



WINTER 2003

IOBC - NRS Newsletter

*International Organization for Biological Control
Nearctic Regional Section*

Volume 25
Number 1

President

Dr. Molly Hunter
University of Arizona

President-Elect

Dr. Rob Wiedenmann
Illinois Nat. History Survey

Past President

Dr. Dan Mahr
University of Wisconsin

Vice President

Dr. Nick Mills
Univ. of Calif. - Berkeley

Secretary/Treasurer

Dr. Stefan Jaronski
USDA-ARS, Montana

Corresponding Secretary

Dr. Susan Mahr
University of Wisconsin

Board Members- at- Large

Dr. Jacques Brodier
Université Laval
Dr. George Heimpel
University of Minnesota
Dr. Sujaya Rao
Oregon State University

Newsletter Editor

Dr. Susan Mahr

CONTENTS

- 1 IOBC-NRS Awards
- 3 Business
- 4 ESA Meeting Briefs
- 5 Newsletter Info
- 6 Meetings



Maurice and Kady Tauber

Distinguished Scientist Award 2002

Drs. Maurice and Catherine Tauber, of Cornell University, were co-recipients of the IOBC-NRS's Distinguished Scientist Award for 2002. They were honored simulta-

neously for their collective achievements, in a ceremony during the Annual Meeting of the Entomological Society of America, at Ft. Lauderdale, FL in November 2002.

The Taubers' research focuses on the evolution of seasonal cycles in insects, speciation, and the comparative biology and systematics of natural enemies. Their book, *Seasonal Adaptations of Insects* (Tauber, Tauber & Masaki) which had been out of print, has been reissued by Oxford University Press.

Kady received her PhD from the University of California at Berkeley in 1967. She then accepted a NIH Postdoctoral Fellowship at

Cornell University and since 1967 has been a Senior Research Associate there. Her areas of expertise include systematics and evolution of Neuroptera, evolutionary biology, speciation, and insect seasonality. She has been an active member of the Entomological Society of America, serving four terms on the Publications Council.

Maurice received his PhD from the University of California at Berkeley in 1966. He accepted a position as an Assistant Professor of Entomology

— continued on page 2



IOBC-NRS award recipients and officials, L-R: incoming President Molly Hunter, DSA presenter John Obrycki, outgoing President Dan Mahr, Honorable Mention Student Award Christing Armer, DSA Catherine Tauber, Honorable Mention Student Award Lindsey Milbrath, DSA Maurice Tauber, and Outstanding Student Award Jason Harmon.

IOBC-NRS Student Award 2002

Last year, IOBC-NRS held, for the first time, a competition for an Outstanding Student in Biological Control. This was tremendously successful, judging by the quality of the applications submitted. With this level of dedication and talent in our students, biological control's future appears bright!

The **2002 Outstanding Student in Biological Control** was awarded to **Jason Harmon**. Jason was an undergrad in Tony Ives' lab at the University of Wisconsin, where, among other things, he did a project on the effects of preda-



tor vision and prey color in foraging behavior of coccinellids. In his Ph.D. with Dave Andow at the University of Minnesota, he has been looking at the effects of alternate prey on predation of pests by generalist predators in a spatially heterogeneous environment.

Dave Andow says about Jason, "he is one of those rare students whose gift for experimental research has resulted in one productive year building logically on each previous productive year. It is not that he is immune from making mistakes; rather he has the remarkable ability to turn mistakes into

— continued on page 2



Distinguished Scientist Awards —Continued from page 1

at Cornell in the same year. He achieved the rank of Professor in 1978, served as Dept. Chair from 1981 to 1986, and was named a Graduate School Professor at Cornell in 2000. He recently retired from Cornell University. His areas of expertise include biological control, insect seasonality, and comparative biology and behavior of predators and parasitoids. Maurice has served on the Governing Boards of the ESA and IOBC-NRS, and on numerous Editorial Boards. He is a fellow of the American Association for the Advancement of Science, and of the Entomological Society of Canada.

