Insect Pests
Kentucky GROW

Go to Table of Contents

The goals of this module are:

To be able to identify and control most common insect pests found in residential landscapes.

What you need:

- Guidebooks (see "Where to go from here" section) or "The program" section of this module to assist in identifying insects
- 10 x hand lens

Time needed:

A large flower or vegetable garden usually has enough insect pests to keep participants busy for an hour or more.

How to prepare:

The best way to present this module is to walk through a diverse planting (with flowers, vegetables, trees, and shrubs) and identify the insects found there. Almost all of the insects listed below are seen only in certain seasons, but this also means this program can be presented in any season but winter (of course, you could even find egg cases and cocoons in the winter if you are so inclined). If entomology is not your strong point, ask someone from a local university or the extension office to lead the walk. He or she would also be able to identify beneficial insects.

Be sure to find out at the start of the program the abilities of the participants so that the insects can be presented in such a way that all participants can learn. Be especially aware of biting or stinging insects, and have a first-aid kit on hand.

The program:

Japanese Beetle

What they look like: Metallic-green to bronze-winged beetles, up to ½ inch long, appear in mid-summer. Larvae are white c-shaped grubs with brown heads that live in the soil and feed on lawn grass roots.

Where to find them: They'll eat anything except vegetables. They favor roses, Japanese maple, Rose-of-Sharon, hollyhock, cherry, plum, grape, and American mountain ash.

How to control them: Handpick these sluggish beetles, especially when their numbers are small, as they secrete a pheromone that tells other beetles that lunch is served. Do not use pheromone traps, as it will just bring to the site more beetles than the traps can handle. Chemical treatment using malathion, rotenone, pyrethrum, carbaryl, and diazinon kills the adults effectively, but the Japanese beetle can fly up to 5 miles, so unless your neighbors treat as well, expect to be re-infested.
Notes: The adults cease feeding in about 6 weeks, so they at least are not around all summer. Landscape with plants they find less appetizing: dogwood, red maple, boxwood, holly, lilac, magnolia, rhododendron, and oak.

Eastern tent caterpillar

What they look like: The caterpillar is about 2 to 2 ½ inches long, with lots of long hairs. The body is black with a white stripe along the back and blue dots on the sides. The most distinguishing characteristic is the communal nest of white silk in the crotches of favored trees. These are often erroneously called bagworms.

Where to find them: Cherry, apple, and plum trees.

How to control them: The best defense is a long stick. Use it to rip open the nest and expose the caterpillars to predators. A strong stream of water from a water hose works well also. Organic methods include using *Bacillus thuringiensis* (*Bt*) (effective only on young caterpillars), soap or oil sprays, trichogamma wasps, and spined soldier bugs. As a last resort, spray with diazinon, carbaryl, malathion, or acephate. Never set the nests on fire – you'll damage the trees.

Tobacco and Tomato Hornworms

What they look like: Hard to mistake, these worms are large (up to 5 inches), bright green with diagonal white stripes, sporting a "horn" on the rear end. The tobacco hornworm has a red horn, and the tomato hornworm has a black horn.

Where to find them: Because they hang upside down and feed, they can be hard to spot. Look instead for a defoliated plant, gnawed fruit, and large black frass pellets. Found on tomato, tobacco plants, they also feed on eggplant, potatoes, and peppers.

How to control them: Handpicking these large worms is the best solution. The squeamish may choose to use kitchen tongs to pull them off the plants. Row covers can be effective if used before the eggs are laid on the plants, as well as *Bt*.

Notes: Tobacco hornworms turn into a fascinating sphinx moth that resembles hummingbirds both in size and flight pattern. Tobacco and tomato hornworms will sometimes rear up and audibly click their mandibles when disturbed. Hornworms with white eggs on their back have been parasitized by braconid wasps and will soon meet an untimely death.

