Common Garden Pests

Army Cutworm

By Whitney Cranshaw, specialist in entomology, Colorado State University Cooperative Extension

One of the few garden insects that get a "jump-start" on the season are Cutworms. The immature (caterpillar) stage of various moths, cutworms have a voracious appetite for emergent plants in spring. Several different species occur in our region, each with somewhat different habits, but the army cutworm is far and away the most important cutworm of the Rocky Mountain region.

A dull gray or gray-brown caterpillar, army cutworms begin the New Year less than ¼ inch long, semidormant, commonly in lawns or amongst the debris of the previous garden. As spring temperatures warm they renew activity and feed on a wide variety of plants, somewhat preferring broadleaves over the grasses. Army cutworms are active at night and often will cut plants near the soil line, dragging unfinished plants into the soil cracks and other protected sites where they spend the day. Late April and early May is typically the time when cutworm damage peaks.

After it has finished feeding on plants, the army cutworm undergoes a radical transition, pupating in the soil and emerging as the adult moth. This adult form has a common name all-too-familiar to many that live east of the Rocky Mountains--the Miller Moth. An insect of unusual habit, the moths try to tough it out during the summer, alternately seeking sources of energy-rich nectar and cool, humid areas to conserve their energy. This behavior causes miller moths to incrementally migrate upward in altitude, ultimately over-summering in the mountains. The army cutworm does not reproduce throughout the summer, but survivors make a reverse migration in late August and September to lay eggs throughout lower elevations.

Army cutworm prefers to lay eggs in dense vegetation. A lush garden full of weeds can be a particularly favored spot for the moths to lay their eggs. By keeping gardens relatively free of weeds late in the season, serious cutworm problems can usually be avoided. Also, rototilling and some other types of early spring tillage can kill many of the young cutworms.

As plants become established watch out for early sign of cutworm activity, as indicated by cut plants. Individual valuable seedling can be protected with collars that will deter the night-foraging cutworms. All manner of materials may be used for this purpose, such as tops of plastic jugs, aluminum foil, and even cardboard pushed down into the soil around new plants. Some gardeners choose to get through cutworm season just by overseeding, letting the insects do some of their thinning for them.

Cabbage and Turnip Aphids

By Carl Wilson, horticulture agent, Colorado State University Cooperative Extension, Denver

Cabbage and turnip aphids feed on members of the cabbage family, including broccoli and kale. They often spend the winter as eggs on wild or cultivated cabbage and mustard family plants.

Pull and destroy mustard family weeds near your garden this spring. If winged forms do fly in and find your plants, allow natural insect predators and parasites to feed on them. As with any aphid, try to wash them off with a stream of water. Several insecticides available at garden centers also can be useful in combination with these other measures.

To control, dust with flour as this constipates the aphid. You can also use neem oil and insecticidal soaps. Aphids are repelled by catnip; mustard or nasturtiums attract aphids so use them as sacrificial plants.

Cabbage Worms

The imported cabbageworm (above), a fuzzy green caterpillar that transforms to the familiar white cabbage butterfly (left), may be the most frequent visitor to members of the cruciferous vegetable family. But eggs and larvae of the cabbage looper, diamondback moth and zebra caterpillar also can be

Before you get too upset about the occasional hole in a leaf, remember that these plants can tolerate a lot of leaf loss without affecting yield or maturity. Only during seedling establishment or early head formation are these plants particularly sensitive to these injuries.

Bacillus thuringiensis, a biological pesticide, controls cabbage family pests. Sevin also is effective. And, the few pests that remain on the vegetables can be washed out after harvest using water and a small amount of detergent or other surfactant.

Flea Beetles

By Whitney Cranshaw, Colorado State University Cooperative Extension, Entomology

One of the earliest garden visitors are flea beetles. Aptly named, they are among the smallest of beetles and readily jump, flea-like, when disturbed. As a result, the insects sometimes elude the gardener but the damage they cause to plants is distinctive. Flea beetles chew small pits into leaves, giving plants the appearance that they may have been blasted with fine shot. Such "shothole" feeding is most common on cabbage family plants due to the most notorious of the Colorado flea beetle bunch, the western cabbage flea beetle. However, other flea beetles are common on tomatoes, potatoes, eggplant, horseradish, and beans.

