clara Beatriz Hoffmann-Campo, Olivia Arantes,and PJEventos

Scientific Program/Meeting Format
Plenary sessions, symposia and oral contributed sessions will be held throughout the meeting. Workshops on specific topics will be held on Friday morning. Poster sessions are scheduled for Monday through Thursday, with all posters being available to participants from Monday morning. Poster presenters will be scheduled to be available during a specified time during this period. Division meetings are scheduled for Monday and Tuesday evenings. There will be student paper and poster competitions, with awards provided by the SIP. Student competitors will be limited to one presentation each, either a poster or an oral presentation. The SIP business meeting is planned for Thursday afternoon. The meeting concludes on Friday at noon, after the workshops are ended. The official language for presentations is English, however, the Organizing Committee is considering the possibility of providing simultaneous translation from English to Portuguese if funding is obtained for this purpose. A decision on availability of simultaneous translation will be made before the early registration deadline (April 30) and will be posted on the event site, in the June SIP Newsletter and on the SIP homepage.

Deadline for abstracts and plenary and symposia papers. The deadline for receipt of abstracts for contributed papers and posters, as well as for complete papers for plenary lectures, symposia, and workshops, is **April 15, 2002**. This deadline will allow the Scientific Program Committee to prepare

and distribute the program, abstracts and papers to all SIP members before the meeting via the SIP web site (www.sipweb.org). Abstracts and complete papers received after the deadline may not be printed. Later submissions will be scheduled as posters on a space-available basis. The Organizing Committee reserves the right to request that some contributed oral papers be presented as posters. In this case, the authors requesting presentation of their papers as oral contributions will be informed in advance of the change of their presentation to posters. A printed Program and Abstracts book, as well as a Proceedings of Plenary, Symposia, and Workshop papers, will be available to those registered for the meeting or to those requesting copies through the SIP Office.

Registration. **April 30** is the deadline for early registration, and the registration fee will increase progressively after that date according to the table in the registration packet. The registration fee includes access to the scientific and social program, Program and Abstract book, Proceedings of plenary and symposia/workshop lectures, mixer, conference dinner, barbecue, coffee breaks during the conference, and transportation during the conference. An outing (excursion) will be organized for Wednesday afternoon (at a surcharge), which will include a trip to the Iguassu Falls. After the excursion, the participants will have a special time to relax (included in the registration fee) while eating a superb Brazilian barbecue and listening to typical Latin American music. Registrants will be notified about their registration and payment upon receipt.

Cancellation Policy. Cancellations will be accepted before July 18, 2002 with a handling charge of US$ 65.00 plus Brazilian governmental taxes withheld to transfer money abroad. After July 18, returns can not be guaranteed due to the required registrations with the Conference Hotel.

Invitations. Those requiring invitations for obtaining visas or funds from governmental and international organizations should send an email to pjeventos@pjeventos.com.br

Visa and Entrance Requirements: Citizens from most countries will require a visa to enter Brazil. Please contact your travel agent or the Brazilian Consulate in your country for more information on visa and entry requirements.

Key dates to remember!!

Deadline for submission of abstracts:
April 15, 2002
Deadline for early registration:
April 30, 2002
Deadline for cancellation (Fee: $65):
July 18, 2002

Flavio Moscardi, Chair
Sergio Batista Alves, Co-chair

The Hotel Bourbon

ANNOUNCEMENTS FOR THE FOS DO IGUASSU MEETINGS

Preliminary List of Symposia and Workshops

Symposia and Workshop titles are still tentative. Final Symposium and Workshop programs, speakers and abstracts will be made available in April. For information concerning contributing to one of the sessions or contacting convenors, please contact Bonifácio Magalhães (boni@cenargen.embrapa.br).

Fungi

Symposium I
Toward the Integration of Fungal Entomopathogens with Other Biological Control Agents

1. Interactions with insect predators
2. Interactions with insect parasitoids
3. Interactions between microbes
4. Interactions with chemicals

Symposium II
Microecology of Entomopathogenic Fungi
1. Soil interactions in agroecosystems
2. Phylloplane ecology: Moisture – radiation, chemical interactions
3. Endophytism
4. Aquatic systems

Symposium III
Genetic Structure of Fungal Populations

1. Genetic structure of Hyphomycetes
2. Genetic structure of Phytopathogenic fungi
3. Genetic structure of Entomophthorales
4. Phylogeny and genetic evolution of entomopathogenic fungi
5. Methods of study of genetic structure of populations

Virus

Symposium I
Arthropod-borne Virus

1. West-Nile virus in the US
2. Encephalitis in South America
3. Dengue and yellow fever in South America

Symposium II
Prospects for the Use of Viral Pesticides

Symposium III
New Technologies in Cell Culture and Use of Baculovirus as Expression Vectors

Bacteria

Symposium I
Bacteria/Insect Interactions: Virulence Aspects.

Symposium II
Bacterial Insecticidal Proteins: Specificity, Improvement and Novel Toxins

Symposium III
Bti and Bsh Mosquitocidal Strains: Use and Necessities.

Symposium IV
Bt Transgenic Plants and Insect Resistance to Bt Toxins

Microsporidia

Symposium I
Biology and Pathology of Microsporidioses

Symposium II
Epidemiology of Microsporidioses in Insect Pests in Medicine, Veterinary, and Agriculture

Symposium III
Taxonomy of Microsporidia

Symposium IV
Use of Microsporidia in IPM

Symposium V
Mass Production of Microsporidia

Nematodes

Symposium I
Entomopathogenic Nematodes: Current Status

1. Worldwide use and market (mass production and formulation included)
2. Taxonomy, phylogenetics and biogeography
3. Research and implementation in South America
4. Classical biological control: A case study of *Steinernema scapterisci*
5. Evaluating non- target effects on below ground invertebrates

Symposium II
Entomopathogenic Nematodes: Research Trends

1. Molecular mechanisms of symbiosis
2. Virulence mechanisms of symbiotic bacteria
3. Novel insecticidal toxins and other metabolites of *Xenorhabdus* and *Photorhabdus*
4. Molecular approaches to trait improvement
5. Ecological genetics: Are there metapopulations?

Microbial Control

Symposium I
Microbial Control of Insect Pests of Potato - from Tiera del Fuego to the Great White North

1. Introduction
2. Control of potato tuber moth in South America using granulovirus - an overview
3. Pilot programs and use of PTM granulovirus by

small farm owners
4. Microbial control of insect pests of potato other than PTM in South and Central America
5. Microbial control of the Colorado Potato Beetle in irrigated desert agroecosystems and effects on non-target organisms
6. Microbial control of the Colorado Potato Beetle in rain-fed potato agroecosystems
7. Integration of insect and microbial control agents for the biological control of potato pest insects

Symposium II
Microbiol Control of the Coffee Berry Borer by Entomopathogenic Fungi
1. Columbia
2. Mexico
3. Honduras
4. Nicaragua
5. Costa Rica
6. Brasil
7. Equador
8. Integration with biological control of other coffee pests around the world.

