

## Acute Toxicity Hazard of Pesticides to Freshwater Fish, Birds and Bees May 2023

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Pesticides are widely used in modern agriculture to aid in the production of high-quality food; however, some have the potential to cause health and/or environmental damage. Producers are encouraged to use pesticides with reduced risks when possible and must read the labels to follow the directions described.

The risk that a pesticide poses to the environment depends on its toxicity to organisms including fish, birds and bees along with exposure. The short-term toxicity of a chemical, either natural or man-made, can be measured using the LC50 (lethal concentration) value, a measurement of how much product is required to kill 50% of a test population over a time-period. For example, the 96-hour LC50 of chlorothalonil, the active ingredient in Bravo ZN, for fish is 0.039 mg/L<sup>1</sup>.

Attempts to minimize the risk of pesticides to humans, fish, birds and bees include selecting a lower risk product and incorporating agronomic practices that reduce runoff and erosion during all phases of the production cycle (field setup, fall and winter management, crop rotation).

The following tables were developed to assist producers in decision-making by providing information on the acute toxicity hazard of pesticides to freshwater fish, birds and bees using data from SAgE Pesticides (<http://www.sagepesticides.qc.ca>). Insecticides, fungicides and herbicides commonly used in potato production on PEI were placed into one of six hazard categories represented by a colour scale including nil (purple), low (green), slight (blue), moderate (orange), high (red) and extremely high (burgundy). It does not reflect the overall environmental or human health risk posed through using these products, as application rates, environmental conditions at time of application or probability of exposure have not been considered.

**The tables are not comprehensive and provided only as a reference; furthermore, reading pesticide labels is required by law and are to be considered correct in the event of any discrepancy between those and this document. Any pesticide label can be searched on the PMRA website using this link: <https://pr-rp.hc-sc.gc.ca/lr-re/index-eng.php>**

<sup>1</sup>Bravo ZN safety data sheet. Syngenta 2022. [https://assets.syngenta.ca/pdf/ca/msds/Bravo\\_ZN\\_28900\\_en\\_SDS.pdf](https://assets.syngenta.ca/pdf/ca/msds/Bravo_ZN_28900_en_SDS.pdf)

**Acute Toxicity Hazard of Insecticide Active Ingredients to Freshwater Fish, Birds and Bees**

Active Ingredient	Product Name	Relative Ranking		
		Fish	Birds	Bees
abamectin + cyantraniliprole	Minecto Pro	Extremely High	Moderate	High
acetamiprid	Assail 70 WP, Aceta 70	Low	Moderate	Moderate
acetamiprid + novaluron	Cormoran	Extremely High	Moderate	Moderate
afidopyropen	Sefina	Moderate	Slight	Low
broflanilide	Cimegra	High	Low	High
carbaryl	Sevin XLR	Extremely High	Low	High
chlorantraniliprole	Coragen	Extremely High	Low	Low
chlorpyrifos	Lorsban NT, Lorsban 50W, Pyrifos 15 G, Pyrinex 480 EC, Warhawk 480 EC, Sharpfos	Extremely High	High	High
clothianidin	Clutch 50 WDG, Titan ST	Low	Low	High
clothianidin + penflufen (fungicide)	Emesto Quantum	High	Low	High
cyantraniliprole	Verimark	Extremely High	Low	High
cyantraniliprole + thiamethoxam	Minecto Duo	Extremely High	Low	High
cyclaniliprole	Harvanta	Extremely High	Low	High
cypermethrin	Ripcord 400, Up Cyde 2.5 EC, Mako, Ship 250	Extremely High	Low	High
deltamethrin	Decis 5 EC, Poleci 2.5 EC	Extremely High	Low	High
deltamethrin + imidacloprid	Concept	Extremely High	Moderate	High
dimethoate	Lagon 480 E	Moderate	High	High
flonicamid	Beleaf 50 SG	Slight	Slight	Low
fluazaindolizine	Salibro	Slight	Low	Low
flupyradifurone	Sivanto Prime	Slight	Moderate	High
imidacloprid	Admire 240 F, Alias 240 SC	Moderate	Moderate	High
kaolin clay	Surround	Nil	Nil	Low
lambda-cyhalothrin	Matador 120 EC, Silencer 120 EC, Labamba	Extremely High	Low	High
malathion	Malathion 50 EC, Malathion 500 E, Malathion 85 E	Extremely High	Slight	High
methomyl	Lannate SP	Extremely High	High	High
mineral oil	Superior 70 Oil, SuffOil-X Spray Oil Emulsion	High	Low	Low
naled	Dibrom	Extremely High	Moderate	High
novaluron	Rimon 10 EC	Extremely High	Low	Low
oxamyl	Vydate L	High	Extremely High	High
permethrin	Perm Up, Pounce, Ambush 500 EC, Bio-Environmental Permethrin	Extremely High	Low	High
phorate	Thimet 20 G	Extremely High	Extremely High	High
phosmet	Imidan 50 WP	Extremely High	Slight	High
pymetrozine	Fulfill 50 WG	Slight	Low	Low

