Shaughnessy No.: _____

Date out of EAB: 22 JUN 1984

To: G. LaRocca
Product Manager 15
Registration Division TS-767

From: Samuel M. Creeger, Chief
Environmental Chemistry Review Section 1
Exposure Assessment Branch
Hazard Evaluation Division TS-769c

Attached, please find the EAB review of:

Reg./File No.: 618-OG

Chemical: Avermectin

Type Product: I

Product Name: AFFIRM Fire Ant Bait

Company Name: Merck

Submission Purpose: Use on non-crop land for fire ant control, new chemical registration

ZBB Code: 3(c)(5)

Action Code: 105

Date In: 3/27/84

EAB No.: 4261

Date Completed: 22 JUN 1984

| TAIS (Level II) | Days |
|---|---|
| 61 | 2 |

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

1.0 INTRODUCTION

Merck Sharp and Dohme has submitted data in support of the registration of Affirm Fire Ant Bait for use on non-crop land including home lawns. Acc. No. 072436, 072425, 072427.

2.0 Affirm; avermectin $B_1$; MK-936

Avermectin $B_1$: a mixture of avemectins containing $\geq$ 80% Avermectin $B_{1a}$ (5-0-demethyl-avermectin $A_{1a}$) and $\leq$ 20% avermectin $B_{1b}$ (5-0-demethyl-25-de(1-methyl propyl)-25-(1-methylethyl)avermectin $a_{1a}$

See figure for structure.

3.0 DISCUSSION

3.1 Affirm in an insecticide that contains 0.011% avermectin $B_1$ or 50 mg avermectin $B_1$/lb product. It is intended for use on pastures and rangelands, turf lawns, and other non-agricultural areas. Using broadcast application method, Affirm is applied at a rate of 1 lb/acre or 50 mg ai/acre. For individual mound treatment 5 to 7 tablespoons of product are sprinkled over the mound and for a distance of two feet from base of mound. No more than 1 lb product/acre is recommended. Up to 18 mounds can be treated with 1 lb of product.

Affirm will be packaged in 25 lb bags for agricultural use and in 1 lb child resistant contains for domestic use. Affirm [redacted]

Avermectin is not expected to hydrolyze in the environment. It will undergo rapid photodegradation whether in water or on soil with halflives less than 1 day in either case. Soil metabolism studies indicate degradation does occur with a possible halflife of 2 months under aerobic conditions. Anaerobic degradation is slower. It is not expected to leach or to accumulate in fish. Avermertin solubility in water is determined to be 7.8 ppb.

3.2 The only field dissipation study available at this time is a residue chemistry study needed to establish a permanent tolerance level for avermectin $B_{1a}$ (Acc No 072436).

In this study, application rates ranging from 1X to 10X (50 mg to 500 mg ai/acre) were used. Tables I and II provide the results of the study. Only the 10X study indicated detectable residues in grass 3 days post application in one of three cases. None of the other samples showed residues in either soil or grass.

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## 4.0 CONCLUSION AND RECOMMENDATION

It was not possible to fully evaluate the field dissipation study since Appendix D which described the field residue trials and sampling protocol was not included in the package presented to EAB.

In addition, a phone conversation with Jack Norton of Merck indicated that a field dissipation study would be undertaken following guideline procedures. EAB awaits the results of this study.

For terrestrial non-crop and domestic uses all data requirements have been met with the exception of the field dissipation study. The study submitted for tolerance purposes indicates residues in soil would not be expected within one or two days after treatment.