Starting in 1965, these two individuals with independent research expertise and interests, have collaborated on over 150 publications, including 9 papers in *Nature* and *Science* and two *Annual Review* articles. Throughout their careers, the Taubers have asked good fundamental research questions and then used this knowledge in biological control.

Research by the Taubers has been influential in numerous aspects of biological control including suppression of both insect pests and weeds. Their studies on optimal storage conditions for predators provide information needed to

develop inundative and augmentative release programs using chrysopids and other predators. Even more pivotal is their work on the biology of predators, which is essential in the design of successful programs to import, release and establish natural enemies. Specifically, their studies have provided new insights into the role of behavior in the evolution of prey specificity. Comparative ecophysiological field studies have been combined with detailed behavioral observations in greenhouse and laboratory conditions to examine the mechanisms involved in prey specialization. These results have elucidated a pathway for the evolution of prey specialization, as well as provided critical practical information for the use of predatory species in biological control.

The most comprehensive studies of the ecological and genetic variability among populations of any predatory species have been conducted by Maurice and Kady Tauber. Their studies have focused on lacewings in the *Chrysoperla carnea* species complex, a taxon that includes species which are commercially mass reared and released in numerous agricultural systems. The



The Taubers talk with IOBC-NRS Past President Dan Mahr at the reception after the awards presentation and symposium.

Taubers' studies have identified the variation in seasonal life cycles, habitat associations, and life-cycle traits, and the ecophysiological and genetic bases of this variation. Their work has resulted in several species descriptions, and the development of widely used keys and manuals for identifying larval stages of predacious Neuroptera.

— Submitted by John J. Obrycki, Dept. of Entomology, Iowa State Univ., who wishes to thank Prof. Jeffrey Scott, Dept. of Ent., Cornell Univ., for assistance with material used in this article.

Student Awards —Continued from page 1

productive insights without losing any time." Jason's research effort promises to improve the predictability of generalist predators response to prey populations in a complex environment. Jason was awarded the EPA Star Fellowship, and ESA oral student presentation award, and has already been active in service and teaching at the University of Minnesota. Jason delivered an excellent presentation on *The ecological mechanisms of shared predation* to lead off the IOBC Informal Conference Symposium.

Because of the quality of this year's applicants, it was decided to acknowledge two students with honorable mention, in addition to our award winner. Both **Christine Armer** and **Lindsey Milbrath** were presented recognition certificates at the Informal Conference.



Christine's work has largely involved multitrophic analyses of biological control systems. As an undergrad in Jay Rosenheim's lab at UC-Davis she participated in a now-classic study of intraguild predation in the cotton aphid community. In her Master's project with Rob Wiedenmann at Illinois she studied plant characteristics that influence plant feeding in the omnivorous bug *Orius*. In her Ph.D. she has been studying the effects of potato glycoalkaloids on infection of the Colorado potato beetle by an entomopathogenic nematode. Among her honors include an EPA Star Fellowship and the John Henry Comstock Award for the Pacific Branch of the ESA.



Lindsey did a Masters degree with the 2002 Distinguished Scientists, the Taubers. Here he studied the effects of green lacewing behavior on prey specificity. In between graduate programs he worked on the biology and natural enemies of weevil and flea beetle pests of clover and oilseed crops. In his Ph.D. he has moved down a trophic level to investigate indirect competition between two biological control agents on musk thistle. Lindsey has long been associated with IOBC and is perhaps the only student to have served on the Governing Board. Other honors include twice winning the ESA poster competition in Section Cd, Behavior and Ecology.



ANNOUNCEMENT

2003 Midwest Institute for Biological Control

The 2003 Midwest Institute for Biological Control short course, "Risk Analysis in Biological Control", will be held at the USDA-ARS European Biological Control Lab in Montpellier, France. The short course will focus on conducting biological control programs overseas, and placing those programs into a risk-analysis framework. The Institute is designed for graduate students, biological control specialists and others interested in biological control of exotic, invasive species. The 2003 Institute will include field, laboratory and classroom exercises.

