

2024 Least-Toxic Pesticides List

Source: *Linda Gilkeson*

This list of active ingredients provides examples of Canadian registered products as of 2023, but it is not a comprehensive list because products often change. *Mention of a product does not constitute an endorsement.* Most products listed below are for residential use and have DOMESTIC on the label. As noted, a few pesticides are currently only available in Canada in products that are registered for Commercial use, which home gardeners cannot buy. They are listed below in the event a Domestic product becomes available. Products named are also not necessarily approved for certified organic growers (consult Organic Materials Research Institute or local organic certification bodies for accepted products).

Insect Control

Bacillus thuringiensis kurstaki (BTK) [*Safer Brand Caterpillar Killer*]

- Contains a common species of soil bacteria; produces spores and protein crystals that infect and kill some species of caterpillars.
- Non-toxic to other insects, animals, and people. Non-persistent, breaks down in a few days.
- Use to control leaf-eating caterpillars in greenhouses, food crop and gardens, and on ornamentals.
- Apply while caterpillars are actively feeding; caterpillars stop feeding immediately but may not die for 2-5 days.

Bacillus thuringiensis galleriae (BTG) [*grubHALT! BeetleGone; Scotts Grub-B-Gon Beetle Killer*]

- Similar properties to above but the bacteria are specific to some beetles and their larvae.
- Use to control June beetles, European chafer, Japanese beetle in turf and ornamentals.
- Applied as a foliar spray or soil drench when target larvae are present.
- Rainfall or irrigation (equivalent of an inch) after application improves performance of soil drenches.

Horticultural (Supreme) Oil: Dormant & Summer Oils [*Green Earth, Wilson's products*]

- Contains highly refined petroleum oil or canola oil; acts upon contact, by suffocation and by disrupting other physical processes; there are no residual effects.
- Dormant oil controls overwintering eggs of aphids, some moths, mealybugs, pear psylla, pear and rose sawflies, scale species, some mites. Use dormant oils on deciduous woody plants after leaves drop or in spring after risk of frost has passed, before buds swell.
- Summer oils are more dilute, for use on woody plants during the growing season (not in hot weather) to control mealybugs, rust mites, scales, spider mites, whiteflies.
- Check product label for list of plants that cannot tolerate oil sprays.

Insecticidal Soap [*Safer Brand products, Scotts, Green Earth products*]

- Contains biodegradable fatty acids; acts upon contact against insects and mites; no residual effects.
- Used on aphids, earwigs, mealybugs, pear and rose slugs, scales, spider mites, whiteflies, and other insects; outdoors and indoors.
- Thorough spraying required; repeat applications may be necessary, but limit the number of times it is used on the same foliage as it can damage leaves.
- Check product label for list of plants that cannot tolerate soap sprays.

Silicon Dioxide (Diatomaceous Earth) [*Doktor Doom GoGreen; Green Earth, Scotts Ecosense, Safer Brand products*]

- Contains ground up fossilised shells of diatoms mined from natural deposits.
- Acts upon contact against insects by causing them to dry up; kills most insects that contact it.
- Non-toxic to people, animals, earthworms, but kills beneficial insects; not recommended for use outdoors.

- Has a long residual effect, if kept dry and not dispersed widely.

Pyrethrins [*Safer Brand; Scotts Ecosense, Green Earth products; Doktor Doom Botanics*]

- Active ingredient extracted from pyrethrum daisies is a nerve toxin that acts upon contact.
- Used on crawling and flying insects on plants, pets, indoors and outdoors. Non-persistent.
- Toxic to bees and beneficial insects; to minimize harm to bees, spray after sunset.
- Moderate toxicity, avoid inhalation or contact with skin and eyes; may cause allergic reactions in some people.

Spinosad [*Conserve Domestic Naturalyte*]

- Compound extracted from soil bacteria. Fast-acting, remains active up to 4 weeks after spraying.
- Controls many leaf eating caterpillars and beetles, thrips, and other insects.
- Highly toxic to bees and beneficial insects; to minimize harm to bees, spray after sunset.
- Do not apply to squash family plants. Avoid spray drift to water bodies.
- Limit the number of applications to any one plant to a maximum of 3 times per year.

