

Type	Insecticide
Controls	Aphids, beetles, beetle larvae, cabbage loopers, cabbage worms, caterpillars, earwigs, gnats, gypsy moths, leafhoppers, leafminers, leafrollers, mealybugs, mites, psyllids, scales, sowbugs, stinkbugs, tent caterpillars, thrips, whiteflies, etc. (Reference 2).
Mode of Action	Canola oil has a non-toxic mode of action and is believed to repel insects by altering the outer layer of the leaf surface or by acting as an insect irritant (References 1 and 2).

Thurston County Review Summary:

Canola oil is also known as low erucic acid rapeseed oil (not exceeding 2% erucic acid) and was first registered by the EPA as a pesticide in 1998 (Reference 2). Canola oil (rapeseed oil) consists of triglyceride esters of the unsaturated fatty acids; linoleic, oleic, and erucic (Reference 6).

Because canola oil is refined for food use, and is considered low in toxicity to humans and wildlife, the EPA did not require a full set of environmental fate and toxicity tests for pesticide registration. Without this data, it is difficult to use the typical hazard evaluation that is used for other Thurston County pesticide reviews. However, Thurston County does believe that canola oil, used as a pesticide according to label directions, represents very little hazard to human health or wildlife.

MOBILITY

Property	Value	Reference	Value Rating
Water Solubility (mg/L)	"Immiscible" does not mix with water	6	Low
Soil Sorption (Kd=mL/g)	Value not found		
Organic Sorption (Koc=mL/g)	Value not found		

Mobility Summary:

Canola oil is not soluble in water and not likely to mix with water and leach into soil and groundwater. No data could be found about how well canola oil binds to soil. Because canola oil is not known to have a chemical property that would have it bind tightly to soil, it is expected to be moderately mobile in the environment.

PERSISTENCE

Property	Value	Reference	Value Rating
Vapor Pressure (mm Hg)	<0.1	3	Unknown
Biotic or Aerobic Half-life (days)	Value could not be found		
Abiotic Half-life (days)	Value could not be found		
Terrestrial Field Test Half-life (days)	Value could not be found		
Hydrolysis Half-life (days)	Value could not be found		
Anaerobic Half-life (days)	Value could not be found		
Aquatic Field Test Half-life (days)	Value could not be found		

Persistence Summary:

Canola oil is expected to undergo "rapid decomposition" in the environment (Reference 4). The persistence of canola oil in the environment is rated low in hazard (although some of the fatty acids that make up canola oil may incorporate into the soil matrix).

BIOACCUMULATION

Property	Value	Reference	Value Rating
Bioaccumulation Factor	Value could not be found		
Bioconcentration Factor	Value could not be found		
Octanol/Water Partition Coefficient	Value could not be found		

Bioaccumulation Summary:

The fatty acids that comprise canola oil are likely to be incorporated into human, fish, or animal tissue but exposures from pesticidal uses are unlikely to have them accumulate to a level that would cause a toxic effect. The risk of bioaccumulation is rated low, although there may be some retention of canola oil components.

ACUTE WILDLIFE TOXICITY VALUES and Risk Assessment

Test Subject	Value	Reference	Value Rating
Mammalian (LD50)	Value could not be found		
Avian (LD50)	Value could not be found		
Honey bee or insect (LD50)	Value could not be found		
Annelida -worms (LC50)	Value could not be found		
Fish (LC50)	Value could not be found		
Crustacean (LC50)	Value could not be found		
Mollusk (LC50)	Value could not be found		
Amphibian (LD50 or LC50)	Value could not be found		

Acute Toxicity Testing and Ecotoxicity Summary:

Regarding the risk to wildlife from pesticidal uses of canola oil, the EPA stated: "Adverse effects to the environment or to organisms other than insects are not anticipated because of the low toxicity of canola oil and its rapid decomposition in the environment. In addition, canola pesticide products are not allowed to be applied directly to bodies of water; therefore, exposure of aquatic organisms should be extremely limited." (Reference 1) and: "Although the Agency does not have toxicity test results for nontarget insects, fish, and other wildlife directly exposed to canola oil, numerous metabolic studies on the dietary effects and metabolism of canola in birds, mammals, and fish are reported in the literature. Ecological effects data for terrestrial and aquatic animals, and nontarget plants for canola were waived for the same reasons given above; principally, the low toxicity of the product, and its rapid degradation in the environment. In addition, these canola products are not to be directly applied to bodies of water; thus the exposure to aquatic animals should be limited to residues from drift" (Reference 2).

