# Common Structural and Health-Related Pests of Utah









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# Common Structural and Health-Related Pests of Utah

Ryan Davis, Utah State University
Deborah Young, Colorado State University
Kelsie Johnson, Utah State University
Roberta Armenta, Colorado State University
Genevieve Berry, Colorado State University

## ORDERING INFORMATION

A PDF version is available online on the USU School Integrated Pest Management website (http://utahpests.usu.edu/schoolipm/). To order additional bound copies of Common Structural and Health-Related Pests of Utah, contact Utah State University Extension Publications.

### Website:

extension.cart.usu.edu

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# FOREWORD

This guide was developed to aid in the identification and control of common arthropod and vertebrate pests found in and around Utah's urban buildings and homes as well as pests of health concern. It is not an exhaustive list of all urban pests in Utah. After using this guide to identify a pest, verify the pest's identity using online resources or by contacting the Utah Plant Pest Diagnostic Lab.

Included in this handbook are pests common to the region and those documented to be a problem in urban areas. Each spread includes:

IDENTIFICATION:
Brief description of the pest.

NESTING HABITS:
Common nesting locations, structures and nest components.

DIET:
Preferred food of the pest.

SIGNIFICANCE:
Damage or injury caused by the pest.

IPM RECOMMENDATIONS:
Brief suggestions on how to handle the pest problem in an effective and environmentally safe way.

# Argentine Ant

Linepithema humile

## Identification

- light to dark brown
- 1/8 inch long
- 12-segmented antennae without a club
- single node (bump between middle and rear body sections) with sharp peak distinguishes it from odorous house ant (see arrow in top image)

## Nesting Habits

- outdoors: in soil; under rocks and logs; potted plants; landscaping mulch; concrete slabs; crawl spaces; piles of wood or organic matter; exterior walls behind brick
- indoors: in wall voids, under carpets and in basements, usually near moisture (sinks, tubs, leaks, etc.)
- not a common pest in most of Utah

## Diet

- honeydew produced by aphids and other insects
- feed on a wide variety of foods, but are partial to sweets

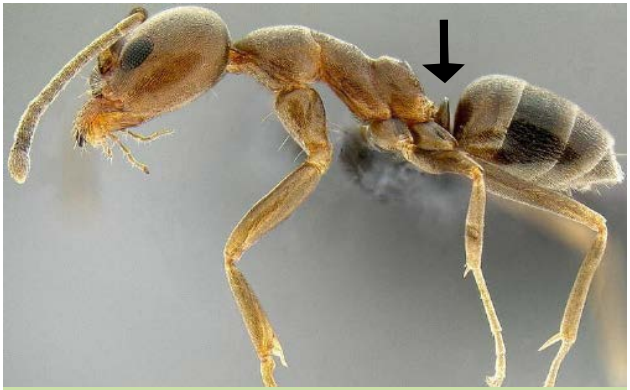
## Significance

- form supercolonies which encompass many individual colonies
- invade buildings when conditions outside are too wet or too dry
- may contaminate food

## IPM Recommendations

- Locate and destroy all nests (follow ant trails from food source to nest, if possible).
- Trim back shrubs and trees that come into contact with buildings.
- Seal all potential ant entryways.
- Use insecticidal baits, especially during winter – early spring when populations are smaller.
- Control is difficult; consider hiring a pest management professional to manage Argentine ants.





Adult Argentine ant (Eli Sarnat, USDA APHIS, Bugwood.org)

Argentine ant trail (Joseph LaForest, University of Georgia, Bugwood.org)


Close-up of an Argentine ant (April Nobile, Antweb.org)

# Carpenter Ants

Camponotus spp.

## Identification

- one node (bump between middle and rear body sections)
- typically black or black with a reddish-brown body
- ants of different sizes
- evenly rounded thorax differentiates them from field ants (see left arrow in top image)
- sawdust outside of nests/galleries (see middle image)

## Nesting Habits

- establish nests in wood (especially decaying wood)
- have a primary nest and separate satellite nests
- satellite nests may occur indoors
- foragers—they go out in search of nutrients but return to the outdoor nest

## Diet

- living and dead insects, meats, and sweets, such as jelly, honey and honeydew excreted by aphids and other insects
- DO NOT eat wood but remove it to create galleries and tunnels

## Significance

- damage wood, infest food/voids and may bite

## IPM Recommendations

- Have ants identified to determine damage potential.
- Find nesting locations by following workers back to their nest, if possible.
- Destroy indoor and outdoor primary and satellite nests.
- Remove and replace water-damaged or decaying wood.
- Seal all potential ant entryways.
- Remove food and water sources in and around structures.
- Use ant baits to help eliminate nests that are hard to find.




Adult carpenter ant; thorax evenly rounded (April Nobile, Antweb.org)

Carpenter ant damage (Edward H. Holsten, USDA Forest Service, Bugwood.org)

Carpenter ant damage (Joseph O' Brien, USDA Forest Service, Bugwood.org)

# Field Ants

Formica spp.

## Identification

- black or reddish brown and black
- one node (bump between middle and rear body sections)
- most common ant found in yards and gardens
- often mistaken for carpenter ants, but not as likely to forage indoors (observed indoors most commonly in spring)
- ants of different sizes
- depression in thorax differentiates them from carpenter ants

## Nesting Habits

- nest outdoors in loose soil
- may produce mounds (sometimes incorporating twigs, dried leaves and other plant materials) in exposed areas or nest under rocks, logs, etc.
- do not frequently come indoors

## Diet

- variety of foods
- prefer sweet materials such as honeydew excreted by aphids and other insects
- can be scavengers or predators

## Significance

- become a nuisance during swarming flights
- can create mounds in turf areas

## IPM Recommendations

- Seal all potential ant entryways.
- Store food in airtight containers and dispose of trash regularly.
- Locate and destroy nests in lawns and adjacent areas.
- Control soft scale, mealybug or aphid populations on nearby ornamental plants.




Adult field ant; depression in thorax (see arrow) (April Nobile, Antweb.org)

Field ant mound (Steven Katovich, USDA Forest Service, Bugwood.org)

Field ant worker (David Cappaert, Michigan State University, Bugwood.org)

# Harvester Ants

Pogonomyrmex spp.

## Identification

- red to brown to black
- larger ants; 1/5 – 1/2 inch long
- two nodes (bumps between middle and rear body sections)
- workers of different sizes
- row of long hairs on the underside of the head
- spines on back sometimes present

## Nesting Habits

- nests appear as flat, bare circular patches of soil averaging several feet in diameter
- nests may be several feet deep

## Diet

- seeds and insects

## Significance

- inflict painful stings when disturbed; some species leave stingers in the wound
- do not invade homes but are occasional pests of lawns and playgrounds
- swarm from June – October
- strip large areas of grass in turf areas

## IPM Recommendations

- Use granular ant baits labeled for lawn use around the nest opening.



Harvester ant (Gracen Brilmyer, Antweb.org)

Harvester ant nest entrance (Whitney Cranshaw, Colorado State University, Bugwood.org)

Harvester ant nest (Whitney Cranshaw, Colorado State University, Bugwood.org)

# Odorous House Ant

Tapinoma sessile

## Identification

- dark brown to black
- 1/8 inch long
- workers of one size
- one node (bump between middle and rear body sections); node difficult to see
- emit an odor similar to coconuts when disturbed or smashed
- raise abdomens in air and run around when disturbed

## Nesting Habits

- outdoors: shallow nests in mulch next to buildings and in soil under protection
- indoors: nest in wall voids and under carpet, usually near water pipes or heaters

## Diet

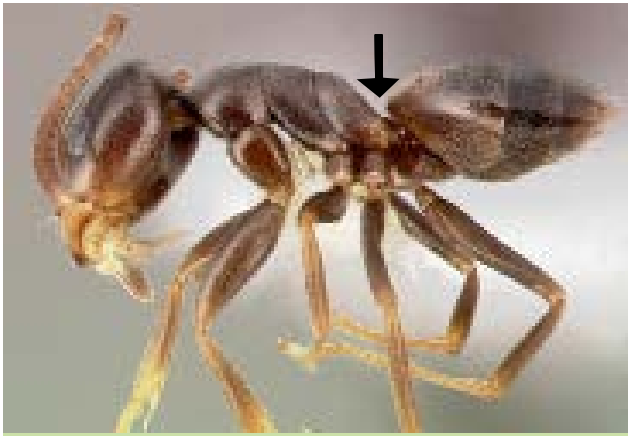
- insects and sweets, especially honeydew excreted by aphids and other insects
- forage indoors for sweets, cooked vegetables, fruit and pastries

## Significance

- contaminate foods such as sweets, meats, dairy products and vegetables

## IPM Recommendations

- Locate and destroy all nests to avoid reinfestation. (Follow ants back from their food source.)
- Clean ant trails with soap and water.
- Trim shrubbery and trees away from buildings.
- Store food in airtight containers and dispose of trash regularly.
- Seal all potential ant entryways.
- Use a bait specific to the odorous house ant.



Adult odorous house ant; hidden node (Fort Ord UCSC Reserve, Antweb.org)

Adult odorous house ants (Susan Ellis, Bugwood.org)

Adult odorous house ant and larva (Dale Ward, Discoverlife.org)

# Pavement Ant

Tetramorium caespitum

## Identification

- two nodes (bumps between middle and rear body sections)
- light to dark brown with fine grooves lining the head and thorax (middle body section)
- legs and antennae lighter than the rest of the body
- workers of one size

## Nesting Habits

- characteristically produce small mounds at the entry of nests
- nests often located outdoors under stones, pavement cracks, wood, next to buildings and under building foundations
- enter homes through cracks in concrete
- nest in walls, under floors and around sinks
- typically swarm in spring after rain; can swarm indoors

## Diet

- prefer greasy and protein materials such as meats, pet food, bread, nuts and insects
- sweets

## Significance

- contaminate food and food preparation areas
- nuisance pest indoors and outdoors

## IPM Recommendations

- Locate and destroy all nests (follow ant trails from food source to nest, if possible).
- Store food in airtight containers and dispose of trash regularly.
- Clean spills and food daily.
- Repair water leaks and maintain proper ventilation.
- Seal all potential ant entryways.
- Use insecticidal baits.




Adult pavement ant; two nodes (see arrows) (April Nobile, Antweb.org)

Pavement ant with wings (Whitney Cranshaw, Colorado State University, Bugwood.org)

Pavement ant swarm (Joseph Burger, Bugwood.org)

# Pharaoh Ant

Monomorium pharaonis

## Identification

- 1/16 – 1/12 inch long
- two nodes (bumps between middle and rear body sections)
- workers of one size
- 12-segmented antennae with 3-segmented club
- golden yellow to red with darker markings down the back

## Nesting Habits

- wide variety of secluded places in cracks and crevices: countertops, baseboards, wall voids, under floors
- prefer a warm and humid environment (e.g., near furnaces, hot water pipes and heat ducts)
- can travel along pipes and wiring
- more likely to nest indoors than other ants
- can have very large colonies
- can have multiple queens in one colony

## Diet

- sweets, protein, fat/grease
- syrups, jellies, grease, cake, pet food, dead insects, toothpaste, soap and several other things most insects would not feed on

## Significance

- contaminate sweets and greases
- serious pest of dormitories, hospitals, schools and apartments

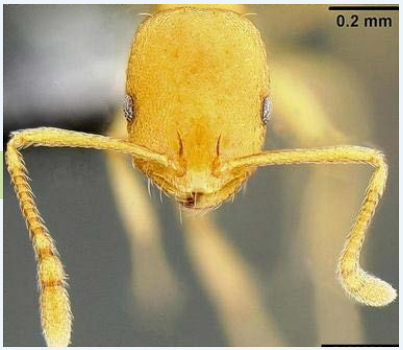
## IPM Recommendations

- Control may be hard because nests can be difficult to find and there may be multiple nesting sites in one building.
- Use a bait specific to the pharaoh ant. Baits can take time (months) to eliminate infestation.
- Do not use liquid or dust insecticides; they could spread ants, making the problem worse.




Adult pharaoh ant (April Nobile, Antweb.org)


Adult pharaoh ant dorsal (Eli Sarnat, Bugwood.org)




Close-up of pharaoh ant (Eli Sarnat, Bugwood.org)

# Pyramid Ants

Dorymyrmex spp.

## Identification

- small; 1/8 inch long
- workers of one size
- single node (bump between middle and rear body sections)
- color ranging from yellow, brown to black
- have a pyramid-shaped projection on top of the thorax (see top image)

## Nesting Habits

- prefer open, dry, sunny areas; soil nesting
- distinctive nest entrance consists of a hole surrounded by a mound of excavated soil
- nests not located indoors
- nests are typically small and shallow

## Diet

- live and dead insects
- honeydew produced by aphids and other insects
- feed on a variety of foods, but prefer sweets

## Significance

- occasionally invade buildings in search of food or moisture
- can bite
- can have unsightly mounds

## IPM Recommendations

- If ants are found indoors, follow them back to the outside foundation wall to determine the entry point.
- Seal cracks and crevices to exclude foraging worker ants.
- Use sweet ant baits.
- If the nest can be located, directly drench the shallow nest with an appropriately labeled insecticide.

Pyramid ant; note pyramid-shaped projection (Gary Alpert, Harvard University, Navajonature.org)

Pyramid ants (Jerry A. Payne, USDA Agricultural Research Service, Bugwood.org)

Pyramid ant mound (John Pearson, Bugguide.net)

# Velvety Tree Ant

Liometopum spp.

## Identification

- brownish-black head; yellowish-red thorax; velvety black abdomen
- single node (bump between middle and rear body sections)
- workers of many sizes
- evenly rounded thorax
- appear similar to carpenter ant

## Nesting Habits

- dead wood in trees, stumps and logs
- build temporary nests indoors for foraging
- nest in wall voids/insulation and areas with high moisture such as water leaks
- under loose bark and rocks

## Diet

- insects
- honeydew produced by aphids and other insects
- partial to sweets

## Significance

- aggressive; inflict a painful bite and spray secretions onto intruders when disturbed
- workers/foragers may enter structures
- damage insulation, drywall and wood by tunneling

## IPM Recommendations

- Trim back shrubs and trees that come into contact with buildings.
- Seal all potential ant entryways.
- Repair water leaks and maintain proper ventilation.
- Replace severely damaged wood.
- Ant baits may be necessary.



