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# Garden Vegetable Insect Control

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Gardening can provide a great deal of personal satisfaction and pleasant exercise. In addition, proper planning in cultural methods and pest control will help assure bountiful yields of quality vegetables for your table.

Vegetable insect pests spend the winter either in the soil or in plant debris around the margins of the garden. Preventing weeds and other unnecessary plants from growing in and around the garden reduces the number of pests and delays their movement into the garden. Fertilize, cultivate and water to insure healthy plants. With fewer insect pests, less insecticide is needed.

Different insecticides are available to the gardener. All have been thoroughly tested and are safe when used according to label directions. Unless the pest and vegetable are listed on the label, you have the wrong insecticide.

## Insecticides

Insecticides used to control garden pests come in several different forms. **Dusts**, **baits** and **granules** are dry forms used as purchased. Baits are mixed with a pest attractant, dusts and granules with an inert carrier. **Emulsifiable concentrates** (EC), liquids, **soluble powders** (SP), powders and **wettable powders** (WP), also a powder, are insecticides that disperse when mixed in water. They are all used as sprays. For best results when applying dusts and sprays, thoroughly cover surfaces of infested plants.

INSECTICIDE	FORMULATION AND MIX	REMARKS
<i>Bacillus thuringiensis</i>	1.2% WP (2-3T/gal)	An insecticide derived from bacteria which cause disease in insects, especially caterpillars. Nontoxic to warm blooded animals.
Chlordane	5 or 10% dust; 40-72% EC (2-3t/gal)	A soil insecticide used to protect seed and seedlings from soil inhabiting insects.
Cygon (dimethoate)	25% EC (1t/gal)	A contact and systemic insecticide.
Diazinon	4% dust; 25% EC (2t/gal)	A contact insecticide with brief residual action.
Dylox (trichlorofon)	5% bait	A contact and stomach insecticide.
Malathion	4% dust; 57% EC (2t/gal)	A contact insecticide with little residual action.
Metaldehyde	15% bait	Slug and snail control.
Mesuroil	2% bait	Slug and snail control.
Methoxychlor	5% dust; 25% EC (2T/gal); 50% WP (2T/gal)	A contact and stomach insecticide with residual action.
Sevin (carbaryl)	10% dust; 5% bait; 50% WP (2T/gal)	A contact and stomach insecticide with residual action. Toxic to bees.

T — tablespoon, t — teaspoon, gal — gallon of water

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## Commonly Grown Vegetables and Their Major Pests

**BEANS:** aphids, blister beetles, corn earworm, cutworm, flea beetles, gray garden slug, Mexican bean beetle, root maggots, stink bugs, spider mites, white grubs and wireworms.

**BEETS and SWISS CHARD:** aphids, blister beetles, cabbage looper, cutworms, flea beetles, grasshoppers, gray garden slug, root maggots, white grubs and wireworms.

**CABBAGE and RELATED PLANTS:** aphids, blister beetles, cabbage loopers, corn earworms, cutworms, flea beetles, gray garden slug, imported cabbage worm, root maggots, stink bugs, white grubs and wireworms.

**CARROT, CELERY and PARSNIP:** aphids, blister beetles, cabbage looper, flea beetles, grasshoppers, meadow spittle bug, white grubs and wireworms.

**CORN:** aphids, blister beetles, corn earworm, cutworms, European earwig, flea beetles, grasshoppers, root maggots, spider mites, white grubs and wireworms.

**CUCUMBER, MELONS, PUMPKIN and SQUASH:** aphids, blister beetles, cutworms, flea beetles, root maggots, squash bug, spider mite, stink bugs, white grubs and wireworms.

**LETTUCE and SPINACH:** aphids, blister beetles, cabbage looper, corn earworm, cutworms, European earwig, flea beetles, grasshoppers, gray garden slug, imported cabbage worm, meadow spittle bug, white grubs and wireworms.

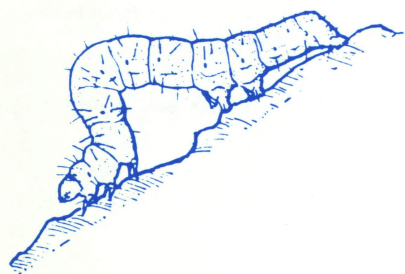
**ONIONS:** root maggots and wireworms.

**PEA:** alfalfa looper, aphids, blister beetles, cabbage loopers, cutworms, meadow spittle bug, pea leaf weevil, pea weevil, root maggots, spider mites, stink bugs and wireworms.

