MARK F. O'BRIEN

NEWSLETTER
of the
MICHIGAN ENTOMOLOGICAL SOCIETY
Volume 29 Number 1 March 12, 1984

The Role of Mr. Sticky as an Effective Tool in Structural Pest Management

by

K. S. Shivashankara Sastry

Current Structural Pest Control practices try to utilize several technological resources in an integrated manner, rather than relying exclusively on one or a few toxic pesticides. Barak et al. (1977) have reviewed work done on traps and have presented some evaluative data on the usefulness of the Zoecon's Roach Detector, manufactured by the Zoecon Corporation of California.

Mr. Sticky, a new type of cockroach trap (distributed by Mitsuboshi Boeki, Inc.), was initially field-tested and later extensively used during 1978 and 1979 in the cockroach control program of the Pest Control Section of Saint Elizabeths Hospital, Department of Health and Human Services, Washington, D.C. Results of these tests and experiences in the trap's use are presented in this note and the usefulness of Mr. Sticky, relative to the Zoecon Detector and Velsicol's Roach Korral (based on the author's earlier observations), is discussed. Interesting information on its usefulness against other pest organisms is also included.

The Test

Mr. Sticky measures 18.4 x 9.9 cm when folded. It is made of cardboard, fairly tough, but thin enough for 360 of them to be held in a small box like the pages of a book. A peeloff paper, 16.5 x 7.9 cm in size conceals the sticky surface under it. The bait containing powdered chrysalis (84.5%), sodium benzoate (.5%) and precipitated calcium carbonate (15.0%) is placed in the center of the sticky surface or scattered after removing the peeloff paper. Then the two flanks of this device are raised and engaged at the top in such a manner as to convert Mr. Sticky into a little tent with the sticky surface forming its floor. This ready-to-use trap can now be set up at the desired site.

Figure 1. Cockroaches trapped by Mr. Sticky

The test sites were selected from a wide variety of hospital areas representing almost all human activities such as: kitchens, cafeterias, bakery, warehouse, laundry, nurses' stations, dormitories, bathrooms, utility rooms, treatment rooms, beauty salons, recreation and occupation therapy areas, surgical areas, chapels, residences, offices, machine rooms, boiler rooms, plumber's panels, and under heavy equipment and appliances. Mr. Sticky was placed on surfaces, stuck between pipes, wedged into cracks, under counters, etc., or stuck on an upright surface with double-stick tape where prone to wetting or trampling.

(cont. on p.4)

The NEWSLETTER of the Michigan Entomological Society is published as four numbers yearly, at irregular intervals. Please send all notes, news, new insect records, research requests, notices, season summaries, membership inquiries, etc. to the Executive Secretary, Michigan Entomological Society, Dept. of Entomology, Michigan State University, East Lansing, Michigan 48824.

Officers of M.E.S.

President	Gary Dunn
President-Elect	Dave Evans
Immediate Past President	Ron Priest
Past President	Gary Simmons
Executive Secretary	Mo Nielsen
Member-at-Large (1981-84)	Ed Voss
Member-at-Large (1982-85)	Fred Stehr
Member-at-Large (1983-86)	Glenn Belyea
Journal Editor	Dave Gosling
Newsletter Editor	Louis Wilson
Associate Newsletter Editor	George Heaton

Notices

(Notices will be run for a year or 4 numbers of the Newsletter unless notified to drop them. Members desiring longer runs should notify newsletter editor, L. F. Wilson, Dept. of Forestry, Michigan State University, 48824)

WANTED: Data on Michigan butterflies for use in a new publication on the butterflies of Michigan. Doubtful specimens can be forwarded for determination or confirmation. Especially interested in Lycaenidae and Hesperiidae records. Contact M. C. Nielsen, 3415 Overlea Dr., Lansing, MI 48917 (517-321-2192).

WANTED: Correspondence with anyone interested in exchanging ants (need not be determined) from outside of Michigan for Michigan insects (ants or others). Write to: Ronald Merchant, 4334 W. Holt Road, Holt MI 48842.

WANTED: Collecting data on Michigan Formicidae. Prefer county, township, range, and section, but county only acceptable. These data will be used in compiling a county list. Send data to: Ronald Merchant, 4334 W. Holt Road, Holt, MI 48842.