Velvety tree ant (April Nobile, Antweb.org)

Velvety tree ants (David Stephens, Bugwood.org)


Close-up of a velvety tree ant head (April Nobile, Antweb.org)

# Bed Bug

Cimex lectularius

## Identification

- clear (unfed young) to straw colored to reddish brown
- oval-shaped, flat bodies
- NEVER with wings; six legs

## Nesting Habits

- rest in crevices and cracks near or on furniture
- clothing, wheelchairs, books, personal items, etc.
- can be found anywhere

## Diet

- human blood; can feed day or night
- must feed between every life stage

## Significance

- can be difficult and costly to eliminate
- bites may result in redness, itching and swelling
- infestations can cause sleeplessness and nervousness in those who have been bitten
- negative media attention and social stigma

## IPM Recommendations

- Consider identification by a professional entomologist.
- Inspect and monitor areas with upholstered furniture.
- Remove clutter or store in sealable containers.
- Seal cracks and crevices.
- Heat-treat individual infested items.
- There are many controls available; consult with a professional entomologist on best control methods.

Adult bed bug (Gary Alpert, Harvard University, Bugwood.org)

Bed bugs in fabric (Gary Alpert, Harvard University, Bugwood.org)

Hatched bed bug eggs (Gary Alpert, Harvard University, Bugwood.org)





Biting Insects

# Bird Mites

Dermanyssus gallinae; Ornithonyssus sylviarum

## Identification

- very tiny; about the size of a period on a typed page
- black, yellow or white; appear bright red after feeding

## Nesting Habits

Dermanyssus gallinae (chicken mite):

- nests of birds
- hide in small, protected areas when they are not feeding

Ornithonyssus sylviarum (northern fowl mite):

- all life stages on host, but adults may be found in areas around the host

## Diet

- blood meals from hosts, including chickens, pigeons, sparrows, doves and starlings
- will feed on humans in absence of primary host
- feed mostly at night

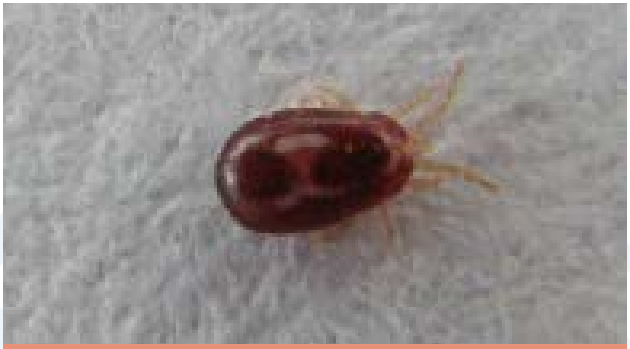
## Significance

- can migrate from bird nests or poultry houses (in- and outdoors) onto structures and crawl onto people and bite, causing skin irritation or itching
- spread by people, equipment and birds from infested areas
- can survive up to a month off a host

## IPM Recommendations

- Remove bird nests using the inverted bag technique and clean the surface that came into contact with the nest.
- Seal cracks and crevices where mites may hide or enter.
- In infested homes, hot wash and hot dry bedding and clothing left on floors.
- Take measures to control wild birds (see Vertebrate Pests, pages 170 – 193).
- Use appropriately labeled dust-formulated insecticides, such as silica aerogel, as crack and crevice treatments.

Bird mite (Whitney Cranshaw, Colorado State University, Bugwood.org)



Chicken mite after feeding (Furado, Wikimedia Commons)

Northern fowl mite (Wikimedia Commons)

# Head Lice

Pediculus humanus capitis

## Identification

- adults: small, cream to rust-colored insect about the size of a sesame seed
- eggs (nits) resemble dandruff flakes both in appearance and size and are attached to hairs

## Nesting Habits

- hold on to hair with claw-like legs
- spread by direct contact with infested persons or belongings

## Diet

- feed by piercing skin with claws and sucking out blood

## Significance

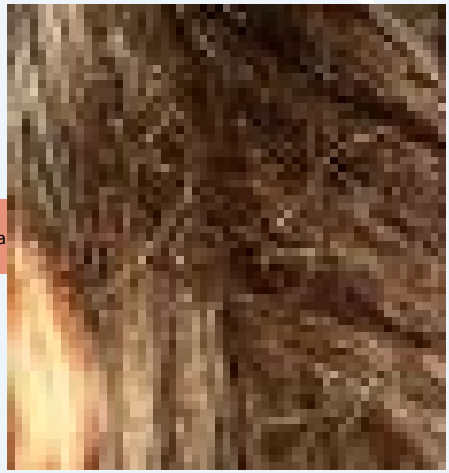
- bites result in small, red, itchy bumps on scalp and shoulders
- will die within 2 days if they are not on a host

## IPM Recommendations

- Encourage children NOT to share brushes, combs, hats, barrettes, towels and bedding.
- Clean carpets and furniture frequently.
- Pesticides are NOT recommended.
- Use a nit comb to remove lice and nits from hair.

Adult head louse (Gilles San Martin, Wikimedia Commons)


Head lice (Jim Occi, BugPics, Bugwood.org)



Head lice nits (Kosta Momcuoglu, Wikimedia Commons)



Biting Insects

# Masked Hunter

Reduvius personatus

## Identification

- 9/10 inch long
- dark brown to black
- slender body
- immatures camouflage by covering themselves in dirt and debris

## Nesting Habits

- garages, dirty closets, boiler rooms and other dirty, dusty areas
- occasionally enter bedrooms

## Diet

- other arthropods

## Significance

- occasionally found indoors and may bite, even if unprovoked
- considered a beneficial predatory insect
- does NOT transmit Chagas disease

## IPM Recommendations

- Use door sweeps on all doors leading outside or into a garage or storage area.
- Eliminate other insects that serve as a food source.
- Vacuum regularly.
- Change exterior lighting to sodium vapor light bulbs.

Adult masked hunter (Joseph Berger, Bugwood.org)

Camouflaged masked hunter nymph covered in debris (Whitney Cranshaw, Colorado State University, Bugwood.org)


Masked hunter eggs (Joseph Berger, Bugwood.org)





Biting Insects

# Mosquitoes

Culicidae

## Identification

- delicate biting fly
- long, needle-like mouthparts
- immature stages are found in water and resemble small worms

## Nesting Habits

- lay eggs in standing or slow-moving water or moist areas that occasionally flood

## Diet

- blood (females)
- nectar

## Significance

- some species can transmit West Nile Virus in Utah
- bites can cause itching

## IPM Recommendations

- Locate and remove all sources of standing water, including clogged gutters/spouts, play equipment, irrigation boxes, poorly drained turf, clogged drains, holes in trees, etc.
- In areas of standing water that cannot be drained, a product known as "mosquito dunks," containing a bacteria toxic to mosquito larvae, can be used.
- Keep screens in good repair to prevent adult mosquitoes from entering a building.
- Avoid outside activity when mosquitoes are active (dawn and dusk).
- Wear long-sleeved shirts, long pants and a hat.
- Use repellents such as DEET, Picaridin, oil of lemon eucalyptus or IR3535.



Adult mosquito (Susan Ellis, Bugwood.org)

Mosquito feeding on a human (Ary Farajollahi, Bugwood.org)

Mosquito larvae (Jim Occi, BugPics, Bugwood.org)

# American Cockroach

Periplaneta americana

## Identification

- reddish brown with a lighter border around the head
- largest species commonly found in Utah; up to 2 inches long
- immatures: smaller than adults; coloration variable; no wings (see middle image)

## Nesting Habits

- can live outdoors and indoors
- usually found in basements or on the first floor
- move indoors during hot weather and flooding
- found in warm, moist areas—under sinks, in bathtubs, in sewer drains and in furnace and boiler rooms

## Diet

- eat almost anything but mostly decaying vegetation, insect remains and sweets

## Significance

- may transmit disease pathogens
- cause allergic reactions, similar to asthma, in some people
- can be an asthma trigger

## IPM Recommendations

- Continually monitor for roaches in pest vulnerable areas, especially kitchens, boiler rooms, closets, etc., using sticky trap monitors.
- Dispose of trash regularly to remove food/shelter sources.
- Store food in pest-proof containers.
- Repair any leaks or plumbing malfunctions because cockroaches are attracted to damp environments.
- Caulk, install weather stripping or replace door sweeps where cockroaches can potentially enter buildings.
- Use roach baits and/or boric acid dust.
- Vacuum (with a HEPA filter) roaches and egg cases.



Adult American cockroach (Daniel R. Suiter, University of Georgia, Bugwood.org)


American cockroach nymphs (Daniel R. Suiter, University of Georgia, Bugwood.org)

American cockroach egg case (Gary Alpert, Harvard University, Bugwood.org)

# Brown Banded Cockroach

Supella longipalpa

## Identification

- about 1/2 inch long; brown with light band behind head
- bell-shaped pattern on the back of the head

## Nesting Habits

- egg cases are fastened to walls, ceilings, and in protected areas
- found in warmer, drier areas than the other common roaches— ceilings, high areas on walls, picture frames, furniture, etc.

## Diet

- may consume materials like glue or paste, starch and certain dyes present in stamps, older books and draperies

## Significance

- chew on nonfood materials such as fabric
- feed on and harbor within food stored indoors
- can transmit disease
- can trigger asthma or allergic reactions

## IPM Recommendations

- Improve sanitation.
- Store food in pest-proof containers.
- Inspect and monitor all areas where food is prepared, stored, or eaten and where moisture and heat are present.
- Use cockroach traps to determine species, harborage location and movement.
- Vacuum (with a HEPA filter) existing roaches and egg cases.
- Use roach baits and/or boric acid dust.



Adult brown banded cockroach (Kansas Department of Agriculture Archive, Bugwood.org)

Brown banded cockroach nymphs and fecal matter (Gary Alpert, Harvard University, Bugwood.org)


Brown banded cockroach eggs (Pest and Diseases Image Library, Bugwood.org)

# German Cockroach

Blattella germanica

## Identification

- light brown with two dark stripes right behind the head
- small; 1/2 – 5/8 inch long

## Nesting Habits

- prefer warm, moist areas near food preparation and/or storage (primary kitchen-infesting roach in Utah)
- found near sinks, appliances, furnaces, etc.

## Diet

- highly varied and diverse

## Significance

- may carry disease
- can cause allergic reactions or asthma symptoms

## IPM Recommendations

- Inspect food or products for roaches or egg cases.
- Improve sanitation (deep clean infested areas).
- Inspect and monitor all areas where food is prepared, stored, or eaten, and where moisture and heat are present.
- Use cockroach traps to determine infestation level, harborage location, movement and control success.
- Store food in pest-proof containers.
- Vacuum (with a HEPA filter) existing roaches and egg cases.
- Use roach baits and/or boric acid dust.
- Dispose of trash regularly to remove food and shelter sources.
- Do not store items in cardboard boxes long-term.
- Repair leaks and plumbing malfunctions.

German cockroach adult (Gary Alpert, Harvard University, Bugwood.org)

German cockroach adults and nymphs (Ryan Davis, Utah State University Extension)

German cockroach egg case (Gary Alpert, Harvard University, Bugwood.org)

# Oriental Cockroach

Blatta orientalis

## Identification

- dark brown to black with wings that are not as long as the body or appear absent

## Nesting Habits

- often found in basements, cellars, crawl spaces, sewers, near drains, leaky pipes and faucets and under refrigerators and sinks
- also referred to as "water bugs" because they can be found in cool, damp, dark areas
- infestations common in spring through fall
- very commonly come up and out of floor drains

## Diet

- garbage and decaying organic material

## Significance

- cause allergic reactions, similar to asthma, in some people
- may transmit disease

## IPM Recommendations

- Prevent roaches from coming out of drains.
- Improve sanitation.
- Store food in pest-proof containers.
- Inspect and monitor all areas where food is prepared, stored, or eaten, and where moisture and heat are present or where floor drains exist.
- Use cockroach traps to determine infestation level, harborage location, movement and control success.
- Repair leaks or plumbing malfunctions.
- Caulk and install weather stripping and door sweeps where cockroaches can potentially enter buildings.
- Use roach baits and/or boric acid dust.
- Vacuum (with a HEPA filter) roaches and egg cases.



Adult oriental cockroach (Kansas Department of Agriculture Archive, Bugwood.org)

Oriental cockroach remains (Bestiasonica, Wikimedia Commons)

Oriental cockroach adults and nymphs (Acrocynus, Wikimedia Commons)

# Black Soldier Fly

Hermetia illucens

## Identification

- large; dark colored
- may have two white patches just behind wings
- flattened appearance
- larvae and pupae: dark brown and flattened; 1 inch long

## Nesting Habits

- egg-laying and larval sites in garbage and other decaying organic material; compost piles; dumpsters
- pupate outside of the food source, sometimes around poorly cleaned dumpsters

## Diet

- moist, decaying organic material

## Significance

- pupae often found in large numbers around dumpsters
- rarely breed indoors; adults usually found in low numbers
- adults indoors indicate breeding areas near the structure

## IPM Recommendations

- Regularly inspect and clean dumpsters and surrounding areas.
- Seal cracks around doors and windows.
- Install properly fitted screens in all windows.
- Install weather stripping around all edges of doorways.
- Keep doors and windows closed or open with properly fitted screens.
- Use fly light traps.

Black soldier fly (Marilyn Sallee, Bugwood.org)

Black soldier fly (Vengolis, Wikimedia Commons)

Soldier fly larvae (Krokofant, Wikimedia Commons)





Flies

# Blow/Bottle Flies

Calliphoridae

## Identification

- medium sized and robust with a metallic appearance
- metallic-looking green and blue are common forms

## Nesting Habits

- eggs may be laid on dead animals, garbage/dumpster receptacles, decaying organic material and manure
- many flies indoors may indicate that an animal has died in a wall void or somewhere within the building

## Diet

- larvae feed on on animal carcasses, garbage, decaying organic material and manure

## Significance

- can spread disease through contact
- nuisance inside buildings

## IPM Recommendations

- Keep exterior doors closed, install screen doors, or install an automatic door closer, especially on doors leading into the kitchen.
- Keep screens in good repair.
- Improve sanitation.
- Keep dumpsters at least 50 feet from the building.
- Locate breeding substrate, if possible, and remove.
- Keep trash cans, dumpsters and garbage areas clean and free of odor.
- Close lids on dumpsters and garbage cans.
- Exclude fly entry via caulking, weather stripping, door sweeps, etc.
- Place light traps to catch flies that come indoors.
- Use a fly swatter.



