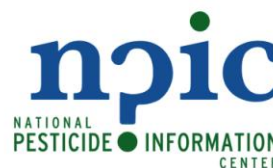


This fact sheet was created in 2001; some of the information may be out-of-date. NPIC is not planning to update this fact sheet. More pesticide fact sheets are available [here](#). Please call NPIC with any questions you have about pesticides at 800-858-7378, Monday through Friday, 8:00 am to 12:00 pm PST.



NPTN Technical Fact Sheets are designed to provide information that is technical in nature for individuals with a scientific background or familiarity with the regulation of pesticides by the U.S. Environmental Protection Agency (U.S. EPA). This document is intended to be helpful to professionals and to the general public for making decisions about pesticide use.

Hydroprene

(Technical Fact Sheet)

Please refer to the **General Fact Sheet** for less technical information.

The Pesticide Label: Labels provide directions for the proper use of a pesticide product. *Be sure to read the entire label before using any product.* A signal word on each product label indicates the product's potential hazard.

CAUTION - low toxicity

WARNING - moderate toxicity

DANGER - high toxicity

What is hydroprene?

- Hydroprene is an insecticide used against cockroaches, beetles, and moths (1). It was registered by the U.S. Environmental Protection Agency (EPA) in 1984. (2).
- Hydroprene belongs to the class of insecticides known as insect growth regulators (IGRs) (3). The U.S. EPA currently categorizes hydroprene as a biopesticide based on its biochemical properties (4, 5).
- Hydroprene is an amber liquid that is soluble in water (2 g/L at 20 °C) and common organic solvents. It is slightly volatile with a vapor pressure ranging from 1.88×10^{-4} mm Hg to 3×10^{-4} mm Hg at 25 °C. Hydroprene is stable for more than 3 years under normal storage conditions (6).
- Signal words for hydroprene products range from Caution to Warning (1). The signal word reflects the combined toxicity of hydroprene and other ingredients in each product. See the **Pesticide Label** box above.
- Hydroprene products are used on a variety of indoor sites including homes, offices, warehouses, restaurants, hospitals, and greenhouses. Commercial formulations of the insecticide include pressurized liquids, emulsions, and impregnated materials (i.e., bait stations) (1).

How does hydroprene work?

- Hydroprene disrupts normal development and emergence of insects by mimicking juvenile hormones produced by immature insects as they develop into reproductive adults (3).
- Hydroprene causes different effects on different insect. It may cause adult sterility, physical abnormalities, desiccation, and premature death (7).

What are some products that contain hydroprrene?

- Gencor®
- Gentrol®
- Raid® Max Sterilizer Discs

How toxic is hydroprrene?

Animals

- Hydroprrene is very low in toxicity when ingested. The acute oral LD50 for rats is >5000 mg/kg and >10,000 mg/kg for dogs (6). See boxes on **Laboratory Testing**, **Toxicity Category**, and **LD50/LC50**.
- Hydroprrene is low in toxicity when applied to the skin. The acute dermal LD50 for rabbits is >5100 mg/kg and >5000 mg/kg for rats (6).
- Hydroprrene is very low in toxicity when inhaled. The acute inhalation LC50 (4 hour) in rats is >5.5 mg/L (6).
- In skin irritation studies, hydroprrene was non-irritating to rabbits and mildly irritating to rats (6, 8). The U.S. EPA classifies hydroprrene as very low in toxicity for skin effects (8).
- In an eye irritation study with rabbits, hydroprrene caused mild eye irritation (6). The U.S. EPA classifies hydroprrene as very low in toxicity for eye effects (8).
- The U.S. EPA classifies hydroprrene as very low in toxicity for skin sensitization based on studies in guinea pigs (8).
- Scientists fed rats hydroprrene for 28 days and noted kidney effects at the higher doses (>250 mg/kg/day). The no observed adverse effect level (NOAEL) was 250 mg/kg/day (8).
- In a 90-day feeding study, investigators exposed male and female rats to hydroprrene. The NOAEL was 50 mg/kg/day. At higher doses (≥250 mg/kg/day), scientists observed liver cell effects in both sexes and ovarian cell effects in female rats (8).

Humans

- Data are not available from occupational exposure, accidental poisonings, or epidemiological studies regarding the acute toxicity of hydroprrene.

Laboratory Testing: Before pesticides are registered by the U.S. EPA, they must undergo laboratory testing for short-term (acute) and long-term (chronic) health effects. Laboratory animals are purposely fed high enough doses to cause toxic effects. These tests help scientists judge how these chemicals might affect humans, domestic animals, and wildlife in cases of overexposure. When pesticide products are used according to the label directions, toxic effects are not likely to occur because the amount of pesticide that people and pets may be exposed to is low compared to the doses fed to laboratory animals.

