Biocontrol Files

Issue #12, December 2007
www.biocontrol.ca
Disponible en français

Canada's Bulletin on Ecological Pest Management

Interview with Guy Boivin, entomologist and biological control researcher, Agriculture and Agri-Food Canada

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Biocontrol Files: In a recent Biocontrol Files survey, readers considered that one of the biggest barriers to wider adoption of biological pest management products and practices was a lack of education, awareness and training in their use. Would you agree?

Guy Boivin: I'm a bit surprised with that answer. Right now, there are not that many biological control options available for growers, and I would say that access to biological control products is the biggest barrier. So, although it's true that growers would be better off if they were better educated on how to use the products, unless they are available, education is a bit meaningless.

BF: In your opinion, what are the best mechanisms for addressing the need to educate users?

GB: In my experience, it's probably through monitoring programs or scouting programs run by IPM consultants that this information could be best transmitted to the growers.

BF: What role do you think researchers play in meeting that need?

GB: Basically, we are a resource for IPM consultants. I am often invited to give short presentations or to advise growers at growers' meetings which are organized by IPM consultants.

BF: So researchers are part of a team that is established by the IPM consultant, working on the grower's behalf?

GB: Yes. In Québec we have a number of small companies which hold regular meetings with their participant growers during the winter. Some are private companies while others are partly owned by the growers and partly private - the growers are board members. The meetings focus on different subjects, depending on growers' requests. For example, crucifer growers had a number of meetings on Swede midge because it was a worrisome pest. Other groups held meetings on how to manage water levels in the field.

BF: Can you touch on the issue of technology transfer from researchers to growers?

GB: I rarely do direct transfer to the growers. The research knowledge is transmitted through people whose job it is to provide that direct transfer. Of course when growers call me directly, I try to answer their questions as best as possible. But normally my presentations to growers are through these meetings or through meetings that are coordinated by the provincial ministry of agriculture, the Ministère de l'Agriculture des Pêcheries et de l'Alimentation du Québec or MAPAQ.

BF: Can you describe the provincial meetings?

GB: These meetings happen on a crop or a problem basis. Typically, there would be a one-day session on a particular subject. MAPAQ also organizes regional annual meetings on a crop basis, for example on vegetable crops. I attend a few of these meetings every year to present the results of our research when it's ready to be transmitted to growers. On these occasions we talk directly to growers and local agronomists.

BF: So it sounds as if the mechanisms are in place to transfer research technologies through the IPM consultants to the grower.

GB: Yes, at the moment, the mechanisms are in place although the technology transferred rarely focuses on biological control. But the situation does vary across Canada, depending on how involved the provincial ministries of agriculture are and depending on whether there are private consultants that are active in the field. Here in Québec, these kinds of activities take place mostly in horticulture, and the growers are pretty much aware of recent research results. Again, what is missing is the availability of products. There are a few large companies like Koppert and Biobest – these are good success stories. But we need more than just a couple of them in Canada to cover the field.

BF: In your experience, have IPM consultants and growers improved in terms of their sophistication and knowledge of biological control practices over the last few years?

GB: For IPM in general, yes. For biological control, except for specific crops for which good biocontrol products are available, there's not much improvement. Some growers use *Bt*, but they use it just as they would use a pesticide, not as a biological control. So their approach hasn't really changed. The big changes that we see are more about IPM – growers want to diversify their approach. However, this focus on IPM could provide us with a good opportunity to introduce and include biological control in their system. ■

Biocontrol Files: Canada's Bulletin on Ecological Pest Management is a quarterly publication which reports on tools and developments in ecological pest management. The co-publishers World Wildlife Fund Canada, the Biocontrol Network and Agriculture and Agri-Food Canada welcome additional partners and sponsors committed to advancing knowledge and adoption of ecological pest management.

Submissions and letters to the editor are welcomed. Guidelines for submission are available on request from biocontrol-network@umontreal.ca.

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Designed and produced by: Design HQ

French translation by: Alain Cavenne

Website production: Biocontrol Network

Note: In an effort to limit the length and retain the non-academic tone of articles, citations are not provided. However, references are available upon request from the editor at biocontrol-network@umontreal.ca

Appreciation is owed to NSERC for its support to the Biocontrol Network, including for public awareness regarding bio-pesticides.

