A vertical photograph on the left side of the slide shows a green wheelbarrow with a metal handle and a single wheel, sitting on a green lawn. The wheelbarrow is partially filled with dry grass or twigs.

Relative toxicity of the main active ingredients
contained in domestic use pesticides used
on green spaces
(trees, shrubs, grass and paved surfaces)












March 2019

































IMPORTANT NOTE






















This document provides an overview of the relative toxicity of active ingredients contained in domestic use¹ pesticides used in green spaces. The pictograms assigned to the toxicity for mammals and the non-target species are determined using the most severe criterion and not by an average. For full details on their toxicity, please consult the SAgE pesticides website: www.sagepesticides.qc.ca.

















Furthermore, the document does not consider the method of application of the pesticide which may influence the risk of exposure. This must be evaluated by the user of the pesticide.











The active ingredients mentioned in a green cell are considered biopesticides by the Pest Management Regulatory Agency.






























Active ingredient	Mammals toxicity including human ²		Non targeted species toxicity ²			Persistence in soil ²	Leaching potential ²	Application area	Main pests controlled	Some examples of end-use products containing the active ingredient ³ (registration number)
	Acute toxicity	Long term effect								
INSECTICIDES										
Acetamiprid						Low	Low	Trees, shrubs and gardens	Aphids, leafhoppers, leaf miners, whiteflies	Acetamiprid RTU Insecticide (27126)
<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>			-	-		-	-	Trees, shrubs and gardens	Caterpillars	Safer's BTK Biological Insecticide (24536) Bioprotec Eco (27251)




























Active ingredient	Mammals toxicity including human ²		Non targeted species toxicity ²			Persistence in soil ²	Leaching potential ²	Application area	Main pests controlled	Some examples of end-use products containing the active ingredient ³ (registration number)
	Acute toxicity	Long term effect								
Borax				-		-	-	Lawns and paved surfaces	Ants	Ortho Ant B Gon Max Ant Traps (23372) Safer's Attack Ant Trap (24355) Knock Down Eco Ant Killer Bait (31203)
Calcium sulphide or calcium polysulphide						-	-	Trees, shrubs and gardens	Mealybugs, mites, scale insects	Green Earth Lime Sulphur Concentrate (7386) Lime Sulphur (27978)
Insecticidal soap						Low	Low	Trees, shrubs and gardens	Various insects	Safer's Insecticidal Soap (14668) Ortho Bug-B-Gon Eco Insecticidal Soap Ready-To-Spray Concentrate (29272) Safer's Trounce Lawn & Turf Insecticide (28681)
								Lawns		
Malathion						Low	Low	Trees, shrubs and gardens	Various insects	Wilson 50 % Malathion Liquid Insecticide-Miticide (9802) Malathion liquid insecticide -miticide concentrate (31179)
Mineral oil						-	-	Trees, shrubs and gardens	Mealybugs, mites, scales, spider mites	Green Earth Horticultural Oil Insect Spray (21348) Liquid Insecticide oil spray for Dormant Trees (25307)
Permethrin						Low	Low	Trees, shrubs and gardens	Aphids, caterpillars	Bio-Environmental Permethrin Water-Based Insecticide (22804)





Active ingredient	Mammals toxicity including human ²		Non targeted species toxicity ²			Persistence in soil ²	Leaching potential ²	Application area	Main pests controlled	Some examples of end-use products containing the active ingredient ³ (registration number)
	Acute toxicity	Long term effect								
Pyrethrins						Low	Low	Trees, shrubs, gardens	Various insects	Pyrocide Aqueous Plant Spray Insecticide (15181) K-G House & Garden Insect Killer I (17953)
								Lawns		
Silicon dioxide (present as diatomaceous earth)	-	-		-	-	-	-	Trees, shrubs, gardens, and paved surfaces	Various insects	Wilson Antout Ant Killer Dust (21936) Knock Down Eco Crawling Insect Control & Killer Bait Powder (31048)
Spinosad						Moderate	Low	Trees, shrubs, gardens and lawns	Caterpillar, Sod webworms, gypsy moth, thrips	Conserve 120 SC Domestic Naturalyte Insect Control Product (27285) Spinosad Insecticide (28602)
FUNGICIDES										
<i>Bacillus subtilis</i> strain QST 713			-	-	-	-	-	Trees, shrubs and gardens	Botrytis blight, leaf spot, powdery mildew	Natria Disease Control Concentrate (28628) Natria Disease Control Ready to Use (28629)
Calcium sulphide or calcium polysulphide						-	-	Trees, shrubs and gardens	Apple scab, black spot	Green Earth Lime Sulphur Concentrate (7386) Lime Sulphur (27978)

