

# Pest Control in Home Vegetable Gardens

WSU EXTENSION MANUAL • EM009



# PEST CONTROL IN HOME VEGETABLE GARDENS

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These control measures for common Washington pests are based on research by scientists at Washington State University, the U.S. Department of Agriculture, and other agencies. Research shows that safe, effective control can be expected when directions are carefully followed and precautions are carefully observed.

## Environmental Protection

Use pesticides in moderation to protect the environment. Follow these guidelines to avoid overuse and unnecessary contamination:

1. Do not use insecticides unless there is a definite need for insect control. Avoid their use when beneficial insects are present and are doing a fairly good job of reducing pest species.
2. Be sure you have a problem that pesticides can correct. Apply them as specific treatments, not as general remedies.
3. Use pesticides only on crops that are being attacked by the target insect or disease.
4. Select pesticides that are the least hazardous to bees, other beneficial insects, and humans.
5. Do not apply more spray or dust than needed. A thorough, light application is more effective than a heavy, spotty one.
6. Avoid the need for disposing of pesticides by making up only the amount of spray you need.
7. Do not flush surplus pesticides down drains into sewage or septic tank systems.

## Pesticide Use

Read the label on the pesticide container and follow the directions carefully.

Never smoke while applying insecticides and avoid breathing the spray or dust. Wear natural rubber gloves when handling pesticides. Wash hands and face carefully with soap and water after applying. If insecticides are spilled on the skin or clothing, remove contaminated clothing and wash exposed skin areas thoroughly.

Always store pesticides in their original containers, never in fruit jars or soft drink bottles, and be sure that labels remain on the original containers. Keep containers away from food or animal feed and out of the reach of children and irresponsible persons.

## Bee Warning

Many insecticides kill bees. Some cannot be applied safely at any time when plants are in bloom, while others should be applied only in the early morning or late evening when bees are not foraging for nectar and pollen. Avoid spraying carbaryl (Sevin) on plants that are surrounded by blooming flowers or weeds. Mow lawns next to garden areas to remove clover blossoms before applying any material hazardous to bees. This is a simple step and one you should always follow. In all cases, when plants in the infested area are in bloom, select the material least hazardous to bees. Avoid using dusts whenever possible. Sprays are preferred for bee safety. For additional information on this subject, refer to PNW0591, *How to Reduce Bee Poisoning from Pesticides*, available from Extension offices and <http://pubs.wsu.edu>.

### *Hazard of Insecticides to Honey Bees*

carbaryl (Sevin) malathion (dust) cyfluthrin permethrin esfenvalerate	Do not apply on bloom or where bees are present.
malathion (spray)	Apply only during late evening when blooms are present.
neem extract rotenone spinosad	Apply during late evening, night, or early morning when blooms are present and bees are not foraging.
<i>Bacillus thuringiensis</i> (Dipel and others)	Apply at any time.

## PEST CONTROL IN HOME VEGETABLE GARDENS

Vegetable	Common pests, description, damage	Some registered pesticides*	Last use of pesticide before harvest	How to apply, other remarks**
<b>General pests</b>	<i>Aphids</i> . Small green, black, pink, or gray plant lice. Suck plant juices, weaken plants. Sticky secretions lead to sooty mold	malathion insecticidal soaps  neem extract	Depends on vegetable; see product label  See label	Apply to both tops and undersides of leaves.
	<i>Cutworms</i> . Large, smooth-skinned caterpillars from 2mm to 2 inches long. Feed on all parts of plants.	carbaryl (Sevin)  Bacillus thuringiensis spinosad	Depends on vegetable; see product label See label See label	Apply to immature larvae before they reach 1 inch in length, which is their most damaging feeding stage.
	<i>Earwigs</i> . Dark brown with pincers at rear end. Feed on many plant parts.	carbaryl (Sevin) cyfluthrin	Depends on vegetable; see product labels for both insecticides	Apply Sevin to soil surface as dust when earwigs are first seen.
	<i>Grasshoppers</i> . Large jumping insects. Feed on leaves and blossoms.	malathion carbaryl (Sevin) cyfluthrin	Depends on vegetable; see product labels for both insecticides	Not normally an important pest.
	<i>Mites</i> . Tiny, spiderlike mites on undersides of leaves. Suck plant juices, cause leaves to yellow and die. Mites can seldom be seen with the naked eye.	insecticidal soaps	See label	Good coverage needed, particularly on undersides of leaves.
	<i>Slugs</i> . Small to large, legless creatures. Feed on many plant parts, causing ragged holes. Leave slime trails.	metaldehyde iron phosphate bait	Depends on vegetable; see product labels	Apply to soil. Do not apply directly to plants. Stale beer in cans sunk to slightly above ground level controls slugs. The beer acts as bait that attracts slugs and drowns them.
	<i>Symphylan</i> . Small, white, centipede-like animals in soil. Consume roots and can ultimately kill plants—particularly young plants.	None currently registered for home use	See product label	
	<i>Wireworms</i> . Brown, jointed larvae of click beetles. Chew holes in edible roots.	None currently registered for home use	See product label	
<b>Asparagus</b>	<i>Asparagus beetle</i> . Blue-black, yellow-mottled beetle. Adults feed on spears and damage them by egg laying. Adults and gray larvae eat fronds.	carbaryl (Sevin) malathion rotenone + pyrethrins permethrin	1 day 1 day 1 day 3 days	Apply to all above-ground parts of plant. Repeat in about a week if needed.
<b>Beans</b>	<i>Spider mite</i> . Small red to green mites on undersides of plant leaves; often accompanied by webbing. Suck plant juices, cause leaves to yellow and die. Too small to see with the naked eye.	insecticidal soap	Same day as harvest	Good coverage needed, particularly on undersides of leaves. Repeat applications may be necessary.

