

# INTERNATIONAL ORGANIZATION FOR BIOLOGICAL CONTROL

## NEARCTIC REGIONAL SECTION

### NEWSLETTER

Volume 23, No. 3

Fall 2001

Editor: S. E. R. Mahr

#### Symposium Rescheduled

The *First International Symposium on Biological Control of Arthropods*, originally planned for 17-21 September 2001, in Honolulu, HI was forced to reschedule because of the impossibility of travel at that time. The symposium will now be held 13-18 January, 2002 in the same location. Old room rates will be honored, but attendees must make new hotel reservations. New registrations are being accepted for participants to attend or present posters. This is the first meeting (to be held every 4 years) for practitioners of biological control of insects and mites. It will focused on conservation, augmentation and importation using parasitoids and predators. For more information visit the website at <http://www.isbca.ucr.edu/> or contact:

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#### Newsletter Naming Contest Extended

We have received very few contributions (2 to be exact) for a new name for this newsletter, and have therefore extended the deadline to submit a suggestion until December 1, 2001. Send your entries to editor Susan Mahr.

#### IOBC Membership Renewal

Treasurer Rob Wiedenmann will be sending dues reminders to all members soon. Dues for next year are to be paid before the end of 2001, as requested by the IOBC Global Body. Please help make Rob's job easier by responding promptly!

#### Notes from the *Biocontrol* Management Board

The Management Board for the journal, *Biocontrol*, met in conjunction with the meeting of the Society of Invertebrate Pathology, August 30, in the Netherlands. Some highlights of the discussions include:

- Production of the journal has been on schedule since mid-2000.
- *Biocontrol* will be published six times per year in 2002 (up from the current four issues per year) and the total number of pages will be set at 600 per year.
- The journal is receiving about 100 papers submitted per year and accepting approximately 60-65% of them.
- The coverage of papers is more even among disciplines than a few years ago.
- New subject editors for IPM and weeds will replace John Trumble and Heinz-Muller-Scharer, who recently asked to be replaced, due to other commitments.
- The term of editor Heikki Hokkanen will be up in 2003, but he will consider extending his term for another three years.
- The Board recommended streamlining the editorial process slightly, to minimize time between submission and publication.

#### Biocontrol Gets Good Press

This is an article printed in the August 26 issue of the L.A. Times:

BIOLOGICAL PEST CONTROLS INCREASINGLY POPULAR — As consumers, environmentalists and government regulators demand decreased use of chemical pesticides, a growing number of farmers are turning to biological controls, using insect predators to kill pests in their fields. The trend is nowhere more evident than in Ventura County, Calif., home to a

handful of pioneer bug breeders and widely considered the hotbed for an industry expected to expand well into the next decade. There are seven insectaries in the county, some established as long ago as the 1920s, to supply biological pest controls to local farmers. (submitted by L. Charlet, from AGNews)

#### Weed Biocontrol on National Public Radio

*Fighting Spurge* chronicles the battle against leafy spurge in North Dakota and other parts of the west using leaf-feeding beetles. The program aired on July 17, 2001 on *All Things Considered*, but you can still listen to the 5½ minute program online (requires RealAudio). Go to the NPR website at [www.npr.org](http://www.npr.org) and click on "archives" (near the top of the page). Then type in "fighting spurge" in the "I'm looking for an NPR story about" box; add the appropriate date and select *All Things Considered*. Click on the title of the story on the next page that comes up, and then you can choose to Listen to Segment, Listen to Entire Show, or View Program Segments on that next page.

#### New Endowment in Biological Control at Simon Fraser Univ.

Thelma Finlyason, Professor Emerita in the Department of Biological Sciences at Simon Fraser University (SFU), is an outstanding teacher and scholar who has contributed her time, counsel and private funds to promote biological control. Because there is no longer a specialist in biological control in the Department at SFU, she has established an endowment for a Chair in Biological Control to ensure the continuation of the program. The purpose of the Chair is to promote excellence in research

and teaching in the field of pest management. To support the Thelma Finlayson Chair in Biological Control with your own contribution, contact Gail McKechnie, Director of Advancement Services, SFU, 888 University Dr., Burnaby, BC, Canada V5A 1S6 at (604) 291-5315, fax, (604) 291-5317 or by email at mckechnie@sfu.ca