Symposium III
Solar Irradiation of Insect Pathogens: Deleterious Effects, and Mitigation through Genetics and Formulation

Cross Division

Symposium I
Microbial Germplasm Repositories: The Legacy, the Problem, the Future

Symposium II
Microsporidia within Entomophthorales

Symposium III
Microsporidia and Fungi: Similarities and Differences in Morphology, Development, and Biology

Workshops - Suggestions

Workshop I
Bacteria – Transgenesis, Ethics and Law Concerns

Workshop II
A workshop with a discussion about ethics and legal concerns of transgenic plants will be prepared to be held during the Bacteria Division Business meeting 2002.

Workshop III
Advances in the Control of Soil Insects

Workshop IV
The Future of Scientific Publications

Workshop V
Bioinsecticide Production Issues, with a Focus on Latin America

Workshop VI
Preservation of Entomopathogenic Fungi

Workshop VII
Methods for the Study of Microsporidia

STUDENT TRAVEL AWARDS

SIP Travel Award Application General Instructions:

Applicants must be students enrolled in a university degree program. They need not be members of the SIP or of any Division sponsoring a travel award.

Applications for Division-sponsored travel awards should be sent to the Chair of the Division offering the award. The subject matter of the presentation should pertain to the Division. Individuals submitting *oral* presentations to a Division will automatically be considered also for the Martignoni Award.

Applications of oral presentations on subjects unrelated to that of any Division offering an award should be sent to the Chair of the Endowment and Student Awards Committee for Martignoni Award consideration.

A student may apply for any number of awards in a single year. However, while students meeting all requirements will be *considered* for multiple awards (for example, one or more Division-sponsored awards and the Martignoni Award), they will be *eligible to receive only one travel award per year*. Each student will be eligible to receive the Martignoni Award only once. Eligibility to receive Divisional awards more than once will be determined by each Division independently. Students should consult Division chairs for current

guidelines.
Required Information for Award Application
(Please note: Email applications are preferred)

1. Curriculum Vitae. This should include the applicant's name, address, institution, earned degrees, current degree program, honors and awards, research experience, and a list of publications and previous presentations.

2. A short biographical sketch and description of scientific interests and goals.

3. A letter from the supervisor providing a recommendation, verification of student status, and confirmation that the research being presented was conducted by the student.

4. Presentation abstract. The application must include a one-page summary of the presentation including title, authors, and affiliations (this may be the abstract submitted to the Annual Meeting Program Committee). The student's research contribution represents one of the most important selection criteria. Therefore, the abstract should be crafted with care, succinctly describing the research rationale, any unusual or novel methods, and the principal results. An explanation of the significance of the research findings should be offered in conclusion, based on sound interpretation of the results.

Deadline for submission (all awards): April 1 , 2002

Mauro Martignoni Student Travel Award
All students of invertebrate pathology are invited to compete for the second annual Mauro Martignoni Student Travel Award. An award of US$500 will be presented to support travel to the International Colloquium in Foz do Iguaçu, Brazil (August 18–23, 2002). The recipient is required to submit an abstract and give an oral presentation based on their own work. The student is not required to be a member of SIP and the subject matter may relate to any area of invertebrate pathology or microbial control. An award presentation will be made at the colloquium, however, arrangement may be made for receiving the funds in advance.

Send application information via e-mail to:
Dr. Stephen Wraight, Chair, Student Awards Committee
email: spw4@cornell.edu

Microbial Control Division Student Travel Award for 2002:
The Microbial Control Division announces two US$500 travel awards for students with financial difficulty to allow them to attend the SIP meeting in Brazil. Students from any country can apply by completing the information as described above via regular mail or email. The award recipients are not required to be members of the Microbial Control Division.

The student award recipient is expected to make a presentation (oral or poster) and be the first or second author. The subject matter of the presentations should pertain to the Division, i.e., applied microbial control of insects, rather than pure mycology, virology, molecular biology, etc. Applications should be sent to the chair of the selection committee (address below)

The selected student(s) will receive an official communication from the Chair of the Microbial Control Division and should confirm their participation as soon as possible. The award is normally delivered at the meeting, but when necessary for travel, funds can be sent earlier.

Decision and notification will be approx. May 1.

Please send applications to

Dr. Stefan Jaronski,
Microbial Control Division, Member-at Large.
USDA, ARS, NPARL,
1500 N. Central Ave.,
Sidney MT 59270-4202 USA
(sjaronski@sidney.ars.usda.gov)

Microsporidia Division Student Travel Award:
The Division on Microsporidia announces a $500 Student Travel Award for the 2002 SIP meeting in Iguassu Falls, Brasil. Students are asked to follow the procedures outlined in this Newsletter for student travel awards. Applications will be accepted for both oral and poster presentations on subject matter related to microsporidia or pathogenic Protozoa. Applications should be mailed electronically to:
Dr. Lee Solter (email: l-solter@uiuc.edu). If electronic mail is not possible, please send hard copy applications to Dr. Lee Solter, Illinois Natural History Survey, 140 NSRC, Box 18, 1101 W. Peabody Dr., Urbana, IL 61801 USA. Please do not send both electronic and hard copy applications.

FROM THE PRESIDENT

The year 2001 has come and gone with many happy and rewarding events for our Society and its members. There have also been sadness due to the deaths of several members, and sadness from the very tragic events here in America and in many parts of the world that have affected all of us directly or indirectly. Relative to the tragic events, former SIP President Betty Davidson restated her concept of the SIP family, a concept that I believe in very firmly, in her letter to the editor in our last Newsletter issue. If you did not read it (Vol. 34, No. 3, page 52), I hope you will. Betty beautifully describes the spirit that unites us internationally as friends, enhances our interactions in our science, and promotes the joy of working in such a challenging and rewarding field as ours.

Since the November Newsletter, the Society has been moving strongly on several fronts, largely through the activities of your committees. The most obvious activity in this Newsletter will be the work of the Program Committee chaired by Flavio Moscardi with co-chairman Sergio Batista Alves and Bonifácio Magalhâes chairing the scientific programming sub-committees. The venue looks exciting, and most attendees should be able to be housed together in the meeting hotel, which always results in a much more valuable and productive meeting for all. The Program Committee has developed a beautiful web site that will be updated regularly at www.pjeventos.com.br/sip2002/, and I encourage you to visit it. Please take time to look at the proposed symposia for the Brazil meeting. Some of these are firmly established while others still provide opportunities for member input and participation. With your input, all aspects of our meeting should be as intellectually rewarding as those of past years.

I hope many of you will be able to participate in the joint annual meeting, colloquium, and *Bt* conference in Iguassu Falls. The organizers indicate that many scientists, students and others from Latin American countries who have not done so in the past will attend the meetings and present research results. This will provide all who attend an unprecedented opportunity to share information and develop new personal and professional relationships. Every meeting I have attended in Latin America has been memorable from the hospitality extended by the host country and organization, from the science presented, from the opportunity for two-way sharing of research findings with new colleagues, and from the enthusiasm of local students who take full advantage of the unique opportunity to attend and participate in an international meeting with global attendance. Those who attended the Guanajuato1999 meetings know what I mean! This year's meeting promises to provide all of these benefits and opportunities for our participants and more, so make your plans and reservations early.

