Chapter 11
Pest Identification

A publication of the Louisville Water Company
Wellhead Protection Plan, Phase III
Source Reduction Grant # X9-96479407-0

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Good Bugs and Bad Bugs

Not all insects are pests, and some are actually beneficial to your home and garden, because they are predators to specific pests and prevent them from becoming a problem. TABLE 1 describes some common beneficial insects found in Kentucky, (and other states), and offers a pictorial guide to aid in identification.

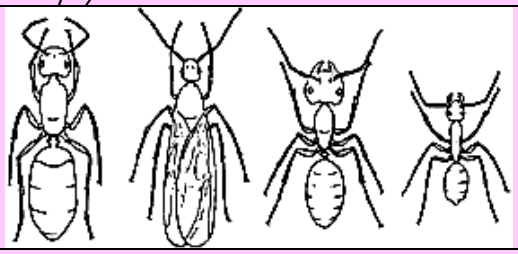
There are over one million kinds of insects, divided into thirty different groups, called *Orders*. So as to simplify this guide, we have ignored most scientific classifications, and instead grouped insects, mollusks, and other arthropods, (bugs, slugs, and eight-legged creatures), into general groups that exhibit a set of characteristics. Beneficial and benign insects are listed as bugs that crawl, those that fly long enough to get from one plant to the next, those that hop, and those that fly. Pest bugs are listed alphabetically.

We would like to attribute many of the photos, text, and general information to the University of Kentucky's Department of Entomology Critter ID and ENTFacts section of their web site. We would also like to thank the University of Kentucky's Cooperative Extension Service for their advice and aid in developing this portion of the guidebook.

Insects can damage plants, (flowers, landscape trees and shrubs, lawn grass, etc.), in a variety of ways. These are listed below.

1. Chewing – Devouring, notching, or mining leaves; eating wood, bark, roots, stems, fruit, seeds;
2. Sucking – Removing sap and cell contents and injecting toxins into the plant;
3. Vectors of Disease – Carrying diseases from plant to plant, e.g. elm bark beetles carry dutch elm disease, various aphids are vectors of certain viral diseases;
4. Excretions – Honeydew deposits lead to the growth of sooty mold, and the leaves can not produce food through photosynthesis.
5. Gall Formation – Forming galls on leaves, twigs, buds, and roots.
6. Ovipositor Scars – Forming scars on stems, twigs, bark, or fruit; and
7. Injection of Toxic Substances – Some insects inject substances into the plant to aid in digestion of the plant to the insect.

However, as previously stated, not all bugs, slugs, and eight-legged creatures are pests. Some are benign or can be very beneficial in the garden as the hunters of pests. Table 1 lists bugs that are beneficial to your garden. Get to know them, so that they do not become a target of a pest control program. The bug listings are color coded to show that they are related in families.

TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Crawling Bugs		
Ants	Ants are considered to be pests inside the home, but outside, ants can be a very beneficial insect. Ants help to aerate the soil, and, once their nest is abandoned, the passageways can provide living space for other beneficial insects. Ants may also eat other harmful insects. There are over 1000 species of ants throughout the world, but this lists only some ants that are common in Kentucky. Ants are social insects and may be divided into three castes: workers, males, (drones), and queens. Workers are sterile, wingless females which range in size from 1/20th of an inch to ½" long, depending on the species. The workers of some species vary in size, as well, from large workers to small workers, (large and small is relative to the species size). Male ants, (drones), are winged, usually the same size or larger than the workers, and their sole purpose is to mate with the queen. They are usually produced in older large colonies. Queens are the largest ant in the colony. They have wings that break off after mating; often two or three times the size of the worker ants, and can live for a number of years. After mating, the queen seeks a proper nesting site, and begins a new colony. The presence of swarming winged ants inside buildings indicates that an ant nest is indoors. Ants vary in color from yellow, red, brown, black, and grey, with various combinations of these. Like all insects, ants have three distinctive body parts; head, thorax, and abdomen. All ants have a pair or elbowed antennae, and a constricted area between the thorax and the abdomen called the petiole. Related to wasps, ants have a wide variety of nesting habits and food preferences. Damage from ants varies. Most are primarily a nuisance in the garden and cause little damage. Generally, there are no disease problems with ants. In hospitals, Pharaoh Ants can transmit disease organisms, such as *Staphylococcus*.	 Ant castes, from left, queen, winged male, (drone), large worker ant, small worker ant
Acrobat Ant	Acrobat ants are only 1/8" in size, and are often very shiny. The final segment of the ant is heart-shaped. When frightened, the ant raises the tip of its abdomen above its head. Individual acrobat ants may occasionally be seen foraging, and usually don't form long lines of foragers to a food source. Frequently, the Acrobat Ant will nest in dead or decaying wood, logs, stumps, and hollow tree cavities. They prefer damp soil, so may also be found beneath tarps, leaf litter, or under stones. They have frequently been observed feeding on termites. Finding these ants in your home may indicate a moisture problem related to a leak or condensation.	 Beneficial Acrobat Ant

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Name	Description	Picture Identification	
Crawling Bugs			
Field Ant	Field ants are relatively large ants, (3/8ths inch), and are often confused with Carpenter Ants, a pest. They have a wide variation in color; black, brown, tan, reddish, or red and black. The thorax is very bumpy in appearance. Under a magnifying glass, you can see the two large eyes on the head of the ant, and three very small eyes on the 'forehead' of the ant. These ants are soil nesters and may construct mounds in open meadows. They also nest under rocks, landscape timbers, and firewood piles.	 Gray Field Ant	
Pavement Ant	A pest when in the home, Pavement Ants are very beneficial in the garden. The Pavement Ant is a medium, brown to black ant, with pale legs and a black abdomen. The ants feed on a variety of materials, including live and dead insects, honeydew from aphids, meats, grease, etc. They usually nest under stone, concrete slabs, at the edge of pavements, and, when in homes, in crevices, woodwork, and masonry. The ants are about 1/8" to ¼" long.	 Pavement Ant	
Antlions	Antlions are a family of bugs that have a predatory larval form. These short, gray or brown bugs have a large head, spiny jaw, short legs, and soft body parts. They prey primarily on ants. Many ant lions set traps for ants, such as digging a pit. They wait at the bottom of the pit for the ant to fall in to be devoured immediately. Antlions are also called "Doodlebugs". Adult ant lions resemble damselflies, and are clumsy fliers. Fully developed larvae are about ½" long.	 Antlion pit	 Fully developed Antlion larvae

<table>
<tr><th colspan="4">TABLE 1 – Common Beneficial Insects of Kentucky</th></tr>
<tr><th>Name</th><th colspan="2">Description</th><th>Picture Identification</th></tr>
<tr><td colspan="4">Crawling Bugs</td></tr>
<tr><td>Beetles</td><td colspan="2">Beetles are usually easy to distinguish from other kinds of insects because of their 'elytra'. Elytra are the beetle's front wings that are a hard, shell-like covering that protects the back wings and abdomen. Beetle elytra usually meet in the straight line down the middle of the abdomen when closed.
Beetles also have chewing mouthparts, and all beetles have complete metamorphosis, which means they have four distinct life stages, (eggs, larva, pupa, adult).There are thousands of beetle species in Kentucky. This section deals with some of the more common types.</td><td> 
The meeting line between two wings is called the elytra. Almost all beetles have this line that runs down their back.</td></tr>
<tr><td></td><td colspan="3">Almost all beetles are beneficial to the environment as they are predators of other, plant-eating insects. The type of beetle found in your garden is dependent upon the pest that it feeds on. You don't have to introduce beetles to your garden, if encouraged, they can find their own way.</td></tr>
<tr><td>Eastern Hercules Beetles</td><td>Eastern Hercules Beetles have chewing mouth parts and elytra, like all beetles. Related to June Beetles, Japanese Beetles, and Dung Beetles, the Eastern Hercules Beetle is the largest beetle in Kentucky. Adult Eastern Hercules Beetles typically have light green, gray or tan elytra with black spots. Adult male beetles have 2 large horns, (1 on the head and 1 on the thorax); they also have 2 small horns located next to the thorax horn. Females lack horns. The large larvae are called grubs and have c-shaped white bodies with large mandibles. Grubs feed on decaying plant material and are an important food source for many mammals. Adult beetles eat bark and rotten fruit. Not considered a pest in KY.</td><td> 
Eastern Hercules Beetle Larvae</td><td> 
Male Eastern Hercules Beetle</td></tr>
<tr><td>Ground Beetles</td><td colspan="3">Like all beetles, Ground Beetles have chewing mouth parts and hardened front wings that meet in a straight line down the back of the abdomen when closed. Ground Beetles have long, slender legs and antennae, and a head that is narrower than their thorax or abdomen. Most Ground Beetles do not climb very well and tend to be found close to the ground or on the ground. Typical Ground Beetle larvae are long and slender with dark coloration. In most Ground Beetle species, females lay eggs in the soil. Upon hatching, the larvae feed and grow for 1 to 2 years and pupate in small chambers made of soil. Many species spend the winter in these chambers, and the adults emerge in spring. Most adult Ground Beetles live for several years.
Most Ground Beetles are fast-moving predators that feed on small insects, spiders, and other arthropods. They usually hunt at night, and found in a wide variety of setting. During the day, most Ground Beetles hide under rocks, logs, and fallen leaves. They seldom fly, and the larvae are also predators.</td></tr>
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TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Crawling Bugs		
Big-headed Ground Beetles	Distinctive, shiny black beetles are usually ¾" long, and are named because of their large mandibles, (jaws).	 Big-headed Ground Beetle
Caterpillar Hunter, Ground Beetle	Vibrantly colored, with metallic green elytra and shiny purple-black highlights on legs and body. Up to ! ¼" long.	 Caterpillar Hunter Larvae  Caterpillar Hunter Adult
Vivid Metallic Ground Beetles, Ground Beetle	Vibrant, vivid metallic colors of beetles, which are covered with tiny hairs. Fairly common, and reach about ¾" long	 Vivid Metallic Ground Beetle
Woodland Ground Beetle, Ground Beetle	Often found in wooded areas, but are also found in lawns and crops. Shiny, dark-colored, and about ¾" long	 Woodland Ground Beetle
Rove Beetle	Rove Beetles are easily identified by their very short elytra, which leaves most of their abdomen exposed. Elongated beetles, they feed on just about any insect available, and are considered to be very beneficial in the garden. There are over 46, 000 species of Rove Beetles. Sizes range from ¼" to 1½". Some Rove Beetles are 'parasites' to mammals that benefit their hosts by eating fleas and other parasitic bugs.	 Rove Beetle

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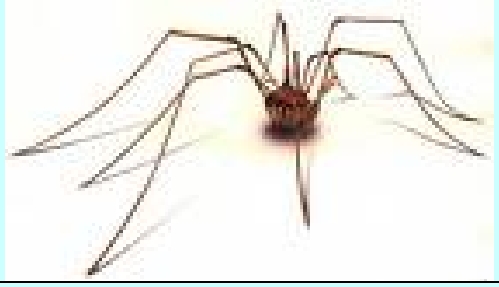
Crawling Bugs			
Stag Beetles	Stag Beetles range from reddish brown to black and have long legs with spiny tibia that are wide at the tips. The antennae are often elbowed with a club-like end. Kentucky is home to several different species. Stag Beetles have all four metamorphoses: eggs, larvae, pupa, and adult. It may take several years to reach the adult stage, and adults usually live for 1-2 years. When threatened, the Stage Beetle will rear its head and hold its mandibles open. Because they help with the decomposition of dead trees, Stag Beetle larvae are a vital part of the ecosystem. No healthy hardwood forest in Kentucky is with out them. They are not considered to be pests, but beneficial insects that help with the decomposition process.	 Stage Beetle tibia	 Stag Beetle antennae
Common Stag Beetle	Also called "Pinching Bugs". There are four species of Stag Beetles and all are similar in size and appearance. These bugs are reddish brown and can grow to be ¾" to 1 ½" long. They eat decaying wood as larvae, while the adults eat little or nothing.	 Stag Beetle larvae	 Common Stag Beetle
Elephant Stag Beetle	Also called "Giant Stag Beetles", Elephant Stag Beetles are the largest beetles found in Kentucky. Elephant Stag Beetles and their larvae are common in forested areas where decaying wood is present. Larvae are about the same length as adults. Male Stag Beetles have heads with huge, branching mandibles that are more than half as long as the beetle itself.	 Elephant Stag Beetle	
Platycerus Stag Beetle	Stag Beetles in the *Platycerus* genus are much smaller than the beetles seen above, (½" to ¾"). Unlike the Stag Beetles pictured above, Males and females have mandibles that are similar in size. They can easily be mistaken for beetles in other families, but are still considered to be a beneficial insect, and can be distinguished by their elbowed antennae.	 *Platycerus* Stag Beetle	

TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Crawling Bugs		
Tiger Beetle	Tiger Beetles closely resemble Ground Beetles, but can be distinguished by their overlapping, sickle-shaped jaws. Most KY species are shiny, metallic blue, green, copper, or orange.	 Six-spotted Tiger Beetle  *Cicindela* Tiger Beetle
Centipedes	Centipedes are long, multi-segmented arthropods that resemble millipedes. Centipedes have only two legs per segment while millipedes have two sets, (4 legs), per segments. Centipedes have 1 pair of antennae and chewing mouthparts. Centipedes are unique because their first pair of legs have evolved into venomous fangs—venomous to other insects and arthropods, that is. Centipede bites are very rare, although they may be painful, and they do not harm humans, unless the human is allergic to the bite. Although they have a scary appearance, they are excellent pest controllers of the home as well as the garden. Most centipedes live underneath rocks, fallen logs, and in soil and leaf litter. They feed on crickets, worms, and other small insects.	 House Centipede
Hemiscolopendra marginata Centipede	Probably the largest centipede found in KY, these centipedes can reach up to 3" long. They are found under logs and loose bark.	 *Hemiscolopendra marginata* Centipede
House Centipedes	These centipedes have very long legs, and are often seen running quickly in basements and attics and other cool, indoor places. They hunt crickets, ants, roaches, sowbugs, and other small creatures. Probably not native to KY, it has come to our country from Europe.	 House Centipede
Scolopocryptops sexspinosus Centipede	This centipede is commonly found under rocks, logs, and loose bark in KY. The vivid red-orange centipede can reach 2" to 3" long.	 *Scolopocryptops sexpinosus* Centipede

TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Crawling Bugs		
Soil Centipedes	Soil centipedes are common in KY, but very small and difficult to photograph.	 Soil Centipede
Harvestmen or Daddy-Long-Legs	Harvestmen are members of the class *Arachnida*, which includes spiders, mites, and scorpions. Like all arachnids, Harvestmen or Daddy-Long-Legs have 4 pairs of legs, fang-like mouth parts, called "chelicerae" and 2 antennae-like appendages near the mouth called "pedipalps". They have no antennae. Most of the species in Kentucky have very long legs. Harvestmen are not true spiders, but are often confused with them. In spiders, the body consists of two separate parts, while in Harvestmen; the segments have fused to form a single large body segment, (like in mites and ticks). Also, spiders have venomous fangs, while Harvestmen have no venom glands. Young Harvestmen hatch, they look like tiny versions of the adults. They molt as they grow larger and live for about a year. They are usually active in darkness or shade, and feed on slow-moving or dead insects, insect eggs, earthworms, and other decaying material. Some species have an unpleasant odor, which is used as a method of protection against predation. They are not harmful to humans, animals, buildings, or garden areas.	
Leiobunum vittatum	Many of the Daddy-Long-Legs found in KY are in the genus *Leiobunum*. In the warm months, they may be seen around trees, shrubs, or any thick vegetation. They are also common on the shady sides of buildings, underneath eaves, in crawl spaces, and in both rural and urban settings.	 Daddy-Long-Legs
Millipedes	Millipedes are long, multi-segmented arthropods that resemble centipedes, but have two sets of legs on each segment, instead of one. Millipedes also lack the venomous front legs of centipedes. Millipedes have one pair of antennae and chewing mouthparts. They are common under soil, rocks, and in other dark, moist places. They cannot must very fast and most species feed on decaying plant material.	 Millipede
Predatory Mites	Predatory mites live in the soil or on the leaves of plants. Aggressively carnivorous, many predatory mites feed on thrips, and other plant pests. These are very small bugs and may go un-noticed in the garden, but are very beneficial bugs to the environment in the control of pests.	 Predatory mite, *Iphiseius degenerans*