Blue bottle fly (Obsidian Soul, Wikimedia Commons)

Green blow fly (Julia Wilkins, Wikimedia Commons)

Blow fly larvae (Joel Smith, Utah State University)

# Cluster Flies

Pollenia spp.

## Identification

- dull grayish brown
- yellow hairs on the thorax
- slow moving; frequent at indoor windows in the winter

## Nesting Habits

- adult flies lay eggs in soil and the maggots move to and develop on earthworms in fields and turf
- as many as four generations per growing season
- seek overwintering sites in buildings
- attracted to sunny, warm walls on building exterior
- typically overwinter in upper levels of buildings (e.g., attics, wall voids, false ceilings)

## Diet

- larvae (maggots) develop as parasites of earthworms
- not associated with garbage or animal wastes
- adults feed on flower nectar

## Significance

- adults seek sheltered areas to overwinter such as crevices and cavities in buildings in late summer and early fall
- may become active during warm periods of winter

## IPM Recommendations

- Monitor for cluster flies in the fall on the outside of buildings on sunny walls.
- Monitor for cluster flies in the winter on windowsills.
- Caulk and seal exterior openings, cracks and crevices on building exterior.
- Keep screens in good repair.
- Vacuum flies.
- Use a fly swatter.

Adult cluster fly with checkerboard pattern (Ryan Davis, Utah State University Extension)

Adult cluster fly (Tristram Brelstaff, Wikimedia Commons)

Yellow hairs on cluster fly (Ryan Davis, Utah State University Extension)

# Crane Flies

Tipulidae

## Identification

- resemble very large mosquitoes
- thin, elongate body and extremely long legs
- do not have biting mouthparts

## Nesting Habits

- breed in moist areas with abundant vegetation
- some breed in turfgrass

## Diet

- larvae feed on roots, grasses and other organic matter

## Significance

- occasionally enter buildings when a door or window is left open; frighten people
- cannot survive indoors for long

## IPM Recommendations

- Control is typically not necessary.
- Install properly fitted screens on all windows.
- Keep doors and windows closed or open with properly fitted screens or screen doors.

Crane fly (Jessica Louque Smithers, Viscient, Bugwood.org)

Crane fly (Joseph Berger, Bugwood.org)

Crane fly close-up (Dani Barchana, Bugwood.org)

# Drain (Moth) Fly

Psychoda phalaenoides

## Identification

- small; about 1/8 inch long
- very hairy
- wings covered in fine hairs; moth-like

## Nesting Habits

- develop in the scum lining drains and sewer lines or decaying organic material
- larvae hide behind scum, making attempted treatments with boiling water, pesticides or other chemicals ineffective
- can breed around broken pipes/drains beneath slabs or in crawl spaces and enter buildings through floor cracks, etc.

## Diet

- drain scum
- decaying organic matter

## Significance

- can spread disease through contact
- bodies of dead flies may disintegrate to form allergens

## IPM Recommendations

- Locate the breeding site and remove.
- Remove larval habitat by using a hard bristle brush to remove the scum film from inside drains.
- Use an enzyme drain cleanser to maintain drains free of organic film.
- If flies are coming from voids, crawl spaces or slabs, fix the moisture issue causing the problem and seal.

Adult drain fly (Joseph Berger, Bugwood.org)

Adult drain fly (Sanjay Acharya, Wikimedia Commons)

Drain fly (Whitney Cranshaw, Colorado State University, Bugwood.org)

# Face Fly

Musca autumnalis

## Identification

- nearly identical in appearance to the house fly
- dull gray color
- four dark stripes behind head
- tuft of bristles at the base of the calypter (see middle image)

## Nesting Habits

- lay eggs in fresh, undisturbed cow manure
- seek indoor overwintering sites in late August – early September

## Diet

- larvae: cow manure
- adults: watery secretions around eyes, nose and mouth of cattle; flower nectar

## Significance

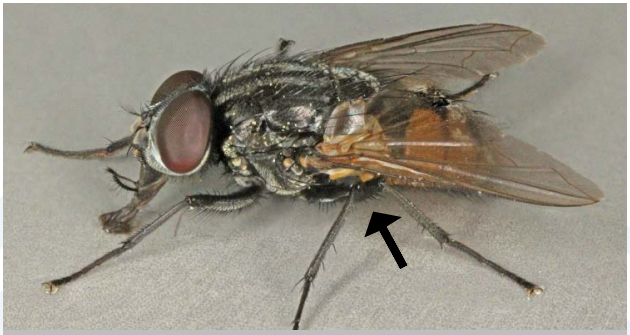
- come from farm/ranch areas with fresh cow manure
- congregate on south/southwest-facing walls in late summer – early fall
- large numbers will congregate within wall voids during winter (similar to cluster flies)
- frequently seen in windowsills and light fixtures during unseasonably warm days during winter

## IPM Recommendations

- Verify identification to determine appropriate management.
- Seal exterior building cracks during summer in areas where flies have been problematic in previous years.
- Tolerate occasional face flies; use a fly swatter; vacuum.
- Search for overwintering flies in voids and mezzanines and vacuum them.
- Use an appropriately labeled insecticidal dust in voids and cracks and crevices where flies overwinter.



Face fly (Clemson University, USDA, Bugwood.org)



Face fly; note bristles at the base of the calypter (see arrow) (Janet Graham, Wikimedia Commons )

Face flies (Clemson University, USDA, Bugwood.org)

# Flesh Flies

Sarcophaga spp.

## Identification

- large and gray with a checkerboard pattern on abdomen
- three dark stripes on top of the thorax (house fly has four)

## Nesting Habits

- lay eggs on dead animals, in or around garbage/ dumpster receptacles and decaying organic material
- many flies indoors may indicate that an animal has died in a wall void or somewhere within the building

## Diet

- larvae feed mostly on animal carcasses, garbage, and decaying organic material

## Significance

- can spread disease through contact
- nuisance inside buildings; infrequent indoor pest

## IPM Recommendations

- Keep exterior doors closed, install screen doors, or install an automatic door closer, especially on doors leading into the kitchen.
- Keep screens in good repair.
- Improve sanitation.
- Keep dumpsters at least 50 feet from the building.
- Locate breeding substrate, if possible, and remove.
- Keep trash cans, dumpsters and garbage areas clean and free of odor.
- Close lids on dumpsters and garbage cans.
- Exclude fly entry via caulking, weather stripping, door sweeps, screens, etc.
- Place light traps to catch flies that come indoors.
- Use a fly swatter.

Adult flesh fly (Johnny N. Dell, Bugwood.org)

Adult flesh fly (Muhammad Mahdi Karim, Wikimedia Commons)

Flesh fly larva (Pest and Diseases Image Library, Bugwood.org)

# Fruit Flies

Drosophila spp.

## Identification

- small; 1/8 inch long
- usually have bright red eyes

## Nesting Habits

- lay eggs on ripe or overripe fruit, vegetables, or on decaying organic material

## Diet

- ripened fruit, vegetables, or decaying organic material

## Significance

- nuisance indoors
- can spread disease through contact

## IPM Recommendations

- Keep exterior doors closed, install screen doors, or install an automatic door closer, especially on doors leading into the kitchen.
- Exclude fly entry via caulking, weather stripping, door sweeps, screens, etc.
- Keep screens in good repair.
- Locate breeding substrate, if possible, and remove.
- Improve sanitation, especially with fruit and food material, soda cans (recycle), juice boxes, mop and broom heads and even floor drains.
- Keep dumpsters at least 50 feet from the building.
- Keep trash cans, dumpsters and garbage areas clean and free of odor.
- Close lids on dumpsters and garbage cans.
- Regularly clean floor drains.
- Vinegar traps or commercially produced fruit fly traps can catch flies that come indoors.

Adult fruit fly (Mohammed El Damir, Bugwood.org)

Fruit flies feeding on cake (Pest and Diseases Image Library, Bugwood.org)


Fruit fly adult (Muhammad Mahdi Karim, Wikimedia Commons)

# Fungus Gnats

Sciaridae and Fungivoridae

## Identification

- smaller, dark, delicate-looking flies similar in appearance to mosquitoes
- light gray to clear wings
- long slender legs
- segmented antennae

## Nesting Habits

- eggs and larvae nest in soil/ moist organic material
- usually originate from soil in potted house plants
- can develop in soil or mulch outside of building
- attracted to light (e.g., windows and exterior lighting)

## Diet

- larvae feed on fungi in soil, potting mix, mulch, etc.

## Significance

- flies inside are a nuisance
- when present in large numbers, larvae can damage roots and stunt growth of seedlings and young plants

## IPM Recommendations

- Locate breeding substrate and remove or alter.
- Do not overwater plants.
- Let soil in potted plants dry out between watering.
- Keep exterior doors closed, install screen doors, or install automatic door closers.
- Exclude fly entry via caulking, weather stripping, door sweeps, screens, etc., especially around windows and doors.
- If flies are coming from outside, consider changing exterior lighting to sodium vapor lighting.
- Use nematode-based insecticides (e.g., Gnatrol) on soil of affected potted house plants.



Fungus gnat (Johnny N. Dell, Bugwood.org)

Fungus gnat (Whitney Cranshaw, Colorado State University, Bugwood.org)

Fungus gnat larvae (Whitney Cranshaw, Colorado State University, Bugwood.org)

# Horse and Deer Flies

Tabanidae

## Identification

horse flies:

- large; brown or black
- large colorful eyes
- biting; sword-like, piercing/sucking mouthparts

deer flies:

- generally smaller than horse flies
- yellowish brown to brownish black
- dark markings on wings
- biting; sword-like, piercing/sucking mouthparts

## Nesting Habits

- develop in moist or aquatic areas like moist soil, ponds, lakes and marshes

## Diet

- females: animal blood
- males: flower nectar

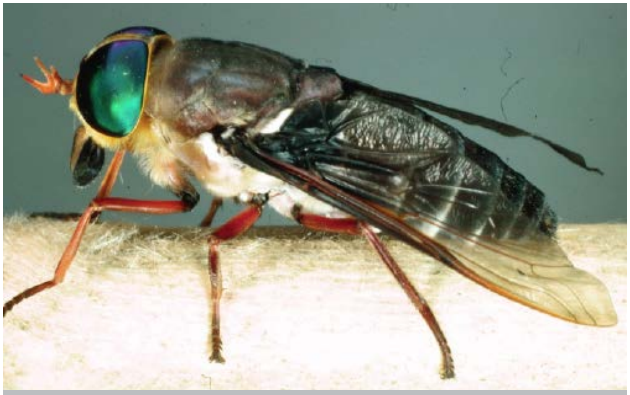
## Significance

- can travel up to a mile from breeding sites
- inflict painful bites that can result in visible, bleeding wounds
- transmission of disease possible, but very rare
- rarely a significant problem inside structures
- can be a severe outdoor problem in areas near wetlands

## IPM Recommendations

- If large numbers of deer or horse flies are present, look for and manage potential breeding sites. (Breeding sites may be located off property.)
- Install properly fitted screens in windows.
- Use insect light traps to catch flies inside.
- Fly traps can reduce populations outdoors.
- Keep doors and windows closed or open with properly fitted screens.





American horse fly (Sturgis McKeever, Georgia Southern University, Bugwood.org)

Horse fly (Sturgis McKeever, Georgia Southern University, Bugwood.org)

Deer fly (Sturgis McKeever, Georgia Southern University, Bugwood.org)

# House Fly

Musca domestica

## Identification

- 1/4 inch long
- four black stripes on the prothorax
- similar in appearance to the face fly

## Nesting Habits

- lay eggs on animal manure or decaying organic matter (especially garbage and dumpsters)

## Diet

- larvae feed on manure and decaying organic material
- adults feed on manure, decaying organic material and human food products

## Significance

- can spread disease through contact
- nuisance inside buildings

## IPM Recommendations

- Keep exterior doors closed, install screen doors, or install an automatic door closer, especially on doors leading into the kitchen.
- Keep screens in good repair.
- Improve sanitation.
- Keep dumpsters at least 50 feet from the building.
- Locate breeding substrate, if possible, and remove.
- Keep trash cans, dumpsters and garbage areas clean and free of odor.
- Close lids on dumpsters and garbage cans.
- Exclude fly entry via caulking, weather stripping, door sweeps, etc.
- Place light traps to catch flies that come indoors.
- Use a fly swatter.


Adult house fly (Pest and Diseases Image Library, Bugwood.org)


House fly life cycle: eggs (top middle), adults (right), larvae (bottom left), pupae (top left) (Clemson University Slide Series, Bugwood.org)

# Phorid (Humpbacked) Flies

Phoridae

## Identification

- very small; 1/64 – 1/8 inch long
- steep arch or humped back behind head
- eyes not red

## Nesting Habits

- lay eggs on decomposing organic material
- larvae need moist organic material to survive
- floor drains are a common breeding ground
- trash cans, dumpsters, moist food on floor or kitchen equipment cracks/crevices, soil in potted plants, dirty mopheads and pet cages (on moist feces/food)
- occasionally found near broken pipes under slabs

## Diet

- decomposing organic material

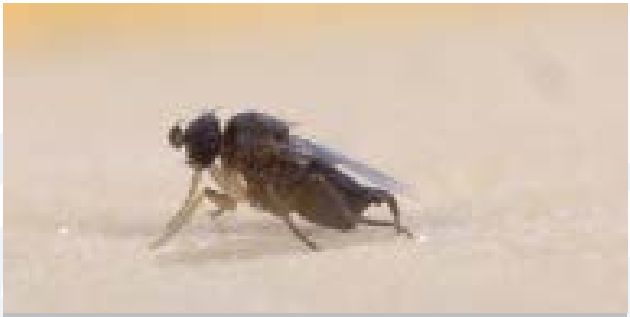
## Significance

- nuisance pest indoors
- can spread disease through contact

## IPM Recommendations

- Locate breeding substrate, if possible, and remove.
- Regularly clean floor drains.
- Keep exterior doors closed, install screen doors, or install an automatic door closer, especially on doors leading into the kitchen.
- Exclude fly entry via caulking, weather stripping, door sweeps, screens, etc.
- Keep dumpsters at least 50 feet from the building.
- Close lids on dumpsters and garbage cans.
- Inspect and clean trash cans, dumpsters and garbage areas.
- Keep food preparation area floors and equipment very clean.