The meetings in Brazil should provide a great opportunity for our Membership Committee to recruit new members to the Society. Jimmy Becnel, chair of the Membership Committee, requested and I approved the addition of Roberto Pereira to the Committee. Roberto has expressed a strong desire to work to enhance our Latin American membership. I have informal reports from Steve Wraight, chair of our Endowment and Student Awards Committee, David Onstad, Chair of the Publications Committee, Dudley Pinnock, Chair of the Founders' Lecture Committee, and Wendy Gelernter, Chair of the Financial Support Committee that these committees are making excellent progress with their respective responsibilities. The Nominating Committee chaired by Bob Granados provided an excellent slate of candidates for officers as published in our last newsletter. Mark Goettel and the Meetings Committee continue to seek venues for future meetings and seek input, invitations and suggestions from all members.

If you have issues you feel that your SIP Council should be addressing in the interests of the Society, I encourage you to write or e-mail me or any Council member, which includes all Division chairs. We

will welcome your comments and suggestions. If you have questions, suggestions or recommendations that need to be considered by the committees of the Society, please address them to the membership of those committees. All of our addresses are easily found on the SIP home page. If you are interested in becoming involved in Society governance and leadership, I would encourage you to work through your Divisions and to contact members of the Council to let us know of your interests. I look forward to seeing many of you this August in South America.

Finally, I am compelled to comment on a photo on the last page of the November newsletter in which I am apparently sliding down the back of a toy giraffe. Local colleagues have questioned me on this, and I have been tempted to explain that it was either computer generated or taken out of context. Ultimately, though, I simply explain that this is from one of the lighter sides of our meeting during the bar-b-que dinner and possibly the result of too much SIPing ! My compliments to the photographers who submitted photos to the editors and to Editor Lee Solter and Assistant Editor Mark Goettel for producing a very nice, information packed issue. The on-line version with full color photos is especially nice.

Jim Harper

MICROBIAL CONTROL NEWS

From ***IPMnet News Issue 92 (August, 2001)*:**

Entomopathogens: Now and in the Future: As development and application of biocontrol for managing crop pests continue to accelerate, complexities and controversies have become front-page news. Two recent scientific overviews on the topic provide concise examinations and assess future potentials of one aspect, using entomopathogens to control pest insects.

Writing in the journal *Biological Control,* L.A. Lacey et al. pose the key question in, "Insect Pathogens as Biological Control Agents: Do They Have a Future?" Entomopathogens, the authors note, should not be compared to pesticides solely on either an efficacy or cost basis. Use of biocontrols offer additional advantages in terms of safety for humans and other nontarget organisms, reduction of pesticide residues in food, preservation of other natural enemies, and increased biodiversity in managed ecosystems.

Greater appreciation for the attributes of entomopathogens in the future is envisioned as well as synergistic combinations with other technologies. However, Lacey and colleagues set forth seven keys necessary to realize expanded biocontrol usage:

1.) improved performance under challenging environmental conditions (cool weather, dry conditions, etc.);
2.) increased virulence and speed of kill;
3.) improved formulations for ease of application, increased environmental persistence, and longer shelf life;
4.) greater production efficiency;
5.) understanding of how pathogens fit into integrated systems and their interaction with the environment and other IPM components;
6.) greater appreciation of their environmental advantages; and,
7.) increased acceptance by growers and the general public.

The most widely used microbial control agent is the bacterium *Bacillus thuringiensis* which, in various forms that are active against Lepidoptera, Coleoptera, and Diptera, is an integral component of widely grown "*Bt* crops." In his *IPM Review*s paper, "*Bt* Transgenic Crops: Risks and Benefits," R.J.C. Cannon observes that the popularity of *Bt* crops is not without complications and, for consumers, concerns.

Bt crops, while reducing usage of primary insecticides, have in some cases triggered upsurges of non-target secondary pest insects that then may require pesticide applications. In years where a *Bt*-targeted pest remains below pest-level thresholds, the added cost of the Bt enhanced seed may be an unneeded expenditure for growers.

Cannon also raises the topic of resistance and the need for establishing refuges. Beyond the need for closely monitoring resistance development, "a widespread consensus on the necessity for such measures, and an appreciation of the importance of multi-tactical approaches, has developed," he notes.

The two papers are part of a growing, thoughtful body of literature exploring the evolution of entomopathogen usage.

L.A. Lacey, USDA/ARS/YARL
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E-mail: R.Cannon@csl.gov.uk
excerpted with thanks from: *Biological Control, 21(3), 230-248,* July 2001 and from *IPM Reviews, 5(3), 151-173,* 2000.

…and a medley of *Bt* information from *IPMnet News 95, November, 2001:*

***Bt*: Best technology, or Big trouble?**

A Definitive Website
Now that the *Bt* corn pollen stirred up in 1999 has settled, staff of the Agricultural Research Service (ARS) of the U.S. Dept. of Agriculture have produced an extensive website, "Research Q&A: *Bt* Corn and Monarch Butterflies", at www.ars.usda.gov/is/br/btcorn/index.html#bt12, an information-rich gateway setting out a variety of questions and answers regarding the impact of *Bt* corn on *Danaus plexippus* (monarch butterfly). The overall conclusion: there is no significant risk to monarchs from environmental exposure to Bt corn. The ARS answers are based on a series of studies by a large informal group of ARS and cooperating scientists (see next item).
R.L. Hellmich, email: RLHellmi@iastate.edu

The Benchmark Studies
The ARS-sponsored workshop that lead to the definitive *Bt* corn-monarch studies involved not only federal government and university staff, but industry and environmental groups as well. The result of this unique collaboration was six scientific papers published in Proc. Natl. Acad. Sci. (PNAS) of the U.S., 98(21), 11908-11942, 09 October 2001, that are now regarded as the benchmark body of research on the issue, and which collectively debunk many of the unsubstantiated fears raised earlier. The reported research found that *D. plexippus* caterpillars are not very sensitive to pollen from most types of *Bt* corn (excepting *Bt* event 176, which is due to be phased out by 2003).
Website: www.pnas.org/content/vol98/issue21/

***Bt* Cotton: Yes and No**
Use of *Bt* in cotton *(Gossypium hirsutum)* is a more global story as key cotton producing countries have split over introduction of the technology. Australia, China, and the U.S. (where *Bt* cotton accounts for more than 30 percent of the total crop now) are among the major adopters. India, on the other hand, has introduced the technology, but is experiencing a combination of misgivings about commercial release centering around concerns over seed costs, seed ownership, and environmental concerns. See: Perlak, F.J., et al., *The Plant Jrnl., 27(6), 489-501*, September 2001.

***Bt* May Not be Economical**
Back to *Bt* corn. The crop is aimed at, and accomplishes control of, *Ostrinia nubilalis* (Hub.) (European corn borer). However, because of *Bt* corn's higher seed price, the technology can result in an economic disadvantage when corn borer infestation rates are below a certain level. A recent economic analysis found that low infestation rates in the U.S. state of Indiana made traditional corn varieties a better choice than *Bt* corn, unless *Bt* corn was viewed as a way of avoiding risk. M. Martin, Martin@agecon.purdue.edu

***Bt* Corn and Mycotoxins**
Reducing insect damage to corn also can reduce the levels of mycotoxins, the toxins produced by ear molds. Research by P.F. Dowd found that planting *Bt* hybrid varieties "still appears to be a useful method for indirectly reducing mycotoxins in corn ears." See: "Biotic and Abiotic Factors Limiting Efficacy of *Bt* Corn in Indirectly Reducing Mycotoxin Levels in Commercial Fields," Dowd, P.F., in: *J. Econ. Entom. 94(5), 1067-1074*, October 2001.

