

# FRASS

**INSECT REARING NEWSLETTER**

Volume 19, number 1 (1996)

Welcome again to the **FRASS Insect Rearing Newsletter**, a forum for anyone interested in, involved in, or in any way associated with insect rearing. I admit that I am a little late with this issue; I had to search for submissions. Please keep those submissions coming, and I will keep producing the **FRASS** Newsletter you want to see.

Please feel free to call, write, fax, or E-mail items you wish to have included. Reach me at:

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The editor reserves the right to edit any submission sent to **FRASS**, but will make the utmost effort to keep everyone's submissions just as they are sent.

Norm Leppia, USDA, APHIS, NBCI, sent this article on the beginnings of **FRASS**:

## **FRASS --**

### **FROM WHERE DID IT COME?**

"FRASS, our Insect Rearing Newsletter, and the International Arthropod Rearing Group (IARG) its supports have become established global technologies for advancing the reliable and low-cost production, and use, of high quality insects and other arthropods. The initial group coalesced and the name FRASS was proposed one evening during the week of September 24-29, 1974, at Gainesville, Florida. Several of us gathered at a hotel near the University of Florida campus to unwind after a long day of attending the "Workshop on the Genetics of Insect Behavior" sponsored by the United States Department of Agriculture, Agricultural Research Service (ARS). The premise of the workshop was, "The use of mass-reared sterile or genetically altered pests for the management of populations of their own species and the use of programmed releases of predators and parasites are highly desirable approaches to

managing pest populations." However, we had been saturated with a theme based more on poor organization and execution of insect mass rearing programs than on biology, "Efforts to exploit these desirable approaches to managing pests will continue to be frustrated in large measure unless we can develop the information and technology needed to assure the adequacy of behavior of mass-reared insects when released in the field." The workshop was full of jargon, such as "**deterioration** in the performance of colonized insects," "**detrimental** alterations in genetic and behavioral composition," and "development of plans for **dealing with the problem**." The implication was that insect rearing had become a barrier to implementing sterile insect technique (SIT) and widespread use of natural enemies."

"Looking back more than 20 years, the gathering that evening was historic. It changed the course of large-scale insect rearing and the dependent pest management technologies because there was a clear impetus to make progress, the technological capability existed, resources were provided, and several of the participants were willing to dedicate their professional lives to the challenge. Scientists who actually reared insects were present and committed to providing the necessary

leadership and energy for establishing insect rearing as a scientific discipline. Dave Akey went on to establish our annual Formal Symposium on Insect Rearing at the Entomological Society of America (ESA) national meeting; Tom Ashley is Production Manager of the Screwworm Mass Rearing Facility at Tuxtla Gutierrez, Mexico, the most successful sterile insect rearing program ever conducted; Alan Bartlett established the principles of sampling and colonization for insect rearing; Bob Bell led the development of gypsy moth mass production; Bill Dickerson was the first leader of the IARG; Pat Greany pioneered the development of artificial diets for predators and ectoparasitoids; Derrell Chambers, along with Ernst Boller, established the International Organization for Biological Control, Working Group on Quality Control of Mass-Reared Arthropods; Milt Huettel contributed the concept of genetic bottlenecks in insect colonization and production; Ed King developed and successfully tested several mass-rearing systems for SIT and augmentation biological control and served as leader of our group; Dial Martin was a mentor to all of us; Ray Moore served for years as the ARS Technical Coordinator for Insect Rearing and chaired our first USDA national meeting on insect rearing at Atlanta in 1980; Tom O'Dell researched every aspect

of gypsy moth rearing, including nutrition and natural enemy production, and also served as IARG leader; Jim Whitten provided research direction for screwworm colonization; and Dave Wilson managed production of screwworm during some of its early years. I concentrated on scientific support for insect mass rearing systems and documentation of our contributions to pest management, including the first few issues of FRASS beginning in January 1975."