**Acute Toxicity Hazard of Insecticide Active Ingredients to Freshwater Fish, Birds and Bees**

Active Ingredient	Product Name	Relative Ranking		
		Fish	Birds	Bees
spinetoram	Delegate	High	Low	High
spinosad	Success, Entrust	Slight	Slight	High
spirotetramat	Movento 240	Moderate	Low	Low
sulfoxaflor	Closer	Low	Slight	High
tetraniliprole	Vayego	High	Low	High
thiamethoxam	Actara 240	Low	Slight	High

**Acute Toxicity Hazard of Fungicide Active Ingredients to Freshwater Fish, Birds and Bees**

Active Ingredient	Product Name	Relative Ranking		
		Fish	Birds	Bees
ametoctradin + dimethomorph	Zampro	Extremely High	Slight	Low
azoxystrobin	Quadris F, Azoshy SC, Elatus A	High	Low	Low
azoxystrobin + difenoconazole	Quadris Top	High	Low	Low
azoxystrobin + difenoconazole + fludioxonil	Stadium	High	Low	Low
<i>bacillus amyloliquefaciens</i> strain F727	Stargus	Nil	Nil	Nil
<i>bacillus amyloliquefaciens</i> strain D747	Double Nickel LC	Nil	Low	Low
<i>bacillus amyloliquefaciens</i> strain MBI600	Serifel	Nil	Low	Nil
<i>bacillus mycoides</i> isolate	LifeGard WG	Nil	Low	Nil
<i>bacillus subtilis</i> QST 713	Serenade Opti	Nil	Nil	Nil
benzovindiflupyr	Elatus B	Extremely High	Slight	Low
benzovindiflupyr + difenoconazole	Aprovia Top	Extremely High	Slight	Low
boscalid	Cantus	Moderate	Low	Low
chlorothalonil	Bravo ZN, Echo 90 DF, Echo 720	Extremely High	Low	Low
chlorothalonil + mancozeb	Elixir	Extremely High	Slight	Low
chlorothalonil + propamocarb	Tattoo C	Extremely High	Low	Low
copper (hydroxide)	Parasol WP, Parasol Flowable, Kocide 2000	Extremely High	Moderate	Low
cyazofamid	Ranman 400 SC, Tarrant 400 SC	Low	Low	Low
cymoxanil	Curzate 60 DF	Slight	Low	Low
cymoxanil + famoxadone	Tanos 50 DF	Extremely High	Low	Low
difenoconazole (fungicide) + fludioxinil (fungicide) + thiamethoxam	Cruiser Maxx Potato Extreme	High	Slight	High
difenoconazole + fludioxonil	Maxim D	High	Low	Low
difenoconazole + mandipropamid + sedaxane	Vibrance Ultra	High	Slight	Low