An International Range of Views
The American Society of Plant Biologists (ASPB) commissioned a series of viewpoint articles, published in the journal *Plant Physiology*, focused on biotechnology and genetically modified crops. The authors, 13 international scientists, expressed a range of views and wrote with their fellow scientists in mind. The result was *Genetically Modified Crops: What do the Scientists Say?* This provocative and far ranging collection can be read online at: www.aspb.org/publications/plantphys/gmcpub.cfm, or ordered as a single publication from: ASPB, 15501 Monona Dr., Rockville, MD 20855-2768, USA. Fx: 1-301-279-2996. Ph: 1-301-251-0560.

_Bt_ Corn Approval Extended
Based on a comprehensive review, the U.S. Environmental Protection Agency (EPA) approved the use of *Bt* corn for seven more years. "We are confident," an EPA administrator said in a news release issued on 16 October 2001, "that it does not pose risks to human health or to the environment." Approval was based on scientific studies and a history of successful use. D. Deegan, Deegan.Dave@epa.gov, Website: www.EPA.gov/oppbppd1/biopesticides/index.htm

Pathologists Support Biotech
The 5,000+ member American Phytopathological Society recently issued a formal statement supporting biotechnology. The proclamation cited "the enormous benefits to humanity possible through biotechnology, while advocating responsible and science-based oversight and regulation." Website: www.APSnet.org, E-mail: APS@scisoc.org
Excerpted from an APS Press Release, 12 October 2001.

PUBLICATIONS

Biopesticide Manual:
The new, fully revised and updated second edition of *The Biopesticide Manual* published by the British Crop Protection Council, contains a comprehensive listing of 273 biocontrol agents that are used in over 1,000 commercial products. The array of biopesticide products is vast, extending from living organisms to genes. Each product in the manual is listed in one of five categories; micro-organisms, macro-organisms, semiochemicals, natural products or genes. And each entry contains extensive information including; nomenclature, mode of action, biological activity, target crops, application, commercialization, toxicity and environmental impact. There are also extensive sections on organic farming, a directory of biocontrol companies, and a Latin/English glossary. Sample entries covering the five types of biocontrol agents can be downloaded and reviewed by accessing the BCPC website at www.bcpc.org/bookshop/ref. Copies of *The Biopesticide Manual* priced £105, are available from BCPC Publications Sales, Bear Farm, Binfield, Bracknell, Berks, RG42 52E, UK. Tel: +44 (0) 118 934 2727, Fax: +44 (0) 118 934 1998. Email: publications@bcpc.org. Secure orders can also be placed on-line from the BCPC website.

Issues in biological control are addressed in the following two publications listed in *IPMnet News 94, October, 2001:*

Biocontrol's Success: a Review: When it is successful, biological control of pest species can be elegant, self-sustaining, non-polluting, and cost effective. A 2000 publication, *Biological Control: Measures of Success*, notes that, for the most documented biocontrol programs (of arthropods by arthropods), only one in ten attempts succeed. Editors G.M. Gurr and S.D. Wratten, with material provided by a host of international scientists as both authors and reviewers, analyze why the majority of biocontrol attempts have failed, as well as examine the components of those that achieved their goals, some in spectacular fashion. The overall thrust of the hardbound, 448-page monograph clearly supports the growing importance of biocontrol across a variety of pest groups, and offers a synthesis for increasing future success rates.
Kluwer Academic Publishers
PO Box 17, 3300 AZ Dordrecht
The Netherlands. Fax: 31-78-654-6474.
E-mail: Orderdept@wkap.nl, Ph: 31-78-639-2392.

Views: Importing Biocontrol Agents A 2001 addition to the Entomological Society of America's (ESA) Thomas Say Publications entomology series explores the complex issue of *Balancing Nature:Assessing the Impact of Importing Non-native Biological Control Agents (An International Perspective)*. Editors J.A. Lockwood, et al. present material based on papers from a 1996 symposium at which widely differing viewpoints on the safety and/or risks of importing natural biocontrol agents to control introduced pest species. The 130-page, softbound work reflects a thoughtful dialog based on facts and values.
Sales-ESA, 9301 Annapolis Rd.,Ste. 300
Lanham, MD 20706, USA.
E-mail: sales@entsoc.org
Fx: 1-301-731-3473. Ph: 1-301-731-4535, ext. 301

MEMBERS ON THE MOVE

Letter from Peter Smits
Dear colleagues and friends,
This summer I have changed jobs. I am now working for the regional government of the Province Gelderland in the Netherlands (the area around

Wageningen on a project called "the reconstruction of the countryside". To be very short: pigs and farmers out, nature and recreation in.

After almost 20 years in insect pathology I needed a new challenge and I am enjoying it very much. What I miss is the big SIP-family that I was part of. Many of you became personal friends, I want to thank you for this friendship and wish you all well.

My home address in Wageningen is still the same; you are always welcome if you are in the neighborhood.

Peter Smits
Wezellaan 6
NL-6705 DG Wageningen
tel.: +317-416706
e-mail: smits684@wxs.nl

Houping Liu has begun a postdoctoral position at Dr. Leah Bauer's laboratory investigating natural enemies of the newly introduced Asian longhorned beetle. Previously, Houping completed his PhD at University of Vermont studying biological control of tarnished plant bug with entomopathogenic fungi. Houping's new address is: Department of Entomology, 208 Center for Integrated Plant Systems, Michigan State University, East Lansing, MI 48824. Tel: (517) 355-7740 ext. 22 (0), (517) 432-1203 (lab). Fax: (517) 355-5121. Email: liuho@pilot.msu.edu

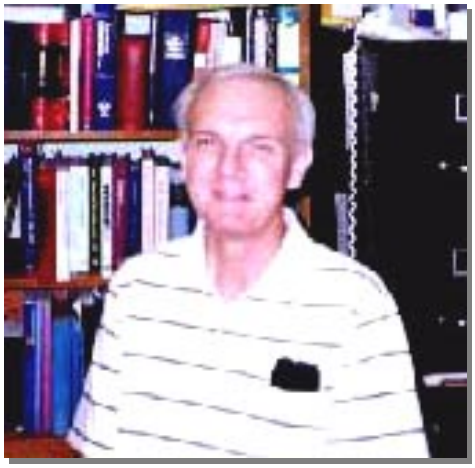
Moving??

Please prepare a paragraph including information about past and present postings, new address, telephone, fax and email address and send to your Newsletter Editor for inclusion in the Members on the Move Section in the next issue of the Newsletter. The editor's address can be found on page 2.

Please also inform the SIP Office of your new address. The address of the Office is also found on page 2.

MEMBER NEWS

Al Yousten retired from the Biology Dept. at Virginia Polytechnic Institute and State University at the end of December 2001. Al worked for 5 years on fermentations, including *B. thuringiensis*, at International Minerals and Chemicals Corp (IMC). He spent 2 years at the University of Wisconsin studying sporulation of *B. subtilis* before moving to Virginia Tech. He recently completed 30 years at



Al Yousten

Virginia Tech in Blacksburg, VA, where his research involved a variety of bacterial insect pathogens. Al's e-mail address remains the same (yousten@vt.edu) and mail can continue to be sent to the Biology Dept.