An interview with Bernie Solymár


Bernie Solymár

Support growers to adopt better practices: a conversation with Bernie Solymár, EarthTramper Consulting

Biocontrol Files: Please comment on our Biocontrol Files reader survey finding that one of the biggest barriers to wider adoption of biological pest management is a lack of grower awareness and education.

BS: Most farmers – and I'm talking fruit and vegetable farmers because that's who I mainly deal with – are just not exposed to these ideas or products. Because of this, they have no real knowledge or comfort level with using them and they don't have any confidence in them.

BF: Are there certain sectors or commodities where there's a little more knowledge?

BS: I think the most advanced in these methods are greenhouses. In perennial crops, there have been some biocontrol projects. For example, in apples there's been work with mite predators. But the technology was never commercialized, and for the most part the knowledge was never conveyed to growers.

BF: Why was there no dissemination of that knowledge?

BS: I think the gap occurs when you get researchers who are focused on the science but are not considering marketing; they're not setting up relationships with companies that might market these products. My belief is that you need to work with top-notch commercial growers, get them familiar with the technology and techniques used, show them the results, and at the same time disseminate those results – in farm papers, organization newsletters, association newsletters, give talks at grower meetings … Otherwise, the technologies are going to die.

BF: Do you know of any on-farm trials conducted by researchers?

BS: I'm not aware of any government-led trials, but a number of consultants have been doing these types of trials. Debbie Henderson, of E.S. CropConsult in B.C., has been doing quite a lot of work on biological control in strawberries, cranberries, raspberries and other crops, and I've been working mainly with strawberries and sweet corn.

BF: There have been some successes. Do you think these successes provide lessons that can be generalized elsewhere?

BS: I think in large part the successes have been in closed structures. I was involved with an apple project with a New Zealand strain of the predatory mite *Typhlodromus pyri*, which feeds on European red mites. A researcher from Nova Scotia tested them in commercial orchards, and provided me with some agents to test in Ontario. When we did the assessment, we found the agents in the trees where we did the release and sometimes in the tree immediately adjacent, but we found a naturally-occurring predatory mite at numbers greater than the agent. The philosophy I have is that by manipulating spray programs and using an IPM system, we conserve those natural predators. So, rather than augmenting a species that's not normally found in the orchard, my idea was to develop a program that helps the natural predator populations to survive and build up, which is a much more sustainable, long term process.

BF: What kind of a role are growers playing in the strawberry biological control project you are coordinating?

BS: When I get funding for these types of projects, they're always carried out in commercial farms under commercial conditions. We do the releases for the growers; we monitor to keep track of what's going on in the field. The grower informs us on what they need to spray for, and we tell them about pest numbers in the fields. This process builds their understanding and their confidence. By showing them the results at the end of the year, they have a much better idea of what's going on. These growers talk to their neighbours and the word spreads. The other really critical part is to compensate the growers for their extra time and for purchasing reduced-risk chemicals that may be a little bit more expensive – the compensation is not a huge amount, normally $1000 an acre.

BF: Do provincial extensionists also disseminate knowledge about biological control?

BS: Over the last decade and a half, there have been tremendous cutbacks to provincial extension services throughout Canada. Many extensionists are not in the field as much as they used to be. They spend a lot more time in the office – they generally don't have regular contact with individual growers.

BF: Correct me if I'm wrong, but the impression I'm getting is that IPM consultants are the only ones who are acting as a bridge between the grower and the body of knowledge and practice concerning biological control.

BS: I don't know if that's really accurate. At a federal level, researchers are still working on biocontrol, but one of the big hang-ups is the large cost of commercializing biocontrol agents. It's really no different than a pesticide company not wanting to register a material on a minor crop like, for example, hazelnuts in Canada, because economically it isn't feasible. But one way to move forward is to do research on predators or parasites that are commercially registered and test them under field conditions for different crops. For example, while a particular biocontrol agent may normally be used in a greenhouse, we'll test its effectiveness in raspberries or strawberries.

Another tactic I've been using with growers is to emphasize local food, sustainable food, low-pesticide food as a marketing tool, particularly for growers involved in direct marketing, like roadside sales. Customers will ask what kind of pesticides are you using, when you sprayed last and this type of thing. And you can say, "Well, I've been using this biological control agent…" and even give them a little blurb about the pest and the biocontrol agent, which is something that I'm hoping to create as part of this strawberry project.