Phorid fly adults (Whitney Cranshaw, Colorado State University, Bugwood.org)



Phorid fly adult (USDA ARS, Wikimedia Commons)

Adult phorid fly (Charles Lewallen, Wikimedia Commons)





Flies

# Stable Fly

Stomoxys calcitrans

## Identification

- 1/4 inch long; gray
- four dark stripes on top of thorax, similar to house fly
- mouth parts are long and straw-like for blood feeding

## Nesting Habits

- lay eggs on moist straw or decaying organic matter such as hay and grass clippings and chicken manure

## Diet

- larvae feed mostly on animal carcasses, garbage, and decaying organic material

## Significance

- can inflict painful bites
- nuisance inside buildings; enter buildings from outside
- can spread disease through contact

## IPM Recommendations

- Keep exterior doors closed, install screen doors, or install an automatic door closer, especially on doors leading into the kitchen.
- Keep screens in good repair.
- Improve sanitation.
- Keep dumpsters at least 50 feet from the building.
- Locate breeding substrate, if possible, and remove.
- Keep trash cans, dumpsters and garbage areas clean and free of odor.
- Close lids on dumpsters and garbage cans.
- Exclude fly entry via caulking, weather stripping, door sweeps, screens, etc.
- Place light traps to catch flies that come indoors.
- Use a fly swatter.
- If animals are raised on school-adjacent properties, consider discussing control options with owner.



Adult stable fly (Whitney Cranshaw, Colorado State University, Bugwood.org)

Adult stable fly mouthparts (Pavel Krok, Wikimedia Commons)


Stable fly life cycle (University of Nebraska)

# Army Cutworm/Miller Moth

Euxoa auxiliaris

## Identification

army cutworm (caterpillar):

- immature stage of the miller moth
- grayish black with patterns of gray and brown stripes

miller moth (adult stage of the army cutworm):

- larger moths; wingspan 1 1/2 – 2 inches long
- gray or light brown wings with different colored markings

## Nesting Habits

- lay eggs in thick vegetation, turfgrass and weedy areas surrounding wheat or hay fields
- seek dark sheltered spaces during the day, such as dense vegetation
- mass migrations of moths in late spring can inundate homes and buildings

## Diet

- army cutworm: variety of plants, including lawn grasses, and broadleaf weeds
- miller moth: nectar from flowering plants

## Significance

- may damage garden plants, field crops and hay
- moths can be a nuisance during migration in late spring (2 – 3 weeks long)

## IPM Recommendations

- Seal any openings, especially around windows, doors, and ventilation systems prior to migration period (late spring).
- Reduce lighting in and around buildings at night.
- Use a vacuum to remove moths indoors and outdoors.



Miller moth (Joseph Berger, Bugwood.org)

Army cutworm pupa (Whitney Cranshaw, Colorado State University, Bugwood.org)

Army cutworm larva (Frank Peairs, Colorado State University, Bugwood.org)



Nuisance Pests/Occasional Invaders

# Booklice/Psocids

Psocoptera

## Identification

- minute: indoors 1/25 – 1/13 inch long
- booklice found outdoors may be larger, up to 1/4 inch
- very common in pest monitors; look like small specks; use hand lens to identify
- may have wings, or not
- outdoor species of psocids are called barklice

## Nesting Habits

- prefer warm, humid or damp places
- can be found around damp books, around leaking/sweating pipes, in voids, cracks and crevices, cupboards, in cardboard boxes or anywhere where mold growth can be supported
- barklice live outdoors on/under bark, grass, leaves, damp wood, etc.

## Diet

- mold spores
- may feed on fungal spores on stored food products

## Significance

- nuisance pest indoors
- indicator of moisture issues

## IPM Recommendations

- Reduce relative humidity within trouble areas.
- Vacuum.
- Remove leaf litter from around the exterior of structures.
- Store food items in pest-proof containers.




Booklice (Tony Willis, Wikimedia Commons)

Booklice (David Sheltar, Ohio State University, Bugwood.org)

Barklice (Wikimedia Commons)

# Boxelder Bug

Boisea trivittata

## Identification

- black bugs with red markings on body
- immature forms are smaller but easily distinguished from adults by their lack of wings and red abdomens
- look similar to red fire bugs and other related groups

## Nesting Habits

- found in and around buildings in the spring and fall
- prefer female boxelder trees
- overwinter in cracks and crevices of buildings, especially in sunny areas of exterior walls or leaf litter

## Diet

- prefer boxelder seeds, which are only found on female boxelder trees, but may feed on other maple seeds

## Significance

- nuisance: congregate on exterior walls of buildings in spring and summer; can come indoors and annoy occupants
- overwinter in cracks and crevices in buildings
- may stain lightly colored materials
- not a health threat

## IPM Recommendations

- Remove female boxelder trees from the area if possible.
- Seal cracks that may allow boxelder bugs to enter buildings.
- Use a vacuum cleaner to remove indoor populations.
- Remove boxelder from tree planting lists.
- Plant non-maple trees to eventually shade sides of buildings where boxelder bugs like to congregate.
- Vacuum often during spring and fall.



Adult boxelder bug (Joseph Berger, Bugwood.org)

Boxelder bug infestation (Jim Baker, North Carolina State University, Bugwood.org)

Left: Boxelder bug eggs (William M. Ciesla, Forest Health Management International, Bugwood.org); Right: Boxelder bug adults and nymphs (Steven Katovich, USDA Forest Service, Bugwood.org)

# Brown Marmorated Stink Bug

Halyomorpha halys

## Identification

- shield-shaped insect; mottled brown/gray
- alternating white and black bands on antennae
- smooth shoulders (no spines)
- black and white alternating pattern surrounding wing

## Nesting Habits

- can overwinter in mass in buildings and houses
- lay eggs on host plants

## Diet

- broad host range including fruits, vegetables, field crops, ornamentals, weeds and native species

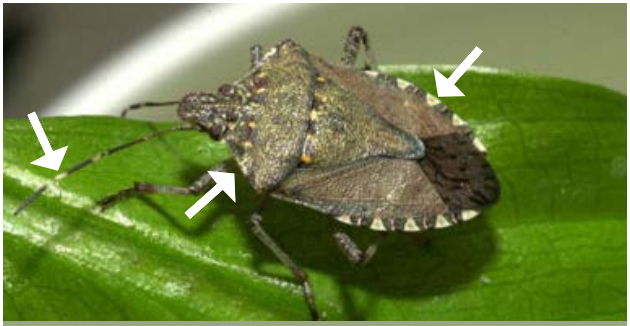
## Significance

- nuisance: congregate indoors over winter; can annoy building occupants
- overwinter in cracks and crevices in buildings
- emit an unpleasant odor when smashed
- not a health threat
- can cause damage to host plants

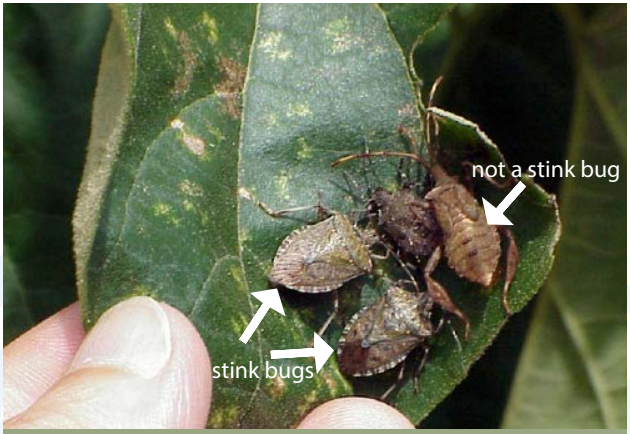
## IPM Recommendations

- Seal cracks and crevices that may allow stink bugs to enter buildings.
- Vacuum to remove indoor and outdoor populations.
- Avoid planting host plants around buildings if possible.





Adult brown marmorated stink bug; note bands on antennae and pattern surrounding wing (David R. Lance, USDA APHIS PPQ, Bugwood.org)




Stink bug leaf damage (Gary Bernon, USDA APHIS, Bugwood.org)

Stink bug eggs and nymphs (David R. Lance, USDA APHIS PPQ, Bugwood.org)

# Carpet Beetles

Dermestidae

## Identification

- 1/16 – 1/4 inch long
- color highly variable: black to multicolored beetles
- often found in windowsills
- larvae: small, hairy, tan to black; appear striped

## Nesting Habits

- live indoors and outdoors
- stored foods, animal hides/materials/textiles, dead animals in voids, grain-based rodenticides, under carpeting, baseboards, and furniture, under seat cushions of upholstered furniture or anywhere hair, lint, dead insects and food crumbs collect are prime areas
- areas of minimal use such as attics, basements, cubbies, under unused or seldom moved furniture or appliances, etc., are also prime locations

## Diet

- varies by species (see above)

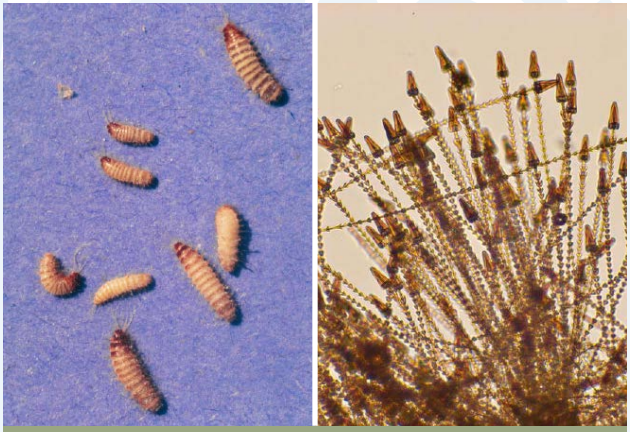
## Significance

- can damage fabrics and furniture
- can infest and destroy food items
- larval hairs can cause throat irritation if consumed

## IPM Recommendations

- Locate source of beetles (see above) and remove infested items.
- Locating the source of beetles can be very difficult.
- Seal cracks around the outside foundation wall.
- Install tight-fitting door sweeps at the base of all exterior doors.
- Vacuum individuals that enter buildings.
- Store food in pest-proof containers.
- Thoroughly clean food storage and preparation areas.

Top left: Furniture beetle; Top right: Black carpet beetle (Clemson University, USDA Cooperative Extension Slide Series, Bugwood.org); Bottom left: Warehouse beetle (Whitney Cranshaw, Colorado State University, Bugwood.org); Bottom right: Carpet beetle larva (Joseph Berger, Bugwood.org)



Left: Carpet beetle larvae (Whitney Cranshaw, Colorado State University, Bugwood.org); Right: Carpet beetle larval hairs (Pest and Diseases Image Library, Bugwood.org)





Nuisance Pests/Occasional Invaders

# Clover Mite

Bryobia praetiosa

## Identification

- very tiny; about the size of a period on a typed page
- green to black, sometimes with red/orange markings/ legs
- very long front legs that look like antennae
- use a hand lens to identify

## Nesting Habits

- live primarily in turfgrass

## Diet

- primarily turfgrass

## Significance

- migrate indoors in the late spring and fall (often up the exterior sides of buildings and through windows)
- mites numbering in the hundreds or thousands can be a major nuisance
- can stain fabric when smashed
- not a health threat

## IPM Recommendations

- Create a turf- and weed-free boundary around buildings 3-5 feet wide minimum.
- Within boundary, use pea gravel or mulch to retard mites.
- Within boundary, use plants that are unattractive to clover mites, such as geranium, chrysanthemum, zinnia, marigold, salvia, rose, petunia or shrubs such as barberry, juniper and yew.
- Ensure that seals around windows are in good repair.
- Vacuum mites indoors and outdoors.
- Double-sided carpet tape can reduce numbers coming into buildings. Place tape as a barrier to building entry.
- Use supplemental irrigation in drought-stressed or hot parts of the turf to suppress mite migration.

Adult clover mite; note long front legs (Rayanne Lehman, Pennsylvania Department of Agriculture, Bugwood.org)

Clover mites (Whitney Cranshaw, Colorado State University, Bugwood.org)


Clover mite adult and eggs (J. Kalisch, University of Nebraska)





Nuisance Pests/Occasional Invaders

# Crickets

Gryllidae

## Identification

- 1/2 – 1 1/8 inches long
- light brown to black, sometimes green
- long threadlike antennae that are longer than their body
- long "stingerlike" appendage coming out the rear of their body (females)
- make a chirping noise

## Nesting Habits

- overwinter as eggs in soil
- found in moist areas such as mulch beds, woodpiles, weeds, stone piles, etc.

## Diet

- agricultural grain crops and vegetables
- fabrics, synthetics or leather and fur, especially when soiled with human perspiration

## Significance

- can cause damage to fabrics
- typically a minor nuisance pest in or around structures

## IPM Recommendations

- Find and eliminate harborage outdoors such as weedy ornamental beds, wood piles, rock piles and moist, secluded areas.
- Seal cracks around the outside foundation wall.
- Install tight-fitting door sweeps at the base of all exterior doors.
- Vacuum individuals that enter buildings.

Female house cricket (Joseph Berger, Bugwood.org)

Field cricket (Joseph Berger, Bugwood.org)

Snowy tree cricket (Joseph Berger, Bugwood.org)





Nuisance Pests/Occasional Invaders

# Elm Leaf Beetle

Xanthogaleruca luteola

## Identification

larvae:

- yellowish with the appearance of black stripes in later stages

adults:

- 3/16 – 1/4 inch long
- yellow with black stripes/markings
- black stripe along the edge of each wing cover
- oval, soft-bodied beetles

## Nesting Habits

- outdoors: live in elm trees on leaves and under bark and leaf litter at the base of the tree; woodpiles
- indoors: garages; behind curtains, between books, under carpets, in wall voids, ventilators or other protected places

## Diet

- elm leaves

## Significance

- enter buildings in large numbers to overwinter or occasionally to escape hot, dry weather
- larvae skeletonize leaves and defoliate elm trees
- adults chew holes in leaves

## IPM Recommendations

- Use a vacuum to remove beetles indoors.
- Do not attempt to kill these beetles in wall voids with insecticides unless they will be removed. Dead insects attract other pests. Instead, wait until summer to take exclusionary control measures.
- Find and seal all exterior cracks in June or July and repair screens and door sweeps to prevent entry.
- Keep elm trees healthy; target pesticide treatments at larvae and adult beetles on host trees.



