

# Insects

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**Table 2.5 - Insecticides**

Crop	Insect	Treatment and Amount to Mix with 1 Gallon of Water or as Indicated Otherwise	Remarks and Days Between Last Application and Harvest
<b>Asparagus</b>	Asparagus beetle, Grasshopper	Carbaryl (Sevin) 50% WP, 2.0 tbspc OR 5% dust.	1-day wait. Treat spears during harvest. Do not repeat a carbaryl (Sevin) application within 3 days.
<b>Beans</b> (snaps and limas)	Aphid	Malathion 57% EC, 1.0 tbspc or Esfenvalerate, 2.0 tsp Thiodan <sup>1</sup>	Treat when first seen. esfenvalerate : 3-day wait. Malathion : 3-day wait. Thiodan : 3-day wait. Do not exceed 7 applications.
	Thrips	Insecticidal soap or Esfenvalerate	Treat when damage is first observed.
	Mexican bean beetle	Carbaryl (Sevin) 50% WP, 2.0 tbspc OR 5% dust OR Esfenvalerate	carbaryl (Sevin) : 3-day wait. esfenvalerate : 3-day wait. Treat when damage appears.
	Grasshopper	Carbaryl (Sevin) or Esfenvalerate	See label for carbaryl (Sevin) esfenvalerate : 3-day wait.
	Stinkbug	Esfenvalerate OR Sevin 5% dust	See label for carbaryl (Sevin) esfenvalerate : 3-day wait.
	Corn earworm	Esfenvalerate OR Carbaryl (Sevin) 50% WP, 3.0 tbspc OR 5% dust.	Treat when first pods are 1 inch long and weekly or as needed thereafter. esfenvalerate : 3-day wait. carbaryl (Sevin) : 0-day wait.
	Spider Mite	insecticidal soap	Treat when damage appears.

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<sup>3</sup>**Special note for all cucurbits:** Row covers, in place from seedling stage until plants push out from the underside, will provide control for many of the pests including Cucumber beetles and Squash vine borer. Row covers are either fine mesh or loose spun fiber cloth that lets air, sun, and rain in, but excludes pests.

<sup>4</sup>Keeping seedbeds free of vegetation for 3 weeks prior to planting time will aid in control of cutworms. For more details on cutworm control see text about soil insects and cutworms-wireworms.

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## 2-8 Home Vegetables: Insects

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Crop	Insect	Treatment and Amount to Mix with 1 Gallon of Water or as Indicated Otherwise	Remarks and Days Between Last Application and Harvest
Beets	Flea beetle	Carbaryl (Sevin) 50% WP, 2.0 tbsp OR 5% dust.	Treat when insects appear in damaging numbers. Repeat as needed. carbaryl (Sevin) : 0-day wait.
Cabbage (broccoli, cauliflower, brussels sprouts, cabbage)	Caterpillars <sup>2</sup> looper, imported cabbage-worm, and diamond-back moth larvae	<i>Bacillus thuringiensis</i> (Bt), 2.0-3.0 tbsp (Bactur, Dipel, SOK-BT, Thuricide). Esfenvalerate Permethrin	(Bt) : 0-day wait. May be applied as a bait. Follow directions on label. Treat every 4 days after first true leaves appear until harvest if worms are present. esfenvalerate : 3-day wait. permethrin : See label.
	Aphid (plant lice), flea beetle	Permethrin (not for brussels sprouts), OR Carbaryl (Sevin). Esfenvalerate	Treat when insects appear in damaging numbers. Cauliflower 5 days, cabbage 7 days, broccoli 5 days for Diazinon. See label for carbaryl (Sevin). esfenvalerate : 3-day wait.
	Cabbage root maggot	See text about maggots and soil Insects.	
	Flea beetle	Carbaryl (Sevin) 50% WP, 2.0 tbsp OR 5% dust, Permethrin Esfenvalerate	carbaryl (Sevin) : 3 day wait. Repeat treatment at 7- to 14-day intervals as needed. permethrin : See label. esfenvalerate : 3-day wait.
Carrots	Aphid	Cyfluthrin, Thiodan insecticidal soap	Thiodan : 7-day wait, do not exceed 2 applications. soap : 0-day wait. cyfluthrin : 0-day wait.