Flea beetles are most damaging to plants that are in seedling stages or struggling to become established after transplanting. In extreme cases plants may be so badly chewed that they are killed or greatly retarded.

However, established plants that are actively putting on new growth are little affected by flea beetles, fully compensating for the injury they produce. Thus the key to avoiding problems can be to provide cultural conditions that allow for vigorous plant growth and rapid establishment in the garden. Seeded crops that chronically are badly damaged, such as broccoli, can usually outgrow flea beetle wounding when grown as transplants.

Trap cropping can sometimes be used to allow seedling crops to get over the hump and past the point where flea beetles can seriously affect the crop. For example, radish and daikon are extremely favored by the cabbage flea beetle. Yet these fast growing plants are vigorous enough to well tolerate the insect - although there may be many holes in the leaves. By planting these near a more susceptible crop, such as seedling mustard or broccoli, a large number of the flea beetles will be diverted to the radish, relieving the main crops.

Flea beetle control with insecticides often produces disappointing results as these insects are very migratory and new ones are continuously visiting the garden. Sevin and permethrin are the best treatments, but can provide control only for a few days. Gardeners may also try repellents. Diatomaceous earth, horticultural oils and some neem-based insecticides have proved to be the most effective repellents in CSU trials.

Squashbugs

By Whitney Cranshaw, Colorado State University Cooperative Extension, Entomology

Squash bugs are the most important insect pest of squash in much of the state. Damage is caused by the feeding of the insects which use their piercing mouthparts to lacerate and destroy pockets of plant tissue. As infestations progress, large areas of the plant become girdled and wilt. Feeding on the fruit also occurs and the sunken

wounds are ready entry courts for rots. Although hard "winter type" squashes (including pumpkins) are particularly susceptible, zucchini and other summer squashes are also damaged.

The adult squash bugs (left) are strong fliers and migrate to fields and gardens in early summer. Squash bug eggs (right) are shiny brown and elliptical, attached in groups to the underside of leaves.

Squash bugs are among the more difficult insects to control. This is in part due to the difficulties of spraying large plants such as squash. But squash bugs are also inherently resistant to most insecticides. Sevin is the standard insecticide for control in gardens.

An optimal timing for managing squash bugs involves early season control. A spray applied when the first eggs are observed and again 10-14 days later should provide good season-long control. This approach has the further advantage of having to treat fairly small plants so coverage should be good and to avoid insecticide use after flowering or near harvest.

However, it may be possible to further restrict the amount of insecticide needed by targeting the applications to the base of the plant. During the day, squash bugs usually seek shady cover and aggregate around the base of the plant. In addition, a few applications of diatomaceous earth around the plant base were also effective, providing an "organic" alternative.

Management around the base of the plant seems to be very important in other respects. When mulch is provided, an additional source of cover, squash bug injury increases. Therefore, it appears that a better approach is to try to open up the area of the plant base through plant training to reduce its suitability to squash bugs.

The Tomato Hornworms

By Judy Sedbrook, Colorado Master Gardener^{SM}, Colorado State University Cooperative Extension, Denver County

Tomato/tobacco hornworms are the largest caterpillars found in this area and can measure up to 4 inches in length. The prominent "horn" on the rear of both gives them their name.

The size of these garden pests allow them to quickly defoliate tomatoes, potatoes, eggplants, and peppers. Occasionally, they may also feed on green fruit. Gardeners are likely to spot the large areas of damage at the top of a plant before they see the culprit. Hornworms are often difficult to see because of their protective coloring. Not much for the heat of direct sunlight, they tend to feed on the interior of the plant during the day and are more easily spotted when they move to the outside of the plant at dawn and dusk

The tobacco hornworm larva (*Manduca sexta)* is generally green with seven diagonal white lines on the sides and a curved red horn (above). The tomato hornworms (*Manduca quinquemaculata)* have eight V-shaped marks on each side and their horn is straighter and blue-black in color (below). These "hornworms" are the larvae of hawk or sphinx moths, also known as hummingbird moths. The tobacco hornworm is the most commonly seen of the two, but both can be found in this region and may even be present on the same plant.

