



Earwig

WHAT'S EATING MY PLANT?!

Insects have been around about 400 million years and know a thing or two about feasting on your vegetable plants.

Bonnie Bunn

Chewing damage is perhaps the most widely recognized type of insect injury to plants.

Insects with mouthparts consisting of two opposing mandibles, or jaws, cause chewing damage. Spring and early summer are prime times for major damage to vegetables, especially seedlings.

Chewing damage can take many forms. Foliage or flowers may simply disappear as they are completely

consumed. Other times, a plant may look ragged and, upon inspection, have chewed edges or centers. Sometimes plants are cut at the base and fall over, and sometimes only the upper or lower surfaces of a plant are eaten, leaving a brown, scorched appearance or openings between the veins, called skeletonization.

Chewing damage inside a plant is usually referred to as mining or boring.

Many of the insect orders have chewing mouthparts, including

beetles (Coleoptera), caterpillars (Lepidoptera), grasshoppers (Orthoptera), and termites (Isoptera).

Some of the more common insects in Wyoming that cause problems in vegetable gardens include beetles (Colorado potato beetle, cucumber beetle, flea beetles, Mexican bean beetle), caterpillars (armyworm and cutworm, corn earworm, cabbage looper, imported cabbage worm, tomato hornworm), earwigs, grasshoppers, leafminers, and slugs.



Beetles consume leaf tissue between leaf veins, causing a lacy or skeletonized type of injury, such as on this bean leaf.



Caterpillar damage on a broccoli leaf.



Earwig feeding damage on cabbage.

Beetles

Beetle damage varies with species, size, and growth stage. **Mexican bean beetle** (*Epilachna varivestis*) larvae feed on the underside of bean leaves producing a lacy appearance, also known as skeletonizing, while the adults chew holes in leaves. **Adult flea beetles** also chew holes in leaves, causing characteristic “shothole” injury (many small holes or pits in leaves). See photo lower right. The adults of the **Colorado potato beetle** (*Leptinotarsa decemlineata*), however, leave notching wounds along leaf margins.

Caterpillars

Caterpillars, such as the **cabbage looper** (*Trichoplusia ni*) and the **imported cabbageworm** (*Pieris rapae*) cause holes in leaves and may occasionally cause serious defoliation when feeding. Initial feeding is concentrated on outer leaves, but as the caterpillars mature, their feeding tends to intensify and moves into the heads of plants such as cabbage and broccoli, creating tunnels. Other caterpillars such as **cutworms**, in addition to feeding on foliage, chew buds, shoots, and may cut seedlings close to the ground. Caterpillars of **corn earworm** (*Helicoverpa zea*) tunnel into various fruiting vegetables in addition to chewing on leaves.

Earwigs

The diverse diet of earwigs includes primitive plants (mosses, lichens, and algae), vascular plants, fungal spores, small invertebrate animals, and decaying organic matter. As opportunistic predators, they provide a benefit by preying upon plant pests such as aphids, scales, caterpillars, maggots, and mites. In contrast, their herbivorous (plant eating) behavior makes them a common pest in agricultural crops, home gardens, and landscapes. Earwigs feed on the buds, flowers, fruits, and leaves causing direct plant damage, reduced crop yields, and aesthetic injury to a broad range of agricultural plants including vegetable fruits, leafy vegetables, and herbs. Earwigs often require intervention to reduce plant damage.

Grasshoppers

Grasshoppers use their chewing mouthparts to tear away plant tissue. In addition to leaves, they also feed on many aboveground plant parts such as flowers, fruits, seed heads, and stems. The most damaging grasshopper species have broad habitat preferences and host plant ranges. These species are capable of building up over several years to high numbers in local areas and migrating considerable distances as vegetation is consumed.

Leafminers

These insects tunnel between the upper and lower leaf surfaces, feeding on the soft inner tissue and avoiding the tough epidermis. They are often classified by the pattern of the mine they create. When larvae are mature, they cut the leaf surface, drop to the soil, and pupate. The two most commonly found leafmining insects that cause problems in gardens include the **spinach leafminer** (*Pegomya hyoscyami*) and the **vegetable leafminer** (*Liriomyza sativae*).