Two-Spotted Spider mite

What they look like: Spider mites are about the size of the period at the end of this sentence. Because of their size, it is usually their fine webbing on the underside of leaves and stem crotches that give them away. Hold a white sheet of paper under the affected plant and tap the branch or leaves. Examine the paper for yellow or green pepper flakes scampering away. With a hand lens, one can see two dark spots on either side of its body.

Where to find them: They do the most damage when the weather is hot and dry in the summertime. They can be found on many varieties of trees (evergreens and deciduous), shrubs, flower, weeds, fruits, vegetables, and greenhouse plants. Affected leaves often have a stippled appearance, or in the case of heavy infestations, can be completely yellow or bronze. Mites can stunt a plant's growth or even kill it.

How to control them: Low populations of mites can be controlled with a steady stream of water directed at the underside of the leaves. Repeat frequently. More severe infestations can be controlled with horticultural oil, insecticidal/miticidal soaps, and kelthane.

Lacebug

What they look like: The adult lacebug is small (about an eighth of an inch), fast, and has clear, speckled wings. Look for other signs of its activity instead: mottled or blotched upper leaf surfaces and black, shiny fecal spots (neither leafhoppers nor spider mites leave this sign) on the undersides of damaged leaves.

Where to find them: There are many species, usually favoring only a few related types of plants. Azaleas and rhododendrons infestations by lacebugs are common. Their numbers are greatest in mid to late summer.

How to control them: Treat with insecticidal soap or water spray, directing the spray to the underside of the leaves. A repeat treatment is usually necessary. Sabadilla, malathion, diazinon, carbaryl, and acephate are also effective.

Whitefly

What they look like: Tiny white insects that fly up in a white cloud when disturbed. Larvae are wingless, hard to see, and cause more damage than the adults.

Where to find them: Look for the adults on the underside of just about any plant. They secrete a sugary substance called honeydew, which attracts ants and sooty mold. Freezing weather kills them, so in the summer they migrate from warmer areas by infested greenhouse-grown plants placed in the garden.

How to control them: Complete control isn't necessary, as the damage is usually not severe enough to kill a healthy plant. Reduce the use of nitrogen fertilizers, as the whiteflies reproduce more quickly when the plant has a lot of succulent, new growth. Pick off severely infested leaves, or spray with insecticidal soap, acephate, diazinon, or malathion.

Aphids

What they look like: Aphids are small, teardrop-shaped insects with soft bodies. They come in many colors, usually without wings, and appear in groups.

Where to find them: Aphids attack just about anything, but they'll be found wherever there is soft new growth on bark, leaves, or buds. They suck plant juices and excrete the excess sugars as honeydew. Ants love honeydew (and will protect their honeydew "cows" from predators), and it is usually large numbers of ants that the gardener first notices. Also look for sooty mold growing on honeydew that has drifted onto to lower parts of the plant.

How to control them: Minor infestations of aphids do not cause lasting damage. Usually natural predators show up before the aphids get out of hand, so patience is a virtue when dealing with this insect. It can actually be somewhat interesting to watch the many predators that feed on aphids – look for ladybug beetles and their larvae, aphid midges, green lacewing larvae, syrphid flies, and parasitic wasps. Keep chemical controls to a minimum to allow these predators to do their work. Start by blasting aphids off the plant with a strong stream of water, followed by insecticidal soap. Other methods include using oil sprays, diatomaceous earth, sulfur, pyrethrum, neem, diazinon, malathion, and acephate.

Notes: Aphids are pretty defenseless, so they compensate for this feature by reproducing madly. They are capable of parthenogenesis, which means that they can reproduce without mating, and to speed up the process, the young are born live and are capable of reproducing themselves within a week after birth. Some species even give birth to pregnant young.

Bagworms

What they look like: Masters of disguise, bagworms clothe themselves in dead plant leaves, often masquerading as pine cones hanging down on evergreen branches. Tiny when hatching from eggs in mid to late May, these caterpillars grow to about 1½ to 2 inches in length by early fall.