Vegetable	Common pests, description, damage	Some registered pesticides*	Last use of pesticide before harvest	How to apply, other remarks**
Beets and Chard	<i>Beet leafminer</i> . White maggots feed under surface of leaf, kill large areas of tissue. Same as spinach leafminer.	spinosad (not on beets) rotenone + pyrethrins (not on chard)	1 day 1 day	Remove and destroy infested leaves. Some gardeners have reported successful prevention with use of row covers, e.g., Remya.
	<i>Flea beetle</i> . Small brown to dark blue, jumping beetles cause "shot hole" leaves. Can be serious on seedlings.	carbaryl (Sevin) rotenone + pyrethrins (not on chard)	7 days (beets) 14 days (chard) 1 day	Apply to leaves when beetles first appear. Repeat in about a week if necessary.
Carrots	<i>Carrot rust fly</i> . Small, legless, whitish maggots. Burrow into crown and roots.	None currently registered for home use		Row covers should work well.
Cole Crops (broccoli, cabbage, cauliflower)	<i>Cabbage maggot</i> . White maggots feed on roots, underground stems; weaken, topple, kill plants. Adults are small gray flies. Lay eggs at plant bases.	None currently registered for home use		Row covers work very well. See FSIPM003, <i>Cabbage Maggot in the Home Garden</i> .
	<i>Cabbage worm</i> . Soft, velvety green caterpillar with faint stripes. Adults are white butterflies with black spots.	carbaryl (Sevin) rotenone + pyrethrins (cabbage only) <i>Bacillus thuringiensis</i> spinosad permethrin	3 days 1 day Same day as harvest 1 day 1 day	Apply to above-ground plant parts when worms first appear. Repeat applications may be necessary.
	<i>Cabbage looper</i> . Pale green larvae with white lines on back and sides. Move in looping manner. Moths are gray-brown with silvery spot.	As above	As above	Row covers, e.g., Remya, are effective and can eliminate the use of chemicals for these pests, particularly in garden plots that are free of overwintering forms. See FSIPM003, <i>Cabbage Maggot in the Home Garden</i> .
	<i>Diamondback moth</i> . Small, light yellow-green larvae with black hairs. Eat holes in leaves. Adults are gray or brown with white wingmarks which form a diamond when wings are folded.	As above	As above	
Corn	<i>Corn earworm</i> . Large, green, brownish, or reddish worms. Feed on silk and kernels of the ear. Related to cutworms.	malathion cyfluthrin permethrin esfenvalerate	5 days Same day as harvest 1 day 1 day	Apply to silks when they first appear. Repeat 3 to 4 times at 7-day intervals.
Lettuce	<i>Cabbage looper</i> . Pale green larvae with white lines on back and sides. Move in looping manner. Moths are gray-brown with silvery spot.	permethrin <i>Bacillus thuringiensis</i> spinosad	1 day Same day as harvest 1 day	Apply to leaves when worms first appear. Repeat as per label instructions.