OBITUARIES

Clarence G. "Hank" Thompson

Dr. Clarence Garrison "Hank" Thompson passed away at his home in Corvallis, OR, on July 16, 2001 at the age of 82. He was survived by his wife, Irma,

whom he married in 1955 (and who passed away on December 21, 2001), son, Grant of Seattle; daughter, Kay of Forest Grove, OR; brothers, Ted of Salem, OR, and Norman of Dallas; sister, Margaret Fowler of New Bern, N.C.; and two grandchildren.

Hank was born in Corvallis, and except for a three-year period in his early childhood when his family lived in California, spent his pre-adult life in that city. He attended Corvallis schools, graduated from Corvallis High School in 1936, and received a bachelor's degree from Oregon State College, now Oregon State University, in 1940.

Hank was in the U.S. Army during World War II, serving as a Lieutenant in the 17th Airborne Division, in the course of which he parachuted behind enemy lines during the Battle of the Bulge. As Hank later modestly described to me his activities at that time, he had landed in the midst of a German machine gun nest, and was surprised when the gunners surrendered rather than shoot him. He then spent the next few hours sitting on a hill watching the action going on below him before rejoining his unit.

On returning to civilian life, Hank entered graduate school in the Department of Entomology at the University of California at Berkeley, majoring in Insect Pathology under the direction of the late Dr. E. A. Steinhaus. The first student to earn a graduate degree under Dr. Steinhaus, he received a Master of Science in 1947, and a Ph.D. in 1950, studying the potential use of entomogenous pathogens in the control of pests of field crops, particularly the alfalfa caterpillar, in the central valleys of California. On completing graduate work, he embarked on a career in professional entomology, specializing in the areas of insect pathology and microbial control, that would span the ensuing 30 years of his active life.

Hank's first professional position was as an academic researcher in the Laboratory of Insect Pathology directed by Dr. Steinhaus at UCBerkeley in 1950. For the next four years, during the first two of which I served as his technician, he continued to carry on his microbial control studies, and was the first to apply an insect virus to control insect pests of forage crops under field conditions. He also used *Bacillus thuringiensis* in his studies.

In 1954, Hank left Berkeley to accept a position with the U.S. Department of Agriculture, Entomology Research Division, at Beltsville, MD. His assignment was to establish a new pioneering insect pathology laboratory that would expand basic and applied work at the federal level in the area of insect pathology/microbial control.

In 1960, Hank returned to Corvallis to join the U.S. Forest Service as a research entomologist, with a primary assignment to establish and direct a new insect pathology research unit within the Forestry Science Laboratory that was located on the campus of Oregon State University. The primary goal of his group was to conduct studies of diseases of insect pests of forests and determine the potential of selected pathogens in microbial control efforts. A major concern was to find a means of controlling the Douglas-fir tussock moth, a serious pest of Douglas-fir in western North America.

Extensive laboratory and field studies by the research team under his direction over many years culminated in 1976 in the development of a virus product and its registration by the Environmental Protection Agency for use as a microbial insecticide against infestations of tussock moth larvae. That was a major achievement in the advancement of microbial control practices as a meaningful part of twentieth-century pest control. Closely associated with this study was the research on virus outbreaks in tussock moth populations. This is one of the most outstanding and fundamental investigations in insect virus epizootiology. For these accomplishments, Hank received the USDA Superior Service Award in 1977.

At Corvallis, Hank participated in the teaching program of the Department of Entomology at Oregon State University by offering a course on Insect Pathology, that has been described as being both 'excellent' and 'rigorous.' Many graduate students who took his course were most fortunate to be able to gain an insight into insect pathology/microbial control as only a person with his experience could present. Hank also served as major professor to at least one graduate student, that being Dr. James D. Harper.

After thirty years of active life as an entomologist, first at Berkeley, then Beltsville and finally Corvallis, Hank chose to retire in 1980 so that he could spend more time doing things he enjoyed in the Corvallis area, such as hiking, fishing, rock collecting, and nature photography, plus traveling on occasion to faraway places such as the Galapagos

Islands.

During our annual Christmas Greetings exchanges over the years, Hank wrote time and time again that he was most fortunate in being able to state that he remained "disgustingly healthy" and able to continue the many outdoor activities that he loved. When no message was received at year-end 2000, I began to suspect that maybe twenty years of good life in retirement was coming to an end. This was confirmed many months later by word of his death.

In writing this obituary, I have not referred to him by his formal name of Dr. Clarence G. Thompson, beyond the introduction, because I have known him since our student days in the late 1940's as just plain "Hank." Where that name emanated from, I do not know, but when we first met, he said "just call me Hank," and that I have done over the past fifty plus years. We saw each other only infrequently at meetings over the years, and kept in touch most often by year-end seasonal greetings, but I continued to see him as a most competent scientist in the field of insect pathology and microbial control, and above all, a good friend. Hank, you will be missed, but not forgotten.

Irvin M. Hall
Professor of Insect Pathology and Insect
Dept. of Entomology, University of California, Riverside.
(current address: 2253 Baskerville Ave., Bishop, CA 93514-1907)

With additions by James D. Harper, Yoshinori 'Joe' Tanada, and Kay Thompson

POSITIONS AVAILABLE

Postdoctoral Researcher to study the relationship between genetic variability and disease incidence in the western harvester ant, *Pogonomyrmex occidentalis*. We seek a person with expertise in insect pathology, particularly pathogenic fungi or microsporidia. The work will involve characterization of infections (pathogen incidence, diversity and load) from samples of brood and workers, and experimental infections with fungi. Applicants must have a Ph.D. degree and must be able to work independently.

The position is funded for two years available in Spring 2002 (no later than May 2002). The salary will be $28,000/yr with medical insurance, retirement and other benefits.

Contact information for applicants:
Dr. Diane C. Wiernasz, or
Dr. Blaine J. Cole
Department of Biology and Biochemistry
University of Houston
Houston, Texas 77204-5001
dwiernasz@uh.edu
bcole@uh.edu
Phone: 713-743-2677 (DCW)
713-743-2679 (BJC)

Postdoctoral position is currently available in the Aroian Laboratory for a unique and exciting study on the potential of controlling plant-parasitic nematodes with *Bacillus thuringiensis* toxins and the interaction of the bacterial toxins with nematode pests. Plant-parasitic nematodes cause >$80 billion of damage per year and account for 10% crop loss worldwide. Our laboratory is the first to study the effects of cloned *Bacillus thuringiensis* toxin genes on nematodes (see Science, 2001, vol. 293 pp. 860-864). We are looking for dynamic, talented scientists to study the potential to use these natural toxins to control plant-parasitic nematodes and to study interactions between toxins and the nematodes. Study involves molecular studies to improve toxin genes, transgenic root and plant work, and studies of genomic response of plants to nematode infection. Applicants should have a strong background in molecular biology and preferably experience working with plants.

U.C. San Diego is a leader in plant biology research and is situated in a vibrant city that is also host to excellent biology and biotechnology communities.

Contact information for applicants: Interested candidates should submit a cover letter, curriculum vitae, and the names of three references to:
Dr. Raffi V. Aroian, Section of Cell & Developmental Biology, University of California, San Diego, La Jolla, CA 92093-0349, fax 858-822-2003, email raroian@ucsd.edu (attachments in rich text format only).
http://www-biology.ucsd.edu/labs/aroian/
Deadline: February 28, 2002.