Active ingredient	Mammals toxicity including human ²		Non targeted species toxicity ²			Persistence in soil ²	Leaching potential ²	Application area	Main pests controlled	Some examples of end-use products containing the active ingredient ³ (registration number)
	Acute toxicity	Long term effect								
Copper octanoate	-	-	-	-	-	-	-	Trees, shrubs, gardens and lawns	Powdery mildew, Corynespora leaf spot, rust, bacterial blight, fire blight, coryneum blight, black spot, cercospora leaf spot	HydroWorxx Disease Control Concentrate (31826)
Polyoxin D zinc salt	-	-				Moderate	-	Lawns	Anthrachnose, brown ring patch, red thread, brown patch, yellow patch, grey snow mould, pink snow mould, botrytis blight, grey mould	Polyoxin D zinc salt 11.3% WDG domestic fungicide (32690)
Sulphur						Moderate	Low	Trees, shrubs and gardens	Leaf spot, powdery mildew, rust, black spot	Safer's Defender Garden Fungicide Ready to Use (19061) Green Earth Garden Fungicide Ready to Use (21880) King Eco-Way Fruit Tree & Garden Fungicide Spray or Dust (29572)
Tribasic copper sulphate						High	Low	Trees, shrubs and gardens	Anthrachnose, black spot, leaf spot, mildew	Green Earth Bordo Copper Spray (17482)

Active ingredient	Mammals toxicity including human ²		Non targeted species toxicity ²			Persistence in soil ²	Leaching potential ²	Application area	Main pests controlled	Some examples of end-use products containing the active ingredient ³ (registration number)
	Acute toxicity	Long term effect								
HERBICIDES										
4-chloroindole-3-acetic acid	-	-	-	-	-	-	-	Lawns	Dandelion plantain, hawkweed, cinquefoil, black medic, hawkbit	Wilson lawn weedout ultra(32515) Wilson lawn WeedOut Ultra concentrate 10X (32513)
Acetic acid				-	-	Low	Low	Lawns and paved surfaces	Dandelion and plantain in lawns, undesirable vegetation growing in paved surfaces	EcoClear For Fast Acting Weed Control (26522) Grotek Elimaweed Weed & Grass killer (28807) Amaizeingly Green Horticultural Vinegar (31459)
Citric acid ⁴	-	-	-		-	Low	High	Lawns	Birds foot-trefoil, black medick, wood sorrel, red clover, white clover	Bioprotec Lawn Herbicide Concentrate (30881) Bioprotec Lawn Herbicide Ready to Use (30883)
Lactic acid	-	-				-	-			
Corn gluten meal	-	-	-	-	-	-	-	Lawns	Dandelion and crabgrass seeds	TurfMaize Corn Gluten Herbicide pre-emergent weed seed germination Inhibitor (27491) Nutrite Pre-Emergent Weed Seed Germination Inhibitor (27727) Corn Gluten Meal Herbicide DDG (31961)