**Acute Toxicity Hazard of Fungicide Active Ingredients to Freshwater Fish, Birds and Bees**

Active Ingredient	Product Name	Relative Ranking		
		Fish	Birds	Bees
difenoconazole + pydiflumetofen	Miravis Duo	High	Low	Low
dimethomorph	Forum	Moderate	Low	Low
fenamidone	Reason 500 SC	High	Low	Low
fluazinam	Allegro 500 F	Extremely High	Low	Low
fludioxonil + mancozeb	Maxim MZ PSP	Extremely High	Slight	Low
fludioxonil	Maxim PSP	High	Low	Low
fluopicolide	Presidio	High	Low	Low
fluopyram	Velum Prime	Moderate	Low	Low
fluopyram + prothioconazole	Proline Gold, Propulse	Moderate	Low	Low
fluopyram + pyrimethanil	Luna Tranquility	Moderate	Moderate	Low
fluoxastrobin	Evito 480 SC	High	Low	Low
fluxapyroxad	Sercadis	High	Low	Low
hydrogen peroxide + peroxyacetic acid	Oxidate	High	Slight	Nil
mancozeb	Dithane M-45, Dithane DG Rainshield NT, Manzate Pro-Stick, Penncozeb 80 WP, Penncozeb 75 DF Raincoat, MancoPlus, Solan MZ, Potato ST 16	Extremely High	Slight	Low
mancozeb + douglas fir bark	Tuberseal	Extremely High	Slight	Low
mancozeb + zoxamide	Gavel 75 DF	Extremely High	Slight	Low
mandipropamid	Revus	Moderate	Slight	Low
mandipropamid + oxathiapiprolin	Orondis Ultra, Orondis B	High	Slight	Low
mefentrifluconazole	Cevya	High	Low	Low
metalaxyl	Ridomil Gold MZ, Ridomil Gold 480 EC	Slight	Slight	Low
metalaxyl-M & S-isomer + oxathiopiprolin	Orondis Gold	High	Slight	Low
metconazole	Quash	Moderate	Slight	Low
metiram	Polyram DF	High	Low	Low
metiram + pyraclostrobin	Cabrio Plus	Extremely High	Low	Low
penflufen + prothioconazole	Emesto Silver	High	Low	Low
penthiopyrad	Vertisan	High	Low	Low
phosphorous acid	Phostrol, Confine Extra, Rampart	Low	Slight	Low
prothioconazole + trifloxystrobin	USF0728 325 SC, Delaro 325 SC	Extremely High	Low	Low
pyraclostrobin	Headline 250 EC, Preach	Extremely High	Low	Low
pyrimethanil	Scala 400 SC	Moderate	Moderate	Low
thiabendazole	Mertect SC	High	Low	Moderate
thiophanate-methyl	Senator PSPT	Moderate	Low	Low

Acute Toxicity Hazard of Herbicide Active Ingredients to Freshwater Fish, Birds and Bees				
Active Ingredient	Product Name	Relative Ranking		
		Fish	Birds	Bees
acetic acid	Serene	Slight	Nil	Nil
carfentrazone-ethyl	Aim EC	Moderate	Low	Low
clethodim	Arrow 240 EC, Select EC, Clethodim 250	Low	Slight	Low
dimethenamid-P	Outlook	Moderate	Slight	Low
diquat	Reglone 240, Diquash, Dissicash	Moderate	Moderate	Low
EPTC	Eptam 8E	Moderate	Slight	Low
fenoxaprop-p-ethyl	Excel Super	High	Low	Low
fluazifop-p-butyl	Venture L	Moderate	Low	Low
glufosinate ammonium	Ignite	Low	Low	Low
glufosinate ammonium + metribuzin	Ignite + Sencor 75D F or Sencor 480 F	Moderate	Moderate	Low
glyphosate	Roundup Weathermax / Ultra 2	Slight	Low	Low
linuron	Lorox L, Lorox DF, Linuron 400 FL	High	Moderate	Low
linuron + metribuzin	Sencor 75 DF, Sencor Solupak 75 DF or Sencor 480F + linuron 480	High	Moderate	Low
linuron + S-metolachlor	Lorox L or Lorox DF + Dual II Magnum	High	Moderate	Low
metribuzin	Sencor 75 DF, Sencor 480 F, Sencor Solupak 75 DF, Metrix, TriCor 75 DF, Meter 75 DF	Moderate	Moderate	Low
metribuzin + S-metolachlor	Sencor 75 DF or Sencor 480 F + Dual II Magnum TieDown TriCor 75 DF + UPI S-Met Boundary LQD Strim MTZ Flag	Moderate	Moderate	Low
metribuzin + sulfentrazone	Sencor STZ	Moderate	Moderate	Low
pyroxasulfone	Zidua	Moderate	Low	Low
rimsulfuron	Prism, Rimsulfuron 25, Sharda	Low	Low	Low
sethoxydim	Poast Ultra	Slight	Low	Moderate
S-metolachlor	Dual II Magnum, Metallica	Slight	Low	Low