The presence of the hornworm may also be noticed because of the large, black droppings (frass) that accumulate on the ground beneath the affected plants.

Hornworm damage usually begins to occur in midsummer and continues throughout the remainder of the growing season.

CONTROL:

- **Handpicking**. The large size of hornworms makes it easy to get hold of them. Once removed from the plant, they can be destroyed by snipping them in half with shears or dropping them into a bucket of water.
- **Rototilling**. Turning up the soil after harvest will destroy any pupae that may be there.
- **Biological**. Bacillus thuringensis, or BT (e.g., Dipel, Thuricide), is also considered very effective, especially on smaller larvae. Spray it as a precaution. Natural enemies, such as the parasitic wasp that

lays its eggs on the hornworm's back, are common. If found, such worms should be left in the garden so the emerging wasps can parasitize other hornworms.

- **Insecticides**. Hornworms can be controlled with carbaryl, permethrin, spinosad insecticides. Read the label carefully before using any insecticide.

Parsleyworm

By Whitney Cranshaw, Colorado State University Cooperative Extension specialist, entomology

The parsleyworm is one of the most striking insects in the garden. These bright-colored caterpillars have a fancy for parsley, dill and the occasional carrot. When disturbed, they project a pair of fleshy, smelly "horns," designed to scare away predators.

Parsleyworms are fairly easy to control, if you want to do that. They are conspicuous and are easily hand-picked. The caterpillars also are susceptible to insecticides, such as Sevin or Bacillus thuringiensis, and are naturally attacked by parasites.

You should, however, consider leaving this insect pest alone -- or even encouraging it. These caterpillars transform into the black swallowtail butterfly, a large, attractive insect that will visit flowers and suck nectar. The possibility of enjoying a few more black swallowtails in the yard often makes it worthwhile to plant a little extra parsley or dill to feed the caterpillars.

Mexican Bean Beetle

Adults are oval, yellow-brown, 1/4-inch beetles with 16 black spots on wing covers, while larvae are fat, dark yellow grubs with long, branched spines. They are found on cowpeas, lima beans, snap beans, soybeans.

Adults and larvae chew on leaves from beneath, leaving behind a lacy appearance. To control: Plant bush beans early, hand pick, spray with insecticidal soap or neem oil

CSU Online Yard and Garden Publications:

http://www.cmg.colostate.edu/pubs.html
Aphids:
http://extension.colostate.edu/topic-areas/insects/aphids-on-shade-trees-and-ornamentals-5-511/
Flea Beetles:
http://extension.colostate.edu/topic-areas/insects/flea-beetles-5-592/
Squash Bugs
http://extension.colostate.edu/topic-areas/insects/squash-bug-management-in-home-gardens-5-609/
Spider Mites:
http://extension.colostate.edu/topic-areas/insects/spider-mites-5-507/
Thrips:
http://www.colostate.edu/Dept/CoopExt/4dmg/Pests/thrips.htm
European Earwigs:
http://extension.colostate.edu/topic-areas/insects/european-earwigs-5-533/
Spittlebugs:
http://extension.illinois.edu/focus/index.cfm?problem=spittlebugs
Beneficial Insets and Other Arthropods:
http://extension.colostate.edu/topic-areas/insects/beneficial-insects-and-other-arthropods-5-550/
Lady Beetles:
http://extension.colostate.edu/topic-areas/insects/lady-beetles-5-594/

ARMY CUT WORM

APHIDS

CABBAGE WORM

MEXICAN BEAN BEETLE

FLEA BEETLE

TOMATO HORNWORM

PARSLEY WORM

Integrated Pest Management

Integrated pest management (IPM), encourages regular monitoring of insect populations to determine when and if treatments are necessary to minimize unacceptable levels of damage. It employs the use of physical barriers, companion planting and cultural techniques, in addition to least toxic controls to maintain a proper balance between pest and predator insect. In IPM, total eradication of pest populations is not sought, since it would upset the ecological balance. The individual needs to determine how much pest-related damage can be tolerated (the injury or damage level) without harming the health of plants or people. Following this, the pest population must be studied to assess how rapidly it will increase to produce that level of damage. The final step involves development of a treatment strategy that will keep the pest population small enough so that it does not cause an unacceptable level of damage.