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Name	Description	Picture Identification
	Crawling Bugs	
Seed Bugs, Big-eyed Bugs	The most commonly encountered member of the Big-eyed Bug family is *Geocoris punctipes* in Kentucky. This is an important natural predator of small insects such as the eggs of mite pests, aphids, and leafhoppers. They also stalk insect prey including caterpillars, spider mites, and flea beetles. These bugs have oval bodies and broad heads with distinctive, wide set, bulging eyes. These bugs are only 1/8" in length. They also have a high tolerance for sprayable insecticides.	
Spiders	Spiders are arachnids, like scorpions, mites, ticks, and Daddy-Long-Legs. They have 8 legs, 2 body parts, and no antennae. Arachnids also have fang-like mouth parts called "chelicerae". Spiders may be distinguished from other arachnids in Kentucky by the connection between the abdomen and the cephalothorax, (head/thorax combination). In spiders, the connection between the cephalothorax and the abdomen is a narrow stalk. In other KY arachnids, the connection is a broad body part, so that the distinction between the two body parts is not obvious. There are many different kinds of spiders in Kentucky, the most common of which are discussed here. Spiders are considered beneficial insects, all but the Black Widow and the Brown Recluse spiders.	
Cellar Spider	Cellar Spiders are often mistaken for Daddy-Long-Legs, but are true spiders, with chelicerae. Common KY species are usually tan or gray, and they usually have very messy webs, typical of cobweb spiders. While considered to be a pest by many homeowners, the spiders are actually beneficial, preferring to build their webs in basements, pantries, closets, attics, barns, and sheds. They feed on small moths, flies, gnats, mosquitoes, and other pests that live indoors. When food is scarce, the Cellar Spider may use another spider's web to trap that spider. The Cellar Spider taps the web to make the web shake, the other spider thinks that prey has come into its nest, and the Cellar Spider then eats that spider.	 Long-bodied Cellar Spider
Common Outdoor Cobweb Spider	Cobweb spiders are common on all types of vegetation, and near buildings. The common cobweb spider, Theridula, is shown at right. It is commonly found under leaves and other sunny, weedy habitats. Most have similar patterns, but different body colors. One species has a yellow spot on a red background, with legs. These spiders are typically only ¼" in size.	 Outdoor Cobweb  Common Outdoor Cobweb Spider

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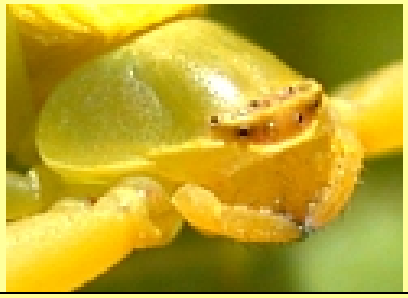
Name	Description	Picture Identification
Crawling Bugs		
American House Spider	This is a cobweb spider, which can be found in nearly every attic, garage, and barn in KY. Cobweb spiders build webs that are messy and disorganized, and do not resemble the webs of orb-web spiders. These spiders catch and eat flies, mosquitoes, and other pests that enter buildings. They reach up to 3/8" in size.	 Typical Cob Web  American House Spider
Crab Spiders	There are several types of spiders called Crab Spiders, all of which have long front legs in comparison to the length of their back legs. Crab Spiders belong in the genus *Thomisid* or in the genus *Philodromid*. All crab spiders have 8 eyes, 8 legs, 2 body parts, and chelicerae. Most live for less than one year and have only one generation per year. These spiders are ambush predators and wait motionlessly on flowers, leaves, and other strategic places for flies, bees, and similar prey. Crab Spiders are able to walk forwards, backwards, and sideways with ease. These spiders are considered to be beneficial to humans.	 A close-up of the chelicerae of a Crab Spider
Thomisid Crab Spiders	Crab Spiders of the genus *Thomisid* often hold their front legs up and out like a crab. Many have bright, "neon" colors that match the colors of the flowers on which they sit, while others are gray and brown color patterns.	 Typical Crab Spider of *Thomisid* genus.
Tmarus Crab Spiders	Crab Spiders of the genus *Tmarus* are more plainly colored, and are not as frequently found in KY. Little is known about their biology	 *Tmarus* Crab Spider

TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
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Flower/Crab Spiders	Flower Spiders are the most commonly encountered Crab Spiders in KY. Most have bright colors which allow them to blend in with the flowers on which they wait for prey. Some are able to change color to become camouflaged on different kinds of flowers, although the color change may take a few days. Flower Spiders have two pairs of legs that are longer than the back to pairs of legs, rather than one pair of elongated legs like true Crab Spiders. Two genera of Crab Spiders/Flower Spiders are *Xysticus* and *Coriarachne*, both of which are darker Crab Spiders with more subdued colors.	 Camouflaged Flower Spider of the genus *Misumenops*  Crab/Flower Spider of the genus *Xysticus*.
		 Flower Spider eating a fly, (spider on the left, fly on the right).  Crab/Flower Spider of the genus *Coriarachne*.
Running Spiders (Crab/Flower Spiders)	Running Spiders are a type of Crab Spider, (see Crab Spider), and belong to the family *Philodromidae*. Running Spiders have longer, thinner bodies than most Crab Spiders.	 Running Spider
Fishing Spiders	Related to Nursery-web spiders, Fishing Spiders are usually large spiders, (up to 3" diameter), and are mottled with brown, gray, white, and black. It is commonly found on the trunks of trees that are near water. Some Fishing Spiders will partially submerge themselves underwater for brief periods of time to catch aquatic prey. While they resemble tarantulas, they are not related.	 Fishing Spider with frog prey.
Dolomedes vittalus Fishing Spider	Dolomedes vittalus is a member of the Fishing Spider family, (see Nursery-web and Fishing Spiders). This picture shows a male of the species.	 Male *Dolomedes vittalus* Fishing Spider

TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Crawling Bugs		
Six Spotted Fishing Spider	(See Nursery-web and Fishing Spiders.) These spiders are often found close to the ground during the day, when they often hide under rocks and leaf debris near stream beds or ornamental ponds.	 Male Six Spotted Fishing Spider
Funnel Weaver Spiders	Funnel Weaver Spiders, as a family, closely resemble Wolf Spiders because Wolf Spiders do not build webs. Usually, Funnel Weaver Spiders are lighter in build than Wolf Spiders, but they also have bristly legs. Most are brown, with gray, black, and tan markings. All spiders in this family have 8 eyes, 8 legs, and 2 body parts, (cephalothorax), with no antennae. The most commonly seen Funnel Weavers in KY are Grass Spiders, which build their webs in grassy areas. These spiders build a funnel-shaped web, and hide at the narrowest part of the web. When an insect, spider, or other prey pass in front of the wide end of the web, the spider can feel the vibrations and jumps out and grabs its prey.	 Funnel Weaver Spider's Head
Grass Spiders, Funnel Weaver Spiders	A member of the Funnel Weaver Spider family, Grass Spiders are very common in KY. There are several species, but they closely resemble one another in appearance in behavior.	 Typical KY Grass Spider

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Name	Description	Picture Identification
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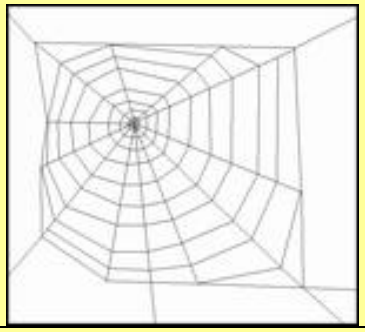
Jumping Spiders	Jumping Spiders have a very distinctive, flat-faced, bug-eyed appearance and a unique jerky way of moving. Most are small and hairy. Like all spiders they have 8 legs, 2 body parts, and no antennae. They have 8 eyes, but one pair of eyes are very small and difficult to see, and one pair of eyes are forward-facing. Their body length is up to about ½". Many female jumping spiders construct a silk case for their eggs and guard them until they hatch. The egg case is often built above the ground in leaves, on branches, or in crevices in the sides of buildings. They are fast-moving, active hunters that search for prey in many different locations. Many species have colors that camouflage them in their surroundings, which helps them to avoid birds and other predators.	 Typical female Jumping Spider with eggsac
Ant-mimic Jumping Spider	There are several species of Jumping Spiders that resemble ants, and feed on ants. They infiltrate a group of ants and feed on them, because the ants have trouble identifying them as predators. These spiders can be tricky—they touch the ant's antennae with their front legs, much like ants touch each other with their antennae.	 *Tutelina fornicaria*, an Ant-mimic Jumping spider.
Long-jawed Orb Weaver Spiders	Long-jawed Orb Weaver Spiders are related to Orchard Weaver Spiders, but have very long chelicerae, (fangs). In some cases, the chelicerae are longer than the abdomen of the spider. Their bodies are usually long and skinny. Most of the spiders in this family live for less than one year. Female spiders lay their eggs in the fall, and they hatch in the spring, resembling tiny adults. These spiders build their webs in strategic locations to catch flies, moths, and other insects. They are also an important food for birds and other small animals.	 This is a close up of the chelicerae, (fangs), of a Long-jawed Orb Weaver Spider.

TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Crawling Bugs		
Nursery-web and Fishing Spiders	Nursery-web and Fishing Spiders are large, hairy spiders in the family *Pisauridae*. The spiders are typically patterned with black, brown, white, and gray markings. While closely resembling Wolf Spiders, they are slimmer in build. These spiders have 8 eyes, 8 legs, and two body parts, (cephalothorax and abdomen). After laying her eggs, the female Nursery-web or Fishing Spider will wrap them in a silk eggsac. They will then carry her eggs in her chelicerae, (extra jaws), until the eggs hatch. When hatching time arrives, the female will build a 'nursery', a few leaves woven together with silk, in which the eggs hatch. This forms a protective pocket, where the female spider places the eggsac. Most of these spiders are active hunters, who search the ground for insects, worms, spiders, and other small creatures. They are common in forests and meadows, and may be found near ornamental ponds, where they patrol rocks and pebbles along the edge.	 Nursery-web Spider
Orb-Weaver Spiders	Orb-weaver spiders build regularly-shaped webs that are very organized and resemble a circular grid. Orb weavers have 8 eyes, and usually have large, spherical abdomens. Like all spiders, orb-weavers hatch and appear like miniatures of the adults. Most orb-weavers only live for one year. At the end of the year, the orb-weaver females produce a large amount of eggs that they wrap in a silken egg case. The young spiders hatch in the spring. They can be found almost anywhere that there are small insects or other spiders they can trap into their web. Considered to be beneficial to humans, they are only dangerous to those humans who are severely allergic.	 Typical Orb Web
Acacesia hamata, Orb Weaver Spider	A colorful Orb Weaver Spider, the Acacesia is also a common spider.	 *Acacesia hamata*

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Arrowshaped *Micrathena* Spider, Orb Weaver Spider	Spiders found in the genus Micrathena are well-known for their distinctive spikes and vibrant colors. They are about ½" long and are commonly found in meadows and on trails. These spiders are known for weaving their webs at face level. These spiders vary in color from brown, black, yellow, red, white, and mottled.	 A colorful Arrowshaped Spider
Black and Yellow Argiope, Orb Weaver Spider	One of KY's largest spiders, the Black and Yellow Argiope is commonly called 'Garden Spiders". These orb-weavers can be up to 3" long from leg tip to leg tip. Although large and intimidating, their bite is not dangerous unless one is highly allergic. Also called "writing spiders", the spider often weaves a zigzag pattern into their web.	 Black and Yellow Argiope
Bola Spiders, Orb Weaver Spiders	Bola Spiders are in the orb weaver family, but do not spin webs. Instead, they use a chemical attractant, and, when prey comes near, they sling a sticky wad of webbing with its front legs and snags its prey right out of the air. Some Bola Spiders become quite large.	 Bola Spider
Cyclosa Spider, Orb Weaver Spider	Orb weavers in the *Cyclosa* genus have a unique cone-shaped abdomen. They maintain a line of debris in their webs, consisting of dead prey and shed skin. The camouflage themselves among the debris when threatened.	 *Cyclosa* Orb Weaver Spider
Furrow Spider, Orb Weaver Spider	The Furrow Spiders are common orb weavers that are often found around homes and other urban areas. Some furrow spiders overwinter as adults. Several species live in KY, but look similar. These spiders grow to about ½" long.	 Typical Furrow Spider

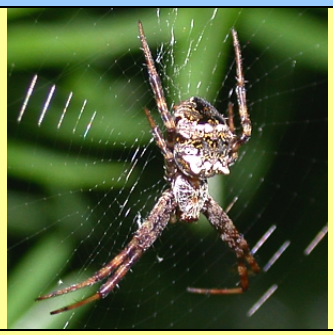
TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Crawling Bugs		
Gea heptagon Spider, Orb Weaver Spider	This orb weaver spider is about ¼" long with a bold color pattern and distinctive spines on the abdomen. A female is pictured at right. Males of the species are usually more brightly colored.	 KY Female *Gea heptagon*
Long-jawed Orb Weaver Spider	The most commonly encountered Long-jawed Orb Weaver Spiders are those found in the genus *Tetragnatha*. These spiders are long, with a 2" leg span, and are tan with white and yellow markings. Their bodies are slender, and they are commonly found in low-lying vegetation, or in sycamore trees.	 *Tetragnatha* Long-jawed Orb Weaver Spider
Marbled Spider, Orb Weaver Spider	The Marbled Spider is a large colorful spider common in urban areas and is over ½" long. They range in color from black, brown, red, orange, and shades of yellow.	 Typical Marbled Spider
Neoscona Spider, Orb Weaver Spider	Spiders found in the genus Neoscona are usually large, (1/2" or more in diameter), and are commonly seen around buildings in the late summer and fall in KY.	 *Neoscona* Spider

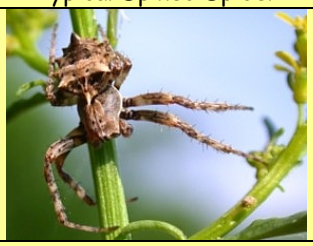
TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Crawling Bugs		
Spined Spider, Orb Weaver Spider	These are ½" long orb weavers and are typically found at face level along woodland trails, meadows, and the edge of forests. This spider is known for its distinctive spikes, and many species are quite colorful.	 Typical Spined Spider
Star-bellied Spider, Orb Weaver Spider	A common Orb Weaver Spider is the Star-bellied Spider.	 Star-bellied Orb Weaver Spider
White *Micrathena* Spider, Orb Weaver Spider	The White *Micrathena* Spider is smaller than other *Micrathena* Spiders, only about ¼" in length. Like other *Micrathena* Spiders, it is an orb weaver that is commonly found on woodland trails, meadows, and at the edge of forests.	 Typical White *Micrathena* Spider
Orchard Spider	Orchard Spiders are a part of the Long-jawed Orb Weaver Spider family. They more closely resemble true orb-weaver spiders, because, while their jaws are elongated, they are more normal sized. Orchard Spiders often have green, white, or bright yellow markings.	 Orchard Spider from KY

TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Crawling Bugs		
Purseweb Spider	Purseweb spiders are medium-sized, dark-colored spiders characterized by their large chelicerae. The common Purseweb Spiders in KY are shiny black, whereas Wolf Spiders are hairy and brown. Their body length reaches 1 ¼". Like all spiders, they are predators, feeding on insects, smaller spiders, and similar creatures. Instead of building a large, orb web or cobweb, these spiders build a compact, upright silk tube. The spider hides inside the tube, and when prey lands on the outside, the spider bites through the silk and pulls the meal inside. Fairly rare, they are not a pest except to humans who are highly allergic.	 Purseweb Spider showing large chelicerae.
Hogna Wolf Spiders	Wolf Spiders in the *Hogna* genus are some of the largest Wolf Spiders in KY. Their body lengths are about 1" long, and with legs, they can be quite large spiders.	  Black and gray Wolf Spiders of the *Hogna* genus
Rabid Wolf Spider	These spiders are very common in Kentucky and grow to about 1" in length. They are characterized by bold brown and white stripes on the cephalothorax.	 Rabid Wolf Spider with spiderlings  Rabid Wolf Spider in KY
Schizocosa Wolf Spider	Wolf Spiders in the genus *Schizacosa* are among the smallest Wolf Spiders in KY. Their body length rarely exceeds ¼". They are also very common, especially in grassy areas and in leaf litter.	 *Schizocosa* Wolf Spider with eggsac

TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Crawling Bugs		
White *Micrathena* Spider	The White *Micrathena* Spider is smaller than other *Micrathena* Spiders, only about ¼" in length. Like other *Micrathena* Spiders, it is an orb weaver that is commonly found on woodland trails, meadows, and at the edge of forests.	 Typical White *Micrathena* Spider
Wolf Spiders	Wolf Spiders are large, hairy spiders which are usually patterned with a mixture of black, gray, and brown. Large Wolf Spiders look very similar to Nursery-web and Fishing Spiders, but are usually more robust with shorter legs. Wolf Spiders have 8 eyes, 8 legs, 2 body parts, and chelicerae. Most Wolf Spiders live for several years. In many species, the female lay dozens of eggs at a time and wrap them in a large ball of silk. The female will then carry the eggsac on her abdomen until the spiderlings hatch. Upon hatching, the female will carry the spiderlings on her back for a few weeks until they are large enough to hunt on their own. These spiders are active hunters that patrol the ground for insects, small spiders, and similar prey. They are the most common KY spiders and are found in all habitats. Some Wolf Spiders build small burrows and defend their territory, while others are free roaming. These spiders sometimes wander indoors where they should be 'caught', (by herding the spider with a pencil into a container), and released outdoors.	 Typical Wolf Spider
Stink Bug – Arboreal Stink Bug	KY is the home for several Arboreal Stink Bugs. "Arboreal" means "tree-dwelling", and these bugs are predators that patrol the trunks of trees for ants and other insect prey. Their rough, brown bodies help to provide camouflage on tree bark. Arboreal Stink Bugs are often fairly large, reaching lengths up to 5/8". Stink Bugs are more fully discussed in Common Pests of KY table.	  Arboreal Stink Bugs

TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Crawling Bugs		
Spined Soldier Bug, Stink Bug	The predatory Spined Soldier Bug is a beneficial Stink Bug that feeds on pests. It is common in gardens and in weedy areas where it feeds on caterpillars and other slow-moving arthropods. Full grown, these bugs are about ½" long. The typical triangular skutellum may b e seen on the back.	 Spined Soldier Bug, (Stink Bug family)
Two-spotted Stink Bug	Stink bugs are in the order *Hemiptera*, which includes Assassin Bugs, and many other insects. Stink Bugs are primarily pests of plants, but one, the Two-spotted Stink Bug is a predator. Stink Bugs secrete a fluid that produces an odor. Unlike Beetles, they have a triangular skutellum that is a part of their thorax.	 Two-spotted Stink Bug, a beneficial Stink Bug showing the triangular skutellum on the thorax.
Clumsy Fliers		
Assassin Bugs and Ambush Bugs	Assassin Bugs and Ambush Bugs are in the order *Hemiptera*, which also includes Stinkbugs, Leaf-footed Buts, and other insects. All insects in *Hemiptera* share a few shared characteristics, including piercing and sucking mouthparts, and wings which are membranous and clear at the tips, but hardened at the base. Ambush Bugs and Assassin Bugs are more closely related, and have short, three-segmented beaks, (most other *Hemipteras* have four segmented beaks). Ambush Bugs are a type of Assassin Bug, but there are a few differences. Assassin bugs are usually dark=colored, with combinations of gray, green, and black. Assassin Bugs also have long, narrow heads compared to Ambush Bugs. Ambush Bugs are usually stoutly built and typically have bright colors, such as yellow, red, or orange. Ambush Bugs have thickened front legs which are used to capture prey. Assassin Bugs will also use their front legs to capture prey, but their front legs are not as thickened. Assassin Bugs are up to 1 ½" in size, while Ambush Bugs are up to ½" in size. These bugs go through a simple metamorphosis with egg, nymph, and adult stages. In warm months, females lay eggs which are stuck in clusters to leaves and stems. After hatching the following June, the wingless nymphs grow and molt four times, (some species molt seven times), before becoming full-sized, winged adults. Adults are usually the overwintering stage. Both bugs are poor fliers. As hunters, the nymphs and adults capture insects and other arthropods in their front legs, then inject a small amount of poison that paralyzes their prey. Then, they use their sharp beaks to suck fluids from their prey. Assassin Bugs actively hunt for prey, while Ambush Bugs wait motionless for prey to come near by. Assassin Bugs hunt on various types of vegetation, including weeds, trees, and bushes. Ambush Bugs usually hunt on flowers. Assassin bugs are voracious predators of many garden pests, including flies, mosquitoes, beetles, and large caterpillars. They may cause a painful bite if handled. Some species 'squeak' when captured. Both the Assassin and Ambush Bugs stab their prey with long, pointed 'beaks' that are held folded under their bodies while not feeding.	

TABLE 1 – Common Beneficial Insects of Kentucky			
Name	Description	Picture Identification	
Clumsy Fliers			
Ambush Bugs	Ambush bugs look different from Assassin Bugs in that these bugs are short and stout, compared to Assassin bugs, and their front legs are thicker and shaped like Praying Mantis legs. Ambush bugs are commonly found on a variety of wildflowers where they wait in ambush for bees, flies, and other prey.	 Ambush Bug nymph	 Ambush Bug adult
Wheel Bug, Ambush Bug	1 ½" in size, largest assassin bug that lives in KY. It is named for the gear or wheel-like structure on its thorax. The Wheel Bug inflict a painful bite if handled carelessly.	 Wheel Bug nymph	 Wheel Bug
Bee Assassin Bug	Since honeybees, bumblebees, and parasitic wasps are included as beneficial insects, one must be careful introducing this insect to the home environment. These bugs patrol flowering plants that re visited by bees, flies, and other pollinating insects. Bee Assassins are usually dark with yellow or red markings on the sides of the abdomen, and are about ¾" long.		
Corsair Assassin Bug	An unusual assassin bug, the males have full-sized wings and are sometimes found hunting on leaves and flowers. Female Corsairs have stunted non-functional wings. They hunt under rocks, logs, and fallen leaves for ground-dwelling prey like caterpillars, crickets, and earthworms. Corsairs are about 1" long.	 Male Corsair Assassin Bug	 Female Corsair Assassin Bug
Pselliopus Assassin Bug	Common Assassin bugs in the *Pselliopus* genus are noted for their black-banded, bright orange bodies. Adults are approximately 1" long.	 *Pselliopus* Assassin nymph	 *Pselliopus* Assassin adult

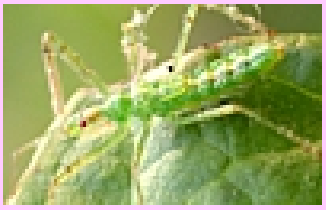
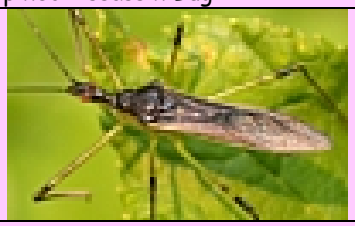
TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Clumsy Fliers		
Spined Assassin Bug	Often found on goldenrod and other wildflowers. ¾" size, and is not noticed as often.	 Spined Assassin Bug
Zelus, Assassin Bug	*Zelus* Assassin Bugs belong to the species *Zelus*, and are commonly found in trees and shrubs. They are about ¾" long and have bright green bodies with dark highlights.	 *Zelus* nymph  *Zelus* Assassin Bug
Lady Beetle, Ladybug, Ladybird Beetle	Ladybugs always have round or broad, oval bodies and most species are orange, red, or yellow with black spots. A few rare types are black with spots. The ends of the ladybugs antennae have small clubs. Most are considered to be beneficial, but a few are listed as pests.	 Lady Beetle eggs  Lady Beetle pupae
Convergent Lady Beetle	A common aphid predator, Lady Beetles also eat scale insects, caterpillars, and other insect larvae. Both adults and larvae actively hunt for prey over the surface of plants, especially in weedy areas and in crops. The larvae secrete a waxy substance that protects it from ants.	 Convergent Lady Beetle larvae  Convergent Lady Beetle
Pink Lady Beetle		 Pink Lady Beetle

TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Clumsy Fliers		
Yellow-spotted Lady Beetle	(See above)	 Yellow-spotted Lady Beetle
Flying Bugs		
Bees	Wasps, ants, and bees are closely related insects. They are classified together under one Order, Hymenoptera, which means, "membranous wing". All insects in this order have chewing mouthparts as adults, and all go through a complete stage of metamorphosis, with immature stages that resemble worms or caterpillars. Most bees have four transparent wings. Bees have evolved to visit flowers and gather pollen and nectar. All bees are covered in branched hairs, which allow the bee to carry pollen. Bees are usually hairier than wasps, and bees are often stouter in build than wasps. Like many ants, hive bees have specialized members of their hive, including workers, queens, and drones. Drones are male bees and their only function is to fertilize queens. All worker bees are females, but only the queen mates and lays eggs. Not all bees live in hives. Some bees are solitary bees, which build a nest or burrow for their eggs, and provision it with pollen and nectar. Most solitary bees spend the winter as eggs or pupae. All members of bee colonies but honey bees die in winter, with the newly mated females emerging in spring to build new colonies. Honey bees survive the winter by eating stored honey. Bees are considered to be a very important part of our ecosystem, because they are the main pollinators of flowers and plants. Without this pollen transfer, many plants would not be able to produce seeds. Many bees have stingers which help them defend themselves. Even with this defense, bees are often eaten by spiders, assassin bugs, birds, and wasps. Bees are not considered to be pests because of their important ecological roles. However, they may cause problems to humans because of their aggressive defensive behavior, and some people have a potentially lethal reaction to bee stings. A few solitary bees are pests as well.	
Bumble Bee	Bumble Bees often find spaces for their hives in underground abandoned mammal burrows. They are native to KY, and are very fuzzy bees, known for their ability to pollinate many different flowers.	 Bumble Bee

TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Flying Bugs		
Carpenter Bee	KY has several species of Carpenter Bees. The most common Carpenter Bees resemble Bumble Bees, but their abdomen is smooth, while Bumble Bees have very hairy abdomens. Carpenter Bees do not live in hives, but are solitary. Many species dig holes in dead wood where they lay their eggs, provisioned with nectar and pollen. They are sometimes considered to be pests because they will dig holes in wooden sheds, porches, and other structures. They rarely do serious damage to the structures, and considered to be beneficial to the ecology. Common Carpenter Bees are about 1" long, but some are smaller and have black or metallic coloration.	 Common Carpenter Bee
Halictid Bees	Halictid Bees are small, (1/4" to ½" long). Most are shiny black, metallic green or metallic blue. Some Halictid Bees are called "Sweat Bees" because they land on skin to gather sweat droplets. Sometimes, if disturbed, the bees will sting while they do this. Some bee-like hover flies do the same thing, but they do not sting if swatted or startled.	 Halictid Bee
Honey Bees	Honey Bees and Bumble Bees are the most commonly seen bees in KY. They are the only bees that live in social colonies. Honey Bees usually build their hives in hollow trees or in man-made structures designed specifically for their use. Honey Bees are not native to KY, but were brought by colonists for their honey and wax production.	 Typical Honey Bee
Soldier Beetles	Like all beetles, Soldier Beetles have chewing mouthparts and hardened elytra that meet in a straight line down the back when closed. Soldier Beetles elytra is not quite as hard as most other beetles, (resembling Lightningbugs), and have long, straight antennae. Although most Soldier Beetles found in KY are orange with black markings, a few are black with orange markings and closely resemble Lightningbugs. While often mistaken for Lightningbugs, the main difference between them is that the Soldier Beetle does not have the large pronotum.	 Soldier Beetle with normal pronotum
	Larvae are found low to the ground and under rocks and logs. They are soft-bodied with 6 legs and chewing mouthparts. The larvae are predators that feed on small insects, worms, slugs, and snails. They hunt in leaf litter and in other locations that are damp and close to the soil. As adults, some soldier beetles feed on nectar and pollen, or hunt for aphids and other soft-bodied insects	 Soldier Beetle larvae

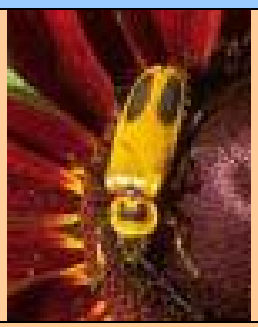
TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Flying Bugs		
Goldenrod Leatherwing Soldier Beetle	Typically ½" to ¾" long, with yellow and black markings. Adults are commonly seen in late summer and early fall on Goldenrod flowers, where it feeds on nectar, pollen, and insects. It is also called the Pennsylvanian Leatherwing	 Goldenrod Leatherwing
Margined Leatherwing Soldier Beetle	Commonly seen on flowers in KY during the summer.	 Margined Leatherwing
Podabrus Soldier Beetle	Soldier Beetles in the genus *Podabrus* are more usually confused with Lightningbugs, because of their orange and black markings. *Podabrus* Soldier Beetles are most common during the early summer in meadows, fencerows, gardens, and other areas with thick, sunlit vegetation.	 *Podabrus* Soldier Beetle
Lightning-bugs, Fireflies, Beetles	Lightningbugs have chewing mouthparts and elytra. Most Lightningbugs have glowing abdomens, but even the species that do not glow are easily recognized by their elongated bodies, distinctive black and orange colors, and their hood-like pronotum. The pronotum is an enlarged first plate of the thorax, and, in the case of Lightningbugs, the pronotum is so large, it conceals the head of the beetle from the top view. Most reach ½" to ¾" long, but some species are smaller. Lightningbugs have 4 distinct life cycles: eggs, larvae, pupa, and adult. They are predators that feed on small insects, worms, slugs, and snails.	 There are many species of Lightningbugs, but this is reported to be a "typical" example.  Lightningbug larvae

TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Flying Bugs		
Damsel Bugs	Damsel Bugs are often called "nabids" from their family name *Nabidae*. They have piercing and sucking mouthparts and wings which are membranous and clear at the tips, but hardened at the base. Damsel bugs look like a cross between a Stink Bug and a Praying Mantid. Like Stink Bugs, Damsel Bugs have a somewhat flat, five-sided shape. Like mantids, Damsel Bugs have spiny 'raptorial' front legs used to grab prey. Most KY Damsel Bugs are about ½" long and are grey or tan in color. Damsel Bugs are predators that live on low-growing plants where they capture and eat aphids, caterpillars, and other insects.	 Damsel Bug
Damselflies	Damselflies are long, narrow insects with 2 pairs of wings, chewing mouthparts, and large, compound eyes. They are close relatives of Dragonflies, but are able to fold their wings up over their bodies when they are not flying. These bugs have incomplete metamorphosis, hatching from eggs, and living underwater, until they molt one last time to leave the water and become flying adults. Damselfly naiads feed on minnows, tadpoles, aquatic insects, and other aquatic prey. They are good fliers, able to swerve, dive, and quickly change directions to catch flying prey. They are considered to be beneficial because they eat mosquitoes and other pests.	 Damselfly
Narrow-winged Damselfly	Small, fragile looking Damselflies that are common near ponds and slow-moving streams	 Narrow-winged Damselfly
Broad-winged Damselfly	Common near KY streams, these Damselflies are fairly large, (2" long), and many common species have shiny blue-black or green-black bodies with dark brown or black wings.	 Broad-winged Damselfly

TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Flying Bugs		
Spread-winged Damselfly	Although not as common as either Narrow-winged or Broad-winged Damselflies, the Spread-winged Damselfly is still a good predator of common pests. Unlike most Damselflies, these bugs hold their wings out when they are not flying, so they look more like Dragonflies. Their long, skinny bodies identify them as Damselflies, though.	 Spread-winged Damselfly
Dragonflies	Adult Dragonflies have 2 pairs of wings, chewing mouthparts, and large compound eyes. Dragonflies look very similar to Damselflies, but are unable to fold their wings over their abdomen when they are not flying. Young Dragonflies, (naiads), are fully aquatic, they resemble adults other than they are wingless. Dragonflies beat each pair of wings at different speeds and hold them at different angles. This enables them to swerve, dive, or even hover in air. Dragonflies are considered to be beneficial because they eat mosquitoes and other pests.	 Dragonfly naiad
Green Darner, Dragonfly	The Green Darner Dragonfly is commonly encountered in KY, especially near ponds. They grow to over 3" long, and have clear wings, a green thorax, and an abdomen that is often bright blue. Green Darners are named for the 'legend' that Dragonflies were thought to be able to sew together a person's lips or ears.	 Green Darner Dragonfly
Common Whitetail Skimmer, Dragonfly	Common Skimmers are very common in KY, and are fast fliers. Skimmers often have bold white and black, or blue and black patterns on their wings and bodies. Most grow to be about 1" to 2½' long.	 Male Whitetail Skimmer Dragonfly
Banded Pennant, Dragonfly	Another kind of Dragonfly is the Banded Pennant Dragonfly, whose wings and body are colored with black or brown bands.	 Banded Pennant Dragonfly

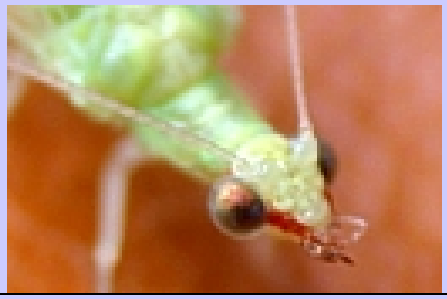
TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Flying Bugs		
Green-eyed Skimmer, Dragonfly	Also known as "emeralds", Green-eyed Skimmers are often found near standing water. Many Skimmers are also called "Basket-tailed" Skimmers, because the vein pattern on their abdomen resembles the weave of a basket.	 Green-eyed Skimmer Dragonfly
Lacewings	Adult Lacewings have 2 pairs of wings and chewing mouthparts, with long, thin bodies. They resemble dragonflies, but the Lacewings hold their wings over their backs when they are not flying, while Dragonflies can not. There are two common Lacewing families, Green Lacewings and Brown Lacewings. Lacewing larvae resemble small caterpillars, but move more quickly, have longer legs, and have a long, sickle-shaped mouth. The adults grow up to 1" long. Lacewings have complete metamorphosis. After hatching from distinct, stalk-shaped eggs, the larvae grow for a few weeks, then become pupae. The pupae stage lasts for a short period of time, and then the adults emerge. Lacewings are fast predators of aphids, insect eggs, and arthropods.	 Adult Lacewing
Green Lacewing	Green Lacewings are the most common Lacewings in KY. They are typically 1" long with lime-green bodies and golden heads. Their wings are transparent.	 Green Lacewing
Brown Lacewing	Brown Lacewings look and behave similarly to Green Lacewings, but they are tan in color, and are not encountered as often. Brown Lacewing larvae are sometimes called "trash bugs" for the debris they carry in their bodies. The wings in the adults are not as transparent as the Green Lacewings.	 Brown Lacewing

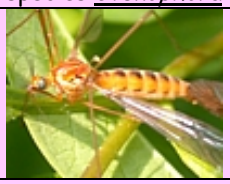
TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Flying Bugs		
True Flies	Only insects in the Order *Diptera* are "True Flies". True Flies are different from other insects because they have only 2 wings or no wings at all. The back pair of wings, (most insects have 4 wings), have developed into small structures called "halteras", which are used during flight for balance. Flies also have unusual mouth parts. Instead of chewing their food, flies have evolved many different kinds of liquid-feeding mouthparts, some of which act as sponges and some of which act as hypodermic needles. True Flies include house flies, mosquitoes, crane flies, and others, many of which are considered to be pests. However, there are several species of True Flies that are considered to be beneficial. True Flies are very common in KY	 The haltera of a True fly is highlighted in yellow.
Crane Flies, True Flies	Crane Flies are long and thin with very long legs, and resemble giant mosquitoes. Unlike mosquitoes, Crane Flies do not bite humans or animals, and are beneficial decomposers. Some aquatic Crane Flies are predators of aquatic insects and other invertebrates. Adult Crane Flies live only a few days, during which many are thought to feed on nectar. Crane flies have only 2 wings. Females have a pointed abdomen, while males have a blunt abdomen.	 Female Crane Fly, species *Ctenophora*  Crane Fly larvae  Crane Fly, species *Nephrotoma*  Crane Fly, species *Tipula*
Drone Flies, True Flies	Drone Flies also resemble bees in the adult stage, but have only 2 wings. Larval Drone Flies, called 'rattailed maggots', live in polluted water. A rattailed maggot has a long breathing tube extending out of its abdomen, which enables it to breathe in oxygen poor water.	 Drone Fly  Rattailed maggot of the Drone Fly
Flower Flies, True Flies	Flower Flies may be difficult to distinguish from other kinds of insects. Many of them are considered beneficial because their larvae feed on aphids and other pests. Flower Flies live in many habitats, but the most common species are found in field crops, gardens, and weedy areas, where the adults feed on nectar. Some live and feed on decaying plant material.	 Flower Fly larvae with aphids

TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Flying Bugs		
Hover Flies, True Flies	Most of the Flower Flies in KY are called Hover Flies, because they hover in mid-air, much like hummingbirds. Many of them resemble bees and wasps, but have only 2 wings, and are found in weedy habitats and gardens. The larvae of sever species are predators of aphids and other small insects.	 Hover Fly
Tachinid Flies, True Flies	Tachinid Flies are parasites of other insects, and considered to be beneficial in the garden. They come in many shapes, sizes and colors, but many feature gray stripes and dark colored bodies, which make them difficult to distinguish from house flies and flesh flies. These flies are often more robust and hairy when compared to fly pests. Tachnid Flies are also more often found in weedy areas.	  Tachinid Flies appear to be hairier and more robust than regular House Flies.
Wasps	Wasps are closely related to bees and ants. Most wasps have four transparent wings, like bees, but unlike many ants. Some wasp species live in colonies, but most species are solitary.	 Close-up of wasp head
Hive Wasps	Wasps that live in hives are considered to be beneficial insects because they eat lots of pest insects and are often beneficial to humans. However, wasps living in nests near human environments can be dangerous to people that are allergic to their stings. Hive wasps work together in hives. Workers patrol the environment for food and bring it back to the hive to feed larvae and other hive members. Workers also build hives, which are complex structures made of a paper-like substance that the wasps make from partially chewed wood. Worker wasps are equipped with stingers, and they use them to defend their hive from predators. Hive wasp larvae are soft and maggot-like, where they also pupate. Queens lay eggs during warm months, who then hide in protected areas through the winter.	 Hornet nest, an example of a wasp hive.
Hornet, Hive Wasp	The most common Hornet in KY is likely the Bald-faced Hornet. These distinctive black and white wasps build large nests in the limbs of trees and other locations. The Giant Hornet, (also called the European Hornet), reaches lengths up to 1 1/8", and is very similar in appearance to the Yellowjacket. Hornets are more usually found in woods, meadows and rural areas.	 Bald-faced Hornet  Giant or European Hornet

TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Flying Bugs		
Paper Wasp, Hive Wasp	Paper Wasps are among the most common insects encountered around homes. Paper Wasp nests are usually not fully enclosed, and are smaller than those of Hornets and Yellowjackets. There are several species in KY, but most are about 1" long, with vivid red, black, orange, and yellow patterns	 Paper Wasp gathering wood for nest.  Paper Wasp
Yellowjackets, Hive Wasps	Yellowjackets are close relatives of Hornets, and have a bold, black and yellow pattern. Usually from ½" to ¾" long, Yellowjackets build their nests in underground burrows, hollow logs, or wall voids. They are common around humans, and sometimes cause problems at picnics and other outdoor activities. These wasps also visit flowers for nectar and feed on insect prey.	 Yellowjacket
Narrow-waisted Solitary Wasps	This is a large group of wasps that do not live in hives or colonies. Most of these wasps are parasitic, whereby their offspring feed on or inside arthropods. There are hundreds of species of Narrow-waisted Solitary Wasps in KY. Most of them are ant-like in appearance and have a narrow waist with thread-like antennae. All have 4 membranous wings, except for a few types, which are wingless. The best way to distinguish between a solitary wasp and a hive wasp is to observe the behavior of the wasp. Solitary wasps have smaller burrows and rarely interact with one another. Many large species build burrows for their eggs, and leave stunned insect prey inside the burrow for the larvae to feed on, as seen at right. Others actually lay their eggs inside a pest insect, and the larvae eat their way out of the body of the prey insect. Most adults feed on nectar. Because their larvae feed on other pest insects, Solitary Wasps are considered to be beneficial. Many species do not sting humans, or are non-aggressive stingers.	 Solitary Wasp larvae feeding on a Beetle grub.
Braconid Wasps, Solitary Wasps	These wasps are some of the most commonly seen beneficial insects in KY. The *Braconid* Wasps attack a variety of pest insects. They are generally ant-like in appearance, usually with dark colors and sometimes with orange or yellow markings. They are smaller wasps, (1/8" to ¾"), and the females may have ovipositors, a long probe-like appendage that helps the female search underground and inside plant material for insect hosts.	 Female *Braconid* Wasp with ovipositor.

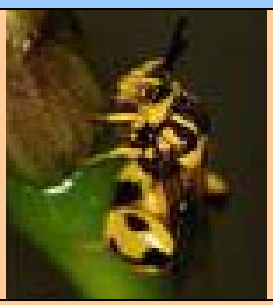
TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Flying Bugs		
Chalcidid Wasps, Solitary Wasps	These small, (less than ¼"), parasitic wasps are found worldwide. All have large, clasping hind legs that grasp their insect prey while a female attempts to deposit an egg. Females also use the large back legs for fighting.	 *Chalcidid* Wasp
Cuckoo Wasps, Solitary Wasps	Cuckoo Wasps are often beautiful, with metallic blue, green, or red colors. Some species are thieving parasites, which lay their eggs in the nests of other solitary bee species, while others lay their eggs in the nests of other insects. The Cuckoo Wasp larvae kill the solitary bee larvae and then feed on the stored provisions for the other larvae.	 Example of a Cuckoo Wasp
Ichnuemon Wasps, Solitary Wasps	*Ichnuemon* Wasps are closely related to Braconid Wasps, and are also some of the most economically beneficial wasps in KY. *Ichnuemon* Wasps are slightly larger, at 1/8" to 1 ½" in length, but this is not always the case. Many female wasps of this species have long ovipositors on the ends of their abdomen. Some *Ichnuemon* Wasps are wingless.	 *Ichnuemon* Wasp  Wingless *Ichnuemon* Wasp
Megaspilid Wasps, Solitary Wasps	Very little is known about the *Megaspilid* Wasps, mainly because they are so tiny, (less than ¼" long). They are thought to be parasites of scale insects, Lacewings, and many fly pupae. The female *Megaspilid* lays her eggs inside a host insect, killing the host as it hatches and grows.	 *Megaspilid* Wasp
Pelecind Wasps, Solitary Wasps	Pelecind Wasps are among the most distinctive wasps with their long, thin abdomen and shiny black bodies. The large, (1 ¾" long), wasps lay their eggs inside Beetle grubs.	 *Pelecind* Wasp

TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Flying Bugs		
Scoliid Wasps, Solitary Wasps	*Scoliid* Wasps are about ¾" long and are black with orange and yellow markings. These wasps are sometimes called "Digger Wasps" because a female *Scoliid* Wasp will dig into the soil for Beetle larva. After paralyzing her prey with one sting, she lays one egg on the larva. Then, the female will prepare a small underground chamber for both her egg and the prey, which will feed on the Beetle larva after hatching.	 *Scoliid* Wasp
Sphecid Wasps, Cicada Killer, Solitary Wasps	There are many species of *Sphecid* Wasps in KY. Most are shiny black or metallic blue, some with bright red, yellow, or orange markings. The Cicada Killer Wasp is a type of *Sphecid* Wasp. At 1 ½" long, it is the largest wasp found in KY. They are commonly seen in late summer as they hunt for cicadas which they use to provision their eggs in underground burrows. Like many *Sphecid* Wasps, Cicada Killers are able to sting people, but they will not do so unless provoked	 Cicada Killer Wasp, *Sphecid* Wasp
Mud Dauber Wasps, *Sphecid* Wasp, Solitary Wasp	One of the most common *Sphecid* Wasps is the Mud Dauber Wasp, which makes mud nests for their larvae which they attach to the sides of buildings or rocks. Mud Daubers usually build several nest together, with an egg in each nest, and provisioned with several spiders. They are not at all aggressive and rarely sting. Their nests must be removed prior to painting your home, but they are generally considered to be beneficial insects.	 Mud Dauber Wasp gathering mud for nest.
Potter Wasps, Solitary Wasps	Potter Wasps are closely related to Yellowjackets and Hornets, but are not as aggressive as Hornets. Potter Wasps build nests out of mud, which are small, 1" balls, and lay their eggs inside the balls. They provision these nests with caterpillars. Common Potter Wasps are black with yellow or white markings.	 Potter Wasp
Spider Wasps, Solitary Wasps	Spider Wasps are large, about 1" long. Their larva feed on paralyzed spiders. Spider Wasps are generally black or brown, but may be metallic blue or green. They are often observed on the lawn or moving quickly along the trunks of fallen trees, looking for spiders. Female Spider Wasps have modified their ovipositor into an effective stinging tool.	 Spider Wasp

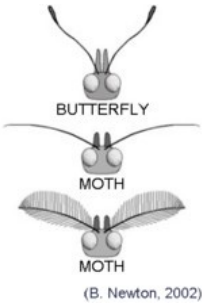
TABLE 1 – Common Beneficial Insects of Kentucky		
Name	Description	Picture Identification
Flying Bugs		
Tiphiid Wasps, Solitary Wasps	*Tiphiid* Wasps are similar in size, (1 ¾" long), shape, and behavior to Scoliid Wasps. The female *Tiphiid* Wasp hunts in the soil for Beetle grubs, on which they place a single egg. Because they kill turf-damaging Beetle grubs, some species are considered beneficial.	 *Tiphiid* Wasp
Velvet Ant, Solitary Wasp	Although Velvet Ants are wasps, they are sometimes called ants because the females do not have wings. Male Velvet Ants usually have shiny black wings. Velvet Ants are covered in dense hair, and most species are bright orange or red with black markings, although some species are metallic green. Common Velvet Ant females place their eggs in the larval and pupal chambers of bee and wasp nests. Although they have very long stingers, they will only sting if grabbed, or stepped on.	 Velvet Ant

Included within Beneficial Bugs are butterflies, but, because these are special insects, they are not included within the general list. Moths can be pests in specific environments. Butterflies and moths are some of the most familiar of all insects, and may also be the easiest to recognize. Their distinctive color patterns are caused by tiny, overlapping "scales", which are very delicate and resemble the scales on a reptile under a hand lens. Many species of butterflies and moths are collected for their beautiful colors. However, as collection usually kills the insect, and since butterflies are beneficial insects, it is not recommended that live specimens be collected.