Topical areas will include:

- Overview of importation biological control and case histories
- Risk analysis (assessment, mitigation and communication) in biological control
- Targeting weed and insects species for biological control
- Searching for natural enemies and field collecting, quarantine and host-specificity
- Student presentations (and shadowing EBCL scientists for a day)

Cost is estimated at \$1200 (US\$) for graduate students (\$1500 for non-students), which includes round-trip airfare from the U.S., hotel, one (and sometimes two) meals per day, in-country transportation, tuition and all course materials. Participants will be responsible for the cost of several evening meals and incidentals. Final costs will be determined by early spring, 2003, depending on grant support. Course enrollment is limited to 15 students.

For course registration and information, contact Rob Wiedenmann at <hr-wiede@uiuc.edu>.

IOBC-NRS BUSINESS

Apply Now For The IOBC-NRS Student Award

IOBC-NRS presented the first annual award for Outstanding Graduate Student in Biological Control to Jason Harmon of the University of Minnesota (see article on page 1). Now is the time for you — or your promising graduate student(s) — to apply for the 2003 award. The recipient will be recognized at the IOBC NRS Informal Conference held at the Annual Entomological Society of America meeting, will receive a cash award of \$250, and will give the lead talk in the IOBC-NRS symposium.

All individuals who are enrolled in a graduate program and are members of the IOBC NRS at the time of the application deadline are eligible. Students who are *not* planning to attend the Entomological Society of America Meetings

would ordinarily be less likely to be considered for the award. We note that students may join IOBC-NRS at the time of submitting their application (membership application on page 7; for more details see the web site at <http://www.entomology.wisc.edu/iobc/nrs.htm>).

Also, while finishing Ph.D. students may be more likely to be able to demonstrate scholarship and achievement than Masters students, promising Masters students are also encouraged to apply.

The deadline for the application is March 17, 2003. Please:

- send a letter which details the significance of your research and its relevance to biological control;

- include a 2 page CV that includes contact information, education, honors & awards, presentations, and publications; and
- ask 2 referees to send letters of reference to Rob Wiedenmann, President-Elect IOBC-NRS.

We also ask that you confirm your plans to attend the Ent. Soc. Mtg. in Cincinnati in late October 2003 in the letter. To facilitate sharing of applications among the Student Award Committee members, we ask that you send the documents as Microsoft Word attachments to <r-wiede@uiuc.edu>. A decision will be made and the recipient notified in time for the recipients' talk title and abstract to be entered in the ESA online submission system.

Distinguished Scientist Award Nominations Requested

At this time, the IOBC-NRS is soliciting nominations for the 2003 DSA. Nominees must have spent most of their career in the Nearctic Region (essentially Canada and the U.S.), and have made significant contributions to biological control, but need not be members of IOBC. Nominations are restricted to one page in length and should include the name and current contact information of both nominator and nominee, as well as a thorough but concise summary of the principle contributions of the nominee.

This is our organization's main way of telling people how much their work is appreciated. The recognition of those scientists who have made outstanding contributions to the science and implementation of biological control over extended and illustrious careers is an important function of IOBC. Many members have expressed to me their enjoyment of seeing colleagues honored with our Distinguished Scientist Award. Help us honor our deserving colleagues!

Please send nominations by **April 1, 2003** to:

Molly Hunter, President IOBC-NRS
Department of Entomology
University of Arizona
1630 Linden Drive
Tucson, AZ 85721-0036

Nominations may also be sent by email to <mhunter@ag.arizona.edu> or by fax to (520) 621-1150.



