ToxicSmart Alternatives
Information Guide Series, Number 2 of 3

What's Your Poison?

Putting Your Lawn and Garden Into De-Tox

Every year British Columbians purchase thousands of liters of poisons to pour and spray around their lawns and gardens. Pesticides are just plain dangerous—dangerous to the people who eat food with pesticide residues (especially children); dangerous to farmers, farm workers and their families; and dangerous to both the terrestrial and marine environments. The good news is you don't have to use chemicals to get the lawn and garden of your dreams!

What are the Benefits of Not Using Pesticides?

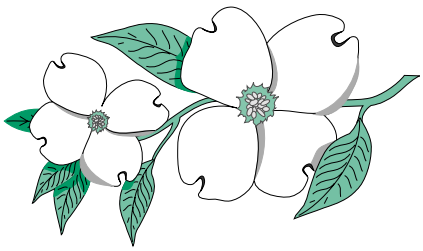
- ✔ Protecting the health of your family.
- ✔ Protecting the health of the environment.
- ✔ Growing healthier plants.
- ✔ Reducing our reliance on chemicals.

There are increasingly popular alternatives to pesticides that use techniques to manage pest problems in an effective and environmentally safe way. Just follow these easy steps.

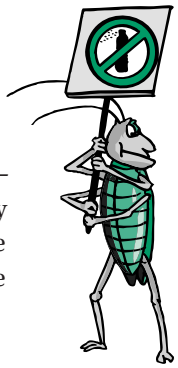
It's as Simple as A,B,C...D and E!

Always work with nature, rather than against it—plan for prevention!

- Use pest resistant plants.
- Plant a variety of species (preferably native).
- Use plants that attract beneficial insects, butterflies, and birds.
- Try companion planting—plants that work together to deter pests (see chart on next page).
- Make sure plants receive adequate sun, water, and nutrients by rotating crops. This helps to replenish nutrients in the soil and deters the build-up of pests.



Be realistic and observant!



- Don't expect a pest free garden.
- Monitor plants carefully, checking for signs of disease or concentrations of pests in one area.
- Identify the real cause of the problem—insects near the damaged area may actually be helping you! These can be beneficial insects "cleaning up" the pests that are causing the problems.

Control

When you see more damage than you can handle, use physical and biological controls to regain a healthy garden.

- Physical controls include such things as traps, barriers, and mechanical removal methods (use these first).
- Biological controls are natural predators that eat, infect or otherwise destroy pests. Try attracting birds and beneficial insects to your garden using plants and a water source.
- Use natural recipes for controlling pests and disease. Refer to the following pages.

Decide

- Decide how effective the steps you have taken have been.

Evaluate

- Evaluate whether you need to change your approach.

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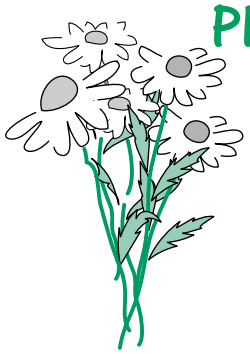


Plants as Natural Pest Control

Plant Together	Wards Off
Beans near potatoes	Potato and bean beetles
Tomatoes near basil	Mosquitoes and flies
Garlic or chives near roses & raspberries	Aphids and Japanese beetles
Horseradish near potatoes	Potato beetle
Marigolds throughout garden	A variety of insects
Mint near cabbage or tomatoes	White cabbage moth, aphids, and flea beetles
Rosemary or sage near cabbage, beans, carrots	Cabbage moth, bean beetle, and carrot fly
Thyme near cabbage	Cabbage worm
Onions among carrots	Carrot fly

Hazards Associated with Pesticide Use

Water Pollution

Heavy rainfall can cause pesticides (including insecticides and herbicides) to enter storm drains. Storm drains empty directly into streams and rivers, and the presence of pesticides can, for example, cause an overgrowth of algae. This in turn, reduces oxygen levels, which harm fish and other aquatic organisms.

