

US EPA ARCHIVE DOCUMENT

ECOLOGICAL EFFECTS BRANCH  
REVIEW

DATE: IN 8/24/79 OUT 5/13/80

FILE OR REG.NO. 241-243

PETITION, EXP. PERMIT, S. 18, 24c, NO. 9F2246

DATE OF SUBMISSION \_\_\_\_\_

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

TYPE PRODUCT(S): I, D, (H,) F, N. R, S Herbicide

DATA ACCESSION NO(S). NONE

PRODUCT MGR. NO. 25 - Taylor

PRODUCT NAME(S) Prowl

COMPANY NAME American Cynamid Company

SUBMISSION PURPOSE Proposed Use on grain sorghum - Incremental  
Risk Assessment Request

CHEMICAL & FORMULATION N-(1-ethylpropyl)-3,4-dimethyl-2,6-  
dinitrobenzeneamine - 42.3% E.C.

Pesticide Name Prowl

100 Pesticide Label Information

100.1 Pesticide Use

Prowl is currently registered for use on field corn, cotton and soybeans as a post-emergence herbicide. The proposed registration would add the use of Prowl to grain Sorghum in Colorado, Kansas, Nebraska, New Mexico, Oklahoma and Texas.

100.2 Formulation Information

Pendimethalin -- 42.3% EC formulation, 4 lbs. of Pendimethalin/gallon

100.3 Application Methods, Directions, Rates

See Appendix.

100.5 Precautionary Labeling

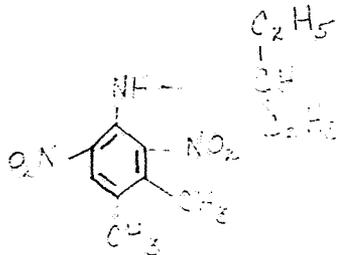
This product is toxic to fish. Keep out of lakes, streams or ponds. DO NOT apply when weather conditions favor drift from target area. DO NOT contaminate water by cleaning equipment or disposal of wastes.

101 Physical and Chemical Properties

101.1 Chemical Name

N-(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine  
[N-(1-ethylpropyl)-2,6-dinitro-3,4-xylidine]

101.2 Structural Formula



101.3 Common Names

Penoxyn, Penoxalin, Pendimethalin, AC92, 553, CL92, 553

101.4 Trade Name

Prowl

101.5 Molecular Weight

$C_{13}H_{19}N_3O_4$  - 281.3

101.6 Physical State

Color and State .....Orange-yellow crystals

Odor .....Faint, nutty odor

Boiling Point ..... 330°C

Melting Point ..... 56-57°C

Specific Gravity ..... 1.9 at 25°C

Vapor Pressure .....  $3.0 \times 10^{-5}$  mm Hg at 25°C

Stability .....Stable to Alkaline and Acidic Conditions

Corrosiveness .....Non-corrosive

101.7 Solubility

<u>Solvent</u>	<u>Temp. °C</u>	<u>Solubility (g/l)</u>
Water	23	0.5
Acetone	26	699
Xylene	26	628
Isopropanol	26	77
Corn Oil	26	148

102 Behavior in the Environment

See the EEB review by W. Rabert (10/23/79).

103 Toxicological Properties

See the EEB review by W. Rabert (10/23/79).

104 Hazard Assessment

#### 104.1 Discussion

Grain Sorghum is a major crop in the Great Plains and the Southwest. It is grown both as a dryland and as an irrigated crop. Texas, Kansas and Nebraska account for over 80 percent of the U.S. production. Colorado, New Mexico and Oklahoma account for a large measure of the remaining production. Together, these six states have approximately 16 million acres of cropland devoted to Sorghum. In Texas, over 900,000 acres are in its coastal counties.

Prowl is applied as a postemergence, incorporated herbicide. Application is made when grain Sorghum is 4 to 6 inches tall or at layby when grain Sorghum is approximately 20 to 24 inches tall. Maximum application rate is 1.5 lbs a.i./acre alone or in combination with Atrazine.

#### 104.2 Likelihood of Adverse Effects to Non-Target Organisms

Applications of Prowl to Sorghum should result in immediate soil residues of 33 ppm in the top 0.1 inch and with incorporation to 1 inch the residue should be 3.3 ppm. The active ingredient in Prowl, Pendimethalin, is slightly toxic to terrestrial vertebrates and is not expected to approach toxic levels in these animals' feedstuff when label directions are followed and applications are fully incorporated.

Pendimethalin is highly toxic to aquatic organisms. A chronic freshwater fish study indicates that reproductive effects may occur down to 10 ppb. Also, Pendimethalin is concentrated to 2200x in fathead minnows suggesting a bioaccumulation problem. Considering the solubility and soil adsorption characteristics of Pendimethalin (500/mg/l in water and slightly leachable) together with information on its persistence ( $1/2$ -life  $\geq$  90 days) a serious aquatic hazard may be expected. Additional information is necessary to fully evaluate this potential hazard. A chronic aquatic invertebrate study is necessary as are studies to determine the toxicity of Pendimethalin to Estuarine organisms.

