



## Bug-Wise

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**Insecticides for the Home Vegetable Garden:** A garden insect control recommendation that one used to hear with alarming frequency was to “mix Sevin and malathion and spray everything in the garden once a week”. This is terrible advice! Not only does it result in a lot of unnecessary spraying (and spraying isn’t one of those fun and relaxing garden chores), but it also puts insecticide residues on every plant in the garden.

Don’t spray insecticides in the garden unless you have a good reason. When you do spray, target insecticide sprays to specific situations. Know what insects you are trying to control, what crop they are attacking, and what insecticide you need to use.

This doesn’t mean that you have to wait until the critters have already eaten half your crop to start spraying. If your tomatoes have begun to set fruit, it’s probably time to start adding some permethrin in with your fungicide spray, to control fruitworms and hornworms. But avoid the tendency to spray this on your eggplants as well, because permethrin can flare spider mite populations. If your pinkeye peas have begun to bloom, and you are concerned about cowpea curculios, start spraying the peas with Sevin (three applications, five days apart), but don’t feel that you need to spray everything else in the garden as well.

There’s a big difference between spraying ornamental plants and vegetables. You’re going to eat the vegetables, and you want to be sure that you are not exposing yourself to harmful pesticide residues. Many insecticides are labeled for use on ornamental plants but not on edible plants. Be sure the insecticide is labeled for use on the vegetable crop you plan to treat. Few insecticides are labeled for use on every vegetable in the garden. Read the label, before you spray!

Observe the Pre-harvest Interval, or PHI. This is the amount of time that must elapse between making an insecticide application and harvesting the crop. PHIs vary greatly, depending on the insecticide being used and the particular vegetable crop being treated. For example, the PHI for carbaryl (Sevin) is 2 days on corn, 3 days on tomatoes, 7 days on Irish potatoes, and 14 days on turnips. Failure to observe PHIs will result in excessive insecticide residues. Read the label, before your spray!

Following are brief descriptions of some of the insecticides that are most useful in the home vegetable garden. These are listed by active ingredient, because a given active ingredient may be sold under many different brand names. See Extension Publication 2347, Insect Pests of the Home Vegetable Garden for more details on insect pests of vegetable crops and how to control them.

## Insecticides for Use In Home Vegetable Gardens

(Active ingredients followed by an \* may be acceptable for organic gardening.)

**Carbaryl:** Carbaryl is most commonly sold under the brand name Sevin. This product has been a standard for insect control in the home vegetable garden for many years. It is effective against a wide range of pests and is labeled for use on most vegetables. It is especially useful against beetles, and it will control stink bugs and leaf-footed bugs. However, Sevin does have a tendency to flare spider mites, when used excessively.

**Malathion:** Malathion is another long time standard insecticide in the home vegetable garden. Like carbaryl, it controls a wide range of pests and is labeled on most vegetables. It is especially useful for control of aphids, 'bugs', and certain beetles.

**Dicofol:** Dicofol is sold under the brand name of Kelthane. It is an older product that is currently labeled for use on only few key vegetable crops. Dicofol is specifically used to control spider mites. It does not control any insect pests.

***Bt kurstaki*\***: *Bacillus thuringiensis* is a bacteria that produces compounds that are toxic to certain insect species. There are different species and strains of this bacteria that produce different toxins. *Bt kurstaki* produces a compound that is toxic to certain caterpillars but has no effect on other insect species. Thuricide is one of the more common brand names under which this product is sold. It is most effective against leaf-feeding caterpillars, such as loopers, diamondback moths, etc.

***Bt tenebrionis*\***: *Bt. tenebrionis* is a strain of Bt that produces a toxin that is only active against certain beetles. It does not control caterpillar pests. Bonide Colorado Potato Beetle Beeter is one of the most common brand names and this product is primarily used to control Colorado potato beetle.

***Spinosad*\***: Spinosad is a relatively new microbial insecticide that is very effective against a number of different caterpillar pests. Two commonly available brand names that are labeled for use on many different vegetable crops are: Monterey Garden Insect Spray and Fertlome Bore, Bagworm, Leafminer, and Tent Caterpillar Spray. Spinosad is very effective against most caterpillar pests, but it is not effective against most other types of insects. It is also effective against thrips, leaf miners, and Colorado potato beetle. Certain formulations of spinosad are acceptable for use by organic gardeners.

***Insecticidal Soap*\***: Insecticidal soaps are potassium salts of fatty acids. They control insects that they contact by disrupting cell membranes. They are most effective against soft-bodied pests, such as aphids, mites and thrips. Thorough coverage of the pest is necessary in order to achieve control. Insecticidal soaps have a short pre-harvest interval and are labeled for use on most vegetables. Safer Insecticidal Soap is an example of one brand name.

***Neem Oil*\***: Neem oil is a botanical product that is primarily useful against aphids, mites, and whiteflies. It is labeled for use on most vegetables and is sold under several brand names (Monterey 70% Neem Oil is one example). Thorough coverage of the pest is necessary in order to obtain control.

**Pyrethrin\*:** Pyrethrin or pyrethrum is a botanical insecticide that is primarily used by organic gardeners. This insecticide provides rapid knock down of most insects, but insects often recover. Piperonyl butoxide (PBO) is often mixed with pyrethrin to act as a synergist. This increases the overall effectiveness, and helps prevent pests from recovering, but piperonyl butoxide is not acceptable for organic gardening. Pyrethrin or pyrethrin + PBO is active against a wide range of insects, is labeled for use on most vegetables, and has a very short pre-harvest interval. However, its efficacy is limited by its very short residual activity.

**Pyrethroids:** The term ‘pyrethroids’ refers to a group of relatively new synthetic insecticides that are modeled after the botanical pyrethrum molecule. These products are effective against a wide range of insect pests, and are used at very low rates. The following four pyrethroid insecticides are currently labeled for use in the home vegetable garden.

**Permethrin:** Permethrin is the oldest, and most common, of the pyrethroid insecticides. It is widely available and is sold under a large number of different brand names (Martin’s Vegetables Plus, Bonide Eight Vegetable, Fruit & Flower, and Hi-Yield Garden, Pet & Livestock Insect Control are three examples). Permethrin is labeled for use on many different vegetable crops and is effective against many beetle, bug, and caterpillar pests. Because it controls so many different insect pests and is labeled on most vegetables, this is probably one of the most useful insecticides for home vegetable gardeners to keep on hand.

**Cyhalothrin:** Lambda cyhalothrin is one of the newer pyrethroid insecticides (Triazicide Soil & Turf Insect Killer Concentrate is the most common brand name). It is very effective against a number of different insect pests, but is only labeled for use on a very few vegetable crops.

**Cyfluthrin:** Cyfluthrin is another relatively new pyrethroid insecticide. It is sold under the brand name of Bayer Advanced Garden Power Force Multi-Insect Killer Concentrate. Like cyhalothrin, it is very effective against a number of different insect pests, but is only labeled for use on a very few vegetable crops.

**Esfenvalerate:** Esfenvalerate is one of the older pyrethroid insecticides. It is labeled for use on a number of different vegetable crops and controls a wide range of insect pests. Two common brand names are Monterey Bug Buster and Ortho Bug-B-Gon Multi-Purpose Insect Killer.