Toxic Persistence

The half-life of modern pesticides (the time it takes for half the active ingredients in a product to lose their effectiveness) in soil ranges from days to weeks, even years! This means, some residues will stay in the soil for years and could leach into and poison groundwater.

Inert Ingredients

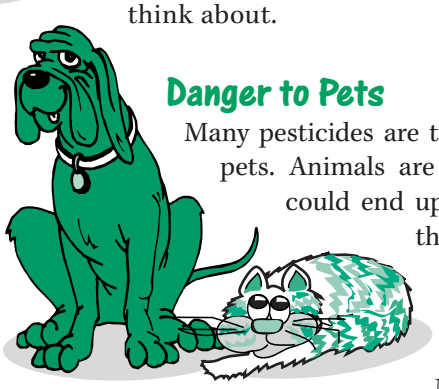
Pesticides consist of "active" and "inert" ingredients. The active ingredients are those specifically used to kill the target pest. The inert ingredients include everything else—solvents, detergents, or other chemicals that make the product work more efficiently. Inerts can be very toxic, and in some cases are more toxic than the active ingredients themselves. Inert ingredients are considered to be a trade secret and are not disclosed on product labels, despite the fact that they frequently make up more than 90% of the product!

Danger to Children

Children are much more susceptible to synthetic chemicals than adults. Try to avoid pesticide use as much as possible, making sure children are not present during or immediately after applying pesticides. Remember, pesticides can be tracked back into the home on shoes, posing a serious risk to toddlers.

Danger to Other Humans

Since pesticides contain chemicals that are strong enough to kill insects and plants, how much exposure to these toxic chemicals is safe for a human? Are there dangers associated with repetitive use? Will negative symptoms like skin, eye, or lung irritation eventually occur? It is something to think about.



Danger to Pets

Many pesticides are toxic to dogs, cats and other pets. Animals are attracted to the taste and could end up tracking residue back into the home, harming themselves and others.

Danger to Wildlife

Many synthetic chemicals (and some naturally occurring ones) have the ability to disrupt the hormone systems of fish, birds, reptiles, amphibians, and mammals—including humans—with potentially devastating effects on reproduction and development. Since most pesticides don't just target one species, they may eliminate beneficial insects as well. Beneficial insects are those which feed on pest species or are essential for pollination—like bees, ladybird beetles (lady bugs), and butterflies!

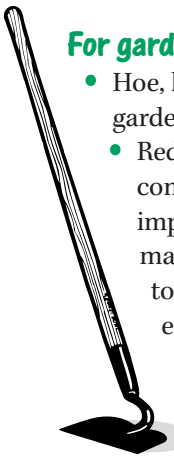
Common Garden Problems & Solutions

Lawn & Garden Weed Controls

Many weed killers pose an unnecessary hazard to groundwater, and when washed away by rain, to local waterways and aquatic life. Some herbicides may target and kill specific plants, while others are not species specific and will kill everything they touch, including the lawn you are trying to protect. Remember that weeds can be useful: they attract valuable wildlife, help nearby plants to grow strong and healthy, provide food and shelter for beneficial insects, and many are attractive and may even be edible!

For lawns

- Aerate every 2-4 years by removing small cylindrical cores from lawn or use a thatching rake to remove the thatch.
- Plant a mixture of grasses, rather than one variety.
- Mow weekly, keeping grass between $1^1/_2$" to 2" in length.
- Water lawn deeply and infrequently.
- Remove weeds, including dandelions, by hand before they seed.



For gardens

- Hoe, hoe, hoe! Invest in quality tools suited to your gardening needs.
- Reduce weeds by improving soil quality. Add compost, manure or mulch. They can be an important source of plant nutrients and organic matter while also improving the soil's ability to hold water and helping to protect against erosion.

Note: Be cautious about applying too much manure in the rainy fall as it can contribute to water and air pollution.

Don't put the seeds, roots or other parts of invasive species (e.g. blackberry, ivy, morning glory, bamboo) in your compost pile. Heat from the composting process kills most seeds and roots, but it isn't usually hot enough to kill aggressive invasive species such as these.