Adult elm leaf beetle (Joseph Berger, Bugwood.org)

Elm leaf beetle larvae (Pest and Diseases Image Library, Bugwood.org)

Elm leaf beetle damage to leaves (Whitney Cranshaw, Colorado State University, Bugwood.org)

# Elm Seed Bug

Arocatus melanocephalus

## Identification

- black and red bug about 1/3 inch long
- triangular segment between the top part of the wings
- triangle is black and surrounded by red on the top portion of the wings
- alternating black and red pattern outside of wings
- red abdomen on underside

## Nesting Habits

- found in and around buildings throughout summer into fall, especially outdoors where elm seeds have accumulated
- elm trees

## Diet

- elm seeds

## Significance

- nuisance: congregate around buildings that have nearby elm trees and elm seeds; can come indoors and annoy occupants
- overwinter in cracks and crevices in buildings
- may stain lightly colored materials and emit an unpleasant odor when smashed
- not a health threat

## IPM Recommendations

- Remove elm trees in the area if possible.
- Seal cracks that may allow bugs to enter buildings.
- Vacuum to remove indoor and outdoor populations.
- Remove elm seeds that have collected around buildings.
- Remove elm from tree planting lists.
- Remove volunteer elms while they are small.

Elm seed bug adults (top), late instar nymph (bottom left) and young nymph (bottom right) (Ryan Davis, Utah State University Extension)

Elm seed bug feces (Ryan Davis, Utah State University Extension)





Nuisance Pests/Occasional Invaders

# False Chinch Bug

Nysius raphanus

## Identification

- 1/8 – 1/6 inch long
- grayish brown and slender
- overlapping wings form an "X" shape on the back
- strawlike mouthparts used to suck plant sap
- immatures lack wings and are mottled gray with reddish markings

## Nesting Habits

- lay eggs around the base of plants or in loose soil
- aggregate in large numbers on plants or exterior walls
- migrate to new sites, including homes and buildings, when food sources dry up, are harvested (e.g., alfalfa) or are treated with herbicide

## Diet

- feed on a wide variety of plants, including turfgrass

## Significance

- nuisance pest
- invade buildings to escape hot, dry weather when host plants dry up or are removed
- cannot survive indoors for long

## IPM Recommendations

- Temporarily discontinue watering plants near the building during problem migrations to encourage the bugs to seek cool, humid conditions elsewhere.
- Find and seal any exterior cracks to prevent entry.
- Vacuum.
- Control is not needed for small numbers.
- Chemical control is marginal against false chinch bugs due to chemical resistance.



Adult false chinch bug (Russ Ottens, University of Georgia, Bugwood.org)

False chinch bugs (Whitney Cranshaw, Colorado State University, Bugwood.org)

False chinch bug nymphs and adults (Whitney Cranshaw, Colorado State University, Bugwood.org)



Nuisance Pests/Occasional Invaders

# Ground Beetles

Carabidae

## Identification

- 1/16 – 1 3/8 inch long
- most are black or dark red, although some are blue, brown, or green
- typically have a shiny/glossy/metallic sheen
- very common in pest monitors

## Nesting Habits

- outdoors under logs, rocks, debris, etc.

## Diet

- prey on other arthropods

## Significance

- nuisance indoors
- beneficial outdoors

## IPM Recommendations

- Minimize hiding areas near the foundation.
- Seal cracks around the outside foundation wall.
- Install tight-fitting door sweeps at the base of all exterior doors.
- Vacuum individuals that enter buildings.
- Change exterior lighting to sodium vapor bulbs.



Predaceous ground beetle (Jim Jasinski, Ohio State University, Bugwood.org)

Predaceous ground beetle (Llona L., Wikimedia Commons)

Predaceous ground beetle (Wikimedia Commons)

# Isopods

Isopoda

## Identification

- also known as sowbugs or pillbugs
- 1/4 – 5/8 inch long
- dark to slate gray
- oval, segmented, armored bodies
- can roll up into a tight ball when disturbed

## Nesting Habits

- many habitats including moist soil, leaves, grass, wood piles, mulch and stones
- require high moisture
- come indoors when moist conditions exist

## Diet

- decaying organic material

## Significance

- occasionally come indoors under thresholds/doors
- may be a nuisance indoors

## IPM Recommendations

- Minimize moisture and hiding/feeding areas near the foundation.
- Seal cracks around the outside foundation wall.
- Install tight-fitting door sweeps at the base of all exterior doors.
- Vacuum individuals that enter buildings.

Adult pillbug (Joseph Berger, Bugwood.org)

Adult pillbugs (Gary Alpert, Harvard University, Bugwood.org)

Pillbugs of various sizes (Wikimedia Commons)





Nuisance Pests/Occasional Invaders

# Millipedes/Centipedes

Diplopoda; Chilopoda

## Identification

millipedes:

- 1/16 inch – 2 inches long (commonly); rounded
- dark brown to gray, sometimes clear
- two pairs of legs per segment
- common in pest monitors; curl up when dead

centipedes:

- 1/8 inch – 2 inches long (commonly); flatter
- yellowish to brown
- 1 pair of legs per segment

## Nesting Habits

millipedes:

- lay eggs in soil or organic material
- need high moisture

centipedes:

- areas of high moisture, especially in basements, wash rooms, etc.
- under bark, organic material, rocks, etc.

## Diet

- millipedes: decaying/moist organic material
- centipedes: predatory on other insects and spiders

## Significance

- can be a nuisance indoors
- presence of either indicates a moisture issue inside or outside of the building
- not a health risk

## IPM Recommendations

- Reduce or eliminate moisture issues indoors and outdoors.
- Exclude entry via caulking, weather stripping, door sweeps, screens, etc.
- Vacuum.



Adult millipede (Whitney Cranshaw, Colorado State University, Bugwood.org)

Adult centipede (Joseph Burger, Bugwood.org)

House centipede (Joseph Burger, Bugwood.org)

# Red Fire Bug

Pyrrhocoris apterus

## Identification

- 1/4 – 1/2 inch long
- vibrant red and black coloration
- wings generally shortened and red with two large black spots
- piercing/sucking mouthparts
- can emit a foul odor

## Nesting Habits

- found in grass, leaf litter, trees and around or on buildings
- seek shade during the day

## Diet

- seeds from a wide variety of plants

## Significance

- nuisance pest
- may congregate in large numbers on structures or plants
- can stain carpet and fabrics if crushed

## IPM Recommendations

- Caulk or seal openings, foundation cracks and around plumbing, gas or electrical conduits to prevent entry.
- Install weather stripping around doors and windows and repair screens.
- Use a vacuum to collect insects indoors and outdoors.
- Spray congregations directly with insecticidal soap.



Adult red fire bug (Andre Karwath, Wikimedia Commons)

Red fire bug adults and nymphs (Lestat, Wikimedia Commons)

Cluster of red fire bug nymphs (L. B. Tettenborn, Wikimedia Commons)

# Root Weevils

Otiorhynchus spp.

## Identification

larvae

- up to 1/2 inch; legless white grub with a brown head capsule

adults

- 1/4 – 1/2 inch long
- shiny black to shiny brownish black
- adults have a blunt snout

## Nesting Habits

- larvae develop in soil at the base of host plants
- adults spend the day at the base of host plants in litter

## Diet

- larvae: roots of woody shrubs, especially lilac
- adults: notch the leaf margins of many plants

## Significance

- adults are common nuisance invaders of homes during late summer and fall
- can damage leaves and roots of ornamental plants

## IPM Recommendations

- Use a vacuum and/or sticky traps to collect weevils indoors.
- Seal cracks, crevices, windows and other areas where weevils can enter.
- Larvae and feeding adults can be managed outdoors with an appropriately labeled, soil-applied insecticide.



Adult lilac root weevil (Entomart, Wikimedia Commons)


Strawberry root weevil size comparison (Whitney Cranshaw, Colorado State University, Bugwood.org)

Root weevil damage to leaves (Whitney Cranshaw, Colorado State University, Bugwood.org)

# Silverfish and Firebrats

Lepisma spp.; Ctenolepisma spp.; Thermobia spp.

## Identification

- 1/2 – 3/4 inch long and have scales
- slender, wingless soft-bodied insects
- firebrats are brown or gray, and silverfish are shiny silver or pearl gray
- long antennae
- long fillaments extending from the back end
- very common in pest monitors

## Nesting Habits

- females lay eggs in crevices, on cloth or buried in food or dust, usually around moist (moisture not always necessary), warm areas or paper products
- very common around vending machines, libraries, or anywhere there is moisture, heat, and paper
- present in most buildings

## Diet

- paper, fabrics, and similar materials
- glue or pastes in paper/books
- dead insects

## Significance

- scrape surface of paper
- may be an asthma trigger

## IPM Recommendations

- Complete control is difficult.
- Reduce moisture by fixing leaky plumbing.
- Remove or store potential food sources in sealed containers.
- Vacuum regularly under vending machines and in cracks and crevices around vending machines, book shelving, etc.
- Seal all cracks and crevices in the above mentioned areas.

Adult silverfish (Clemson University, Bugwood.org)

Adult firebrat (Clemson University, Bugwood.org)

Silverfish damage (Clemson University, Bugwood.org)





Nuisance Pests/Occasional Invaders

# Springtails

Collembola

## Identification

- very small; 3/16 inch long
- appear to jump or fling when disturbed
- color ranges from black to gray to white
- do not have wings
- use a hand lens to identify

## Nesting Habits

- naturally very numerous in soil/turf
- require moisture; prefer cool, moist conditions
- can migrate into structures
- frequently seen crawling around on concrete

## Diet

- decaying vegetation, fungi, bacteria, pollen, algae, lichens, arthropod feces, carrion

## Significance

- can migrate indoors in large numbers in late spring/early summer when soil starts to dry out, seeking moisture

## IPM Recommendations

- Inspect area under sinks and other moisture sources for springtails, because they seek moisture indoors.
- Seal cracks and crevices where springtails may enter structures.
- Reduce clutter and clean under sinks and around areas with a water source.
- Thoroughly clean baseboards, cracks and crevices around problem areas.
- Vacuum individuals that enter structures.

Springtail (Ryan Davis, Utah State University Extension)

Springtails (Samuel Abbott, Utah State University)

Springtails (Ryan Davis, Utah State University Extension)





Nuisance Pests/Occasional Invaders

# Western Conifer Seed Bug

Leptoglossus occidentalis

## Identification

- 5/8 – 3/4 inch long
- overall brownish color; yellow-orange upper abdomen with five black patches visible during flight
- flat leaf-like projections on hind legs
- emit a piney odor when handled
- similar in appearance to western leaf-footed bug; distinguished by absence of thorn-like projection extending from the head

## Nesting Habits

- develop on pines, Douglas-firs and other conifers

## Diet

- primarily seeds of pines and Douglas-fir

## Significance

- common invader of homes
- seek overwintering sites indoors when cold fall weather begins (September – October)
- major outbreaks/migrations can occur in the fall
- resemble kissing bugs (Triatoma spp.) and other assassin bugs, but pose no threat to human health

## IPM Recommendations

- Tolerate occasional seed bugs.
- Equip foundation and attic vents with tight-fitting screens during warmer months.
- Find and seal any exterior cracks.
- Vacuum conifer seed bugs found indoors or outdoors.



Adult western conifer seed bug (David Cappaert, Michigan State University, Bugwood.org)

Western conifer seed bug on host (Steven Katovich, USDA, Bugwood.org)

Western conifer seed bug nymphs (Sandy Kegley, USDA Forest Service, Bugwood.org)

# Western Leaf-footed Bug

Leptoglossus spp.

## Identification

- 3/4 – 1 inch long
- brown  with a white band across the back
- flat, leaf-like projections on hind legs
- similar in appearance to western conifer seed bug; distinguished by thorn-like projection extending from the head and white band across the back

## Nesting Habits

- can overwinter in and around buildings and homes
- aggregate in protected areas outdoors
- often found on conifer species, weeds, and other garden plants

## Diet

- wide range of flowering plants, ornamentals and conifers
- fruits and nuts
- thistles and other weeds in spring

## Significance

- outbreaks may occur after mild winters
- may overwinter on or in buildings or temporarily cluster on the sides of buildings, causing a nuisance

## IPM Recommendations

- Tolerate occasional seed bugs.
- Equip foundation and attic vents with tight-fitting screens during warmer months.
- Find and seal any exterior cracks.
- Vacuum leaf-footed bugs found indoors or outdoors.
- Eliminate weeds around the building.



Western leaf-footed bug (Natasha Wright, Cook's Pest Control, Bugwood.org)

Leaf-footed bug (Ayanava Majumdar, Alabama Cooperative Extension System, Bugwood.org)

Leaf-footed bug nymph (Ayanava Majumdar, Alabama Cooperative Extension System, Bugwood.org)



Nuisance Pests/Occasional Invaders

# Western Subterranean Termite

Reticulitermes hesperus

## Identification

- swarmers (winged): 3/8 inch long; dark body and legs
- winged termites differ from winged ants in that termites have equal-length front and back wings, bead-like antennae and a broad connection between the middle and rear of the body
- workers: 1/4 – 3/8 inch long; pale cream color
- soldiers: similar to workers but have a large head and mouthparts (see comparison in middle image)

## Nesting Habits

- prefer to nest in moist wood in contact with the soil
- use mud tubes to cross masonry or other surfaces
- indoors: can be found anywhere wood products and moisture exist

## Diet

- feed directly on wood, typically the softer layers (springwood) or on wood by-products (e.g., drywall, paper-based ceiling tiles)

## Significance

- can cause structural damage to wood and wood products

## IPM Recommendations

- Eliminate wood-to-soil contact.
- Seal cracks and crevices in the foundation.
- Wood siding, stucco and foam board should be at least 6 inches from the ground.
- Keep vegetation trimmed and away from the foundation.
- Repair leaking plumbing and other moisture sources.
- Reduce humidity in basements, crawl spaces, etc.
- Use baits in conjunction with moisture-reducing tactics to eliminate colonies.
- Consider hiring a professional to control termites.