WANTED: Studies on the Comparative Ethology of Digger Wasps of the Genus Bembix by Evans; Beetles of the Pacific Northwest by Hatch (5 vol.); Biology of the Leaf Miners by Hering; The Ecology of Plant Galls by Mani. Write stating condition and price to John E. Holzbach, 229 Maywood Drive, Youngstown, Ohio, 44512. *(long run)*

EXCHANGE: I'm working on Noctuidae (Orbis terrarum) and would like to exchange Noctuidae of all nearctic species for Old World Lasiocampidae (nearly all European species possible). The Noctuidae are for scientific use. They can be damaged, but they have to be complete, especially the genitalia, legs, and antennae. If interested, write to Hermann Hacker, Dipl.-Forsting, Gries 38, 8621 Ebensfeld, West Germany.

FOR SALE: Entomologische Arbeiten aus dem Museum G. Frey Band 1 to 27 (1950-1976) -- Abstracts of Entomology, vol. 1-14 (1972-1983) complete except for cumulative index (available only for 1972-1973). BEST OFFER. Rev. Carlo Brivio, 17400 Quincy, Detroit, MI 48221, phone (313) 342-4066.

RESEARCH NOTICE: To those participating in the Sesiidae pheromone Project, if you have caught anything interesting wirh the pheromone please notify me at your convenience. I can be reached evenings at (312) 237-0543 or write to Dr. John Holoyda, 2819 N. Marmora, Chicago, IL 60634. *(long run)*

WANTED: data and/or specimens of Michigan carabid beetles (including Cicindelinae) for a state faunal study aimed at studying the distributions, seasona activity and ecological requirements of all species. Collections of undetermined material will be accepted for making or verifying determinations. Contact Gary A. Dunn, Department of Entomology, Michigan State University, East Lansing, MI 48824.

EXCHANGE: Wish to exchange specimens of Nearctic Cicindelidae (and Carabidae). Also, correspondence welcomed from those interested in these groups. I am interested in records, label data and other information of Cicindela spp., especially hirticollis. Write: Gary A. Dunn, Department of Entomology, Michigan State Univ., East Lansing, MI 48824.

VOLUNTEERS NEEDED: A number of Michigan 4-H Entomology clubs are in need of technical support and guidance from experienced entomologists. Your help is needed to lead field activities, help at leader workshops, judge collections at the fair, and provide helpful hints to club members. If you are interested in helping a 4-H club, please contact me and I will attempt to match you up with the nearest club.

Along similar lines, the Teen International Entomology Group (TIEG), which is based at Michigan State University in East Lansing, is in need of both long and short articles on any entomology-related topic.

If you are interested in helping either of these organizations, contact Gary A. Dunn, Department of Entomology, Michigan State University, East Lansing, MI 48824-1115.

RESEARCH REQUEST: The following Lepidoptera, Noctuidae, are becoming pests of corn: Hydraecia immanus Guenee, H. micacea Esper, and Oligia fractilinea (Grote). I have no Michigan records of the first two, but they should be present in Michigan. The last is an "old fashioned" pest of grasses and should be fairly common in collections. Would you please check your collections and, if you find specimens, let me know the species, locality, date, host, and sex? R. F. Ruppel, Department of Entomology, Michigan State University, East Lansing, Michigan 48824.

Annual Meeting June 8 and 9

It's that time again to start planning for the Annual Meeting. Set aside June 8 and 9. This is the first notice. By the next issue of the Newsletter Dave Evans will have a program planned for your enjoyment. This year's meeting will be at the Kellogg Biological Station near Hickory corners, MI starting at 9 am on the 8th. The program will continue on the 9th, and as usual, collecting is planned. Let's make this a memorable meeting. Plan to come now. Registration forms will be in the next newsletter.

Our guest speaker this year will be Dr. Austin P. Platt, of the Biological Sciences Dept at the University of Maryland Baltimore County. Dr. Platt has been investigating the population biology and evolution of admiral butterflies. (Members may have seen his strikingly illustrated article in the Fall 1983 Bulletin of the ESA.)

His talk, presented with slides, will be Evolution of North American admiral butterflies.

