



PRODUCTS FOR MANAGEMENT OF INSECT PESTS

Many pest management products, which are less hazardous to the environment and to non-target organisms, are commercially available to home owners. The selection can be a bit overwhelming. However, with sufficient information you can make the correct choice for your lawn or garden. All of the following products have been registered by Health Canada. This means that they were reviewed and determined to be safe and effective when used according to label directions. As with any pesticide, read the label carefully prior to use, and follow all label directions.

BOTANICAL INSECTICIDES

Some insecticides are derived from plants or plant products. They are often used by home gardeners because they are perceived to be safer than the synthetic pesticides registered for domestic use. While they break down very rapidly, they are non-specific, killing beneficial as well as pest insects.

Pyrethrins (Pyrethrum) are extracted from flower petals of *Chrysanthemum*(*Tanacetum*.) species (pyrethrum daisies). They act as nerve poisons, knocking insects down on contact, but often not killing them. These products usually contain another active ingredient to actually kill insects. Pyrethrins break down rapidly in sunlight, so should be applied in the evening or on overcast days. They should not be applied when the temperature is above 32°C. Exposure to pyrethrins may result in skin allergies, sneezing, and/or a runny nose. As with all pesticides, some individuals may be more susceptible than others. While this product is normally not toxic to plants, maidenhair fern may be adversely affected. **Pyrethrins are extremely toxic to fish.**

Rotenone is extracted from roots of tropical legumes (*Derris* species (Malaysia) and *Lonhocarpus* species (South America)). It must be ingested by the target pests to be effective. It was originally used as an insecticide and as a fish poison by aboriginal tribes. **Rotenone is toxic to non-target insects and mites and extremely toxic to fish and pigs.** Exposure to Rotenone may cause mild skin or eye irritation in some individuals

MICROBIAL INSECTICIDES

***Bacillus thuringiensis* var. *kurstaki*, (B.t. k.)** can be used by home owners for control of caterpillars (Lepidopteran larvae) which feed on plant foliage. It is very specific, affecting only butterfly and moth larvae, although other strains of this bacteria are available for management of other groups of insects. *B.t.k.* is a naturally occurring soil bacterium. It must be eaten by the target pest in order to be effective. When a caterpillar feeds on foliage sprayed with *B.t.*, it ingests the bacteria. In the alkaline conditions of the lepidopteran digestive tract, the bacteria produces spores and protein crystals which results in paralysis of the muscles of the digestive tract. The caterpillar stops feeding and dies within a few days. *B.t.* breaks down in the environment after approximately 2 days. Inhalation of this product can result in allergic reactions in sensitive individuals. **Do not use *B.t.k.* if you are trying to establish a butterfly garden.**

OTHER INSECTICIDES

Diatomaceous Earth is composed of fossilized diatoms (microscopic sea creatures). They possess a shell composed of Silicon dioxide (SiO₂). This product is extremely sharp when viewed under a microscope. It acts by scratching the outer waterproofing layer of the insect's body, which leads to dehydration. It may also act as a deterrent. In order to be effective, pests must come into contact with this product (eg. crawl through it). It should be applied to areas where pests feed (eg. leaf surfaces), or to areas where pests live (eg. cracks and crevices for earwigs, around ant hills etc.) It must be reapplied after heavy rain. A dust mask and goggles are recommended when applying this product, to keep diatomaceous earth out of your eyes and lungs.

Dormant Oils and **Superior Oils** act by plugging the holes that insects and mites, as well as their eggs, use to obtain oxygen from the environment. They may also prevent disease spores from germinating. Dormant oils must be applied after leaves of deciduous trees and shrubs drop in the fall or before growth begins in the spring. Superior oils are more highly refined, and can be applied when deciduous plants have foliage or to conifers (they evaporate quickly, before damage to plants occurs). Both are sold as liquid concentrates that are mixed with water for application. They can be used to manage scale insects or insect and mite eggs. They should not be applied when freezing weather is predicted or while foliage is wet. Oils must have time to dry before rain or heavy dew is predicted. Some plants are easily damaged by oils - read the label carefully to make sure that the plants you are spraying will not be damaged (eg. Blue spruce, maple, ferns, etc. are all sensitive to damage by oils). **Oils should not be applied to plants that are stressed by disease or drought, or when the temperature is above 30°C.** If in doubt, spray a small test area, and wait for 48 hours to see if the plant is damaged (you will see discoloration or burning of foliage) before treating the entire plant. **Superior oils are non-selective, killing any insects and mites contacting the spray.**

Insecticidal Soaps contain unsaturated long-chain fatty acids similar to those in household soaps. They kill insects by dissolving the outer, waterproofing layer of an insect's external skeleton (cuticle), causing death by dehydration. They are most effective against small, soft bodied insects such as aphids, whitefly, mites, and other small, soft insects (eg. small caterpillars). They are also very effective against earwigs. Applications must be repeated to kill any newly hatched eggs, usually every 7 to 10 days, until pest numbers are reduced. Insecticidal soap must come into contact with an insect to work, so all plant surfaces must be thoroughly sprayed. It has no effect once it dries on the plant. Soaps should not be sprayed onto plants during hot sunny periods as plants may be harmed. If in doubt, rinse soap off of treated plants after a few hours.

Soap can damage leaves of some plants (especially bleeding heart, crown of thorns, gardenia, horse chestnut, Japanese maple, maidenhair fern, mountain ash, poinsettias, and sweet peas) Read the label carefully before applying soap, checking for plants that cannot tolerate soap.

Insecticidal Soaps will kill beneficial insects and mites which come into contact with the spray.

Boric Acid is manufactured from Borax. It contains the inorganic compound Boron. It kills pests which ingest it. It is available as dusts, baits, or as a liquid. Boric acid is used primarily as a bait for control of ants. It should be kept out of reach of pets and children, and may kill plants which are exposed to it. It is extremely persistent in the environment.

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