Postdoctoral position is available to characterize selected genes of a novel entomopoxvirus from a

parasitic wasp. The virus is introduced into the fruit fly larval host by the female wasp during ovipositon and invades and replicates in the host's hemocytes (blood cells). Consequently, the cellular defense capabilities of infected hemocytes are compromised.

Duties: The appointee shall develop a restriction map of the viral genome, identify and sequence viral transcripts in infected hosts, screen existing genomic libraries and construct new ones to identify new viral genes, translate viral transcripts in vitro, characterize them and determine their function and relationship to those of other poxviruses.

In addition to the above assignment, the appointee may participate in ongoing projects including: (1) sequencing and bioinformatic analysis of the poxvirus genome; (2) development and use of monoclonal antibodies to characterize hemocytes involved in the cellular defense response, and (3) in vitro translation of an apparent anti-viral protein (cDNA clones already available).

Qualifications: A Ph.D. in insect molecular biology or insect virology is required. The appointee must be knowledgeable about standard and state-of-the-art molecular techniques, including gene expression, be innovative and willingto try new approaches. Must have an excellent command of english with good writing skills and must be able to work independently in a small (5-7 people), well equipped laboratory. Applicants must already have legal authorization to work in the United States. Renewal of appointment is on an annual basis over a possible duration of 3 years and is dependent on satisfactory performance.

Salary and Benefits: Commensurate with experience. Appointee will also receive all expenses paid to one national or international scientific meeting per year to present results of work conducted on this project.

Contact information for applicants:
Dr. Pauline O.Lawrence
Department of Entomology and Nematology
University of Florida
Gainesville, Fl. 32611-0620
Phone: 352-1901, ext 127
Fax: (352) 846-2011
e-mail: pol@gnv.ifas.ufl.edu

Senior Biological Scientist, The University of Florida, Entomology and Nematology Department. Competitive applicants will possess experience with Insect viruses, DNA purification, restriction enzyme digestion, Southern, northern, and western blotting, and DNA sequence analysis. Experience with current bioinformatics tools, cell culture, SDS PAGE and agarose gels, laboratory supervision, and the ability to write clear and accurate research reports, is preferred. This position will supervise laboratory assistants and coordinate laboratory activities; also, prepare materials, methods, and results including graphs and figures/tables for publication in appropriate journal format in consultation with the supervisor. Some respirator use required.

Minimum qualifications include a Bachelor's degree and three years of appropriate work experience. This is a permanent State-funded position (after a 6-mo probationary period) with full medical, vacation and retirement benefits.

MINIMUM salary $31,000/12 months

Contact information for applicants: Refer to LP#91452F. You may download the USPS application @ www.ups.ufl.edu. If an accommodation is needed to apply due to a disability, please call (352) 392-4621 or TDD (352) 392-7734.

Postdoctoral positions (2) are available to investigate mechanisms of baculovirus gene regulation. This NIH-funded project includes structural analysis of a novel viral RNA polymerase and the characterization of genes involved in virus-host interactions. Applicants should have a Ph.D. and strong background in molecular biology, preferably with experience in protein biochemistry. Kansas State University is located in the scenic Flint Hills of Kansas in a pleasant college community offering diverse cultural and recreational opportunities. Submit curriculum vitae, a brief overview of prior experience and interests, and names and contact information for three references to the address below. Review of applications will begin February 18, 2002, and will continue until the positions are filled.
Contact information for applicants:
Dr. A. Lorena Passarelli
Kansas State University
Division of Biology
232 Ackert Hall
Manhattan, KS 66506

E-mail: lpassar@ksu.edu
Kansas State University is an equal opportunity employer and highly encourages diversity among its employees.

Postdoc/graduate student position. We are seeking a well motivated person to join our research team investigating biological control in greenhouse systems. Opportunities exist for research at the MSc, PhD dissertation or Postdoc levels. The project would look into the interactions between microbial control agents, predators and parasitoids used in an integrated manner to control insect pests within greenhouses. Knowledge of microbiology and entomology and experience with entomopathogenic fungi, insect parasitoids or predators would be helpful but not essential.

The research will be carried at Agriculture and Agri-Food Canada's Research Centre at Agassiz under the supervision of Dr. David Gillespie with training in insect pathology, if required, at the Lethbridge Research Centre.

Contact information for applicants:
Mark Goettel, Research Scientist
Insect Pathology
Lethbridge Research Centre &
Adjunct Professor
Simon Fraser University

e-mail: Goettel@em.agr.ca
Tel: 403-317-2264
Fax: 403-382-3156

FUTURE MEETINGS AND WORKSHOPS

04-07 March, 2002 - **2nd International Conference on the Alternative Control Methods against Plant Pests, Diseases and Weeds**, Lille, France.
Contact: AFPP, 6 Blvd. de la Bastille
75012 Paris, France
E-mail: CDuboscq@afpp.net
Fax: 33-01-434-42919. Phone: 33-01-434-48964.
Web: www.anpp.asso.fr/calendrier.htm

11-14 March, 2002 - **Arthropod Pest Problems in Pome Fruit Production Workshop**, IOBC/WPRS Working Group, Vienna, AUSTRIA.
Contact: F. Polesny, BFL, Resch. Ctr. of Agric., Spargelfeldstr. 191, A-1226 Vienna, AUSTRIA.
E-mail: FPolesny@bfl.at
Fax: 43-1-73216. 43-1-73216-5177.

22- 26 April 2002 - **Third International Conference on Biopesticides** will convene at the Renaissance Hotel, Kuala Lumpur Malaysia. It will cover all aspects of the development of natural products, phytochemicals microbial agents and fermentation products in pest management programs in agriculture, forestry and public health. For attendance, paper presentation and exhibits contact:
Website:
http://www.mapps.org.my/mapps/biopesticide.html
Dr. Mohamad Roff, Secretary: roff@mardi.my
Dr. Mir S. Mulla: mulla@mail.ucr.edu

Future SIP Meetings

SIP 2002!!
Iguassu Falls, Brazil
August 18-23, 2002

SIP 2003
Burlington, Vermont; August

SIP 2004
Open

SIP 2005
Open, probably USA

SIP 2006
Open

Proposals for hosting future meetings are welcomed. Please contact Mark Goettel, Chair of the Meetings Committee. e-mail: goettel@em.agr.ca

Book Reviews for the SIP Newsletter

If you would like to have your book reviewed or if you would like to review a book, please contact our book review editor:

Dr. James Becnel, USDA/ARS, CMAVE
P.O. Box 14565
Gainesville, FL 32604 USA
Tel. (352) 374-5961
Fax. (352) 374-5966
e-mail: jbecnel@gainesville.usda.ufl.edu

BOOK REVIEWS

Formulation: more than just cookbook science?

