fosamine ammonium

Review Date: 10/14/2009
CAS #: 25954-13-6

Type	Herbicide / plant growth regulator
Controls	Used to control brush and herbaceous plants
Mode of Action	Plant growth regulator that inhibis bud growth the year following the application.

Thurston County Review Summary:

As of 2009, fosamine ammonium is the active ingredient in only one herbicide registered in the state of Washington ("Krenite S Herbicide Brush Control Agent"). Testing of the active ingredient fosamine ammonium, indicates that it is considered high in hazard for the potential to move off the site of application although it is considered low in hazard for persistence and bioaccumulation. After using an herbicide containing fosmine ammonium, the risk of toxicity to humans and other non-target organisms is considered low. However, toxicity testing also produced statistically significant genetic mutation (chromosome breakage).

Herbicides containing the active ingredient fosamine ammonium fail Thurston County's pesticide review criteria due to it's potential as a chemical mutagen.

MOBILITY

Property	Value	Reference	Rating
Solubility (mg/L)	"miscible"	1	High
Soil Sorption (Kd=mL/g)	Not found		
Organic Sorption (Koc=mL/g)	8	1	High

Mobility Summary:

Fosamine ammonium mixes very well with water and adheres very poorly to soil (with or without organic material). There is a high potential for fosamine ammonium to move off the site of application with rain or irrigation water.

PERSISTENCE

Property	Value	Reference	Rating
Vapor Pressure (mm Hg)	0.000004	1	Moderate
Biotic or Aerobic Half-life (days)	4-11	1	Low
Abiotic Half-life (days)	Stable	1	High
Terrestrial Field Test Half-life (days)	< 5	1	Low
Hydrolysis Half-life (days)	Stable	1	High
Anaerobic Half-life (days)	<4	1	Low
Aquatic Field Test Half-life (days)	4	1	Low

Persistence Summary:

In both terrestrial and aquatic environments, fosamine ammonium is likely to degrade to half of the application concentration within one week. The persistence hazard of fosamine ammonium is considered low.

BIOACCUMULATION

Property	Value	Reference	Rating
Bioaccumulation Factor	Not found		
Bioconcentration Factor	Could not be calculated	1	Low
Octanol/Water Partition Coefficient	log Kow = -2.9	1	Low

Bioaccumulation Summary:

Fosamine ammonium has a very low octanol / water partition coefficient which indicates that it does not bind well to fats and oil. The bioaccumulation hazard of fosamine ammonium is considered low.

ACUTE TOXICITY

Test Subject	Value	Reference	Rating
Mammalian (LD50)	1,682 mg/kg (dermal)	1	Moderate
Avian (LD50)	>5,620 mg/kg	1	Low
Honey bee or insect (LD50)	>200 ug/bee	1	Low
Annelida -worms (LC50)	Not found		
Fish (LC50)	>128 ppm	1	Low
Crustacean (LC50)	>136 ppm	1	Low
Mollusk (LC50)	>122 ppm	1	Low
Amphibian (LD50 or LC50)	Not found		

Acute Toxicity Summary:

Single-dose toxicity testing indicates that fosamine ammonium is moderately toxic to mammals and low in toxicity to birds, insects, fish and other aquatic organisms. The potential exposures to non-target organisms (following applications up to 26 pounds of active ingredient per acre), are calculated to have at least a twenty-fold margin of safety from the dose of concern (dose of concern is 50% of the LD50 or LC50 for the individual species). The hazard to non-target organisms from the herbicidal use of fosamine ammonium is considered low.

ACUTE TOXICITY - Risk Assessment

Subject and Scenario	Dose of Concern	Exposure	Margin of Safety	Route	Reference	Rating
The risk to applicator / mixer was not calculated.						
Exposures to treated vegetation were not evaluated						
Short-term contact exposures were not evaluated						
Combined exposures were not evaluated						

Acute Toxicity Risk Assessment Summary

The routes of exposure for fosamine ammonium include inhalation and skin absorption (no ingestion exposures are expected). The calculated inhalation dose is at least 40 times less than exposures from skin absorption. Toxicity testing indicates that there is no prolonged adverse effect from skin exposures to fosamine ammonium, therefore the risk from skin absorption was not evaluated.

Since ingestion and inhalation exposures to fosamine ammonium are non-existent or insignificant, and there is no risk of toxicity from skin absorption - the risk of toxicity from the herbicidal use of fosamine ammonium is considered low.

CHRONIC TOXICITY

Property	Value	Adverse Effect	Reference	Rating
Carcinogenicity	Not a recognized or suspect carcinogen	Not a recognized or suspect carcinogen	3	Low
Mutagenicity	15 thru 33 uL/ml	Chromosome abberation and breakage	1	High
Neurotoxicity - (NOAEL)	1,567 mg/kg	None	1	Low
Endocrine Disruption	Data gap	- -	- -	N/A
Developmental Toxicity (NOAEL)	3,000 mg/kg	- -	1	Low
Reproductive Toxicity (NOAEL)	Data gap	- -	1	N/A
Chronic Toxicity (NOAEL)	10 mg/kg/day	Kidney toxicity	1	Check risk

Chronic Toxicity Summary:

Fosamine ammonium is not a recognized or suspect carcinogen, nor is it considered a developmental toxicant. Toxicity testing of fosamine ammonium caused statistically significant, dose-related chromosomal abberations (chromosome breakage). Thurston County's IPM policy states that a pesticide represents an unacceptable risk if there is positive evidence of mutagenicity in any mammalian cell mutation assay or microbial assay with mammalian enzyme activation. The chromosome abberations were observed with and without S-9 enzyme activated cultures. Testing for reproductive toxicity or endocrine disruption could not be found.

CHRONIC TOXICITY - Risk Assessment

Subject and Scenario	Dose of Concern	Exposure	Margin of Safety	Route	Reference	Rating
There are no long-term contact exposures						
There are no combined long-term exposures						
There are no long-term drinking water exposures						
There are no long-term dietary exposures						

Chronic Toxicity Risk Assessment Summary:

There are no long-term exposures expected from the herbicidal use of fosamine ammonium.

DegradationProducts:

Fosamine ammonium degrades to carbamoylphosphonic acid (CPA), carboxyphosphonic acid (ING-3003), and carbon dioxide (Reference 1).

Health Canada determined that fosamine ammonium herbicide products do not contain impurities of toxicological concern (Reference 2).

Comments:

Fosamine ammonium is not considered a skin sensitizer and it is low in potential for eye and skin irritation (Reference 1).

References

1. USEPA. Reregistration Eligibility Decision (RED), Fosamine ammonium. EPA 738-R-95-004. January 1995.
2. Health Canada, Pest Management Regulatory Agency. Proposed Acceptability for Continuing Reistration: PACR2004-5. Re-evaluation of Fosamine Ammonium. 16 April 2004.
3. Scorecard - The Pollution Information Site. Health Effects (Accessed 10/19/2009). http://www.scorecard.org/health-effects/