Where to find them: They can be found on any tree, but prefer junipers, arborvitae, spruces, pine, and cedar. Large populations can strip and kill trees.

How to control them: In the fall, winter, and early spring, picks off the bags by hand if the infestation is slight and the tree is small. The best time to treat with *Bt* (*Bacillus thuringiensis*) and insecticides is when the larvae are less than 1/2" long and the worm's baggage is upright like a small ice cream cone made out of plant material. Chemicals that are effective include malathion, diazinon, carbaryl, and acephate.

Scale

What they look like: A large and diverse group of insects, they all have a chemically-resistant outer covering that makes them look like tiny army helmets glued onto plant stems and leaves. Some are called "soft scales," having a waxy covering, others "armored scales," with their tough outer cover. The adults don't have wings or legs, but when first emerging from the egg they have legs, move about quite a bit, and are called crawlers. Some scales excrete honeydew, so look for ants and/or sooty mold first.

Where to find them: More than 100 plants are attacked by scale. They include mugo pine, southern magnolia, dogwood, apple, willow, lilac, pines, and juniper.

How to control them: Because of their armor, scales must be attacked when they are crawlers. They have many natural enemies, avoid broad-spectrum insecticides whenever possible. Early in the spring, coat the branches with horticultural oil to smother overwintering scales. Spray with insecticidal soap, rotenone, malathion, diazinon, carbaryl, and acephate when crawlers are present in the spring.
Notes: To kill the crawlers, timing is crucial. Crawlers are hard to see, so it is recommended that sprays be timed to coincide with the blooming of certain plants (this is called plant phenology). For example, when 95% of the sargent crabapple blooms are open, oystershell scale is hatching and crawlers are active. Calico scale is vulnerable when oakleaf hydrangeas have their first bloom in late May.

Leafminers

What they look like: Light-colored irregular trails wind through the leaves. The trails are caused by the larvae of certain moth, beetle, and fly larvae, although the fly larvae are the most common. The larvae are tiny and work between the upper and lower surfaces of the leaf.

Where to find them: Columbine, dahlia, boxwood, holly, spinach, tomato, and many other plants.

How to control them: Hand-picking off the leaves and clearing all foliage in the fall are the best solutions. Seedlings infested with leafminers may be stunted or killed, but most gardeners see leafminers as affecting only the looks of mature plants. Once leafminers enter the leaves, sprays are ineffective.

Cabbage Loopers

What they look like: Cabbage loopers are green, smooth-skinned caterpillars with legs on either end of their bodies. Cabbage loopers have no legs in the middle and must make a loop of its body as it brings its back end up to the front. They can be as long as 1½ inches.

Where to find them: They love cole crops such as Brussels sprouts and cabbage, but they will also eat lettuce, celery, and tomatoes. They chew large, irregular holes in the leaves and bore through tomatoes as well as cabbage and lettuce heads.

How to control them: Cover the crops with row covers at planting or peel off the outer leaves when they first begin to cause damage. *Bt*, pyrethrum, rotenone, neem, and carbaryl are also effective.
Notes: Cabbage loopers with eggs on their backs have been parasitized by a wasp, so leave them alone to their fate. Chalky white loopers are sick with a virus.

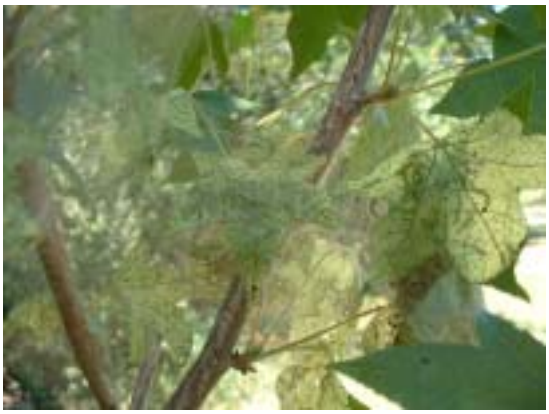
Leafhoppers

What they look like: There are about 2,500 species of leafhopper, but all are small, agile, wedge-shaped insects of varying colors and stripes. Although usually no larger than an eighth of an inch long, they can leap several feet, move swiftly sideways, or fly away.

