

US EPA ARCHIVE DOCUMENT

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3-15-79

EEE BRANCH REVIEW

DATE: 11/28/78
IN _____ OUT _____ IN _____ OUT _____
FISH & WILDLIFE ENVIRONMENTAL CHEMISTRY EFFICACY

FILE OR REG. NO. 241-243

PETITION OR EXP. PERMIT NO. _____

DATE DIV. RECEIVED _____

DATE OF SUBMISSION _____

DATE SUBMISSION ACCEPTED _____

TYPE PRODUCTS(S): I, D, H, F, N, R, S _____

DATA ACCESSION NO(S). _____

PRODUCT MGR. NO. _____

PRODUCT NAME(S) B PROWL

COMPANY NAME _____

SUBMISSION PURPOSE _____

CHEMICAL & FORMULATION _____

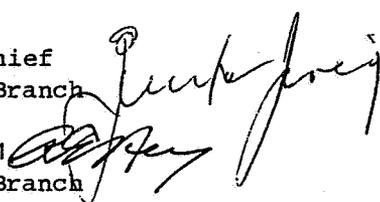
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DATE: **MAR 15 1979**

To: Product Manager
TS-767

Through: Dr. Gunter Zweig, Chief
Environmental Fate Branch

From: Review Section No. 1
Environmental Fate Branch



Attach please find the environmental fate review of:

Reg./File No.: 241-243 9F2134

Chemical: Pendimethalin

Type Product: Herbicide

Product Name: Prowl Herbicide

Company Name: American Cyanamid

Submission Purpose: Use on Potatoes--tank mixes also

ZBB Code: 1118

Date in: 11-29-78

Date out: 03-06-79

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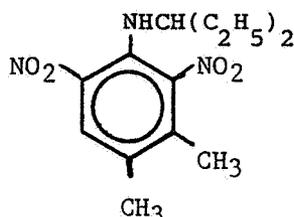
1.0 Introduction

1.1 Trade Name: Prowl herbicide (43.8% a.i.; 1 gal. contains 4 lbs. a.i.)

1.2 Chemical Name: Pendimethalin = [N-(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine]

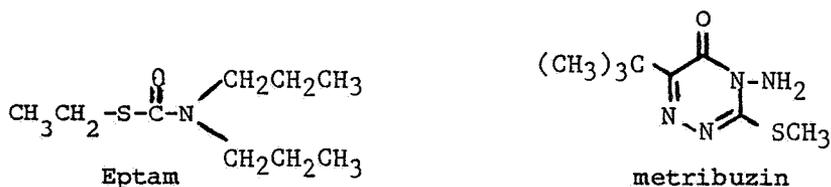
1.3 Other names: Penoxalin

1.4 Chemical Structure:



1.5 The registrant requests the added use of Prowl on potatoes as well as the use of Prowl in tank mixtures with metribuzin (Sencor or Lexone) and Eptam 7E.

1.6 Chemical Structures



2.0 Directions for Use

- 2.1 Apply preemergence or preemergence incorporated (incorporate 1-2 inches within seven days after application unless it rains) alone or in tank mixtures with Sencor or Lexone or Eptam 7E.
- 2.2 Apply 1.5 to 3 pts. of Prowl in ten or more gals. of water per acre by ground equipment. Do not apply before planting or post-emergence. Dosage depends on soil type and weed problem. Do no use on peat or muck soils.
- 2.3 Tank Mixtures
- 2.3.1 Apply 1.0 to 3.0 pts. of Prowl and 0.5 to 1.0 lb. of Sencor or Lexone 50WP per acre depending on soil type and weed problem. Do not use on peat or muck soils, sands, or loamy sands containing less than 1.5% organic matter, nor on any soils containing less than 0.5% organic matter.
- 2.3.2 Apply 1.0 to 3.0 pts. of Prowl and 3.0 - 3.5 pts. of Eptam 7E per acre depending on soil type and weed infestation. Do not use on peat or muck soils.
- 2.4 Keep out of lakes, streams or ponds. Do not apply when weather conditions favor drift. Do not contaminate water by cleaning of equipment or disposal of wastes.

2.5 Disposal

Rinse container three times and do not reuse. Crush and recycle for scrap to a steel melting plant. If not possible, crush container and bury at an approved dump site.

2.6 Destroy existing weeds before applying.

2.7 Do not store below 40° C as crystal formation may occur. Do not store near food or feed products. Keep container closed to avoid spills and contamination.

2.8 Observe all cautions and limitations on the labels of products used in combination with Prowl.

3.0 Discussion of Data

3.1 Environmental Chemistry data is referenced and has been reviewed previously in:

5F 1556	01/06/75
6F 1704	02/19/76
6F 1741	03/05/76

3.2 Tank mix data for Prowl with metribuzin (Sencor/Lexon) has previously been reviewed in 6F 1704, 2/19/76. An 18 month crop rotation restriction is required for metribuzin.

3.3 The following tank mix studies for Prowl with Eptam are included in this submission and are reviewed herein:

3.3.1 Exhibit 1 - Section D1B, EPA Acc. No. 9F2134: PROWL Pendimethalin Combination: Determination of CL92,553 and EPTAM Residues in Soil (NY, 1977). American Cyanamid Report No. C-1395, Expt. No. 60913-77-H8S.

A silty loam soil (2.2% organic matter) in this Riverhead, New York field study was divided into rows and either treated with Prowl or Prowl + Eptam tank mix preemergence incorporated.

Soil samples were collected from the 0-3 and 3-6 inch depths at 7, 14, 28, 56, and 90 days following applications and analyzed using GC (Prowl: Method M-520 validated in report C-462; Eptam: Stauffer Chemical Company Method WRC 73-42 validated in report C-1370).