Eastern subterranean termite (Gary Alpert, Harvard University, Bugwood.org)

Eastern subterranean termites (Gary Alpert, Harvard University, Bugwood.org)

Termite mud tubes (USDA FS Wood Products Insect Lab Archive, Bugwood.org)

# Bean and Cowpea Weevils

Acanthoscelides obtectus; Callosobruchus maculatus

## Identification

bean weevil:

- 1/8 inch long
- light olive brown with darker brown or cream-colored markings
- reddish appendages
- body narrows evenly toward the small head
- strong fliers

cowpea weevil:

- outer wings tipped with black with two large black dots above

## Nesting Habits

- usually infest legumes in the field
- indoors: can breed continuously in dried legumes stored in warm conditions

## Diet

- legumes in the field
- dried/stored legumes such as beans, cowpeas, lentils and peas

## Significance

- can infest stored legumes

## IPM Recommendations

- Inspect legumes for beetles and monitor indoor legume storage regularly.
- Locate and dispose of infested legumes.
- Store susceptible food items in pest-proof containers.
- Clean spilled food products and food storage areas.
- Keep food, especially legumes, in regular rotation.
- Keep moisture low in food storage areas by improving ventilation.



Bean weevil on host (Clemson University, Bugwood.org)

Cowpea weevil (Ryan Davis, Utah State University Extension)

Cowpea weevil damage to sweet potatoes (B. Merle Shepard, Clemson University, Bugwood.org)

# Cigarette Beetle

Lasioderma serricorne

## Identification

- 1/8 inch long
- shiny light brown to reddish brown
- head barely visible or not visible from above
- strong fliers
- similar to drugstore beetle, but wider with serrated (sawlike; not clubbed) antennae and no rows of pits on wing covers
- larvae: c-shaped, hairy, white grub with legs

## Nesting Habits

- adults hide in crevices indoors during the winter
- can infest stored food products

## Diet

- variety of foods including grains, peanuts, seeds, processed grain products, dried fruits and vegetables
- prefer spices, tobacco products and dry pet food
- rodent baits, dried flowers, dead rodents and insects

## Significance

- damage books and furniture
- infest a variety of food sources
- may attack furniture stuffing, silk and animal materials such as leather

## IPM Recommendations

- Locate and dispose of infested items.
- Inspect all incoming food items for pests.
- Monitor with pheromone traps.
- Clean up all spilled food products and food storage areas.
- Store all susceptible food items in pest-proof containers.
- Keep food in regular rotation.
- Periodically change insect monitors and service mouse traps and multi-catch traps on a regular basis.


Cigarette beetle (Pest and Diseases Image Library, Bugwood.org)

Cigarette beetles (Brian Little, The University of Georgia, Bugwood.org)


Cigarette beetle larva (Pest and Diseases Image Library, Bugwood.org)





Stored Products Pests

# Dark/Yellow Mealworms

Tenebrio spp.

## Identification

dark mealworm:

- adults: dull black or very dark brown
- larvae: up to 1 1/4 inches long; smooth, cylindrical and brownish to dark yellow

yellow mealworm:

- adults: shiny black to dark brown
- larvae: up to 1 1/4 inches long; smooth, cylindrical and golden yellow

## Nesting Habits

- lay eggs singly or in clusters in food sources
- prefer dark, damp and undisturbed environments
- larvae are often seen migrating from infested areas

## Diet

- old or moldy grain, oats or seeds

## Significance

- presence indicates a lack of proper sanitation
- eggs and/or larvae ingested with breakfast foods can cause gastrointestinal discomfort

## IPM Recommendations

- Improve sanitation procedures in affected areas.
- Inspect all incoming food items for pests.
- Store food items in pest-proof containers.
- Dispose of infested food items.
- Keep moisture low in food storage areas by improving ventilation.
- Keep food in regular rotation.

Adult dark mealworm (Pest and Diseases Image Library, Bugwood.org)

Dark mealworm larva (Clemson University, USDA Cooperative Extension Slides, Bugwood.org)

Adult yellow mealworm (Clemson University, Bugwood.org)

Yellow mealworm larva (Clemson University, USDA Cooperative Extension Series, Bugwood.org)

# Drugstore Beetle

Stegobium paniceum

## Identification

- 1/10 inch long
- reddish brown to brown
- head not visible from above
- rows of deep pits on wing covers and 3-segmented club distinguish it from cigarette beetle
- larvae: c-shaped, white and hairy with legs

## Nesting Habits

- lay eggs in food materials
- larvae pupate within food materials

## Diet

- larvae eat nearly anything but prefer bread, flour, meal, spices and pet foods
- adults do not feed on food, but can chew through food packaging

## Significance

- pest of stored food in homes, schools and storehouses
- attack a variety of nonfood products
- can cause damage to books

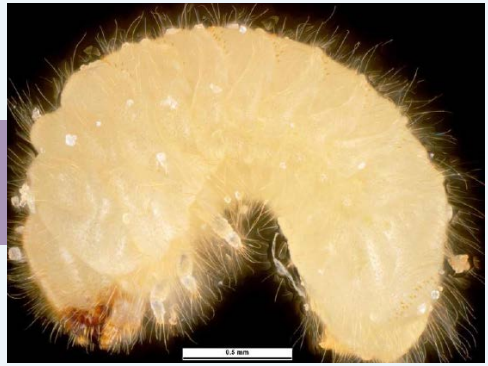
## IPM Recommendations

- Improve sanitation procedures in affected areas.
- Inspect all incoming food items for pests.
- Store food items in pest-proof containers.
- Dispose of infested food items.
- Keep food in regular rotation.



Drugstore beetle (Pest and Diseases Image Library, Bugwood.org)

Drugstore beetle (Natasha Wright, Florida Department of Agriculture and Consumer Services, Bugwood.org)



Drugstore beetle larva (Pest and Diseases Image Library, Bugwood.org)

# Grain Beetles

Oryzaephilus spp.; Tribolium spp.

## Identification

- 1/8 inch long; brown to red
- use hand lens to identify
- sawtoothed grain beetle has spines on side of body behind the head
- red flour beetles have clubbed antennae and eyes split above and below the head
- other small beetles in grain also exist; consider collecting beetles for identification verification from USU Extension

## Nesting Habits

- lay eggs on stored food products, especially of high moisture content
- prefer damaged food rather than intact grains, kernels, etc.

## Diet

- highly varied
- grain products, cereals, breads, peas, beans, dried meats, flour, macaroni, nuts, dried fruits, spices, chocolate, drugs, tobacco, herbarium, insect and museum specimens

## Significance

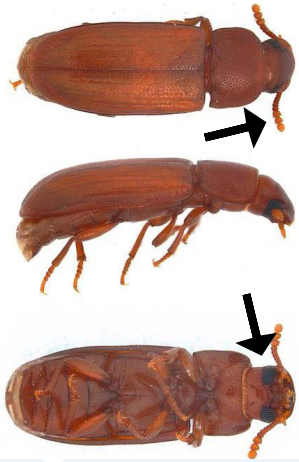
- infest food, rendering it inedible

## IPM Recommendations

- Improve sanitation procedures in affected areas.
- Inspect all incoming food items for pests.
- Store food items in pest-proof containers.
- Dispose of infested food items.
- Keep moisture low in food storage areas by improving ventilation.
- Keep food in regular rotation.



Sawtoothed grain beetle; note spines behind the head (Kansas Department of Agriculture Archive, Bugwood.org)



Left: Red flour beetle adults (Emilie Bess, USDA APHIS PPQ, Bugwood.org); Above: Red flour beetle larva (Frank Peairs, Colorado State University, Bugwood.org)

Red flour beetle in wheat (Clemson University, Bugwood.org)



Stored Products Pests

# Granary Weevil

Sitophilus granarius

## Identification

- 1/8 – 3/16 inch long; long snout
- reddish brown
- elongated oval pits on the thorax
- tuck in legs and remain motionless when disturbed; cannot fly
- larvae: small, white legless grubs with brown head capsules

## Nesting Habits

- lay eggs in small holes chewed by female
- larvae develop inside kernels of grain

## Diet

- feed on whole corn, wheat, barley, rice, pet food, bird seed, sunflower seeds, old pasta, chestnuts and acorns

## Significance

- attack a wide variety of grains
- primarily distributed by people via infested food

## IPM Recommendations

- Use traps to monitor activity in structures, pantries and bulk grain storage.
- Improve sanitation procedures in affected areas.
- Inspect all incoming food items for pests.
- Store food items in pest-proof containers.
- Dispose of infested food items.
- Keep moisture low in food storage areas by improving ventilation.
- Keep food in regular rotation.




Granary weevil (Pest and Diseases Image Library, Bugwood.org)


Granary weevil (Pest and Diseases Image Library, Bugwood.org)

Granary weevil in wheat (Clemson University, Bugwood.org)

# Indian Meal Moth

Plodia interpunctella

## Identification

- very tiny moth: 5/8 – 3/4 inch long
- weak, meandering fliers
- wings with copper-colored tips (use hand lens to see wing tips if necessary)
- typically fly at night

## Nesting Habits

- lay eggs on stored food products
- pupate off food in food storage areas, containers, etc.

## Diet

- wide variety of stored food products
- grains/grain products, cereals, dried fruits, seeds, nuts, powdered milk, biscuits, chocolate, candy, spices, dry pet food, bird seed, etc.

## Significance

- very common in homes and food storage areas
- larval feeding destroys stored food items
- contamination by larvae droppings and silken webs
- moths are an annoyance to building occupants

## IPM Recommendations

- Inspect all incoming food items for pests.
- Clean up all spilled food products and food storage shelves and storage areas.
- Store all susceptible food items in pest-proof containers.
- Keep food in regular rotation.
- Keep moisture low in food storage areas by improving ventilation.
- Dispose of infested food items.
- Indian meal moth traps can monitor and help control moths.



Indian meal moth adult; note copper-colored wing tips (Mark Dreiling, Bugwood.org)

Indian meal moth larvae and adult (Clemson University, Bugwood.org)

# Larder Beetle

Dermestes lardarius

## Identification

- 3/8 – 1/2 inch long; elongate oval shape
- adults: dark brown to black with pale yellow band around the wing covers containing six spots
- larvae: dark brown; covered in long brown hairs; two spines on the end of the body that curve upward toward the rear of the body; 1/2 inch long

## Nesting Habits

- typically found indoors feeding on rodent carcasses or on high protein food
- bore into materials such as wood and insulation to nest and plug the nest entrance

## Diet

- animal products including dead animals, meats, cheese, powdered milk, dry pet food and dried insects

## Significance

- primarily breed in food storage areas or in areas where dead insects or rodents are found

## IPM Recommendations

- Inspect all incoming food items for pests.
- Locate and dispose of infested items.
- Monitor with pheromone traps.
- Clean up all spilled food products and food storage areas.
- Store all susceptible food items in pest-proof containers.
- Keep food in regular rotation.
- Periodically change insect monitors and service mouse traps and multi-catch traps on a regular basis.




Larder beetle (Pest and Diseases Image Library, Bugwood.org)

Larder beetle damage to wood (Mohammed El Damir, Bugwood.org)

Larder beetle larva (Mohammed El Damir, Bugwood.org)

# Rice Weevil

Sitophilus oryzae

## Identification

- 1/16 – 1/8 inch long
- dull reddish brown
- deep pits covering the pronotum (area behind the head)
- four light spots on wing covers
- strong fliers
- tuck in legs and remain motionless when disturbed
- larvae: white, legless grubs with brown head capsules

## Nesting Habits

- lay eggs inside of grain and other products
- larvae develop inside grain or other products

## Diet

- corn, wheat, rice, beans, nuts, cereals, rye, barley, buckwheat, bird seed, pet food and stored cotton and wheat products

## Significance

- one of the most important pests of stored products

## IPM Recommendations

- Inspect all incoming food items for pests.
- Locate and dispose of infested items.
- Monitor with pheromone traps.
- Clean up all spilled food products and food storage areas.
- Store all susceptible food items in pest-proof containers.
- Keep food in regular rotation.

Rice weevil (Olaf Leillinger, Wikimedia Commons)

Rice weevil damage (Clemson University, Bugwood.org)

Rice weevils on host (Joseph Berger, Bugwood.org)

# Warehouse Beetle

Trogoderma variabile

## Identification

- 1/8 inch long
- covered in orange, white and black scales/hairs
- look similar to other carpet beetles; verify identification

## Nesting Habits

- lay eggs in stored food products and many animal or plant-based products

## Diet

- cake mix, candy, cereals, chocolate, cookies, corn, pet food, pasta, oats, peas, potato chips, dried fruit, rice, spices
- anything of animal origin including dead animals and pet and human hair that has collected on the floor, etc.

## Significance

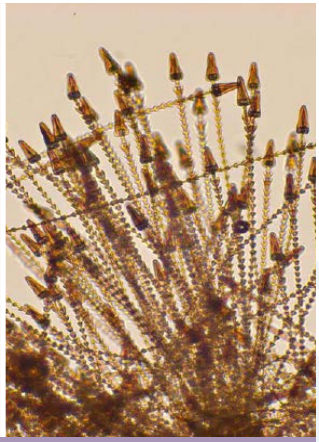
- infest and ruin food
- hastasetae (arrow-shaped hairs) on larvae can irritate throat if consumed

## IPM Recommendations

- Inspect all incoming food items for pests.
- Clean up all spilled food products, especially in food storage areas.
- Store all susceptible food items in pest-proof containers.
- Keep food in regular rotation.
- Keep moisture low in food storage areas by improving ventilation.
- Dispose of infested food items.
- Consider monitoring in food storage areas with a warehouse beetle pheromone lure and trap.