Formulation of Microbial Biopesticides: Beneficial microorganisms, nematodes and seed treatments.
Edited by H.D. Burges
Kluwer Academic Publishers, Dordrecht, The Netherlands. 1998
412 pp. $305 (US) I ISBN 0 412 62520 2

The 1998 book, *Formulation of Microbial Biopesticides,* is a valuable resource for students, scientists, government agencies, international aid projects, commercial enterprises and all others whose attempts to develop new and promising beneficial microorganisms have, in the past, been frustrated by a dearth of sound data and practical expertise in the development of microbial formulations. In this combination textbook, manual and resource guide, editor Denis Burges and 14 other authors effectively synthesize the disparate data and interpret it in light of the biology of the microorganism and the purpose for which it will be used, thus making it possible for the scientist with little or no formulation experience to develop a useful and biologically sound biopesticide formulation.

Formulation chemistry, one of the most industrially based of all disciplines, and (not coincidentally) also one of the least understood, is indisputably a critical contributor to the success or failure of a new biopesticide. Famous horror stories that highlight the importance of formulation include the tale of the exploding *Bacillus thuringiensis* (Bt) containers that were the result of an insufficiently stabilized formulation that promoted post-formulation microbial growth and associated gas generation; the oil-based fungal formulation that became an invert emulsion and turned to mayonnaise in the spray tank, or the baculovirus formulation that sprayed beautifully, but unfortunately contained only polyhedra that had been inactivated by the high pH formulation.

But for every horror story, there are success stories as well: the ultra-low volume, high potency *Bt kurstaki* and NPV formulations whose increased efficacy led to their wide-spread use in Canadian and U.S. forestry; the oil based *Metarhizium* formulations that allowed fungal spores to survive in the hot and dry African climate and the Bt granular formulation that solved the problem of targeting the cryptically feeding European corn borer by depositing the formulation in the corn whorl, exactly where corn borer larvae feed before boring into the stem.

Despite it's importance, formulation chemistry is often maligned as a pseudo-science that is nothing more than a glorified collection of recipes and case-by-case anecdotes that are linked neither by theory, models nor principles. This charge has been hard to disprove because of the shroud of secrecy that surrounds this field – a field where new innovations are anxiously guarded as trade secrets rather than shared as presentations or publications, potential colleagues are typically bitter industrial rivals, and progress is delayed by a lack of information exchange and collaboration that exceeds even that of the most patent-hungry genetic engineers.

A fragmented body of literature, the lack of obvious scientific principles and the inaccessibility of industrially developed data are only some of the hurdles that this book seeks to overcome in its goal of promoting the development of cost effective formulations. For the special problems posed by formulation of living microorganisms – their fragility in the environment, the need to preserve their viability and at the same time protect them from the environment, and the possibility that even closely related microbial strains can behave differently further complicates this mission. The fact that no comprehensive review of biopesticide formulation has been attempted until now is therefore hardly surprising.

It is hard to imagine anyone better fitted to the task of bringing some order, scientific insight and reason to this unruly field than Denis Burges. His career

has been dedicated to studying, implementing and supporting the use of biopesticides, and whose ability to see things from the dual perspectives of research and practicality has significantly advanced the field of microbial control. Burges serves as both editor and author of several of the book's 10 chapters and 3 appendices, and is joined by 14 other authors (3 of whom currently work in industry, while the remainder work in public and private research institutions) to review the formulation of microbes as insect, plant disease and weed biocontrol agents, as beneficial soil inoculants and as seed treatments.

The first challenge, to ferret out the useful data and deal with the lack of availability of trade secrets, is dealt with through extensive citation of the peer reviewed scientific literature, technical bulletins, and to a lesser extent, patent literature. To what degree the overall quality of our understanding would be enhanced if private companies were willing to disclose their trade secrets is impossible to tell, but the exhaustive review presented in this book seems to leave few stones unturned, at least where data that is available to the public is concerned. And there is a great deal of this data, though it is largely disjointed, unorganized, and difficult to decifer.

The second challenge is to bring some order to this data. My original hope upon first reading the book was that some general principles of formulation chemistry might emerge to guide new formulators in the selection of approaches and ingredients and in their ability to predict the behavior of different combinations of ingredients. This hope was unrealized, and may have been unreasonable, since it is possible that these principles simply don't exist. In other words, formulation chemistry may really be what its critics contend -- a cookbook science based strictly on empirical data, with no general organizing principles. To deal with this apparent deficit, Burges has instead focused on biology, rather than chemistry as the overriding theme of the book, thus giving him the opportunity to voice his key thesis -- that understanding the biological mode of action of the microbe or nematode is the critical ingredient in the development of successful formulations. The book's chapters are accordingly distributed among three main Parts to reflect this thesis. "Organisms with a peroral mode of action" deals with formulation of bacteria, viruses and protozoa to control insects, while "Organisms with a contact mode of action" includes chapters that deal with mycoinsecticides, microbial herbicides. plant disease control agents, soil inoculants and seed treatments. And "Organisms with a power of search" deals with formulation of entomopathogenic nematodes.

This approach brings some welcome clarity to the overwhelming blur of data and provides a useful framework on which to hang the information in one's memory banks. Another important approach that helps the reader wade through the information was supplied by many (though not all) of the authors, who were willing to state their opinions on the suitability of varying formulation strategies. I am always so grateful when experts are willing to share their expertise and even their intuition with the reader (chapters written by Drs. Burges and Paau were particularly welcome in this respect), but all too often, review chapters are more a simple recitation or re-organization of the published literature that provide few insights.

Other positive features of the book include an Appendix that provides useful information on the functions, properties and suppliers of an extensive list of 706 formulation components. The authors of this Appendix (Konrad Bernhard, Peter Holloway and Denis Burges) have committed to updating this database periodically. Adding information on the relative costs of the formulation components as well as on their relative levels of mammalian toxicity to future versions would make this Appendix even more valuable. Further improvement could be achieved by including information on the efficacy (or lack thereof) of these formulation ingredients in updated versions of the Appendix. Some of this information appears scattered through the text of the preceding chapters, but it would have much more impact if collated and integrated into this Appendix. An additional plus is that Tables are liberally used throughout the text, providing practical information on topics ranging from components of successful (and not so successful) formulations to laboratory and field efficacy results, storage stability data and even production methods for different beneficial microbes.

There is fairly good continuity among the chapters, despite the fact that many authors were involved. I particularly appreciated the fact that each chapter included specifics on the various production methods used for each group of microbes, and the manner in which the selection of production method influences formulation. Similarly, most of the

chapters include discussions on the influence of the spray technology that will be used to deliver the product, and of the environment it will be applied into (forests, row crops, waterways, greenhouses, soils, etc) on the approach to formulation development.

One important gap in the book is the omission of a section on the types and procedures for tests (storage stability, handler's toxicity, physical compatibility, environmental stability, container integrity, etc) for evaluating the utility of a new formulation. The need for these tests as well as the protocols is not intuitive to the novice formulator, but they are critical to development of an effective biopesticide.

One further defect of the book is its high price ($305 U.S.). Since the book is likely to be most helpful to young scientists, students, and international aid projects in the developing world, the high price is particularly frustrating. The trend among many publishers, including Kluwer, to price their books right out of the intended market is a problem not only for insect pathology but for other disciplines as well, and will hopefully receive more discussion in a symposium that will be organized as part of this year's SIP meetings in Brazil.

But the many achievements of this book far outweigh its few defects. The litmus test for the value of *Formulation of Microbial Biopesticides* can, I believe, be run by asking the question, "Could someone without experience develop a useful biopesticide formulation from scratch based on the information in this book?" And my answer would be a resounding "Yes!"