Risk to non-target organisms is rated low in hazard.

ACUTE HUMAN TOXICITY - Risk Assessment

Subject and Scenario	Route	Dose of Concern	Exposure	Margin of Safety	Reference	Value Rating
Human risk assessments were not available						
Human risk assessments were not available						
Human risk assessments were not available						
Human risk assessments were not available						

Acute Toxicity Risk Assessment Summary:

Regarding the risk to humans from pesticidal uses of canola oil, the EPA stated: "No harmful health effects to humans are expected from the use of canola oil to repel insects" (Reference 1). No risk assessments were calculated for canola oil pesticide registration. Use of canola oil pesticide products are rated low in hazard for human health.

CHRONIC HUMAN TOXICITY HAZARDS

Property	Value	Adverse Effect	Reference	Rating
Carcinogenicity	Classification not available from EPA or IARC	Data does not indicate carcinogenic potential	3	Low
Mutagenicity	Value not provided	Crude canola oil showed anti-mutagenic properties	3	Low
Neurotoxicity - (NOAEL)	Neurotoxicity testing was not performed			
Endocrine Disruption	Endocrine disruption wasn't evaluated			
Developmental Toxicity (NOAEL)	Developmental toxicity testing was not performed			
Reproductive Toxicity (NOAEL)	Reproductive toxicity testing was not performed			
Chronic Toxicity (NOAEL)	Canola oil toxicity tests could not be found			

Chronic Toxicity Hazard Summary:

In subchronic toxicity tests with mice, canola oil diets resulted in increases in plasma lipids, high levels of hepatic triglycerides and cholesterol, and elevation of lipogenic gene expression (Reference 3). A diet of 1.5 grams/kg per day of canola oil reduced aortic wall thickness, reduced blood pressure, and prevented increases in blood pressure in spontaneously hypersensitive rats (Reference 3). Crude canola oil was determined to be an antimutagenic compound (Reference 3). No data could be located to evaluate reproductive or developmental toxicity, neurotoxicity, or endocrine disruption potential.

CHRONIC HUMAN TOXICITY - Risk Assessment

Subject and Scenario	Route	Dose of Concern	Exposure	Margin of Safety	Reference	Value Rating
Human risk assessments were not available						
Human risk assessments were not available						
Human risk assessments were not available						
Human risk assessments were not available						

Chronic Toxicity Risk Assessment Summary:

Human risk assessments from potential long-term exposures to canola oil from pesticidal use was not evaluated. The Material Data Safety Sheet for 100% canola oil states; "Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems" Reference 6.

The risk from long-term exposures to canola oil from pesticidal uses are rated low in hazard.

Metabolites and Degradation Products:

Metabolism of canola oil results in the desaturation and elongation of the phospholipid fatty acids (Reference 3). In sunlight canola oil will undergo lipid oxidation (Reference 4).

Comments:

Canola oil is not expected to be an eye irritant at concentrations up to 90% (EPA Toxicity Category IV) but may be skin sensitizing (Reference 7).

References

1. USEPA. Pesticides: Regulating Pesticides. Canola Oil (011332) Technical Fact Sheet. October 1998.
2. USEPA. Office of Pesticide Programs. Biopesticide Decision Document. Canola Oil. Date Issued: October 1998.
3. National Library of Medicine. Toxnet, Hazardous Substances Database. Canola Oil. Accessed 11/16/2012.
4. Przybylski, Dr. Roman. Canola Council of Canada. Canola Oil: Physical and Chemical Properties. 2011.
5. Ehsan Jenab and Feral Temelli. Department of Agricultural, Food and Nutritional Science, University of Alberta. Modeling Physical Properties of Canola Oil and its Blend with Fully-hydrogenated Canola Oil in Equilibrium with High Pressure Carbon Dioxide. 2011.
6. CHEMWATCH for Santa Cruz Biotechnology Inc. Canola oil sc-211009. Material Safety Data Sheet. Nov-26-2009.
7. USEPA. Office of Prevention, Pesticides and Toxic Substances. Vegetable and Flower Oils Summary Document, Registration Review: Initial Docket. March 2010.