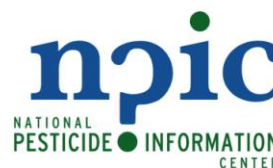


This fact sheet was created in 2002; some of the information may be out-of-date. NPIC is not planning to update this fact sheet. More pesticide fact sheets are available [here](#). Please call NPIC with any questions you have about pesticides at 800-858-7378, Monday through Friday, 7:30 am to 3:30 am PST.



NPIC General Fact Sheets are designed to answer questions that are commonly asked by the general public about pesticides that are regulated 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 pesticides.

# Hydramethylnon

## (General Fact Sheet)

Please refer to the **Technical Fact Sheet** for more 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.* Signal words, listed below, are found on the front of each product label and indicate the product's potential hazard.

**CAUTION - low toxicity**

**WARNING - moderate toxicity**

**DANGER - high toxicity**

## What is hydramethylnon?

- Hydramethylnon is an insecticide that was first registered for use in the United States by the Environmental Protection Agency (EPA) in 1980 (1).
- Currently, 28 products containing hydramethylnon are actively registered with the EPA (1).

## How is hydramethylnon used?

- Products with hydramethylnon are often used to control ants, cockroaches, termites, crickets, and silverfish (2).
- Products containing hydramethylnon are formulated as granules or incorporated into materials such as baits or gels (1).
- Hydramethylnon is a registered chemical alternative for chlorpyrifos for use as a termiticide and against ants, crickets, and cockroaches around the home and lawn (3).

## What are some products that contain hydramethylnon?

- Maxforce®
- Combat®
- Siege®
- Amdro®
- Sensible®

## How does hydramethylnon work?

- Hydramethylnon kills insects by disrupting energy production in their cells (4).
- Hydramethylnon is a slow-acting poison (delayed toxicity) that needs to be eaten to be effective (4).
- A slow-acting poison is desirable when controlling social insects, such as ants or termites, because then they live long enough to return to the colony to share it with other insects (5).

## How toxic is hydramethylnon?

### Animals

- Hydramethylnon is low in toxicity to both male and female rats (1). See boxes on **Laboratory Testing**, **Toxicity Category**, and **LD50/LC50**.
- When researchers applied hydramethylnon to the skin of rabbits, they found no evidence of toxicity (1).
- Hydramethylnon is not a skin sensitizer in guinea pigs (1).
- Hydramethylnon causes moderate, but temporary, eye irritation in rabbits (6).
- Researchers found that hydramethylnon is practically non-toxic when inhaled by rats (1).
- Rats fed hydramethylnon showed the following signs: salivation, decreased activity, decreased appetite, weight loss, bloody nose, and difficulty with coordination and balance (1).

**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.

**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) 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.

Toxicity Category

	High Toxicity (Danger)	Moderate Toxicity (Warning)	Low Toxicity (Caution)	Very Low Toxicity (Caution)
<b>Oral LD50</b>	Less than 50 mg/kg	50 - 500 mg/kg	500 - 5000 mg/kg	Greater than 5000 mg/kg
<b>Dermal LD50</b>	Less than 200 mg/kg	200 - 2000 mg/kg	2000 - 5000 mg/kg	Greater than 5000 mg/kg
<b>Inhalation LC50 - 4hr</b>	Less than 0.05 mg/l	0.05 - 0.5 mg/l	0.5 - 2 mg/l	Greater than 2 mg/l
<b>Eye Effects</b>	Corrosive	Irritation persisting for 7 days	Irritation reversible within 7 days	Minimal effects, gone within 24 hrs
<b>Skin Effects</b>	Corrosive	Severe irritation at 72 hours	Moderate irritation at 72 hours	Mild or slight irritation

U.S. Environmental Protection Agency, Office of Pesticide Programs, Label Review Manual, Chapter 7: Precautionary Labeling  
<http://www.epa.gov/oppfod01/labeling/lrm/chap-07.htm>

### Humans

- Data is not available from accidental poisonings, occupational exposures, or epidemiological studies regarding the toxicity of hydramethylnon in humans.

## Does hydramethylnon break down and leave the body?

- Male and female rats fed hydramethylnon lost 85-98% of the chemical through their feces and 1-2% through their urine within 7 days (1, 6).
- Less than 10% of hydramethylnon fed to rats remained in their bodies after 7 days of testing, with a slightly greater amount accumulating in the females (1).
- Hydramethylnon was put into the diet of goats for 8 days and cattle for 21 days. Tests found no residues in any tissues or milk (6).

## Does hydramethylnon cause reproductive problems or birth defects?

### Animals

- Scientists did not find any evidence of damage to the embryo or fetus when hydramethylnon was given to rats and rabbits during pregnancy (6).
- Hydramethylnon was fed to rats over the course of two generations. Researchers observed that male rats were less inclined to mate and had smaller testicles. At the highest dose tested, females were less likely to become pregnant (7).
- Tests in rats have shown that hydramethylnon primarily affects the testes (8).
- Exposure to high levels of hydramethylnon may cause prostate and testicular degeneration, which may result in small, soft testes of reduced weight (1, 7).

### Humans

- Current scientific data shows that common exposure levels of hydramethylnon are not likely to cause any adverse reproductive problems in humans (8).

## Are there other effects of long-term exposure to hydramethylnon?

- Scientists fed holstein calves 1/4 lb. of a product containing 0.5% hydramethylnon in corn each day for 7 weeks. Treated animals had significantly reduced white blood cell counts (9).