## PRESIDENTS COLUMN

### *Cactoblastis cactorum*: Summary of the September 2000 workshop

It's early October, so university Extension Service telephones here in the upper Midwest and southern Canada are ringing off the hook with calls about *Harmonia*. Phil Pellitteri operates our department's diagnostic lab. On warm days this time of the year he gets up to 50 calls per day, each taking a minimum of 5-10 minutes. The local radio and television stations are having great fun ("No beetle that bites and causes such a nuisance can truly call herself a lady."). Many callers are truly desperate; one gentleman claimed that his family was driven out of their newly-built dream home by the unstoppable hoards. As a fruit crops entomologist, I get calls from home and commercial fruit growers wondering how they can save their fall fruit crops from the feeding injury caused by these "supposedly insectivorous" beetles. Several callers have heard that the federal government actually introduced these "noxious pests," and want to know who they can sue for their misery. These folks could care less that the U.S. is safer from the ravages of aphids. In today's critical view of biological control, *Harmonia* has become to the general public what *Rhinocyllus* has been for the ecological community.

I have stated here before that I believe that one of the most important issues facing biological control today is the potential impact on non-target organisms. The decade of the 1990s was a period of increased scrutiny of biological control, especially classical biological control. Certainly, the cases that have been criticized are those involving oligophagous or polyphagous natural enemies that have caused adverse effects on non-target organisms. It is easy to argue that the criticisms aren't very meaningful because, in the era when those natural enemy introductions were made, soci-

etal interests were more on protecting food supplies and natural resources than on safeguarding the existence of every known taxon. However, priorities change in both science and society, and it is clear that today's biological control projects must be more concerned about non-target impacts. It is equally clear that review systems must be in place to assess the benefits and the costs, both of doing a specific biological control program, as well as not conducting the program. In the U.S., such mechanisms are not totally in place now, and, regrettably, do not seem to be on the horizon.

Biological control has resulted in incalculable good here in North America and throughout the world. Unfortunately, there have been a few cases of harm that were either unconsidered or unpredicted. I think that it is imperative that the biological control community take a proactive stance to avoid unacceptable non-target impacts in future projects. Must all natural enemies be strictly monophagous? Of course not. If this were required, biological control would be all but dead. But I do think that we should be reasonably certain that non-target impacts will be biologically minimal.

And now, to *Cactoblastis*. *Cactoblastis cactorum* (Lepidoptera: Pyralidae) is an oligophagous species that feeds internally within the stems (cladodes) of prickly pears and related cacti. A native of Argentina, it was released into Australia in the 1920s to combat weedy, alien prickly pear cactus (*Opuntia* spp.: Cactaceae). The result was the liberation of millions of hectares of Australian farmland, rangeland, and natural habitat. Because of this outstanding success, *Cactoblastis* was introduced to other areas where opuntias had become established and weedy. In 1956, the decision was made to introduce *Cactoblastis* to the island of Nevis in the West Indies, where native opuntias were affecting rangeland. This was the first case of using *Cactoblastis* against prickly pears in their natural habitat. From a biological control perspective, the project was a success, and *Cactoblastis* then spread, by both human transport and natural movement, through many islands of the Caribbean where there is a diversity of native cacti, including many species of *Opuntia*. In 1989, *Cactoblastis* was first found in the Florida Keys. Here it attacks various native opuntias, including the highly localized and threatened *Consolea*

(=*Opuntia*) *corallicola*. In 10 years *Cactoblastis* has spread from southern Florida as far north as coastal Georgia. Its westward spread has been slower, but it has been intercepted on infested nursery stock as far west as Pensacola. As a genus, *Opuntia* occurs naturally from southern Canada to South America. There is a continuous distribution across the southern United States from southern Florida, through the states along the Gulf of Mexico, and westward across Texas, the Southwest, to the Pacific Ocean. There are about 200 species in the genus, and Mexico is a center of diversity, with about 100 species. Opuntias are significant components of fragile arid ecosystems, where they provide food, moisture, shade, nesting sites, and refuge for numerous species of plants, invertebrates, and vertebrates. In addition, prickly pear is a highly important subsistence food crop and uniquely-adapted arid cash crop throughout much of Mexico, and, to a lesser extent in the United States. In summary, the potential damage caused by *Cactoblastis* to the natural environment and to food production could be staggering. Currently, *Cactoblastis* is making its presence known to the general public in Georgia and Florida, where homeowners are witnessing the collapse of landscape specimens of opuntias.