Dr. Platt has served as editor of the Journal of the Lepidipterists' Society, is a Fellow of the Royal Entomological Society of London, and is a member of the ESA and The Lepidopterists' Society. He is also a charter member and past-president of the Maryland Entomological Society. He received his undergraduate education at Williams College and his doctorate from the University of Massachusetts at Amherst.

How about giving a paper at the meeting! If you can, fill in the Call for Papers form inserted with this newsletter and send it to Dave Evans. He needs your support to make it an exemplary program. Papers, of course, given at the meeting may also be submitted to the Great Lakes Entomologist or the Newsletter to be considered for publication.

Please send in the Call for Papers form by April 20.

Governing Board Meeting

The Governing Board of the Michigan Entomological Society met on November 1, 1983 at the home of Louis Wilson in East Lansing. Members in attendance: Glen Belyea, Gary Dunn, David Evans, David Gosling, Mo Nielsen, Ronald Priest, Fred Stehr, Edward Voss, Louis Wilson. Absent was John Witter. The meeting convened at 1914 hours by President Dunn and the following items were discussed:

1. The 1984 Annual Meeting time and place were reviewed by the Arrangements Chairman Evans. First and second choice dates and locations were suggested. It was left to Evans to investigate the availability of the Kalamazoo Nature Center or the Gull Lake Biological Station, and to report the selection to the Newsletter Editor as soon as possible;
2. The Nomination Committee Chairman Priest suggested several names for President-Elect and Governing Board Member-at-Large. Other names were offered. It was agreed to obtain two names for each position to avoid a costly run-off election. Nielsen agreed to run again for Executive Secretary.
3. Gosling, Editor of the Journal, reported on the status of the journal schedule. Volume 16, No. 4 has been delayed and is still in process. The Index for Volume 15 is complete and will be mailed with the next journal issue--probably early in 1984. He had enough manuscripts at present to complete Volume 16 and initiate Volume 17.
4. Wilson, Newsletter Editor, NEEDS more lead articles!! Also, he urged that members consider submitting Entomological Notes so we may keep up with the series, now at 14. Members should send in more news items dealing with any aspect of entomology-either serious or humorous.
5. Nielsen, Executive Secretary, presented a financial summary as of October 31. Checking account at $2,323.21; Savings Account at $3,879.66; CD of $4,000; Accounts receivable at $1,057.50. Total cash assets of $11,260.37 (compared to $12,296.64 on Oct. 25, 1983). Payments and income yet to be made and received will continue to keep the Society operating in the 'black'.
6. Dunn discussed plans for the Annual Meeting of ESA in Detroit; he plans to have a display and handouts featuring the Michigan Entomological Society. Dunn also reviewed plans to assist 4-H and would appreciate any assistance from members to judge entomological projects at county fairs and help with similar activities. A pledge card for 4-H assistance will be mailed to all members with the 1984 dues notice. Dunn also briefed the GB on T.I.E.G. which is in poor financial condition at present and will undergo restructuring of its publication.
7. The Board gave its approval to once again support the Michigan 4-H with a donation of $150.00, to assist the 4-H Entomology Project delegate to attend the National 4-H Congress.
8. Nielsen will send notices to other entomological societies regarding the availability of back issues of THE GREAT LAKES ENTOMOLOGIST and M.E.S. Newletter, as an effort to reduce existing stocks. Dunn will enter the Journal at the book fair exhibit to be held at the ESA Detroit meeting. We need to interest libraries and other institutions of the Journal with complete back issues.

The meeting adjourned at 2210 hours.

New M.E.S. Note

The newest note in the MES Entomology Note Series accompanies this newletter. Entitled "Rearing Insects Indoors", it gives the details of rearing several insects for fun and profit. Featured insects are the milkweed bug, flour beetle, cricket, and mealworm. This Note and the other 14 published by your society are available for use by 4-H and schools where insect projects are in demand.

Mr. Sticky (cont. from p.1).

