AD NUMBER

AD483630

NEW LIMITATION CHANGE

TO
Approved for public release, distribution unlimited

FROM
Distribution authorized to DoD only; Administrative/Operational Use; May 1966. Other requests shall be referred to the Office of Naval Research, 800 North Quincy Street, Arlington, VA 22217-5660.

AUTHORITY

ONR ltr, 4 May 1977

THIS PAGE IS UNCLASSIFIED
A Study of the Environmental Effects of Termite Control Insecticides

Research Sponsored by the Office of Naval Research

Reproduction in whole or in part is permitted for any purpose of the United States Government.
May 25, 1966

Dr. Robert K. Jennings
Head, Biochemistry Branch
Office of Naval Research
Department of the Navy
Washington, D. C. 20360

Dear Dr. Jennings:

This is a semiannual progress report on "A Study of the Environmental Effects of Termite Control Insecticides", ONR Contract No. Nonr-5156(00).

This study was conducted to determine if termite control pesticides, principally aldrin and dieldrin, applied to supporting structures of houses in the Tarawa housing development, Camp LeJeune, North Carolina, are translocated through the terrestrial environment and into the aquatic food chain of creeks in the vicinity of the housing area.

Samples of soil, water plants, fish, and algae were collected on December 7, 8, and 9, 1966 and were stored at about 4°C, prior to residue analysis. Electron capture and thin layer chromatographic methods were used in the analyses. Although the residue analyses are complete, the data have not been fully processed for reporting. Where appropriate, residue values for certain samples are stated below.

Water

Samples taken from Northeast Creek (a) near the outflow of Sewage Lift Station Number 1, (b) approximately 500 yards upstream from the lift station, and (c) approximately 20 yards offshore near the sewage treatment plant outflow, showed no detectable aldrin, dieldrin, or DDT and its metabolites. Samples taken from three wells 10 to 12 feet deep and located in the general areas of insecticide application revealed no detectable aldrin, dieldrin, or DDT and its metabolites.
Soils

Data evaluated to date on 15 mud samples collected from the shoreline and the bottom at various sites along Northeast Creek adjacent to the housing areas revealed aldrin in only one instance, at a level of 0.06 ppm. These samples showed dieldrin residues in four instances, ranging from 0.05 to 0.28 ppm. Residues of DDT and its metabolites, DDE and DDD, were found at levels ranging from 0.1 to 0.9 ppm in the above samples.

Soil samples were collected at approximately one- and three-foot levels at thirty one sites in and peripheral to the housing development. Aldrin levels ranged from nondetectable to 1600 ppm, and dieldrin residue levels ranged from nondetectable to 100 ppm. Residue data evaluated to date have revealed no correlation between soil depth and leaching gradient for aldrin or dieldrin. It is hoped that when all values for soil insecticide residues are evaluated, conclusions can be drawn regarding leaching of insecticides, particularly aldrin and dieldrin, from sites of application.

Plants

These samples were restricted to the perennial grasses and the cold-tolerant broad-leaved plants. Root portions of respective plants were soaked and rinsed in water to remove adhering soil and then combined with foliar portions in a blender. To optimize analytical sensitivity, it was necessary to combine respective root and leaf portions. Plant insecticide residues will therefore be reported on a whole-plant basis.

Since the magnitude of plant sampling was restricted by "winter-kill", it is felt that more meaningful evaluations of uptake or accumulation of termite insecticides by plants can be obtained if vegetation in the Tarawa housing development is sampled during the summer months.

Fish

Nine flounder, caught in Northeast Creek, were found to contain no detectable aldrin or dieldrin residues, but DDT was found in concentrations of 0.05 to 0.16 ppm (wet weight) in seven fish. A DDT metabolite, DDE, was found in concentrations of 0.20 to 0.60 ppm in eight fish. Another DDT metabolite, DDD, was detected at concentrations of 0.11 to 0.85 ppm in eight fish. No other species of fish were seen or trapped during this winter sampling project. It is suggested that sampling of fish, aquatic crustaceans, and algae should be conducted during the summer months to permit more definitive evaluation of termite control insecticides in relation to passage through aquatic food chains.
Background information, maps, etc. are being collected for preparation of the final report. Geological, climatological, and toxicological discussions will be presented along with the residue data in the final report.

