

FILE COPY

Date Out EFB: 04 JUN 1982

To: Product Manager
TS-767

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

Attached please find the environmental fate review of:

Reg./File No.: 241-260

Chemical: Amdro

Type Product: Insecticide - fire ant

Product Name: Amdro

Company Name: Am. Cyanamid

Submission Purpose: Review photolysis & bluegill flow through
bioaccumulation studies

ZBB Code: ?

ACTION CODE: 336

Date in: 5/20/82

EFB # 332

Date Completed: 04 JUN 1982

TAIS (level II) Day

Deferrals To:

67 .3

 Ecological Effects Branch

 Residue Chemistry Branch

 Toxicology Branch

After extraction using acetonitrile and 80% aqueous methanol in 0.1 N HCl, the extract was analyzed using HPLC. The effluent from the column was monitored by UV_{254nm} followed by on-line mixing of Aquasol-2 scintillator. The resulting solution was passed through a scintillation spectrometer for analysis by LSC.

Essentially 100% of the applied radioactivity was accounted for; Table II gives the distribution of the applied radioactivity in the various fractions. The HPLC effluent indicated at least 9 compounds in addition to parent were found (Figure 1). No metabolite was present in excess of 4.5% of total radioactivity (Table III).

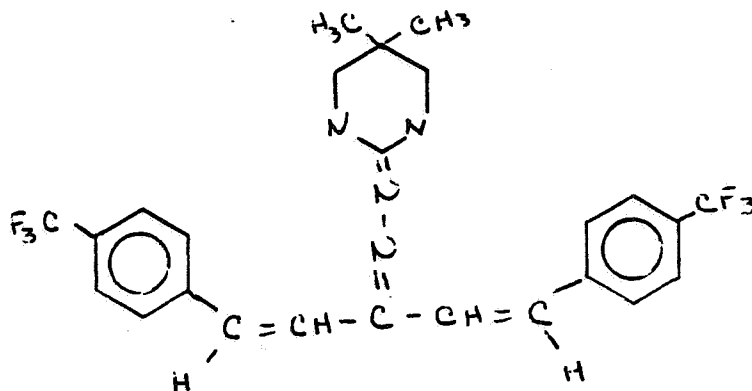
Conclusions

This study was conducted as a supplement to a photolysis study previously submitted and reviewed (Moraski, EFB, 5/27/81). The current results indicate that Amdro degrades quickly with a half-life of about 7 days. Photodegradation produces a number of metabolites none of which present more than 10% of the amount originally applied. These results compare favorably with the earlier study.

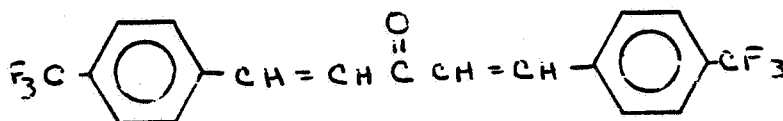
1.0 INTRODUCTION

American Cyanamid has submitted environmental fate data in support of its registration petition for Amdro. Acc. No.: 247502

- 2.0 Amdro: AC 217,300: CL 217,300
Tetrahydro-5,5-dimethyl-2(1 H)-pyrimidone{3-[4-trifluoromethyl) phenyl]-1-{2-[4-(trifluoromethyl)phenyl]ethenyl}-2-propeny- lidene}



- 2.1 CL 98,724



3.0 DISCUSSION OF DATA

- 3.1 Amdro Fire Ant Insecticide (CL 217,300): Photolysis on Soil Thin-Layer Plates (Pyrimidine Carbon-14 Labeled).
D.F. Barringer, Jr., Project No.: 0420, Report No.: PP-M
Volume 18-22.

The photolysis experiment was carried out in an environmental chamber equipped with a xenon arc lamp using borosilicate filters to simulate sunlight at 6000 watts and 27°C. The labeled Amdro in a methylene chloride solution was applied to a 0.75 mm layer of Princeton sandy loam soil (Table 1). This resulted in a concentration of 10 ppm Amdro in the soil. The plate was exposed to the light for 7 days.

AMORO (118401)

Page _____ is not included in this copy.

Pages 4 through 8 are not included.

