International Organization for Biological Control
Nearctic Regional Section
Organisation Internationale de Lutte Biologique
Section de la Region Néarctique

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IOBC-NRS NEWSLETTER

INSIDE THIS ISSUE:

Natural Enemies in North America: New Threats on the Landscape ?

While there is increasing recognition of the importance of beneficial natural enemies as well as pollinators in the landscape, there are also new threats to their populations and to the benefits that healthy, abundant populations provide.

The widespread planting of herbicide-resistant field crops, and the associated reduction in the diversity of flora (including genuine crop weeds) across the landscape, has eliminated many sources of pollen, nectar, alternate hosts, and other resources vital to beneficial biodiversity. Seed and soil treatments with systemic insecticides originally gained US EPA regulatory certification as reduced-risk pesticides. These pesticides are now being recognized as a potentially serious threat to beneficial predators and other non-target organisms, as explored in several papers for the ESA symposium "Ecological Considerations of the Rising Use of Systemic Insecticides" organized by Jon Lundgren and Adrianna Szczepaniec (see list of ESA biocontrol-related symposia on page 7). IPM for field crops is perhaps best described as "Insurance Pest Management" according to Michael Gray of the University of Illinois, one of the speakers at the symposium "Remember IPM? Risks and Benefits of Global Expansion of Transgenes and Insecticide Seed Treatments in Field Crops."

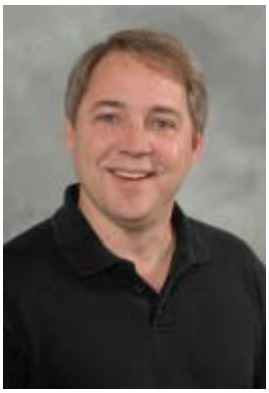
As novel technologies including RNA interference move rapidly to application and are also characterized as having reduced or even negligible risk, the question arises: Is the scientific research into non-target effects, and the corresponding regulatory requirements, keeping up with the technology or lagging behind it? Once new technologies develop into profitable products, experience has shown that it is difficult to impose restrictions, even when justified by subsequent scientific findings. The time to assess threats to beneficial organisms is now!

IOBC NRS Annual Meeting and Symposium: Risk Assessment for Classical Biocontrol

The Annual IOBC NRS Membership Meeting and Symposium will take place **Tuesday evening** at the Entomological Society of America (ESA) annual meeting in Knoxville Tennessee, in Ballroom F, 3rd Floor of the Convention Center.

Starting at 6pm, the Symposium, organized by Jian J. Duan of USDA ARS Beneficial Insect Introduction Lab in Newark, Delaware, is entitled "Risk Assessment for Natural Enemies used for Classical Arthropod Biocontrol." Proper risk assessment is vital to the continued success of this extremely productive and historically highly impactful form of biological control. Harmonization of regulation with the best available science balances the urgency with the restrictions which must accompany effective classical BC. Robert Tichenor of USDA APHIS will discuss regulatory approval, while Jian Duan, Scott Salom, and George Heimpel, will provide case studies of programs testing host specificity of candidate arthropods for introduction.

The IOBC mixer will follow the symposium. See you there!



Message From the President:
Tackling the Grand Challenges:[1] Biological Control and Land Use Change

Douglas A. Landis, IOBC NRS President, Michigan State University, *landisd@msu.edu*

Habitat loss due to land use change often grabs headlines as the number one threat to threatened and endangered species globally. While the accompanying images often show charismatic birds or mammals struggling to survive in the altered landscape, land use change impacts natural enemy communities as well. In fact, I will argue that addressing land use change may be necessary to achieving successful biological control in many ecosystems.

The big biocontrol picture

Land use change affects biological control in several ways. At the local level, changes in the target habitat itself may render it unsuitable for natural enemies to do their job, even if the overall landscape is still effectively supplying them. The most obvious examples are pesticide applications that can make target habitats temporary death zones for natural enemies while allowing pesticide-tolerant pests to increase. At the landscape level, loss of critical breeding sites, overwintering habitats, or areas for population build-up, may limit the overall capacity of the environment to support effective natural enemy populations over wide areas. Often these declines are subtle and difficult to distinguish from year-to-year, or seasonal fluctuations in natural enemy abundance. There may even be tipping points, where the effect of habitat loss is initially slight but suddenly becomes important once a threshold is passed. Biological control scientists and practitioners have been very good at identifying and modifying local impacts but far less attuned to the larger landscape conditions that may be limiting success.