**POTATO, EGGPLANT, PEPPER and TOMATO:** aphids, blister beetle, cabbage looper, Colorado potato beetle, corn earworm, cutworms, European earwig, flea beetles, grasshoppers, gray garden slug, root maggots, spider mites, stink bugs, white grubs and wireworms.

## Description and Habits of Pests

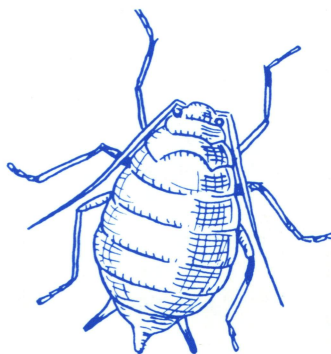
These are the major vegetable pests, their distinguishing habits and suggestions for control. Should your pest and plant damage fail to correspond with the descriptions listed below, take a specimen of the pest and damaged plant to your County Agent for further assistance.



Alfalfa looper, Cabbage looper  
Cabbage worm

These pests are very similar. The looper is a cream to light or dark yellowish green color with two whitish stripes on the back and another along the sides. It grows to about 1 1/2 inches in length and crawls in a looping fashion. Older larvae may bore into heads of cabbage and lettuce, notch pea pods and will devour entire leaves. There are three or more generations each year. The cabbage worm is light green and velvety in appearance. When mature it is about 3/4 inch long.

**CONTROL:** Sprays of *Bacillus thuringiensis* or Sevin are most effective against small loopers. Diazinon and malathion treatments are generally ineffective.

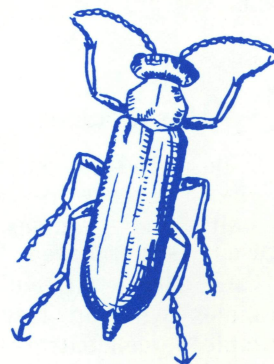


Aphids

There are many different kinds. Their color will vary from light yellow to dark green, brown, red, or almost black. A few species will move from one vegetable to another but they usually attack only one kind of plant. These tiny plant lice suck sap from plant tissues causing

foliage and blossoms to wilt and shrivel. Severely injured plants turn yellow, dry up and die.

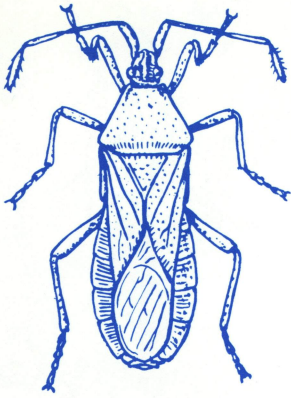
**CONTROL:** Early season applications of malathion or diazinon will prevent damage.



Blister beetles

The spotted or striped beetles may be gray, blue or black in color and up to 3/4 inches long. They differ from most beetles by having soft, flexible wing covers. The beetles feed on tender

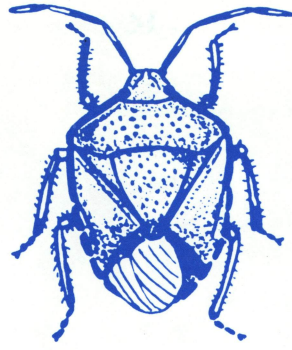




### Squash bug

All vine crops are subject to attack by pale or dark grayish brown bugs with an orange margin around the body. Young immature bugs have reddish legs, thorax and head. Their bodies turn to a grayish color with black legs when they mature. They feed by sucking the plant sap which cause the vines to wilt.

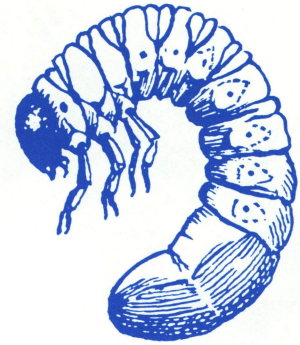
**CONTROL:** Sevin applications are effective.



### Stink bugs

These shield-shaped bugs are about 5/8 inch long, brown, solid green or green with 4 white spots on the back. They often attack vegetables causing blotches in the plant tissue under the skin or causing distorted growth. The young are gray to green to brown. All are shield-shaped.

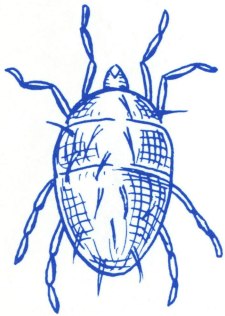
**CONTROL:** Repeated applications of malathion or diazinon are needed for control.