The material not included contains the following type of information:

- ___ Identity of product inert ingredients.
 - ___ Identity of product impurities.
 - ___ Description of the product manufacturing process.
 - ___ Description of quality control procedures.
 - ___ Identity of the source of product ingredients.
 - ___ Sales or other commercial/financial information.
 - ___ A draft product label.
 - ___ The product confidential statement of formula.
 - ___ Information about a pending registration action.
 - FIFRA registration data.
 - ___ The document is a duplicate of page(s) _____.
 - ___ The document is not responsive to the request.
-

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

3.2 Amdro Fire Ant Insecticide (CL 217,300):
Identification and Characterization of CL 217,300 and Its
Metabolite in Bluegill Sunfish Exposed to 1.8 ppb of
CL 217,300 in Water, D. Barringer, Project No.: 0420,
Report No.: PD-M Volume 19-6.

Bluegill sunfish with an initial mean weight of 2.3 g and an initial mean length of 43 mm were used in this study. Aerated well water (Table 1) flowed through the aquaria at a rate of 350 ml/min/aquarium. The aquaria were maintained at 22°C. Following a 24 hr equilibration period, the test concentration was confirmed by radioanalysis before introducing the fish. One hundred fish were transferred to the control and test chambers. The fish were exposed to a constant average concentration of 1.8 ppb (solubility of Amdro = 2 ppb) for 30 days. A 14-day depuration period followed.

The sampling schedule is shown in Table 6. All measurements of radioactivity were made using a LSC system. A steady state approach was used to evaluate data from the bioconcentration study. A water-fish two compartment model was used to describe movement of test material in and out of fish. This was used to determine the bioconcentration factor (BCF), uptake rate constant (K_1), and the depuration rate constant (K_2).

Table 2 gives the results of the radioanalysis in whole fish, fillet, and viscera during uptake and depuration. The data seem to indicate that after 10 days, a steady state plateau was reached suggesting no further accumulation was occurring. The 30 day bioaccumulation factors of 1300 for whole fish, 780 for fillet, and 1900 for viscera were determined. By linear regression analysis of tissue concentration during uptake and depuration and the two-compartment, model, the uptake rate constant, K_1 , is 83 ml/gm/day depuration rate constant, K_2 , = 0.044 day⁻¹, and BCF = 1900 (Table 4).

Depuration data (Table 3) indicate a gradual clearance from bluegill tissue up to day 14. At the end of the depuration period, 48% depuration was found in whole fish, 63% in fillet, and 57% in viscera.

Residues in edible tissue and viscera analyzed by TLC indicated that the parent accounted for 56 to 76% of the total residue. The rest was made up of 15 metabolites, one of which was identified as CL 98, 724. No metabolite exceeded 6% of the total residue.

Conclusions

In an earlier study, American Cyanamid reported BCF of 34,900 (whole fish), 11,900 (fillets) and 35,900 (viscera), compared to 1300 (whole fish), 780 (fillet) and 1900 (viscera) found in this study.

These results indicate that there is a rather high potential for Amdro accumulating in fish. This is reasonable considering the water solubility is low (2 ppb) and the octanol-water partition coefficient is moderate to high. (203-212 for octanol concentrations of 0.1 - 1.0 ppm and 3000 to 1700 for starting octanol concentrations of 10 - 1000 ppm.) Depuration occurs but is gradual.

AMDRO (118401)

Page is not included in this copy.

Pages 11 through 15 are not included.

The material not included contains the following type of information:

- Identity of product inert ingredients.
 - Identity of product impurities.
 - Description of the product manufacturing process.
 - Description of quality control procedures.
 - Identity of the source of product ingredients.
 - Sales or other commercial/financial information.
 - A draft product label.
 - The product confidential statement of formula.
 - Information about a pending registration action.
 - FIFRA registration data.
 - The document is a duplicate of page(s) .
 - The document is not responsive to the request.
-

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

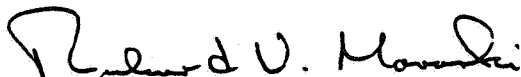
4.0 SUMMARY

4.1 Soil photolysis study confirms Amdro degrades in this manner rather quickly with a $t_{1/2}$ of 7 days or less.

4.2. The resubmitted fish accumulation study indicates Amdro does have a potential to bioconcentrate in fish with a gradual depuration when exposure ceases.

5.0 RECOMMENDATIONS

EFB believes these studies to be valid and to satisfy guideline requirements in those areas. EFB believes the potential exists for accumulation only when Amdro is directly discharged into receiving waters especially since hydrolysis is not as significant a route of degradation as was initially believed (Moraski, EFB, 5/6/82). EFB recommends that use near surface waters be restricted.



Richard V. Moraski
Review Section No. 1
Environmental Fate Branch