

# **E X T O X N E T**

## **Extension Toxicology Network**

A Pesticide Information Project of Cooperative Extension Offices of Cornell University, Michigan State University, Oregon State University, and University of California at Davis. Major support and funding was provided by the USDA/Extension Service/National Agricultural Pesticide Impact Assessment Program.

**P**esticide  
**I**nformation  
**P**rofile

# Haloxypop

Publication Date: 9/95

## **TRADE OR OTHER NAMES**

The common name haloxypop is also used for haloxypop-methyl and haloxypop-ethoxyethyl. Trade names include Verdict, Gallant, Zellek, and Dowco 453 ME (haloxypop methyl) or Dowco 453 EE (haloxypop ethoxyethyl)([1](#)).

## **REGULATORY STATUS**

Registration is pending for use of haloxypop in the United States ([3](#)).

## **INTRODUCTION**

Haloxypop is in the pyridine chemical family ([2](#)). It is produced in two forms, haloxypop-methyl and haloxypop-ethoxyethyl. Both are used as pre- and postemergence selective herbicides. They control annual and perennial grasses in sugar beet, oilseed, potatoes, leaf vegetables, onions, sunflowers, strawberries, and other crops. Haloxypop-ethoxyethyl and haloxypop-methyl are absorbed into the plant and inhibit growth ([1](#)). The EPA classifies haloxypop as toxicity class II-moderately toxic. All products containing haloxypop bear the Signal Word "Warning." It is available as an emulsifiable concentrate ([3](#)).

## **TOXICOLOGICAL EFFECTS**

### **ACUTE TOXICITY**

The oral LD50, the dose of haloxypop-methyl that kills half of the study animals, is 393 mg/kg for rats. The LD50 is greater than 5,000 mg/kg for rabbits whose skin is exposed to haloxypop-methyl ([4](#)). Haloxypop-ethoxyethyl has an oral LD50 of 518-531 mg/kg for rats. The dermal LD50 is greater than 2000 mg/kg for rats and greater than 5,000 mg/kg for rabbits.

Both haloxypop forms are non-irritating to skin and do not cause skin sensitization. They are mild eye irritants ([1](#)). The symptoms of toxicity in rats are reduced food intake and reduced food consumption. They may also cause liver and kidney damage ([4](#)).

### **CHRONIC TOXICITY**

## Reproductive Effects

In rats, oral doses of 10 and 50 mg/kg/day of haloxypop-ethoxyethyl from days 6 to 16 of pregnancy reduced the number of live offspring per litter and caused vaginal bleeding in the mother (5).

## Teratogenic Effects

Oral doses of 50 mg/kg/day of haloxypop-ethoxyethyl in rats between days 6 and 16 of pregnancy caused developmental abnormalities in the offspring's urogenital system and death to the fetus (5). Oral doses of 7.5 mg/kg/day of haloxypop-methyl given to rats from days 6 to 15 of pregnancy caused delayed bone formation in the offspring (6).

## Mutagenic Effects

No information is currently available.

## Carcinogenic Effects

Studies show that 0.1 mg/kg/day of haloxypop-methyl for two years, the highest dose tested, does not cause cancer in rats. Similarly, 0.6 mg/kg/day for two years, the highest dose tested, is not carcinogenic to mice (6).

## Organ Toxicity

Doses of 100 mg/kg/day of haloxypop-methyl caused kidney damage in adult rats (4). Doses of 0.6 mg/kg/day for 2 years in mice caused reduced body weight gains and increased liver weights in mice. In dogs, 5 mg/kg/day causes a significant decrease in serum cholesterol, as well as a decrease in thyroid weight (6).

## Fate in Humans and Animals

In rats, haloxypop-ethoxyethyl undergoes metabolism to haloxypop which is excreted in feces and urine (1).

## ECOLOGICAL EFFECTS

### Effects on Birds

Haloxypop-methyl and haloxypop-ethoxyethyl are practically non-toxic to birds. The oral LD50 is greater than 2,150 mg/kg for mallard ducks. The dietary LC50 (8 day) is greater than 5,620 mg/kg for bobwhite quail (1, 2).

### Effects on Aquatic Organisms

Haloxypop-methyl is practically non-toxic to fish. The LC50, the concentration in water at which half of the test animals died, ranges from 96 to greater than 1000 mg/kg (2). Haloxypop-ethoxyethyl is moderately to highly toxic to fish. The LC50 (96 hour) is 0.54 mg/l for fathead minnows, 0.28 mg/l for bluegill sunfish, and 1.8 mg/l for rainbow trout. The LC50 (48 hours) for Daphnia is 4.64 mg/l (1).

### Effects on Other Animals (Nontarget species)

Haloxypop is not toxic to bees. The contact and oral LD50 (48 hours) is 100 micrograms haloxypop/bee (1).