## Does hydramethylnon cause cancer?

### Animals

- Researchers fed rats hydramethylnon for 2 years and at the highest dose noted an increase in uterine and adrenal tumors (1).
- Mice fed hydramethylnon over their lifetime had an increase in lung cancers (1).
- Researchers often test chemicals to see if they change the genetic material of an organism, which would indicate potential to cause cancer. Hydramethylnon tested negative in such tests (1).

**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, then the EPA considers it unlikely the pesticide will cause cancer in humans. Testing for cancer is not done on human subjects.

## Humans

- The EPA has classified hydramethylnon as a possible (group C) human carcinogen (1). This classification means that hydramethylnon has been shown to cause cancer in one strain or sex of laboratory animals, but there is inadequate or no evidence that it may cause cancer in humans. See **Cancer** box.

## What happens to hydramethylnon outdoors?

### Water

- Hydramethylnon has a half-life of 1 hour in water and 5 days in soil when exposed to sunlight (10). See **Half-life** box.
- Hydramethylnon is not likely to contaminate groundwater because it does not dissolve in water and will stick to the soil (1).

### Air

- Hydramethylnon has the potential to evaporate from water but is stable on soil surfaces (10, 11).

### Soil

- Hydramethylnon binds tightly to soil, making its movement and availability in the environment extremely low (12).
- The half-life of hydramethylnon in soils may range from 7-391 days (1, 6, 12).
- A product containing 0.88% hydramethylnon was exposed to typical summer field conditions in Florida . Temperature did not influence the rate of breakdown; however, the product rapidly degraded when exposed to sunlight, becoming ineffective for fire ant control after 12-30 hours (13).

### Plants

- Plants do not take up hydramethylnon from the soil, and any residues on plant leaves typically come from direct contact during application of the product (10).

## Does hydramethylnon affect wildlife?

- Hydramethylnon dust is practically non-toxic to honey bees that eat or touch the dust (1, 6).
- Hydramethylnon is slightly toxic to practically non-toxic in birds depending upon the species (1).
- Hydramethylnon is moderately to very highly toxic to freshwater fish. Hydramethylnon is also moderately toxic to freshwater insects and shrimp. However, aquatic life is not likely to be exposed because hydramethylnon does not dissolve in water and also breaks down rapidly in water (1, 10).

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

**1 half-life=50% remaining**  
**2 half-lives=25% remaining**  
**3 half-lives=12% remaining**  
**4 half-lives= 6% remaining**  
**5 half-lives= 3% remaining**

The amount of chemical remaining after a half-life will always depend on the amount of the chemical present initially.

### 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://exttoxnet.orst.edu/

## References

1. *Reregistration Eligibility Decision: Hydramethylnon*; EPA 738-R-98-023; U.S. Environmental Protection Agency, Office of Pesticide Programs, U.S. Government Printing Office: Washington, DC, December 1998.
2. *Pest-Bank Pesticide Product Data* [CD-ROM]; Purdue Research Foundation: West Lafayette, IN, August 2001.
3. U.S. EPA Registered Chemical Alternatives for Chlorpyrifos.  
<http://www.epa.gov/pesticides/op/chlorpyrifos/alternatives.htm> (accessed Nov 2001); United States Environmental Protection Agency, Office of Pesticide Programs.
4. Lovell, J. B. Amidinohydrazones - A New Class of Insecticides. *Proceedings 1979 British Crop Protection Conference - Pests and Diseases*. **1979**, 575-582.
5. Stringer, C. E., Jr.; Lofgren, C. S.; Bartlett, F. J. Imported Fire Ant Toxic Bait Studies: Evaluation of Toxicants. *J. Econ. Entom.* **1964**, *57*, 941-945.
6. *A World Compendium: The Pesticide Manual*, 12<sup>th</sup> ed.; Tomlin, C. D. S., Ed.; British Crop Protection Council: Farnham, UK, 2000; pp 516-517.
7. *Summary of Toxicological Data: Hydramethylnon*; California Environmental Protection Agency, Department of Pesticide Regulation, Medical Toxicology Branch: Sacramento, CA, 2000.
8. Hydramethylnon. In *Pesticide Profiles: Toxicity, Environmental Impact, and Fate*; Kamrin, M. A., Ed.; CRC/Lewis Publishing: Boca Raton, FL, 1997; pp 539-542.
9. Evans, D. L.; Jacobsen, K. L.; Miller, D. M. Hematologic and immunologic responses of Holstein calves to a fire ant toxicant. *Am. J. Vet. Res.* **1984**, *45*, 1023-1027.
10. Bacey, J. Environmental Fate of Hydramethylnon; California Environmental Protection Agency, Department of Pesticide Regulation: Sacramento, CA, 2000. Available at <http://www.cdpr.ca.gov/docs/empm/pubs/envfate.htm> (accessed Jan 2002).
11. *Hazardous Substances Data Bank* [CD-ROM]; National Library of Medicine, Department of Health and Human Services: Bethesda, MD August 2001.
12. Vogue, P.; Kerle, E.; Jenkins, J. *Oregon State University Extension Pesticide Properties Database*; Oregon State University Extension Service: Corvallis, OR, 1994.
13. Vander Meer, R. K.; Williams, D. F.; Lofgren, C. S. Degradation of the Toxicant AC 217,300 in Amdro Imported Fire Ant Bait under Field Conditions. *J. Agric. Food Chem.* **1982**, *30*, 1045-1048.