Poster and Paper Presentation Summaries From the ESA Meeting

The following brief summaries are just some of the numerous presentations at the annual meeting of the Entomological Society of America, November 17-20, 2002 in Ft. Lauderdale, FL, that dealt with biological control. Only the presenting author is included. The number in parentheses refers to the presentation number in the program. Complete abstracts for these and many more presentations can be viewed by using the Personal Scheduler on the ESA website at <http://esa.confex.com/esa/2002/scheduler/>. You can search keywords, names, and/or abstract title, or view program sessions with a list of papers that were scheduled to be presented there, and then click on a paper title to read the abstract (assuming one was submitted).

Biological control of the glassy-winged sharpshooter in citrus with releases of predators and parasitoids — Gregory Simmons, USDA-APHIS, Bakersfield (D0187). Parasitism by the native egg parasitoid *Gonatocerus ashmeadii* often exceeds 90% on midsummer populations of GWSS, suggesting that early season augmentative releases could be an effective control strategy in citrus. The exotic *G. trigitattus* could also be effective. Sleeve cage tests showed that release rates of the assassin bug *Zelus renardii* should be 6.5:1 or less. Green lacewing larvae did not significantly reduce GWSS populations at 20 or 100 larvae per tree.

Leaf consumption by a North American flea beetle, *Altica litigata*, and its impact on seed production of purple loosestrife, *Lythrum salicaria* — Debra Hoyme, Univ. of Tenn. (D0046). Herbivory by this native beetle, found feeding on purple loosestrife in Tenn., especially larvae, had a negative impact on seed production and plant height. Being a native insect, this species should have less negative environmental consequences than an introduced species.

Prey preference of *Orius insidiosus* (Say) (Heteroptera: Anthrocoridae) for species of *Frankliniella* flower thrips (Thysanoptera: Thripidae) in pepper flowers — Ignacio Baez, USDA-ARS, Tallahassee (D0096). *Orius* is an efficient predator that successfully fed on all types of prey offered; predation was most likely to occur inside the flower. *Frankliniella tritici*, the more mobile species that tended to disperse more than *F. occidentalis*, was more vulnerable to predation at low densities due to higher chance of encounter with *Orius*. At high density, *F. occidentalis* was more susceptible, and larvae were more susceptible than adults.

Field evaluations of the dispersal and biocontrol efficacy of *Trichogramma cacoeciae* Marchal (Hymenoptera: Trichogrammatidae) — Koen Breedveld, Washington State Univ. (0444). Augmentative releases of the wasp against cherry bark tortrix on rosaceous trees in urban ornamental plantings resulted in up to 97% parasitism and dramatic reductions in tortrix eggs (including elimination at 3 of 4 sites). Wasps do not disperse between trees, but disperse well within the tree, so this is a good natural enemy for release on individual trees, as homeowners would do.

Attractiveness of various flowering plants to adult syrphid flies — George Hamilton, Rutgers Univ. (D0311). Annual and perennial flowering plants were sampled once a week for three years to determine that *Achillea millefolium*, *Coreopsis tinctoria*, *Coriandrum sativum* and *Fagopyrum esculentum* consistently attracted the most adult syrphids. Several other plants were inconsistent (high some years, low others), and many, including *Echinacea purpurea*, *Foeniculum vulgare*, *Lavendula*, *Pyrethrum*, and *Rudbeckia lacinata*, were not very attractive at all.

Susceptibility of a native and an exotic lady beetle (Coleoptera: Coccinellidae) to *Beauveria bassiana* — Ted Cottrell, USDA-ARS, Byron, GA (D0382). The native beetle *Olla v-nigrum* is more susceptible to *Beauveria bassiana* than the introduced *Harmonia axyridis*, suggesting this may have something to do with why the latter has been so successful.

Manipulating floral density in ornamental landscapes to encourage natural enemies of herbivorous insects — Ashley Bennett, Univ. of Illinois (0653). Plantings of four species of perennial flowering plants (white clover, goldenrod, euphorbia, and coreopsis) around pine trees infested with pine needle scale increased the number of natural enemies in the system and parasitism by an aphelinid parasitoid.

