halosulfuron methyl

Review Date: 7/14/2009

Type	Selective herbicide for post-emergent control of sedges.
Controls	Sedges (purple and yellow nutsedge) in turf grass, lawns and landscaped areas.
Mode of Action	Halosulfuron methyl is part of the sulfonylurea chemical family which inhibit acetolactate synthase (an enzyme in the biosynthetic pathway).

Thurston County Review Summary:

Halosulfuron methyl is considered high in mobility and persistence hazard. Bioaccumulation potential and the risk for toxicity from exposures following herbicide applications are considered low in hazard. Because of the high hazard for persistence and mobility,, herbicide products containing halosulfuron methyl as the sole active ingredient, are rated as conditional.

MOBILITY

Property	Value	Reference	Rating
Solubility (mg/L)	1,650	2	High
Soil Sorption (Kd=mL/g)	Not found		
Organic Sorption (Koc=mL/g)	124	2	High

Mobility Summary:

Halosulfuron methyl is very soluble in water and adheres poorly to soils containing organic matter, therefore it is considered high in hazard for moving off the site of application.

PERSISTENCE

Property	Value	Reference	Rating
Vapor Pressure (mm Hg)	0.0000001	7	High
Biotic or Aerobic Half-life (days)	51	2	Moderate
Abiotic Half-life (days)	Not found		
Terrestrial Field Test Half-life (days)	Not found		
Hydrolysis Half-life (days)	14	2	Moderate
Anaerobic Half-life (days)	23	2	Moderate
Aquatic Field Test Half-life (days)	Not found		

Persistence Summary:

Little information was available for the dissipation of halosulfuron methyl in the environment. Halosulfuron methyl appears to break down to half of its applied concentration between 2-weeks and 2-months, however, the EPA states that it can persist at phytotoxically significant levels (concentrations that can kill plants) for months or years. Therefore, the persistence hazard of halosulfuron methyl is considered high.

BIOACCUMULATION

Property	Value	Reference	Rating
Bioaccumulation Factor	Not found		
Bioconcentration Factor	Not found		
Octanol/Water Partition Coefficient	log Kow = -0.0186	8	Low

Bioaccumulation Summary:

The bioaccumulation potential is rated solely on the chemical's octanol water partition coefficient (log Kow) because bioconcentration and bioaccmulation values could not be found. The log Kow value indicates that halosulfuron methyl has a very low attraction to organic material and is highly soluble in water. This indicates that it would rather mix with water than combine with fats and oil in fish and animal tissue, and so, the bioaccumulation hazard is considered low.

ACUTE TOXICITY

Test Subject	Value	Reference	Rating
Mammalian (LD50)	1,287 mg/kg	3	Moderate
Avian (LD50)	>5,620 mg/kg	6	Low
Honey bee or insect (LD50)	>100 ug/bee	6	Low
Annelida -worms (LC50)	Not found		
Fish (LC50)	>118 mg/L	3	Low
Crustacean (LC50)	>107 mg/L	3	Low
Mollusk (LC50)	Not found		
Amphibian (LD50 or LC50)	Not found		

Acute Toxicity Summary:

Single-dose toxicity testing indicates that halosulfuron methyl is moderately toxic to mammals, and low in toxicity to birds, bees, fish, and other aquatic organisms.

ACUTE TOXICITY - Risk Assessment

Subject and Scenario	Dose of Concern	Exposure	Margin of Safety	Route	Reference	Rating
Women (13+) applying herbicide to home lawns	0.5 mg/kg/day	0.000043 mg/kg/day	11,628	Dermal	1	Low
Occupational applicator exposure wasn't evaluated						
Infants or children drinking treated surface water	0.5 mg/L/day	0.00083 mg/L/day	602	Ingestion (drinking water)	1	Low
Child playing in treated turf grass	0.5 mg/kg/day	0.017 mg/kg/day	29	Dermal + incidental ingestion	1	Low

Acute Toxicity Risk Assessment Summary

Short-term risk assessment studies indicate that the exposures to halosulfuron methyl after residential herbicidal use is considered low in hazard for toxicity. The exposures evaluated include a homeowner applying herbicide to turf grass, children playing in treated turf, and infants and children drinking contaminated surface water.