Adult warehouse beetle (Joseph Berger, Bugwood.org)



Left: Adult and larval warehouse beetle (Whitney Cranshaw, Colorado State University, Bugwood.org); Right: Larval hairs (Pest and Diseases Image Library, Bugwood.org)


Warehouse beetle larva (Ryan Davis, Utah State University Extension)

# Black Widow Spider

Latrodectus hesperus

## Identification

- adult females are shiny black with a red hourglass on the underside of the abdomen (there are beneficial look-alikes without the red hourglass)
- immature females have a pale brown to black body with white to orangish banding; they get progressively more solid black as they molt toward adulthood
- males are about 1/3 the size of females and are pale brown with white markings, resembling immature females

## Nesting Habits

- prefer preexisting holes in dark, undisturbed areas
- hide during the day and are in their cobwebs at night
- common around building foundations, rock piles, wood piles, outbuildings, water meter/irrigation boxes and around exterior lighting

## Diet

- insects and spiders

## Significance

- can be a serious health risk, especially to children and elderly people
- bite can cause pain, nausea, cramping or death (rare)

## IPM Recommendations

- Minimize nesting habitat around property.
- Seal exterior cracks and crevices to reduce hiding places.
- Regularly vacuum individuals and webs.
- Reduce clutter indoors and outdoors.
- Install tight-fitting door sweeps.
- Install tight-fitting screens in windows.
- Reduce insects that serve as food.
- Change exterior lighting to sodium vapor bulbs.

Adult female black widow spider (Clemson University, Bugwood.org)

Immature female black widow (Joseph Berger, Bugwood.org)


Adult male black widow (Whitney Cranshaw, Colorado State University, Bugwood.org)

# Cellar Spiders

Pholcus spp.

## Identification

- long delicate legs with small, elongate or globular body
- pale tan or yellow with a gray mark in the center of the carapace

## Nesting Habits

- common in basements, crawl spaces and behind HVAC units, furniture, pianos and other seldom-moved objects, but can occur outdoors, too
- make irregular cobwebs near windows, over pipes, or all over the ceiling and walls, especially in corners
- female spiders carry eggs in their fangs

## Diet

- insects and other arachnids

## Significance

- webs build up over time and collect dirt/dust making areas where they are located unsightly
- not known to be a health hazard
- beneficial

## IPM Recommendations

- Minimize nesting habitat around property (e.g., plants).
- Seal exterior cracks and crevices to reduce daytime hiding places.
- Regularly vacuum individuals and webs inside and outside of buildings.
- Reduce clutter in favored areas.
- Install tight-fitting door sweeps at the base of all exterior doors.
- Install tight-fitting screens in windows.
- Keep windows closed.
- Reduce other insects that serve as food.
- Change exterior lighting to sodium vapor bulbs.




Adult cellar spider (Joseph Berger, Bugwood.org)

Adult cellar spider with eggs (Olei, Wikimedia Commons)

Cellar spider eyes (Joseph Berger, Bugwood.org)

# Crevice Weaving Spiders

Filistatidae

## Identification

females:

- large bodies with velvety brown to black coloration; sometimes mistaken for small tarantulas

males:

- thin bodies and long legs with tan coloration; sometimes mistaken for brown recluse spiders

## Nesting Habits

- make webs in small holes or crevices around structures
- active at night
- more common in southern Utah

## Diet

- small insects

## Significance

- can become a nuisance in and around buildings

## IPM Recommendations

- If this spider is found indoors, inspect for webs associated with a hole or crack in exterior walls.
- Clear away vegetation in contact with the building foundation.
- Find and seal cracks and holes along the building's exterior.
- Catch and release (with a glass jar) spiders found indoors.
- Step on or swat unwanted spiders outdoors.
- Change exterior lighting to sodium vapor bulbs.



Female southern house spider (Kokako1, Wikimedia Commons)

Male southern house spider (Edward L. Manigault, Clemson University, Bugwood.org)

Crevice weaving spider web (Marshal Hedin, Wikimedia Commons)

# Desert Recluse Spider

Loxosceles deserta

## Identification

- in Utah, only found in Washington County
- 1/4 – 1/2 inch long
- tan to dark brown with darker fiddle-shaped marking behind the eyes
- six eyes arranged in three groups of two

## Nesting Habits

- spin irregularly shaped webs in undisturbed areas
- found outdoors in native vegetation, pack rat dens, etc.
- seldom found indoors

## Diet

- feed on small live insects and occasionally large dead ones

## Significance

- bites can result in a necrotic ulcer that can take several weeks to heal; these spiders are rarely encountered indoors

## IPM Recommendations

- Call a physician or go to an emergency room immediately after being bitten or when symptoms develop. Bring the spider if possible for identification.
- Reduce other insects that serve as food.
- Prune vegetation around the building to limit habitat.

Desert recluse spider (Lynette, Flickr.com)

Recluse spider egg sac (Jeffrey Tucker, Bugguide.net)

Brown recluse spider (similar in appearance to desert recluse); note fiddle-shaped marking (Mark Dreiling, Bugguide.net)

# Ground Spiders

Gnaphosidae

## Identification

- many different kinds; typically earthtone coloration
- found crawling around (not within a web)
- two large spinnerettes sticking out the rear of the abdomen are even in size throughout their length (rather than tapering toward the end)

## Nesting Habits

- found in leaf litter, grasses, ornamental plantings, areas around buildings
- make web chambers in which they lay eggs
- active hunters that wander in search of food

## Diet

- insects and spiders

## Significance

- nuisance when indoors
- not known to be a health hazard
- beneficial

## IPM Recommendations

- Minimize nesting habitat around property.
- Seal exterior cracks and crevices.
- Install tight-fitting door sweeps at the base of all exterior doors.
- Vacuum individuals that enter buildings.
- Step on or smash individual spiders that enter.
- Catch and release (with a glass jar) spiders found indoors.
- Change exterior lighting to sodium vapor bulbs.
- Use pest monitors to capture invading spiders, especially between August and October.

Adult ground spider (Joseph Berger, Bugwood.org)

Adult ground spider (Joseph Berger, Bugwood.org)

Adult ground spider (Joseph Berger, Bugwood.org)

# Hacklemesh Weaver Spiders

Amaurobiidae

## Identification

- 1/5 – 6/10 inch long
- reddish brown head; dark grayish colored abdomen with light colored patches
- eight eyes arranged in two rows
- resemble hobo spiders
- commonly found on sticky trap pest monitors

## Nesting Habits

- damp, protected areas such as woodpiles and underneath rocks
- deposit egg sacs in irregularly-shaped mesh webs, where the spiders are typically found

## Diet

- insects

## Significance

- frequently found in damp basements and other areas in buildings during fall
- not known to be a health hazard

## IPM Recommendations

- Minimize nesting habitat around property.
- Remove webbing via vacuuming or a broom.
- Find and seal cracks and crevices along the building's exterior.
- Install tight-fitting door sweeps.
- Install tight-fitting screens in windows.
- Reduce insects that serve as food.
- Use pest monitors/sticky traps to capture spiders that enter buildings.

Hacklemesh weaver spider (Marshal Hedin, Wikimedia Commons)

Hacklemesh weaver spider with egg sac (Marshal Hedin, Flickr.com)

Hacklemesh weaver spider in web (Danny Steven, Wikimedia Commons)

# Hobo and Grass Spiders

Agelenidae

## Identification

- adult bodies up to 3/8 inch long (longer including legs)
- robust, fast-moving spiders
- many funnelweb spiders look similar; verify your spider identification with USU Extension

## Nesting Habits

- outside in grass, gardens, ornamental plants and trees, along foundations, log piles, under rocks and lawn ornaments, etc.
- often found in tubs and sinks, or running along the floor indoors

## Diet

- insects

## Significance

- hobo spider: evidence suggests that hobo spiders do not cause necrotic lesions in humans
- very common indoors between August and October
- spiders should be considered beneficial

## IPM Recommendations

- Minimize nesting habitat around property (rocks, logs).
- Seal exterior cracks and crevices.
- Install tight-fitting door sweeps at the base of all exterior doors.
- Vacuum individuals that enter buildings.
- Step on or smash individual spiders that enter.
- Catch and release (with a glass jar) spiders found indoors.
- Change exterior lighting to sodium vapor bulbs.
- Use pest monitors to capture invading spiders, especially between August and October.

Hobo spider (Ryan Davis, Utah State University Extension)

Domestic house spider (Sanchom, Wikimedia Commons)

Left: Adult grass spider (Joseph Berger, Bugwood.org); Right: Funnelweb-type web made by grass spiders, hobo spiders and other funnelweb spiders (David Stephens, Bugwood.org)

# Jumping Spiders

Salticidae

## Identification

- smaller spiders
- eye pattern gives appearance of two small eyes and large nostrils
- active during the day
- very agile and erratic movement
- the most common jumping spider in Utah, the bold jumper, has a black body with green chelicera and a white dot on the back of the abdomen; the color of the dot may vary (most frequently red)

## Nesting Habits

- often found on walls (indoors and outdoors) or ceilings
- make silk retreats in which the female will lay eggs

## Diet

- insects and spiders

## Significance

- could be a nuisance pest indoors
- not known to be a health hazard
- beneficial

## IPM Recommendations

- Minimize nesting habitat around property.
- Seal exterior cracks and crevices.
- Install tight-fitting door sweeps at the base of all exterior doors.
- Install tight-fitting screens in windows.
- Keep windows closed.
- Vacuum individuals that enter buildings.
- Step on or smash individual spiders that enter.
- Catch and release (with a glass jar) spiders found indoors.
- Change exterior lighting to sodium vapor bulbs.

Bold jumper (Kaldari, Wikimedia Commons)

Jumping spider (David Cappaert, Michigan State University, Bugwood.org)

Jumping spider (Karan A. Rawlins, University of Georgia, Bugwood.org)

# Orb Weaving Spiders

Araneidae; Tetragnathidae

## Identification

- small to large spiders
- generally with a large, bulbus abdomen
- make classic orb-shaped web

## Nesting Habits

- often found around buildings and homes in late summer and early fall, especially around overhanging structures (e.g., porches or entryways) or in ornamental plantings
- spiders die out every year and leave egg sac behind
- eggs hatch in spring and spiderlings disperse
- common near exterior lighting

## Diet

- insects and spiders

## Significance

- can be a nuisance pest outdoors, especially the webs
- not known to be a health hazard
- beneficial

## IPM Recommendations

- Minimize nesting habitat around property.
- Seal exterior cracks and crevices to reduce daytime hiding places.
- Install tight-fitting door sweeps at the base of all exterior doors.
- Install tight-fitting screens in windows.
- Keep windows closed.
- Vacuum individuals and webs inside and outside of buildings on a daily basis.
- Step on or smash individual spiders that enter.
- Catch and release (with a glass jar) spiders found indoors.
- Change exterior lighting to sodium vapor bulbs.



Left: Banded garden spider (Ward Upham, Kansas State University, Bugwood.org); Right: Catface spider (Joseph Berger, Bugwood.org)

Left: Shamrock orb weaver (David Cappaert, Michigan State University, Bugwood.org); Right: Typical orb web (Tom Bean, Encyclopedia Britannica Online)

Long-jawed orb weaver (David Cappaert, Michigan State University, Bugwood.org)

# Sac Spiders

Cheiracanthium spp.

## Identification

- yellowish coloration
- ends of legs with brown to black tufts of hairs that look like socks

## Nesting Habits

- found indoors and outdoors
- under bark, rocks, leaf litter, in rolled leaves, etc.
- behind or in clutter/storage
- often make a silk, saclike retreat where walls meet other walls or ceilings, or other hidden places; they spend the day in the sac and hunt at night
- easily climb slick surfaces

## Diet

- insects and spiders

## Significance

- could be a nuisance pest indoors
- not known to be a health hazard, but can aggressively bite when trapped against the skin
- painful bite
- beneficial

## IPM Recommendations

- Minimize nesting habitat around property.
- Seal exterior cracks and crevices.
- Install tight-fitting door sweeps at the base of all exterior doors.
- Install tight-fitting screens in windows.
- Keep windows closed.
- Vacuum individuals and silk retreats in buildings.
- Step on or smash individual spiders that enter.
- Catch and release (with a glass jar) spiders found indoors.
- Change exterior lighting to sodium vapor bulbs.



Adult yellow sac spider (Joseph Berger, Bugwood.org)

Newly hatched yellow sac spiders (Joseph Berger, Bugwood.org)

Sac spider eggs (Joseph Berger, Bugwood.org)

# Wolf Spiders

Lycosidae

## Identification

- small to very large spiders
- unique eye pattern (see top image)
- females carry egg sacs on spinnerettes and spiderlings on their back

## Nesting Habits

- solitary wandering hunters
- not found in webs
- found in ornamental plantings, turfgrass, under objects, woodpiles, in mulch, etc.
- some small black species occur in great numbers in lawns in the spring, causing alarm

## Diet

- insects and spiders

## Significance

- can be a nuisance when they mistakenly enter buildings
- not known to be a health hazard
- beneficial

## IPM Recommendations

- Minimize nesting habitat around property.
- Seal exterior cracks and crevices to reduce hiding places.
- Regularly vacuum individuals and webs.
- Reduce clutter indoors and outdoors.
- Install tight-fitting door sweeps.
- Install tight-fitting screens in windows.
- Reduce insects that serve as food.
- Use pest monitors to capture wandering spiders.
- Change exterior lighting to sodium vapor bulbs.

Classic wolf spider eye pattern (Opoterser, Wikimedia Commons)

Female wolf spider with egg sac (Wikimedia Commons)

Female wolf spider with babies on back (Circumjacence, Wikimedia Commons)

# Woodlouse Spider

Dysdera crocata

## Identification

- reddish head area with cream to gray colored abdomen
- mouthparts and fangs protrude directly in front of the head, giving a menacing appearance
- six eyes

## Nesting Habits

- under rocks, bark, trash cans, mulch, plants, wood piles, etc.
- prefer moist areas where isopods live

## Diet

- isopods

## Significance

- appear menacing because of their large, forward-projecting mouth parts and fangs
- not known to be a health hazard
- beneficial

## IPM Recommendations

- Minimize nesting habitat around property.
- Seal exterior cracks and crevices.
- Install tight-fitting door sweeps at the base of all exterior doors.
- Vacuum individuals that enter buildings.
- Step on or smash individual spiders that enter.
- Catch and release (with a glass jar) spiders found indoors.
- Change exterior lighting to sodium vapor bulbs.
- Use pest monitors to capture invading spiders, especially between August and October.
- Reduce moisture issues around buildings.
- Follow control methods for isopods (see page 90) to reduce or eliminate this spider's primary food source.