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Crop	Insect	Treatment and Amount to Mix with 1 Gallon of Water or as Indicated Otherwise	Remarks and Days Between Last Application and Harvest
Cucurbits <sup>3</sup> (cantaloupes, cucumbers, squash, pumpkins, and watermelons)	Cucumber beetle	Carbaryl (Sevin) 50% WP, 1.0 tbsp OR 5% dust. Permethrin 25% EC, Thiodan. Esfenvalerate	Treat when seedlings emerge from soil if damage appears. Repeat at 5-day intervals as needed. Make application in late afternoon. esfenvalerate : 3-day wait. Esfenvalerate is not labeled for cantaloupe or watermelon. Carbaryl (Sevin) may kill bees when applied between 10 a.m. and 2 p.m. To avoid injury to tender foliage, do not apply when rain or humidity is expected during the next 2 days. Repeat as needed. See label for carbaryl (Sevin). permethrin : 3-day wait. Thiodan : 0-day wait.
	Squash bug Pickleworm	Carbaryl (Sevin) 50% WP, 1.0 tbsp OR 5% dust. Esfenvalerate	Treat when damage appears. Treat when seedlings emerge. carbaryl (Sevin) : See label. permethrin : 3-day wait. esfenvalerate : 3-day wait. Esfenvalerate is not labeled for cantaloupe or watermelon.
	Squash vine borer	Permethrin 25% EC OR 2.0-3.0 tbsp Thiodan. Esfenvalerate	Treat when vines begin to run, apply to bases of plants four times at 7-day intervals. Honeybees are necessary for good fruit set. Insecticides are toxic to bees. Apply in evening when fewer bees are working. Treat flower buds, stems, and vines weekly. permethrin : 3-day wait. Thiodan : 0-day wait. esfenvalerate - 3-day wait. Esfenvalerate is not labeled for cantaloupe or watermelon.

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<b>Cucurbits</b> <sup>3</sup> (cantaloupes, cucumbers, squash, pumpkins, and watermelons) (cont.)	Aphid (plant lice)	Permethrin 25% EC, Thiodan, Esfenvalerate	Treat when seedlings emerge. CARBARYL (SEVIN) WILL NOT CONTROL APHIDS. Treat when insects appear in damaging numbers. Repeat as needed. permethrin : 3-day wait. Thiodan : 0-day wait. esfenvalerate : 3-day wait. Esfenvalerate is not labeled for cantaloupe or watermelon.
	Spider mite	Insecticidal soap,	Treat when damage appears. Kelthane : 2-day wait. Repeat as needed. esfenvalerate : 3-day wait. Esfenvalerate is not labeled for cantaloupe or watermelon.
	Leafhopper, leafminer	Permethrin 25% EC. Esfenvalerate	Treat when damage appears. permethrin : 3-day wait, repeat as needed. Pick and destroy infested leaves. esfenvalerate : 3-day wait. Esfenvalerate is not labeled for cantaloupe or watermelon.
	Whitefly	See text about Whiteflies. Esfenvalerate	esfenvalerate : 3-day wait. Esfenvalerate is not labeled for cantaloupe or watermelon.
<b>Eggplant</b>	Flea beetle, Colorado potato beetle, grasshopper	Carbaryl (Sevin) 50% WP, 2.0 tbsp OR 5% dust. Thiodan Esfenvalerate	carbaryl (Sevin) : 0-day wait. Treat when damage appears. Repeat as needed. Thiodan : 1-day wait. Do not exceed 0.5 lb of active ingredient/A. esfenvalerate : 7-day wait.
<b>Greens or Leaf Crops</b> (turnips, kale, spinach, collards)	Caterpillars <sup>2</sup> looper, imported cabbage-worm, and diamond-back larva	<i>Bacillus thuringiensis</i> , for spinach and turnips. Esfenvalerate	<i>Bacillus thuringiensis</i> : 0-day wait.. Treat every 4 days after first true leaves appear until harvest, if worms are present. Esfenvalerate not labeled for turnips, kale, or spinach.