"Imagine what it was like in 1975 to network by means of letters and the telephone in the absence of facsimile machines or computers and with photocopiers, to attempt insect rearing in inadequate facilities, to have personnel because they were not needed for more important work, to have no easily accessible sources or inventories of insect colonies, to be without books on insect rearing, to have little knowledge of effective sanitation practices, to not have reliable sources of ingredients for insect diets or rearing containers, to be without a directory of rearing personnel, to have no standards of quality and little confidence in laboratory insects within the research and operational pest control communities, and to have virtually no help from other scientific disciplines, such as genetics and engineering. It was a time when scientific meetings

were rarely attended by insect rearing personnel and most of us knew each other for years, having met once or twice if at all. We were ready and anxious to come together as a group, but what could we call ourselves and what would we name our newsletter?"

"Reflecting on that evening in Gainesville, I recall lasting friendships, happy reunions and a sense of camaraderie. We were filled with the typical zeal of young, ambitious scientists with a cause and the means to make progress. Within this mix was a more seasoned veteran, Ray Patana, from the ARS Cotton Insects Biological Control Laboratory at Tucson, Arizona. I was privileged to become acquainted with Ray, few had that opportunity, when he provided pink bollworm larvae for my Ph. D. research at the University of Arizona. I would arrive at his insectary early in the morning on my way to campus and usually find him testing some new idea for rearing insects. This was his passion, although he is not well-known because he rarely published his results. He would make "jellyrolls," laminated strips of diet and waxed paper rolled and placed in 1-gallon ice cream cartons or "diet flakes," dried diet popped free from the underlying substrate. He would construct adult cages, pupal separators and other "machines" for semi-automating insect rearing operations. I always looked

forward to his latest creation. Well, it was this spirit of inventiveness, but not taking things too seriously, that Ray blurted out that evening, "Let's call our newsletter FRASS." Everyone laughed and gave it little thought at the time but the idea stuck and FRASS it is. I am sure that the idea came from nowhere but Ray's fertile imagination."

"All of the early documents and correspondence associated with the history of FRASS and the IARG are in my files, and I would be pleased to share them with anyone who has an interest. We have had a fascinating evolution and have helped to spawn many allied enterprises. Recently, for example, we were contacted by Karel Bulckmans on behalf of the International Biocontrol Management Association in Europe. They are using some of our founding principles in developing their organization. We have permeated ESA, IOBC, and the International Fruit Fly Working Group, among others, and have conducted countless reviews to assist in improving large-scale insect rearing programs. Among the most interesting and little known activities of the group has been training for laboratories that test chemical and biological pest management products in the private sector. As Dick Baranowski wrote immediately after receiving his first issue of FRASS, we certainly have a

proclivity for disseminating this stuff!"

### **A DIFFERENT SORT OF REARING**

We so often think of insect rearing as something done in a laboratory, under controlled conditions; but given the precarious state of our environment, there is another rearing personnel often overlooked who can use our help -- *Mother Nature*! The following article illustrates what can be done if we all become active in rearing insects with *Mother Nature*, and would be a perfect addendum to Gary Bernon's Symposium on the "*International Insect*", mentioned later in this issue.

"Which species are thriving, and which are at the brink of extinction? Answering these questions is crucial for targeting conservation efforts towards species and ecosystems in greatest need. Those species in the most precarious condition can receive the conservation and research attention necessary to assure their survival. Of 109 species of U. S. Tiger Beetles, 5 are imperiled, 2 are vulnerable, and 15 rate an 'apparently secure'" *from Priorities for Conservation: 1996 Annual Report Card for U. S. Plant and Animal Species.*

### **Saving the Tiger ... Beetles?**

Notes on Recent Tiger Beetle  
(Coleoptera: Cicindelidae)  
Conservation Efforts at the  
Connecticut River, by  
Jason R. Cryan  
Department of Entomology  
North Carolina State University  
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"Of the literally hundreds of plant and animal species found at or near the Connecticut River, an estimated 30 are known to be endangered. Of entomological note among these threatened taxa are two species of tiger beetles (Coleoptera: Cicindelidae): the cobblestone tiger beetle, *Cicindela marginipennis* and the puritan tiger beetle, *C. puritana*. Extraordinary conservation efforts have been undertaken to preserve these diminutive predators, in part because of the potential use of tiger beetles as indicator organisms of habitat quality."

