

Cutworms



Cutworm Damage

Fight Cutworms with Plant collars







- Plastic Cups
 Earth Staples
- 3. Cutting knife
- 4. Sharp Object such as awl or ice pick
- 5. Optional: Spaghetti tube Poly tubing
- 6. Scissors
- 7. Optional: Drip emitters and Connectors



6

You can also use Diatomaceous earth or other baits.



Aphids

<u>Aphids-</u> can attack young seedlings and in large number will destroy the plants

Aphids' natural enemies like the lady beetle, parasitic wasps, green lacewings, syrphid fly should provide some level of control. They can be washed off plants or killed with insecticidal soap or a blast or water from the garden hose. You can also use neem Oil.



Aphid damage on okra leaves



Scarab beetle



<u>Grubs-</u> can attack young seedlings at the root level. Most grubs in this area are the result of scarab or June beetles that have laid eggs in the soil.

Beneficial nematodes applied to the soil are an effective treatment for grubs. Also, you can dig the soil and remove them by hand.



Grubs



Green June beetle. A and B, Adults. C, Eggs. D, Larva. E, Pupa chambers.

Life Cycle



Grubs



Seedcorn maggots



Seedcorn maggot damage

<u>Seedcorn maggots-</u> Maggot-attacks planted seeds of cantaloupes and watermelons in the spring

A preventative seed treatment or transplant drench is the best method of control when conditions are ideal for Seedcorn<u>maggot</u> infestation



Leafminer



Leafminer damage

<u>Leafminer-</u> Mining of leaves by the larvae is the principal cause of plant injury

- <u>Leafminers</u> rarely require treatment in gardens
- Provide proper care, especially irrigation to keep plants vigorous
- Clip off and remove older infested leaves
- Plant resistant species or varieties
- Small seedlings can be protected by protective cloth



Flea beetle



Flea beetle damage

Flea Beetles-Adults feed mostly on leaves, leaving tiny pits or small holes at their feeding sites. Damage is not usually serious beyond early seedling stage

- Flea Beetles can be controlled through the use of :
 - Sticky traps
 - Sulfur containing pesticides may be repellent
 - Carbaryl Sprays and various foliar sprays



Tomato fruitworm larva



Tomato fruitworm adult



Tomato fruitworm damage

Tomato Fruitworm larva-Control: Beneficial insects such as the Big Eyed Bug, Minute pirate bug. Chemical control can include Spinosad, or products containing BT, or pyrethrin



Tomato hornworm larva

Tomato hornworm larva-Control: There are several important naturally occurring parasites that help control hornworms in tomatoes. Hornworm eggs are attacked by Trichogramma parasites and the larvae by Hyposoter exiguae. Trichogramma released for control of tomato fruitworm will also attack hornworm eggs. Sprays containing BT are also effective.

You can also remove them by hand



Tomato hornworm adult-Sphinx moth



Tomato hornworm damage



White flies-

Control is difficult. Whiteflies have many natural enemies. General predators include lacewings, big eyed bugs, and minute pirate bugs. Several small lady beetles also feed on whiteflies. Hand removal, small vacuums and sticky traps have been shown to decrease the population

You can also spray them with neem oil, but it must make contact with the fly when they are at rest, usually in the evening hours



Grasshoppers



Grasshopper nymph damage to broccoli leaves

Grasshoppers-

Control: Where migration of grasshoppers frequently occurs is to keep an attractive green border of tall grass or lush green plants around the perimeter of the garden to trap insects and divert them from vegetables or flowers. Don't mow this trap crop or let it dry out, or you will send the grasshoppers straight into the garden

You can try to catch and remove them by hand, but that is generally difficult



Sowbugs and Pillbugs

<u>Sowbugs and Pillbugs-</u> Sowbugs and pillbugs are not insects but soildwelling crustaceans.