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Crop	Insect	Treatment and Amount to Mix with 1 Gallon of Water or as Indicated Otherwise	Remarks and Days Between Last Application and Harvest
	Flea beetle, Harlequin bug	Carbaryl (Sevin) 50% WP, 2.0 tbsp. Esfenvalerate	carbaryl (Sevin) : 14-day wait. esfenvalerate : 7-day wait. Esfenvalerate not labeled for turnips, kale, or spinach.
<b>Greens or Leaf Crops</b> (turnips, kale, spinach, collards) (cont.)	Grasshopper	Carbaryl (Sevin), Esfenvalerate	Treat when insects appear in damaging numbers. Repeat as needed. See label for carbaryl (Sevin). esfenvalerate : 7-day wait. Esfenvalerate not labeled for turnips, kale, or spinach.
	Aphid (plant lice)	Rotenone 1% dust. Insecticidal soap, Esfenvalerate	See label for Rotenone. Treat when insects appear in damaging numbers. esfenvalerate : 7-day wait. Esfenvalerate not labeled for turnips, kale, or spinach. Insecticidal soap : Use up to the day before harvest.
<b>Lettuce</b>	Aphid (plant lice)	Permethrin OR insecticidal soap, OR Malathion 4% dust OR 57% EC, 1.0 tsp.	Treat when insects appear in damaging numbers. Malathion : 14-day wait for leaf lettuce, 7-day wait for head lettuce. permethrin : 1-day wait. soap : 0-day wait.
	Flea beetle, harlequin bug, stink bug	Carbaryl (Sevin) 5% dust Permethrin	carbaryl (Sevin) : 3-day wait for head lettuce, 14-day wait for leaf lettuce. permethrin : 1-day wait.
<b>Mushroom</b>	Gnat, rove beetle	Pyrethrins, Malathion	See label. Only certain specific brands have mushrooms on the label. Make sure the brand you use is registered for mushrooms.
<b>Okra</b>	Aphid (plant lice)	Rotenone 1% dust	See label. Treat when insects appear in damaging numbers.
<b>Onion</b>	Thrips, Aphid	Malathion 4% dust OR 57% EC, Insecticidal soap	Malathion : Three days green onion. 1.0 tbsp For onion, treat when thrips appear in damaging numbers.

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	Onion Maggot		Maggot control, see section on wireworms and maggots under soil insect control.
<b>Pea</b>	Aphid (plant lice)	Insecticidal soap. Esfenvalerate	Treat when insects appear in damaging numbers. esfenvalerate : 3-day wait. Insecticidal soap : Use up to the day before harvest.
	Earworm, cowpea curculio, grasshopper	Carbaryl (Sevin) 50% WP, 2.0 tbsp OR 5% dust OR Esfenvalerate	Treat for cowpea curculio when pods begin to form. esfenvalerate : 3-day wait.
<b>Pepper</b> (bell or hot)	European corn borer, grasshopper	Carbaryl (Sevin) 50% WP, 1.0 tbsp OR 5% dust	carbaryl (Sevin) : 0-day wait. Use at 4- to 5-day intervals as long as needed.
	Aphid (plant lice)	Esfenvalerate Cyfluthrin	Treat when insects appear in damaging numbers. esfenvalerate : 7-day wait. cyfluthrin : 7-day wait.
<b>Potato</b>	Colorado potato beetle,	Thiodan (Thiogard) Carbaryl (Sevin) <i>Bacillus thuringiensis</i> var. tenebrionis	Try planting potatoes as far from last year's crop as possible. Short-season varieties such as Superior can withstand late-season damage. Hand picking will work as a last resort. Sevin: 0-day wait Thiodan: see label Bt: 0-day wait <i>Bacillus thuringiensis</i> var. <i>tenebrionis</i> is sold under the trade names: M-Trak, Foil and Novodor

