aminopyralid

Review Date: 04/06/2009

CAS #:

Type	Terrestrial - systemic, post-emergent herbicide for invasive broadleaf control.
Controls	Control of invasive annual, biennial, and perennial weed species including broadleaf weeds.
Mode of Action	Systemic auxin growth regulation (growth hormone).

Thurston County Review Summary:

Aminopyralid is considered practically non-toxic to all land and aquatic organisms. The risk assessment studies for applicators, handlers, and people entering and contacting treated areas show that the hazard for toxicity is very low. But, even though aminopyralid is considered low in toxicity to humans and other non-target organisms, it is also rated as high in hazard for mobility and persistence and is therefore given a conditional rating.

MOBILITY

Property	Value	Reference	Value Rating
Water Solubility (mg/L)	2,480	2	High
Soil Sorption (Kd=mL/g)	Not found		
Organic Sorption (Koc=mL/g)	1.05	1	High

Mobility Summary:

Aminopyralid is soluble in water and adheres poorly to soils with or without organic matter. Mobility hazard for aminopyralid is considered high.

PERSISTENCE

Property	Value	Reference	Value Rating
Vapor Pressure (mm Hg)	0.00000000007	1	High
Biotic or Aerobic Half-life (days)	up to or >103	1	High
Photolysis Half-life (days)	72	1	High
Terrestrial Field Test Half-life (days)	up to 32	1	Moderate
Hydrolysis Half-life (days)	"Stable"	1	High
Anaerobic Half-life (days)	"Stable"	1	High
Aquatic Field Test Half-life (days)	>462	1	High

Persistence Summary:

Aminopyralid has a low vapor pressure so it is unlikely to dissipate into the air, and it is stable in water, anaerobic soil and sediment conditions. Sunlight can breakdown the chemical to half of the original concentration in less than 60 days (moderate persistence). Without sunlight, aminopyralid can be expected to have more than half of its original concentration 60 days after application. Pesticides that are not expected to break down to half of their application concentration within 60 days are considered high in persistence hazard by Thurston County's review criteria.

BIOACCUMULATION

Property	Value	Reference	Value Rating
Bioaccumulation Factor	Not found		
Bioconcentration Factor	Not found		
Octanol/Water Partition Coefficient	log Kow = 0.201	2	Low

Bioaccumulation Summary:

No numerical data could be found for bioaccumulation or bioconcentration. The octanol/water partition coefficient shows that aminopyralid has a much greater affinity to water than to organics, which means it is unlikely to accumulate in animal tissue. Also, the EPA made the following statement after evaluating studies; "Tissue distribution and bioaccumulation were minimal; <0.73% of administered dose was recovered in tissue after 7 days for all dosing groups" (Reference 1). Bioaccumulation hazard is considered low for aminopyralid.

ACUTE WILDLIFE TOXICITY VALUES and Risk Assessment

Test Subject	Value	Reference	Toxicity Rating
Mammalian (LD50)	>5,000 mg/kg	1	Low
Avian (LD50)	>2,250 mg a.e./kg	1	Low
Honey bee or insect (LD50)	>100 ug/bee	1	Low
Annelida -worms (LC50)	>1,000 mg/kg	2	Low
Fish (LC50)	>100 mg/L	1	Low
Crustacean (LC50)	>98.6 mg/L	1	Low
Mollusk (LC50)	>89 mg/L	1	Low
Amphibian (LD50 or LC50)	>95.2 mg/L	1	Low

Acute Toxicity Testing and Ecotoxicity Summary:

Acute toxicity testing indicates that aminopyralid is practically non-toxic to mammals, birds, insects, worms, fish, crustaceans, mollusks, and amphibians (Reference 1). Risk to non-target organisms were evaluated by the New York State Department of Environmental Conservation and they stated that the risk assessment was highly conservative and that there were no exceedances (calculated exposures were below their level of concern) for non-target toxicity (Reference 4). The risk to non-target organisms from potential exposures to aminopyralid following a labelled application is rated low.

ACUTE HUMAN TOXICITY - Risk Assessment

Subject and Scenario	Route	Dose of Concern	Exposure	Margin of Safety	Reference	Risk Rating
Adult aerial (plane) application	Inhalation	1.04 mg/kg/day	<0.0026 mg/kg/day	400	1	Low
Child playing in treated vegetation	Ingestion by hand-to-mouth activity	1.04 mg/kg/day	<0.0007 mg/kg/day	1,500	1	Low
Other post-application exposures weren't evaluated						
Aggregate risk assessment was not evaluated						

Acute Toxicity Risk Assessment Summary:

The human risk assessment for post-application exposures to aminopyralid included a caculation for a child playing in treated vegetation. The calculated dose to the child was 1,500 times less than the EPA's dose of concern. The risk assessment indicates that the hazard for human toxicity from a short-term post-application exposure to aminopyralid from labelled herbicidal use is low.

