

Harmful Insects

There are two main types of harmful insects-sucking and chewing. Sucking insects have a mouth part that sticks like a straw into a plant to suck out the nutrients and water. Chewing insects bite the plant and leave behind noticeable chew marks. These are just a few of the many harmful insects. Each plant can attract different types of insects.

NOTE: A great prevention practice is frequent scouting in your garden!

INSECT	DESCRIPTION	DAMAGE	TREATMENT/ MANAGEMENT
Aphids (sucking) (many types)	Soft, pear-shaped bodies; green, yellow, or black; love new growth	Mottled leaves and yellowing; curled leaves; stunted growth; wilting; death; can spread diseases through mouth parts	Release predator insects (lady beetles); spray small outbreaks with high pressure water; remove highly infested plant parts; spray with insecticidal soap or Neem oil
Leaf Miners (chewing)	Winding light green paths where tissue has been eaten in leaves of tomatoes, peas, and greens	Mainly cosmetic but can weaken the plant if too much damage	Remove infected leaves by hand
Grasshoppers (chewing)	Various colors of green, brown, or black; long rear legs	Chew leaves and fruits of plants	Reduce grassy weeds; encourage birds or chickens; cover plants with row cover
Squash Vine Borer (chewing)	Larvae of the orange and black Hummingbird Moth; found at bases of squash/pumpkins with "frass" (excrement)	Larvae eat inside of stem which results in rotting.	Wrap base of plant with foil to discourage egg laying; plant resistant types such as Cucurbita moschata; inject Bt (organic) into stem or poke borers with needle
Tomato Horn Worm (chewing)	Green caterpillars with white stripes on back and horn on tail	Remove foliage and can chew holes in fruit	Pick off by hand; fall cultivation (overwinter in soil); apply Bt; release Braconid wasps

Source: Grow Veg (n.d.) "Plant Disease ID Guides". Grow Veg. <https://www.growveg.com/plant-diseases/us-and-canada/>

INSECT	DESCRIPTION	DAMAGE	TREATMENT/ MANAGEMENT
Cabbage Worm (chewing) (different than Cabbage Looper)	Velvety green with faint yellow stripes on back; eggs on underside of leaves; "frass" seen before worm	Chew noticeable holes in leaves	Use row covers; apply Bt; plant flowers nearby to attract beneficial predators
Spider Mite (sucking)	Tiny, orange-red insects; look for webbing under leaves and on edges; leaves become stippled	Attack drought-stressed plants; feed on nutrients from plants and weaken them	Keep garden watered and moist; beneficial insects; spray high pressure water on infected plants; spray Neem oil; remove infected parts
Thrips (sucking)	Look like dark slivers on plants; easier to see if shake leaves onto a white sheet of paper	Feed on leaves which causes white patches; transmit viruses, such as Tomato Spotted Wilt Virus, through mouthparts	Use sticky traps indoors; use reflective mulches to camouflage plants; grow resistant varieties; use insecticidal soaps or oils; have many natural predators
Whitefly (sucking)	White, wedge-shaped; scatter quickly when plants are disturbed	Attack most veggies; suck nutrients from plants; excrete honeydew which attracts ants and sooty mold	Spray high pressured water on plants (especially underside of leaves); use insecticidal soap
Slugs/Snails (chewing)	Leave behind trail of slime; reproduce quickly; prefer densely planted areas and moisture	Attack many crops (mostly at night); chew on leaves, fruits, and seedlings	Pick off by hand and drown in soapy or salty water; use iron phosphate slug baits such as Sluggo (organic)

Source: Grow Veg (n.d.) "Plant Disease ID Guides". Grow Veg.
<https://www.growveg.com/plant-diseases/us-and-canada/>

BENEFICIAL INSECTS

Many can be bought and added to your garden. These are just a few of the insects that can help your garden.

- Beneficial Nematodes: microscopic worms that help control grubs and cutworms, among other pests. Establish well in areas with regular watering.
- Lacewings: Love eating caterpillars and aphids, among others. Release when the weather is consistently above 50°F.
- Lady Beetles: Larvae and adults love eating aphids. Release after a light watering and at dusk.
- Praying Mantises: Larvae and adults will attack and eat any other moving insect.
- Assassin Bugs: Attack aphids, large caterpillars, beetles, and flies.
- Braconid wasps: tiny wasps that use many pests as a host for their eggs. Females can lay 50-200 eggs.