Companion Planting

As part of a well managed IPM system, strategies employing intercropping and companion planting are utilized to increase crop diversity. In this system, many different herbs, flowers and even weedy groundcovers are used to deter pest insects and attract beneficial predators. Insects locate their preferred food by means of sight, smell and taste. They use sensitive receptors on their feet and mouthparts to find a certain crop from a great distance (e.g. the white cabbage butterfly can recognize the mustard oils of the broccoli family from a distance of ten miles).

Plants produce substances that either attract or repel insects. These include:

- *Attractants*: Some examples include mustard oils of the brassica family, that attract cabbage butterflies, apple skins attract codling moths and onions produce sulfur and attract the onion maggot.
- *Stimulants*: These substances encourage feeding and/or egg laying behavior. Bitter chemicals in cucumber and melon skins stimulate feeding by the cucumber beetle.
- *Deterrents*: These substances inhibit feeding or egg laying. Mustard oils sicken spider mites and Mexican bean beetles.
- *Repellants*: These substances force insects to move away from a plant. Citronella and catnip sprays repel many insects.

Beneficial Insects to Attract

Ground beetles and lady beetles:

- Attracted by clovers, tansy and yarrow for egg-laying material; eat aphids, slugs and many soft-bodied pests.

Hover or syrphid flies (also known as flower flies):

- Flat, open flowers such as marigolds or daisies provide areas for egg laying. Larvae control aphids.

Tachinid flies:

- White clover and members of the carrot family (e.g. carrots, parsley, lovage, queen anne's lace and cilantro) provide sites for egg laying. Adults are parasites of Mexican bean beetles.

Lacewings:

- Increase in numbers when provided with nearby evergreens for shelter. Adults and larvae are fierce predators of soft-bodied pests.

Flowers and Nectar and Pollen for Adult Beneficial Insects

The compositae family is attractive to most beneficial insects and includes daisies, goldenrods, black-eyed susans, coreopsis, asters, bachelor buttons and lettuces that have bolted (sent up a seed stalk). Other flowers and herbs that attract beneficial insects include bee balm, yarrow, the carrot family, mints, hyssop and salvia.

Legumes, such as peas or beans, are used as companions to increase nitrogen levels in the soil. White clover can be used in-between corn rows, as well as peanuts. Vetch can be used as nitrogen providing mulch around fruit trees.

Beans:	Plant rosemary, marigolds and nasturtiums to repel Mexican bean beetles.
Tomatoes:	Good planted with basil (a possible fly repellant) and asparagus.
Broccoli family:	Try with dill, mint, sage, onions and southernwood to repel cabbage butterflies.
Chamomile:	Good hosts for hover flies and wasps.
Cucumbers:	Plant with marigolds and onions.
Peas:	Plant with shade lovers such as spinach and lettuce.
Carrots:	Plant with peas, leeks and onions.
Garlic sprays:	Combine with hot peppers and onions (blenderized) for aphid control.
Catnip sprays:	Try this for control of aphids and flea beetles.
Copper strips:	To repel slugs. Also, try fermented yeast traps to attract and down them. Non-alcoholic Kingsbury Malt beverage was the brew of choice (or non-choice) that provided good slug control. Pull mulch away from transplants if weather is rainy and slugs are congregating there.

