



## **Acute Toxicity Hazard of Pesticides to Freshwater Fish**

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Pesticides are widely used in modern agriculture to aid in the production of high quality food. However, some pesticides have the potential to cause serious health and/or environmental damage. As such, producers should take care to follow the label directions and select a reduced risk product when possible.

The risk that a pesticide poses to the surrounding environment depends on its toxicity to birds, bees, fish and other organisms, and their exposure to the pesticide. The short term toxicity of a chemical, either natural or man-made, is measured using the LC50 (lethal concentration) value. An LC50 is a measure of how much product is required to kill 50% of the test population over a period of time. For example, the 96 hour LC50 of Bravo 500 for fish is 47 ppb which means 0.000047 grams of Bravo 500 added to 1 litre of water would kill half the fish present in 96 hours.

The following tables were developed to assist producers in decision making by providing information on the short term toxicity hazard of pesticides to freshwater fish. The information was developed using data from SAgE Pesticides (<http://www.sagepesticides.qc.ca>). Fungicides and insecticides commonly used in potato production on PEI were placed into one of five hazard categories represented by a colour scale. The scale runs from green (low toxicity to rainbow trout), through yellow and orange, to red (high to extremely high toxicity to rainbow trout). The ranking does not take into account the application rate or environmental conditions at the time of application.

Attempts to minimize the risk to fish and aquatic habitats from pesticides should not simply be limited to the selection of a lower risk pesticide. Consideration should be given to practices that reduce runoff and erosion during all phases of the production cycle (from crop rotation, to field setup, to fall and winter management of the field). Practices that prevent erosion and runoff are key in preventing pesticides from reaching surface water and eliminating negative environmental impacts.



**Table 1: Acute Toxicity Hazard of Insecticide Active Ingredients to Fresh Water Fish**

<b>Active Ingredient</b>	<b>Product Names</b>	<b>Relative Ranking</b>
Bacillus thuringiensis tenebrionis	Novodor	Low
Clothianidin	Clutch 50 WDG	Low
Thiamethoxam	Actara 240 SC	Low
Acetamiprid	Assail 70 WP	Slight
Chlorantraniliprole	Coragen	Slight
Flonicamid	Beleaf 50 SG	Slight
Imidacloprid	Admire 240 F, Alias 240 SC	Slight
Pymetrozine	Fulfill 50 WG	Slight
Dimethoate	Cygon 480EC	Moderate
Oxamyl	Vydate L	Moderate
Spinetoram	Delegate	Moderate
Spinosad	Success 480, Entrust 80 W	Moderate
Spirotetramat	Movento 240	Moderate
Carbaryl	Sevin XLR	High
Chlorpyrifos	Lorsban NT, Lorsban 50W, Pyrifos 15 G, Pyrinex 480 EC	High
Cypermethrin	Ripcord 400, Up Cyde 2.5 EC	High
Diazinon	Diazinon 50W	High
Endosulfan	Thionex EC, Endosulfan 50W, Endosulfan 400 EC	High
Phosmet	Imidan 50WP	High
Lambda-cyhalothrin	Matador 120EC	High
Malathion	Malathion 50EC, Malathion 25W, Malathion 500E, Malathion 85E	High
Methomyl	Lannate SP	High
Naled	Dibrom	High
Novaluron	Rimon 10 EC	High
Deltamethrin	Decis 5EC	Extremely High
Deltamethrin + imidacloprid	Concept	Extremely High
Permethrin	Perm Up, Pounce, Ambush 500 EC	Extremely High
Phorate	Thimet 15G	Extremely High

**Table 2: Acute Toxicity Hazard of Fungicide Active Ingredients to Fresh Water Fish**

Active Ingredient	Product Names	Relative Ranking
Pyrimethanil	Scala 400 SC	Low
Cyazofamid	Ranman 400SC, Tarrant 400 SC	Slight
Cymoxanil	Curzate 60 DF	Slight
Metalaxyl	Ridomil Gold 480 EC	Slight
Phosphorous acid	Phostrol	Slight
Boscalid	Cantus (Lance) 70 WDG	Moderate
Dimethomorph	Acrobat 50 WP	Moderate
Mandipropamid	Revus	Moderate
Azoxystrobin	Quadris F	High
Azoxystrobin + Difenconazole	Quadris Top	High
Chlorothalonil + Propamocarb	Tattoo C	High
Fenamidone	Reason 500 SC	High
Fluopicolide	Presidio	High
Mancozeb	Dithane DG Rainshield NT, Manzate Pro-Stick, Penncozeb 80 WP, Penncozeb 75 DF Raincoat	High
Metalaxyl + Chlorothalonil	Ridomil Gold/Bravo Duo, Ridomil Gold MZ	High
Metiram	Polyram DF	High
Penthiopyrad	Vertisan	High
Zoxamide + Mancozeb	Gavel 75 DF	High
Ametoctradin + Dimethomorph	Zampro	Extremely High
Chlorothalonil	Bravo 500, Bravo ZN, Echo 90DF, Echo 720	Extremely High
Copper	Parasol WP, Parasol Flowable, Kocide	Extremely High
Cymoxanil + Famoxadone	Tanos 50 DF	Extremely High
Fluazinam	Allegro 500 F	Extremely High
Pyraclostrobin + Metiram	Cabrio Plus	Extremely High
Pyraclostrobin	Headline 250 EC	Extremely High