Slugs

These pests are not insects but mollusks that are more closely related to shellfish, such as mussels and clams. Slugs are active at night or on dark, cloudy days. They seek relief from the sun and heat in shade under plants, rocks, wood, or compost piles. They need moisture to thrive but survive in reasonably dry conditions by hiding in protected areas.

Slugs feed on a wide variety of living plants, on fungi, and decaying plant materials. They are particularly damaging to new seedlings and maturing vegetables or fruits that touch the soil. They chew irregular holes that have smooth edges in leaves. They eat flowers and clip off small plants and plant parts. They damage



Symptoms of grasshopper feeding include irregularly shaped holes on the edges or within the foliage.



Leafminer larvae hatch from small, oval eggs and begin feeding inside leaf tissue leaving mines.



“Shothole” damage on this eggplant leaf caused by flea beetles.

strawberries, tomatoes, basil, lettuce, beans, cabbage, and many other vegetables.

Management

Plan ahead: Having a knowledge of pest biology and behavior as well as the host plant will aid in planning what, when, and how to manage pests in a garden. This knowledge will allow use of preventative strategies where possible. Examples of preventative strategies include adjusting your planting schedule. Planting early and/or late crops can help avoid the major activity period of insects

Pesky insect pest control

These resources arm homeowners and agriculturalists with photographs, websites, and control methods.

Book – *Garden Insects of North America: The Ultimate Guide to Backyard Bugs*. W.S. Cranshaw

For websites, books, apps

- Utah State University Extension newsletter – bit.ly/utahnews

Information about insect pests in garden, on farm, in home

- University of Wyoming College of Agriculture and Natural Resources – bit.ly/uwentomology

when plants are young or more vulnerable to feeding damage. Rotating crops from year to year will decrease soil-dwelling insect populations and diseases from accumulating. Promote healthy plants (provide the needed nutrients, fertilizer, water, etc.). They will be less susceptible to insect injury.

Other preventative strategies include selecting plant varieties best adapted to an area, using resistant varieties when available, using certified seed, using row covers, and planting a diversity of crops. Fall tillage will help decrease overwintering sites for many insects that dwell in the soil or under plant debris.

Monitor for pests: Search for insect pests and diseases regularly. Monitoring helps identify and target susceptible life stages and assists in timing control measures. When, where, and how you monitor for pests varies with the different plant and insect species in which you are interested. In general, you'll want to scout for pests and diseases about once per week in the spring and every two weeks in the fall. Check areas along borders and interiors. Examine the overall plant health, check leaves and fruits for spots, and evidence of chewing, discoloration, rot, etc. Also take note of the pattern of plant decline or injury; insect injury tends to be aggregated or patchy. Consider that the injury could be associated with another problem such as irrigation, herbicide spraying, or weather damage. Monitoring helps identify when the threshold for treatment has been reached and action needs to be taken. The threshold for starting



Row covers can protect young plants from many kinds of insects. They are typically used to exclude insects from feeding or laying eggs on leaves.

control measures will vary with plant species and maturity, the insect species and developmental stage, as well as the location and climate.

Row covers: Row covers exclude insects from feeding and/or laying eggs and are often used when plants are young and vulnerable.

Traps/baits: Traps for earwigs (tuna fish can with bacon grease, rolled cardboard as a refuge trap) and baits for grasshoppers (wheat bran plus carbaryl, Corry's Bug Bait, and Sevin 5 Bait) or *Nosema locustae* (a microscopic fungi, NOLO Bait Biological or Planet Natural Semaspore Bait) can help decrease their populations.

Enhance biodiversity: Plant a variety of plants so there is spatial and temporal diversity. Beneficial insects often need a source of nectar or pollen to complete their lifecycle throughout the season. A diversity of plants will make the garden more attractive to these beneficial insects, which will provide biological control for many pest insects.

Insect pests may only gaze longingly from afar at plants in Bonnie Bunn's garden; putting mandible to plant may bring swift retribution. She is the vegetable integrated pest management associate at Utah State University and can be reached at bonnie.bunn@usu.edu.

Trade or brand names used in this publication are used only for the purpose of educational information. The information given herein is supplied with the understanding that no discrimination is intended, and no endorsement information of products by the University of Wyoming Extension is implied. Nor does it imply approval of products to the exclusion of others, which may also be suitable.