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	European corn borer	Carbaryl (Sevin) Thiodan (Thiogard) <i>Bacillus thuringiensis</i>	To control ECB, make 3 applications at 7-day intervals, starting in mid-May. Treat when insect and/or damage first appear. Sevin: 0-day wait Thiodan: see label Bt: 0-day wait
<b>Potato</b> (cont.)	Grasshopper	Carbaryl (Sevin) (Thiogard)	Treat when insect and/or damage first appears. Sevin: 0-day wait
	Whitefly	Thiodan (Thiogard)	Purchase pest-free plants. Treat when insect and/or damage first appears. Thiodan: see label
	Potato leafhopper	Carbaryl (Sevin) Thiodan (Thiogard)	Treat in mid-June or when insects and/or damage first appear. Sevin: 0-day wait Thiodan: see label
	Aphids	Insecticidal soap Malathion Thiodan (Thiogard)	Treat when insect and/or damage first appear. Sevin: 0-day wait Thiodan: see label
	Potato tuberworm	Thiodan (Thiogard) Esfenvalerate	Keep potatoes hilled properly to avoid infestation and store potatoes at a temperature below 50°F. If insecticide is needed, treat 10 days before harvest.
<b>Strawberry</b>	Spider mite	Insecticidal soap	Treat when damage appears. Damage usually occurs in hot, dry seasons, and it may be severe.
	Cyclamen mite	Thiogard 3, 1.67 tbsp <sup>1</sup>	Four days. Do not reapply within 15 days or more than twice within a 35- day period when fruit is present.
	Leafroller, root lice (root aphid)	Malathion 5% dust OR 57% EC, 2 tsp	Malathion : 3-day wait. Treat when damage appears or insects appear in damaging numbers.

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	Aphid (plant lice)	Insecticidal soap	Treat when insects appear in damaging numbers.
<b>Strawberry</b> (cont.)	Strawberry weevil "Clipper" and Strawberry rootworms	Carbaryl (Sevin) 50% WP, 2.0 tbsp OR 5 % dust Malathion 5% dust OR 57% EC, 1.0 tbsp	carbaryl (Sevin) : 1-day wait. Malathion : 3-day wait. Start treatment when cut buds or leaf holes are seen. This is usually just after beginning of bloom (late March or early April). Treat at weekly intervals as needed. Rotate strawberries to a part of the garden that has not had strawberries in the last year.
<b>Sweet Corn</b> <sup>4</sup>	Flea beetle, grasshoppers	Carbaryl (Sevin) 50% WP, 2.0 tbsp Cyfluthrin Esfenvalerate Permethrin	carbaryl (Sevin) : 0-day wait. Treat when insects and damage appear on young plants. Application of carbaryl (Sevin) to the tassel region of corn during the pollen shedding period will seriously reduce the bee population. cyfluthrin : 0-day wait. esfenvalerate : 1-day wait. permethrin : 1-day wait.
	Fall armyworm	Carbaryl (Sevin) 50% WP, 2.0 tbsp OR 5% dust Cyfluthrin Esfenvalerate Permethrin	Treat when "window pane" feeding damage appears on leaves of young corn or in whorls of older corn. cyfluthrin : 0-day wait. esfenvalerate : 1-day wait. permethrin : 1-day wait.
	European corn borer	Carbaryl (Sevin) 50% WP, 2.0 tbsp OR 5% dust Cyfluthrin Esfenvalerate Permethrin	Treat when 50% of plants show tiny pin holes in leaves. cyfluthrin : 0-day wait. esfenvalerate : 1-day wait. permethrin : 1-day wait.