Landscape effects on pest suppression have been increasingly identified in both natural and managed ecosystems. For those of you who know me, it should come as no surprise that in my parting comments as IOBC-NRS President, I encourage you all to *look outside the target habitat/ecosystem and consider how changes in the larger landscape might be affecting your results.* Doing so may require you to utilize novel techniques, engage with new colleagues and stakeholders, and perhaps even challenge your ideas about what is actually driving the system. You might even find yourself exploring creative ways to proactively influence land use patterns in ways that enhance the potential for biological control.

Finally, I want to say a big thanks to all the members and Governing Board representatives who have worked hard to make IOBC-NRS a success. I look forward to seeing you all in Knoxville!

[1]In this year's Presidents Message I have explored the role of biological control in addressing some of the grand challenges in science including food security, invasive species, and land use change.

Your New Governing Board

Election results are in for the new Governing Board for IOBC NRS FOR 2013-2014. The election results were as follows:

President-Elect: Donald Weber
Vice President: Stefan Jaronski
Secretary-Treasurer: James Harwood
Corresponding Secretary: Jana Lee
Members-at-Large (THREE): Rose Buitenhuis, James Nechols, and Cesar Rodriguez-Saona

These seven will be joined by the President (Jon Lundgren) and Past President (Doug Landis) to make up the new 9-member Governing Board.

Those of you who you voted, and there was a nice turnout, your vote very likely mattered. Amongst the Member-at-Large candidates only 2 votes separated the 3rd and 4th ranks. Thank you to all who stood for election.

RESEARCH BRIEF

Weed Management of Canada Thistle: integration of stem-mining weevils and plant competition under two levels of soil nutrients

Erin E. Burns[1,2], Deirdre A. Prischmann-Voldseth[3], Greta G. Gramig[1]

[1]North Dakota State University, Department of Plant Sciences, Fargo, ND
[2]Currently at Montana State University, Department of Plant Sciences and Plant Pathology, Bozeman, MT
[3]North Dakota State University, Department of Entomology, Fargo, ND. Deirdre.Prischmann@ndsu.edu

Canada thistle (*Cirsium arvense*) is a highly invasive perennial weed that flourishes in disturbed areas. It has a deep root system and can spread rapidly via adventitious shoots that arise from root buds. Several non-chemical management options have been investigated to combat this weed, including biological control using herbivorous insects.

One such biocontrol agent is a stem-mining weevil, *Hadroplontus litura* (adult & larvae, photo D. P-V, left), although reports of its efficacy have been mixed. We used outdoor mesocosms to investigate the effects of integrating *H. litura* and plant competition (common sunflower, *Helianthus annuus*) in two soil nutrient levels (low, high) on Canada thistle performance (i.e. vegetative and root biomass, stem height, number of side shoots and flowers).

In general, all three treatments behaved in an additive fashion, and weevil attack, plant competition, and low soil nutrients negatively impacted some aspect of Canada thistle performance. However, weevil attack did not have a significant negative impact on two important measures of Canada thistle invasiveness: root biomass and side shoot production. Our research suggests that using multiple control tactics will enhance Canada thistle suppression and that resource availability is an important factor to consider when managing this weed.

Editor's note: John Lydon was closely involved with research on biocontrol and management of Canada thistle.

Death of John Lydon, National Program Leader for USDA ARS in Weed Ecology and Biocontrol

Following is a message from USDA Agricultural Research Service Administrator Edward Knipling Jr.:

It is with great personal sadness that I inform you that our ARS colleague John Lydon passed away last night (Thursday, October 18) at the Community Regional Medical Center in Fresno, California.

As National Program Leader (NPL) for Weed Science in the Office of National Programs, John was visiting our Parlier, California, location 2 weeks ago to meet with stakeholders at an annual insect pest management research meeting when the car in which he was riding was struck by another car at a rural intersection.