### White grubs

These "C" shaped dirty white grubs with brown heads and legs are larvae of the 10-lined June and carrot beetles. They are most frequently found in soil containing an abundance of humus. They feed on plant roots.

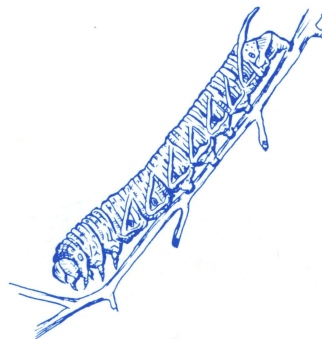
**CONTROL:** General soil treatment is the most satisfactory control. Apply 1 cup of 40% chlordane E.C. in at least 10 gallons of water over a garden area of 20 x 50 feet and immediately roto-till the soil thoroughly. This treatment should kill all grubs and wireworms present and prevent the soil from becoming reinfested for at least 5 years.



### Spider mites

This barely visible mite is only 1/50-inch long. It is oval, yellow or green and has two dark spots on its back. The young mites are a pale yellow to green color. Dense webs spread over the underside of infested leaves protect the mites during their developing and feeding. Mottled or speckled foliage indicates early feeding.

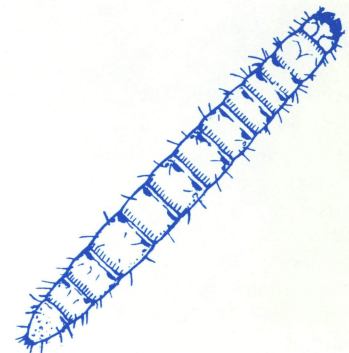
**CONTROL:** Thorough coverage is absolutely necessary to obtain control. Cygon, diazinon or malathion sprays must be repeated at 7 to 9 day intervals to be effective.



### Tomato hornworm

The green caterpillars have 8 diagonal white stripes along the sides and will grow to 3 or 4 inches long. They are the larvae of the dusk and dawn flying hawk or hummingbird moth which feed on nectar of petunia and similar plants. Larval feeding can cause severe defoliation to tomato and eggplant.

**CONTROL:** Handpicking is often satisfactory. Contact sprays of *Bacillus thuringiensis*, diazinon, malathion and Sevin are effective.

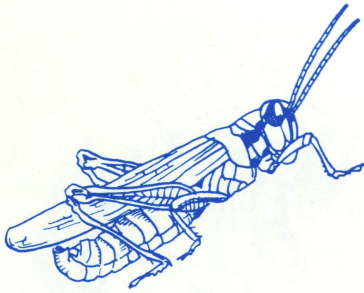


### Wireworms

Shiny, yellow hardworms up to 5/8 inch long will bore into seeds, potato seed pieces, potato tubers, root crops and underground portions of most plants. Adults are click beetles and do no damage. Each generation requires 2 to 5 years to mature.

**CONTROL:** See white grubs.

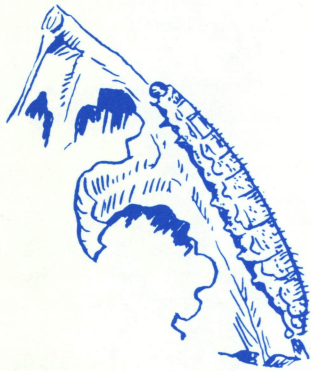




### Grasshoppers

About 5 of the over 600 different species attack garden plants. They have enormous appetites and can do tremendous damage.

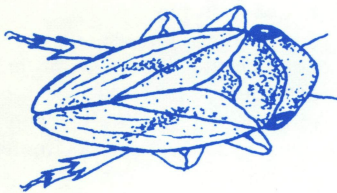
**CONTROL:** Sprays of chlordane, malathion, diazinon, Sevin or Cygon are all effective.



### Imported cabbageworm

The adult is a white butterfly often seen flying about cabbage and related plants. Their worms are light velvet green with a slender orange stripe down the middle of the back. They will grow to about 3/4 inch long. When numerous they can destroy all members of the cabbage plant family.

**CONTROL:** See alfalfa looper. Methoxychlor is also effective.

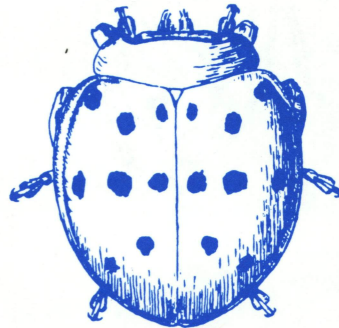


### Meadow spittlebug

These robust leafhopper-like insects are light tan to dark mottled brown with spots or stripes. Adult and nymph

feeding often stunts plant growth. The spittle produced by the nymphs protects them from their enemies. There is only one generation a year. Eggs are laid in the fall.