Active ingredient	Mammals toxicity including human ²		Non targeted species toxicity ²			Persistence in soil ²	Leaching potential ²	Application area	Main pests controlled	Some examples of end-use products containing the active ingredient ³ (registration number)
	Acute toxicity	Long term effect								
Dichlobenil						High	High	Trees and shrubs	Undesirable vegetation	Casoron Granular Herbicide (20233)
Glufosinate-ammonium						Low	Low	Paved surfaces	Undesirable vegetation growing in paved surfaces	Wilson Total WipeOut Ready-To-Use (25300) Wilson Total Wipeout Max concentrate (25301)
Glyphosate (present as acid)						Low	Low	Lawns and paved surfaces	Undesirable vegetation growing in paved surfaces	Roundup Quik Stik Non-Selective Herbicide Tablets (23786)
Glyphosate (present as amine salts)						Low	Low	Lawns and paved surfaces	Undesirable vegetation control lawn, patio weed control	Glyfos (R) herbicide 7 Ready-to-use (26610) Wilson total wipeout max grass & weed killer refill (32090)
Herbicidal soap					-	Low	Low	Trees, shrubs, garden, lawns and paved surfaces	Undesirable vegetation growing in paved surfaces, moss and lichen	Safer's Fast Acting TopGun Weed Killer Herbicide (22244) Finalsan Concentrate (29017) Scotts Ecosense Moss B Gon Herbicidal Soap Concentrate Moss & Algae Killer (29303)
Iron (present as FeHEDTA)			-	-	-	-	-	Lawns and paved surfaces	Several species of broadleaf weeds, moss and algae	NEU1173H Large Size (29538) Scotts Ecosense Weed B Gon Ready-To-Spray Weed Control (30145)

Active ingredient	Mammals toxicity including human ²		Non targeted species toxicity ²			Persistence in soil ²	Leaching potential ²	Application area	Main pests controlled	Some examples of end-use products containing the active ingredient ³ (registration number)
	Acute toxicity	Long term effect								
Napropamide						High	High	Trees and shrubs	Undesirable vegetation	Devrinol 2-G Ready-To-Use Herbicide (28512)
<i>Sclerotinia minor</i> strain IMI 344141			-	-	-	-	-	Lawns	Dandelion	Sarritor Selective Biological Lawn Weed Killer (28546)
Sodium chloride ⁴	-	-		-	-	-	-	Lawns	Small ragweed, various broadleaf weeds	WeedOut lawn Weed Control (31027)
Trifluralin						High	Low	Trees and shrubs	Undesirable vegetation	Biobarrier Root Control System (Domestic) (28780)
MOLLUSCIDES										
Ferric phosphate			-	-	-	-	-	Trees, shrubs and gardens	Slugs and snails	Sluggo Slug and Snail Bait for Gardens (26102) Ortho Slug B Gon Eco Slug and Snail Bait (28375)
Ferric sodium EDTA					-	-	-	Trees, shrubs and gardens	Slugs and snails	Safer's Slug & Snail Killer (28775)
Metaldehyde						Moderate	High	Trees and shrubs	Slugs and snails	King Slug & Snail Pellets (28287) Wilson SlugOut Meal (25908)

Active ingredient	Mammals toxicity including human ²		Non targeted species toxicity ²			Persistence in soil ²	Leaching potential ²	Application area	Main pests controlled	Some examples of end-use products containing the active ingredient ³ (registration number)
	Acute toxicity	Long term effect								
Silicon dioxide (present as diatomaceous earth)	-	-		-	-	-	-	Trees, shrubs, lawns and paved surfaces	Slugs	Wilson Antout Ant Killer Dust (21936) Pro Professional ProGreen Insect Dust (28746)

¹ Active ingredients mentioned in this table are contained in pesticides for domestic use (federal government) and classes 4 and 5 (provincial government).






² Source : SAgE pesticides. Québec : ministère de l'Agriculture, des Pêcheries et de l'Alimentation / ministère de l'Environnement et de la Lutte contre les changements climatiques / Institut national de santé publique du Québec [www.sagepesticides.qc.ca].

The aquatic indicator species is rainbow trout or daphnia while the indicator bird species is mallard or northern bobwhite.

³ The pesticide may contain one or more active ingredients other than mentioned. To learn more about the product, check the label on the Pest Management Regulatory Agency [label search](#) tool.






