

EEE BRANCH REVIEW

DATE: IN \_\_\_\_\_ OUT \_\_\_\_\_ IN \_\_\_\_\_ OUT \_\_\_\_\_ IN \_\_\_\_\_ OUT \_\_\_\_\_  
FISH & WILDLIFE 6/22/75 9/4/75 ENVIRONMENTAL CHEMISTRY EFFICACY

FILE OR REG. NO. \_\_\_\_\_

21137-0  
PETITION OR EXP. PERMIT NO. \_\_\_\_\_

DATE DIV. RECEIVED \_\_\_\_\_

6/5/75, 11/1/75  
DATE OF SUBMISSION \_\_\_\_\_

167 11/1/75  
DATE SUBMISSION ACCEPTED \_\_\_\_\_

TYPE PRODUCT(S): I, D, H, (F), N, R, S \_\_\_\_\_

PRODUCT MGR. NO. \_\_\_\_\_

22  
PRODUCT NAME(S) \_\_\_\_\_

~~Cate H-554 Insectifiable Concentrate~~  
COMPANY NAME \_\_\_\_\_

~~Data to clarify previous submitted data~~  
SUBMISSION PURPOSE \_\_\_\_\_

~~Triflorin~~  
CHEMICAL & FORMULATION \_\_\_\_\_

## 1.0 Recommendations

- 1.1 The data submitted was sufficient to assess the hazard for greenhouse use. This use is acceptable.
- 1.2 The leaching study is acceptable to determine the leaching hazard for this use and outdoor uses if proposed.
- 1.3 The soil metabolism study is acceptable.
- 1.4 A hydrolysis study carried out according to the enclosed protocol is needed to assess the hazard but it may be submitted after registration. (See Enclosure)  
[P.M. - Enclose V-33 of second draft guidelines].

## 2.0

- 2.1 Ceta W-524 has been transferred from FMC (File symbol 279-E00N) to E. Merck (EM laboratories, file symbol # 21137-4).
- 2.2 Roses - Greenhouse
- 2.3 See environmental chemistry review for Triforine dated 1/10/75 (submission of 10-31-74 by FMC Corp., for greenhouse roses).

## 3.0 Directions for Use

See environmental chemistry review dated 1/10/75.

- 4.1 Soil Degradation of Triforine - Additional Data  
(See Sect. III-1 of review dated 1/10/75 of # 279-E00N, submitted 10-31-74).

In study mentioned above the results of the soil metabolism study were given in terms of per cent of radioactivity present rather than per cent of radioactivity applied. This submission enables us to calculate soil metabolism in terms of % of applied radioactivity.

### Results of 90 day aerobic <sup>14</sup>C Triforine metabolism % of applied <sup>14</sup>C

Soil	ppm	Organic	Polar	CO <sub>2</sub>	Bound
Sandy Loam	2.0	17.9	5.3	24.2	27.6
	20.0	14.5	4.3	25.5	25.2
Silt Loam	2.0	7.4	1.9	18.4	43.8
	20.0	4.2	1.4	16.2	45.2

**Results of 60 Day Aerobic  $^3\text{H}$  Triforine Metabolism  
% of Applied  $^3\text{H}$**

Soil	ppm	Organic	Polar	Bound
Sandy Loam	2.0	32.1	8.9	32.6
	20.0	24.9	16.1	33.7
Silt Loam	2.0	13.2	12.8	52.4
	20.0	8.4	12.6	53.6

**Results of 90 Day Aerobic  $^3\text{H}$  - Triforine Metabolism  
% of Applied  $^3\text{H}$**

	ppm	Organic	Polar	Bound
Silt Loam	2.0	9.4	27.1	--
	20.0	4.3	18.2	--

90% of organic extract was parent compound

**Conclusions**

1. This review is a continuation of section III-1 (titled Soil Degradation of Triforine) of the environmental chemistry review dated 1/10/75.
2. The data submitted were adequate to clarify the aforementioned study and to remove the previous objections we made in reference to this study (recommendation #1 of review dated 1/10/75; item #3 of EPA ltr. of 3/17/75).
3. Studies with  $^{14}\text{C}$  (side chain labelled) and  $^3\text{H}$  (ring labelled) Triforine show that under aerobic conditions after 60 - 90 days 44 - 54% of applied was bound to silt loam and 25 - 28% of applied was bound to sandy loam.