BF: Do you think that more farmers are interested in going that route?

BS: I think it's a mixed bag. I did a survey of the sweet corn growers I'm working with on another project where we are using *Trichogramma* wasps to manage European corn borer, and they all said they were interested. But the biocontrol agent was supplied free, they received $1000 an acre, the preliminary results looked good, and it was a low pressure year for corn borer. Next year could be a high pressure year, and they may balk. You can't just come in, do a project, get out again, and expect adoption to grow. You've got to work with the growers and build that confidence all the time. When government extension was severely cut in Ontario that confidence disappeared for the grower. When they didn't have that backup, they went back to the more comfortable spray on a calendar basis strategy. On the other hand, I've been working with Local Flavour Plus in Ontario and helping them develop a few of their standards. In this case, putting a marketing spin on using pesticide alternatives, biological control, and mating disruption can have a real positive effect, especially because there's so much media attention and so much more consumer awareness of healthy and local foods now.

BF: I want to return to the issue of the level of awareness and understanding in growers, and the best ways to increase that. Is there anything further you want to say along that line?

Apple blossoms containing the predatory mite, *Typhlodromus pyri*

BS: Again, I think it's key that, whether you're a researcher, a private consultant, a company or an extension agent, you've got to be out there working with the growers. If you're just providing information on paper or at a presentation, they're not going to pick it up. But if you work with them and build up their confidence and their comfort level with the product, that's the way to implement it. And you work with growers that have an influence on other growers, ones that are well-known and innovative and that other growers will listen to - that's key as well. ■

Bernt (Bernie) Solymár owns EarthTramper Consulting Inc., a company specializing in sustainable agricultural practices, integrated pest management, land stewardship, wildlife and habitat conservation, species-at-risk recovery, and farmer/rural landowner outreach. Prior to forming his company in 2001, Bernie was employed for 13 years as an IPM specialist with the Ontario Ministry of Agriculture, Food and Rural Affairs.

The Pest Management Centre's Biopesticide Initiative

By the Pest Management Centre

Introduction

During consultations in the winter of 2004-5, the lack of biological pest control products in the Canadian marketplace was brought forward as a barrier to the adoption of lower risk pest management practices by Canadian growers. At a workshop held in Saskatoon in February and March of 2005, participants from the research and regulatory communities, the US IR-4 Biopesticides Program, the biopesticide industry sector and the PMC identified a need to support the registration and implementation of biological control in Canada.

The PMC responded to the identified need with the creation of the "Biopesticide Initiative" under the Pesticide Risk Reduction Program. Since that time, significant effort has been devoted to this Initiative, with the goal of increasing the availability of biological control products for use by Canadian growers.

The Biopesticides Initiative is a three-pronged approach, including:

- support for research and implementation projects,
- regulatory support, and
- strategic / commercial support.

Research and implementation projects

Since the establishment of the Centre, the PMC has committed more than $4.6 million to over 40 projects involving biopesticides between 2003 and 2009. Support covers:

- early stage research for biopesticide development,
- formulation and/or scale-up studies to optimize production cost, shelf life, or efficacy,
- trials to optimize application timing and methods for Canadian conditions,
- laboratory or field trials to generate value data,
- on-farm demonstration trials, and
- economic analyses / marketing strategies for the implementation of biopesticides.

More information on supported projects can be found on the PMC website.

Regulatory support

Initial attention focused on 15 key products (most of which were already available in other jurisdictions), which had the potential to provide needed tools for high priority pesticide risk reduction issues. This short list was developed in consultation with provincial experts, minor use coordinators, grower organizations, and researchers. Key considerations included: utility to the agricultural industry, potential to contribute to reduction in specific pesticide risks (for example, as OP replacements), and potential for registration and commercial deployment in Canada.

Relevant companies were contacted and regulatory support was offered. Companies gladly accepted PMC's offer, and work in most cases resulted in submission of a registration dossier to PMRA.

The nature of PMC's regulatory support was/is assessed on a case-by-case basis, and includes advice and "pathfinding" work, development of scientific rationales, funding of value trials, and administrative assistance with submissions.