The mouthparts of butterflies and moths are unique to the insect world. They are designed to siphon water and nectar from flowers. When not drinking, the siphon is tightly coiled. However, upon landing on a flower, the siphon extends to enable the butterfly or moth to drink. In the process, the butterfly gathers pollen on its feet, which is transferred from flower to flower, pollinating the flowers and enabling reproduction of the plants.

Coiled siphon

Butterflies and moths are closely related, and are both in the scientific Order Lepidoptera. Both have coiled mouthparts and scaly wings, so it is sometimes difficult to tell them apart. In most cases, butterflies fly during the day and moths fly at night. However, this is not always true. The best way to distinguish butterflies from moths is to observe their antennae. Butterfly antennae are always straight with a distinct knob at the end. Moth antennae are straight, and may be either bare or feathery. Moth antennae never have a knob on the end.



Moth and Butterfly Antennae

Table 2 below describes various species of butterflies that are commonly seen in Kentucky for identification purposes. We would like to attribute much of the information shown here to the Society of Kentucky Lepidopterists, the UK Entomology Department, and other sources listed in Chapter 9. Many of the individual photographs are reprinted here by permission from the Society of Kentucky Lepidopterists, and are attributed to the photographer. Additional information may be obtained from the Society of Kentucky Lepidopterists at the web address below:

Kentucky Lepidopterists Society

http://www.kylepidopterists.org

Butterflies are classified into several major Family groups:

1. Brushfoots, Family *Nymphalidae*;
2. Hairstreaks and Blues, Family *Lycaenidae*;
3. Metalmarks, Family *Riodinidae*;
4. Milkweeds, Family *Danainae*;
5. Satyrs, Family *Satyrinae*;
6. Skippers, Family *Hesperiidae*;
7. Swallowtails, Family *Papionidae*; and
8. Whites and Sulfurs, Family *Pieridae*.

Of the groups listed above, only those most commonly found in Kentucky are discussed in Table 3. Additional information may be found at the web site listed above.

Table 2 Beneficial Butterflies Common in Kentucky			
Type	Name	Picture Identification	Picture Identification
Brushfoots, *Nymphalidae*	American Lady *Vanessa cardui*		 Caterpillar
	Common Buckeye; *Junonia coenia*		 Caterpillar

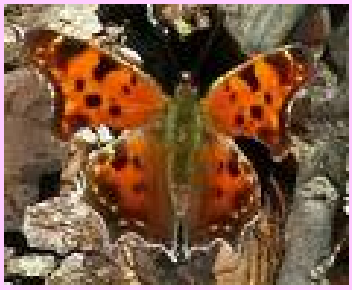
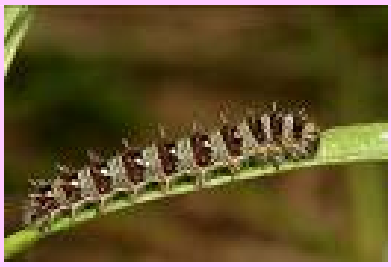
Table 2 Beneficial Butterflies Common in Kentucky, (continued)			
Type	Name	Picture Identification	Picture Identification
Brushfoots, *Nymphalidae*	Eastern Comma *Polygonia comma*		 Caterpillar
	Great Spangled Frittilary *Speyeria cybele*		 Caterpillar
	Hackberry Emperor *Asterocampa celtis*		 Caterpillar
	Painted Lady *Vanessa cardui*		 Caterpillar

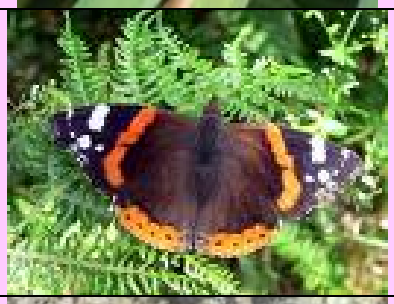
Table 2 Beneficial Butterflies Common in Kentucky, (continued)			
Type	Name	Picture Identification	Picture Identification
Brushfoots, *Nymphalidae*	Pearl Crescent *Phyciodes tharos*		
	Question Mark *Polygonia interrogationis*		
	Red Admiral *Vanessa atalanta*		
	Red-Spotted Purple *Limenitis arthemis astyanax*		
	Variegated Frittilary *Euptoieta claudia*		
	Viceroy *Limenitis archippus*		

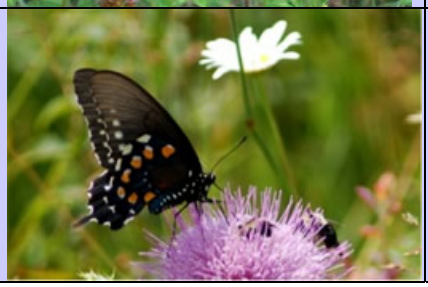
Table 2 Beneficial Butterflies Common in Kentucky, (continued)			
Type	Name	Picture Identification	Picture Identification
Hairstreaks and Blues, *Lycaenidae*	Eastern Tailed Blue, *Everes comyntas*		
	Gray Hairstreak, *Strymon melinus*		
	Spring Azure *Celastrina ladon*		
Swallowtails, *Papionidae*	Eastern Tiger Swallowtail, *Pterourus glaucus*		
	Pipevine Swallowtail, *Battus philenor*		

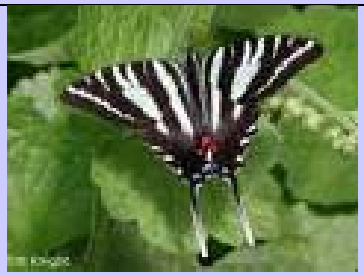
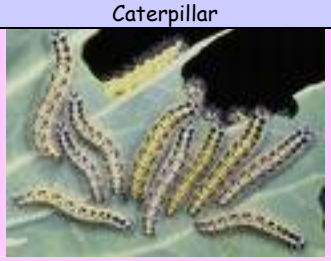
Table 2 Beneficial Butterflies Common in Kentucky, (continued)			
Type	Name	Picture Identification	Picture Identification
Swallowtails, *Papionidae*	Spicebush Swallowtail *Pterourus troilus*		 Caterpillar
	Zebra Swallowtail *Eurytides marcellus*		 Caterpillar
Sulfurs and Whites, *Pieridae*	Cabbage White *Pieris rapae*	 ©yates.co.nz	 Caterpillars
Milkweeds *Danainae*	Monarch Danaus plexippus		
Satyrs *Satyrinae*	Carolina Satyr *Hermeuptychia sosybius*		 Caterpillar

Table 2 Beneficial Butterflies Common in Kentucky, (continued)			
Type	Name	Picture Identification	Picture Identification
Satyrs *Satyrinae*	Gemmed Satyr *Cyllopsis gemma*		 Caterpillar
Skippers, *Hesperiidae*	Sachem Skipper *Atalopedes campestris*		
	Silver-spotted Skipper, *Epargyreus clarus*	 ©Ohio Nature	 Caterpillar, ©enchantedtree.com
White and Sulfurs, *Pieridae*	Clouded Sulphur, *Colias philodice*	 ©simplybutterflies.com	
	Cloudless Sulphur, *Phoebis sennae*		

Table 2 Beneficial Butterflies Common in Kentucky, (continued)			
Type	Name	Picture Identification	Picture Identification
White and Sulfurs, *Pieridae*	Orange Sulphur, *Colias eurytheme*		

Another important, beneficial organism is the earthworm. Called "the intestines of the earth" by Aristotle, earthworms live in the top 1 to 1 1/2' feet of soil. They ingest thatch, an upper layer of living and dead roots, stems, and organic matter. The food moves through the intestines of the earthworm, which helps to decompose the organic materials. The use of pesticides can severely affect earthworms. Populations of earthworms should be encouraged by using little fertilizer and pesticides on the lawn, especially where thatch buildup may be a problem.

As previously stated, not all insects are pests. Some bugs are not considered to be either pests or beneficial to homes, lawns, and gardens. They may be predators to specific pests but also eat their share of beneficial bugs, or they just may have a place in the ecosystem that doesn't represent a problem to homes, lawns, or gardens. TABLE 4 describes some common benign insects found in Kentucky, (and other states), and offers a pictorial guide to aid in identification. As in TABLE 2, these bugs are divided into crawling bugs, hopping bugs, clumsy fliers, and flying bugs. Again, this listing is not a complete listing of all the benign bugs found in the state, but may act as a starting point for identification.

Table 3 Common Benign Bugs Found in Kentucky			
Type	Name	Comments	Picture Identification
Crawling Bugs			
Giant Water Bug	Giant Water Bug	These bugs have a unique appearance and look like a cross between a praying mantid and a cockroach. Most commonly about 1"long in KY, these bugs go through egg, nymph, and adult stages. The bugs are aquatic predators that are found in ponds, slow-moving streams and wetlands. They are not considered pests.	

Table 3 Common Benign Bugs Found in Kentucky			
Type	Name	Comments	Picture Identification
Crawling Bugs			
Kentucky Sowbugs	Roly-poly, Woodlice, or Pillbug	KY Sowbugs are often called by their common names or Roly-poly, Woodlice, or Pillbug. They look very similar, but true Pillbugs roll themselves up into a ball when disturbed. Many of the species in this arthropod family live in aquatic habitats, while others live under rocks and logs. The young hatch from eggs and look like small adults. Even though these bugs sometimes enter buildings, they can not hurt people and do not contaminate food cause damage.	
Seed Bugs	Large Milkweed Bug	Both Large and Small Milkweed Bugs are seed bugs that live on Milkweed plants, and feed on the sap within the plant. Milkweed sap is toxic to most organisms, but Milkweed Bugs store the sap in their bodies to use as a defense. The Large Milkweed Bug is about ¾" long with bold black and red-colored patterns. The Small Milkweed Bug looks very similar, but is smaller, (about ½" long). For more information about Seeds Bugs, see Big-eyed Bugs, Seeds Bugs, page 20.)	 Large Milkweed Bug
	Small Milkweed Bug		 Small Milkweed Bug
	Long-Necked Seed Bug	This distinctive seed bug is very common in gardens, lawns, and agricultural habitats in KY. It is about 3/8" long.	

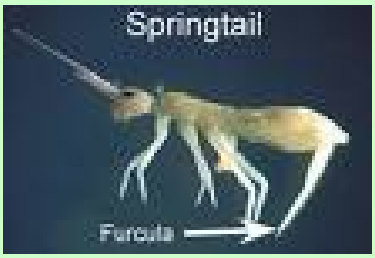
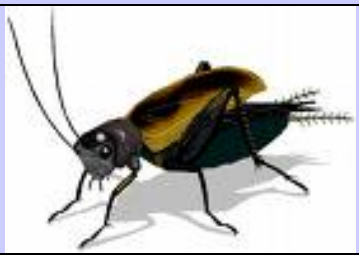
Table 3 Common Benign Bugs Found in Kentucky			
Type	Name	Comments	Picture Identification
Crawling Bugs			
Springtails	Springtails	Springtails are tiny wingless insects with distinctive heads and a humpbacked appearance. Their name comes from a forked structure attached to their abdomen which acts as a spring to flip them into the air. Most live in rich soil or leaf litter, but they may also be found along a house foundation, or sidewalks, or can occur around floor drains, in damp basements and crawl spaces. They are not a pest.	
Worms	Horsehair Worm	Also known as Gordian worms, these worms are very long, (4" or more), and very thin, (1/80 to 1/10" in diameter). Horsehair worms are normally found in water or wet areas, but they may also be found in any open container with water. They are not parasites to humans, livestock, or pets, and they pose no public health threat.	
Hopping Bugs			
Crickets	Crickets have 6 legs, 2 antennae, and three body parts. They are distinctive because of their large back legs. Crickets have leathery front wings, which help to protect the delicate back wings. Females have a long ovipositor at the tip of their abdomen which is used to lay eggs. Crickets are sometimes hard to distinguish from grasshoppers, and undergo a simple metamorphosis. The babies hatch from eggs, resembling wingless adults, and molt several times until they emerge as winged adults. They are omnivorous, feeding on a variety of plant and animal materials, and are an important food source for many animals. Field and house crickets are considered to be pests inside homes, but most crickets cause no harm and prefer to stay in out-of-the way places. Males rub their legs together to make a chirping sound to attract females.		
	Field Cricket	Field Crickets are encountered more often than other crickets. Active at night, they feed on discarded food, dead insects, and almost anything else. They are usually darker than House Crickets	

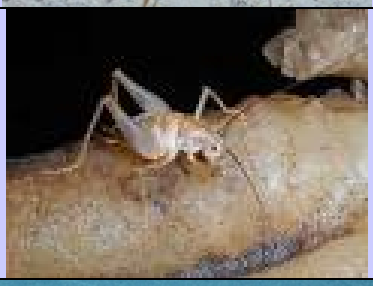
Table 3 Common Benign Bugs Found in Kentucky			
Type	Name	Comments	Picture Identification
Hopping Bugs			
Crickets, (continued)	House Cricket	House Crickets are also active at night, feeding on a variety of discarded food, other insects, or anything handy. They are raised at fish and pet food.	
	Tree Cricket	Tree Crickets are often mistaken for Grasshoppers because they are bright yellow and green in color. Tree Crickets live in trees where they feed on leaves and small insects. Some species are active during the day and others at night.	
	Camel Cricket	Camel Crickets are large, (about 1 ½") and wingless. They live in dark, moist places like caves and basements where they scavenge for decaying plant and animal materials. They are harmless bugs.	
	Cave Cricket	Cave Crickets are included within this guideline simply because they occasionally escape from caves and may be found within the Karst region of Kentucky. These Crickets are large, (1 ½"), wingless, and harmless.	
	Mole Cricket	Mole Crickets have a very different appearance than other crickets. They spend their lives burrowing underground and feeding on plant roots. Some can grow up to 2" long.	

Table 3 Common Benign Bugs Found in Kentucky			
Type	Name	Comments	Picture Identification
Hopping Bugs			
Grasshoppers	Like all insects, Grasshoppers have 6 legs, 2 antennae and 3 body parts. They are distinctive because of their large back legs. These bugs have leathery front wings called "tegmina", which help to protect the delicate back wings. Females have long ovipositors which are used to lay eggs. Grasshoppers are very closely related to Crickets and Katydids, and it may be difficult to tell them apart. In Kentucky, most Grasshoppers are from ½" to 2" long. Young Grasshoppers hatch from eggs inside plant stems, and look like wingless adults. They shed their skin as they go, (molt), finally emerging as winged adults. Most Grasshoppers are herbivores, feeding on plants, and are an important food source for many other animals, including spiders, birds, centipedes, reptiles, amphibians, and small mammals. They are common in sunny locations that are covered with low-growing vegetation. Although these bugs may be a pest if found in large numbers, they are rarely a major concern in KY. Even though many Grasshoppers can fly very well, they have been placed in the hopping category, because their legs are their dominant feature.		
	Katydids	Although they are large and distinctive, Katydids are a type of Long-horned Grasshoppers. They tend to be much larger than other Grasshoppers, and are known for their song: "katy-did-katy-didn't", which is sung by both males and females.	
	Long-horned Grasshoppers	Long-horned Grasshoppers usually have longer antennae than other Grasshoppers. Their antennae are usually as long or longer than their body. They are not as common as other Grasshoppers, but are still very common.	
	Pygmy Grasshopper	Pygmy Grasshoppers look like miniature short-horned grasshoppers. They are usually less than ½" long and are characterized by a long shield which extends all the way down their abdomen.	