Effectiveness of Mr. Sticky

Mr. Sticky is apparently very effective, especially for catching German cockroaches (fig. 1). Although the actual numbers of roaches trapped is a function of the size and structure of roach populations at the site of infestation, it is significant that as many as 125 to 150 have been entrapped and killed by a single Mr. Sticky. Furthermore, several first-instar nymphs that hatched from the egg capsules, extruded by trapped females, as well as the eggs not yet hatched are also entrapped and eliminated from the environment. On an average, 28 roaches in adult and nymphal stages and 0.2 egg capsules are thus killed. Assuming the average number of nymphs hatched from one egg capsule is 30, 0.2 egg capsules mean another six nymphs. Thus, one Mr. Sticky can eliminate 34 roaches. This has a significant impact not only on the overall roach population but also on the numbers noticed in an infested area at a particular time. The latter statement can be appreciated when it is realized that just-hatched nymphs remain active for nearly 1½ to 4 months before attaining adulthood and that the adult, in turn, lives for about 10 months (Truman and Butts 1967).

Both males and females, including the gravid ones were caught in the trap; 842 females and 368 males were entrapped on 102 Mr. Stickys during these observations. Similarly, 1,784 nymphs (of various instars) were entrapped. The trapped roaches did not seem to deter the other members of the population from being similarly entrapped as long as the sticky surface was still available. Mr. Sticky retained its efficacy in entrapping roaches to even 10 months after the day it was set up.

The recommended roach bait for use with the trap did not seem to serve as an attractant because traps without the bait were also effective. In fact on some occasions when both baited and unbaited traps were set up in the same general area of infestation, as in a dishwashing area, the ones without the bait entrapped roaches, whereas the ones with the bait did not. We dispensed with using any bait in subsequent routine use without any adverse effects on its performance. These observations support my suggestion that cockroach behavior, namely, positive thigmotaxis (feeling protected only when having all-around contact with a surface) and negative phototaxis (feeling protected only in areas away from light), drives the roaches to seek shelter in Mr. Sticky rather than attraction by the bait. However, it is worth investigating whether the German cockroaches release any aggregating pheromone (as in ants) on contacting food and are drawn to Mr. Stickys with the bait than to those without it.

Mr. Sticky entraps adults and nymphs of other creatures such as the brown banded cockroach, Supella supellectilium; the American cockroach, Periplaneta americana; and the Oriental cockroach, Blatta orientalis. It also controlled the house cricket, Acheta domestica; field cricket, Acheta assimilis; and the camel cricket, Ceuthophilus sp., when found inside structures. Firebrats, katydids, and millipedes were also readily captured.

Mice feed voraciously on German cockroaches (as also seen by the author in his earlier experiments with Zoecon Detectors and Velsicol's Roach Korrals), and eat American and Oriental cockroaches. The mice leave behind the telltale traces in the form of insect antennae, wings, legs, and droppings in Mr. Sticky. On some occasions during such feeding bouts, young mice are entrapped amidst their prey.

In the overall management of domiciliary cockroaches, Mr. Sticky can not only be used as an adjunct control tool, but also in detecting exact sites of infestation and in the overall evaluation of day-to-day treatment effectiveness. It also can be used as a scientific tool, for estimating pre- and post-treatment roach populations in insecticidal tests, for learning more about roach circadian and seasonal activity, sex ratio and natural control agents. It may be used for sampling and collecting the organisms occurring in a specific environment and in studying the effects on the roach population size.

Because of both the need to use a toxic bait and its design, Roach Korral is limited for use in sampling populations before and after treatment. Roaches get into the korral because it serves as an uncontaminated harborage in a test environment where crack and crevice harborages would have been contaminated by application of experimental roachicides.

Mr. Sticky, Zoecon Detectors, and others of similar design do entrap roaches. However, the sticky surface in Mr. Sticky is much larger, and is located on the device floor, on which roaches are more likely to crawl. Mr. Sticky can be easily transported and can be applied in more sites than the Detectors. Furthermore, because of the narrower adhesive strips, the first trapped roaches in the Detectors form a substrate that the others can simply walk over without being caught. The Detector also develops a slight pungent odor after a few days. These two disadvantages do not occur with Mr. Sticky. This trap was found to be more effective than the others under our test conditions.