Although *Cactoblastis* was not intentionally introduced to continental North America (circumstantial evidence suggests it possibly arrived in Miami on infested nursery stock imported from the Caribbean (Pemberton 1995)), it is highly likely that it arrived via the Caribbean where it was intentionally introduced. Both ecologists and biological control workers have already used *Cactoblastis* to point to needed reform in biological control practices (for example, see Strong and Pemberton 2000).

Because of my belief that our science needs to squarely address the issue of non-target impacts, I helped organize a workshop to assess the issue of *Cactoblastis* in North America. The workshop was held in Tampa, FL in September, 2000. The workshop was co-sponsored by the USDA, APHIS, National Biological Control Institute (primary funding agency), the Nearctic Regional Section of IOBC, and the Cactus and Succulent Society of America. The final details are being completed on the workshop proceedings which are due to be

published in the December 2001 issue of *Florida Entomologist*. Further, a white paper detailing the conclusions and recommendations of the workshop is in preparation. Because of the sponsorship of IOBC-NRS, I think it is appropriate to summarize some of the workshop highlights here.

Because this was designed as a true workshop with the goal of accomplishing some objectives, participation was limited and by invitation only. There were 21 participants, representing the fields of biological control, botany, conservation biology, crop protection, ecology, entomology, and horticulture. By geographical distribution, the potentially-affected states of Florida, Georgia, Texas, Arizona, and California were represented. There were four representatives from the biological control and crop protection communities of Mexico, and an authority on biological control of prickly pear from South Africa. There were specific sessions on (1) the biology and economic importance of *Opuntia*, (2) the biology and status of *Cactoblastis*, and (3) possible *Cactoblastis* management strategies. There were formal presentations, discussion sessions, and working sessions. This brief summary is organized along the lines of some of the key questions addressed by the workshop.

*Question 1. How far is Cactoblastis likely to expand its range?* There is a continuous transcontinental distribution of *Opuntia*, many species of which are either known or assumed hosts. However, wide-ranging host testing has not been conducted. Within its native range, *Cactoblastis* is known to survive in a diversity of climates, both wetter and drier, and including cooler, high-elevation areas. The northern limit of its potential distribution in the United States is unknown. However, it is anticipated to spread throughout much of Mexico. One paper in the proceedings by Soberon and colleagues in Mexico reports on modeling studies to predict the potential distribution in Mexico based upon bioclimatic and host distribution data. These studies suggest that *Cactoblastis* can possibly colonize much of Mexico, and that the route of most likely invasion of Mexico would be from Texas via the states along the Gulf of Mexico. A workshop recommendation is that bioclimatic modeling be conducted in the United States to determine potential areas of spread.

*Question 2. What might be the impact of Cactoblastis on natural stands of Opuntia spp. and the other plants and animals that use opuntias as a resource? What will be the impacts on localized endemic species?* Host plant testing of *Cactoblastis* has been minimal. But it is known that many novel species of *Opuntia* are readily attacked. Prickly pears (“platypuntias”) are more common hosts than chollas (“cylindropuntias”) but attack on chollas has been documented. There have been few studies on the ecological importance of opuntias, but in many arid areas they are a major component of the plant community and play important roles benefitting other plants and a diversity of vertebrates and invertebrates. In some regions, the localized and, in some cases threatened, taxa of *Opuntia* are well known. For example, six such taxa occur in Texas. But a complete documentation of such species has not been compiled. A workshop recommendation is that research be conducted on the environmental importance of model *Opuntia* species in areas prior to infestation by *Cactoblastis*. Another recommendation is that all potentially vulnerable localized and/or threatened opuntias be documented, and the current status of the “health” (e.g. age structure, density, sexual and vegetative recruitment rates) of such taxa be studied.