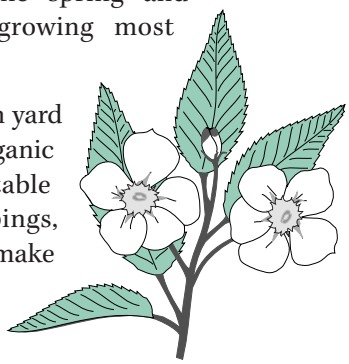
Better: Products containing corn gluten meal inhibit the growth of weed seeds. Corn gluten meal then breaks down into useful nutrients, which pose no health or environmental threat.

Best: Pull them out! But remember, some weeds can be beneficial.

Fertilizers/soil amendments

Fertilizers and soil amendments may help the garden look healthy, but excess nutrients can be washed away in heavy rainfall—polluting our waterways. This is particularly dangerous if the fertilizer also contains weed killers. "Weed 'n' Feed" products spread toxic herbicides over entire lawns, whether weeds are present or not.

Better: Choose a fertilizer that is best suited for the plants you are growing. Commercial fertilizers and soil conditioners containing slow releasing nutrients promote slow, steady growth (e.g. bone meal slowly releases calcium and phosphorus into the soil), while reducing the possibility that excess nutrients will run off and contaminate surface water. Also, avoid fertilizing when plants are about to fall dormant in autumn. Most plants only need fertilizers in the spring and summer when they are growing most actively.



Best: Organic! Start your own yard or worm compost, using organic waste such as: fruit/vegetable peelings, lawn clippings, coffee/tea grounds, etc. Or make your own organic fertilizer—see recipe below.†

Organic Fertilizer

4 cups seed meal or fishmeal
1 cup rock phosphate (or 1/2 cup bone meal)
1/2 cup kelp meal
1 cup†† agricultural lime or dolomite

Mix all ingredients together in a large bucket. Use in garden or on lawn.

Note Bone meal should be mixed into soil, not left on the surface, as it is attractive to dogs.

†Recipe from the *Territorial Seed Catalogue.*
††Adjust lime/dolomite levels as needed as too much can make soil acidic.

Disease controls

Chemicals designed to control plant diseases are often hazardous to humans, wildlife, soil, and/or water quality.

Better: Safer's brand Defender Garden Fungicide.

Best: Select disease resistant plants or prepare your own organic mixtures (see chart on page 5 for recipes).

Slugs and Snails

The damage caused by these mollusks can be frustrating; however, slug and snail baits that are spread on the ground are hazardous to dogs and other small mammals, and can be hazardous to aquatic life if washed into waterways. There are no substantially less toxic chemical products for controlling slugs and snails, so aim for chemical free control!

Follow these easy steps:

Reduce hiding places. Keep garden and yard clean and free of debris, pots, boards and other objects under which slugs and snails like to hide. Also, check under rocks, another popular hiding place!

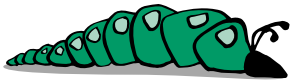
Reduce humidity and moist surface. Slugs and snails favor moist areas; by switching from a sprinkler to a drip irrigation system you can reduce the amount of surface moisture in your garden.

Plant slug and snail resistant plants. These include: begonias, fuchsias, geraniums, and impatiens, as well as stiff leaved plants with highly scented foliage (i.e. lavender, sage, rosemary).

Create barriers. Slugs and snails do not cross copper as it reacts with their mucus, producing electricity. Since these mollusks travel on a soft foot, crushed egg/oyster shells (or anything prickly such as wood chips or fireplace ash) can also produce an effective barrier.

Trap and remove. A flashlight and a pair of tongs are a slug hunter's best friend! You can also create a beer trap using a small plastic container—cut holes near the lip, sink into ground leaving holes exposed, fill with beer (or 2 tbsp baking yeast to 1 gallon of luke warm water, let sit 10 minutes then add 2/3 cup sugar) and secure lid in place. Empty often.