Sowbugs and pillbugs feed primarily on decaying plant material and are very important in the process of decomposing organic matter in the garden. However, they occasionally feed on seedlings, new roots, lower leaves, and fruits or vegetables lying directly on the soil or near a damp soil surface

Control-Limit moisture and decaying matter. Try to water early in the day so the soil dries by evening. Using raised beds or planting boxes, plastic mulch, and drip or furrow irrigation instead of sprinklers usually keeps sowbugs from becoming serious problems. Black plastic mulch may be more effective at discouraging sowbugs than white or clear plastic are because it gets hotter



Spider mites



Spider mites damage on cucumber



Spider mites on the underside of leaves

Spider Mites-Spider mites are arachnids, a group of arthropods which also includes spiders, ticks, and scorpions. To the naked eye, spider mites look like tiny, moving dots; however, you can see them easily with a 10X hand lens. Adult females, the largest forms, are less than 1/20 inch long. Spider mites live in colonies, mostly on the undersurfaces of leaves;

Damage- Mites cause damage by sucking cell contents from leaves. A small number of mites usually isn't reason for concern, but very high populations—levels high enough to show visible damage to leaves—can damage plants, especially herbaceous ones.

Control-In gardens and on small fruit trees, regular, forceful spraying of plants with water will often reduce spider mite numbers adequately. Be sure to get good coverage, especially on the undersides of leaves. If more control is required, consider using an insecticidal soap or oil in your spray. Some miticides are available, but their use should be minimized to conserve populations of predatory mites and insects and to minimize pesticide resistance



<u>Environment:</u> Dry leaf surface, moderate relative humidity and temperature, low light intensity

Management: Plant resistant varieties when available Fungicides: sulfur or other compounds used as protective sprays

Powdery Mildew on Cantaloupe



Early Blight on tomatoes

Early Blight will first cause leaf yellowing on older leaves, followed by grey or brown spotting, then dieback of the plant

Control-This disease can be easy to control if you start early. The key to prevention and spread of the disease is sanitation and rotating your vegetables between garden spots.

Remove yellowing foliage at the stem by "snapping" off the leaves or by cutting with a scissors. It is important to remove the infected leaves and stems as early as possible and put them in the trash, not the compost pile.

Prevent the disease from spreading on new foliage by using a fungicide. Any commercial vegetable fungicide will work but those containing in the ingredients *chlorothalonil, mancozeb and copper* work the best

Rhizoctonia diseases: Symptoms





Fruit Rot on Tomatoes

Environment: Wet soil, high organic matter **Symptoms:** seed decay, damping-off, stem lesions, wilting, seedling death

Control-This disease can be easy to control if you start early. The key to prevention and spread of the disease is sanitation and rotating your vegetables between garden spots.

Management:

- Avoid overwatering and other plant stress factors
- Purchase vigorously growing plants
- Apply fungicides as soildrench treatments: iprodione, thiophanate-methyl

Black scurf on potato



Damping off and wirestem



Crater rot of carrot



17. Fusarium wilt. A, Field with high incidence of Fusarium wilt. B, Detached leaf showing unilateral yellowing. C, Mature plant showing golden yellowing. D, Longitudinal section of stem with browning of the vascular system.

Fusarium wilt on tomato

Verticillium wilt on tomato

Environment: Moderate

temperatures (below 85 F) favor *Verticillium*; warmer temperatures favor *Fusarium* **Symptoms:** Wilting, internal stem discoloration, plant death

Management:

 Plant resistant or immune plants

Pythium diseases:





Damping off

Environment: Wet soil that drains poorly **Symptoms:** Seed decay, damping-off, wilting, plant death

Management:

- Avoid overwatering and poorly draining soil
- Use seed treated with fungicide to reduce seed decay
- Apply a fungicide as a soil drench: mefenoxam





Stem rot

Root rot



Pythium soft rot on potato



Pythium soft rot on cucumber

Abiotic diseases



Blossom end rot on tomato

Cause:

- Irregular irrigation
 Calcium deficiency

Insect Pest	Natural, Less Toxic Insecticides
Aphids	insecticidal soap
	neem oli extract
Tomato Fruitworms & Hornworms	Bacillus thuringiensis (B.t.) spinosad pyrethrin neem oil extract
Leaf-footed Bugs & Stink Bugs	horticultural oil
Flea Beetles	insecticidal soap neem oil extract horticultural oil pyrethrin
Whiteflies	insecticidal soap neem oil extract pyrethrin horticultural oil
Thrips	spinosad
Spider Mites	insecticidal soap horticultural oil
Cutworms	protective collars or <i>B.t.</i> mixed with molasses & grain as a bait, Diatomaceous earth