Value added strawberry transplants with *Phytoseiulus persimilis* predatory mites — James F. Price, Univ. of Florida, (D0444). Strawberry transplants infested with twospotted spider mites and the predatory mite *Phytoseiulus persimilis* were subjected to simulated post-harvest storage and shipping conditions. The predators can survive well and could establish in fruiting fields to offer biological control of spider mites there, saving growers the expense and inconvenience of purchasing and applying predators later.

Selecting food sources to enhance biocontrol in brassicas — Felix L. Wäckers, Netherlands Institute of Ecology (0773). Some flowers that are attractive to parasitoids may not provide accessible nutrients, so it is important to select appropriate plants for conservation biocontrol. Some plants are actually repellent: *Achillea* is reported to be a good plant for syrphids, but was repellent to small Hymenoptera in this study. There is no one perfect flower for all natural enemies; we need to use a mix.

Applying theory to practice in conservation biological control: Lessons from a model system using broccoli, cabbage aphids, and predacious hoverflies — J. M. Luna, Oregon State Univ. (0775). Alyssum was one of the best flowers for attracting naturally occurring syrphids in broccoli, but this varied by species. Syrphids need specific aphid densities to start laying eggs, so adding flowers does not improve cabbage aphid biocontrol by getting the natural enemies started earlier.



Enhanced fungicide resistance in *Beauveria bassiana* through strain discovery and artificial selection — David Shapiro-Ilan, USDA-ARS, Byron, GA (D0380) Commercial preparations of the fungus may be hindered by fungicide applications, but fungicide resistance can be obtained through artificial selection. Natural levels of resistance varied significantly among strains; wild strains isolated from pecan orchards were more resistant than commercial strains.

Utilization of North American Scrophulariaceae by *Mecinus janthinus*, a classical control agent of the exotic weed Dalmatian toadflax, *Linaria dalmatica* — Rich Hansen, USDA-ARS, Bozeman (D0300). Although this stem-boring weevil will feed on the native species *Antirrhinum kelloggii*, *A. virga*, and *Maurandya antirrhiniflora* in no-choice tests, the potential risk to these plants is probably small. In choice tests only *A. virga* showed evidence of oviposition and progeny development, and at only 5% of that found on the introduced weed.

The effect of floral resources on longevity of *Gonatocerus ashmeadii* and *G. triguttatus*, parasitoids of the glassy-winged sharpshooter — Nic Irvin, UC-Riverside (D0186). Floral resources improved survival up to 95%, with buckwheat and dill as the best plant candidates for utilizing in citrus orchards and vineyards to enhance survival. Low soft scale infestations (and their honeydew) may also be beneficial for increasing longevity.

Biological control of the European corn borer by the parasitic wasp *Trichogramma ostrinae* in bell peppers — Karen Friley, Univ. of Kentucky (D0536). The wasp controlled ECB at low populations, and appears to be a promising biocontrol agent in this cropping system.

Importation of parasitoids for control of *Lygus hesperus* in California — Charles Pickett, CDFA, Sacramento (D0539). *Peristenus stygicus* and *P. digoneutis* were recovered one year after the last release in Sacramento area. The two combined resulted in up to 60% parasitism 3 years after the first releases. The wasps are not yet established at other sites.

Field release of *Tetrastichus setifer*, a parasitoid of *Lilioceris lili* — Lisa Tewksbury, Univ. of Rhode Island (D0550) and **Parasitoids of *Lilioceris lili*: Potential for biological control** — Marion Gold, Univ. of Rhode Island (D551). The wasp, which is now established in Mass., parasitized up to 67% of the beetles within 2-3 weeks of release in Boston and RI in 1999-2000. The ichneumonid *Lemophagus errabundus* — the predominant ichneumonid in European gardens where the beetle occurs (and which can be reared in the lab) — will be released in 2003.

