

PEST CONTROL

The control of undesired insects, diseases, and weeds will be accomplished by "organic" gardening techniques. Recognizing that there are diverse definitions for what constitutes "organic", the following guidelines have been established. The underlying purpose is to protect the safety and health of the gardeners, other people, and the nearby environment. Furthermore, it has been our experience that more dangerous pesticides are simply not necessary to grow healthy, attractive, and bountiful gardens in Fort Collins.

Since most insects and diseases prefer to attack stressed plants, the first line of defense with organic gardening is to keep plants as healthy as possible. This is achieved through building fertile, organic-rich soil that is well aerated. Compost, aged manure, and other organic materials are used, rather than synthetic fertilizers.

The second line of defense is to rely on simple measures such as the following:

- Insect pests:
 - time planting such that your plants are larger and more established when the pests are likely to be abundant
 - hand-picking of large insects
 - physical barriers, such as row covers or cardboard collars
 - traps
 - use of resistant varieties
 - interplanting with repellent or "companion" plants
 - crop rotation between years

- Diseases:
 - use of resistant varieties
 - sanitation
 - timing of watering

- Weeds:
 - mulching
 - dense planting
 - hand-pulling

Small occurrences of pest insects and disease are tolerated if they're not causing major damage. Pesticides are not used for prevention, but only after a problem has been diagnosed. When treatment is necessary, the least toxic solution is always tried first. Acceptable products are those that:

- deteriorate rapidly in sunlight, soil, and/or open air
- are relatively non-toxic
- toxicity is specific to the pest

Following is a list of acceptable pest control measures, with a brief description for each.

1. *Bacillus thuringiensis* (Bt): A bacteria that produces a caterpillar-killing toxin not poisonous to other insects, birds, pets or people. Sold as "Dipel" or "Thuricide", it comes

in liquid, dust or granular form. Various strains have been developed for different types of insects, such as tomato hornworms, cabbage worms, and Colorado potato beetles.

2. Diatomaceous earth: The source of this pesticide is microscopic marine crustaceans called diatoms. The minute sharp edges of the fossilized diatoms cut the soft bodies of insects, dehydrating and killing them. Humans can handle the powder with no adverse effects. It works well for aphids and slugs.
3. Nolo (*Nosema locustae*) bait: This is a grasshopper pathogen sold on a bran carrier. It takes four to six weeks to kill the grasshoppers, but once the infection is established in the population, it can be spread on its own. It is not effective if the garden is surrounded by an untreated field full of grasshoppers, providing a constant source of new infestation.
4. Soap sprays: Soap sprays are useful for treating certain small, soft-bodied insects, like aphids, psyllids, mealybugs and spider mites. Commercial insecticidal soap sprays, such as "Safer's", are available, or you can make your own. Here is the recipe for an effective, general purpose soap spray: to three quarts of water add one quart of rubbing alcohol and one tablespoon of liquid dishwashing soap such as "Ivory" (one that is not for automatic dishwashers). An optional addition is one tablespoon garlic juice, and/or one tablespoon hot pepper sauce. Test homemade varieties on a small part of the plant first, since they can damage some plants.
5. Horticultural "summer" oils: Dormant oil sprays have long been used to kill overwintering insects on plants before they leaf out in early spring. In contrast, summer oils are ultra-fine oils that can be used during the growing season to control such insects as scale, aphids, mites, beetle larvae, and whiteflies. They act by smothering the insects, rather than poisoning them, therefore insects do not develop an immunity.
6. Copper dust: Copper dust or liquid is used to prevent and treat many diseases, including powdery mildew and early blight of tomatoes, two fairly common diseases in this region.

Here are a few final points to keep in mind:

- Despite being acceptable, the above products should still be considered toxic to humans, pets, and other critters. They should be used with care, and all instructions should be read and followed scrupulously. Be sure to keep all of these substances out of the reach of children.
- If a particular pest problem develops that is not acceptably solved by the following methods, we may consider other methods of control not on this list.
- Upon request, we will be happy to provide you with further information and guidance on pest control.
- If you are a first-time gardener, please do not react to this information with discouragement - - thinking that gardening will be an overwhelming challenge. In fact, we live in a very favorable climate for gardening and it is not particularly difficult to grow a bountiful and relatively pest-free garden.