*Question 3. What will be the impacts on agricultural and horticultural uses of prickly pear?* Proceedings papers by Viguera G. and Portillo, and Soberon *et al.* fully document the significance of the Mexican prickly pear industry. About 30 native taxa are used and over 3,000,000 ha are harvested. Much of this production is from tended wild stands, and serves as a local subsistence source of fruit and vegetables (cladodes), as livestock fodder, and as an important cash crop in low income areas. The value of the industry averaged about \$50 million annually through the 1990s. There is also a prickly pear food industry in the southern United States but its size and value were not documented by the workshop. However, the landscaping importance of prickly pears in arid environments is substantial. A proceedings paper by Irish estimates that the value of Arizona prickly pear nursery stock approaches \$10 million. Pemberton (1995) documented that about 300,000 prickly pear plants for the nursery industry annually arrived at Miami ports from the Domini-

can Republic during the 1980s. In addition to agricultural and horticultural uses, prickly pears have other commercial value, such as the production of cochineal dye and pharmaceuticals. A workshop recommendation is that substantial host range testing of *Cactoblastis* be conducted, to include (1) common and widespread species that could serve as major distribution hosts, or that are key contributors of natural community stability, (2) all commercially utilized species, and (3) localized endemics that could be particularly vulnerable.

*Question 4. If the biological and economic impacts of Cactoblastis are substantial, what are possible means of control?* Proceedings papers by Badii and Flores, and Leibe and Osborne suggest possible insecticides that could be evaluated for *Cactoblastis* control, but these would be impractical to use for preserving natural *Opuntia* populations. Two papers in the proceedings by Carpenter and colleagues discuss the potential of using  $F_1$  sterility as a management and research tool. This technology may have benefit for eradicating localized infestations and for slowing the spread of *Cactoblastis*, but will be of marginal value in protecting plants in natural environments. Two papers by Pemberton and Cordo summarize the knowledge of natural enemies of *Cactoblastis* and discuss possible approaches to biological control. Many of the known natural enemies are somewhat generalists which could adversely affect native cactophagous pyralids. However, classical biological control may be the only logical approach to protecting native stands of prickly pear. Education is an important component of pest management. A proceedings paper by Perez-Sandiy Cuen discusses a proposed FAO project on *Cactoblastis* in Mexico with a substantial educational component. No coordinated educational programs currently are in place in the United States.

The workshop recommended that insecticides be evaluated, that research on  $F_1$  sterility be accelerated, that searches for specialized natural enemies of *Cactoblastis* be initiated, and that research on environmental impacts of oligophagous potential natural enemies be conducted. Another workshop recommendation was that coordinated educational programs targeted at appropriate audiences be conducted throughout the southern United States.

*Question 5. How will the Cactoblastis situation likely affect the science and application of classical biological control?* This is a difficult question without easy answers. The ultimate answer will likely be known only after we begin to understand the extent of the insect's impact on *Opuntia*. Biological control has already been under recent scrutiny because of non-target impacts. It is unlikely in today's world that biological control workers would consider a project such as that conducted on Nevis. However, in the United States we are still coping with an unsatisfactory regulatory framework for assessing biological control programs, and funding necessary to conduct research on non-target impacts is largely unavailable. For these reasons, the biological control community must continue to be proactive in considering non-target impacts.

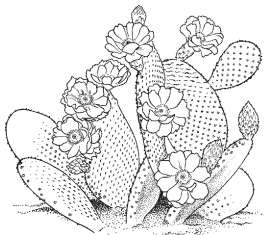
In summary, *Cactoblastis* has the potential to inflict considerable harm on prickly pears cultivated for agricultural and horticultural purposes. Further, its impact on fragile natural environments could be substantial. The workshop participants are hopeful that cooperative state, national, and international programs can be launched to address these problems.

— Dan Mahr, IOBC-NRS President

**Note:** limited numbers of the workshop proceedings are available for distribution. Contact Dan Mahr at: <dmahr@entomology.wisc.edu>.

#### References Cited

- Strong, D. R., and R. W. Pemberton. 2000. Biological control of invading species – risk and reform. *Science* 288: 1969-1970.
- Pemberton, R. W. 1995. *Cactoblastis cactorum* (Lepidoptera: Pyralidae) in the United States. An immigrant biological control agent or an introduction of the nursery industry? *Amer. Entomol.* 41: 230-232.