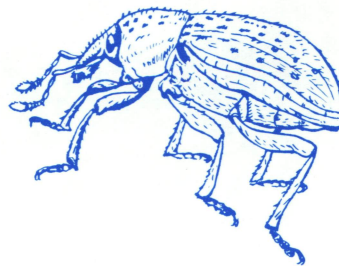
**CONTROL:** Diazinon, malathion, methoxychlor are all effective.



### Mexican bean beetle

Where present it is the worst-known pest of beans. The coppery-yellow colored beetles with 16 black spots on their wings spend the winter in garden trash. In mid-June they appear and feed and lay eggs on the underside of bean leaves. The larvae are soft yellow, 1/3 inch long, covered with black-tipped spines. They feed by removing the undersurface leaf tissue leaving only a skeleton of leaf vines. At times they will feed on pods and stems.

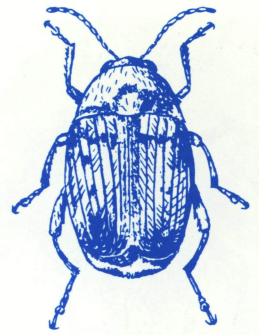
**CONTROL:** Repeated sprays of malathion or Sevin are generally required.



### Pea leaf weevil

Found only in the Palouse and surrounding areas. They are grayish elongated weevils about 3/16 inch long with three light stripes extending from the head backward. They eat "U" shaped holes in the margins of pea plant leaves as the plants emerge from the soil. Weevil feeding may retard growth and at times kill small plants. Larvae feed on root nodules, apparently doing little damage.

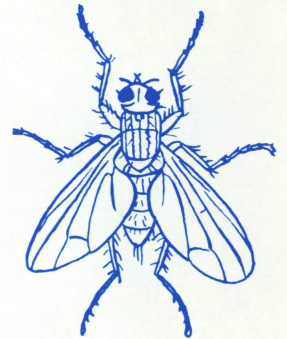
**CONTROL:** Spray emerging and seedling plants with methoxychlor. A second treatment may be needed.



### Pea weevil

The beetles are chunky, 1/5 inch long, brown, flecked with white, black and gray patches. The eggs are laid on the side of the developing pea pod. The tiny larva eats its way into the pod and seed where it feeds until mature.

**CONTROL:** Dust or spray with malathion or methoxychlor when first pods are 1/2 inch long and apply second treatment in 7 days.



### Root maggots

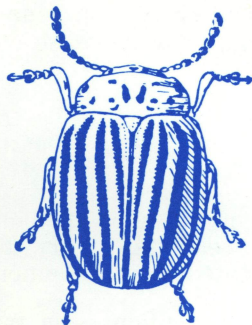
Roots and bulbs are scarred or tunneled by white maggots up to 1/3 inch long, without legs or a distinct head. Infested plants often wilt and die. Tiny white eggs are laid by gray flies, smaller than a housefly, in soil alongside cabbage, corn, onion and related plants. There may be three or more generations each season.

**CONTROL:** Dust or spray furrows at seed planting or bedding time with chlordane or diazinon for cabbage, corn, onion and related plants. In locations where root maggots are abundant dust or spray a chlordane or diazinon border around the base of seedling plants. Repeat 2 or 3 times at 10 day intervals.



foliage and flowers and are often numerous following years of large grasshopper populations.

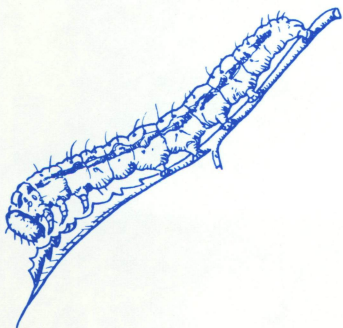
**CONTROL:** When numerous, contact sprays of diazinon, malathion or methoxychlor are effective.



### Colorado potato beetle

Yellow convex beetles about 3/8 inch long with black spots just back of the head and 5 black lines on each wing cover, they will often be found on potato plants as they emerge from the soil. The eggs are yellow-orange and laid in clusters, usually on the underside of potato leaves. The larvae are "hump-backed", red in color with black spots along the sides. When numerous they defoliate potato plants and egg plants.

