Date Out EFB: 05 FEB 1982

To: Product Manager 15 LaRocca
TS-767

From: Dr. Willa Garner WG
Chief, Review Section No. 1
Environmental Fate Branch

Attached please find the environmental fate review of:

Reg./File No.: 618-EUP-RN

Chemical: Avermectin B_1

Type Product: Insecticide

Product Name: MK-936

Company Name: Merck Sharp & Dohme

Submission Purpose: Fire Ant Control

ZBB Code: 3(c)(5)

ACTION CODE: 700

Date in: 12/14/81

EFB # 104

Date Completed: 05 FEB 1982

TAIS (level II)	Days
52	3

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

1.0 INTRODUCTION

Merck Sharp & Dohme has submitted an application for an experimental use permit for avermectin B_1 for red imported fire ant control. Acc. No. 246358

2.0 MK-936: Avermectin B_1

See Figure for structure.

3.0 DISCUSSION OF DATA

3.1 Hydrolysis of avermectin B_1 at three pH's.

This study was not conducted due to limitations in lab personnel. Registrant indicates study should be completed before the end of March, 1982.

3.2 Aerobic Soil Metabolism Study: Fate of Avermectin B_1a After Application to Soil. D.L. Bull, Agricultural Research Service, USDA, 9/30/81.

Tritium labeled avermectin B_1 a was used at 0.10 and 1.0 ppm in Lufkin fine sandy loam and washed construction grade sand. In addition, an experiment using 50 ppm avermectin was conducted in the sandy loam soil.

Ten grams of soil were placed into standard glass scintillation vials. After the vials were treated with appropriate amounts of avermectin and the contents mixed thoroughly, one ml of water was added and the moisture was allowed to disperse throughout the soil. Samples, other than 0 hr samples, were placed into vented dessicators containing water to maintain high humidity levels. Samples were kept in these containers at ambient lab temperatures.

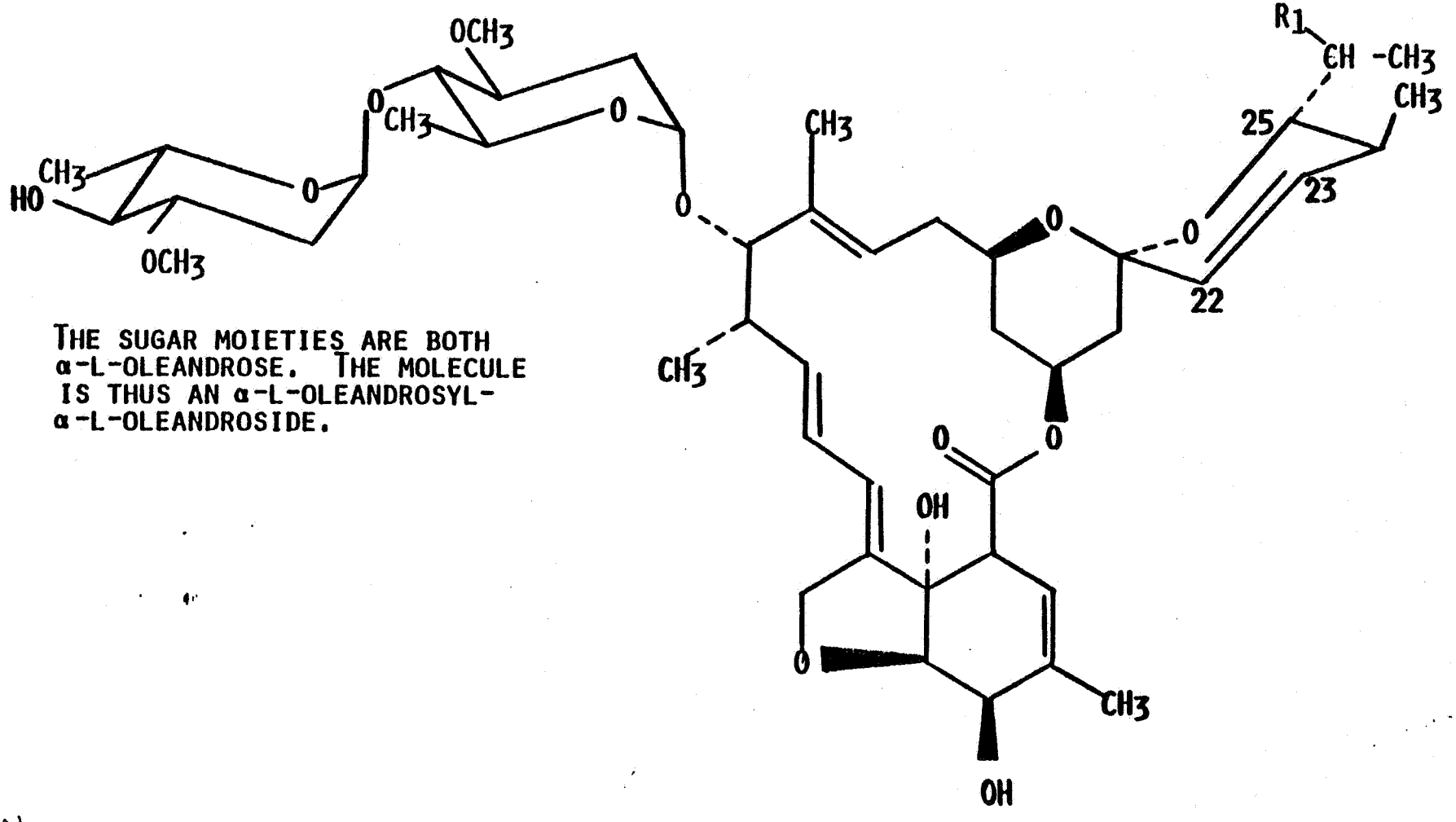
Extracted soil was air dried and held for combustion analysis of unextracted tritium. Solvent extracts were radioassayed, dried and analyzed with TLC. Radioactive materials were located on TLC via autofluorography procedures and quantitation was accomplished via LSC.

Dried extracted soil was combusted in a tube furnace for 30 min at 1000°C in an oxygen atmosphere. Released tritium was trapped as tritiated water in a U-tube cold trap. Quantitation of U-tube contents was accomplished via LSC. Unextractable tritium residues have not been identified.

MK-936

AVERMECTIN B_1

L-676,863



THE SUGAR MOIETIES ARE BOTH α-L-OLEANDROSE. THE MOLECULE IS THUS AN α-L-OLEANDROSYL-α-L-OLEANDROSIDE.

$R_1 = C_2H_5 \geq 80\%$ (AVERMECTIN B_{1A}, L-676,895)

Tables 1-4 indicate preliminary results. It should be noted that compound 5 is identified as avermectin and compound 7 may be the monosaccharide derivative. Other degradates were not identified.

Conclusion

The half-life appears to be about 4 weeks in sandy loam but about 10 weeks in construction sand. Identification of major metabolites is not given.

4.0 RECOMMENDATIONS

EFB cannot concur with the EUP until

1. the hydrolysis study is completed and submitted for review.

2. the aerobic soil metabolism study is submitted in its final form which includes soil characteristics and identification of major metabolites formed.

Richard V. Moraski
Chemist
Environmental Fate Branch

Avermectin science review

Page _____ is not included in this copy.

Pages 5 through 8 are not included in this copy.

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___ Identity of product inert ingredients

___ Identity of product impurities

___ Description of the product manufacturing process

___ Description of product quality control procedures

___ Identity of the source of product ingredients

___ Sales or other commercial/financial information

___ A draft product label

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___ Information about a pending registration action

X FIFRA registration data

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