ammonium salt of fatty acids

Review Date: 5/8/2009

Type	Herbicide
Controls	Unspecified weeds, moss, algae, lichens, and liverworts.
Mode of Action	Disrupts photosynthesis and causes death.

Thurston County Review Summary:

Ammonium salts of fatty acids are very prevalent in our environment and can be found in food, soil, plants, etc. Because fatty acids are so common the Food and Drug Administration has classified them as "Generally Regarded as Safe" (GRAS) chemicals and the EPA has waived the typical toxicity and environmental fate testing. The EPA also concluded that the exposures that are expected from pesticidal use are not likely to exceed the amount naturally occurring in food.

Pesticide products containing ammonium salt of fatty acid as the only active ingredient are considered low in hazard and pass the Thurston County review criteria.

MOBILITY

Property	Value	Reference	Rating
Solubility (mg/L)	0.011	5	Low
Soil Sorption (Kd=mL/g)	Not found		
Organic Sorption (Koc=mL/g)	11,670	5	Low

Mobility Summary:

Ammonium salts of fatty acids are expected to break down in less than one day by microbial activity in the soil. When they break down, the chemical components become part of the natural soil matrix and are not expected to migrate off the application site to cause harm to non-target organisms. The mobility hazard of ammonium salt of fatty acids is considered low.

PERSISTENCE

Property	Value	Reference	Rating
Vapor Pressure (mm Hg)	1.5	5	Low
Biotic or Aerobic Half-life (days)	<1	1	Low
Abiotic Half-life (days)	Not found		
Terrestrial Field Test Half-life (days)	<1	1	Low
Hydrolysis Half-life (days)	>43	1	Moderate
Anaerobic Half-life (days)	Not found		
Aquatic Field Test Half-life (days)	Not found		

Persistence Summary:

Ammonium salt of fatty acids are expected to break down by microbial action within one day. The persistence hazard of ammonium salt of fatty acids is considered low.

BIOACCUMULATION

Property	Value	Reference	Rating
Bioaccumulation Factor	Not found		
Bioconcentration Factor	Not found		
Octanol/Water Partition Coefficient	log Kow = 7.73	5	3

Bioaccumulation Summary:

Fatty acids have a high affinity to bind to organic material and are likely to incorporate into fish and aninmal tissue. Because fatty acids are not a toxicity hazard, bioaccumulation is not considered a endpoint of concern.

ACUTE TOXICITY

Test Subject	Value	Reference	Rating
Mammalian (LD50)	>5,000 mg/kg	5	Low
Avian (LD50)	2,150 ppm	1	Low
Honey bee or insect (LD50)	>25 ug/bee	5	Low
Annelida -worms (LC50)	Not found		
Fish (LC50)	59.2 ppm	5	Moderate
Crustacean (LC50)	"highly toxic"	6	High
Mollusk (LC50)	Not found		
Amphibian (LD50 or LC50)	Not found		

Acute Toxicity Summary:

Single dose toxicity testing indicates that fatty acids (not specific to ammonium salt) are considered low in toxicity to mammals, birds, bees, moderately toxic to fish, and highly toxic to aquatic invertebrates.

ACUTE TOXICITY - Risk Assessment

Subject and Scenario	Dose of Concern	Exposure	Margin of Safety	Route	Reference	Rating
Applicator/handler exposure assessment was waived						
Pesticide contact exposure assessments were waived						
Dietary exposure assessments were waived						
Combined exposure assessments were waived						

Acute Toxicity Risk Assessment Summary

Short-term exposures expected from pesticidal use are not likely to reach the amounts in a typical diet (Reference 1). All risk assessment requirements have been waived for exposures to ammoniated salts of fatty acids.

The toxicity risk for ammonium salts of fatty acids is considered low in hazard.

CHRONIC TOXICITY

Property	Value	Adverse Effect	Reference	Rating
Carcinogenicity	Not listed	- -	3, 4	Low
Mutagenicity	None with ammonium salts	None with ammonium salts	1	Low
Neurotoxicity - (NOAEL)	Not tested	- -	1	Low
Endocrine Disruption	Not listed	- -	4	Low
Developmental Toxicity (NOAEL)	Not tested	- -	1	Low
Reproductive Toxicity (NOAEL)	Not tested	- -	1	Low
Chronic Toxicity (NOAEL)	Not tested	- -	1	Low

Chronic Toxicity Summary:

Long-term exposures are not expected from pesticidal use with products containing ammonium salts of fatty acids because they break down in about a day and become part of the soil composition. So, the hazard for toxicity from long-term exposures to ammonium salts of fatty acids is considered low.

CHRONIC TOXICITY - Risk Assessment

Subject and Scenario	Dose of Concern	Exposure	Margin of Safety	Route	Reference	Rating
Pesticide contact exposure assessments were waived						
Combined exposure assessments were waived						
Drinking water exposure assessments were waived						
Dietary exposure assessments were waived						

Chronic Toxicity Risk Assessment Summary:

All toxicity evaluation requirements have been waived by the EPA, and long-term exposures to the pesticide ingredient are not expected. The risk of toxicity from long-term exposures to ammonium salts of fatty acids is considered low in hazard.

DegradationProducts:

Fatty acids are metabolized by cellular activity, where they are oxidized to compounds that are used as an energy source and structural cell components. Potassium, sodium and ammonium are normally part of the bodies metabolism and electrolytic balance (Reference 1).

Comments:

Ammonium soap salts are irritating to the eyes, and can cause permanent eye damage, they are also considered a mild to moderate skin irritant but is not a skin sensitizer (Reference 1).

References

1. USEPA. Office of Prevention, Pesticides and Toxic Substances. Reregistration Eligibility Decision (RED) - Soap Salts. LIST D Case 4083. September 1992.
2. USEPA. Office of Pesticide Programs. "List of Inert Pesticide Ingredients". Updated August 2004.
3. USEPA. Science Information Management Branch, Health Effects Division, Office of Pesticide Programs. Chemicals Evaluated for Carcinogenic Potential. July 19, 2004.
4. S. Kegley, B. Hill, S. Orme, PAN Pesticide Database, Pesticide Action Network, North America (San Francisco, CA. 2007), http:www.pesticideinfo.org
5. Thompson, Watkins, et. al. Future Environmental Effects of Non-Synthetic Chemical Use (CTHS0306). Report to the Horizon Scanning Programme Manager. July 31, 2004.
6. USEPA. Office of Pesticide Programs, Biopesticides Registration Action Document. Ammonium Nonanoate (PC code 031802).