Managing vegetable pests

An ounce of prevention is worth a pound of cure. This is certainly true in the vegetable garden! Knowing the potential insect and disease pests and using preventative measures is the first step in managing vegetable pests.

Insect pests

The vegetable garden has an ecology all its own. Many beneficial insects, such as pollinators, decomposers, and pest predators and parasites coexist with pest insects. Therefore, keep in mind that your efforts to control the pest insects may impact the beneficial insects as well.

To be most effective in your control methods, you should get to know the insects in your garden. Look at pictures so that you can visually identify the pests as well as the beneficials. Get to know which plants each insect likes, the time of year the insect is active, and the type of damage caused. Finally, get to know when control is really necessary: just because an insect pest is present doesn't mean it will impact your harvest.

When you're working in your garden, take a few minutes to walk around and look for possible problems such as wilted leaves or plants, holes in leaves, discoloration of plant tissue, insect eggs (often on underside of leaves), or the actual insect. If you catch the problem early, you'll have the most options for control.

Disease organisms

Disease causing organisms include fungi, bacteria, viruses, and nematodes. The vast majority of diseases are caused by fungi.

Plant disease organisms can attack vegetables from the time seed is put into the soil until the time the crop is harvested, and even in storage. Some diseases can destroy an entire crop while others just cause cosmetic damage.

Diagnosing plant diseases is not always easy. Look for symptoms expressed by the plant (e.g. change in colour, wilting, etc.) and signs of disease (e.g. mould, fungal fruiting bodies, bacterial slime). Also, think about how the problem developed. If identical symptoms develop on several different species of plants, it is unlikely that the problem is caused by a disease organism. If a single plant species is affected, it is more likely to be disease-related. Search reference books and on-line sources for descriptions and pictures to make your diagnosis.

Managing pest problems

Follow these practical guidelines and your pest problems will be much more manageable:

Begin with a good rotation. Move crops around in the garden to prevent the build-up of disease organisms and the overwintering of insect pests. Try not to plant the same crop or crop family in the same place in the garden any more than once every three years.

Use resistant or tolerant crop varieties which are most suited to the climatic conditions of your region.

Maintain a healthy, fertile, well-drained soil with good aeration. This permits rapid germination, good root penetration, and strong plant growth. Strong, healthy plants are better able to resist pest problems than plants weakened by stress.

Monitor soil fertility every three years with a soil test. Make yearly applications of plant nutrients as required for strong plant growth. Adjust the soil pH as required, and maintain a high level of organic matter. Use compost.

Avoid side by side planting of crops which are susceptible to the same pest problems. Interplant non-related crops to reduce pressures or use companion planting to help repel insect pests.

Plant a variety of companion flowering plants to provide pollen and nectar as an attractant for insects such as parasitic wasps and flies.

Encourage the presence of beneficial organisms. In addition to beneficial insects such as ladybird beetles and ground beetles, birds, frogs and toads, spiders, and even snakes can be helpful in controlling pests.

Delay planting to avoid early generations of some insect pests. This is effective in carrots and cole crops to avoid the early generation of root maggots.

Delay planting of crops sensitive to cool, wet soil conditions in order to avoid problems with poor germination, damping-off, seed or root rot, or early season insect problems (cutworms and seed corn maggots).

Use proper row and plant spacings to reduce competition for moisture and nutrients and to increase air circulation for disease control.

Use disease free seeds and healthy transplants.

Keep an eye on moisture levels throughout the growing season. An even soil moisture will encourage consistent growth and reduce plant stress, so water properly to reduce disease development. Keep out of the garden when foliage is wet, to avoid spreading disease organisms.

Control weeds in the garden to reduce competition for moisture and nutrients and to improve air circulation.

Practice good garden sanitation by removing diseased tissue from plants as it appears. To prevent overwintering of pests and diseases, remove infected crop residues in the fall.

When setting out transplants, place a cylinder made from cardboard or from a tin can, milk carton, or plastic container with the bottom cut out, around each plant. Sink the bottom rim into the soil 2 cm deep. Alternatively, place two or three toothpicks or finishing nails around plant stems. This will help protect transplants from cutworms chewing through the stalks. Also, sprinkling crushed egg shells or seashells around plants or around the garden perimeter helps to deter slugs.

Hand-pick larger, slower moving pests such as slugs or Colorado potato beetles. Dig around the base of young plants to find and eradicate cutworms.

Use traps to collect earwigs and slugs. (Shallow dishes of stale beer will attract slugs.) Collect earwigs in rolled-up newspaper or any form of tubing and dump them into a bucket of soapy or oily water. Place trap material in and around the garden at night and collect insects in the morning.

Some insects, such as aphids and mites, can be removed from plant surfaces with a strong spray of water from the garden hose.

Use pesticides only when necessary. Read labels thoroughly and know which insects and diseases you are targeting.

Mug shots

Several excellent books and on-line resources are available with photographs, full descriptions, and control options for common vegetable pests. Here is a preview of what you might encounter in your garden and your research.

INSECT PESTS

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CUTWORM: Cutworms are fleshy soft-bodied, night feeding caterpillars ranging in length from 4-6 cm. They are most troublesome early in the growing season. Cutworms 'cut off' seedlings and transplants at or just below the soil surface. Cutworms feed at night, and during the day they can usually be found just below the soil surface, curled up close to the base of the chewed plant stalk.

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ROOT MAGGOT: Maggots are the larvae of adult flies. They are whitish in colour, approximately 8 mm in length and legless, with one pointed (the feeding end) and one blunt end. Because most species have two to three generations per year, root maggots cause damage throughout the growing season. Adult flies are similar in appearance, but slightly smaller than, houseflies. Adults lay eggs at the soil surface beside the host crops, and emerging larvae burrow into roots.