Vegetable	Common pests, description, damage	Some registered pesticides*	Last use of pesticide before harvest	How to apply, other remarks**
Onions	<i>Onion maggot.</i> Larvae are legless, blunt, white maggots which kill seedlings and damage bulbs of older plants. Adults are flies, pale to dark gray in color, less than ¼ long.	None currently registered for home use		Row covers should work.
	<i>Onion thrips.</i> Adults are small, pale yellow to light brown, with feathery wings. Young are pale yellowish green and without wings. Feed on leaves, causing silvery areas and wilting.	<i>Beauveraria bassiana</i> malathion insecticidal soap	Same day as harvest 3 days Same day as harvest	Apply to leaves when thrips first appear.
Peas	<i>Pea leaf weevil.</i> Grayish brown weevil about 1/6 inch long. Feed on foliage, severely scalloping edges of leaves. Greatest injury occurs during seedling stage.	<i>Beauveraria bassiana</i> esfenvalerate	Same day as harvest See label	Apply at first signs of notching on the leaves. No need to treat after 6-leaf stage.
	<i>Pea weevil.</i> Black to brownish weevil with white zig-zag bands across back. Eggs laid on pods. Larvae burrow into pods and feed on developing peas.	malathion rotenone + pyrethrins esfenvalerate	3 days 1 day See label	Apply soon after first blooms appear and before pods start to form. Additional applications may be needed to control migrating weevils. Not a problem in western Washington.
	<i>Pea moth.</i> Small whitish caterpillar that feeds within seeds.	None registered		Rarely a problem.
Peppers and Eggplant	<i>Flea beetle.</i> Small, oval, shining bronze or dark blue, jumping beetles. Chew small circular holes in leaves.	carbaryl (Sevin) esfenvalerate rotenone + pyrethrins cyfluthrin (not on eggplant)	3 days 7 days 1 day 7 days	Apply to leaves when damage or beetles first appear.
Potatoes	<i>Potato flea beetle.</i> Small oval, shining bronze, jumping beetles. Chew small irregular holes in leaves. Larvae of some species damage tubers.	rotenone + pyrethrins carbaryl (Sevin) neem extract esfenvalerate	1 day 7 days Same day as harvest 7 days	Apply to leaves when damage or beetles first appear.
	<i>Colorado potato beetle.</i> Yellow and black striped beetles. Larvae are reddish orange, with two rows of black spots on each side. Feed on leaves.	As above	Same day as harvest	Apply to leaves when damage or beetles first appear.
	<i>Spider mite.</i> Tiny spiderlike mites feed on undersides of foliage. Cause yellowing and browning on leaves. Mites cannot be seen without a hand lens	insecticidal soap	Same day as harvest	Must achieve thorough coverage, especially to undersides of leaves.

Vegetable	Common pests, description, damage	Some registered pesticides*	Last use of pesticide before harvest	How to apply, other remarks**
Radish	<i>Cabbage maggot</i> . White legless larvae feed in root.	None registered		Row covers work well.
	<i>Flea beetle</i> . Small, brown to dark blue, jumping beetles cause "shot holes" in leaves. Can be serious on seedlings.	carbaryl (Sevin) cyfluthrin esfenvalerate	7 days Same day as harvest 7 days	Apply to leaves at first sign of damage. Row covers work well.
Spinach	<i>Cabbage looper</i> . Slender dark olive green worms with white stripes. Move in looping manner.	carbaryl (Sevin) <i>Bacillus thuringiensis</i> spinosad	14 days Same day as harvest 1 day	Apply when worms first appear. Row covers work well.
	<i>Spinach leafminer</i> . See beet leafminer.			
Squash, including Melons and Cucumber	<i>Striped cucumber beetle</i> . Small, slender, greenish yellow beetles with 3 black stripes on back. Larvae feed on roots and underground stem. Adults chew on above-ground portions of plants.	malathion carbaryl (Sevin) rotenone + pyrethrins esfenvalerate spinosad	1 day 3 days 1 day 3 days See label	Apply to leaves at the first sign of damage.
	<i>Western spotted cucumber beetle</i> . Yellowish green, black-spotted beetles, common west of the Cascades. Damage usually limited to young plants	As above	As above	Apply to leaves at the first sign of damage.
	<i>Squash bug</i> . Large, grayish sucking insects. Adults and nymphs kill leaves and vines. Attack squash only.	carbaryl (Sevin) esfenvalerate	3 days 3 days	Apply to vines and foliage when bugs are first noticed.
Tomato	<i>Colorado potato beetle</i> . Yellow and black striped beetles. Larvae are reddish orange, with two rows of black spots on each side. Feed on leaves.	cyfluthrin permethrin (not on cherry tomato) neem extract	Same day as harvest Same day as harvest  Same day as harvest	Apply to leaves as needed.
	<i>Tomato fruitworm</i> . Large, green, brownish, or reddish worms feed in fruit. Same insect as corn earworm.	As above (but, use <i>B. thuringiensis</i> strain specific to caterpillars)	As above	
	<i>Flea beetle</i> . Small, oval, shining bronze or dark blue, jumping beetles. Chew small irregular holes in leaves.	As above		
	<i>Hornworm</i> . Caterpillar 4 to 5 inches long. Pale green with a short curved red horn on rear end.	As above (but, use <i>B. thuringiensis</i> strain specific to caterpillars)	As above	
Turnips and Rutabagas	<i>Cabbage maggot</i> . White legless larvae feed in root.	None registered		Row covers work well.

\*These pesticides are registered with the Environmental Protection Agency. However, they may not be registered for all the plants on which the pest occurs. Also, there may be several different brands of pesticide on the market, some of which may not be registered for the specific pest or crop. BE CERTAIN THAT THE CROP IS LISTED ON THE LABEL before you select a material to use and follow all directions on the label.

\*\*SEE BEE WARNING SECTION BEFORE APPLYING INSECTICIDES. Carbaryl (Sevin) and malathion are particularly hazardous to bees.





Use pesticides with care. Apply them only to plants, animals, or sites listed on the label. When mixing and applying pesticides, follow all label precautions to protect yourself and others around you. It is a violation of the law to disregard label directions. If pesticides are spilled on skin or clothing, remove clothing and wash skin thoroughly. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.

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