Common Insect Problems & Solutions

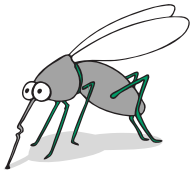


Tent Caterpillars

These are often found on deciduous trees and shrubs, particularly alder, willow, fruit trees and roses. You can easily identify them by their silky white tents from which they emerge in the spring. Tent caterpillars are native insects and will eventually be controlled by natural factors, but for those of you who can't wait, the easiest way to remove them is by hand.

- Prune in early morning or late evening when the temperature is cool and the caterpillars are still in their tents.
- Dispose of tents in a sealed paper bag in the garbage or compost (freeze first to make sure caterpillars are dead).
- Egg masses can be rubbed off branches in the winter or collected using a plastic spoon. Egg masses are approximately 1.5cm in length, gray or brown in color with the appearance of hardened Styrofoam.

Mosquitoes



The best way to keep mosquitoes away is to not attract them in the first place! Mosquitoes need shallow, standing water to lay their eggs and can develop in as little as 7-10 days. As a result, water should not be allowed to stand outside for more than a week.

Clean up/prevent the build-up of standing water.

- Turn buckets upside down.
- Cover rainwater barrels with fine screen or mesh or add a few drops of vegetable oil.
- Clean outdoor pools and hot tubs frequently.
- Change pond water weekly and make sure pump is circulating water properly.
- Check eaves and drains regularly for debris that may be pooling water.
- Store boats, canoes, and wheelbarrows upside down.

Protect yourself while outdoors!

- When mosquitoes are most active—from dusk till dawn and after rain—cover up as much skin as possible. Wear long pants and long-sleeved shirts.
- Wear light colored clothing (dark colors attract mosquitoes) that is woven tightly. This will prevent mosquitoes from biting through clothing.
- Cover open doors and windows with screens.
- Use a mosquito repellent containing citronella.

Ants, Cockroaches & Flies

These pests enter your home in search of one thing: food. Many commercial pesticides provide temporary relief but don't solve the problem. Try these alternative solutions to spraying:

Ants

Follow trail to entry point and seal crack or hole. Wipe areas where ants occurred with soapy water to erase any odor trail they may have left behind for other ants to follow.

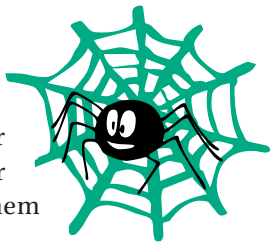
Flies

Keep a fly swatter handy and have screens covering all windows and doors.

Cockroaches

Borax, a desiccating mineral, is handy under appliances and other areas where it is difficult to plug holes (borax may also be used on ants).

Spiders



Spiders eat a lot of destructive insects and should be spared! Cover with jar or glass, slide a piece of paper or cardboard underneath and put them outside.

Prevent Further Problems

The following steps will minimize further infestation:

- Keep kitchen free of food scraps and crumbs.
- Wash counters, stovetops and floors as often as possible.
- Store food in airtight containers.
- Wash dishes immediately.
- Rinse bottles and cans before recycling.
- Keep compost material in sealed containers.
- Immediately repair leaky faucets and dripping pipes.
- Keep counters, dish racks and bathrooms dry.
- Cover garbage and take out often.
- Don't leave pet food or water out overnight.
- Make sure garbage cans seal properly and are free from holes.
- Keep drains free of food scraps.
- Plug all crack and holes.

Carpenter Ants

There are ants and then there are carpenter ants! The former are fairly easy to deal with, the latter can be a serious problem. Some conventional chemicals used on carpenter ants (Ficam™, Diazinon™, and Dursban™) are very persistent and highly toxic formulas that attack the central nervous system. Treatment often involves one application to kill the nest and another application around the outside edge of the house, which can be lethal to birds and increases the possibility of the toxin leaching into groundwater. Pyrethins are a less toxic choice than conventional chemicals containing pyrethrum, an insecticide made from chrysanthemums. Although natural, pyrethins are still pesticides and should be handled with care.

