

US EPA ARCHIVE DOCUMENT

Shaughnessy No.: 108501

Date Out of EAB: 23 APR 1984

To: Robert Taylor  
Product Manager 25  
Registration Division (TS-767)

From: *Samuel Creeger* Samuel Creeger, Chief  
Review Section #1  
Exposure Assessment Branch  
Hazard Evaluation Division (TS-769)

Attached, please find the EAB review of...

Reg./File # : 241-243

Chemical Name: Pendimethalin

Type Product : Herbicide

Product Name : Prowl

Company Name : American Cyanamid

Purpose : Review data: Anaerobic Metabolism: Use on Rice.

ZBB Code : other

EAB #(s) : 4293

Action Code(s): 400

TAIS Code: 63

Date Received: 4/11/84

Total Reviewing Time: 1.0 days

Date Completed: APR 23 1984

Deferrals to: \_\_\_\_\_ Ecological Effects Branch  
\_\_\_\_\_ Residue Chemistry Branch  
\_\_\_\_\_ Toxicology Branch

## 1.0 INTRODUCTION

American Cyanamid has submitted an anaerobic soil metabolism study (accession 252623), in support of the use of its herbicide PROWL [pendimethalin : N-1(ethylpropyl)-3,4-dimethyl-2,6-dinitro-benzenamine] on rice. In the review of 12/3/82, EAB agreed to a modification to the study protocol to permit a 7 day aerobic incubation period (vs 30 days) which would more accurately reflect rice cultural practices.

## 2.0 STRUCTURE and DIRECTIONS FOR USE

See previous reviews.

## 3.0 SUBMITTED DATA

Mangels, G. 1984. PROWL™ Herbicide, pendimethalin (CL 92,553): Anaerobic Metabolism in Soil from a Rice Field. Chemical Development. Agricultural Research Division. American Cyanamid Company (company confidential). January 30, 1984. 18 pages, 3 tables, 1 figure, 4 references, appendix.

### Introduction

The rate and nature of the degradation of pendimethalin was evaluated in a flooded soil under anaerobic conditions designed to closely simulate actual field conditions.

### Experimental

Pendimethalin was <sup>14</sup>C-radiolabeled in both the 3 and 4 methyl groups, and found to have a specific activity of 25.67 uCi/mg. Radiopurity exceeded 95% as confirmed by 2-dimensional TLC. The product actually applied in these studies was a simulated 4E formulation (containing the appropriate other constituents) the mixture having a specific activity of 12.62 uCi/mg. The treatment rate was expected to simulate a field application of 1.5 lb ai/A.

An Arkansas silt loam was used in the study. Characteristics are summarized in report table I, appended to this review.

Five anaerobic chambers were prepared, to contain 500 gm soil each. Stock radiolabeled formulation was added to each, after which they were irradiated for 7 days under artificial light (12 hours on/off).

After the aerobic aging period, four of the flasks were flooded and purged under vacuum followed by N<sub>2</sub> replacement (two complete treatments), then stored at 25°C in the dark. The remaining flask was thoroughly extracted. At 14 day intervals, another of the flasks was taken for extraction.

The analytical procedures included combustion and/or LSC counting for total radioactivity. Extracts were subjected to 2-dimensional TLC, with spots visualized by radioautography. Scraped spots were quantified by LSC counting.

#### Results and Discussion

At the conclusion of the 7 day aerobic phase, >90% of the applied dose remained in the soil, 99% of which was found to be parent compound. During the anaerobic phase of the study, total organic extractability decreased to 34%, possibly due to loss of untrapped volatiles.

#### Conclusions

This study is unacceptable

No attempt was made to identify the degradation products which formed during this study. Material balance was poor, and neither halflife estimates nor decline curves were provided.

Figure 1 of the report (autoradiograms) was completely illegible and could not be evaluated. Autoradiograms for each sample period should be provided.

It is also not clear whether sufficient sampling and analysis was done to produce statistically significant results.

4.0

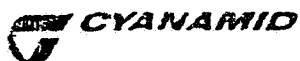
#### CONCLUSIONS

The anaerobic soil metabolism data requirement has still not been satisfied.

The registrant should address the issues noted in 3.0 above, or submit additional data.



Emil Regelman  
Chemist  
EAE/HED  
April 23, 1984



American Cyanamid Company  
Agricultural Research Division  
Princeton, New Jersey

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Table I: Analysis of Arkansas Soil\*

C.E.C. (meq/100 g)	23.1
Sand (%)	12.0
Silt (%)	62.8
Clay (%)	25.2
Texture	Silt Loam
Field Moisture at 1/3 Bar (%)	39.4
Bulk Density on Dry Soil (g/cc)	1.17
Organic Matter (%)	2.5
ph (Soil)	5.9
pH (Salt Buffer)	6.7
Hydrogen (meq/100 g)	2.5

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\* Performed by: United States Testing Company, Incorporated  
Memphis Laboratory  
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