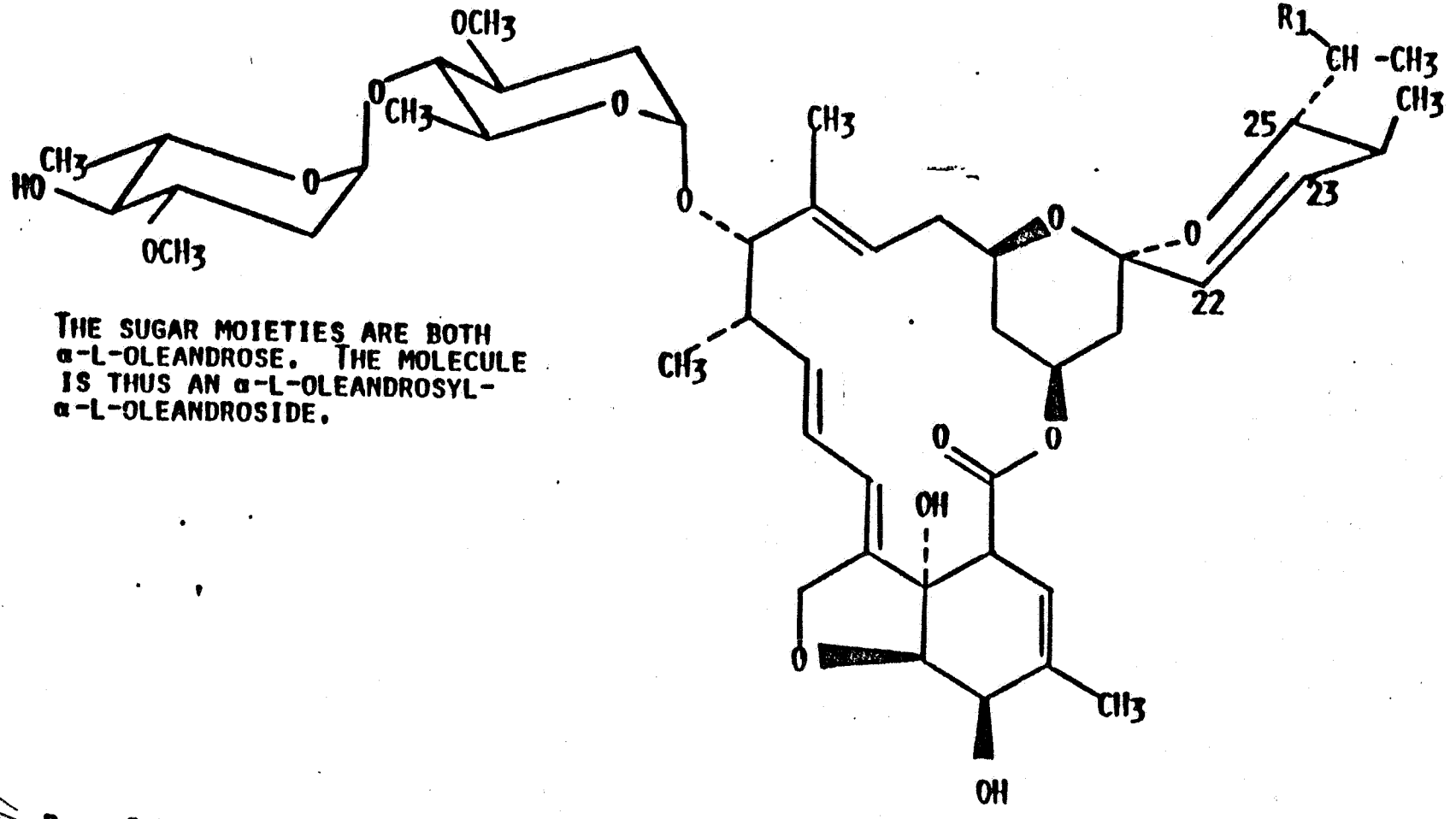
EAB can concur with the registration of Affirm on condition that the field dissipation study be submitted within the next six months.

Richard V. Moraski
Environmental Chemistry
Review Section No. 1

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.

