



# FRASS

## INSECT REARING NEWSLETTER

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March 8, 1978

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The newsletter FRASS continues to be a success. Objectives as outlined in the original newsletter (1975) have been accomplished. Individuals interested in insect rearing and receiving FRASS have been identified (531). These individuals are located throughout the U.S. and 24 other countries. We have developed cooperation, shared resources, exchanged information, and shared our mutual concern for the future of insect rearing.

### Publication of Insect Rearing Papers

A major issue in 1977, particularly among entomologists involved in rearing insects in the U.S., was publication of papers on insect rearing in the Entomological Society of America (E.S.A.) journals. Their policy the last few years has been to not publish these papers.

The push for resolving this apparent paradox was spearheaded by Norman C. Leppa and heartily backed by contributors to the FRASS newsletter. A survey conducted in the July 1977 issue of FRASS indicated that most respondents (50%) preferred to publish in a section of one or more existing journals rather than create a new one. Subsequently, Norm met with the Special Council on Publications at the 1977 E.S.A. National Meeting held in Washington, D.C. and our case for equal recognition was presented.

The council unanimously recommended establishment of a section "Entomological Techniques" in the *Journal of Economic Entomology*, *Annals of E.S.A.*, and *Environmental Entomology*. A resolution to this effect was unanimously approved by the E.S.A. governing board. Norm will report more complete results of this action in the next E.S.A. Bulletin as part of a paper entitled "Publication of Entomological Techniques."

The above action means that manuscripts emphasizing techniques will be accepted as regular articles refereed by specialists, and assigned to journals according to established topics.

### Insect Rearing Conference

The 1977 Informal Conference on Insect Rearing was held at the E.S.A. National Meeting in Washington, D.C. and chaired by the 1977 editor of FRASS--Tom O'Dell. Approximately 50 people attended the 2-1/2 hour session. Topics dealt with in the conference included (1) publication and communication of insect colonization techniques, (2) quality control in insect rearing procedures, materials and the product--insects, (3) updating the insect rearing materials, arthropod culture, and participant list, (4) career opportunities in insect rearing, and (5) the future of FRASS.

### Quality Control

Quality control in insectary-produced insects continues to be of concern and there is interest in a workshop to discuss what has been done, what is being done, and what needs to be done, etc. Tom O'Dell wrote the following relative to this subject:

"In 1974, a workshop on the genetics of insect behavior was held in Gainesville, Florida. The participants identified many deficiencies of present colonization techniques and made recommendations for improving them relative to the production of high quality (improved performance) insects. In the three years since the Gainesville workshop, significant changes have been made in colonization techniques: Stock selection and breeding techniques have been improved; dietary requirements have been investigated; environmental factors have been given more consideration; and the physical and chemical factors which effect behavior have been studied and included as normal protocol in colonization procedures.

"Unfortunately, the progress made since the 1974 meeting remains, for the most part, isolated within individual research and/or rearing facilities. To prevent the attendant duplication and inefficiency that stems from lack of communication, and to stimulate further research and development of protocols for assessing the behavioral and physiological performance of insects, efforts have been initiated to convene a 1978 workshop on the quality of colonized insects.

"Some of the lines of research proposed by the 1974 workshop report are listed below. We would hope that many of these would be addressed at the next workshop. There are certainly other areas that command attention and your suggestions are requested! We need your support and participation."

- (a) Fluctuating temperature, humidity, and diurnal light patterns should be evaluated as factors which tend to maintain or increase heterozygosity and vigor of laboratory strains. These environmental factors could either be programmed or they could be driven to simulate field conditions by signals from sensors located in the natural environment.
- (b) The feasibility of using behavioral parameters of wild insects as standards for measuring performance of laboratory reared insects should be evaluated.
- (c) When new laboratory colonies of insects are established, as many wild insects from as wide a range of ecological niches as possible should be collected. The heterogeneity of such broadly based colonies might be compared to that of colonies derived from a narrow ecological base.
- (d) The advantages and costs of rearing several colonies of a species and releasing hybrids should be compared to that of a program of infusing wild germplasm into a laboratory strain and to that of frequent strain replacement.