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**Table 2.5 - Insecticides (cont.)**

Crop	Insect	Treatment and Amount to Mix with 1 Gallon of Water or as Indicated Otherwise	Remarks and Days Between Last Application and Harvest
	Corn sap beetle, European corn borer in the ear, corn earworm, Japanese beetle	Carbaryl (Sevin) 50% WP, 2.0 tbsp OR 5% dust Thiodan Cyfluthrin Esfenvalerate Permethrin	Apply to silks every other day beginning at 10% silking and continuing until 90% of silks have wilted and turned brown. cyfluthrin : 0-day wait. esfenvalerate : 1-day wait. permethrin : 1-day wait.
<b>Sweet Corn<sup>4</sup></b> (cont.)	Corn earworm	Carbaryl (Sevin) Cyfluthrin, Esfenvalerate, Permethrin	Carbaryl (Sevin) : 1-day wait. Apply at 2- to 3-day intervals when silking. cyfluthrin : 0-day wait. esfenvalerate : 1-day wait. permethrin : 1-day wait.
	Seedcorn maggot	Soil insecticide labeled for vegetables	For fields with a history of seedcorn maggot problems or when a cool, wet spring is expected.
<b>Tomatoes<sup>4</sup></b>	Flea beetle, stink bugs, grasshoppers, leaf-footed bugs	Carbaryl (Sevin) 50% WP, 2.0 tbsp OR 5% dust Thiodan Cyfluthrin, Esfenvalerate	carbaryl (Sevin) : 0-day wait. Thiodan : 1-day wait. Treat when damage appears or when insects appear in damaging numbers. cyfluthrin : 0-day wait. esfenvalerate : 1-day wait.
	Colorado potato beetle	Thiodan Cyfluthrin, Esfenvalerate	Thiodan : 1-day wait. Treat when damage appears or when insects appear in damaging numbers. cyfluthrin : 0-day wait. esfenvalerate : 1-day wait.
	Blister beetles, hornworm, tomato russet mite, cabbage looper	Carbaryl (Sevin) Thiodan, Cyfluthrin, Esfenvalerate	Thiodan : 1-day wait. Repeat as needed. Follow directions on label. cyfluthrin : 0-day wait. esfenvalerate : 1-day wait.

<sup>1</sup>Three percent Thiogard is a low-concentrate formulation of Thiodan for homeowner and home garden use. It may be available under other trade names.

<sup>2</sup>Loopers are hard to kill. *Bacillus thuringiensis* (*B.t.*) will work well but is not fast. *B.t.* is safe. Loopers and other worms get sick the first day and die later. Loopers become a problem in Virginia in late July or early August. They will remain a problem until a killing frost or light freeze occurs.

<sup>3</sup>**Special note for all cucurbits:** Row covers, in place from seedling stage until plants push out from the underside, will provide control for many of the pests including Cucumber beetles and Squash vine borer. Row covers are either fine mesh or loose spun fiber cloth that lets air, sun, and rain in, but excludes pests.

<sup>4</sup>Keeping seedbeds free of vegetation for 3 weeks prior to planting time will aid in control of cutworms. For more details on cutworm control see text about soil insects and cutworms-wireworms.

The three formulations of Diazinon are now sold for home and garden use under the Spectracide label, the Ortho label, and several others. For this reason we urge home gardeners to **read the label** and act accordingly.

**Dusts** should always be applied as a "fog" to cover leaf surfaces with a very light but visible film of insecticide. A hand-operated crank duster is in most cases the only hand equipment that is really acceptable for applying dusts. However, a puff duster is adequate for small plants such as young cucumbers and for treating silking ears of corn.

**Sprays** should be applied to the point of runoff. An effort should be made to spray undersides of leaves, especially for effective spider mite, aphid, and whitefly control.

**Wettable powders** are omitted in some cases to conserve space. They are generally as effective at comparable rates, but usually require more agitation. Read labels for amount per gallon of water.