Wendy Gelernter
PACE Consulting
1267 Diamond St.
San Diego, CA 92109

EDITOR'S NOTES

As I work on this Newsletter edition, I am completely surrounded by photos from the 2001 Nordwijkerhout meeting. Over 200 of them cover every flat surface in the office- work table, chair seats, even the floor. *En masse*, they truly capture the essence of SIP. We are a sound society in many ways. Members are strongly international with scientists hailing from around the globe. We are welcoming to our student members and honor our mentors. We "work hard and play hard", and support each other in our research efforts. Perhaps we are not the only scientific society in which members interact in this way, but we are probably among the unusual few. I hope SIP members continue to value, support and contribute to the unique character of SIP. And, if your office was filled with all these wonderful photos, you'd be smiling, too.

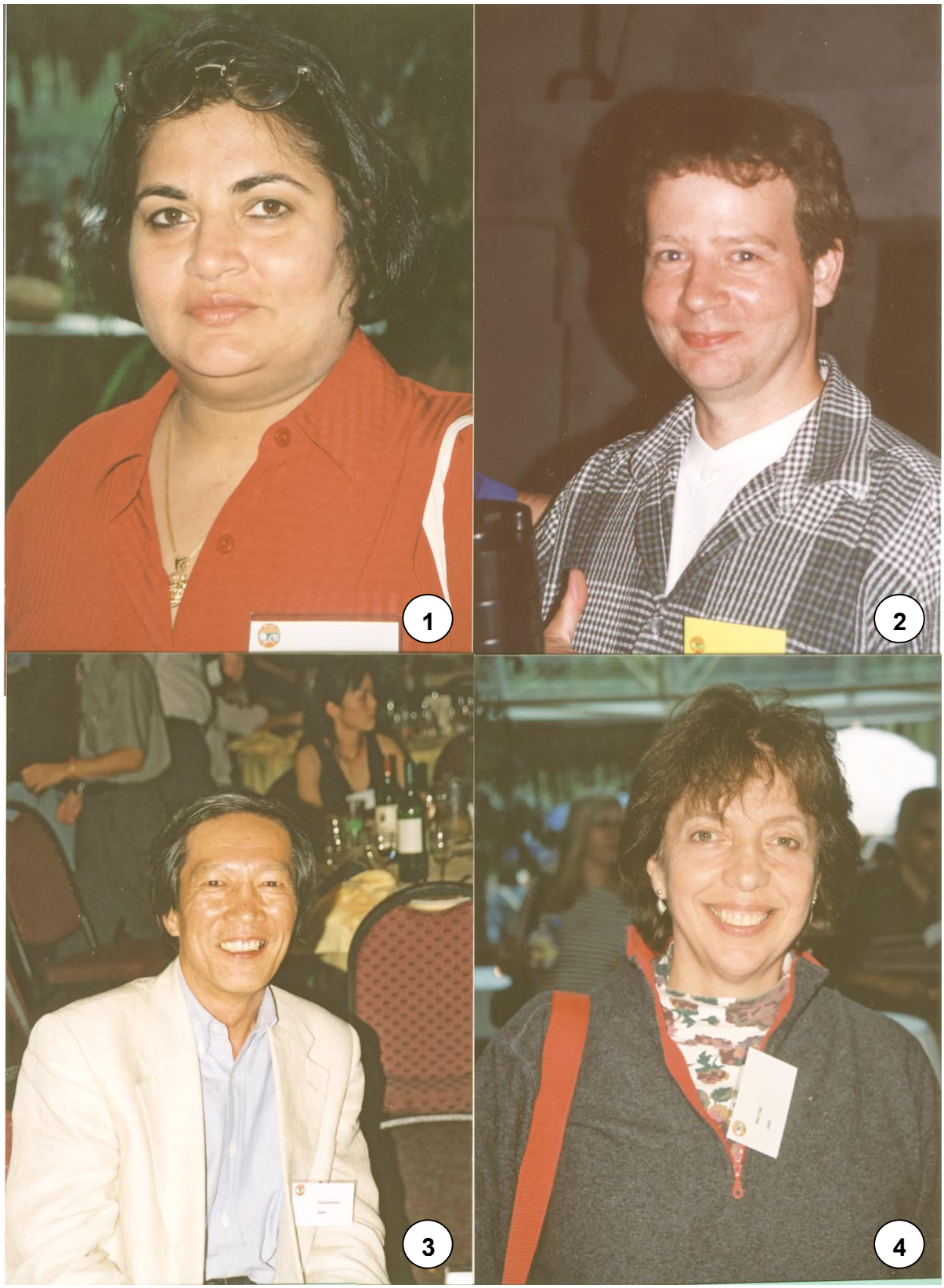
Lee Solter

Lee and Mark (and, no, the perspiration isn't from working on the Newsletter, it was the dancing at SIP 2001….)

Don't Forget to Pay Your Dues for 2002

To ensure that your membership remains current and that you continue receiving the Newsletter, please return your dues notice with payment or access the web site for online dues payment. Please contact the SIP Executive Secretary if you have questions or need information about payment. (See Page 2 for addresses.)

PICTURES FROM THE 2001 SIP MEETING IN NOORWIJKERHOUT, THE NETHERLANDS



1. Savita Bagga (USA), 2. Michael Henn (Germany), 3. Yasuhisa Kunimi (Japan), 4. Ann Cali (USA).

PICTURES FROM THE 2001 SIP MEETING IN NOORWIJKERHOUT, THE NETHERLANDS

1. Nguya Maniania (Kenya), 2. Cipriano García-Gutiérrez (Mexico), 3. Ingeborg Klingen (Norway), and 4. Hong Wan (Germany).

PICTURES FROM THE 2001 SIP MEETING IN NOORWIJKERHOUT, THE NETHERLANDS

1. Suzanne Thiem (USA) (We have more of these photos, Suzanne!); 2. Jaroslav Weiser (Czech Republic, Founder's Honoree) and Denis Burges (UK); 3. Tina Scopa (UK) and Mike Bidochka (Canada); 4. Jurgen Langewald selling (lots!) of MCD Biological Control CDs.

PICTURES FROM THE 2001 SIP MEETING IN NOORWIJKERHOUT, THE NETHERLANDS

1. Jimmy Becnel, Elizabeth Davidson and Ted Andreadis (USA); 2. Gernot Hoch (Austria); 3. George Kyei-Poku (Canada) and Nikolai VanBeek (USA); 4. Jim Slavicek (USA), Nor Chejanovsky (Israel), Douwe Zuidema (The Netherlands), and Martin Erlandson (Canada); 5. Peter Krell with students Kristine Haggerty and Jondavid de Jong (Canada); 6. Nor and Basil Arif(Canada).

PICTURES FROM THE 2001 SIP MEETING IN NOORWIJKERHOUT, THE NETHERLANDS

1. Josh Feuerstein, Dietrich Stephan, Andreas Linde, Kerstin Jung, and Arne Peters (all from Germany), 2. Melanie Filotas (USA, Student Award Winner), Lerry Lacey (USA), Robert Ouedraogo (Canada, Student Award Winner), Stephen Wraight (USA), and Jim Harper (USA), 3. The newest Division: The Division of SIPpers!