- (e) The use of stress tests, measurements of activity, measurement of microbial load, etc., should be evaluated as possible clinical tests of quality.
- (f) The behavioral traits of wild populations which can profoundly influence a population management program should be identified for species that are candidates for such programs.
- (g) Direct methods for observing reproductive behavior in the field have been developed for Heliothis and such methods should be developed for pink bollworm, codling moths, gypsy moth, medflies, and other important species.
- (h) The influence of various physical and chemical factors in conditioning the behavior of released insects should be evaluated. For example kairomones may be useful in managing the behavior of released predators and parasites. Factors such as holding conditions and time of release should be evaluated for their influence on the post-release behavior of important species such as the boll weevil and pink bollworm.

#### Arthropod Culture List

FRASS has been asked by Dr. P. L. Adkisson, Chairman of the National Research Council's Committee on the Biologies of Pest Species, to develop and publish a source manual listing important pest species that can be easily reared in the laboratory. These arthropods could serve as model organisms for basic research studies. Those at the E.S.A. conference felt that this was a worthwhile task for FRASS and that this list could be developed. Also, the arthropod culture list developed in 1975 and 1976 needed updating. A form has been developed that hopefully will increase the value of this list and is attached as Appendix Item 1. Note that information is requested on arthropods; thus entomophagous arthropods would be included.

Mr. Bill Dickerson is coordinating development of the arthropod culture list and you can either mail your information to him or to me with the other information requested.

#### Insect Rearing Materials List

Responses from recipients of previous FRASS newsletters have repeatedly commented on the usefulness of the materials list. This list is in need of immediate updating. Thus, when you respond to questions in the Appendices please take the time to list your 1977 purchases of common insect rearing supplies. This list should include the common name, trade name, source and cost per unit for each item. I will consolidate this list and publish it in the next FRASS newsletter.

### Participant List

We have attempted to make the present list current so no one desiring a FRASS newsletter would be left out. However, there is a need to determine if all individuals listed still desire to continue receiving FRASS; costs for producing and mailing out the newsletter have increased proportionally with size of the distribution list. Thus, we have prepared a form for you to fill out, sign, and return to me, if you want to continue receiving FRASS (Appendix, Item 2).

### Career Opportunities

Discussion at the E.S.A. conference included training (on the job and academic), pay scales, job ceilings, and ways of increasing recognition of insect colonization as a scientific profession. It became apparent that there was considerable variance among rearing personnel in training, sophistication of rearing task, and pay scale. It was agreed that management generally does not recognize what all is entailed in the consistent production of high quality insects and this has often resulted in a downgrading of these positions. Consequently, we involved in insect rearing must often change positions or areas of research to continue advancement. In any event, FRASS will continue to advertise positions available and wanted relative to insect rearing, as they occur.

### Future of FRASS

By popular demand FRASS will stay as it is. However, there are those, including myself, who would prefer that the participant mailing list be called something other than the "FRASS list." Several have proposed the name "Insect Colonization Society"--others have preferred the word "Group" over "Society." In any event a list of proposed names is presented in the Appendix, Item 3 and you can check your preference. Please return this information at the same time as the other.

### Insect Zoos

Insect zoos seem to be an expanding area of interest and obviously important to insect colonization and public interest in insects (other than swatting and stamping on them). Gerry S. Wegner at Ohio State University submitted an article entitled "Insectaria of the World's Zoos" and I have summarized it:

There are seven zoos in Europe and Japan that are well known for their insectaria. These include the Amsterdam Zoological Gardens, the virarium of the Jardin des Plants in Paris, the London Zoo, the West Berlin Zoological Gardens, the Cologne Zoo, the Exotarium of the Frankfurt Zoological Gardens, and in Tokyo, Japan, the Lama Zoological Park and the Tashima-en Insectarium. The Hall of Arthropods at the National Museum of Natural History of the Smithsonian Institution in Washington, D.C. presently has the only noteworthy public insectarium in the U.S., but one is under construction at the Cincinnati Zoo.

These insectaria provide a place where the public can observe many of the interesting and valuable roles of insects and their relatives; in addition, it is a place for breeding and exhibiting exotic and native insect species that could not otherwise be appreciated by the general public because of the danger of increased colonization. A commonality between these insectaria is that they all require the ability to maintain and propagate arthropods.

#### Past and Future Newsletters

Tom O'Dell wrote that he thanked all those who participated in the E.S.A. conference and wished us the best for 1978. We plan to have one more newsletter during 1978--probably August. This issue will include the updated materials and participant list and the preferred name for our "aggregation." However, the Arthropod Culture list may not be completed by that time and in that case will be circulated separately. Also, I would like to continue to distribute interesting rearing facts and new publications. If you have anything to contribute here, please mail them to me and we will include them in the next newsletter.