**Table 2.5 - Insecticides (cont.)**

Crop	Insect	Treatment and Amount to Mix with 1 Gallon of Water or as Indicated Otherwise	Remarks and Days Between Last Application and Harvest
	Fruitworm	Carbaryl (Sevin) 50% WP, 2.0 tbsp OR 5% dust. Cyfluthrin, Esfenvalerate	carbaryl (Sevin) : 0-day wait. Treat every 5- to 7-days when fruit begins to set. Continue as long as fruit is present if needed. cyfluthrin : 0-day wait. esfenvalerate : 1-day wait.
<b>Tomatoes<sup>4</sup></b> (cont.)	Thrips, Aphids	Insecticidal soap OR Malathion 5% dust OR 57% EC, 1.0 tbsp. Esfenvalerate, Cyfluthrin	Malathion : 1-day wait. Treat when insects appear in damaging numbers. esfenvalerate : 1-day wait. cyfluthrin : 0-day wait.
	Spider mites	Insecticidal soap	Treat when mites appear in damaging numbers.
	Cutworms	See text about Cutworms and Wireworms and soil insects.	
	Whiteflies	Esfenvalerate	esfenvalerate : 1-day wait.

<sup>1</sup>Three percent Thiogard is a low-concentrate formulation of Thiodan for homeowner and home garden use. It may be available under other trade names.

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## The Potato Tuberworm

Each year, Virginia home gardeners are plagued by injury to their white potatoes by the potato tuberworm.

The injury shows up in stored potatoes as unsightly feeding tunnels filled with excrement throughout the flesh of the tubers and, consequently, the tubers become unfit for food. Each year, many people ask how these pests get in the stored potatoes and how they can be controlled.

The potato tuberworm is the larva or immature stage of a gray moth not over one-fourth inch long. It has small, dark brown or black markings on the wings. The female moth lays her pearly-white eggs on the leaves and stems of the plants or in the eyes of exposed tubers in the field or in storage. The moths are seldom seen because they hide during the daytime but are active at night. The female usually lays from 150 to 200 eggs. In warm storage places, the tuberworm may continue to reproduce and be a pest throughout the winter. In the field, it overwinters as a larva or pupa in the soil. The life cycle may be as short as 2 weeks in the summer or as long as 7 months in the winter. In the field, there are five or six generations in the South, but probably not more than three or four in Virginia.

The full-grown larva of the potato tuberworm is about one-half inch long. Its head is brown and its pinkish green or white body sometimes has a reddish-purple band down the back. **CONTROL MEASURES:** Protective measures for controlling the potato

tuberworm include the following: 1) plant only seed pieces that are not infested, 2) cultivate so as to hill the soil against the plants - keeping at least 2 inches of soil over the developing tubers, 3) harvest as soon as the crop is mature. During harvest, do not leave the dug potatoes in the field overnight, and do not cover piles of potatoes with potato tops, 4) destroy all culled or infected potatoes as soon as possible, 5) store tubers at temperatures below 52° F if possible and practical. Use either new or thoroughly cleaned bags or baskets when storing. The storage area should be screened or enclosed in such a way that moths cannot get in. Without such an enclosed storage area, the moths can still fly in and still become a problem even though the storage area was clean and the potatoes insect-free when stored.

There is no legal chemical control for this insect in stored potatoes. However, an approved household insecticide may be used at regular intervals to control tuberworm moths. Potatoes should be covered while these sprays are being applied. Consider a weekly spray application as long as the problem persists.