Submitted or registered products PMC has assisted with are listed below (with submission and registration numbers). Work towards a submission package is ongoing for a number of other products.

• BlightBan A506	Sub. # 2007-1394
• BlightBan C9-1	Reg. # 28392
• BloomTime	Reg. # 28436
• Botanigard ES/22WP	Sub. # 2006-0696 & 0697
• Contans WG	Sub. # 2007-4323 & 4328
• Met-52	Sub. # 2006-4033 & 4035
• Prestop	Sub. # 2006-2302 & 2303
• Rhapsody	Reg. # 28627
• Serenade	Reg. # 28626 & 28549
• Root Shield	Sub. # 2006-7124 & 6806 (label expansion submission)

Further to its regulatory support work, the PMC is also working with the Research Branch of Agriculture and Agri-Food Canada on the development of an introductory guide to the registration of microbial pest control products. This guide is aimed at giving biocontrol enterprises and researchers an overview of the regulatory process, information on potential pitfalls and how to avoid them, as well as other issues to consider on the path from development to marketing of a new product.

Strategic / commercial support

PMC's activities in this area include: working with grower groups to identify high priority biopesticides, building markets and raising awareness through communication activities and materials (such as providing support for this publication), disseminating

information on possible biocontrol solutions to the grower community for minor use program prioritization, and efforts to support the coordination of the biocontrol industry in Canada.

In this context, PMC commissioned a Biopesticides Industry Study in 2006-07, which was conducted by Dr. Stéphane Dupont. This study evaluated existing organizational models of the biopesticides sector worldwide, identified ways the Canadian biopesticide industry would benefit from a concerted voice, assessed the needs of the sector, and evaluated industry interest in developing an organizational approach to address shared problems. Results of the study (soon to be available as an executive summary on the PMC website), indicate that there is considerable interest in the idea on the part of the Canadian biopesticides sector.

Examples of work on specific submissions

Contans® WG (Prophyta)

Coniothyrium minitans is a common soil-dwelling fungus belonging to the Ascomycetes which parasitizes sclerotia of the white mould disease pathogen (see also Biocontrol Files 2006 8: 5-6).

Contans®, a biopesticide based on *Coniothyrium minitans*, was identified by PMC as part of the original priority list of 15 products for the Biopesticides Initiative. This product was the first biological fungicide registered in Germany in 1997, and has become available in many countries over the last decade. The registrant, Prophyta, was encouraged by the PMC to consider Canadian registration in late 2005, and the first step was a presubmission consultation held with PMRA and PMC in the summer of 2006.

Following the identification of data requirements at the presubmission consultation, the PMC assisted with the assembly of the registration package for the Canadian submission. The PMC's Biopesticides Project Coordinator worked closely with Prophyta's US representative to compile data from EU and EPA dossiers. Substantial support was given in the area of efficacy requirements: PMC summarized data, provided information on the pest problem in Canada and developed rationales specific to Canadian legislation. In addition, trials were funded through the Biopesticide Initiative to further support use of Contans® in Canadian organic (muck) soils.

The registration package was submitted to PMRA in June 2007.

BlightBan® A506 (Nufarm)

BlightBan® A506 is a biological control product based on the bacterium *Pseudomonas fluorescens*. Well-adapted to life on plant surfaces, this organism is able to colonize and protect leaves and flowers from the fireblight pathogen *Erwinia amylovora* (for more information see also Biocontrol Files 2006 6: 5-6). BlightBan® A506 was identified as a valuable low risk tool in a fire blight management strategy developed in 2005 by the Canadian Horticultural Council (CHC) apple working group, with the guidance of the Pesticide Risk Reduction program. The product had been available for some time in the U.S.

The Risk Reduction program contacted Nufarm, the registrant, to encourage them to register the product in Canada, and then assisted the company in discussions with the PMRA regarding data requirements for a submission. Once the regulatory requirements were determined, the Risk Reduction program's Biopesticide Projects Coordinator provided extensive regulatory support by collecting and analyzing information from the scientific literature, writing scientific rationales and data summaries, updating the dossier, organizing efficacy data, and assembling the package in the Canadian format. This Category A submission was submitted by PMC on behalf of Nufarm in February 2007. ■

For more information about any of the activities of the PMC in the area of biopesticides, contact the PMC's Biopesticide Projects Coordinator, Dr. Tobias Längle (laenglet@agr.gc.ca, 613 759-1493) or Leslie Cass, Research Coordinator for the Pesticide Risk Reduction Program (cassla@agr.gc.ca, 613 694-2438).