John suffered massive head and internal injuries in the accident and had been under intensive care since. Joel Siegel, a Research Entomologist in Parlier, was also injured in the collision, but has since been released from the hospital though he continues to recover from his injuries.

As National Program Leader since 2009, John led ARS research initiatives involving invasive plants, herbicide resistance, and biological control. Prior to assuming his duties as NPL, John was a research scientist for the Sustainable Agricultural Systems Laboratory at the Beltsville Agricultural Research Center for many years.

John was a truly insightful and dedicated scientist, whose most recent work had shown the importance of physiological control mechanisms in plants. He was very proud of this achievement and had only recently completed an important manuscript on the work. That direct experience in science made him a realistic and respected scientific administrator at the Office of National Programs.

In a short amount of time, he had become an essential member of the ARS leadership team charting the course for plant protection research. His specialty was weeds, but he also managed the entire areawide integrated pest management program, was one of the main liaisons to the National Invasive Species Council, sat on the committee that evaluates potential biological control agents for APHIS, and helped with the scientific direction of ARS' Overseas Biological Control Laboratories.

John was a respected scientist and colleague with many friends in the Beltsville Area and throughout all of ARS. John's wife, Martina, also a member of our ARS family, works at the National Agricultural Library in Beltsville. All in ARS extend to Martina and her family our most sincere condolences on their loss.

This day we all join with his family in mourning his passing.

More information will come later as funeral and memorial arrangements are finalized.

Research Brief: Attack on the Flying Spuds

BIOLOGICAL CONTROL OF AIR POTATO

Ted Center reports ...

Dioscorea bulbifera (air potato) is an herbaceous, perennial twining vine that attains lengths of 20 m or more rendering it capable of climbing over and smothering native vegetation. Genetic analysis determined that Florida material was most likely to have originated from China. It was introduced to south Florida in 1905 by a local nurseryman, and has since attained a reputation as one of the "most aggressive weeds ever introduced". By the 1980s, air potato vines were growing in thickets, waste areas, and hedges or fencerows in many parts of Florida. By 1999, *D. bulbifera* was altering plant communities by displacing native species, changing community structure and disrupting ecological functions .

Vegetative propagation occurs primarily through aerial bulbils (hence the name "air potato") that form in leaf axils during late summer. These bulbils, which may weigh up to 1 kg, drop to the ground when the vines die back during the cooler months. Vines resprout during spring from subterranean tubers or from bulbils. Seed production rarely occurs in Florida. Spread is mainly through human dispersal of the bulbils. Besides Florida, air potato has also been reported from most of the Gulf Coast states, Puerto Rico, and Hawaii. Climate matching models suggest that *D. bulbifera* could also spread as far north as Charleston, South Carolina.

Lilioceris cheni Gressit & Kimono (left) is a rather large orange-red Asian leaf beetle (Coleoptera: Chrysomelidae) in the subfamily Criocerinae. It is a host-specific specialist that feeds and develops only on *D. bulbifera*. The USDA-ARS Invasive Plant Laboratory in Fort Lauderdale acquired this beetle from China and has begun an ambitious release program against air potato. USDA APHIS granted permission for release after extensive testing demonstrated its host fidelity with virtually no risk to other plant species.

Feeding by both adults and larvae skeletonizes the leaves (left). Larvae can often be found in aggregations on the growing tips. This damage inhibits vine elongation and may reduce the ability of the plant to climb vertical structures.

The host plant drops its leaves during the winter, forcing the adult beetles to survive several months without food, presumably in diapauses beneath debris, such as leaf litter, on the ground. The overwintered adults emerge during spring. Females initially lay about 90 eggs/d during a 13-day period of ovipositional activity.

Open releases were done beginning in March 2012 and during the ensuing summer. Extensive damage became apparent within three months with little apparent dispersal of the beetles even to adjacent areas. By autumn, however, most of the vines in release areas had been stripped of foliage, which seems to have induced local dispersal. Initial observations suggest that bulbil production has been reduced where defoliation has been prolonged and intense. Although it is a bit early to declare the beetles established, at least four sites, ranging from Miami in the south to Gainesville in the north, now seem to have persistent populations. It remains to be seen if they will survive the winter period when foliage is unavailable for sustenance.