## **Slugs**

Slug populations are the result of favorable environmental conditions for slug reproduction and survival. Any type of mulch may give rise to greater problems with slugs. Young seedlings and the more succulent parts of plants and even some entire plants are devoured by these pests. They leave a trail of mucus on the surfaces on which they crawl, and, on drying, silvery marks result. Moist, humid environments favor slug development. Slugs generally spend the winter in sheltered situations outdoors. Eggs are usually deposited in moist habitats and maturity requires a year or more. Many different modern-day insecticides have been tested against slugs and very few show any promise at all. The following are suggestions for minimizing slug damage to either vegetable or flower gardens:

1. Spade or rototill the garden area in the fall.
2. Spade or rototill the garden again around April 1.
3. Maintain a system of clean cultivation by hoeing so that the surface of the soil is dry and crumbly.
4. Where heavy infestations of slugs cause serious damage, hand-picking will reduce slug populations. Use a flashlight to check infestation. About 10:00 p.m., inspect garden for active slugs. Those detected can be picked up with an old teaspoon. Place captured slugs in a container of salt, which will kill them. If this activity is continued for 3 or 4 nights in a row, damage can be greatly reduced.
5. In order to increase organic material in the soil, it is best to compost materials such as grass clippings, leaves and other plant debris for at least one year. At the end of this time the compost should be black and crumbly. This then should be spread over the garden and spaded into the soil.
6. Gardeners have reported some success with stale beer placed in small cups or pans sunken in the soil so the lip of the container is slightly below the level of the ground. Slugs are attracted to the containers; once inside they drown. The beer needs to be replaced about every three days for best results. However, stale beer must be used. Slug populations can be greatly reduced if this method is started early in the spring and enough of the containers are set out.
7. Slug baits are available and effective against this pest if applied exactly as directed on the label. None of these commercial baits are to be used directly on food crops.
8. Crushed oyster shells (a chicken feed supplement) placed around the base of the plant may also deter slugs.

### **Cutworm, Wireworm, and Root Maggots**

Several companies produce granular insecticides that are labeled for use in vegetable gardens. In general, diazinon has been replaced by carbaryl and permethrin, but other active ingredients may also be labeled and appropriate.

Check insecticide label to make sure it is labeled for your specific crop and for rates and other instructions.

For cutworms, apply on soil surface.

For wireworms and root maggots apply in planting furrow.

### **Whiteflies**

During the past several years, whiteflies have become a serious problem in home gardens. They are very small non-mobile insects with sucking mouthparts. They are closely related to aphids. They are likely to be found on several garden crops such as tomatoes, beans, squash, etc. The problem may arise from transplants that become infested in greenhouses. This insect is almost totally resistant to any of the insecticides commonly used in the home garden. In a nutshell, this insect is not only extremely hard to kill, there is nothing legal to recommend for its control in the home garden that will kill all stages.

We have suggested repeated applications of malathion, esfenvalerate, or Thiogard 3 (which may be the most effective). Use in accordance with label for other garden pests. Observe dosage and waiting period recommendations. Make at least three applications at four day intervals. Thorough coverage is a must, especially on undersides of leaves.

Yellow Sticky Boards should be considered as a means of mechanical control. They may be constructed as follows: (1) Cut standard (22" X 28"), bright yellow posterboard into 7" X 7" squares, (2) fasten squares of posterboard to stakes and drive into the ground, (3) with small paint brush, spread 90-weight gear oil or vegetable shortening onto both sides of posterboard squares; repeat as necessary. Makes 12 squares of Yellow Sticky Board; one board to be used for six plants.

Consider bright yellow empty containers in lieu of poster board, such as plastic motor oil, antifreeze, or tennis ball containers. Invert them over bamboo stakes and treat the outsides of the empty yellow containers with 90-weight gear oil or vegetable shortening.

### **Cabbage Maggot**

Cabbage maggot feeding usually shows no effect until late in the spring. The first outward sign is a slight drooping of the leaves of a few plants, which later wilt and die. Such plants have had their root systems entirely destroyed, and some may have their tap roots entirely cut off, leaving only a stub. In small plants, the maggots sometimes burrow up into the stems and cause quick wilting. Usually, they destroy the branch roots and make furrows in the sides of the tap roots, sometimes completely girdling them.