## NEWS

### Microbial Products Tested for Poinsettia Disease Suppression

This NY State IPM project tested the efficacy of four microbial products for control of poinsettia diseases in several commercial greenhouses during 1997-2000. The treatments at different sites included RootShield (*Trichoderma harzianum*), Mycostop (*Streptomyces griseoviridis*), Actino-Iron (*Streptomyces lydicus* WYEC 108), and AgBio Endos (mixed mycorrhizae species), while the fungicides Banrot, Subdue MAXX, Terraclor, and Truban were applied at different sites. At sites where disease was present, the plants treated with microbials tended to look better than the untreated control plants. Each microbial product tested was beneficial in suppressing disease at some site, but the same effects could not be predicted at different sites. Many factors influence poinsettia resistance to disease, and disease development is greatly dependent on environmental conditions. Success with microbials for root rot suppression will depend on the history of the site and cultural conditions. Microbials used in combination with early detection, careful diagnosis, and roguing can improve disease management and reduce the total number of conventional fungicide drenches. For more information on this project, see the full report at <http://nysipm.cornell.edu/grantspgm/projects/proj00/orn/hall.html>

### Papaya Mealybug Parasitoids

The papaya mealybug, *Paracoccus marginatus*, was recently introduced into the United States, and poses a threat to a variety of agricultural crops, including papaya, citrus, cotton and avocado, as well as many ornamentals, such as hibiscus. Two natural enemies, newly discovered species of parasitoid wasps in the genera *Pseudleptomastix* and *Acerophagus*, were collected during field research in Texcoco, Mexico, in 2000. Releases of the parasitic wasps reduced mealybug populations 98% near the research sites. ARS scientists are confident a parasite-release operation can be an effective tool in the war against papaya mealybugs. (From ARS News & Information, *Parasitic Wasps Could Curb Mealybug*, August 17, 2001; for the complete article see <http://www.ars.usda.gov/is/pr/2001/010817.htm>)

### Improving Thrips Control in NY Greenhouses

The predatory mite *Neoseiulus cucumeris* has been successfully used to control thrips for three consecutive seasons in the retail portion of a greenhouse range participating in a NY State IPM program. Demonstrations over the past four years with *N. cucumeris* have provided educational opportunities for growers, extension staff and researchers. In 1999 the thrips predator demonstration was expanded from one retail greenhouse to three production greenhouse operations. In 2000 two application methods, sprinkle vs. sachet, were compared and the use of *Hypoaspis miles* in combination with *N. cucumeris* was investigated. Preliminary results suggest that the sprinkle method provided better thrips control than the sachet method, and the addition of *Hypoaspis* provided improved control of thrips at one greenhouse operation. Adapted from the program report at <http://nysipm.cornell.edu/grantspgm/projects/proj00/orn/couch.html>

### Biological Control of Viburnum Leaf Beetle

Viburnum leaf beetle, *Pyrrhalta viburni* (Paykull), was discovered in NY State in 1996 and has been spreading rapidly. It is likely that viburnum leaf beetle will soon pose a serious threat to viburnums throughout the Northeast and beyond. The ability of several generalist predators and a pathogenic nematode to control viburnum leaf beetle was examined in recent laboratory experiments. *Harmonia axyridis*, the Asian multicolored lady beetle, and the green lacewing *Chrysoperla carnea* were quite effective in killing larvae of viburnum leaf beetle in the lab. Even more encouraging were the results with the entomopathogenic nematode *Heterorhabditis bacteriophora*. In most cases the nematode killed all of the larval viburnum leaf beetles that entered the soil to pupate. Although the field efficacy of these natural enemies is unknown, the results were encouraging enough to warrant such investigation in the future. For more information on this project, see the full report at [http://nysipm.cornell.edu/grantspgm/projects/proj00/orn/weston\\_p.html](http://nysipm.cornell.edu/grantspgm/projects/proj00/orn/weston_p.html)