Results

<u>Treatment Rate</u> (lbs. ai/A)		<u>Days Post</u> <u>Treatment</u>	<u>Soil</u> <u>Depth</u>	<u>Apparent ppm</u>	
<u>Prowl</u>	<u>Eptam</u>			<u>Prowl</u>	<u>Eptam</u>
1.5	-	7	0-3"	0.75	-
1.5	3.0	7	0-3"	1.07	1.08
1.5	-	7	3-6"	0.46	-
1.5	3.0	7	3-6"	0.29	0.26
1.5	-	14	0-3"	2.53	-
1.5	3.0	14	0-3"	0.67	2.45
1.5	-	14	3-6"	0.67	-
1.5	3.0	14	3-6"	<0.05	0.23
1.5	-	28	0-3"	0.35	-
1.5	3.0	28	0-3"	0.17	0.45
1.5	-	28	3-6"	0.35	-
1.5	3.0	28	3-6"	0.31	1.10
1.5	-	56	0-3"	1.94	-
1.5	3.0	56	0-3"	0.51	0.04
1.5	-	56	3-6"	0.58	-
1.5	3.0	56	3-6"	0.36	0.04
1.5	-	90	0-3"	0.45	-
1.5	3.0	90	0-3"	1.88	0.16
1.5	-	90	3-6"	0.11	-
1.5	3.0	90	3-6"	0.21	0.14
0.0	0.0	-	0-3"	<0.003	<0.02
0.0	0.0	-	3-6"	<0.003	<0.02

Residue values for Prowl are somewhat erratic.

The value of 1.88 ppm obtained for Prowl in the 90-day tank mix sample is abnormally high compared to earlier samples and is probably due to poor sampling technique and/or contamination. Three or at least two samples should have been taken and averaged for each of the varied parameters in this study. More consistent results would most likely have been obtained if this had been done.

Conclusions:

Use of the Prowl/Eptam tank mix does not significantly alter the soil halflife of Prowl or Eptam.

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- 3.3.2 Exhibit 2 - Section D1B, EPA Acc. No. 9F2134: PROWL: The Gas Chromatographic Determination of N-(1-ethyl-propyl)-2,6-dinitro-3,4-xylidine in Fortified Soil. American Cyanamid Report No. C-462.

Studies on high organic and low organic soils were conducted to determine if method M-520 is satisfactorily sensitive for the determination of Prowl in soil. CL 92,553 is extracted from soil with aqueous, acidic methanol, partitioned into hexane, and cleaned by adsorption chromatography on Florisil. GC is used with an electron capture detector against an external standard. Column used was a 180-cm. borosilicate glass tube packed with 5% EGSS-X on Gas Chrom Q, 100/120 mesh.

Results

The validated sensitivity of the method is 0.05 ppm, recoveries ranging from 80.1% to 99.4% for high organic soil and 78.3% to 101.2% in low organic soil.

Conclusions:

Method M-520 has a validated sensitivity to 0.05 ppm.

- 3.3.3 Exhibit 3, Section D1B, EPA Accession No. 9F2134: EPTAM: Contract Validation of Stauffer Chemical Company GLC Method WRC 73-42 for Residues of CL 35,863 in Potatoes and Soil by Technological Resources, Inc. (Camden, NJ, 1978). American Cyanamid Company Report No. C-1370.

Eptam is extracted from crop samples by steam distillation and is determined by GC using a 10% OV-17 column and a flame photometric detector in the sulfur mode.

Results

The recovery of EPTAM from soil fortified at levels of 0.05-2.0 ppm ranged from 40-90% with an average of 65%. The recovery of EPTAM from potatoes fortified at 0.05-1.0 ppm ranged from 30-120% with an average of 60%.

Conclusions:

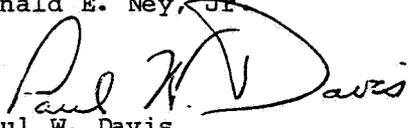
This procedure has already been approved for EPTAM.

4.0 Conclusions

- 4.1 Soil metabolism - anaerobic metabolism of parent is more rapid than aerobic metabolism but breakdown products are more rapidly metabolized aerobically than anaerobically.

- 4.2 Soil persistence - halflife of Prowl is 12-16 months.
- 4.3 Hydrolysis Prowl is stable at pH 5, 7 and 9 at 25° C in dark.
- 4.4 Photolysis - Soil TLC - 33-56% of applied activity lost in eight weeks, while 87% of applied activity is lost from glass slides in 24 hours. No volatilization from water solution but all parent is degraded in one week. Prowl volatilizes under photolysis.
- 4.5 Leaching - not significant.
- 4.6 Microbial - microbes do not degrade parent nor does Prowl affect microbe activities.
- 4.7 Catfish accumulation - 1450 in edibles, 2040X in viscera but edible residues declined during withdrawal.
- 4.8 Rotational crops - no significant residues found.
- 4.9 Disposal - label disposal information suffices.
- 4.10 Use of PROWL in combination with metribuzin (Sencor/ Lexon) does not significantly alter the halflife of the two active ingredients. Metribuzin has an 18 month crop rotation restriction.
- 4.11 Use of PROWL in a tank mix with EPTAM does not significantly affect the halflife of either active ingredient. There is no crop rotation restriction for EPTAM.
- 5.0 Recommendations
- 5.1 The environmental fate of this compound is known. The proposed use on potatoes is acceptable.
- 5.2 The proposed tank mixes for use on potatoes are acceptable.

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Review Section No. 1
EFB-HED

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