Source: North Haven Gardens (n.d.) "Beneficial Insects". NHG.
<https://www.nhg.com/guides/beneficial-insects/>

Pest Management

Management/Control Practices

- Types of Control
 - IPM (integrated pest management)
 - Use of multiple control techniques to prevent and/or control pests
 - Cultural control/practices
 - Gardening practices used such as crop rotation, variety selection, weed and water management
 - Leaving garden fallow for a time between planting seasons
 - Remove piles of dead or diseased plants
 - Sanitize garden tools with rubbing alcohol if used on a known diseased plant
 - Select healthy plants and pest-resistant varieties if available
 - Prepare soil well with fertilizer, nutrients, and other additives if needed
 - Scout garden regularly for pests
 - Biological control
 - Using one organism to control another, such as releasing lady bugs to eat aphids
 - Mechanical control
 - Using physical means in the garden to help protect plants from pests
 - High pressure water, covers, barriers, and hand-picking pests from plants



Source: Jackman, J. (n.d.) "Managing Insects and Mite Pests in Vegetable Gardens." Texas A&M AgriLife Extension. <https://agriflifeextension.tamu.edu/library/gardening/managing-insect-and-mite-pests-in-vegetable-gardens/>

Pest Management

Management/Control Practices Continued

- Chemical control (do not spray on windy days)
 - Toxic
 - Certain chemicals that are allowed in home gardens
 - Must follow directions on safety sheet and homeowner responsible for any consequences
 - Less toxic approaches
 - Such as oils or by-products from plants and animals like lemongrass oil or neem oil
 - Many general use products that are for a variety of pests
- Products for Pests (check labels for how, when, and if you can use it in a vegetable garden)
 - Snails & Slugs
 - Products containing metaldehyde
 - Grasshoppers and crickets:
 - Carbaryl, esfenvalerate, malathion, and azadirachtin
 - Soil pests such as millipedes, centipedes, cutworms, root maggots, mole crickets, earwigs, etc
 - Fallow period in garden
 - Some synergized pyrethrins and carbaryl can help
 - Preplant treatments can be done



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Plant Diseases

Many diseases are spread through water. When watering, try to keep the leaves as dry as possible and only water the root system. Moist conditions with cool temperatures are an extremely conducive environment for diseases. Spring and fall are prime times for disease.

4 TYPES OF DISEASES

Viruses

- Spread through insects (particularly sucking insects) and people.

Bacteria

- Spread through splashing water.

Nematodes

- Wormlike organisms in the soil that feed on roots which stunt the plant's growth.

Fungus

- Spores spread through wind, splashing water and equipment. Fungi love moist, mild conditions.

SIGNS OF DISEASE

- Wilting of leaves
- Root rot or knots
- Galls
- Leaf spots
- Leaf blight
- Fruit rot
- Cankers

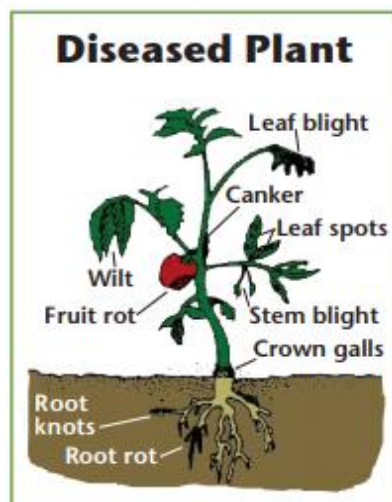


Figure 1. Possible disease symptoms on plants.

Source: Masabni, J. (n.d.) "Diseased Plant" [Infographic]. Texas A&M Agrilife Extension. <https://cdn-ext.agnet.tamu.edu/wp-content/uploads/2017/02/EHT-054-disease-control.pdf>

Plant Diseases

PREVENTION & CONTROL PRACTICES

- Fertilize and water plants properly
- Avoid splashing the leaves with water, and water in the morning to prevent damp conditions for too long.
- Plant disease-resistant varieties
- Rotate crops in garden each season, if possible
- Avoid overcrowding plants in beds
- For bacteria, fungi, and viruses spray copper and sulfur-containing products (organic)
- For nematodes, till the soil and dry it out or cover the soil with clear plastic for 6-8 weeks during the summer.

Resources

- <https://www.agrilifebookstore.org/Pocket-Guide-to-Vegetable-Diseases-p/ht-028.htm>
- <https://plantclinic.tamu.edu/forms/>
- <https://plantclinic.tamu.edu/factsheets/>
- <https://www.youtube.com/user/PlantDiseaseClinic>

What does a disease look like?



Stem blight



Leaf spot



Fungus (powdery mildew)

Mosaic Virus



Nematodes

Sources: Isakeit, T. (n.d.) Vegetable Resources [Photographs]. Texas A&M AgriLife Extension. <https://aggie-horticulture.tamu.edu/vegetable/watermelon/foiar-diseases/>
<https://aggie-horticulture.tamu.edu/vegetable/watermelon/root-vascular-diseases/>