#### New Publications

- (1) Ridgway, R. L. and S. B. Vinson, eds. 1977. Biological Control by Augmentation of Natural Enemies. Plenum Press, New York. 480 pp.

This is the first book devoted exclusively to biological control of arthropod pests by augmentation of entomophagous arthropods. One chapter deals exclusively with techniques for the large-scale rearing of entomophagous-arthropods "Mass Production of Natural Enemies," but several of the other chapters contain rearing information including one on the quality of laboratory-reared insects. A list of commercial sources for entomophagous arthropods in the U.S. and Canada is given.

- (2) Guerra, A. A. and A. D. Bhuiya. 1977. Nutrition of the tobacco Budworm: An Economical Larval Diet for Rearing. J. Econ. Entomol. 70:568-70.

This paper includes a further modification of a soybean flour--wheat germ diet first developed at the Cotton Insects Research Laboratory, U.S. Dept. Agric., in Brownsville, TX. Of most interest is that wheat germ can be replaced by corn oil resulting in a considerable cost reduction for diet.

- (3) A booklet with the title "Quality Control--An Idea Book for Fruit Fly Workers" has been published in the Bulletin Series (No. 1977/5) of the IOBC that can be purchased by interested persons. It has been edited by E. F. Boller and D. L. Chambers, and contains besides an introductory chapter a section dealing with general concepts and approaches as well as 62 technical contributions made by 43 fruit fly specialists from

11 countries. The ideas and methods described cover the following main topics: Measuring overall performance; measuring individual performance traits (motility, orientation to habitat, sexual activity, sexual physiology); monitoring production characteristics, measuring adaptation; and implementation of quality control.

The booklet (168 pages) is sold at actual printing costs for U.S. \$3.00/copy.

#### ERRATUM

July 1977 Newsletter -- p. 18 -- The statement "it is appropriate to extend his original statement" should read "it is inappropriate to extend his original statement."

APPENDIX

Item 1

This information is to be utilized in compiling a list of colonized arthropods which will be published and available for distribution. Please return to:

Willard A. Dickerson  
SEA, USDA  
P.O. Box 33745  
Raleigh, North Carolina 27606

or Edgar G. King, 1978 FRASS Editor  
SEA, USDA  
P.O. Box 225  
Stoneville, Mississippi 38776

1. Class \_\_\_\_\_; Order \_\_\_\_\_; Family \_\_\_\_\_  
Scientific name \_\_\_\_\_; Common name \_\_\_\_\_
2. Availability (check one) ( ) Research quantities; ( ) Colony starts;  
( ) very limited.
3. Time in culture: Years \_\_\_\_.
4. Source of culture: Country \_\_\_\_\_  
State \_\_\_\_\_; County \_\_\_\_\_; City \_\_\_\_\_  
Host \_\_\_\_\_.
5. Rearing diet: ( ) Natural (Scientific name) \_\_\_\_\_, (Common name) \_\_\_\_\_;  
( ) Artificial (Main diet ingredients) \_\_\_\_\_
6. Rearing procedure reference: Author, last name \_\_\_\_\_, first name \_\_\_\_\_; middle initial \_\_\_\_\_; Other authors \_\_\_\_\_  
yr. \_\_\_\_\_; Title \_\_\_\_\_  
Published in \_\_\_\_\_ Vol. \_\_\_\_; pages \_\_\_\_\_
7. Present use of culture \_\_\_\_\_
8. Other (include pertinent info such as aseptic culture, genetic markers, etc.)
9. Submitted by: \_\_\_\_\_, Mailing address \_\_\_\_\_  
Telephone number: \_\_\_\_\_.

\*Please photocopy this form and submit a separate page for each species reared.

Item 2

\_\_\_\_\_ Please continue to send the Insect Rearing Newsletter, FRASS

\_\_\_\_\_ Please remove my name from the mailing list.

Name: \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Item 3

Proposed Names:

Insect Colonization Society ( ) or Group ( )

Insect Rearing Society ( ) or Group ( )

Arthropod Rearing Society ( ) or Group ( )

Insect Zoo Society ( ) or Group ( )

Entomological Rearing Society ( ) or Group ( )

Entomological Colonization Society ( ) or Group ( )

Others