Less Toxic Insecticides

Insecticides are substances applied to control, prevent, or repel insects. Insecticides can be an important part of integrated pest management programs; however, some products can worsen pest problems or harm people or wildlife. Other products—often called "less toxic pesticides"—cause few injuries to people and organisms other than the target pest. The less toxic insecticides listed below should be a first choice when you need pesticides to control insects. Always check product labels to be sure they are registered for your plant or pest situation.

Soaps (potassium salts of fatty acids).

Insecticidal soaps control aphids, whiteflies, and mites; come in easy-to-use squirt bottles for small jobs; and require complete coverage of pests and sometimes a repeat application.

Insecticidal oils.

Oils control aphids, whiteflies, mealybugs, scale insects, spider mites, lacebugs, psyllids, and thrips. Good coverage of plants is required. Don't apply to water-stressed plants or when temperatures are above 90°F. Petroleum-based oil products include superior, supreme, narrow range, and horticultural oils. Plant-based oil products include jojoba, neem, and canola oils.

Microbial insecticides.

Microbials are derived from microorganisms that cause disease only in specific insects:

- ***Bacillus thuringiensis* subspecies *kurstaki* (Bt) controls leaf-feeding caterpillars.**
- ***Bacillus thuringiensis* subspecies *israelensis* (Bti), sold as mosquito dunks, controls mosquitoes.**
- **Spinosad is a microbial-based insecticide that controls caterpillars, leafminers, and thrips, but it also can harm some beneficial insects.**

Insect-feeding nematodes.

Entomophagous nematodes are microscopic worms, mostly *Steinernema* and *Heterorhabitis* species, that attack insects. Use them against lawn insects, clearwinged moths, and carpenterworm. Because they are living organisms rather than a pesticide, they are very perishable, so order through the mail to assure freshness.

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Botanical insecticides.

Derived directly from plant materials, botanicals vary greatly in their chemical composition and toxicity but usually break down in the environment rapidly.

- **Pyrethrins (pyrethrum) are used against a range of insects but toxic to fish and aquatic organisms.**
- **Azadirachtin, from the neem tree, has limited effectiveness against pests but low toxicity to nontargets. Don't confuse with neem oil.**
- **Garlic, hot pepper, peppermint oil, and clove oil are sold as insect repellents that protect plants. Little data is available on effectiveness.**

Avoid these more toxic pesticides:

- **Pyrethroids such as permethrin, cyfluthrin, cypermethrin, and bifenthrin move into waterways and kill aquatic organisms.**
- **Organophosphates such as malathion, disulfoton, and acephate are toxic to natural enemies.**
- **Carbaryl harms bees, natural enemies, and earthworms.**
- **Imidacloprid is a systemic insecticide that can be very toxic to bees and parasitic wasps, especially when applied to flowering plants.**
- **Metaldehyde, a common snail bait, is toxic to dogs and wildlife. Use iron phosphate baits instead.**

Look at the active-ingredients section of the pesticide label to see if it lists one of the less toxic chemicals.

Active Ingredient
Spinosad (a mixture of Spinosyn A and Spinosyn D).....0.5%
Other Ingredients.....99.5%

KEEP OUT OF REACH OF CHILDREN
CAUTION See back panel booklet for additional precautionary statements.
NET CONTENTS: 1 pint (473.16 ml)

Less toxic pesticides are sold under many brand names.

Minimize the use of pesticides that pollute our waterways. Use nonchemical alternatives or less toxic pesticide products whenever possible. Read product labels carefully and follow instructions on proper use, storage, and disposal.

For more information about managing pests, contact your **University of California Cooperative Extension office** listed under the county government pages of your phone book or visit the UC IPM Web site at **www.ipm.ucdavis.edu**.

UC IPM
Statewide Integrated Pest Management Program

UC CE University of California Cooperative Extension

What you use in your landscape affects our rivers and oceans!

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