"The cobblestone tiger beetle inhabits pebble beaches maintained by the free-flowing waters of the Connecticut River. As most of the Connecticut's free-flowing waters have been eliminated, so has most of the tiger beetles' habitat. Indeed, a total of only 20 populations are known to remain in existence, five of which are located in a ten-mile stretch of the Connecticut River between southern Vermont and southern New Hampshire.

Although not included on the United States Endangered Species List, the cobblestone tiger beetle has not only become Vermont's first officially protected insect, but also the stretch of river where *C. marginipennis* is found has been included in the Connecticut River Protection Program initiated by the Nature Conservancy in the 1980's; it is now unlawful to kill or remove the beetle from its natural habitat."

"The puritan tiger beetle is one of the two cicindelid species on the US Endangered Species List. Populations of *C. puritana* are found both along the Connecticut River (recorded from Vermont, Massachusetts, and Connecticut) and around the Chesapeake Bay area. Extensive molecular analyses of the mitochondrial DNA have led to a phylogenetic reconstruction of this species that indicate the Connecticut River populations are genetically distinct from the Chesapeake Bay populations. Most conservationists agree that protection efforts should be extended to so-called 'evolutionary significant units' (ESU's); thus, for purposes of conservation, the Connecticut River populations of the puritan tiger beetle should be considered evolutionarily distinct."

"The conservation efforts of the Connecticut River Protection Program have become a model for other wildland preservation projects. One important aspect of this program is that it involves

ecosystems that cross political boundaries. However, to threatened animals such as these tiger beetle species, political boundaries are meaningless."

#### REFERENCES:

- Tanner, O. 1988. Of tiger beetles and wedge mussels: protecting Connecticut River's riches. *The Nature Conservancy Magazine* 38(5): 4-11.
- Vogler, A. P., C. P. Knisley, S. B. Glueck, J. M. Hill, and R. DeSalle. 1993. Using molecular and ecological data to diagnose endangered populations of the puritan tiger beetle, *Cicidela puritana*. *Molecular Ecology* 2: 375-388.
- Stein, B. A. and R. M. Chipley. 1996. Priorities for Conservation. *1996 Annual Report Card for U. S. Plant and Animal Species*. The Nature Conservancy, Arlington, VA.

Karel Bolckmans of Biobest Biological Systems wishes to relate that Biobest is the second largest producer of beneficial insects for biological control in greenhouses and the world's first and largest producer of bumble bees for pollination of greenhouse crops (> 100,000 colonies per year). Karel is setting up the IBMA, or International Biocontrol Manufacturers Association, with offices in Paris, and hopes to establish a newsletter similar to FRASS.

If you are interested, or can offer Karel any help, please give Biobest a call, at:

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#### **\*\*Editor's Special Request\*\***

#### **SHOW OFF YOUR KNOWLEDGE**

#### **Help with LINNAEAN GAMES**

Once again, all you trivia scholars, do I offer you a chance to demonstrate your superior knowledge. Think up a good "College Bowl" type question, along with the correct answer, and submit it to **FRASS**, using any of the addresses I have listed on p. 1 (**E-mail is great if you so choose**). I will keep a file of all questions submitted, and pass them along to the chairman. Thanks in advance for your assistance -- thinking up questions to keep ahead of today's graduate students is a worthy challenge!

## FRASS BOOK REVIEW

This second edition of reviews on insect books for **FRASS** is once again by Beth Dickerson. Beth is a second-generation *Insect Rearing Specialist*, getting her start from her father Bill Dickerson, mentioned by Norm Leppla in his **FRASS** history lesson. Thus, Beth becomes the first-known second generation **FRASS** author!