Editor's note: *Liliocerus lilii* Scopoli is a serious introduced pest of lily plants in northeastern North America, and the target of an earlier classical biological program involving University of Rhode Island and CAB International. Interesting that the chrysomelid genus was the pest in the earlier case, and now the beneficial in Florida!

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Incoming President Announces Job Stimulus Program

Research Entomologist (Research Associate)
GS-0414-11/12 *** $57,408-$89,450 per annum

The USDA, Agricultural Research Service, Northern Central Agricultural Research Laboratory (NCARL) in Brookings, South Dakota, is seeking a Postdoctoral Research Associate for a two year appointment. A Ph.D. in entomology or a related field of study is required. The researcher will identify the benefits of flowering biofuel crops to pollinator services within the landscape and to pollinator health and community structure by describing pollinator abundance, diversity, and function within the landscape and using biochemical analyses to assess the nutrient status and health of pollinator communities. The researcher will also evaluate spillover effects by natural enemies in bioenergy crops to adjacent corn and soybean fields. Successful execution of this research requires a working knowledge of theory and experimental techniques of entomology, ecology, and plant biology, as well as general agronomic practices. Specific requirements are the understanding and experience with both molecular techniques (e.g., PCR, immunoassays) and entomological experimental methods such as laboratory and field assays. Direct experience with pollinators or predators is necessary for the successful completion of this work. A comprehensive benefits package includes paid sick leave and annual leave, life and health insurance, a savings and investment plan (401K type), and a Federal retirement plan . Refer to https://www.usajobs.gov/GetJob/ViewDetails/329297500 for further information on Postdoctoral Research Associate Jobs, for complete application instructions, and the full announcement (RA-13-002). Send application materials and references to Dr. Jonathan Lundgren, USDA/ARS, NCARL, 2923 Medary Avenue, Brookings, South Dakota, 57006, or email Jonathan.Lundgren@ars.usda.gov. ***The position is open until filled or September 30, 2013***. Citizen Restrictions Apply. **USDA/ARS is an equal opportunity employer and provider.**

Research Entomologist (Research Associate)
GS-0414-11/12 *** $57,408-$89,450 per annum

The USDA, Agricultural Research Service, Northern Central Agricultural Research Laboratory (NCARL) in Brookings, South Dakota, is seeking a Postdoctoral Research Associate for a two year appointment. A Ph.D. in entomology or a related field of study is required. The specific objectives are to: The specific objectives are to: 1) contrive and investigate sources in the environment that could harbor small, insecticidal RNAs produced by GM corn plants (these may include soil aggregates, decaying plant tissues, microbes, etc.); 2) determine the persistence of small RNAs under varying environmental conditions; 3) examine the bioactivity of small insecticidal RNAs against key non-target taxa based on their demonstrated function and relative abundance in the corn system. This series of projects will involve the use of molecular tools and partnering with other disciplines to explore known and novel ecological pathways through which small RNAs may affect food webs, research under field and laboratory conditions, and the ability to conduct laboratory toxicity assays involving arthropods. Successful execution of this research requires a working knowledge of theory and experimental techniques of entomology, plant biology and genetics, as well as general agronomic practices. Specific requirements are the understanding and experience with both molecular techniques (e.g., PCR) and entomological experimental methods such as laboratory and field assays. A comprehensive benefits package includes paid sick leave and annual leave, life and health insurance, a savings and investment plan (401K type), and a Federal retirement plan. Send application materials and references to Dr. Jonathan Lundgren, USDA/ARS, NCARL, 2923 Medary Avenue, Brookings, South Dakota, 57006, or email Jonathan.Lundgren@ars.usda.gov. ***The position is open until filled or September 30, 2013***. Citizen Restrictions Apply. **USDA/ARS is an equal opportunity employer and provider.**

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MORE JOBS, PAGE 6

... More Jobs in Biological Control

Post-Doctoral Position in Population Ecology and Biological Control of Hemlock Woolly Adelgid. University of Massachusetts, Amherst.

