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# Pendimethalin (CASRN 40487-42-1)

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**0292**

### Pendimethalin; CASRN 40487-42-1

Human health assessment information on a chemical substance is included in the IRIS database only after a comprehensive review of toxicity data, as outlined in the [IRIS assessment development process](#). Sections I (Health Hazard Assessments for Noncarcinogenic Effects) and II (Carcinogenicity Assessment for Lifetime Exposure) present the conclusions that were reached during the assessment development process. Supporting information and explanations of the methods used to derive the values given in IRIS are provided in the [guidance documents located on the IRIS website](#).

STATUS OF DATA FOR Pendimethalin

**File First On-Line 06/30/1988**

Category (section)	Status	Last Revised
Oral RfD Assessment (I.A.)	on-line	02/01/1991
Inhalation RfC Assessment (I.B.)	no data	
Carcinogenicity Assessment (II.)	no data	

## I. Chronic Health Hazard Assessments for Noncarcinogenic Effects

### I.A. Reference Dose for Chronic Oral Exposure (RfD)

Substance Name — Pendimethalin  
CASRN — 40487-42-1  
Primary Synonym — Prowl  
Last Revised — 02/01/1991

The oral Reference Dose (RfD) is based on the assumption that thresholds exist for certain

toxic effects such as cellular necrosis. It is expressed in units of mg/kg-day. In general, the RfD is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. Please refer to the Background Document for an elaboration of these concepts. RfDs can also be derived for the noncarcinogenic health effects of substances that are also carcinogens. Therefore, it is essential to refer to other sources of information concerning the carcinogenicity of this substance. If the U.S. EPA has evaluated this substance for potential human carcinogenicity, a summary of that evaluation will be contained in Section II of this file.

### **\_\_I.A.1. Oral RfD Summary**

<b>Critical Effect</b>	<b>Experimental Doses*</b>	<b>UF</b>	<b>MF</b>	<b>RfD</b>
Increase in serum alkaline phosphatase and liver weight, and hepatic lesions	NOEL: 12.5 mg/kg/day LEL: 50 mg/kg/day	300	1	4E-2 mg/kg/day
2-Year Dog Feeding Study				
American Cyanamid, 1979				

\*Conversion Factors and Assumptions — none

### **\_\_I.A.2. Principal and Supporting Studies (Oral RfD)**

American Cyanamid Co. 1979. MRID No. 00058657. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Purebred beagle dogs, 4/sex/dose, were fed pendimethalin 7 days a week by gelatin capsule at 0, 12.5, 50, and 200 mg/kg/day. Clinical chemistry findings were considered within normal limits for all dose levels however, serum alkaline phosphatase (SAP) was increased at the mid- and high-dose levels. Liver weights were increased and the liver showed lesions consisting of inflammation and hemosiderosis at the mid- and high-dose levels. The NOEL and LEL for systemic toxicity are 12.5 and 50 mg/kg/day, respectively, based on hepatic lesions and an increase in SAP and liver weights.

### **\_\_I.A.3. Uncertainty and Modifying Factors (Oral RfD)**

UF — An uncertainty factor of 100 was used to account for the inter- and intraspecies differences. An additional UF of 3 was used to account for the lack of an acceptable long term study in a second species. A factor of 3 was chosen rather than 10 since the studies at hand, although of insufficient quality, indicate that the dog is the more sensitive species, and since there is no significant difference in subchronic and chronic effects for this chemical.

MF — None

### **\_\_I.A.4. Additional Studies/Comments (Oral RfD)**

#### Data Considered for Establishing the RfD:

- 1) 2-Year Feeding - dog: Principal study - see previous description; core grade minimum (American Cyanamid Co., 1979a)
- 2) 3-Generation Reproduction - rat: Reproductive NOEL=500 ppm (25 mg/kg/day); Reproductive LEL=5000 ppm (250 mg/kg/day) (HDT; reduced litter size, survival index, and pup weight); core grade minimum (American Cyanamid Co., 1974a)
- 3) Teratology - rat: Fetotoxic and Teratogenic NOEL=500 mg/kg/day (HDT); core grade guideline (American Cyanamid Co., 1979b)
- 4) Teratology - rabbit: NOEL=60 mg/kg/day (HDT); core grade minimum (American Cyanamid Co., 1982)

#### Other Data Reviewed:

- 1) 90-Day Feeding - rat: NOEL=500 ppm (25 mg/kg/day); LEL=5000 ppm (250 mg/kg/day) (decrease in hematocrit and hemoglobin in males, decreased body weight and food consumption, hypertrophy of the liver accompanied by increased liver weights); core grade guideline (American Cyanamid Co., 1974b)
- 2) 90-Day Feeding - dog: NOEL=2500 ppm (62.5 mg/kg/day) (by gavage); no core grade (American Cyanamid Co., 1973)

Data Gap(s): Chronic Rat Feeding Study

#### **\_\_I.A.5. Confidence in the Oral RfD**

Study — Medium  
Database — Medium  
RfD — Medium

The critical study appears to be of good quality and is given a medium confidence rating. Since the database on chronic toxicity is supportive but incomplete, the database is given a medium confidence rating. Medium confidence in the RfD follows.

#### **\_\_I.A.6. EPA Documentation and Review of the Oral RfD**

Source Document — This assessment is not presented in any existing U.S. EPA document.