Toxicity Category

	High Toxicity (Danger)	Moderate Toxicity (Warning)	Low Toxicity (Caution)	Very Low Toxicity (Caution)
Oral LD50	Less than 50 mg/kg	50 - 500 mg/kg	500 - 5000 mg/kg	Greater than 5000 mg/kg
Dermal LD50	Less than 200 mg/kg	200 - 2000 mg/kg	2000 - 5000 mg/kg	Greater than 5000 mg/kg
Inhalation LC50	Less than 0.05 mg/l	0.05 - 0.5 mg/l	0.5 - 2 mg/l	Greater than 2 mg/l
Eye Effects	Corrosive	Irritation persisting for 7 days	Irritation reversible within 7 days	Minimal effects, gone within 24 hrs
Skin Effects	Corrosive	Severe irritation at 72 hours	Moderate irritation at 72 hours	Mild or slight irritation

LD50/LC50: A common measure of acute toxicity is the lethal dose (LD50) or lethal concentration (LC50) that causes death (resulting from a single or limited exposure) in 50 percent of the treated animals. LD50 is generally expressed as the dose in milligrams (mg) of chemical per kilogram (kg) of body weight. LC50 is often expressed as mg of chemical per volume (e.g., liter (L)) of medium (i.e., air or water) to which the organism is exposed to. Chemicals are considered highly toxic when the LD50/LC50 is small and practically non-toxic when the value is large. However, the LD50/LC50 does not reflect any effects from long-term exposure (i.e., cancer, birth defects, or reproductive toxicity) that may occur at levels below those that cause death.

Is hydroprone metabolized and eliminated from the body?

Animals

- In a rat metabolism study, hydroprone levels peaked in the blood at 5 to 7 hours. Researchers detected the highest residue levels in the liver, fat, and adrenal glands after 6 hours. Elimination of the chemical was biphasic, and the second half-life occurred 2 to 10 days after exposure. Approximately 13% of the hydroprone was retained in rats (8). See box on **Half-life**.

Humans

- Data are not available regarding the metabolism and elimination of hydroprone in humans.

Half-life is the time required for half of the compound to degrade.

1 half-life=50% degraded
2 half-lives=75% degraded
3 half-lives=88% degraded
4 half-lives=94% degraded
5 half-lives=97% degraded

Remember that the amount of chemical remaining after a half-life will always depend on the amount of the chemical originally applied.

Does hydroprone cause reproductive or teratogenic effects?

Animals

- In a reproductive study, researchers fed rats hydroprone in the diet at doses of 0, 300, 1500, or 7500 mg hydroprone/kg diet. They detected no fertility effects related to treatment. Adult and progeny rats had lower body weight gains at the highest dose (7500 mg hydroprone/kg diet). The NOAEL for parental effects was 1500 mg hydroprone/kg diet (8).
- In a developmental study, scientists exposed pregnant rabbits to hydroprone and detected no developmental effects. At the highest dose (90 mg/kg/day), scientists noted maternal weight loss. The developmental NOAEL was 90 mg/kg/day (8).

Humans

- Data are not available from occupational exposure, accidental poisonings, or epidemiological studies regarding the reproductive and developmental toxicity of hydroprone.

Is hydroprone a carcinogen?

Animals

- In a cancer study, laboratory workers fed rats hydroprone at doses of 0 (two control groups), 100, 1000, or 10,000 mg hydroprone/kg diet. Workers noted no evidence of treatment-related carcinomas or precancerous changes (8).
- Methoprene, an IGR that is a structural analog of hydroprone, has not displayed carcinogenicity (8).
- Researchers often use studies designed to test for mutagenicity to screen chemicals for carcinogenicity. Sufficient evidence exists to determine that hydroprone does not have significant potential for mutagenicity (8).

Humans

- The U.S. EPA currently classifies hydroprone as a group D carcinogen (10). This classification denotes that hydroprone is not classifiable as to human carcinogenicity (10). See box on **Cancer**.
- Data are not available from occupational exposures or epidemiological studies regarding the carcinogenicity of hydroprone.

Cancer: The U.S. EPA has strict guidelines that require testing of pesticides for their potential to cause cancer. These studies involve feeding laboratory animals large *daily* doses of the pesticide over most of the lifetime of the animal. Based on these tests, and any other available information, EPA gives the pesticide a rating for its potential to cause cancer in humans. For example, if a pesticide does not cause cancer in animal tests at large doses, then the EPA considers it unlikely the pesticide will cause cancer in humans. Cancer tests are not conducted on human subjects.

What is the environmental fate and behavior of hydroprene?

- Hydroprene rapidly degrades in soil with a half-life of a few days (6).
- No data are available regarding the aquatic fate of hydroprene.
- Plants degrade hydroprene (6).

What effects does hydroprene have on wildlife?

- Hydroprene is practically non-toxic to fish (LC50 >100 mg/L) (6). It may be toxic to aquatic invertebrates. Scientists observed that hydroprene causes premature metamorphosis in immature aquatic invertebrates (11).
- No data are available regarding the toxicity of hydroprene to birds.
- Hydroprene is low in toxicity to adult bees. The acute oral and contact LD50s for bees are more than >1000 µg/bee. Bee larvae are affected by hydroprene at levels of 0.1 µg/bee (6).

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For more information contact: NPIC

Oregon State University, 310 Weniger Hall, Corvallis, Oregon 97331
Phone: 1-800-858-7378 Fax: 1-541-737-0761 Email: npic@ace.orst.edu
NPIC at www.npic.orst.edu EXTTOXNET at <http://extoxnet.orst.edu/>

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