Where to find them: They feed on many plants and fruits. They are generally found on the underside of plants, sucking the sap. Their feeding results in stippling, and sometimes the leaf edges turn brown and curl upward. They excrete honeydew, which attracts ants and sooty mold. Some species transmit plant diseases.

How to control them: Cover the young plants with row covers. Clean up all debris in the fall and keep weeds down (especially thistles, plantains, and dandelions), which can serve as leafhopper egg nurseries. Try also yellow sticky traps, sulfur, insecticidal soap, pyrethrum, rotenone, sabadilla, malathion, diazinon, carbaryl, and acephate.

Fall Webworm



What they look like: They are long-haired, pale green or yellow caterpillars that feed in groups inside of a silk nest. They are about an inch long at maturity and have a black stripe down their backs.

Where to find them: Look for their nests or tents at the tips of branches of fruit, nut, and shade trees. They will also infest roses and other ornamental shrubs. They defoliate entire branches and sometimes entire plants. Their nests appear in late summer to early fall.

How to control them: Like tent caterpillars, the best way to control them is to destroy the nest with a long stick. Cut out the webs by hand or wrap sticky bands around the trunk to catch them as they descend to the ground to pupate. *Bt*, malathion, diazinon, carbaryl, and acephate are effective if applied when the caterpillars are young and the sprayer is poked through the web.

Accommodations for this program:

As with all Kentucky GROW programs, providing needed accommodations is an individualized process. Below are some ideas to get you started, but the best route to take is to listen to the person, as he or she will usually have the best ideas of all!

For those with mobility impairments, ensure that all materials are placed at an accessible height and reach. If strolling through a planted area to identify insect pests in the flesh, make certain that pathways are accessible. Identify flat, level areas for participants to rest along the way if an extended walk is planned.

For those who have cognitive impairments, consider working as a team for this module. Use photos or pictures to show the insects that are being looked for. This would be helpful to everyone participating in this program! If at all possible, have actual examples of healthy plants to compare to those impacted by different insect pests. Provide choices for different levels of participation so that some individuals can stroll through the garden and others can remain in the classroom area to see plants and pests if desired.

For those with learning disabilities, provide the information in a variety of methods. Some individuals learn best by hearing about the insects, others will prefer to see pictures of the insects or live insects (this is the best way to learn about them if available!) in order to identify them. Written information will also be helpful for those with hearing impairments.

For individuals with visual impairments, review placement of the needed materials. Don't move items without informing the person. Ensure that the area and pathways are well lit and free of obstructions. Provide any written information in large print and other alternative formats as requested. A strong magnification lens may be helpful. Provide tactile opportunities for participants to touch affected plants and healthy ones (in instances when this will not spread disease).

Where to go from here:

University of Kentucky's entomology website has excellent online articles on many of the common landscape insect pests. Find online at: www.uky.edu/Agriculture/Entomology.

"Home Vegetable Gardening in Kentucky," University of Kentucky Cooperative Extension Service publication ID-128.

"Timing Control Actions for Landscape Insect Pests Using Flowering Plants as Indicators," by G.J. Mussey et al., University of Kentucky Cooperative Extension Service publication ENT-66.

Sunset Garden Pests and Diseases, Sunset Publishing Corporation, 1993.

A Field Guide to Insects: America North of Mexico (Peterson Field Guide), by Donald Joyce Borror and Richard White, Houghton Mifflin Company, 1998.

Ortho's Home Gardener's Problem Solver, Meredith Books, 2001

Rodale's Landscape Problem Solver, A Plant-by-Plant Guide, by Jeff and Liz Ball, Rodale Press, 1989.

This material is available in alternate formats. Contact Kentucky GROW for more information.