Foreign exploration of natural enemies for the hemlock woolly adelgid in China — Gabriella Zilahi-Balogh, Virginia Polytechnic & State Univ. (D0558). Of the predators in four orders collected in two areas of China, two species of the derodontid beetle *Laricobius* are now in quarantine for evaluation as potential biocontrol candidates. *Scymnus camptodromus* was also collected.

Phorid flies in Alabama: Have fire ant populations been affected? — Lawrence Graham, Auburn Univ. (D0618). *Pseudacteon tricuspis*, released in red imported fire ant colonies in Macon Co., have been established there since May 1999. Releases of *P. curvatus* in May 2000 in Talladega Co. also established. Weather extremes (drought, cold) affected fire ant populations, but phorids caused further decline.

Augmentation of natural enemies in pepper systems for the control of thrips — Gerald Brust, Glades Crop Care, Jupiter, FL (D0649). Rows of companion sunflowers along pepper field margins increased density of *Orius* bugs. *Orius* were found primarily on the sunflowers until thrips moved into the peppers, then the *Orius* followed the thrips.

NEWSLETTER INFO

Improve This Newsletter by Submitting Articles

Submission of news items from the membership is what makes this newsletter of value to all.

Do you have a student finishing a M.S. or Ph.D.? Send in their abstract to publicize the work they've done.

Know of some biocontrol work done by your local county, state, or provincial government that will probably never be published? Submit excerpts from their report so others can hear about these success stories (or cautionary tales of biocontrol gone bad).

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
- Biocontrol position announcements
- New appointments or people moving around
- Awards or honors received by members
- Meetings or workshops related to biological control
- New publications

Items for the Summer Newsletter are due by 15 May 2003



MEETING CALENDAR

Biological Control of Tropical Weeds

March 16-28, 2003
Brisbane, Australia

This international short course, being offered by CSIRO Entomology, Queensland Dept. of Natural Resources and Mines, and The University of Queensland, aims to give participants a sound understanding of the theory of weed biological control and practical training in the procedures involved in implementing a weed biological control program. Fee for each participant is \$AUD3900, which includes tuition, lab work, field trips, course notes, meals, accommodation and transport within Queensland associated with the course.

To receive a circular about the course send a request to:

Sally Brown Conference Connections
PO Box 108
Kenmore QLD 4069
AUSTRALIA
Ph: 61 7 3201 2808
Fax 61 7 3201 2809
email <sally.brown@uq.net.au>

4th National Integrated Pest Management Symposium

April 8-10, 2003
Indianapolis, IN

One of the many symposium topics is Biological Control and Bio-based IPM for management of weeds, diseases and arthropods. For BC session content information, contact Neal VanAlfen at <nkvanalfen@ucdavis.edu>, (530) 753-1605; or Bob Nowierski at <rnowerski@reeusda.gov>, (202) 401-4900

For registration information contact Elaine Wolff at (217) 333-2881; fax (217) 333-9561; email: <wolff1@uiuc.edu> or visit the symposium website at <<http://nautilus.outreach.uiuc.edu/conted/conference.asp?ID=244>>

11th Symposium on Biological Control of Weeds

April 27 - May 02, 2003
Canberra, Australia

For more information contact:

Sharon Corey
Phone: 61-02-6246-4136
Fax: 61-02-6246-4177
email: sharon.corey@ento.csiro.au

Or visit the conference website at <<http://www.ento.csiro.au/weeds2003/index.html>>.



Biocontrol 2003: Bringing Science to Practice

April 28-30, 2003
Beziers, France

For more information contact S. Chatham, IBMA Secretariat at <Schatham@calliope-sa.com> or visit the conference website at <<http://www/ibma.ch/pdf/biocontrol2003.pdf>>.