### Ring Nematode Suppression

The beneficial bacterium *Pseudomonas* sp. (BG33R), isolated in the early 1990s from

soil that was known to suppress the ring nematode (*Mesocriconema xenoplax*) in South Carolina, inhibits *M. xenoplax* reproduction under laboratory and greenhouse conditions. Combining BG33R and soil solarization in peach orchard field plots resulted in ring nematode populations at or below nematicide treatment thresholds for about 18 months, unlike unsolarized plots. Soil solarization is a special mulching method that uses a transparent plastic covering to trap the sun's heat. This gives beneficial bacteria, such as BG33R, a competitive edge by lowering the native population of bacteria and killing harmful pests like the ring nematode. Introducing BG33R after solarization treatment will help reduce the dependence on nematicides. (From ARS News & Information, *Lowly Ring Nematode Suppressed With Biological Control*, August 28, 2001; for the complete article see <http://www.ars.usda.gov/is/pr/2001/010828.htm>)

## PUBLICATIONS

### More Than a Century of USDA Biological Control R&D

The Biological Control Documentation Center, Insect Biocontrol Lab in Beltsville, MD still has a fairly good supply of its massive publication (4 cm thick with 645 pages) from August 2000 entitled *110 Years of Biological Control Research in the United States Department of Agriculture*. This tome chronicles the research and implementation of biocontrol in North America, beginning with the first introduction of an exotic natural enemy in late 1883 (you'll have to get the book to find out which one, if you don't already know!). The text actually only comprises 165 pages, with another 93 pages of references. The remainder of the publication is appendices, including large sections for ARS insect pathology research (124 pages) and an in-depth review of research and biocontrol efforts on specific insects and groups by the Forest Service (84 pages). To get your free copy, contact primary author Jack Coulson (email <[jcoulson@nal.usda.gov](mailto:jcoulson@nal.usda.gov)>, phone 301-504-6350 or fax 301-504-6355) at

National Ag Library  
10301 Baltimore Blvd  
14th Floor  
Beltsville, MD 20705-2350

### New Extension Publication for Greenhouse Biocontrol

*Biological Control of Insects and Other Pests of Greenhouse Crops* is a new 104-page North Central Regional Extension publication that provides information on important natural enemies and offers practical advice on how to use beneficial organisms for pest management in greenhouses. The publication emphasizes the use of biological control, but it also tells how best to use cultural and least-toxic chemical controls if it becomes necessary to supplement biological control. The publication also provides background information on biological control in general, and on the specific pests and their natural enemies that occur in greenhouse crops to help refine pest management programs. More than 1,000 research, technical, and popular publications were reviewed and summarized for this publication to help practitioners plan and conduct successful biological control.

For more information, contact University of Wisconsin Cooperative Extension Publications, 45 North Charter Street, Madison, WI 53715 or visit their website at <http://www1.uwex.edu/ces/pubs/index.cfm>

## MEETING CALENDAR

**IOBC-NRS Symposium** at the Entomological Society of America, December 9-13, 2001, San Diego, California. See page 6 for more information.

**IPM in Glasshouses**, IOBC-West Palearctic and Nearctic working groups joint meeting, 8-11 May 2002, Laurel Point Inn, Victoria, British Columbia, Canada. The meeting will feature 4 days of presentations and workshop discussions on Integrated Pest Management in Glasshouses, and will include a research tour of the dynamic glasshouse industry in southwestern British Columbia. The meeting will be restricted to 150 delegates, on a first-come, first-served basis. To be placed on a mailing list to receive further details, please contact: D. R. Gillespie, Pacific Agri-Food Research Centre, Agriculture and Agri-Food Canada, P.O. Box 1000, Agassiz, British Columbia, Canada V0M 1A0. Fax (604) 796-0359 or e-mail: [gillespied@em.agr.ca](mailto:gillespied@em.agr.ca).

**The Role of Genetics and Evolution in Biological Control**, 3rd International Symposium of the IOBC, Montpellier, France, 14-16 October 2002. The aims of the symposium are to acquaint biological control workers with the latest advances in genomics and molecular biology and to explore ways that these advances can be put to practical use in biological control. Leading ecologists and biological control researchers have been invited as keynote speakers; papers can also be submitted until 1 March 2002. There will be 6 themes, each introduced by a keynote speaker, followed by oral papers and posters. The second announcement is expected in late 2001. For more information visit the website at <http://www.iobc.agropolis.fr/symposium2002> or contact:

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## NEW MEMBERS

Welcome to the following new members:

James Alan Matteoni  
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Jay A. Rosenheim,  
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## Annual IOBC-NRS Symposium

The annual IOBC-NRS Symposium will once again be held in conjunction with the national meetings of the Entomological Society of America, in San Diego, California this December. John Ruberson is our symposium coordinator and he and Molly Hunter will be co-moderators. This year's symposium is entitled *Generalist Predators in the Mist: The Search for Clarity*. John has provided the following background for the symposium.