Sincerely yours,

JOHN M. BARNES, Ph.D.
Research Coordinator
# A study of the environmental effects of termite control insecticides

**Barnes, John M.**

## ABSTRACT

Samples of soil, plants, fish, and algae were collected from sites peripheral to, and within areas where termite and fire ant control insecticides were repeatedly applied. These samples were then analyzed for insecticide residues by electron capture and thin layer chromatographic methods. Aldrin and dieldrin residues were found in soils in areas where the insecticides were applied. Occasional low levels (0.05 to 0.28 ppm) of aldrin and dieldrin were found in mud samples taken from two nearby creeks. Flounder caught in these creeks were free from detectable aldrin and dieldrin, but DDT, DDD, and DDE were found. Water from wells in the insecticide application area and from nearby creeks contained no detectable aldrin, dieldrin, or DDT.
**UNCLASSIFIED**

Security Classification

### KEY WORDS

<table>
<thead>
<tr>
<th>ROLE</th>
<th>WT</th>
<th>ROLE</th>
<th>WT</th>
<th>ROLE</th>
<th>WT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td>2.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>insecticide residues</strong></td>
<td></td>
<td><strong>environmental distribution of insecticides</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### INSTRUCTIONS

1. **ORIGINATING ACTIVITY**: Enter the name and address of the contractor, subcontractor, grantee, Department of Defense activity or other organization (corporate author) issuing the report.

2a. **REPORT SECURITY CLASSIFICATION**: Enter the overall security classification of the report. Indicate whether "Restricted Data" is included. Marking is to be in accordance with appropriate security regulations.

2b. **GROUP**: Automatic downgrading is specified in DoD Directive 5200.10 and Armed Forces Industrial Manual. Enter the group number. Also, when applicable, show that optional markings have been used for Group 3 and Group 4 as authorized.

3. **REPORT TITLE**: Enter the complete report title in all capital letters. Titles in all cases should be unclassified. If a meaningful title cannot be selected without classification, show title classification in all capitals immediately following the title.

4. **DESCRIPTIVE NOTES**: If appropriate, enter the type of report, e.g., interim, progress, summary, annual, or final. Give the inclusive dates when a specific reporting period is covered.

5. **AUTHOR(S)**: Enter the name(s) of author(s) as shown on or in the report. Enter last name, first name, middle initial. If military, show rank and branch of service. The name of the principal author is an absolute minimum requirement.

6. **REPORT DATE**: Enter the date of the report as day, month, year. If more than one date appears on the report, use date of publication.

7a. **TOTAL NUMBER OF PAGES**: The total page count should follow normal pagination procedures, i.e., enter the number of pages containing information.

7b. **NUMBER OF REFERENCES**: Enter the total number of references cited in the report.

8a. **CONTRACT OR GRANT NUMBER**: If appropriate, enter the applicable number of the contract or grant under which the report was written.

8b. & 8d. **PROJECT NUMBER**: Enter the appropriate military department identification, such as project number, subproject number, system numbers, task number, etc.

9a. **ORIGINATOR'S REPORT NUMBER(S)**: Enter the official report number by which the document will be identified and controlled by the originating activity. This number must be unique to this report.

9b. **OTHER REPORT NUMBER(S)**: If the report has been assigned any other report numbers (either by the originator or by the sponsor), also enter this number(s).

10. **AVAILABILITY/LIMITATION NOTICES**: Enter any limitations on further dissemination of the report, other than those imposed by security classification, using standard statements such as:

   (1) "Qualified requesters may obtain copies of this report from DDC."

   (2) "Foreign announcement and dissemination of this report by DDC is not authorized."

   (3) "U. S. Government agencies may obtain copies of this report directly from DDC. Other qualified DDC users shall request through DDC."

   (4) "U. S. military agencies may obtain copies of this report directly from DDC. Other qualified users shall request through DDC."

   (5) "All distribution of this report is controlled. Qualified DDC users shall request through DDC."

   If the report has been furnished to the Office of Technical Services, Department of Commerce, for sale to the public, indicate this fact and enter the price, if known.

11. **SUPPLEMENTARY NOTES**: Use for additional explanatory notes.

12. **SPONSORING MILITARY ACTIVITY**: Enter the name of the departmental project office or laboratory sponsoring (paying for) the research and development. Include address.

13. **ABSTRACT**: Enter an abstract giving a brief and factual summary of the document indicative of the report. If additional space is required, a continuation sheet shall be attached.

   It is highly desirable that the abstract of classified reports be unclassified. Each paragraph of the abstract shall end with an indication of the military security classification of the information in the paragraph, represented as (TS), (S), (C), or (U).

   There is no limitation on the length of the abstract. However, the suggested length is from 150 to 225 words.

14. **KEY WORDS**: Key words are technically meaningful terms or short phrases that characterize a report and may be used as index entries for cataloging the report. Key words must be selected so that no security classification is required. Identifiers, such as equipment model designation, trade name, military project code name, geographic location, may be used as key words but will be followed by an indication of technical context. The assignment of links, roles, and weights is optional.