Production changes introduced in some recent lots of Mr. Sticky manufactured by Leon Wright Enterprises brought some adverse effects on its efficacy (fig. 2). The Mr. Sticky with a clear plastic-like sticky sheet dried up within 4 or 5 days. Furthermore,

(continued next page)

Figure 2. Cockroaches trapped by four Mr. Stickys set in the same area. The lower right trap is the plastic sheet variety and not as efficient as the cardboard variety.

this thin sheet warped slightly after a few days forming a space between it and the cardboard bottom. German cockroach nymphs and adults hid in this space. Thus, instead of serving as a tool to eliminate roaches, it encouraged them to hide. The bait preparation, which included powdered wheat, also affected its performance. This powdery bait was prone to be easily blown away from the applied spot forming a thin film over a considerable part of the sticky surface, thus rendering it nonsticky. The currently produced lots of Mr. Sticky have overcome the above difficulties. However, a minor snag is that the side walls of this kind easily tear away from the main part when the protective paper is being pulled off. Except for this, the effectiveness seems to be as good as that of first lots.

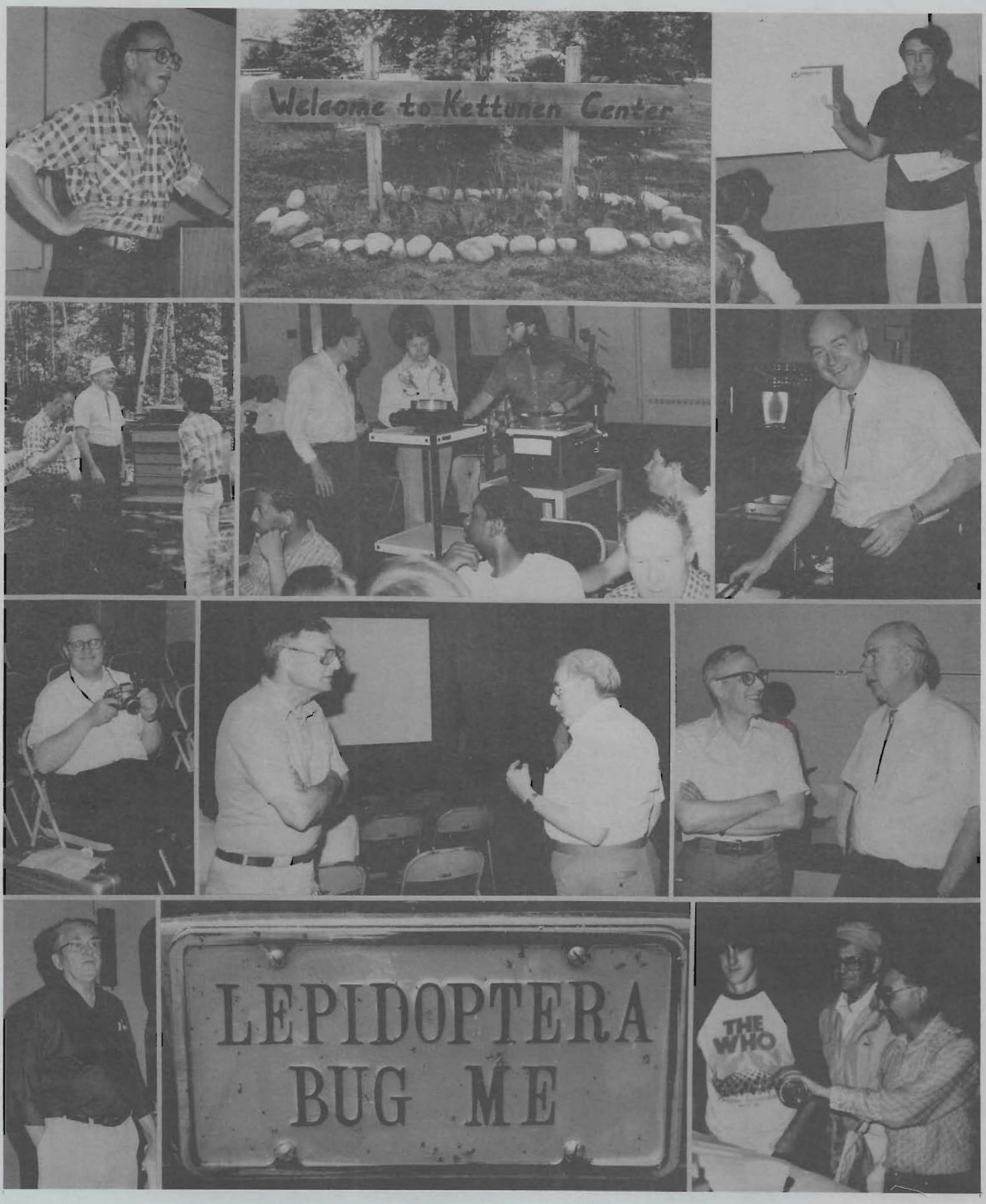
The following few suggestions may help in improving the effectiveness of this versatile and useful tool: 1. Unless proven essential, the bait material need not be used. If used, the material should be used in small quantities and must have small, crumb-like consistency; 2. Two, small, peeloff strips can be affixed at the two ends on the bottom cardboard so Mr. Sticky can be set up on any surface; and 3. If possible, the height of the side walls may be reduced, so that Mr. Sticky can be set up in the flatter enclosed spaces.