8th International Symposium on Neuropterology

July 26-29, 2003
College Station, Texas

The three-day scientific program of the Symposium is open to all fields of research on neuropteroid insects (Neuroptera, Raphidioptera and Megaloptera), including, but not restricted to, systematics, biological control, faunistics, behavior, paleontology and general biology. Two field excursions will follow the formal scientific meetings.

To receive copies of the formal symposium announcement (containing information on fees, accommodations, field excursions, etc.) and registration materials, and to be added to the e-mailing/ mailing list to receive future announcements, please contact the symposium organizer:

Dr. John D. Oswald
Department of Entomology
Texas A&M University
College Station, TX 77843-2475
Phone: (979) 862-3507; Fax: (979) 845-6305
e-mail: j-oswald@tamu.edu

The symposium documents are available as Microsoft Word document files or pdf files, or can be mailed as hard copies (indicate your preference). The announcement and registration materials (in pdf format) are available on the symposium web site (<http://entowww.tamu.edu/research/neuropterida/isn8/index.html>).

XIII International Entomophagous Insects Workshop

July 27-31, 2003
Tucson, Arizona

Attendance for these meetings generally runs from about 100-150 participants, and consists of a single session of talks with posters in the evening, all designed for maximum interaction. Details related to travel arrangements, accommodations and registration fees will be supplied in the second announcement.

To receive more information contact:

Molly Hunter
Dept. of Entomology
University of Arizona
Tucson, Arizona 85721-0036, USA
e-mail: mhunter@ag.arizona.edu



Application For Membership
in
**INTERNATIONAL ORGANIZATION FOR BIOLOGICAL CONTROL
OF NOXIOUS ANIMALS AND PLANTS (IOBC)
NEARCTIC REGIONAL SECTION (NRS)**

Membership (check one): NEW ___ RENEWAL ___

Category of Membership:

- Individual (in Canada, U.S. or Bermuda; U.S. \$25) ___ (elsewhere, U.S. \$30) ___
Student (all locations, U.S. \$15) ___

Of these funds \$10 will be forwarded to the Global Body for each member. Members receive both Global and NRS newsletters, and publication privileges in *BioControl*.

- Individual, with subscription to *BioControl* (U.S. \$115) ___
Includes subscription fee and \$10 forwarded to Global Body
- Institutional member (U.S. \$300) ___
Includes 2 copies of Global and NRS newsletters, *BioControl*, and \$150 forwarded to Global Body
- Supporting member (U.S. \$1000) ___
Includes 2 copies of Global and NRS newsletters, *BioControl*, \$900 for support of Global organization, and \$100 to support NRS

U.S. \$ ___ enclosed for annual membership for the year 200__ (January to December)

Date: _____ Signature: _____

Name and address (please print or type):

Telephone, Telex or Cable Number and FAX: _____

E-mail address: _____

Brief description of specialty area: _____

Please add on the reverse of this form comments concerning any services or assistance that IOBC/NRS could/should provide that would be helpful to you.

Send application form and payment to:

Stefan Jaronski
Secretary-Treasurer IOBC/NRS
P.O. Box 232
Sidney, MT 59270 USA

MAKE CHECK PAYABLE TO IOBC/NRS

**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>

IOBC website: <www.iobc.agropolis.fr>

**Send items for the
Summer 2003 IOBC-NRS Newsletter
by 15 May to:**

**Susan Mahr
Department of Horticulture
University of Wisconsin
Madison WI 53706 USA
Phone (608) 265-4504
FAX (608) 262-4743
e-mail: semahr@facstaff.wisc.edu**

The International Organization for Biological Control - Nearctic Regional Section Newsletter is published 3 times a year in February, June, and October to provide information and further communication among members of the Region (Bermuda, Canada, and the United States).

**Nonprofit Org.
U.S. Postage
PAID
Permit No. 658
Madison, WI**

**University of Wisconsin
International Organization for Biological Control
Nearctic Regional Section
Department of Entomology
1630 Linden Dr.
Madison, WI 53706**