The interest in generalist predators is increasing as their roles in suppressing pest species are becoming more apparent. There are, however, some very important questions that we have barely addressed, and which are in need of greater emphasis. Growing concerns over nontarget impacts of introductions are encouraging greater interest in conservation biological control, where generalist predators are often numerically dominant. It is of great importance to better understand the outcomes of interactions between predators and multiple prey species and types, and the interactions of generalist predators with their environments. There is a pressing need to devise ways of anticipating with some reasonable probability the outcome of interactions between generalist predators and a prey cornucopia in diverse habitats. To do so will require more fundamental knowledge of the life histories of generalist predators and their interactions with other predators, prey, and their environment. This conference is structured to provide an examination of our current thinking in these three areas, although it will by necessity be rather cursory. Nevertheless, the topics and speakers should generate a greater interest in the role of generalist predators in managed ecosystems.

The speakers and their topics are as follows.

- Kenneth Yeargan, Dept. of Entomology, Univ. of Kentucky, Lexington  
*"Generalist predators and ephemeral agroecosystems: An overview"*
- Steve Naranjo, USDA-ARS, Western Cotton Research Lab, Phoenix, Arizona  
*"Measuring generalist predation: Integrating functional response behavior and ELISA"*
- Jacques Brodeur, Dept. de Phytologie, Centre de Recherche en Horticulture, Université Laval, Ste Foy, Quebec  
*"Generalist predators in greenhouse systems"*
- David Horton, USDA-ARS, Wapato, Washington  
*"Seasonal dynamics of predators and biological control in orchards"*
- Fabian Menalled and Douglas Landis, National Soil Tilth Laboratory, Iowa State University, Ames, and Center for Integrated Plant Systems, Michigan State University, East Lansing  
*"Generalist predators in fragmented and disturbed systems"*

## NEWSLETTER INFORMATION

Submission of news items from the membership is what makes this newsletter of value to all. Although a deadline is set for the editor's sake, please submit at any time for future newsletters (my address is on the back page). Some suggested topics are:

Items in the news affecting biological control  
 Taxonomy (revisions or studies impacting biocontrol)

Reports of Working Groups  
 Announcements  
 New research projects  
 Thesis or dissertation topics  
 Open Forum type letters  
 New appointments or people moving around  
 Awards or honors received by members  
 Meetings or workshops related to biological control  
 New publications

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**Items for the Winter Newsletter are  
due by 15 January 2002**

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**International Organization for Biological Control of Noxious Animals and Plants  
Nearctic Regional Section**

**Organisation Internationale De Lutte Biologique Contre Les Animaux Et Les Plantes Nuisibles  
Section De La Region Nearctic**

<http://www.entomology.wisc.edu/iobc/nrs.htm>

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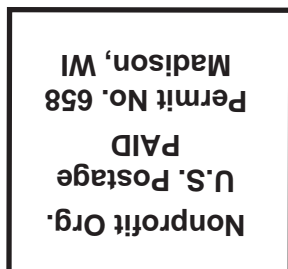
President:	Daniel Mahr	The International Organization for Biological Control - Nearctic
President Elect:	Molly Hunter	Regional Section Newsletter is published 3 times a year in February,
Past President:	Larry Charlet	June, and October to provide information and further communication
Vice President:	John Ruberson	among members of the Region (Bermuda, Canada, and the United
Secretary-Treasurer:	Robert Wiedenmann	States).
Corresponding Secretary:	Susan Mahr	
Members-at-Large:	Jacques Brodeur	
	Stefan Jaronski	
	Peter Mason	

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**Send items for the Winter 2002 IOBC-NRS Newsletter by 15 January to:**

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RETURN SERVICE REQUESTED

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