Table 3 Common Benign Bugs Found in Kentucky			
Type	Name	Comments	Picture Identification
Hopping Bugs			
Grasshoppers (continued)	Short-horned Grasshopper	These are the most commonly encountered grasshoppers in KY. Short-horned Grasshoppers have shorter antennae than the Long-horned Grasshopper, and the antennae are usually about ½ of the body length.	
Clumsy Fliers			
Cicadas	Cicadas have sucking and piercing mouth parts and are plant-feeders, who use their mouthparts to suck fluids from plants. All Cicadas go through a simple metamorphosis, from egg, to nymph, to adult phases. The females insert eggs into small twigs on living trees using ovipositors. When the eggs hatch the nymphs burrow into the soil where they feed on the juices of plant roots. The nymphs shed several times as they get larger, which takes 1-3 years for the Annual Cicadas and 13 to 17 years for the Periodic Cicadas. Adult Cicadas make a droning noise to help the adults find one another. The Cicada is not a pest of humans, pets, or livestock, but large numbers of them may harm young trees. Older, well-established trees are not usually affected adversely.		 Annual Cicada Nymph
	Annual Cicadas	Annual Cicadas are seen every summer in KY, but individual species may emerge only ever 1 to 3 years. Their nymphs live underground for several years, and their emergence is not as predictable as those of the Periodical Cicada. Most Annual Cicadas are larger, and most have dark green or black bodies and dark eyes.	
	Periodical Cicadas	Periodical Cicada nymphs live underground for either 13 or 17 years, depending on the species, and are very predictable in their emergence. Populations of species are called broods. These Cicadas are usually smaller than the Annual Cicadas, and typically have red eyes. Periodical Cicada adults typically emerge in early summer.	

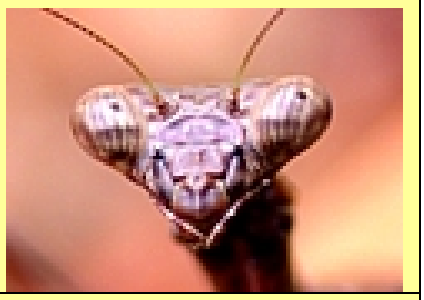
Table 3 Common Benign Bugs Found in Kentucky			
Type	Name	Comments	Picture Identification
Clumsy Fliers			
Praying Mantids	Praying Mantids are among the most distinctive insects. They have elongated bodies, triangular heads, and spiny prey-grabbing, (raptorial), front legs. Mantids have thickened front wings that help protect their hind wings. They also have chewing mouthparts. Praying Mantids are also called Praying Mantis. Sometimes, other insects, such as a Walking Stick or a Mantid Fly, are confused with Mantids. Walking Sticks do not have the raptorial front legs, and Mantid Flies are more rare, smaller, and do not have the protective front wings. Mantids go through a simple metamorphosis, from egg, to nymph, (that resembles a wingless adult), to adult. The Praying Mantids feed on moths, butterflies, caterpillars and other insects. They are not considered to be a pest, but, since they eat beneficial bugs, they are not considered to be beneficial, either. Praying Mantids are an important food source for many other animals.		 Head of a Praying Mantid  Praying Mantid Egg Sac
	Carolina Mantid	An insect native to KY, the Carolina Mantid reaches about 2 ½" long and has a mottled appearance, with gray, white, black, and tan.	
	European Mantid	The European Mantid is usually tan or green and is only 2" to 3" in length. These Mantids were originally in Europe, and were introduced to the US in the 1800's.	

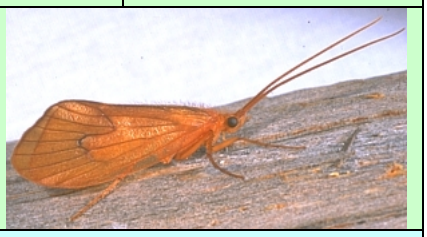
Table 3 Common Benign Bugs Found in Kentucky			
Type	Name	Comments	Picture Identification
Flying Bugs			
Caddisflies	Adult Caddisflies resemble moths, with hairy wings, and 3 body parts, but they do not have the long siphoning mouthparts. Caddisflies live in water, where many of species construct a protective case made of small pebbles, twigs, or other debris. The larvae use silk produced from glands in their mouths. Most live for 2 or 3 years as a larval stage, overwinter in the pupae stage, and emerge as flying adults only for about a month—long enough to mate and produce offspring. They are not considered pests, because they feed on other organisms or algae.		 Caddisfly Larva Case
	Caddisfly	Caddisflies are often used by scientists to determine pollution of streams, lakes, or other waterways, because they require clean water to live.	
Dobsonflies	Dobsonfly	Adult Dobsonflies are large and have 2 pairs of wings and chewing mouthparts. They resemble Dragonflies, but fold their wings over their backs when not flying, and are not as good fliers. Male Dobsonflies have sickle-shaped mandibles that are more than twice the length of their head. The larvae are fully aquatic and resemble wingless adults. They are not considered pests.	
Fishflies	Fishfly	Fishflies are very closely related to Dobsonflies, but are slightly smaller. Both male and female Fishflies have smaller mandibles than the male Dobsonfly. Like the Dobsonfly, the Fishfly undergoes complete metamorphosis. The larvae live underwater for several years before becoming pupae that overwinter. In the spring, the adults emerge to live for only a few days—long enough to mate and lay eggs	

Table 3 Common Benign Bugs Found in Kentucky			
Type	Name	Comments	Picture Identification
Flying Bugs			
Mayflies	Mayfly	Adult Mayflies have 2 pairs of wings that are held over their bodies when they are not flying. The front pair of wings is much longer than the back pair, and the insects have 2 or 3 long "tails" that extend from the tips of their abdomens. Adults have no functional mouthparts, and only live for a few days. Mayflies have an incomplete metamorphosis, The naiads may live underwater for several years before molting into a subimago, or sub-adult that can not mate but has wings.	
Midges & Gnats	Midges & Gnats	Midges and gnats are common names for a variety of small, non-biting flies. Many species look like mosquitoes, and may for annoying swarms or clouds in the air, but they do not bite. These tiny flies do not live long, usually only long enough to mate and breed. There are no problems associated with midges and gnats, even if the swarms can be annoying. Also, there is no way to effectively kill them without harming other, beneficial insects.	
Scorpionflies and Hangingflies	Scorpionfly	Adult Scorpionflies have chewing mouthparts and 4 wings. They can be easily identified by a long mouthpart called the "rostrum". Despite stinger-like external genitalia on the male, neither sex of the Scorpionfly can sting. They have complete metamorphosis. There are several species in KY, and are believed to feed on dead insects, nectar, rotting fruits, and other organic matter. They are not pests.	

Table 3 Common Benign Bugs Found in Kentucky			
Type	Name	Comments	Picture Identification
Flying Bugs			
Scorpionflies and Hangingflies, (continued)	Hangingfly	Hangingflies are much like Scorpionflies, but are distinctive because of their long, raptor-like front legs that are used to catch prey. These bugs are predators that feed on caterpillars, mosquitoes, flies, moths, and other flying insects. Hangingflies attach themselves to a wall, tree, or other object and wait to ambush their prey. They hunt in grassy areas, meadows, and along sheltered cliff-lines.	
Stoneflies	Stonefly	Adult Stoneflies have 2 pairs of wings that are held flat over their bodies when they are not flying. They also have "tails" at the tips of their abdomens. Stonefly naiads are fully aquatic, living for 2 to 3 years underwater, and molt into winged adults. The may be found in fast-moving streams, and are very sensitive to pollution. Most Stoneflies found in KY are very similar in appearance.	
True Flies	The family of True Flies includes house flies, mosquitoes, crane flies, robber flies, and others. For more information please see True Fly, page 40.		 Robber Fly

Table 3 Common Benign Bugs Found in Kentucky			
Type	Name	Comments	Picture Identification
Flying Bugs			
True Flies, (continued)	Robber Flies	Like all true flies, Robber Flies have only 2 wings. They also have a distinctive space between their large eyes. This space between the eyes distinguishes Robber Flies from most other kinds of flies. Most Robber Flies have fine hairs covering their long, piercing mouthparts. Larval Robber Flies are rarely seen, and are usually found in soil. They are legless and soft-bodied, and some are fairly large, and pupate within the soil. Winged adults are active during warm months. These insects are predators of other insects. The adults are famous for their ability to capture prey in the air, and are adept at catching insects that are larger than themselves. These flies are not normally considered pests, even though they may sometimes bite humans. Because they feed on other insects, they may be considered beneficial, but they are indiscriminate feeders and also feed on other beneficial insects.	
	Bearded Robber Fly	Bearded Robber Flies are named because of the many stiff hairs around the mouthparts. Some are also called "Bee Killers" because they are often observed catching bumble bees. Most of these flies are over 1" long, but they will only bite if handled roughly.	
	Hanging Thief Robber Fly	From the Diogmites genus, these flies are often called Hanging Thieves because they hang from plants by their long legs to catch prey.	
	Laphria Robber Fly	Robber Flies in the genus *Laphria* closely resemble bumble bees, with alternating black and yellow patterns. They often capture and eat bees.	
	Small Robber Flies	KY has several small (1/2") Robber Flies in the genus *Cerotainia*. Though common, they are seldom noticed because of their small size. The insects in these genera are all predators.	

The concept of a pest is based on human purposes and perceptions. Under this criterion, a pest is an organism that has characteristics regarded by humans as injurious or unwanted. Usually, an organism is identified as a pest because it is harmful to agricultural activities or the ecosystem, or carries germs within human habitats. Examples include those organisms that vector human disease, such as rats and mosquitoes. The term may also include fungi and viruses.

Table 4 lists some of the common insect pests found in the home and in the lawn for identification purposes. Control options are not discussed in this chapter. Some of these insects may not be considered to be a pest in the lawn and garden, but are certainly a pest in the home, while others are considered to be pests wherever they may be located. This list is not at all complete, but offers a starting point for identification by the homeowner. If you have encountered a pest that is not listed within this table, contact your local Cooperative Extension Agent, the regional university, your nursery, or a Certified Pesticide Applicator for identification purposes.

Again, as noted above, some insects that are commonly considered to be pests are benign or even beneficial. If, during your pest survey, you discover a pest and its predator, you will have to decide whether the damage caused by the insect can be accepted until the predator can control the pest, according to its nature. Remember that using a pesticide often kills not only the pest, but the beneficial predator.

Insects can damage plants, (flowers, landscape trees and shrubs, lawn grass, etc.), in a variety of ways. These are listed below.

8. Chewing – Devouring, notching, or mining leaves; eating wood, bark, roots, stems, fruit, seeds;
9. Sucking – Removing sap and cell contents and injecting toxins into the plant;
10. Vectors of Disease – Carrying diseases from plant to plant, e.g. elm bark beetles carry Dutch Elm disease, various aphids are vectors of certain viral diseases;
11. Excretions – Honeydew deposits lead to the growth of sooty mold, and the leaves can not produce foot through photosynthesis.
12. Gall Formation – Forming galls on leaves, twigs, buds, and roots.
13. Ovipositor Scars – Forming scars on stems, twigs, bark, or fruit; and
14. Injection of Toxic Substances – Some insects inject substances into the plant to aid in digestion of the plant to the insect.

Table 4 Common Home and Lawn Insect Pests Found in Kentucky

Type	Name	Comments	Picture Identification
Ants		While ants are not usually a pest in the lawn and garden, they may be a pest inside the house. Ants can contaminate food, or can cause structural damage to buildings and homes. To most people, all ants look pretty much alike, but each species that occur in the home has unique characteristics that influence the methods of control. Collect a few of the ants and store them in a plastic bag for identification by a professional. It is better to try to herd the ants onto a sheet of paper, then fold the paper and empty it into a plastic bag.	 Worker ants attending to pupae.

Table 4 Common Home and Lawn Insect Pests Found in Kentucky			
Type	Name	Comments	Picture Identification
Ants, (continued)	Allegheny Mound Ants	The Allegheny Mound Ant is common all along the eastern coastal areas, and extends westward into Kentucky as far as Jefferson County. These ants build large mounds at the colony entrance, which can reach up to 2' wide and 8" tall in 5 months. The ants inject the surrounding vegetation with formic acid to clear the area. Small trees and shrubs within 40' - 50' of the mound can be killed, as well as trees up to 8' tall. Populations can be as dense as 27 ants per ft^2. These ants feed on any type of small insect or arthropod.	 Allegheny Mound Ant
	Carpenter Ants	Carpenter Ants are some of the largest ants found in KY, (up to ¾" long). Although they resemble Termites, their waists are narrow, similar to wasps, unlike Termites (the same width from end to end). They make their nests in dead wood, and prefer moist areas. Carpenter Ants search for a variety of food, including insects, nectar, pollen, seeds, or fruit. Although they build their colonies in wood, the do not eat the wood, and rarely cause serious damage to homes.	 Carpenter Ants looking for a satellite nest in a box of tissue
	Large Yellow Ants	Large Yellow Ants, (1/4" long), are also known as Citronella Ants for the "lemony" odor they give off when crushed. The ants nest in soil under logs, rocks, patios, or concrete slabs, but can be abundant in open fields, as well. These ants are usually not a problem unless they are colonies within the home's foundation, crawl spaces, or between insulation and sub-flooring, and they forage in the structure. They are harmless, but can be a temporary nuisance to homeowners because of their superficial resemblance to termites.	

Table 4 Common Home and Lawn Insect Pests Found in Kentucky			
Type	Name	Comments	Picture Identification
Ants, (continued)	Odorous House Ants	Odorous Hose Ants are a common infestation problem. This pest is often found in long trails over household surfaces and can contaminate food products. Although these ants do not bite or sting, they can become a pest if found foraging in large numbers. These ants are tiny, (about 1/8" long), and are dark brown or black in color. They are easily identified by the coconut odor produced when their bodies are crushed.	 Odorous House Ant trail.
Aphids	Aphids	Aphids are soft-bodied insects that use their piercing and sucking mouthparts to feed on plant sap. They usually occur in colonies on the undersides of tender end growth. Heavily infested leaves can wilt or turn yellow because of excessive plant sap. While an established plant may look bad, aphid feedings will not usually harm healthy trees and shrubs. However, some plants are very sensitive to aphid feedings. Aphid feedings may cause some plant leaves to pucker or become severely distorted. Aphids produce a large amount of a sugary liquid "honeydew" that can spot windows and cars. A black, sooty mold can grow on honeydew deposits, which can be the first sign to a homeowner that aphids are infesting plants. Some aphids are vectors of plant viruses.	 Aphids on flower blossom
Bagworms	Bagworms	Bagworms are caterpillars that make distinctive spindle-shaped bags on a variety of trees and shrubs. They attack both deciduous and evergreen trees and shrubs. Bagworms are the larval, (caterpillar), stage of a moth that is rarely seen. Only the males fly, the females remain as grub-like worms.	 Bagworm cocoon – usually seen in late summer throughout fall.