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IMPORTED CABBAGEWORM/CABBAGE LOOPER/DIAMOND BACKED MOTH: All three pests are similar in appearance: green caterpillars with thin orange or white stripes along their sides. The adult cabbage worm is a creamy white butterfly, while adults of the cabbage looper and diamond-backed moth are night-flying moths. Caterpillars make holes in leaves and cabbage heads, deposit masses of green-brown droppings, and crawl into broccoli heads to feed. Damage occurs from May to October. Broccoli, cabbage, cauliflower, turnip, rutabaga, and Brussels sprouts may be affected.

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LEAF MINER: The adult fly lays eggs on the undersurface of a leaf. Tiny maggot-like larvae bore into the leaf, creating tunnels between the upper and lower layers. Leaf minor infestations can occur any time during the season but are most prevalent in the spring. Damage is mostly a problem on edible leaves such as spinach, chard, and beets.

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APHID: Aphids are small, soft-bodied, pear-shaped insects often found in large clusters on the stems and leaves of plants. They can be green, red, pink, brown, gray, or black; winged or wingless. Aphids cause injury by sucking sap, and heavy feeding will cause stunting and deformation of buds, flowers, and new shoots as well as curling, puckering, yellowing, and withering of leaves. Aphids can transmit plant viral diseases while feeding, and nearly all vegetable crops are susceptible to injury from aphids.

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COLORADO POTATO BEETLE: Adult beetles are hard-shelled, about 12 mm long, with yellow and black stripes. They emerge from the soil in late spring and deposit bright orange egg clusters on the underside of leaves. Larvae are hump- backed and brick-red, with two rows of black spots on each side. Larvae begin to feed as soon as they hatch and are the most destructive stage of this pest. Although potatoes are the favorite food, they will also attack tomatoes and eggplants.

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FLEA BEETLE: Flea beetles are small, shiny beetles about the size of a pin-head. They can be seen jumping around affected plants like fleas. Flea beetles chew small, circular holes in leaves and can destroy much of the leaf surface. Damage occurs in early spring and mid-summer on potatoes, tomatoes, peppers, eggplant, cole crops, radish, turnip, and rutabaga.

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CORN EARWORM/EUROPEAN CORN BORER: Both pests are the larval stage of night flying moths. Larvae of corn earworm can be green, pink, brown, or black; larvae of the European corn borer have a black head and pale body. Earworm larvae enter the cob through the silk so most damage is at the tip of the ear. Borer larvae can enter the cob at any point so damage is more random.

CUCUMBER BEETLE: Adult beetles are yellowish-green with dark stripes. They feed on stems and leaves of young cucurbit crops including cucumber, squash, melon, and pumpkin. Adults lay eggs in the soil at the base of the cucurbit plants and hatching grubs feed on roots and below-ground stems, causing plants to wilt or become stunted. Cucumber beetles can also carry diseases (mosaic and bacterial wilt).

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WIREWORM: Wireworms are shiny, segmented, hard-bodied, yellowish-brown worms, 2-4 cm in length. They are the larval stage of the click beetle. Hatched worms will feed for 2-6 years before maturing. They feed on underground plant parts and seeds of carrots, corn, turnip, beets, beans, peas, lettuce, and potatoes. Affected seeds can be destroyed. Affected plants are stunted and slow growing while root crops exhibit holes and tunnels in the sides of roots or tubers.

DISEASES

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EARLY BLIGHT: Early blight affects tomatoes and potatoes in Atlantic Canada. It is somewhat misnamed as it can appear any time and is often found in mid-August. Small circular or oval brown to black spots appear first on older leaves. The spots gradually enlarge and concentric rings can often be seen in the large lesions. Defoliation may also occur. Damage on tomato fruit appears as large, sunken areas, particularly at the stem end or on growth cracks.

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LATE BLIGHT: Late blight affects potatoes and tomatoes in Atlantic Canada. Symptoms appear first as brown-black, water-soaked blotches on leaves. It can spread rapidly, causing complete defoliation. Infection on tomato fruit appears as rough, greasy, greenish-brown patches.

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ANTHRACNOSE: Anthracnose can be a problem on a number of crops, with beans and tomatoes being the most severely affected. On beans, the disease appears as sunken lesions on the pods and stems. During periods of moist weather, the lesions are covered with a salmon-coloured ooze. On tomatoes, sunken, circular spots develop on the fruit; spots expand as the disease progresses.

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WHITE MOLD/GRAY MOLD: These diseases can affect a number of crops and are most serious under moist conditions. White mold appears first as soft, watery spots. As the disease progresses, a white, fuzzy growth develops on the infected tissue. Gray mold has similar symptoms except that a gray-brown growth develops on the infected tissue.

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POWDERY MILDEW: This foliar disease is most serious on cucumbers, squash, pumpkins, melons, and peas. Symptoms develop as a white, talcum-like powdery growth on the upper surface of the leaf. Affected leaves wither, turn colour, become brittle, and die.

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DOWNY MILDEW: This foliar disease affects vine crops, cole crops, turnips, rutabagas, and onions. Symptoms appear first as pale green to yellow angular spots on the upper surface of the leaf. As the disease progresses, spots enlarge, become more yellow, and dry up. In moist conditions, a downy white to pale purple growth appears on the underside of the leaf.

Activity

Insect search.

Review the insect mugshots above and have a look at some books and on-line resources that have photographs and descriptions of common insect pests. Then take a walk around your garden and dig in the soil around some plants to see what types of insects you can find. You'll need: a clipboard (for notes/descriptions); an insect net (optional); a few jars (for capturing insects); and a digital camera. See how many insects you can identify. Remember, not all insects are pests. It's a good idea to get to know the beneficial insects as well!