Better: "Desiccants" are much less toxic and act by drying insects out. Try diatomaceous earth, silica aerogel or use a mixture of icing sugar, water and borax (keep adding water as it dries out quickly).

Best: Avoid infestation!

- Eliminate sources of moisture in and around the home.
- Don't store firewood against the house (including the garage)—insects love woodpiles!
- Trim trees and shrubs so they don't touch the house.

Preventive Recipes!

Fungal disease

Mix 1 part compost with 5 parts water; let stand one week then strain. Spray directly onto diseased plant.

Insect infestation and to control disease

Soak 85g minced garlic in 10ml mineral oil for 24 hrs, strain and add 600ml water and 5ml natural liquid dish soap.

OR

Mix powdered garlic with water and dish soap. Spray plants with a mixture of 15-30ml garlic spray and 600ml water.

Powdery mildew

Mix 5ml baking soda, and a few drops liquid dish soap in 1 litre of water. Spray directly onto plant, weekly in spring before symptoms appear (only if plant has history of mildew).

A wide range of insects (including aphids, cabbage loopers, cabbage maggots, cutworms, leaf miners, mites, weevils, and whiteflies)

Mix 15ml liquid dish soap and 235ml oil (peanut, safflower, corn, soybean, or sunflower). Mix 5-12ml of soap-oil base to 1 cup water and spray directly onto plant.

OR

Add several drops of an essential oil (rosemary, pine or citronella) to 235ml water. Spray directly onto plant.

OR

Use garlic spray (recipe under "preventing insect infestation"). Spray plants with a mixture of 15-30ml garlic spray and 600ml water.

Outdoor Insect Control

Some of the most harmful insecticides are those containing carbaryl, Diazinon™, Dursban™, lindane, Malathion™, Orthene™, Sevin™ dust or liquid. Remember some insects can be good for your garden. Pests might be food for beneficial insects that let your garden function as a healthy ecosystem.

Better: The least toxic chemical controls are insecticidal soaps. Safer's offers a variety of these.

Note: The natural bacteria Bacillus thuringiensis (Bt) is approved for organic gardeners, however it is deadly to butterflies.

Best: Physical controls such as sticky barriers and traps are the safest ways for dealing with insects. You can also try an aromatic remedy (recipes on page 5) or a powerful spray of water from a garden hose.

Fleas

No one wants to see their pets suffering from fleas but, if you have a dog or cat in the house, chances are it's something you'll eventually have to tackle. The chemical products available to deal with this problem contain nerve poisons toxic to both pets and humans, so should be avoided.

Better: Try a shampoo. Pure soap (such as Dr Bronner's Castile soap) should work quite well; however, a stronger insecticidal shampoo may be required. The least toxic are Safer's Flea soap for Dogs or Cats, and sprays formulated with d-Limonene (a citrus extract), such as Daltek Organic Spray for Dogs and Cats.

Best: Vigilance is the key to avoiding flea infestations. As soon as you suspect a flea infestation:

- Clean and wash bedding material. Place a removable, washable material where pets like to sleep or rest for easy cleaning.
- Comb fur with a fine-toothed comb. Place a light colored towel or blanket under the animal when combing; fleas will be collected and easily disposed of by dunking the towel/blanket in soapy water.
- Vacuum carpeted areas to get rid of flea eggs.
- Give your pet a hair cut. This also allows for easy combing.
- If you must use a desiccant powder such as diatomaceous earth or silica gel, be extremely careful not to inhale any dust as it could irritate the lungs of both you and your pet.

Lice

An outbreak of head lice at the local school is something every parent dreads. Most products available contain toxic substances such as pyrethroids, lindane, or Malathion™, which affects the nervous system of these insects. The effects these chemicals can have on humans are not known.

Better: There are several nontoxic products available on the market including: SH-206 Shampoo, Lice Cure, HairClear 1-2-3, and Nature's Best.

