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9 SEMI-ANNUAL PROGRESS REPORT, 1 Oct 65 - 1 Apr 66

HAZLETON LABORATORIES, INC.

10 John M. Barnes,

6 A STUDY OF THE ENVIRONMENTAL EFFECTS OF TERMITE CONTROL INSECTICIDES

Research Sponsored by the Office of Naval Research

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~~ONR Contract Authority~~ Nonr-5156(00) - New

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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, 1965~~ and were stored at about -5° F. 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.



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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

JOHN M. BARNES, Ph.D.
Research Coordinator

JMB:bjp

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ABSTRACT			
<p>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.</p>			

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