Specific Organic Remedies (Insects and Diseases)

Pest/Disease	***Crop***	***Remedy***
Aphids	All crops	Wash off with strong spray of water, insecticidal soap.
Corn Earworm	Corn	Use few drops of mineral oil in the tips of baby corn ears or dust with Diatomaceous earth.
Cut Worms	All young transplants	Protect stems with a 'collar' made of toilet paper cores. Utilize Diatomaceous earth on the soil around transplants.
Earwigs	All crops	Shallow containers of beer as traps.
Flea Beetles	All young transplants	Garden row-covers, such as Reemay, Safer Insecticidal Soap, Neem oil, Diatomaceous earth, beneficial nematodes (use the last product for juvenile forms of flea beetles that live in the soil), available as Scanmask from Planet Natural
Mexican Bean Beetle	Beans (all types except soybeans)	For adult beetles: Pyganic, an organic botanical product derived from chrysanthemums. For larvae: Neem oil. Both products are available at Arbico Organics
White Cabbage Butterfly (Cabbage Worm)	Crucifer family: Broccoli, cabbage, cauliflower, turnips, Brussels sprouts, Chinese cabbage, kale	Brush off eggs that are mainly laid on the underside of leaves and also brush off the larval caterpillar form of the pest. Bacillis thuringiensis kurstaki (sold as: Thuricide or Dipel), which must be ingested by the caterpillars, so it is important to spray on the underneath leaf surfaces. Neem oil (available locally) can be used as a foliar spray.
White Grubs	All transplants and seeded crops	Eat germinating seeds and young roots. Use 'Scanmask' from Planet Natural.
Blights (spots, brown, yellowing leaves)	Mostly tomatoes	Pick off yellowing leaves, water at the roots. Use Serenade, available at Planet Natural.
Powdery Mildew	Summer and winter squash, cucumbers, pumpkins and melons	Water plants at the roots and discard severely infected leaves. Spray leaves with a solution of: 1 Tbsp. baking soda, 2 drops dishwashing liquid or Safers Insecticidal Soap, 1 Tbsp. horticultural oil such as 'Sunspray R', mixed in 1 gallon of water.

Sources: Carr, Anne. *Rodale's Color Handbook of Garden Insects.* Rodale, 1979.
Cranshaw, Whitney. *Garden Insects of North America: The Ultimate Guide to Backyard Bugs.* Princeton, NJ: Princeton University Press, 2004.
Cunningham, Sally Jean. *Great Garden Companions: A Companion-Planting System for a Beautiful, Chemical-Free Vegetable Garden*. Rodale, 2000.
Riotte, Louise. *Carrots Love Tomatoes: Secrets of Companion Planting for Successful Gardening.* 2nd Ed. Storey Publishing, 1998.

COMMON GARDEN WEEDS

Lambs Quarters

Related to spinach (in the goosefoot family), lambs quarters is an edible weed very common in Colorado. It will usually pop up in the very early spring and many gardeners harvest and eat their lambs quarters like spinach (great sautéed or in salads)! If you don't pull it out early, lambs quarters can grow tall enough to take over parts of your garden, shading out your veggies. So even if you harvest and eat your lambs quarters, pull out the whole plant once you're done harvesting so it does not take over your garden! Best managed by hand weeding or hoeing. Make sure to pull it out before it gets too big or its strong roots will pull out other plants along with it.

Bindweed

The dreaded bindweed! This is a very common, vining weed that has small white, morning glory flowers. It can be difficult to kill because it spreads by both seed and root. If you pull out bindweed and leave a small piece of root in the ground, that root will re-sprout to grow a new plant. However, the best way to get rid of bindweed is indeed to just keep pulling it up! Think of it as a "war of attrition" – starving the bindweed of energy over time. Pull bindweed whenever you see it in your garden and you should be able to eradicate most of it over time. If you have a particularly bad bindweed problem, you can also consider landscape fabric below and/or around your bed to limit its growth. Bindweed is technically edible (but not very enjoyable).

Purslane

Another edible weed, purslane is actually higher in omega-3 fatty acids than any other known leafy plant. It is a succulent plant with a lemony flavor. Many people *love* purslane from the garden, in salads or very lightly cooked. That said, don't let your purslane grow long enough to go to seed (unless you want a garden FULL of purslane). One purslane plant can produce over 200,000 seeds! And those seeds can continue to germinate for years into the future. Purslane grows prostrate on the ground from one main taproot and is best managed by hand weeding.