⁴ Source : University of Hertfordshire (2013). The Pesticide Properties DataBase (PPDB) developed by the Agriculture & Environment Research Unit (AERU), University of Hertfordshire, 2006-2013, (Pages viewed in February 2016), [En ligne]. <http://sitem.herts.ac.uk/aeru/ppdb/en/index.htm>





LEGEND

	<p>This symbol is used to describe pesticides with very high risk to human health or the environment.</p> <p>These pesticides should be used in last resort and all necessary prevention measures must be taken to avoid all form of exposure and minimized risk for the environment.</p>
	<p>This symbol is used to describe pesticides with high risk to human health or the environment.</p> <p>These pesticides should be used in last resort and all necessary prevention measures must be taken to avoid all form of exposure and minimized risk for the environment.</p>
	<p>This symbol is used to describe pesticides with moderate risk to human health or the environment.</p> <p>Users should take all necessary prevention measures to avoid all form of exposure and minimized risk for the environment.</p>
	<p>This symbol is used to describe pesticides with slight risk to human health or the environment.</p> <p>Although these pesticides can normally be used without adverse effects, users should take all necessary prevention measures to avoid all form of exposure and minimized risk for the environment.</p>
	<p>This symbol is used to describe pesticides with low risk to human health or the environment.</p> <p>These pesticides should be used in first place. Although these pesticides can normally be used without adverse effects, users should take all necessary prevention measures to avoid all form of exposure and minimized risk for the environment.</p>
-	<p>This symbol indicates that the data is not available.</p>

Source : SAgE pesticides. Québec : ministère de l'Agriculture, des Pêcheries et de l'Alimentation / ministère de l'Environnement et de la Lutte contre les changements climatiques / Institut national de santé publique du Québec. [www.sagepesticides.qc.ca]






➤ Mammals toxicity including human

<i>Acute toxicity criteria</i>	Severity of the effects				
					
	Indicator values				
LD₅₀ oral (mg/kg)	≤ 5	> 5 - 50	> 50 - 300	> 300 - 2000	> 2000
LD₅₀ dermal (mg/kg)	≤ 50	> 50 - 200	> 200 - 1000	> 1000 - 2000	> 2000
LC₅₀ inhalation (mg/l)	≤ 0,05	> 0,05 - 0,5	> 0,5 - 1	> 1 - 5	> 5
Dermal irritation		Severe to extreme irritant	Moderate irritant	Slight irritant	Little or no irritant
Ocular irritation		Severe to extreme irritant	Moderate irritant	Slight irritant	Little or no irritant
Sensitization		Yes	Potential		No






<i>Long term effects criteria</i>	Severity of the effects					
						
	Indicator values					
Carcinogenicity	Human carcinogen	Probable human carcinogen	Possible human carcinogen	Data inadequate for assessment of human carcinogenic potential		Not likely to be carcinogen to humans
Genotoxicity		Genotoxic for humans	Potential genotoxic for humans		No or inadequate data	No evidence of human genotoxicity
Endocrine disruption		Evidence of endocrine disruption	Potential of endocrine disruption		No or inadequate data	No evidence of endocrine disruption
Reproductive effects	Confirmed human effects	Suspected human effects	Confirmed animal effects	Suspected animal effects	No or inadequate data	No effect
Development	Confirmed human effects	Suspected human effects	Confirmed animal effects	Suspected animal effects	No or inadequate data	No effect

➤ **Non-target species toxicity**




Bird toxicity criteria

LD ₅₀ (mg/kg)	Symbol
< 10	
10 - 50	
50 - 500	
500 - 2000	
> 2000	

Freshwater fish and aquatic invertebrate toxicity criteria

LC ₅₀ (µg/L)	Symbol
< 100	
100 - 1000	
1000 - 10 000	
10 000 - 100 000	
> 100 000	

Honey bee toxicity criteria

LD ₅₀ (µg/bee)	Symbol
< 2	
2 - 11	
> 11	

➤ Persistence in soil

Environmental persistence potential criteria

DT ₅₀ (days)	Persistence potential
< 30	Low
30 - 90	Moderate
≥ 90	High

➤ Leaching potential

Leaching potential criteria

GUS* Index	Leaching potential
< 1,8	Low
1,8 - 2,8	Moderate
≥ 2,8	High

*Groundwater Ubiquity Score