Post-doc will lead research project aimed at understanding adelgid population growth and survival in the presence and absence of *Laricobius nigrinus*, a predatory beetle established at various sites in eastern United States as part of a biological control effort against the adelgid. Requirements: PhD in Entomology, Ecology or related field. Applicants should have strong background in population dynamics and statistics along with some familiarity with DNA biotyping techniques. Post-doc will be expected to work with cooperators in several states on the biological control of this system . Salary competitive and depends on experience. Please e-mail application letter along with CV and names of three professional references to Joe Elkinton: elkinton@ent.umass.edu . Contact him and visit his web site http://elkintonlab.wordpress.com/ for more information. Mailing address: Dept of Environmental Conservation, Holdsworth Hall, University of Massachusetts Amherst, MA, 01003.

Two graduate student positions are available at the Department of Entomology, University of Manitoba.

1- **Soybean aphid control by natural enemies in Manitoba**: The candidate will study for the first time the natural enemies of soybean aphids in Manitoba, establish their sources in the agricultural landscape and their potential for dispersion across different habitats (M.Sc. level).

2- **Landscape scale role of multiple predator assemblages and bottom-up controls**: The candidate will compare the relative strength of top-down and bottom-up control in agricultural landscapes that vary in structural and functional components (Ph. D. level).

For more information
contact Alejandro Costamagna,
Ale_Costamagna@umanitoba.ca

Biocontrol Musing: Unexpected outcomes of herbivory

Beginning in the 1980's a number of cases of overcompensation' have been reported in plants – these are cases in which plant reproductive success is improved by herbivory. The most famous case is scarlet gilia, which produces 2.4 times as many seeds when browsed by elk as when it is left alone. Patterns such as these have sparked controversy in the ecological literature but have not been well-documented for herbivores of crop plants. That is, until a recent report of overcompensation in potatoes attacked by the Guatamelan potato tuber moth, *Tecia solanivora*, in Colombia. In the study, the larvae of *T. solanivora* burrowed and fed within tubers and this represented real damage, but the total number of undamaged tubers produced by infested plants exceeded those of uninfested plants as long as less than half of the tubers were infested. Plants from which 10% or fewer of the tubers were damaged produced a yield of undamaged potatoes that is 2.5 times higher than the yield of undamaged potatoes. A discussion of the potential mechanisms that could lead to this unexpected result is beyond the scope of this column, but the comment that I would like to make is that this case and others like it from the ecological literature can have important

implications for both weed and arthropod biological control. For weed biological control, this case study illustrates the risk that weed biological control may face tolerance and even overcompensation in the field – potentially exacerbating weed problems. This risk is not unknown to biological control scientists and it is related to cases when weed biological control agents release target weeds from intraspecific competition. For insect biological control, it brings up the somewhat troubling possibility that our biological control agents may be suppressing a beneficial 'pest' insect! The overall message is that the possibility of plant tolerance and overcompensation can add complexity to biological control interactions, and it behooves us to keep this in mind.

George Heimpel
University of Minnesota

Photos Poveda (L) & Kessler (R)
from Cornell University
Chronical Online 25 May 2010

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

Send items for the IOBC-NRS Newsletter to:

Newsletter Editor, Jana Lee

Horticultural Crops Research Unit

USDA-ARS, 3420 NW Orchard Avenue

Corvallis, OR 97330 USA

E-mail: Jana.Lee@ars.usda.gov

Clic ici ! → **IOBC NRS Website Calendar of Biocontrol Meetings & Events 2012-2013**

Newly-announced Meetings 2013

12th International Symposium "Ecology of Aphidophaga"

will be held in Belgrade, Serbia 9-13 September 2013, reports JP Michaud.

The meeting continues a series of symposia which began with one organized by Prof. Ivo Hodek (Institute of Entomology, Czech Academy of Sciences) in the former Czechoslovakia in 1965. Ever since, Aphidophaga meetings have offered a unique international forum for discussions of ecological and behavioural interactions among aphid natural enemies and their prey populations.