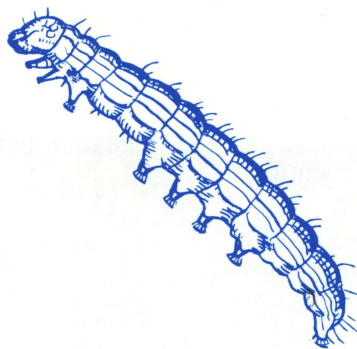
**CONTROL:** Spray infested plants thoroughly with malathion, methoxychlor, diazinon or Sevin. A second spray may be needed.



### Corn earworm

In areas where this pest occurs the moth lays eggs on fresh corn silks. The tiny larvae eat their way through the silks into the ear where they destroy the developing kernels. Larvae are yellowish-green to green and grow to 1 1/2 inches long. Sometimes early season infestations will destroy the whorls.

**CONTROL:** As corn silks appear, apply 4-5 treatments of Sevin, diazinon or malathion dusts at 3 to 4 day intervals to silks and ears.



### Cutworms

Solidary or surface cutworms feed on plants near the soil surface. Climbing cutworms crawl up plant stems to feed on foliage. Subterranean cutworms remain under soil surface and feed on underground stems. Some cutworms are migratory. They are generally smooth, shiny, gray to black in color and usually found just under the surface of the soil during the day. Most feeding is done at night and nearly all plants are susceptible to their attack.

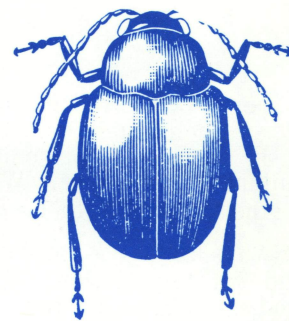
**CONTROL:** Thorough treatments of chlordane dusts or sprays applied to the ground surface around attacked plants will be effective. Dylox and Sevin baits are also quite effective.



### European earwig

The nuisance grows to about 3/4 inch long. The body is reddish brown. The legs, antennae and wing covers are yellowish brown. There is a pair of so-called "forceps" on the rear of the body. Earwigs feed on tender portions of most plants during the night. They are obnoxious nuisances when they enter homes.

**CONTROL:** Dust or sprays of diazinon, malathion or chlordane are effective as contact and protective border treatments.



### Flea beetle

These tiny bronze or black beetles about 1/16 inch long hop when disturbed. They eat "shot holes" in plant leaves and often kill seedlings.

**CONTROL:** Dusts or sprays of diazinon, malathion or Sevin are effective. Several treatments may be necessary.



### Gray garden slug

Slugs are snails without shells and are often quite destructive. They spend the winter in the soil, often in night crawler tunnels. They appear in early spring and attack tender seedling plants. Eggs, young and adults live through the winter. Their color varies from white to pale yellow, lavender purple or nearly black with brown spots, specks and mottlings.

**CONTROL:** Commercial metaldehyde or Mesural baits are generally effective. The effectiveness of the bait is improved and extended when the baits are placed under a protective cover such as a 5-inch diameter pie tin or a 4 x 4-inch piece of board.



## General Warnings

All pesticides are poisonous to warm-blooded animals in some degree. They should be handled cautiously to prevent poisoning pets, livestock, wildlife, children, or the user. When using any chemical, observe the following safe-use procedures:

1. Always read the label before using any chemical, and carefully follow the directions. Note warnings and cautions **each time** before opening the container.

2. Keep insecticides out of the reach of children and pets. Pesticides should be kept in their original containers outside the home and in a locked storage.

3. Do not spill concentrates or sprays on the skin or clothing. If they are spilled, remove the contaminated clothing immediately and wash body and clothes thoroughly.

4. Never smoke while spraying.

5. Avoid inhaling insecticide mists and vapors and, when directions specify, wear protective clothing and

a mask. A handkerchief fitted to the face, a long-sleeved shirt and gloves will help prevent excessive inhalation and contact with the insecticide.

6. Wash hands and face and change to clean clothing immediately after spraying. Always wash clothing before re-use.

7. Cover food and water containers when treating around livestock or pet areas. Do not contaminate fish ponds.

8. Use separate equipment for applying hormone-type herbicides to avoid accidental injury to susceptible plants from contaminated spray equipment.

9. Always dispose of empty containers in trash or by burning or burying so that they pose no hazard to humans, animals or plants. When burning containers avoid inhaling the smoke.

10. Observe label directions and cautions to keep residues on fruits within the limits permitted by law.

**The Authors** — Roland W. Portman recently retired from his position as extension professor and extension entomologist.

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