CHRONIC TOXICITY

Property	Value	Adverse Effect	Reference	Rating
Carcinogenicity	"not likely"	No human data suggesting potential for cancer	1	Low
Mutagenicity	None	- -	5	Low
Neurotoxicity - (NOAEL)	1,000 mg/kg/day	"No evidence"	4	Low
Endocrine Disruption	No evidence	- -	5	Low
Developmental Toxicity (NOAEL)	50 mg/kg/day	Decreased litter size	5	Check risk
Reproductive Toxicity (NOAEL)	50.5 mg/kg/day	Body weight	5	Check risk
Chronic Toxicity (NOAEL)	0.1 mg/kg/day	Alterations in hematology	1	Check risk

Chronic Toxicity Summary:

Halosulfuron methyl is categorized by the USEPA as "not likely" a carcinogen and it is not considered a mutagen. Developmental toxicity was observed at the same dose as maternal toxicity and reproductive toxicity was observed at doses higher than maternal toxicity. Long-term toxcity testing indicates that the lowest dose concentration that produces and adverse effect is at 0.1 mg/kg/day for alterations in blood or blood forming organs (this effect was observed at doses almost 4 times less than developmental toxicity was observed).

CHRONIC TOXICITY - Risk Assessment

Subject and Scenario	Dose of Concern	Exposure	Margin of Safety	Route	Reference	Rating
Adults contacting treated turf wasn't evaluated						
Child playing in treated turf grass	0.1 mg/kg/day	0.009 mg/kg/day	11	Dermal + incidental	1	Low
Infants or children drinking treated surface water	0.1 mg/L/day	0.00017 mg/L/day	588	Ingestion (drinking water)	1	Low
Long-term applicator exposures were not evaluated						

Chronic Toxicity Risk Assessment Summary:

Intermediate risk assessments (exposures lasting 1-6 months in duration) represented the largest exposure. The potential exposure involves a child playing in treated turf grass (chemical absorption through skin combined with hand-to-mouth and object-to-mouth chemical ingestion). This potential exposure is calculated to be eleven times less than the dose of concern and is rated as low in hazard for toxicity. Long-term exposures from contaminated drinking water was calculated to be 588 times less than the dose of concern and is also rated as low in hazard. There were no assessments made for occupational applicators or handlers.

Long-term exposures to halosulfuron-methyl from the use of herbicide products are considered low in hazard for toxicity.

DegradationProducts:

Metabolite is identified as 3-chloro-1-methyl-5-sulfamoylpyrazole-4-carboxylic acid (Reference 1).

Comments:

Halosulfuron-methyl is moderately irritating to the eyes and slightly irritating to the skin, but not considered a skin sensitizer (Reference 3).

References

1. USEPA. Federal Register Environmental Documents. Halosulfuron-methyl; Pesticide Tolerance. December 26, 2001 (Volume 66, Number 247).
2. S. Orme and S. Kegley, PAN Pesticide Database, Pesticide Action Network, North America (San Francisco, CA. 2006), http:www.pesticideinfo.org. Halosulfuron - Identification, toxicity, use, water pollution potential, ecological toxicity and regulatory information.
3. Gowan Company. Material Safety Data Sheet, SedgeHammer. Revision Date: 4/21/5.
4. USEPA. Federal Register. Vol. 72, No. 39. Wednesday, Friday 28, 2007. Rules and Regulations. 40 CFR Part 180. Halosulfuron-methyl; Pesticide Tolerance.
5. USEPA. Federal Register: Halosulfuron-methyl; Pesticide Tolerance. (Volume 65, Number 190). September 29, 2000.
6. Monsanto Company. Material Data Safety Sheet, Yukon [TM] Herbicide. Version 1.1, Effective Date: 02/28/2002.
7. James Jones, Director, Office of Pesticide Programs. USEPA. Order Denying Objections to Issuance of Tolerances [FR Doc. 05-15840 Filed 8-9-05; 8:45 am].
8. Gullf Ag Pty Ltd. MATERIAL SAFETY DATA SHEET, Gullf Ag Halosulfuron 750 WG Herbicide. Issued: 29-Nov-2004.