Curly Dock

A member of the buckwheat family, curly dock is a very common weed in Colorado and is also edible, although less commonly harvested for food. Dock has broad leaves, a bushy habit, and can get very tall if left to grow. With a deep and strong taproot, it can be hard to get the entire plant out by hand weeding and will regrow from roots left in the ground. The best way to kill dock is to use a shovel to dig up the entire plant (with as much of the taproot as possible). However, if pulling out dock risks ripping out your veggies along with the dock, its best to continue to cut the dock back below the soil surface throughout the season to stay on top of it. At the end of the season, dig the dock when the garden is empty.

Kochia

Kochia is a member of the goosefoot family (along with lambs quarters, spinach, beets, and chard). Non-native to the U.S., kochia is now found in all western states, except Alaska. It has grey-green leaves and can grow to be 5' or taller if not controlled. When small, kochia can often have a slight purple color on the underside of its leaves. Luckily, kochia has a shallow taproot and is very easily pulled if you catch it early. Once you get to know what young kochia looks like, it is unmistakable and so you can watch for it during early germination in your raised bed.

Canada Thistle

Many different varieties of thistle grow in CO, but the one we find frequently in UFCO raised beds is the Canada thistle. Also known as "Creeping thistle", it can generate growth from vegetative buds on its root system and so it spreads easily and quickly. Wear gloves to pull Canada thistle, because its leaves are covered with spines! The best way to rid your garden of Canada thistle (or other thistle varieties) is to aggressively pull or dig out thistle when you see it, being sure to get as much of the root as possible. You'll quickly notice that Canada thistle roots can often spread horizontally across an entire bed from just one or two plants, so you may have to wait to pull all the roots in the off season when you won't disturb your veggies.

Dandelion

Most of you likely already know what dandelion looks like! There are many different varieties of dandelion and they are all edible, from flower to leaves to roots. Most commonly, people eat their bitter leaves in fresh salads or juices. Dandelion is a perennial plant of the Aster family. It has broad green leaves, a low growth habit, and yellow flowers that form fluffy seed heads that travel by wind when released. Like dock, dandelion has deep tap roots and thus, can be difficult to get rid of in your garden. If you leave any of the root in the ground, dandelion can re-grow. Dandelion is best pulled out by using a trowel or small shovel to dig as much of the root out as possible.

Common Mallow

Leaves are slightly wavy with serrated edges and have a long leaf stem. Leaves and stems are covered with short hairs. Growth habit is low and spreading. Thick short tap root. Has white or pink flowers with five petals.

Puncturevine

Also called Goathead, Bullhead, Sandbur, it is a broadleaf weed with yellow flowers. Low growing spreading weed with fern like leaves and an extensive root system. Flowers have five petals, seed pods have five segments, each with two spines that are sharp enough to penetrate shoes or tires. Will tolerate heat and compacted soils.

Cheat Grass

Branched base with stems usually displaying red coloration. Blades are flat, and both leaves and sheaths are covered with soft hairs. Seed heads are open and drooping. Grows rapidly from seed, maturing in two months. Can grow up to two feet tall.

CSU Master Gardener Resources

Weeds http://cmg.colostate.edu/pubs/Weeds.html

Weed Management http://cmg.colostate.edu/Gardennotes/351.pdf

Weed Descriptions http://cmg.colostate.edu/Gardennotes/352.pdf

On Line Garden Publications http://cmg.colostate.edu/pubs.shtml

Colorado Noxious Weeds https://www.colorado.gov/pacific/agconservation/noxious-weed-species#a

Apps Colorado Noxoius Weeds Weed ID


LAMBS QUARTERS


BINDWEED


PURSLANE


CURLY DOCK


KOCHIA


CANADA THISTLE


DANDELION

COMMON MALLOW

PUNCTUREVINE


CHEAT GRASS