An interview with Paul Godspeed

The role of industry in biocontrol training and education: An interview with Paul Goodspeed, Koppert Canada

OMAFRA greenhouse specialists demonstrated effectiveness of new biocontrol agents for whitefly in poinsettia in 2005

Photo by Deborah Hilbor, University of Guelph

Biocontrol Files: According to a survey of Biocontrol Files readers, one the biggest barriers to wider adoption of biological pest management products and practices is a lack of education, awareness and training in their use. Would you agree?

Paul Goodspeed: I think that's somewhat true, but I think it varies by commodity. In the vegetable sector, there's a pretty strong level of knowledge among producers. Most large companies have a staff member who is very aware of biocontrol and fills the role of IPM manager. Smaller vegetable customers are also well educated, but they don't generally have a dedicated staff member for IPM/biocontrol. Floriculture is a different matter. While there's some IPM work and biocontrol being done, it's not at the same level as vegetables. However, there are crops such as *Gerbera* where biocontrol plays a big role, and growers have found it to be a very sustainable way of managing their pest problems.

BF: How have things changed since the reductions in provincial extension?

PG: In my opinion, most of the education in biocontrol now comes from industry providing the growers with technical support. We have a lot of great young people coming out of Kwantlen University College, University of Guelph, Niagara College and Olds College. They have a lot of theoretical knowledge, but it is the suppliers who take them from that theoretical standpoint to practical application. Having said that, there are people like Graeme Murphy and Gillian Ferguson (both crop specialists with OMAFRA), and other who are still in the extension game, and who have continued to play a big role, and are very dedicated to education in biocontrol. But I think a key role has been played by the suppliers. They're the ones that know the products best because they work with them daily on a practical basis.

BF: How has the industry played this role on the ground?

PG: I'll use our company as an example. Koppert has eight full-time technical support people called biological systems specialists whose role is to visit growers on a regularly scheduled basis. They visit the account and walk the crop; they talk to the grower's scout and the grower, and then make a written recommendation on how to proceed – just like a family doctor making a house call.

BF: Describe a scenario for me, where industry and biocontrol researchers and extensionists all play a role in the education and training of the user.

PG: I can give you a classic example: Graeme Murphy. Graeme Murphy acts as the coordinator for the Niagara flower growers. He sets up regular meetings to which he invites growers and suppliers of biological controls, he brings in outside speakers, and it's held in the government facility at Vineland. Another example would be the grower day seminars and workshops held at Kwantlen University College in B.C. Growers and industry specialists get together to discuss and debate new and different practices and theories.

BF: What is the role of the researcher in this?

PG: Well, in many cases it may be more development than research. It's more about taking technology that's already out there and doing extension work – which is what Graeme really does. He is trying to find practical ways of taking a product and making it fit with growers' needs. He's out talking to the growers and understanding their problems, and then he brings everyone together and the problems are discussed and hopefully some good solutions arise. Researchers also play a role; several products sold in Canada today have been the result of Canadian discoveries by Dave Gillespie (AAFC researcher) and others. In our company, research generally takes place in Europe and the interaction with Canadian researchers is done through Karel Bolckmans, who's the head of R&D at Koppert.

BF: Have you noticed a change in growers' awareness and ability to use these products, and more understanding of biocontrol?

PG: I would say yes. Growers today have fewer options, and resistance is an issue that they face regularly. We have the feeling that our customers would rather use biocontrol, though they understand that they may still have to spot treat with chemicals. I've been watching this market for 20 years, and the change over that long period has been quite astounding, and even the change in the last few years has been dramatic as better solutions come along. Industry has approached growers and said, "Here's a different way. Try this." And these programs have been in the main very successful.

BF: What would you say are the best mechanisms for addressing the continuing need of growers to be educated on biocontrol?