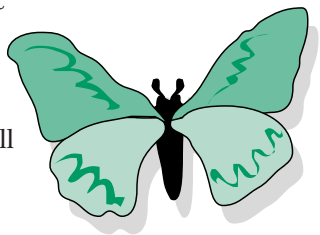
Best: Try using a fine-toothed comb through wet hair (water slows lice down). Wash hair with regular shampoo, condition and comb with a wide toothed comb (this will remove tangles, making fine-toothed combing easier). Then comb clean hair with fine-toothed comb making sure to wipe or rinse comb after each pass through hair to remove caught lice. This process should be repeated on a four-day cycle over the next two weeks. By this time, all stages of the lifecycle should have been removed and no unhatched eggs should be remaining.

Moths

Moth larvae will munch on anything containing wool, fur, feathers, cotton, silk, rayon and synthetics if soiled or mixed with wool. The larvae eat fabric, preferring areas where there are food or dirt stains, lint, salt, dead insects, and even sweat stains! Mothballs or camphor balls contain naphthalene, which is highly toxic and extremely dangerous if ingested. They can be particularly tempting to children as they look like candy.

Better: When buying used furniture or clothing, inspect it carefully for signs of moth larvae and clean immediately. Get rid of all unused clothes—especially woolens!

Best: Store clothes in tightly sealed containers making sure they are clean before storage. Periodically shake, brush and expose clothes to sunlight (moths like dark places) and ensure closets remain clean. Occasionally, clean and rearrange furniture, as it will prevent moths from establishing themselves.



Don't Forget About Native Plants!

There are many naturally occurring plants in British Columbia, which make excellent additions to any garden. Native plants are plants that have been naturally growing in this region since before European settlement.

What are the Benefits of Native Plants?

1. Since these plants are used to the soil and climate conditions of the area, they do not require extra watering, pesticides or fertilizers.
2. Native birds and insects will be attracted to your garden as they rely on native plants for food, shelter and nesting/breeding sites.
3. Native plants will reduce the amount of weeding you will have to do in your garden as they seed quickly and use as much soil space as they can.

What are Some of the Native Plants in BC?

Coastal strawberry, mock orange, red huckleberry, kinnikinnick, salal, high bush cranberry, wild and big blue lupine, Oregon grape, yellow pond lily, vine maple, red-osier dogwood, red flowering current, Nootka rose, wild calla lily, spring sunflowers, bluebell or harebell, Pacific bleeding heart, shooting star, Oregon iris, columbine, violet, orange and purple honeysuckle and many, many more!

Violet photo Laurie MacBride

Columbine photo Laurie MacBride

If Your Strategies Fail and You Resort to Pesticide Use, Remember:

- Always wear a dust mask and gloves when working with chemicals. Try to cover all areas of exposed skin.
- Avoid spraying on windy days. This could cause the chemicals to drift onto unwanted areas.
- Read labels carefully and follow all directions.
- Buy only as much as you need. This will reduce the chances of accidental spillage of any waste product leftover.
- Pre-mixed products are safer to handle than concentrates.
- Dispose of unused material properly. Contact your Regional District for information about collection programs or depots, or call the BC Recycling Hotline 604-R-E-C-Y-C-L-E (732-9253) in Greater Vancouver or 1-800-667-4321 throughout British Columbia.

TOP 10 ACTIONS to Reduce Your Risk From Pesticides

1. Buy organically or ecologically grown foods, especially for children.
2. Call the makers of your favorite brands of food and urge them to use ecologically and organically grown crops in their products.
3. Avoid fatty foods, as persistent pesticides are stored in fatty tissues.
4. Urge your local municipality to implement pesticide reduction by-laws.
5. Garden without pesticides.
6. Avoid using pesticide based flea and head lice treatments.
7. Work with your local schools, and/or daycares to implement alternatives to indoor and outdoor pesticide use.
8. Keep away from areas freshly sprayed with pesticides.
9. Lobby Health Canada to reform pesticide laws.
10. If you farm, adopt ecological techniques that reduce reliance on chemical pesticides.

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Caring for our Coastal Waters

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