## ENVIRONMENTAL FATE

### Breakdown of Chemical in Soil and Groundwater

Haloxypop-ethoxyethyl is converted to haloxypop in soil. The half-life of haloxypop-ethoxyethyl, the amount of time needed to reduce its concentration by half, is greater than one day on silty clay loam at 20 degrees C. The half-life of haloxypop in soil is 55-100 days depending on the soil (1). Leaching is moderate (5).

### Breakdown of Chemical in Surface Water

The half-life of haloxypop in water is 33 days for haloxypop at pH 5, 5 days at pH 7, and a few hours at pH 9 (1).

### Breakdown of Chemical in Vegetation

No information is currently available.

## PHYSICAL PROPERTIES AND GUIDELINES

Haloxypop (acid) is a white crystal with an offensive odor. Haloxypop-ethoxyethyl is a colorless crystal which is hydrolyzed to haloxypop under acidic and alkaline conditions. The rate of hydrolysis increases with temperature (1). Haloxypop-methyl is an amber to straw yellow solid with a mild aromatic odor. It is stable to UV light and in high temperatures. There is no decomposition after 88 hours at 200 degrees C.

### Physical Properties:

<b>CAS#:</b>	Haloxypop-ethoxyethyl 87237-48-7
<b>Chemical Name:</b>	2-(4-((3-chloro-5-trifluoro methyl)-2-pyridinyl) oxy)phenoxy)-2-ethoxyethyl ester
<b>CAS#:</b>	69806-40-2
<b>Chemical name:</b>	2-(4-(3-chloro-5-(trifluoro methyl)-2-pyridinyl)oxy)phenoxy-methyl ester
<b>Molecular Weight:</b>	361.7 (acid) 433.81(haloxypop ethoxyethyl) 375.73(haloxypop-methyl)
<b>Melting points:</b>	107-108 degrees C (acid) 56-58 degrees C (haloxypop-ethoxyethyl) (1) 55-57 degrees C (haloxypop-methyl)
<b>Solubilities in water:</b>	0.5 mg/l (haloxypop-ethoxyethyl) 43.3 mg/l(acid) 9.3 mg/l (haloxypop-methyl)(7)
<b>Solubilities in solvents:</b>	xylene: 125g/100 ml (haloxypop-ethoxyethyl) 127g/100 ml (haloxypop-methyl) 7.4g/100 ml(acid)

acetone: >100g/100 ml (acid, haloxypop ethoxyethyl, haloxypop-methyl)

toluene: >100g/100 ml (ethoxyethyl)  
11.8g/100 ml (acid)

**Vapor pressure:** <math>1.3 \times 10^{-7}</math> mm Hg at 25 degrees C (acid)  
<math>3.4 \times 10^{-6}</math> mm Hg at 25 degrees C (haloxypop ethoxyethyl)  
<math>6.5 \times 10^{-7}</math> mm Hg at 25 degrees C (haloxypop-methyl)

**Partition coefficient (octanol/water):** (haloxypop-ethoxyethyl) 29,500 ([1](#))

### Exposure Guidelines:

All guidelines given are for haloxypop-methyl.

**RfD:**  $5.0 \times 10^{-5}$  mg/kg/day (kidney effects)([4](#))

**NOEL:** 0.005 mg/kg/day ([4](#))

**LEL:** 0.05 mg/kg/day (reduced fertility) ([4](#))

## BASIC MANUFACTURER

DowElanco  
Crops Division  
9002 Purdue Road  
Indianapolis, IN 46268-1189  
Telephone: 800-258-3033  
Emergency: 517-636-4400

### Review by Basic Manufacturer:

Comments solicited: October, 1994

Comments received: November, 1994

## REFERENCES

1. The Agrochemicals Handbook, Third Edition. 1994. Royal Society of Chemistry Information Systems, Unwin Brothers Ltd., Surrey, England.
2. Meister, R.T. 1994. Farm Chemicals Handbook '94. Meister Publishing Company. Willoughby, OH.
3. Meister, R.T. 1992. Farm Chemicals Handbook '92. Meister Publishing Company. Willoughby, OH.
4. National Institute for Occupational Safety and Health (NIOSH). 1993. Registry of Toxic Effects of Chemical Substances (RTECS). NIOSH. Cincinnati, OH.
5. Machera, K. 1993. Developmental Toxicity of Haloxypop Ethoxyethyl Ester in the Rat in Bulletin of Environmental Contamination and Toxicology, Vol.51, No.4. pp. 625-632.
6. U.S. Environmental Protection Agency. 1994. Integrated Risk Information System (IRIS) through TOXNET. U.S. EPA. Washington, DC.