PG: First of all, I think they need to have a strong relationship with their suppliers, because that's where the practical knowledge base is. Everything is about relationships these days, and if they have a good working relationship with their suppliers, that really helps. There are a lot of good websites on biocontrol, but nothing beats hands-on collaboration with the supplier - or with an extension agent - to be able to see it work. ■

Paul Goodspeed is General Manager of Koppert Canada Limited. See the Koppert Canada website at http://www.koppertonline.ca/home.asp

Biocontrol News Digest

REUTERS, HONG KONG, JUNE 13, 2007: Gut bug responsible for giving pests a bad name – What makes an insect a pest might be determined by what micro-organism is residing in its gut, a group of Japanese scientists have found.

Writing in the latest issue (2007) of the *Proceedings of The Royal Society B: Biological Sciences*, the researchers (Hosokawa et al.) said the finding sheds new light on the evolution of pests and may offer fresh approaches to controlling insects that harm livestock and crops.

The team worked on two very closely related species of stinkbugs in Japan - *Megacopta punctatissima*, which is a pest of soybean and other crop legumes, and *Megacopta cribraria*, that hardly causes any agricultural problems.

After the scientists switched the gut bacteria between the two species, the non-pest species thrived and reproduced prolifically on soybean plants in their laboratory. The pest species, meanwhile, suffered sharply reduced egg-hatch rates and higher death rates of its nymphs, or larvae — the very problems that the non-pest species used to face.

Takema Fukatsu of the National Institute of Advanced Industrial Science and Technology and his colleagues are now analyzing the bacteria found in the two species of stinkbugs.

"We suspect that some mutation may have occurred in their (gut) bacteria and we hope to find the difference between them. In this way, we hope to understand the molecular mechanism underlying what makes a pest and what makes a non-pest," he said.

CANADIAN BROADCASTING CORPORATION (CBC), FREDERICTON, JUNE 27, 2007: Fredericton to use natural virus against gypsy moths – The city of Fredericton is turning to nature to tackle an infestation of gypsy moth caterpillars chomping through the leaves of hardwood trees throughout the city.

The city is hoping a naturally occurring virus being tested by Sylvar Technology will stop the caterpillars in their tracks.

Renée Lapointe is a researcher with the company, which offers baculovirus biopesticide technologies for forest pest control. She says the virus is sprayed onto trees, and is ingested by the caterpillars. The caterpillars then die before they're able to form cocoons.

It's not a quick fix solution, however, as officials say it will likely take a year or more before the virus has a significant effect on the gypsy moth population. There is also a possibility the moths will develop a resistance to the virus.

Don Murray, a forester with the City of Fredericton, says by the time the virus kicks in, it may be too late to save some of the city's trees.

"Naturally occurring viruses and bacteria will lower the population of gypsy moth, but by the time these viruses catch up to the population of gypsy moth, we've often seen some extensive defoliation," Murray said Wednesday.

Lapointe says the virus is not modified, and is specific to gypsy moths so it shouldn't affect other insects.

AGRICULTURAL RESEARCH SERVICE, USDA, JUNE 28, 2007: Can The Right Potting Mix Replace Fungicide? – Agricultural Research Service (ARS) plant pathologists Leona Horst, James Locke and Charles Krause found this was true for a mix of peat, compost and the beneficial fungus *Trichoderma hamatum* strain 382.

The beneficial *Trichoderma* fungus seems to enter the plants through the roots and spread through the entire plant internally. One advantage of systemic biocontrol — as opposed to spraying the plant leaves with a solution containing beneficial fungi — is that it doesn't leave a residue on the plant that harms plant market value.

Begonias grown in this mix had much fewer symptoms of Botrytis gray mould, caused by the *Botrytis cinerea* fungus, and much higher market value that those grown in straight peat and sprayed with chlorothalonil. The improvement in plant quality and market value makes the *Trichoderma*-compost mix very promising for greenhouse operations.

The *Trichoderma* fungus thwarts Botrytis on more than one front. It prevents Botrytis from infecting fresh wounds, and produces compounds that keep Botrytis spores from germinating. Surprisingly, the compost mix had a similar effect even without *Trichoderma*. This means there could be naturally occurring beneficial fungi or other biocontrol agents in the compost.