Other EPA Documentation — Pesticide Registration Standard, September 1984; Pesticide Registration Files

Agency Work Group Review — 08/19/1986, 09/16/1987

Verification Date — 09/16/1987

#### **\_\_I.A.7. EPA Contacts (Oral RfD)**

Please contact the IRIS Hotline for all questions concerning this assessment or IRIS, in

general, at (202)566-1676 (phone), (202)566-1749 (FAX) or [hotline.iris@epa.gov](mailto:hotline.iris@epa.gov) (internet address).

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### **\_I.B. Reference Concentration for Chronic Inhalation Exposure (RfC)**

Substance Name — Pendimethalin  
CASRN — 40487-42-1  
Primary Synonym — Prowl

Not available at this time.

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### **\_II. Carcinogenicity Assessment for Lifetime Exposure**

Substance Name — Pendimethalin  
CASRN — 40487-42-1  
Primary Synonym — Prowl

This substance/agent has not undergone a complete evaluation and determination under US EPA's IRIS program for evidence of human carcinogenic potential.

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**\_III. [reserved]**  
**\_IV. [reserved]**  
**\_V. [reserved]**

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### **\_VI. Bibliography**

Substance Name — Pendimethalin  
CASRN — 40487-42-1  
Primary Synonym — Prowl  
Last Revised — 02/01/1991

#### **\_VI.A. Oral RfD References**

American Cyanamid Company. 1973. MRID No. 00026672, 00040305, 00106763. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

American Cyanamid Company. 1974a. MRID No. 00026671, 00059470, 00106762. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

American Cyanamid Company. 1974b. MRID No. 00026667, 00026668, 00040302. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

American Cyanamid Company. 1979a. MRID No. 00058657. Available from EPA. Write to FOI,

EPA, Washington, DC 20460.

American Cyanamid Company. 1979b. MRID No. 00025752. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

American Cyanamid Company. 1982. MRID No. 00117444. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

### **\_VI.B. Inhalation RfC References**

None

### **\_VI.C. Carcinogenicity Assessment References**

None

### **\_VII. Revision History**

Substance Name — Pendimethalin

CASRN — 40487-42-1

Primary Synonym — Prowl

<b>Date</b>	<b>Section</b>	<b>Description</b>
02/01/1991	I.A.	Text edited
02/01/1991	VI.	Bibliography on-line
01/01/1992	IV.	Regulatory Action section on-line
04/01/1997	III., IV., V.	Drinking Water Health Advisories, EPA Regulatory Actions, and Supplementary Data were removed from IRIS on or before April 1997. IRIS users were directed to the appropriate EPA Program Offices for this information.
12/10/1998	I.A., II.	This chemical is being reassessed under the IRIS Program.
02/09/2004	I.A., II.	This chemical is no longer being reassessed under the IRIS Program. See Federal Register February 9, 2004 (Volume 69, Number 26).

### **\_VIII. Synonyms**

Substance Name — Pendimethalin

CASRN — 40487-42-1

Primary Synonym — Prowl  
Last Revised — 06/30/1988

- 40487-42-1
- AC 92553
- ANILINE, 3,4-DIMETHYL-2,6-DINITRO-N-(1-ETHYLPROPYL)-
- BENZENAMINE, 3,4-DIMETHYL-2,6-DINITRO-N-(1-ETHYLPROPYL)-
- BENZENAMINE, N-(1-ETHYLPROPYL)-3,4-DIMETHYL-2,6-DINITRO-
- HERBADOX
- HORBADOX
- N-(1-AETHYLPROPYL)-3,4-DIMETHYL-2,6-DINITROANILIN
- N-(1-AETHYLPROPYL)-2,6-DINITRO-3,4-XYLIDIN
- N-(1-ETHYLPROPYL)-3,4-DIMETHYL-2,6-DINITRO- BENZENAMINE
- N-(3-PENTYL)-3,4-DIMETHYL-2,6-DINITROANILINE
- PAY-OFF
- Pendimethalin
- PENDIMETHALINE
- PENOXALIN
- PENOXALINE
- PENOXYN
- PHENOXALIN
- Prowl
- STOMP
- STOMP 330D
- STOMP 330E
- TENDIMETHALIN
- 3,4-XYLIDINE, 2,6-DINITRO-N-(1-ETHYLPROPYL)-

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#### Chronic Health Hazards for Non-Carcinogenic Effects

#### Reference Dose for Chronic Oral Exposure (RfD)

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- Uncertainty and Modifying Factors
- Additional Studies/Comments
- Confidence in the Oral RfD
- EPA Documentation and Review

#### Reference Concentration for Chronic Inhalation Exposure (RfC)

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- Modifying Factors
- Additional Studies/Comments
- Confidence in the Inhalation RfC
- EPA Documentation and Review

### **Carcinogenicity Assessment for Lifetime Exposure**

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- Human Carcinogenicity Data
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- Supporting Data for Carcinogenicity

#### **Quantitative Estimate of Carcinogenic Risk from Oral Exposure**

- Summary of Risk Estimates
- Dose-Response Data
- Additional Comments
- Discussion of Confidence

#### **Quantitative Estimate of Carcinogenic Risk from Inhalation Exposure**

- Summary of Risk Estimates
- Dose-Response Data
- Additional Comments
- Discussion of Confidence
- EPA Documentation, Review and, Contacts

#### **Bibliography**

#### **Revision History**

#### **Synonyms**