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

$R_1 = CH_3$ ≤20% (AVERMECTIN $B_{1B}$)

Table I. Summary of Residues of Avermectin $B_{1a}$ in Soil Treated with AFFIRM[1] FIRE ANT BAIT

| Sample No. | Residue Trial/ Site No. | Location | Rate (lb/ac) | Days Post Application | ng/g (2) |
|---|---|---|---|---|---|
| 1503-1 | 1 | Texas | 0 | 0 | N.D. |
| 1507-1 | 2 | Louisiana | 0 | 0 | N.D. |
| 1519-1 | 3 | Georgia | 0 | 0 | N.D. |
| 1538-1 | 4 | South Carolinia | 0 | 0 | N.D. |
| 1545-1 | 5 | Florida | 0 | 0 | N.D. |
| 1504 | 1 | Texas | 1 | 1 | N.D. |
| 1508 | 2 | Louisiana | 1 | 1 | N.D. |
| 1520 | 3 | Georgia | 1 | 1 | N.D. |
| 1540 | 4 | South Carolina | 2 | 1 | N.D. |
| 1542 | 5 | Florida | 2 | 1 | N.D. |

(1) Trademark of Merck & Co., Inc. for formulation containing .011% avermectin $B_1$ [redacted]

(2) N.D. - None detected, defined as less than 1.0 ng/g when analyzed by HPLC using Merck Assay No. 3002.

INERT INGREDIENT INFORMATION IS NOT INCLUDED

Table II. Summary of Residues of Avermectin $B_{1a}$ in Pasture and Range Grass Treated with AFFIRM[1] Fire Ant Bait

| Sample No. | Residue Trial/ Site No. | Location | Rate (lb/ac) | Days Post Application | ng/g |
|---|---|---|---|---|---|
| 1511 | 1 | Texas | 0 | 0 | N.D. |
| 1515 | 2 | Louisiana | 0 | 0 | N.D. |
| 1523-1 | 3 | Georgia | 0 | 0 | N.D. |
| 1539-1 | 4 | South Carolina | 0 | 0 | N.D. |
| 1544-1 | 5 | Florida | 0 | 0 | N.D. |
| 1512-1 | 1 | Texas | 1 | 1 | N.D. |
| 1516-1 | 2 | Louisiana | 1 | 1 | N.D. |
| 1524 | 3 | Georgia | 1 | 1 | N.D. |
| 1536-1 | 4 | South Carolina | 2 | 1 | N.D. |
| 1543 | 5 | Florida | 2 | 1 | N.D. |
| 1273 | 6 | Texas | 0 | 0 | N.D. |
| 1309-1 | 7 | Alabama | 0 | 0 | N.D. |
| 1310-1 | 7 | Alabama | 0 | 0 | N.D. |
| 1317-1 | 8 | Georgia | 0 | 0 | N.D. |
| 1349-1 | 9 | South Carolina | 0 | 0 | N.D. |
| 1351-1 | 9 | South Carolina | 0 | 0 | N.D. |
| 1277 | 6 | Texas | 1[2] | 1 | N.D.[4] |
| 1313 | 7 | Alabama | 1 | 1 | N.D.[4] |
| 1314 | 7 | Alabama | 1 | 1 | N.D.[4] |
| 1318 | 8 | Georgia | 1 | 1 | N.D. |

(continued)

Table II. Summary of Residues of Avermectin $B_{1a}$ in Pasture and Range Grass Treated with AFFIRM[1] Fire Ant Bait

(continued)

| Sample No. | Residue Trial/ Site No. | Location | Rate (lb/ac) | Days Post Application | ng/g |
|---|---|---|---|---|---|
| 1328 | 9 | South Carolina | 10 | 1 | N.D.[4] |
| 1326 | 9 | South Carolina | 10[2] | 1 | N.D.[4] |
| 1340 | 9 | South Carolina | 10 | 3 | N.D.[4] |
| 1337 | 9 | South Carolina | 10[2] | 3 | 2.0[4] |

(1) Trademark of Merck & Co., Inc. for formulation containing .011% avermectin $B_1$ [redacted]

(2) Formulation described in (1) with the [redacted]

(3) N.D. - None detected, defined as less than 1.0 ng/g when analyzed by HPLC using Merck Assay No. 2002.

(4) Average of the analysis of duplicate samples.