Table 4 Common Home and Lawn Insect Pests Found in Kentucky			
Type	Name	Comments	Picture Identification
Bedbugs	Bedbugs	In recent years, bed bugs have become more prevalent. Bedbugs are small, brownish, flattened insects that feed solely on the blood of animals. Adult Bedbugs are about 3/16" long, and are sometimes mistaken for ticks or cockroaches. Under favorable conditions, (70°-80°), Bedbugs can complete their development from egg to nymph to adult in as little as a month. Bedbugs do not have nests like ants or bees, but they tend to congregate in habitual hiding places, that are often marked by dark stains.	 Bedbugs on a mattress with the staining commonly associated with an infestation.
Bees and Wasps	Carpenter Bees	Carpenter Bees are normally not pests, but can be considered to be a pest when they hover around the doorway of a home. While the males are aggressive, they have no stinger, but the females can inflict a painful sting if handled or molested. Carpenter Bees resemble Bumble Bees, but their abdomens are shiny and black. These bees tunnel into wood to lay their eggs, and prefer bare wood to painted surfaces. Staining wood surfaces offers some protection, as well. Nests are perfectly round and about the size of your little finger.	 Carpenter Bee entering nest.
	Honeybees	Honeybees are considered to be a beneficial insect, but may be considered a pest if they build a hive that interferes with human's everyday life. Even though these bees can inflict a painful sting, it is usually not fatal except to those that are severely allergic. See Honeybees, page 35 for more information.	

Table 4 Common Home and Lawn Insect Pests Found in Kentucky			
Type	Name	Comments	Picture Identification
Bees & Wasps	European Hornet	The European Hornet is normally a woodland species, but may also be found in barns, attics, hollow walls, and abandoned bee hives. Their nests are large, partially because the insects are so large. This hornet may be a pest because it is a stinging insect that may build its nest too close to human activities, but it also strips bark from ornamental plants, eats tree fruits, and it may raid domestic honeybee hives. Since these hornets live 400 or more to a nest, they should be approached with caution.	
	Hornets	Hornets are far more difficult and dangerous to control than other bees and wasps. The nests resemble a large, inverted tear-drop shaped ball which is typically attached to a tree. These are very aggressive stingers that often hover around open garbage cans, picnic areas, or other places where food is readily available.	
	Yellowjackets	Yellowjackets can be another dangerous wasp encountered around homes and buildings. Nests are often located underground in an old rodent burrow, beneath landscape timber, or in a rock wall or the wall of a building. Yellowjackets are as aggressive as hornets when disturbed.	
	Paper Wasps	Paper Wasps can be pests if located around homes and buildings. They typically build their umbrella-shaped nests under eaves and ledges. Paper Wasps are not as aggressive as Hornets and Yellowjackets, but can deliver several painful stings.	

Table 4 Common Home and Lawn Insect Pests Found in Kentucky			
Type	Name	Comments	Picture Identification
Beetles	Blister Beetles	Blister Beetles get their name by leaking a caustic fluid from their leg joints when disturbed. In KY, these beetles may be a problem for hay producers because they are toxic to horses.	
	Colorado Potato Beetle	For home gardeners, the Colorado Potato Beetle, or "Potato Bug" is a very familiar pest. Both the adult and the larvae feed on plants, damaging or even killing plants. These can be a serious pest to potatoes, tomatoes, eggplants, and peppers. The Colorado Potato Beetle is also notorious for developing resistance to insecticides.	
	Confused Flour Beetle	Confused Flour Beetles, Red Flour Beetles, and Saw-toothed Grain Beetles are about 1/8" long and are reddish-brown in color. These Beetles can not feed on whole or undamaged grains, but will feed on a wide variety of processed grains, (flour, meal), as well as dried fruits, dry dog food, dried meats, candy bars, drugs, tobacco, and a variety of other products. The immature or larval stages of these bugs usually occur only in infested products and are not normally seen.	 The Confused Flour Beetle can fly and are attracted to lights.
	Red Flour Beetle		 The Red Flour Beetle can not fly and will crawl toward light.
	Saw-toothed Grain Beetle		 The Saw-toothed Grain Beetle is not attracted to light, and can not fly.

Table 4 Common Home and Lawn Insect Pests Found in Kentucky			
Type	Name	Comments	Picture Identification
Beetles	Cigarette Beetle	The Cigarette and Drugstore Beetles attack almost any household food, spices, and leather articles. Cigarette Beetles are more usually found in dry dog food and paprika. Drugstore Beetles are often in bread, flour, meal, breakfast foods, and spices like red pepper. Adults of both species can fly and are attracted to light.	 Cigarette Beetle
	Drugstore Beetle		 Drugstore Beetle
	Carpet Beetle	Carpet Beetle larvae are capable of damaging carpets, or any other household materials such as wool, silk, feathers, felt, and leather. Serious infestations may develop undetected. These are small, (1/8"), oval beetles. The most common color of adult beetles is black, but they may also be yellow, white, brown, or orange.	
	Elm Leaf Beetle	Elm Leaf Beetles are olive-green beetles with black stripes running down their backs on both sides and in the center. They are a serious pest of Elm Trees, as well as other urban trees. Elm Leaf Beetles lay their eggs in double rows on the undersides of leaves. The larvae are black, and the pupae are orange.	
	Flea Beetle	Also called Grape Flea Beetles are small beetles found on buds and unfolding leaves, primarily on wild and cultivated grapes. Adults are a dark metallic greenish-blue, about $\frac{1}{4}$" long.	

Table 4 Common Home and Lawn Insect Pests Found in Kentucky			
Type	Name	Comments	Picture Identification
Beetles	Japanese Beetle	The Japanese Beetle is probably the most damaging of landscape pests in KY. Adult Japanese Beetles are about ½" long, metallic green beetles with copper brown wing covers. Adults emerge from the ground and begin feeding on plants in June, for 30 to 45 days. Japanese Beetles feed on about 300 species of plants. A single beetle does not do much damage; it is group feeding that result in severe damage. Leaves that have been eaten by Japanese Beetles have a lacy or skeletal appearance, while trees appear to be fire-scorched. Japanese Beetle grubs may infest lawns, as well, leaving dead or brown patches.	 Japanese Beetles are brown, whereas other beneficial Beetles are green, even though they appear to be very similar.
	Lady Beetle -- Asian Lady Beetles	Asian Lady Beetles are considered to be beneficial in the lawn, because they are predatory to many pests. However, they can overwinter in homes and become a pest. The species also attacks other Lady Beetle larvae, reducing native populations. It is difficult to identify because it has a highly variable number of spots.	
	Mexican Bean Beetle	The Mexican Bean Beetle is a type of Lady Beetle that is large, and plant-eating. It will sometimes cause injury to bean crops or other plants. It is more common in the south.	
	Powderpost Beetles	Powderpost Beetles are a type of beetles that attack wood, reducing it to a fine, flour-like powder. Damage is done by the larvae as they create narrow, meandering tunnels in wood as they feed. The beetles may infest wood paneling, molding, window and door frames, hardwood floors and furniture, as well as structural timbers.	

Table 4 Common Home and Lawn Insect Pests Found in Kentucky			
Type	Name	Comments	Picture Identification
Beetles	Squash Beetle	Squash Lady Beetles may also become a pest. They are usually yellow with black spots.	
	Southern Pine Beetle	Southern Pine Beetles are 1/8" long and is the most destructive forest insect in the southern US. Fortunately outbreaks of major infestations only occur in KY every 25 to 30 years, and only last for 3-4 years.	
	Striped and Spotted Cucumber Beetle	Both the Striped and Spotted Cucumber Beetles feed mainly on foliage, pollen, and flowers of cucumber, watermelons, and muskmelons, as well as represent a major concern of the bacterial wild of these plants. About ¼" long, their distinctive pattern makes them relatively easy to identify.	
Borers	Clearwing Borers	Borers are delicate, day-flying moths that resemble small wasps. The Borer moths feed only on nectar, (or not at all), so they do not cause damage. The larvae are whitish, hairless caterpillars with a brown head that can cause severe damage to trees, by tunneling under the bark.	 Clearwing Borer -- Banded Ash Borer
		 Clearwing Borer – Dogwood Borer	 Clearwing Borer – Lilac Borer
		 Clearwing Borer -- Lesser Peachtree Borer	 Clearwing Borer -- Peachtree Borer

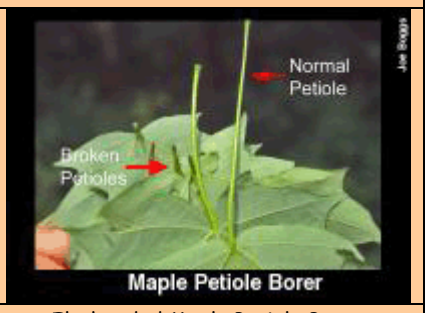
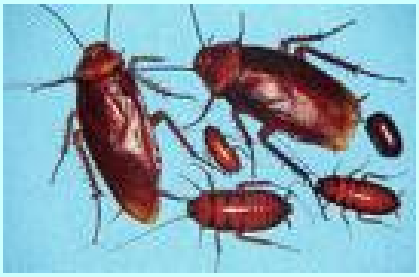
Table 4 Common Home and Lawn Insect Pests Found in Kentucky			
Type	Name	Comments	Picture Identification
Borers	Flatheaded Borers	Flatheaded Borers are so named because the first body segment behind their head is flattened. The adults are fast-moving, flattened, metallic covered, and have short antennae. The whitish, legless larvae make winding tunnels beneath the bark. The tunnels may be visible externally as spiral ridges or cankers on the limbs or trunks.	 Flatheaded Borer -- Bronze Birch Borer
		 Flatheaded Appletree Borer	 Flatheaded Maple Petiole Borer
Boxelder Bugs	Boxelder Bugs	Boxelder bugs are common pests that feed on sap from leaves, twigs, and seeds of boxelders, as well as other members of the maple family. These bugs are about 1/2" long, and are considered to be a nuisance outdoors, not necessarily a pest. They do not invade home.	
Cockroaches	Cockroaches are the most common pest infesting homes, food service establishments, and other structures in KY. Not only are these bugs repulsive, they are also capable of mechanically transmitting disease organisms such as the bacterial which cause food poisoning. Recently, cockroaches have been found to be an important source of allergy in people, second only to house dust. Cockroaches typically become established in homes after being introduced in grocery bags, laundry, or, in some cases, from wandering in from outdoors. Once established, they are prolific breeders capable of producing several thousand offspring per year.		
	American Cockroach	The American Cockroach is a structure-infesting species that is about ½" long, with reddish-brown wings and light markings on the thorax. They are very aggressive, and prefer warm, damp areas. The American cockroach is more likely to be seen in daytime, and in food preparation areas. As a scavenger, it will eat almost anything.	

Table 4 Common Home and Lawn Insect Pests Found in Kentucky			
Type	Name	Comments	Picture Identification
Cockroaches	Brown-banded Cockroach	The Brown-banded Cockroach is named for the two brownish-yellow bands on its wings. They are about 5/8" long, and are more usually seen at night. The can fly, and may be found throughout many structures, but prefer dry, warm areas, high locations, (like attics), and furniture. As a scavenger, it will eat almost anything.	
	German Cockroach	The German Cockroach is about 5/8" long, and has two dark longitudinal streaks on the thorax. It is a nocturnal cockroach found in and primarily infests food areas. It is commonly found around apartments, supermarkets, and restaurants.	
	Oriental Cockroach	The Oriental Cockroach is about 1" long, and is dark brown in color. It is commonly seen outdoors, and it often enters buildings through sewer pipes. They tend to live near the ground and in warm, damp areas. The Oriental Cockroach is often found feeding on garbage, sewage, and decaying organic matter. If available, the insect seems to prefer starches.	
Drain Flies	Drain Flies	Drain Flies are sometimes called Moth Flies. They are common insects, but are often overlooked because the like moist, highly organic areas such as sink drains, sewage treatment facilities, storm drains, dung, and rotten vegetation. The larvae are considered to be beneficial, but the adult flies can become so numerous as to be a nuisance.	

Table 4 Common Home and Lawn Insect Pests Found in Kentucky			
Type	Name	Comments	Picture Identification
Fleas	Fleas	Flea is the common name for any of the small wingless insects that are external parasites, living off of the blood of humans and mammals. There are several species of fleas, including the cat flea, the dog flea, the human flea and the Northern rat flea.	
Fruit Flies	Fruit Flies	Fruit Flies are common in homes, restaurants, supermarkets, and wherever else food is allowed to rot and ferment. Adults are about 1/8" long and usually have red eyes. Fruit Flies lay their eggs near the surface of fermenting foods or other moist, organic materials. Their entire life cycle can be completed in about a week.	 Fruit Fly
Galls	Galls	Galls are irregular plant growths caused by the interaction between plant hormones and chemicals produced by some insects or mites. They are a symptom of an insect or mite infestation	 An example of galls, a symptom of insect or mite infestation.
Houseplant Pests, (if not listed elsewhere)	Cyclamen Gnats	Cyclamen mites are microscopic and almost transparent. They infest violets and cyclamen, and occur in protected areas on tender growth. Leaves of an infested plant are twisted and brittle and may turn black.	
	Springtails	Springtails range in size from microscopic to about $\frac{1}{4}$" long. Their color ranges from white to black. They are able to jump and may float to the soil surface during watering. These insects may chew seedlings or tender plant parts near the soil surface.	

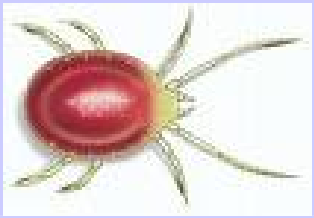
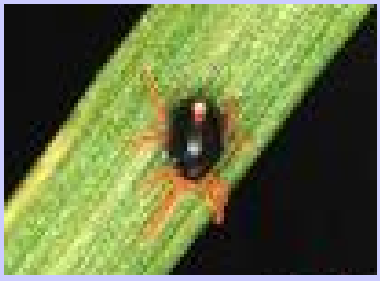
Table 4 Common Home and Lawn Insect Pests Found in Kentucky			
Type	Name	Comments	Picture Identification
Houseplant Pests, (if not listed elsewhere)	Thrips	Thrips are slender insects that are barely visible to the naked eye. Colors range from yellow, tan, brown, or black. Thrips rasp leaves and suck sap from leaves and flowers. Injury to the plant appears as silvered areas that are speckled with dark fecal spots.	
	Whiteflies	Whiteflies are about 1/16" long and resemble powdery white moths. They suck sap, causing leaves to turn pale and die or drop off.	
Lice	Head Lice	Head Lice are blood-sucking insects that live exclusively on humans. The usually infest only the head, preferring the nape of the neck and behind the ears. The first indication of head lice is itching and scratching caused by the irritating bites.	
Mites	Clover Mites	Clover Mites are accidental invaders in the home that can be a nuisance during the early spring and fall. They are very small, reddish-brown creatures that appear only as moving dark spots to the naked eye. They do not suck blood and do not harm people or pets.	
	Grain Mites	Grain Mites are pests that can feed on a variety of processed or finely ground grains, wheat germ, yeast, cheese, powdered milk, flour, or mold spores. Mite dust, caused by excess population of mites on the search for food, is often the first sign of trouble.	

Table 4 Common Home and Lawn Insect Pests Found in Kentucky			
Type	Name	Comments	Picture Identification
Mites	House Dust Mites	House Dust Mites are related to ticks and chiggers, but are very tiny. Their primary source of food is skin dander shed from human and pet activity. Their significance is the powerful allergens carried by the mites, their skin casts, fecal material, and secretions.	
	Parasitic Mites – Bird & Rodent Mites	Rodent and Rodent Mites normally live on the host or in their nests but migrate to areas of a structure where the animal dies or abandons the nest. Their bite causes moderate to intense itching and irritation to humans. They are very tiny, but can usually be seen with the naked eye.	
	Parasitic Mites – Chiggers	Chiggers are the larvae of a family of mites that are sometimes called red bugs. The adults are large, red mites often seen running over pavement and lawns. Chiggers are extremely small and are difficult to see without magnification. Their larvae are yellow-orange or dark red in color, and are usually found in low, damp places where vegetation is rank, and grass and weeds are overgrown. The larvae do not bury in the skin, but inject a salivary fluid which produces a raised, hardened area and an intense itch.	
	Spider Mites – Red Spider Mites	Red Spider Mites are very difficult to see. Leaves become speckled, as though covered with hundreds of thousands of dots, giving the plant a 'dusty' appearance. Heavily infested plants may become covered with fine webs. These pests feed on the sap of plants.	