But, growers need to add beneficial fungi like *Trichoderma* to their mix, because they can't count on commercial composts to have them naturally. ■

Resources:

Books

Published as a colorful historical account, *International Organisation for Biological Control of Noxious Animals and Plants: History of the First 50 Years (1956-2006)* commemorates a half-century of pioneering biological control by the IOBC, whose expertise is now said to extend to "all aspects of sustainable crop protection in major annual and perennial crops." E.F. Boller et al edited the publication to celebrate an initiative originally born at a meeting of concerned European scientists, but which has evolved into an independent organization with six regional sections and worldwide scope. J.C. van Lenteren, Lab. of Entomology, Wageningen Univ., PO Box 8031, 6700 EH Wageningen, The Netherlands. E-mail: Joop.vanLenteren@wur.nl www.iobc-wprs.org/pub/index.html

A 2007 book focuses on the ecological underpinnings of IPM and captures important themes in both pest management and ecology that have arisen in the last 20 years. In *Perspectives in Ecological Theory and Integrated Pest Management*, IPM advocate-scientists M. Kogan and P.C. Jepson have drawn on the expertise of an international contributing author group to present assessments of the role that basic ecology serves in the development of rational and sustainable crop pest management practices. Cambridge Univ. Press, The Edinburgh Bldg., Shaftesbury Rd., Cambridge CB2 8RU, UK. Phone: 44-0-1223-312393. Fax: 44-0-1223-315052. E-mail: information@cambridge.org Website: http://www.Cambridge.org/catalogue/catalogue.asp?isbn=9780521822138.

Conferences

November 27-29, 2007. Canadian Weed Science Society Annual Meeting, Mont-Tremblant, QC, Canada. Contact: D.L. Benoit, Ag/Agri-Food Canada, 430 Boul. Gouin, Saint-Jean-sur-Richelieu, QC J3B 3E6, Canada. E-mail: BenoitD@agr.gc.ca Phone: 1-450-515-2010. Fax: 1-450-346-7740. www.cwss-scm.ca/2007_meeting.htm

December 9-12, 2007. Entomological Society of America Annual Meeting, San Diego, CA, USA. Contact: ESA, 9301 Annapolis Rd., Lanham, MD 20706-3115, USA. Email: meet@entsoc.org. Fax: 1-301-731-4538. http://www.entsoc.org.

The Canadian Forum for Biological Control

The Canadian Forum for Biological Control (CFBC) is a national non-profit organization that was established in 1994. Its mandate is "*to study, advance, and promote/advocate biological control in Canada.*" Membership is open to everyone, but currently includes primarily federal government and university researchers, government regulators, provincial extension personnel and a few representatives from the biological control industry. In total, there are close to 100 members.

The CFBC provides an independent voice on biocontrol issues and uses its meetings to encourage cross-group and cross-disciplinary interactions. In this way, we continue to communicate biocontrol results and needs, generate important discussion and avenues for research, and facilitate the process of getting biocontrol from the bench to the field. Towards this end, the CFBC annually plans a symposium of general interest to the biocontrol community. This symposium has been historically linked to Annual Meetings of the Entomological Society of Canada or the Canadian Phytopathological Society. However this year, the CFBC sponsored a symposium at the ANBP/IOBC meetings in Montreal, 28 October to 1 November, 2007. The symposium was titled: "Effectiveness of commercial natural enemies / microbials impact performance," and was well attended.

The CFBC Executive for 2007-2008 [elected in Oct. 2007] is:

President: Bruce Broadbent (Agriculture and Agri-Food Canada, London, ON)

Past-President: Kevin Floate (Agriculture and Agri-Food Canada, Lethbridge, AB)

Vice-President: Leslie Cass (Agriculture and Agri-Food Canada, Ottawa, ON)

Secretary: James Coupland (FarmForest Research, Almonte, ON)

Treasurer: Gary Peng (Agriculture and Agri-Food Canada, Saskatoon, SK)

Director-at-Large (2 year term): Michelle Roy (Quebec Ministry of Agriculture and Fisheries, Sainte-Foy, QC)

Director-at-Large (4 year term): Tobias Längle (Agriculture and Agri-Food Canada, Ottawa, ON) ■

For more information, contact CFBC Secretary James Coupland (couplandj@hotmail.com)

Future issues of Biocontrol Files will feature a regular CFBC contribution.