#### 104.3 Endangered Species Considerations

The use of Prowl sorghum may adversely affect endangered amphibious and aquatic organisms in the proposed use area. Additional studies are needed to fully evaluate this potential hazard.

105 Conclusions

The Ecological Effects Branch does not concur with the proposed conditional registration of Prowl for use on Sorghum. Additional studies are necessary to complete a hazard evaluation.

105.5 Data Requests

The following studies are required by the Ecological Effects Branch before an Environmental Hazard Assessment can be completed.

1. An Aquatic invertebrate life-cycle toxicity study preferably with Daphnia magna.  
[See 7/10/78 EPA Guidelines, Sec. 163.72-4(a)(1)(iii) and (iv)]
2. An estuarine fish embryo-larvae toxicity study preferably with sheepshead minnow or spot, also the 96-hr LC<sub>50</sub> should be reported.  
[Sec. 163.72-3(a) and Sec. 163.72-4(a)(1)(iii) and (iv)]
3. An estuarine invertebrate life-cycle toxicity study preferably with mysid shrimp, also the 96-hr LC<sub>50</sub> should be reported.  
[Sec. 163.72-3(a) and Sec. 163.72-4(a)(1)(iii) and (iv)]

Additionally, field monitoring data on a sorghum or similar field may be needed to determine the residues of Pendimethalin in runoff, groundwater and receiving aquifers under actual use conditions.

Any questions concerning the above requests or acceptable protocols should be directed to the Ecological Effects Branch.

*Leslie Touart* 5/22/80  
Leslie Touart, Fisheries Biologist, Section 1

*Ray Matheny* 5/22/80  
Ray Matheny, Head, Section 1

*Clayton Bushong* CB 5-22-80  
Clayton Bushong, Chief, Ecological Effects Branch

Pendimethalin ecological effects review

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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 product 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
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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.

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# CYANAMID

American Cyanamid Company  
Agricultural Research Division  
P.O. Box 400  
Princeton, NJ 08540  
(609) 799-0400

December 19, 1979

Mr. Robert J. Taylor  
Acting Branch Chief  
Fungicide-Herbicide Branch  
Registration Division (WH-567)  
U.S. Environmental Protection Agency  
Waterside Mall, East Tower  
Washington D.C. 20460

Dear Mr. Taylor:

Re: PROWL® herbicide

Mr. William Rabert of the Fish and Wildlife Division contacted me about some questions that arose during his review of our pending application for use of PROWL on grain sorghum. Would you please make the following information available to him for his files:

- A. The accession numbers for the study titled: Chronic Toxicity of CL 92,553 to the Fathead Minnow, are 95521, 96342 and ~~253264~~.
- B. The time of application of PROWL herbicide on grain sorghum would be 6 to 8 weeks after planting for a lay-by application and no less than 2 to 3 weeks after planting when applied on sorghum up to 4 to 6 inches tall.
- C. In the study titled: Acute Toxicity of AC 92,553 to Bluegill, Rainbow Trout and Channel Catfish, done by Bionomics, Inc. (9/72), 10 fish of each species were used at each dose level. A copy of the letter from Bionomics confirming the number of fish is attached.
- D. The percent by weight of active ingredients of the test compounds in the study titled: Acute Toxicity of PROWL 3E, PROWL 4E and AVENGE® 2A-S wild oat herbicide to Bluegill and Rainbow Trout, done by Bionomics, Inc. (5/74) was at the time the tests were performed:

11

PROWL 3E	35.4%	pendimethalin
PROWL 4E	44.3%	pendimethalin
AVENGE 2A-S	22 %	difenzoquat cation

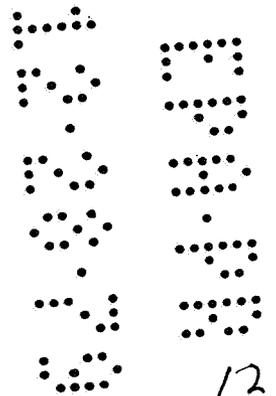
Very truly yours,



J. Gretchen Dyer, Ph.D.  
Registrations Coordinator  
Plant Industry Registrations

JGD:vec

Attachment



12



BIONOMICS  
AQUATIC TOXICOLOGY LABORATORY  
790 Main Street  
Wareham, Massachusetts 02571  
(617) 295-2550

November 14, 1979

Mr. Jim Behm  
American Cyanamid Company  
Agricultural Division  
P.O. Box 400  
Princeton, NJ 08540

Mr. J. A. Behm

NOV 20 1979

RE: Acute toxicity of AC 92553 to bluegill, rainbow trout and channel catfish

Dear Mr. Behm:

This is to confirm Dr. Macek's assurance to you in a telephone conversation on November 13, 1979 that during the acute toxicity testing performed in September of 1972 with AC 92553, we exposed ten fish in each concentration for tests with all three species, i.e. bluegill, rainbow trout and channel catfish. The omission of that information from the report was an oversight and I apologize for any inconvenience this may have caused you.

If you should need further information on this subject, or if I might help you in any other way, please contact me. Again, I am sorry for the oversight.

Sincerely,

EG&G, BIONOMICS

*Bevier H. Sleight III*

Bevier H. Sleight, III  
Manager, Aquatic  
Toxicology Laboratories

BHS:jeb