***Itsy Bitsy Bug Book***, by Jacob Hoefnagel, is a small leaf-shaped book with illustrations from the Boston Museum of Arts' Hoefnagel collection. 16 insects can be found in the exquisite pictures; but others are small and harder to find. A magnifying glass is attached to the book to help small eyes find the insects and get a careful look at them. The text is brief, and includes excerpts from childrens' author Joan Walsh Anglund, words to "*The Itsy Bitsy Spider*", and more. This book is for children as young as two or three; but would be a great gift for anyone who would appreciate Hoefnagel's beautiful and incredibly accurate drawings.

***Two Bad Ants***, by Chris Van Allsburg (popular author of childrens' books, such as *The Polar Express* – editor's note: *I still can hear the bell*), is the story of two ants who abandon the ant world for a sugar bowl and discover the dangers of the kitchen. The story is told and, most outstandingly, the pictures are drawn from the ants' point of view: a bit of lawn is a "dark forest", the side of a house is a "mountain", and a spoon in a cup of coffee creates "crushing waves". In the end, the two ants realize they belong back in the ant world, but the reader will want to look back at Van Allsburg's incredible pictures of the ants' expedition.

***Insects***, by Joni Phelps Hunt; ***Mysteries & Marvels of Insect Life***, by Dr. Jennifer Owen; and ***The Ultimate Bug Sticker Book***, by Esther Labi; are all designed to grab the attention of anyone who picks them up. These three books have large, bright pictures (stickers in *The Ultimate Bug Sticker Book*) coupled with attention-grabbing captions and questions. The close-up, colorful pictures of the insects get the reader's attention and draw them into the informative and entertaining text.

***Bugs That Go Blam! and Other Creepy-Crawler Trivia***, by Barbara Seuling, is a collection of facts designed to grab interest and keep the reader combing through it. The book's facts are divided into insect orders and the book is filled with comical black and white cartoons.

***Butterflies and Moths: How to watch and understand the world of butterflies and moths***, by John Feltwell, is a book for a reader who has begun to show some interest in the subject. The pages are filled with colorful pictures, facts, and activities to involve and excite.

Finally, *Kids & Things (mail order) Catalog*, by Demco, is offering several book sets and videos. *The Very Hungry Caterpillar*, *The Grouchy Ladybug*; and *The Very Busy Spider*, all by Eric Carle; are all available with a puppet of the book's main character. Also, *Two Bad Ants* is offered with either one or two ant puppets. The videos offered are *See How They Grow: Insects and Spiders*, and *Insect*, from the Eyewitness Video series.

#### REFERENCES:

- Boston Museum of Art. *Itsy Bitsy Bug Book*, Jacob Hoefnagel. Boston: Boston Museum of Arts Press, 1995.
- Feltwell, John. *Butterflies and Moths: How to watch and understand the world of butterflies and moths*. New York: Dorling Kindersley, 1993.
- Hunt, Joni Phelps. *Insects*. ed. Viki Leon. Close-up: A Focus On Nature. Parsippany, NJ: Silver Burdett, 1995.
- Labi, Esther. *The Ultimate Bug Sticker Book*. New York: Dorling Kindersley, 1994.
- Owen, Dr. Jennifer. *Mysteries & Marvels of Insect Life*. ed. Rick Morris. London: Usborne Publishing, 1989.
- Seuling, Barbara. *Bugs That Go Blam! and Other Creepy-Crawler Trivia*. St. Petersburg, FL: Willowisp Press, 1995.
- Van Allsburg, Chris. *Two Bad Ants*. Boston: Houghton Mifflin, 1988.
- Demco's Kids & Things Catalogue*. P. O. Box 7488, Madison, WI 53707-7488; 1-800-356-1200.



## UPCOMING EVENTS

**XX International Congress of  
Entomology  
Florence, ITALY  
August 25 - 31, 1996**

I will not be making this one!

**E. S. A. Annual Meeting  
Louisville, KY  
The Galt House  
December 8 - 12, 1996**

I hope to see you there! While you are there, please plan to attend the **Formal Conference on Insect Rearing**; whose program is listed here.