Table 4 Common Home and Lawn Insect Pests Found in Kentucky			
Type	Name	Comments	Picture Identification
Mites	Spider Mites – Spruce Spider Mite	The Spruce Spider Mite is most prevalent during the cool spring and fall weather, causing discolored foliage and premature leaf drop. The oval shaped mite is very tiny and difficult to see. Red eggs may be seen on the bark of small branches. They may produce webbing.	
	Spider Mites – Two-spotted Spider Mites	Two-spotted Spider Mites are the most common destructive mite on deciduous ornamental plants. Strands of webbing are spun by the mites on the undersides of infested leaves between branches.	
Mosquitoes	Mosquitoes	Mosquitoes can be both a significant nuisance and a vector of human and wildlife diseases. While more than 50 species may be found in KY, only a few are a significant nuisance/public health threat. Female mosquitoes are blood feeders, and require a meal before laying their eggs. Malaria and yellow fever used to be common in KY, thanks to mosquitoes, but these diseases have been successfully eliminated. Currently, viral encephalitis and the West Nile virus represent the greatest danger to humans.	
Moths & Caterpillars	Moths are one of the most familiar of insects, along with their harmless counterparts, butterflies. Many adult moths are harmless, but moths in their larval stage, caterpillars, may cause serious damage to plants. Unlike butterflies, the antennae of moths are long and have no knob on the end. Other moth antennae are feathery. In most cases, butterflies fly during the day, while moths fly at night. There are exceptions to this rule, of course.		
	Angoumois Grain Moth	The Angoumois Grain Moth is a pest of pantries that is ½" long and pale yellow brown. It is usually found fluttering in the house. Like weevils, the larvae develop in whole kernels or caked grain. Decorative ear corn is a common source of the insect.	

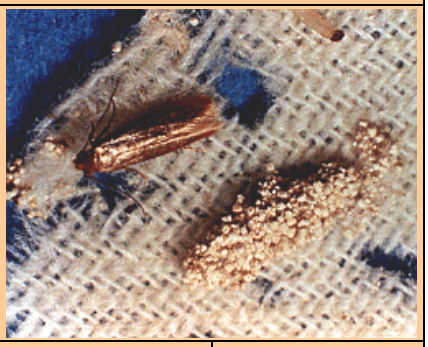
Table 4 Common Home and Lawn Insect Pests Found in Kentucky			
Type	Name	Comments	Picture Identification
Moths & Caterpillars	Cankerworm	Cankerworms are also called inchworms, loopers, or spanworms because they move with a distinct 'looping' motion. Small numbers are present every year and are not a nuisance. However a large infestation can seriously damage landscape plants. The adult moths are not considered to be pests.	
	Clothes Moth	Clothes Moths are small, (1/2" long), buff-colored moths. Two different species are common in KY, the Webbing Clothes Moth is uniformly buff-colored, and the Casemaking Clothes Moth has distinct dark specks on the wings. They avoid light, and prefer dark, undisturbed areas where they can feed on fabric.	
	Eastern Tent Caterpillar	Eastern Tent Caterpillars are considered to be pests because they defoliate trees, build unsightly nests in trees, and wander onto sidewalks, patios, other plants, and roads. Usually a defoliated tree with put out new leaves, but the caterpillars are a nuisance and can create a mess. The adult moth is not considered to be a pest.	 Eastern Tent Caterpillar  Eastern Tent Caterpillar Moth
	Fall Webworm	Fall Webworm caterpillars are sometimes mistaken for the Eastern Tent Caterpillar. The easiest way to tell them apart is that Fall Webworms build their nests on the ends of branches, while the Eastern Tent Caterpillar builds its nests in the forks of branches. The adult moths are not considered to be pests.	 Fall Webworm nest  Fall Webworm Moth

Table 4 Common Home and Lawn Insect Pests Found in Kentucky				
Type	Name	Comments	Picture Identification	
Moths & Caterpillars	Forest Tent Caterpillar	The Forest Tent Caterpillar is also very similar to the Eastern Tent Caterpillar in habits, except they feed primarily on tender leaf buds at the ends of branches. After the buds open, they feed on foliage. The Forest Tent Caterpillar has key-hole shaped markings on its back.	 Forest Tent Caterpillar	 Forest Tent Moth
	Gypsy Moth	Gypsy Moth caterpillars feed on a approximately 500 different kinds of plants, often decimating large areas of forest, while the adults do not feed. The caterpillars shown at right are on an egg sac, but the adult females do not build nests.	 Gypsy Moth Caterpillar	 Gypsy Moth
	Sphinx Moths – Carolina Sphinx & Tobacco Hornworm	The Tobacco Hornworm is a major pest of tobacco and related plants, like the tomato. The moth and the caterpillar are fairly large, (up to 3" for the caterpillar and 2" for the moth). They are often seen dotted with the white larvae of a parasitic moth.	 Tobacco Hornworm	 Carolina Sphinx Moth
	Sphinx Moths – Catalpa Sphinx & Catalpa Worms	The Catalpa Sphinx is often found in urban areas where its larvae feed on leaves of the Catalpa Tree. The larvae are sometimes raised and sold as fish bait.	 Catalpa worm	 Catalpa Moth
	Sphinx Moths – Clearwing Sphinx	Clearwing Sphinx Moths are often referred to as Hummingbird Moths, because, like the hummingbird, they mimic bees in their behavior. Larvae feed on honeysuckle and snowberry among other plants.	 Clearwing Sphinx caterpillar	 Clearwing Sphinx Moth

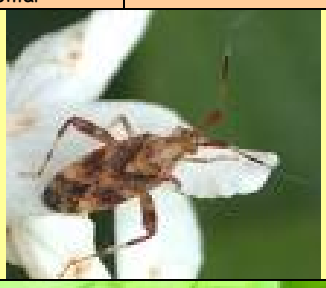
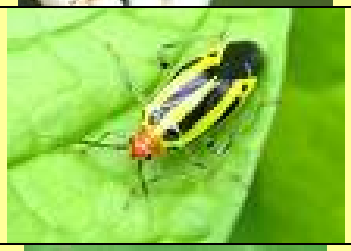
Table 4 Common Home and Lawn Insect Pests Found in Kentucky			
Type	Name	Comments	Picture Identification
Moths & Caterpillars	Sphinx Moths - Five-spotted Hawk Moth & Tomato Hornworm	Very closely related to the Carolina Sphinx Moth, the Five-spotted Hawk Moth is found on many of the same host plants.	 Tomato Hornworm caterpillar  Five-spotted Hawk Moth
	Sphinx Moths - Waved Sphinx	Closely related to the Catalpa Sphinx, the Waved Sphinx caterpillar feeds on Ash trees, Lilac, and a few other hosts. The larvae look very similar to tobacco hornworms.	 Waved Sphinx caterpillar  Waved Sphinx Moth
Plant Bugs or Leaf Bugs	Clouded Plant Bug	The Clouded Plant Bug is about ¼" long and may be a pest on landscape plants, causing the leaves to shrivel and die. They are often found on the lower branches of shrubbery.	
	Four-lined Plant Bug	The Four-lined Plant Bug has four distinct black and yellow stripes down its back. It appears in May and June on a variety of plants in gardens, occasionally damaging landscape plants.	
	Tarnished Plant Bug	The Tarnished Plant Bug is about 3/8" long. The bug is common throughout late spring, summer, and fall in KY, and is sometimes a serious pest of garden plants.	
Praying Mantids	Chinese Mantids	The Chinese Mantid is the largest praying mantid in KY. Introduced as a beneficial bug, it is now considered to be a pest because it feeds on other beneficial bugs and native insects, like the Carolina Mantid, (See Beneficial Bugs).	

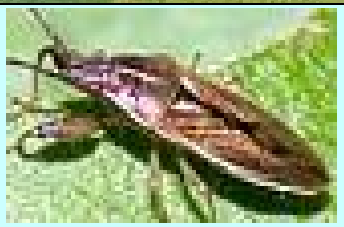
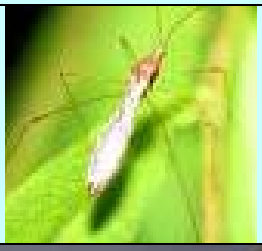
Table 4 Common Home and Lawn Insect Pests Found in Kentucky			
Type	Name	Comments	Picture Identification
Seed Bugs	Chinch Bug	The Chinch Bug is a small, (1/4") insect that feeds on grasses, lawn grasses, corn, and related plants like wheat. It is sometimes a serious pest.	
	Oedancala Seed Bug	Seeds bugs in the *Oedancala* genus may be the most frequently encountered pest bugs in KY. They are about $\frac{1}{4}$" long, and is believed to feed on the seed heads of grasses and sedges.	
	Stilt Bug	Stilt bugs have long, thread-like antennae and legs. They can be found feeding on tomatoes, tobacco, gourds, and related plants, although they do not usually cause significant damage.	
Scales	Scales	Scales are so unlike insects that most people don't know they are insects. These insects are hidden under a waxy or hard cover. Long, piercing mouthparts allow them to suck juices from leaves, stems, twigs, branches, and trunks. The entire plant may decline and die. Honeydew may be abundant, and sooty mold may grow on the honeydew, obscuring the damage from the insect.	 Calico Scale  Cotton Maple Scale
		 Euonymus Scale	 Magnolia Scale
		 Oystershell Scale	 Tuliptree Scale

Table 4 Common Home and Lawn Insect Pests Found in Kentucky			
Type	Name	Comments	Picture Identification
Silverfish	Silverfish	Silverfish and Firebrats are shiny, silver gray, or mottled gray insects that prefer warm, dry areas, such as a furnace room. They are active at night and hide during the day. They eat foods high in protein and starch, like glue or paste, book bindings, starch in clothing, and rayon fabrics.	
Slugs	Gray Field Slug	The Gray Field Slug is a European slug that is common in Kentucky. Some are tan with a speckled pattern, while others are light colored with little speckles. They can reach lengths up to 2½" long. They can lay 500 eggs per year and are some of the most destructive slugs in KY.	
	Spotted Garden Slug	The Spotted Garden Slug is about the same size as a Gray Field Slug, but is light colored and speckled with brown spots. This, too, can be a very destructive slug.	
Spiders	Black Widow	Black Widow Spiders have shiny black bodies. The females have bright red markings on their thorax, while the male has yellow and white markings. It is cobweb spider. The males rarely bite humans and are often not seen. The females can deliver a painful bite, and are about ½" long.	
	Brown Recluse	The Brown Recluse is a tan, long-legged spider with a dark pattern on its head that resembles a violin or a fiddle. They usually build their webs that are messy and dense, and are located close to the ground or floor against the side of a wall in underground or secluded locations. These spiders can deliver a very painful bite.	

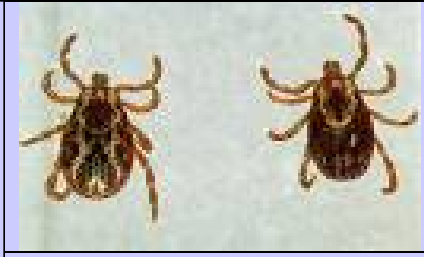
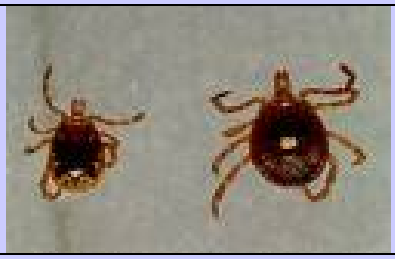
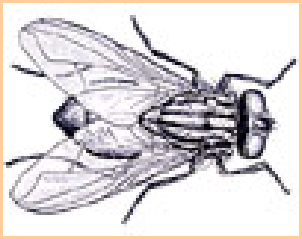
Table 4 Common Home and Lawn Insect Pests Found in Kentucky			
Type	Name	Comments	Picture Identification
Stink Bugs		Stink Bug pests commonly feed on plants and trees, and are often found in a variety of woody and weedy habitats. They use their piercing and sucking mouth parts to feed on the sap of insects. Stink bugs get their name from the bad-smelling, bad-tasting fluid they excrete from pore on the sides of their bodies.	 *Mormidea* Stink Bug
		 Red Shouldered Stink Bug	 Rice Stink Bug
Termites	Termites	Termites can be some of the most damaging insects to homes. Related to ants and wasps, Termites are usually discovered during March through May, when winged termites swarm inside of structures. Termites are often seen around doors, windows, and light fixtures. Unlike ants, Termites have straight antennae, uniform waist, and wings of equal size.	
Ticks	Ticks	Ticks have eight legs and two main body parts, a head and a thorax. These arthropods attach themselves to a host for several days, sucking the blood out of the host and living on the blood. Some ticks grow to about ¼", but most are smaller, unless they are engorged on blood. Neither the American Dog Tick, nor the Lone Star Tick, which are commonly found in KY, are transmitters of Lyme Disease. Lone Star Ticks have a single dot in the middle of their thorax.	 American Dog Tick  Lone Star Tick

Table 4 Common Home and Lawn Insect Pests Found in Kentucky			
Type	Name	Comments	Picture Identification
True Flies	Black Horse Fly	Horse Flies are related to House Flies, and are large flies usually found around stables. They are known for their painful bite to humans, pets, and livestock. Some people are allergic to Horse Fly bites.	
	Blow Fly	Blow Flies have distinctive metallic blue or green coloration. They are usually associated with decaying animal flesh.	
	Blue Bottle Fly	Blue and Green Bottle Flies are robust flies with shiny metallic bodies that can often be found in homes. These insects often develop in carrion and are usually apparent in small numbers. However, their buzzing noise can be annoying.	
	Cluster Fly	Cluster Flies often become pests in the home. They usually buzz around in the late fall, early winter, or on a warm, sunny day in the spring. These flies are a little larger than a house fly, but are more sluggish. The maggots develop as parasites in the bodies of earthworms, so they do not breed indoors.	
	Deer Fly	Deer Flies are typically smaller, (about $\frac{1}{4}$"), than Horse Flies, and they deliver a painful bite. These flies usually have patterned wings. They many transmit a bacterial disease, (tularemia), to rabbits, livestock, pets, and humans.	
	Face Fly	Face Flies are serious pests of cattle and may over-winter in homes. They closely resemble houseflies, but their larvae develop in fresh cattle manure. The adults feed on the mucous secretions from the eyes and noses of cattle and horses.	

Table 4 Common Home and Lawn Insect Pests Found in Kentucky			
Type	Name	Comments	Picture Identification
True Flies	Green Bottle Fly	See Blue Bottle Fly	
	House Fly	House Flies may easily be confused with Blow Flies, or other flies, because they are similar in appearance. They are usually dark colored, with 4 black stripes on their thorax, about 3/8" long, robust, and hairy. These flies have sponge-like mouth parts that soak up liquids. They usually breed in carrion, animal wounds, or animal waste. Maggots serve an important ecological function by breaking down wastes. They are an important food source for birds and other insects.	
White Grubs	White grubs are the larval stage of several different types of beetles and other insects. They can be some of the most destructive pests of turfgrass, when the grubs chew off the grass roots just below the surface. Most are curled into a "C" shape when at rest.		
Weevils	Rice Weevil	Rice Weevils are small reddish-brown or black weevils that invade grain supplies inside the home. The grain may be chewed to a fine powder, and the weevil discovered some distance from the food source..	

References for this chapter are listed in Chapter 9.