The human risk assessment evaluated by the EPA included the worst-case exposure scenario for an occupational mixer/loader/applicator. The EPA determined that the application that would result in the largest potential exposure would come from mixing and loading for an aerial application. This potential exposure was calculated to be more than 400 times less than the EPA's dose of concern for human toxicity. All other labelled applications are expected to create even a smaller potential exposure. Therefore, potenitial exposures to applicators of aminopyralid herbicides is rated low in hazard.

CHRONIC HUMAN TOXICITY HAZARDS

Property	Value	Adverse Effect	Reference	Rating
Carcinogenicity	"Not likely"	No human data suggesting a potential for cancer	1	Low
Mutagenicity	Value not provided	Negative	1 and 4	Low
Neurotoxicity - (NOAEL)	>1,000	Negative	1	Low
Endocrine Disruption	--	Negative	2	Low
Developmental Toxicity (NOAEL)	260	Decreased fetal weights	3	Check risk
Reproductive Toxicity (NOAEL)	1,000	No reproductive effects	3	Low
Chronic Toxicity (NOAEL)	50	Intestine enlargement	1	Check risk

Chronic Toxicity Hazard Summary:

Aminopyralid is not considered carcinogenic, mutagenic, neurotoxic, an endocrine disruptor, or a reproductive toxicant (Reference 1). In developmental toxicity testing, an overall decrease in fetal weights was observed at doses above maternal toxicity.There are no chronic toxicity effects associated with aminopyralid that are rated high in hazard by Thurston County's pesticide review criteria.

CHRONIC HUMAN TOXICITY - Risk Assessment

Subject and Scenario	Route	Dose of Concern	Exposure	Margin of Safety	Reference	Risk Rating
Long-term applicator exposures were not evaluated						
Child playing in vegetation + eating treated food	Ingestion	0.5 mg/kg/day	0.0033 mg/kg/day	152	1	Low
Adult exposure from treated food and water	Ingestion	0.5 mg/kg/day	0.0013 mg/kg/day	384	1	Low
Other long-term exposures were not evaluated						

Chronic Toxicity Risk Assessment Summary:

To evaluate the risk to adults from long-term exposures to aminopyralid from herbicidal use, the EPA combined potential dietary and drinking water exposures. The combined dietary and drinking water exposure was calculated for adults to be less than 0.0013 mg/kg/day. The EPA's calculated dose of concern for long-term exposures is 0.5 mg/kg/day, The difference between the potential exposure and the dose of concern is the safety factor. The safety factor is 384, which is considered low in hazard. Combining all potential exposures to a child (eating treated food, drinking treated water, and incidental ingestion from hand -to-mouth activities in treated vegetation) results in a potential exposure 150 times lower than the EPA established dose of concern. The risk for toxicity from potential long-term exposures to aminopyralid from herbicidal uses rated low.

Metabolites and Degradation Products:

CO2, oxamic and malonamic acid are the major degradation products of aminopyralid.

Comments:

Aminopyralid is not considered a skin irritant (USEPA toxicity category IV) or a skin sensitizer (Reference 1). Pure aminopyralid is considered a severe eye irritant but formulated products are not likely to be so concentrated and will likely be far less irritating to the eyes. Read label directions for personal protection requirements.

References

1. USEPA. Office of Prevention, Pesticides Environmental Protection and Toxic Substances Agency (7501C). Pesticide Fact Sheet, Name of Chemical: Aminopyralid. Reason for Issuance: Conditional Registration. Date Issued: August 10, 2005.
2. Environmental Risk Management Authority, New Zealand. Form HS1, Volume 1. Name of Substances: Aminopyralid, GF-389, GF-871, GF-1118, GF-982, GF-1397. Applicant: DOW AgroSciences (NZ) Ltd.
3. USEPA, Federal Register Environmental Documents. Aminopyralid; Pesticide Tolerance. [Federal Register: August 10, 2005 (Volume 70, Number 153)].
4. New York State Department of Environmental Conservation. Division of Solid & Hazardous Materials. Letter to Mr Jim Baxter, State Regulatory Manager Dow AgroScience, LLC. Re: Withdrawal of Milestone Herbicide Application (EPA Reg. No. 62719-519) Containing the Active Ingredient Aminopyralid. Chemical Code: 005209. February 7, 2007.