**4.2 Movement of  $^3\text{H}$  labelled Triforine Aged Residues in Cosad Sandy Loam Soil (FMC Report # M-3595)**

$^3\text{H}$  (uniform ring label) Triforine was applied to soil at 20 ppm, and aged aerobically for 30 days. Soil was then extracted with 90% methanol/water. Extract was partitioned with methylene chloride to yield an organic phase and a polar phase. Organic phase was analyzed by TLC autoradiography. Soil and extracts were radioassayed.

0.32 x 12" soil columns were prepared. Either 10 microliters of methylene chloride phase of methanolic soil extract (containing 2.2 micrograms Triforine equivalent) or one gram of soil which had been extracted with methanol (containing equivalent to 6.5 micrograms Triforine.)

Column was subjected to 0.5" rainfall per day for 45 days.

Column was segmented, and assayed by combustion with LSC assay of Triforine. Effluent was radioassayed, and partition values of radioactivity in effluent between water and methylene chloride were examined.

Soil Characteristics: Sand 75.2%; Silt 18.0%; Clay 6.8%; O.M. 3.1%; pH 6.1; C.E.C. 7.3 meg/100g.

Leaching of Aged Triforine Residues in Sandy Loam Soil  
% of Radioactivity Applied to Column

Inches	Methylene Chloride phase of methanol Extract applied to column	Extracted Soil applied to column
0-3	32.9	36.4
3-6	12.6	4.9
6-9	10.2	2.9
9-12	6.25	1.9
Effluent	59.6	42.4

TLC showed methylene chloride phase to be almost all Triforine

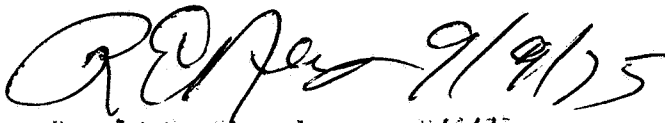
Partition Values for Effluent  
Methylene Chloride/Water

Days	Extract applied to column	Extracted Soil applied to column
18-24	.12	.02
25-31	.12	.05
32-38	.18	.07
39-45	.44	.10

Triforine partitioned totally into methylene chloride phase.

Conclusions:

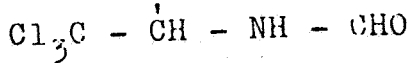
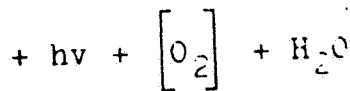
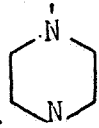
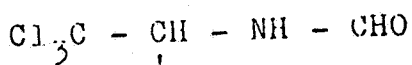
1. The leaching characteristics of the polar phase of the methanol extract were not examined. However, the polar metabolites did leach as parent compound degraded to polar compounds which leached.
2. Partition values of the effluent indicate that the parent compound was partially degraded on the column and that the parent is leached at a much slower rate than the polar metabolites.
3. This study was sufficient to show that both the parent compound (methylene chloride phase) and the non-extractable residues were very mobile, with the major portion of the radioactivity being found in the effluent water.
4. This study was submitted and reviewed in review dated 1/10/75, but there were many deletions concerning the data and experimental technique. The study has been re-submitted in a more complete form and has been re-reviewed here.

  
Ronald E. Key, Jr. 9/4/75

Frank J. Schenck 9/3/75

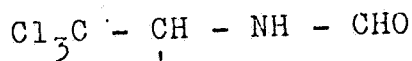
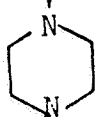
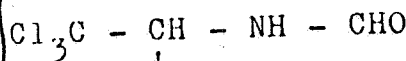
Environmental Chemistry Section  
E. E. E. B.

# Photodegradation

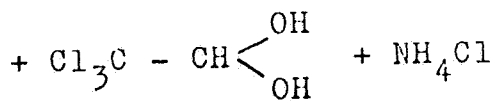
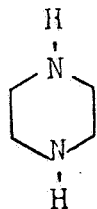
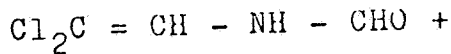
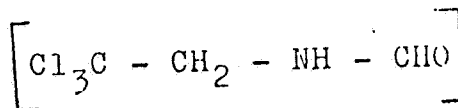
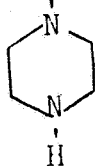


triforine

- HCl



W 1084



WOS 2599