It would be worthwhile investigating the rarely occurring phenomenon of just-hatched nymphs escaping unstuck.

In conclusion, Mr. Sticky undoubtedly can be used as an effective, non-toxic pesticide in cockroach management in structures. It can also be readily adapted as a useful tool in learning cockroach ecology and behavior in wild populations rather than laboratory ones. However, it must be emphasized that any domiciliary cockroach management program can achieve effective control of cockroach populations by applying a combination of control measures rather than by relying on any one or a few. These measures include the judicious use of toxic pesticidal formulations

(continued on p.7)

Annual Meeting Photos



and Mr. Sticky-type devices and ongoing efforts to avoid and eliminate conditions that support pest ingress, harborage, growth, and build-up. Also important is the continuing education of citizens on their cooperative role in pest control.

References

Barak, A. V., M. Shinkle and W. E. Burkholder. 1977. Using Attractant Traps to Help Detect and Control Cockroaches. Pest Control, October 1977: pp. 14-16, 18-20.

Truman, L. C., and W. L. Butts. 1967. Scientific Guide to Pest Control Operations. Second Edition (Rev.), published by Pest Control Magazine, Cleveland, Ohio.

Notes

Dr. Sastry is entomologist at Saint Elizabeths Hospital, Department of Health and Human Services, Washington, D.C. 20032.

Mention of a proprietory product does not constitute endorsement by the Department of Health and Human Services.

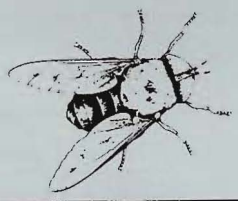
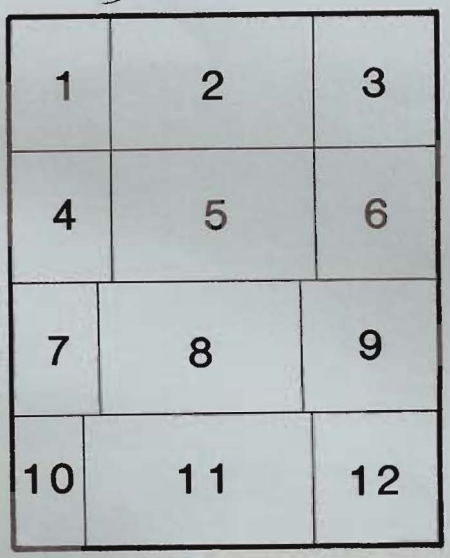


Photo Captions



L. to R. 1. Roland Fischer; 2. (sign); 3. L. Wilson; 4. Roland Fischer, Mo Nielsen, Bob Lee; 5. At Projector: Edward Voss, Donald Wilson, Gary Dunn; 6. Mo Nielson; 7. George Heaton; 8. Murray Hanna, J. Hoffman; 9. David Gosling, Mo Nielsen; 10. Bob Ruppel; 11. (License plate); 12. Jim Bess, Murray Hanna, Edward Voss, Night collecting.