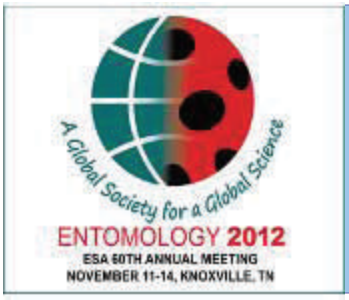
Recently, climatic changes are leading to regional changes in the pest status of some aphid species and the appearance of others as newly invasive pests. Aphid predators, parasitoids and pathogens are increasingly regarded as valuable groups for biological control of aphids, whether invasive or otherwise. Widespread resistance of aphids to insecticides, coupled with increasing public appreciation of the generally negative health and environmental impacts of these materials, continues to drive interest in aphid biological control research. These efforts, in turn, hinge on advancing research into fundamental aspects of the biology and ecology of aphid natural enemies in both natural and managed agricultural landscapes.

More info including the first circular can be found at http://aphidophaga12.bio.bg.ac.rs/

Jacques Brodeur reports that the Third International Entomophagous Insects Conference will be held in Orford, Québec, Canada, from 3-6 June 2013. The venue of the conference is the Hotel Chéribourg, a resort nestled at the bottom of the majestic Mount Orford and only minutes from Magog. This hotel is located in the scenic Eastern Townships, 125 km east of Montreal.

This conference represents a merging of two previous workshops: the International Entomophagous Insects Workshop held in North America and the European Parasitoid Workshop. Our first meeting took place in Minneapolis, Minnesota, in 2009, followed by a second one in Antibes, France, in 2011.

Details on registration fees, hotel reservation, ground transportation and abstract submission will be made available very soon by the co-organizers, Guy Boivin, guy.boivin@agr.gc.ca, and Jacques Brodeur, jacques.brodeur@umontreal.ca .



Biological Control: Symposia at 2012 ESA Meetings

***** Ctrl-Click on any title to see details of that Symposium *****

Editor's note: I realize there are many other presentations and posters addressing biological control topics and research. This list is just to make sure you don't miss out on whole symposia of interest. See you Tuesday night at the IOBC meeting & symposium!

Sunday morning, November 11:

Persistence of Microbial Control Agents: Current Challenges, Recent Advancements and Future Needs.
Organizer: Denny Bruck

Sunday afternoon:

Holistic Pest Management: Realistic Integration of Biological, Chemical, and Cultural Strategies in Horticultural Production Systems. Randy Martin and Raymond A. Cloyd

Linkages Between Climate Change And Global Insect Pestilence: From Theory To Practice
Aaron S. Weed, Lauren E. Culler, Tobin Northfield and Sanford D. Eigenbrode

Tuesday afternoon: November 13:

Biology and Management of Hemlock Woolly Adelgid in North America (Part 2)
Albert E. Mayfield and Shimat V. Joseph

Tuesday Evening, 6:00 to 8:15 PM (mixer follows)

IOBC Symposium: Risk Assessment for Natural Enemies used for Classical Arthropod Biocontrol: From Regulatory Requirements to Science-Based Approaches
(Organizer: Jian J. Duan) ***see page 1 for details !***

Wednesday morning, November 14:

Ecological Considerations of the Rising Use of Systemic Insecticides
Jonathan Lundgren, Adrianna Szczepaniec, Kevin Floate, David Goulson, S. J. Castle, Maggie Douglas, Daniel A. Herms, David J. Hawthorne, John F. Tooker and Nilima Prabhaker

Ecological and Evolutionary Origins of Insect Pests in Agriculture: The Role of Crop Domestication and Global Crop Translocation. Yolanda H. Chen, Raul F. Medina and Raul F. Medina

Wednesday afternoon:

Improving the Safety and Effectiveness of Biological Control Agents of Weeds in the USA
Lincoln Smith and James P. Cuda

Remember IPM? Risks & Benefits of Global Expansion of Transgenes & Insecticide Seed Treatments in Field Crops
Arthur W. Schaafsma, Christian H. Krupke and John F. Tooker

***IOBC NRS Advocates for Scientific Travel*: On July 13, President Doug Landis addressed a letter to USDA Secretary Thomas Vilsack, pointing out that travel to IOBC, Entomological Society, and other professional meetings was not wasteful but rather, that "participation at scientific and technical conferences by USDA scientists and researchers [is essential] to the advancement of agricultural science and the USDA mission."**