

Type	Fungicide / insecticide / rodenticide
Controls	Fungi - Insects and mites - Invertebrae
Mode of Action	Adversely affects the germination of fungal spores.

Thurston County Review Summary:

Sulfur is considered low in hazard and pesticide products containing it as the sole active ingredient pass Thurston County's pesticide review criteria.

MOBILITY

Property	Value	Reference	Value Rating
Water Solubility (mg/L)	0.063	2	Low
Soil Sorption (Kd=mL/g)	Value not found		
Organic Sorption (Koc=mL/g)	1,950	2	Moderate

Mobility Summary:

Sulfur is not soluble in water and adheres moderately to soil. Sulfur is a naturally occurring element in soil and pesticidal use of sulfur products are not expected to contribute significantly to the amount in nature. The hazard for sulfur to move off the site of application with rain or irrigation water is rated low.

PERSISTENCE

Property	Value	Reference	Value Rating
Vapor Pressure (mm Hg)	0.00000074	2	High
Biotic or Aerobic Half-life (days)	30	2	Moderate
Abiotic Half-life (days)	Value not found		
Terrestrial Field Test Half-life (days)	Value not found		
Hydrolysis Half-life (days)	Stable	2	High
Anaerobic Half-life (days)	Value not found		
Aquatic Field Test Half-life (days)	Value not found		

Persistence Summary:

Sulfur is an element and cannot be degraded. Sulfur that is applied to vegetation and soil may combine with other chemicals, but will not be degraded or removed from the environment. The persistence of sulfur is rated high.

BIOACCUMULATION

Property	Value	Reference	Value Rating
Bioaccumulation Factor	Value not found		
Bioconcentration Factor	Value not found		
Octanol/Water Partition Coefficient	logKow = 0.23	1	Low

Bioaccumulation Summary:

Sulfur is part of mammalian metabolism and is always present in our bodies. Sulfur used as a pesticide is not expected to result in an accumulation of sulfur or sulfur metabolites in fish or animals. The hazard for bioaccumulation is rated low.

ACUTE WILDLIFE TOXICITY VALUES and Risk Assessment

Test Subject	Value	Reference	Value Rating
Mammalian (LD50)	>5,000 mg/kg	1	Low
Avian (LD50)	>5,620 ppm	1	Low
Honey bee or insect (LD50)	>100	1	Low
Annelida -worms (LC50)	>2,000	1	Low
Fish (LC50)	>180 ppm	1	Low
Crustacean (LC50)	736 ppm	1	Low
Mollusk (LC50)	Value not found		
Amphibian (LD50 or LC50)	Value not found		

Acute Toxicity Testing and Ecotoxicity Summary:

Single-dose toxicity testing indicates that sulfur is low in toxicity to animals, birds, bees, worms, fish and other aquatic organisms (Reference 1). EPA believes that the pesticidal use of sulfur is not going to pose an environmental problem because it is quickly dissipated into sulfides or sulfates and incorporated into soil. Risk to non-target organisms from pesticidal use of sulfur is rated low in hazard.

ACUTE HUMAN TOXICITY - Risk Assessment

Subject and Scenario	Route	Dose of Concern	Exposure	Margin of Safety	Reference	Value Rating
Risk from short-term exposures is low in hazard						
Risk from short-term exposures is low in hazard						
Risk from short-term exposures is low in hazard						
Risk from short-term exposures is low in hazard						

Acute Toxicity Risk Assessment Summary:

Sulfur is a known eye irritant, but pesticidal use of sulfur is rated low in hazard for short-term exposures.

CHRONIC HUMAN TOXICITY HAZARDS

Property	Value	Adverse Effect	Reference	Rating
Carcinogenicity	Not listed as a known or suspected carcinogen	--	3 and 4	Low
Mutagenicity	Non-mutagenic	--	1	Low
Neurotoxicity - (NOAEL)	Value not found			
Endocrine Disruption	Not a known endocrine disruptor	--	5	Low
Developmental Toxicity (NOAEL)	Value not found	--	1	Low
Reproductive Toxicity (NOAEL)	Value not found	--	1	Low
Chronic Toxicity (NOAEL)	Value not found			

Chronic Toxicity Hazard Summary:

Sulfur has no risks of oncogenic, teratogenic, or reproductive hazards, it is non-mutagenic in microorganism testing, and is not a known or suspected carcinogen or endocrine disruptor (References 1 and 5).

CHRONIC HUMAN TOXICITY - Risk Assessment

Subject and Scenario	Route	Dose of Concern	Exposure	Margin of Safety	Reference	Value Rating
Risk from long-term exposures is low in hazard						
Risk from long-term exposures is low in hazard						
Risk from long-term exposures is low in hazard						
Risk from long-term exposures is low in hazard						

Chronic Toxicity Risk Assessment Summary:

Long-term exposure to sulfur is expected for all living things as part of the natural system and not considered a hazard. Exposures to sulfur from pesticidal uses are not expected to contribute significantly to the amounts we are exposed to naturally (except on a short-term basis for applicators).

Metabolites and Degradation Products:

In the environment sulfur will oxidize to sulfate in aerobic conditions and will be reduced to sulfide in anaerobic conditions (Reference 1).

Comments:

Sulfur is considered an eye irritant (EPA Toxicity Category III) and may be slightly irritating to the skin (EPA Toxicity Category IV) but not a skin sensitizer (Reference1).

References

- USEPA. Office of Pesticide Programs. Reregistration Eligibility Document, Sulfur. List A Case 0031. March 1991.
- International Union of Pure & Applied Chemistry. Pesticide Properties Database. sulphur (Ref: SAN 7116). Accessed 6/26/2012.
- International Agency for Research on Cancer. Agents Classified by the IARC Monographs, Volumes 1-102. (Accessed 6/26/2012). <http://monographs.iarc.fr>
- USEPA. Science Information Management Branch, Health Effects Division, Office of Pesticide Programs. "Chemicals Evaluated for Carcinogenic Potential" July 19, 2004.
- Scorecard - The Pollution Information Site. Health Effects / Endocrine Toxicants (Accessed 7/2/2012). <http://scorecard.goodguide.com/health-effects>.
- Melpat International Pty Limited. Technical Note: SULFUR AS A FUNGICIDE. September 2008.