Kaolin Clay [*Surround Crop Protectant - Commercial*]

- Fine clay particles applied as a spray, forms a thin white barrier film when dry that still allows photosynthesis.
- Reapply at 1-2 week intervals and after rainfall to maintain the barrier; can be used up to day of harvest.
- Not registered or suitable for ornamentals.
- Clay barriers have repellent, anti-feedant effects on caterpillars, sawflies, apple maggot and other fruit flies, tarnished plant bugs. Can be used to protect fruit trees from extreme heat.

Weed Control

Fatty Acid Herbicide [*Finalsan, Safer Brand products; Scotts Ecosense Pathclear; Roundup Advanced Fatty Acids*]

- Naturally occurring fatty acid compound, acts on contact to kill foliage of most plants; non-residual.
- Controls annual weeds, provides suppression or top-kill of some perennials.
- Apply in spring or summer to actively growing weeds, less than 12 cm tall (5 inches).
- Avoid spray drift onto desirable plants.

Acetic Acid Herbicide [*Scotts Ecoclear, Roundup Advanced Acetic Acid, Ecosense products; Green Earth products*]

- Contains the same naturally occurring acid as in vinegar, but in higher concentration.
- Acts on contact to kill foliage; non-residual.
- Use and timing as for fatty acid herbicide, above.

Corn Gluten Pre-Emergent Herbicide [*TurfMaize; Scotts products; Crab Arrest; Safers Weed Prevention Plus; Wilson Weed-Out; WOW Without Weeds; Green It Liquid Bio-herbicide*]

- Granular or liquid form of corn gluten, suppresses germination of seeds.
- Registered to control dandelion and smooth crabgrass in lawns.
- Controls only germinating seeds, not established weeds; do not use on new lawns.

Chelated Iron [*Scotts Weed-B-Gon; Fiesta*]

- Selective for broadleaf weeds, moss in lawns; unlike grasses, mosses take up toxic levels of iron.
- Fast acting; controls dandelion, English daisy, thistles, plantains, creeping buttercup, black medic, chickweed.
- May require 2 or more applications; do not apply to drought stressed lawns.

Disease Control

Sulphur [*Later 's, Wilson 's, Green Earth, Green Cross, C-I-L* brands; Safer Brand *Defender*]

- Sulphur particles bind with spores to prevent germination.
- Used on foliage to control fungal pathogens: black spot, powdery mildews, rusts, apple scab; also controls russet/rust mites.
- Use only on plants tolerant to sulphur or leaf injury may result (check product labels for sensitive plants).
- No residual effects once dry, but toxic to beneficial mites.

Lime Sulphur [*Later 's, Green Earth, Green Cross, C-I-L* brands]

- Contains a calcium sulphur compound; controls fungi, also mites and some insects; no residual effects.
- Used as dormant spray for fungal diseases separately or in combination with dormant oil.
- Dormant sprays before buds break also control scales on woody plants.
- Damages leaves on some plants (check product labels)
- Moderate toxicity to mammals, bees, birds; toxic to beneficial mites.

Citric & Lactic Acid [*Bioprotec* products are currently registered but not widely available]

- Fermentation products of *Lactobacillus* suppress fungal and bacterial leaf diseases
- Used on foliage for powdery mildew, downy mildew, bacterial leaf spot diseases; also, as a herbicide

Slug & Snail Control

Iron or Ferric Phosphate/Ferric Sodium EDTA [Safer® Brand products; *Sluggo; Escar-go; Scotts EcoSense Slug-B-Gone*]

- Contains iron mixed in an attractant bait.
- Consuming metal ions causes slugs & snails to stop feeding, dry up and die in 3-6 days.
- Non-toxic to pets, birds, insects, earthworms, other wildlife. Remains active for a week even in heavy rain.
- Broadcast small amount over garden area - do not surround target plants with bait as it attracts slugs to feed.
- Replace after prolonged rainfall.

Notes:

Copper fungicide sprays (fixed copper, copper sulphate) are no longer legal in British Columbia due to the risk of building up toxic levels of copper in the soil.

No combination products containing mixtures of insecticides and fungicides are included. It is unlikely that gardener would ever need both types of pesticide at the same time, therefore use of such products almost always constitutes an overuse of pesticides.