Brown Bags and Bugs

How would you like to lead a collecting outing next year? It's an idea we discussed at the November Board meeting as a way to bring members and friends together at convenient times and places for a days collecting. It can also serve as a good means of introducing insects to our younger people. What you need to do is: select a familiar collecting site of varied habitats; obtain owner's permission, if necessary; and set a time and date to meet (noon for a brown bag lunch?)

Send me this information along with directions to the meeting spot and a brief site description. I'll coordinate the dates and places submitted before they go the newsletter. The notice itself will ask those planning to attend to contact the leader with the number of people they expect to bring.

So give it some thought and send me your ideas. Ron Priest, 1011 N. Fairfield, Mt. Pleasant, MI 48858.

E.R.I. to Award Cash Prize

In an effort to develop new controls for Dutch elm disease, Elm Research Institute, Harrisville, NH has announced its first annual research prize of $10,000.

The prize to be announced via national media, will go to the entry which best outlines a research program that will ultimately lead to development of a new systemic repellent for the elm bark beetle.

All proposals will be judged on the basis of: water solubility for systemic injection; phytotoxicity; beetle deterence at point of feeding; chemical stability of the repellent; and bioassay technique for tracing distribution.

ERI stresses that this is not a research grant. It is an award for originality in the presentation of new concepts, new methods of achieving repellency through systemic treatment.

Prizes will be awarded as follows: $5,000. first place, $3,000. second, $2,000. third. Judging will be by a panel of recognized experts composed of entomologists and plant pathologists.

All entries should be mailed to Elm Research Institute, Harrisville, NH 03450 by May 1st, 1984 and will become the property of the Institute. For further information call (603) 827-3048.

Note From 4-H Winner

Your society sponsored Brad Marks at the 62nd National 4-H Congress. Brad sent us this thank you note.

Dear Mr. Nielson,

I would like to extend my sincere gratitude to the Michigan Entomological Society for the support it provides the 4-H Entomology Program. I had one of the greatest experiences of my life at the 62nd National 4-H Congress.

Thanks again,
Brad Marks

MICHIGAN ENTOMOLOGICAL SOCIETY

Membership Application

Please enroll me as a member of the Michigan Entomological Society, in the classification checked below.

- ☐ Student Member (including those currently enrolled as college sophomores)--annual dues $4.00
- ☐ Active Member--annual dues $8.00
- ☐ Institutional Member (organizations, libraries, etc.)--annual dues $15.00
- ☐ Sustaining Member--annual contribution $25.00 or more.

● [NOTE: Membership is on a calendar year basis (Jan. 1-Dec. 31). Memberships accepted before July 1 shall begin on the preceeding January 1; memberships accepted at a later date shall begin the following January 1 unless the earlier date is requested and the required dues are paid.]

I enclose $_____(cash, check, or money order) as dues for the calendar year(s)_____, appropriate for the class of membership checked above. (Please make remittance payable to Michigan Entomological Society).

NAME (please print)_____

ADDRESS_____

_____ZIP_____

Please provide the information requested below, so that it may be included in our directory of members.

MY SPECIFIC INTERESTS ARE (orders, families, genera, geographical area)_____

_____

_____

● Publications: THE GREAT LAKES ENTOMOLOGIST, a journal dealing with all aspects of entomology with emphasis in the Great Lakes Region, and a quarterly NEWSLETTER. Persons requesting student membership must furnish proof of their student status. Student members cannot vote nor hold office in society affairs.

The Michigan Entomological Society, a non-profit organization, derives its sole support from membership dues, contributions, and bequests, all of which are deductible for income tax purposes.

▶ MAIL TO: Michigan Entomological Society, Department of Entomology, Michigan State University, East Lansing, Michigan 48824.

MICHIGAN ENTOMOLOGICAL SOCIETY

DEPARTMENT OF ENTOMOLOGY
MICHIGAN STATE UNIVERSITY
EAST LANSING, MICHIGAN 48823

NONPROFIT ORG.
U. S. POSTAGE
PAID
East Lansing, Mich.
PERMIT NO. 14

ADDRESS CORRECTION REQUESTED

4030290 050001
MARK F O'BRIEN
INSECT DIV MUS/ZOO
UNIVERSITY OF MICH
ANN ARBOR MI 48109