### **Innovations in Science and Technology for Insect Mass-Rearing**

Introduction: K. Bloem, Codling Moth Sterile Insect Release Program, Box 1080, Osoyoos, B. C., Canada V0H 1V0; phone: (604) 495-2555, FAX: (604) 495-6439; e-mail: OKSIR@ftcnet.com

Mass-Rearing Pink Bollworm: The Benefits and New Problems Inherited with the Implementation of New Technology. E. Miller, USDA-APHIS-PPQ, PBWRF, 4125 E. Broadway Rd., Phoenix, AZ 85040  
phone: (602) 379-4485; FAX: (602) 379-4794

Maximizing Facility Production and Field Performance: The Use of Diapause in Codling Moth Mass-Rearing. S. Bloem, A. Knight, and C. Calkins, USDA-ARS, 5230 Konnowac Pass Rd., Wapato, WA 98951  
PHONE: (604) 494-7711; fax: (604) 494-0755

Improvements in the Automation of Tsetse Fly Mass-Rearing. E. Opiyo, D. Nadel, and D. Lugar, Entomology Unit, IAEA Laboratories, A-2444 Seibersdorf, Austria  
phone: + 43-1-2060-28402; FAX: + 43-1-2060-28447

New Techniques in Screwworm Transportation and Release. T. Ashley, USDA-APHIS-IS, Screwworm Eradication Program, Box 3149, Laredo, TX 78044; phone: + 52-961-414-33; FAX: + 52-961-414-34

The Application of Genetic Sexing to Medfly Mass-Rearing -- From Laboratory Concerns to Field Results. P. Rendon, USDA-APHIS-PPQ, Guatemala Medfly Station, US Embassy/APHIS, Unit 3319, APO AA 34024  
phone: + 502-2-318543; FAX: + 502-2-348260

Business Meeting. T. Ashley.

Also, Gary Bernon has been coordinating a Formal Conference on International Affairs, with a theme of "*the international insect*"; based on the idea that insects are no respecters of political borders and their importance must be viewed in a different way. As of March, Gary had ten speakers lined up, as follows:

- A. Cameron: international projects involving pests & potential beneficials.
- B. Wallner: Gypsy Moth -- global perspective, with special reference to Asian or Russian strain.
- K. Shields: Hemlock Woolly Adelgid -- new pest to North America & future biocontrol.
- R. McDonald: Japanese Beetle -- global perspective.
- M. Hoddle: New Zealand weed biological control -- global implications.
- D. Lance: Mediterranean Fruit Fly -- global perspective.
- A. Showler: Locust -- global perspective
- Bruce Gill: Dung Beetle community -- global perspective.
- A. Schroeder: Armyworm -- pending
- D. Janzen: the entomological half of Costa Rica's Biodiversity Inventory, the world's first biodiversity moonshot.

No further details are available at present, but be sure to watch for this in your ESA program.

Ron Wheeler is still the person to contact about updating your address. Please contact him at:

**Dr. Ron Wheeler, Manager**  
**Pan-Pacific Research Center**  
**The Solaris Group**  
**27201 Cool Water Ranch Road**  
**Valley Center, CA 92082**

Ron really makes the editor's life easier by agreeing to keep up with, and printing on self-stick labels, the **FRASS** mailing list. If you respond, be sure to say "*thanks, Ron*".

**FRASS Newsletter** is a cooperative effort among the members of the Insect Rearing Group designed to provide a vehicle for communication among individuals involved in all aspects of insect rearing. **PLEASE PARTICIPATE** by sending editorial comments, short papers on rearing techniques, information requests, requests for starter colonies, your source list for supplies, items for sale or trade, announcements, appropriate meeting dates, and other related newsworthy items. Items may be edited as needed, but the editor promises to be as kind as possible!.

\*\*\*This issue of **FRASS** is brought to you by **Rhone-Poulenc AG Company**; editor **J. W. Smith**:

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(and a special thanks to maintaining **FRASS**'s mailing list):

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