Adult woodlouse spider (Joseph Berger, Bugwood.org)

Adult woodlouse spider (Joseph Berger, Bugwood.org)

Adult woodlouse spider with food source (Joseph Berger, Bugwood.org)





Spiders

# Baldfaced Hornet

Dolichovespula maculata

## Identification

- 5/8 – 3/4+ inch long
- black with yellowish-white face; no hairs

## Nesting Habits

- social
- colony dies off every fall; fertilized queens overwinter
- nest on building eaves, etc., or in plants/trees; aerial
- queens start new every spring; colonies grow throughout the summer months

## Diet

- insects
- nectar

## Significance

- nests pose a serious health risk to humans

## IPM Recommendations

- Monitor for hornet nests from early summer – fall.
- Purchase and use a bee veil, suit and gloves.
- Minimize nesting habitat around property.
- Install tight-fitting screens in windows.
- Nest removal: wear protective bee veil, suit and gloves. At night, using a ladder or bee pole, apply an aerosol wasp insecticide into the nest entrance hole, bag and remove the nest and place the bagged nest in a dumpster away from people.

Baldfaced hornet (Piccolo Namek, Wikimedia Commons)

Baldfaced hornet (Johnny N. Dell, Bugwood.org)

Baldfaced hornet nest (The High Fin Sperm Whale, Wikimedia Commons)





Stinging Insects

# Bumble Bees

Bombus spp.

## Identification

- 1/4 – 1 inch long; stout
- fuzzy/hairy in appearance
- black and yellow, some with white and orange markings

## Nesting Habits

- social
- colony dies off every fall; fertilized queens overwinter, usually underground
- nest in old rodent burrows, holes, grass clumps, etc.
- queens start new every spring; colonies grow throughout the summer months

## Diet

- nectar, honey, pollen

## Significance

- nests pose a minimal health risk to humans
- can sting multiple times; sting is painful
- important pollinators

## IPM Recommendations

- Monitor for bumble bee nests early summer – fall.
- Purchase and use a bee veil, suit and gloves.
- Minimize nesting habitat around property by caving in old rodent burrows, sealing exterior cracks and crevices, holes in trees, wall voids, removing grass clumps, etc.
- Never plug entrance holes to nests (if in a structural void)!
- Apply a non-repellent insecticidal dust in and 6 inches around entrance hole(s) at night.
- Because of honey pots in the nest, nests should be removed and voids filled or sealed to prevent reinfestation or the presence of other pests.

Bumble bees (Whitney Cranshaw, Colorado State University, Bugwood.org)


Bumble bee (David Cappaert, Michigan State University, Bugwood.org)


Bumble bee nest (Panoramedia, Wikimedia Commons)





Stinging Insects

# Honey Bee

Apis mellifera

## Identification

- 1/2 – 5/8 inch long
- yellow and black; hairy

## Nesting Habits

- social
- colony perennial, surviving the winter
- occasionally swarm

## Diet

- pollen, nectar, honey

## Significance

- nests and individual bees pose a health risk to humans, especially allergic individuals
- swarms can alarm people, but typically aren't dangerous
- Africanized honey bees do exist in Washington, Iron and San Juan counties in Utah, and are more dangerous than European honey bees
- genetic tests or precise morphological measurements are needed to distinguish between Africanized and European honey bees

## IPM Recommendations

- Monitor for bees season-long.
- Purchase and use a bee veil, suit and gloves.
- Minimize nesting habitat around property.
- Install tight-fitting screens in windows.
- Never plug entrance holes to nests!
- Bees are a valuable resource; consider contacting your local beekeepers association for hive or swarm extraction.

Additional resources:

- www.beeremovalsource.com/bee-removal-list/utah
- www.utahbeekeepers.com



Africanized honey bees look identical to European honey bees (Jeffrey W. Lotz, Florida Department of Agriculture and Consumer Services, Bugwood.org)

Protective bee suit (Timothy Haley, USDA Forest Service, Bugwood.org)

Honey bee swarm (Fir0002/ Flagstaffotos, Wikimedia Commons)

# Mason, Potter, Mud Dauber Wasps

Vespidae; Sphecidae

## Identification

- 3/8 inch – 1+ inches long
- various colorations: black and yellow; black; black with a bluish tinge
- often have an elongated segment between the middle and rear

## Nesting Habits

- mud nests on sides of structures or under windowsills, eaves, etc.
- nests can appear as clay pots, mud patches or mud tubes or pipes

## Diet

- insects, spiders
- nectar

## Significance

- nests pose a slight health risk to humans
- not aggressive
- may be considered beneficial since they prey on many species of spiders

## IPM Recommendations

- Monitor for wasp nests from early summer – fall.
- Purchase and use a bee veil, suit and gloves.
- Minimize nesting habitat around property.
- Install tight-fitting screens in windows.
- Nest removal: wear protective bee veil, suit and gloves. Early in the morning, remove nest in a garbage bag or scrape from side of building or structure, then clean nest area with soap and water.



Yellow and black mud dauber (Johnny N. Dell, Bugwood.org)

Blue mud wasp (Show Ryu, Wikimedia Commons)

Potter wasp (Bruce Marlin, Wikimedia Commons)

A variety of mason, potter and mud dauber nests.

Left: Pipe organ wasp (Wikimedia Commons)
Center: Potter (Ogre Bot, Wikimedia Commons)
Right: Mud dauber (Howard Ensign Evans, Colorado State University, Bugwood.org)

# Paper Wasps

Polistes spp.

## Identification

- 5/8 – 3/4 inch long
- black with yellowish-white face; no hairs
- long legs that hang in flight
- abdomen at anterior end gradually slopes
- appear longer and more slender than yellowjackets

## Nesting Habits

- social
- colony dies off every fall; fertilized queens overwinter
- nest on building eaves, play equipment, benches, any hollow pipe, etc., or in plants/trees
- nest is open, umbrella shaped, with all wasps exposed
- queens start new every spring; colonies grow throughout the summer months

## Diet

- insects
- nectar

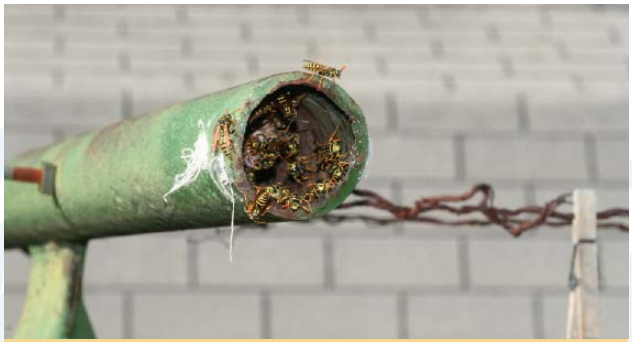
## Significance

- nests pose a health risk to humans
- not as aggressive as yellowjackets or hornets

## IPM Recommendations

- Monitor for hornet nests from early summer – fall.
- Purchase and use a bee veil, suit and gloves.
- Minimize nesting habitat around property.
- Install tight-fitting screens in windows.
- Nest removal: wear protective bee veil, suit and gloves. Early in the morning, crush nest and remove it, then clean nest area with soap and water to remove pheromones.

Paper wasp on nest (Alvesgaspar, Wikimedia Commons)



Paper wasp nest (Whitney Cranshaw, Colorado State University, Bugwood.org)

Paper wasps (Left: Whitney Cranshaw, Colorado State University, Bugwood.org; Right: Paper wasp, Johnny N. Dell, Bugwood.org)

# Sand Wasps and Cicada Killers

Crabronidae: Bembix spp.; Sphecius speciosus

## Identification

- 3/4 inch – 1 5/8 inches long
- black wasps with yellowish markings
- some have bright green eyes
- no hairs

## Nesting Habits

- solitary, but often nest together (aggregations) in favorable sandy sites in the ground (not in colonies)
- favorable sites are often areas of bare sandy areas

## Diet

- nectar, insects

## Significance

- nests pose a minimal health risk to humans
- can give a painful sting but wasps are not aggressive

## IPM Recommendations

- Monitor for burrows or aggregations early summer – fall, especially in sandy areas or areas with prior wasp activity.
- Purchase and use a bee veil, suit and gloves.
- Eliminate nesting habitat by proactively renovating bare soil areas with turf or other cover.
- Eliminate sandy areas.

Bembix sand wasp (Howard Ensign Evans, Colorado State University, Bugwood.org)

Cicada killer (Jessica Louque, Smithers Viscient, Bugwood.org)

Cicada killer with cicada (Ronald F. Billings, Texas Forest Service, Bugwood.org)

# Scorpions

Buthidae; Luridae; Vaejovidae

## Identification

- long, thin segmented bodies
- long tails equipped with stingers
- eight legs and pincer-like mouthparts
- glow a fluorescent green/blue color under black light

## Nesting Habits

- spend the day resting underneath objects on the ground and come out at night to search for prey
- seek dark protected areas to hide indoors

## Diet

- small arthropods

## Significance

- venom may cause swelling, inflammation, discoloration and pain
- most scorpion stings are similar to bee or wasp stings
- the only deadly scorpion in Utah is the Arizona bark scorpion, found only in southern Utah along the Colorado River

## IPM Recommendations

- Anyone stung by a scorpion should collect the scorpion and immediately contact a physician or the poison control center for medical instructions.
- If scorpions are suspected in or around a structure, conduct an inspection at night using a black light.
- Find and seal any openings or crevices in exterior walls.
- Repair leaky air conditioners or other outside water sources.
- Prune trees and shrubs up and away from the ground.
- Remove leaf litter, large mulch, debris and other harborage around buildings.
- Install door sweeps and tight-fitting screens and weather stripping around windows and doors.



Common striped scorpion (Sturgis McKeever, Georgia Southern University, Bugwood.org)

Giant desert hairy scorpion (Mohammed El Damir, Bugwood.org)

Arizona bark scorpion (Jim Kalisch, University of Nebraska-Lincoln)

# Solitary/Ground Bees

Andrenidae (mining bee); Colletidae (plasterer bee); Halictidae (sweat bee)

## Identification

- 1/8 – 3/4 inch long
- coloration variable: brown to black to metallic green

## Nesting Habits

- solitary, but often nest together (aggregations) in favorable sites in the ground (not in colonies)
- favorable sites are often areas of bare soil

## Diet

- nectar, pollen

## Significance

- nests pose a minimal health risk to humans
- can sting, but sting is mild
- important pollinators

## IPM Recommendations

- Monitor for bumble bee nests early summer – fall.
- Purchase and use a bee veil, suit and gloves.
- Eliminate nesting habitat by proactively renovating bare soil areas with turf or other cover.
- Rope off areas with these bees to keep individuals away from aggregations until they become inactive (then renovate nesting site).

Mining bee (Whitney Cranshaw, Colorado State University, Bugwood.org)

Plasterer bee (Michael Becker, Wikimedia Commons)

Sweat bee (Jon Sullivan, Wikimedia Commons)

# Western Yellowjacket

Vespula pensylvanica

## Identification

- 3/8 – 5/8 inch long
- yellow and black; no hairs
- abdomen is blunt on the anterior side

## Nesting Habits

- social
- colony dies off every fall; fertilized queens overwinter
- nest in old rodent burrows, holes, structural voids, etc.
- queens start new every spring; colonies grow throughout the summer months

## Diet

- insects, nectar
- scavengers (meat, sugar, human food, etc.)

## Significance

- nests pose a serious health risk to humans
- scavenge in fall making outdoor events dangerous

## IPM Recommendations

- Monitor for yellowjacket nests early summer – fall.
- Purchase and use a bee veil, suit and gloves.
- Minimize nesting habitat around property by caving in old rodent burrows and sealing exterior cracks and crevices, holes in trees, wall voids, etc.
- Install tight-fitting screens in windows.
- Never plug entrance holes to nests!
- Use a wet-vac to vacuum yellowjackets, then dig up nest. This technique can be dangerous if not done properly. Research the proper technique and always wear protective gear. Do not attempt while people are present.
- Apply a non-repellent insecticidal dust in and immediately around entrance hole(s) at night.
- Consider outsourcing yellowjacket management.



Yellowjacket (Eugene Zelenko, Wikimedia Commons)

Yellowjacket nest (Whitney Cranshaw, Colorado State University, Bugwood.org)

Yellowjackets (Whitney Cranshaw, Colorado State University, Bugwood.org)

# Bats

Chiroptera

## Identification

- wingspan ranges from a few inches to 17 inches
- 18 species in Utah

## Nesting Habits

- caves and mines, tree foliage, hollow trees, cracks in rock cliffs and buildings
- some live in Utah year round; some are migratory

## Diet

- insects

## Significance

- major disruptor to building occupants
- health hazard: could transmit histoplasmosis and rabies

## IPM Recommendations

- Do NOT kill bats; they are protected by law!
- Do NOT seal cracks and crevices when bats and their young are present (late May – late July).
- Exclude bats: seal exterior cracks, crevices and areas around pipes and electrical that enter through walls.
- Exclude bats: use netting that allows bats to leave structures but blocks them from re-entering the building.
- Construct bat boxes as an alternative roosting site.
- Keep all exterior doors and windows closed.
- Keep screens in good repair.
- Avoid leaving gaps in construction where bats can roost.
- Seal all cracks and crevices where bats may enter a building. This may take great effort and special equipment.
- Use the presence of guano (bat feces) and grease markings on siding, etc., to find openings that need exclusionary measures taken.
- Never handle bats with bare hands.



Big brown bats (USDA Forest Service Southern Research Station Archive, Bugwood.org)

Silver hair bat (Larisa Bishop-Boros, Wikimedia Commons)

Bat exclusion with mesh (M. D. Tuttle, UC Statewide IPM Project)

# Deer Mouse

Peromyscus maniculatus

## Identification

- brown to gray colored body with a white belly, furry tail and ears smaller than that of a house mouse
- 6 inches long, including tail
- multiple species exist

## Nesting Habits

- prefer rural areas including fields, pastures, vegetative areas around buildings and out buildings
- move indoors when it gets cold outside

## Diet

- seeds, fruits, vegetation, berries, nuts and insects

## Significance

- known carrier of Hantavirus Pulmonary Syndrome, a rare but potentially fatal lung disease found in mouse feces and urine

## IPM Recommendations

- Deer mice are only occasional invaders in buildings.
- Install tight-fitting door sweeps.
- Seal exterior cracks, crevices and areas around pipes and electrical conduits that enter buildings through walls.
- Reduce clutter indoors and outdoors.
- Minimize nesting habitat around property.
- Keep all exterior doors closed.
- Store food in pest-proof containers.
- Use snap-traps placed with triggers toward the baseboards, especially in dark corners.
- Train kitchen and custodial staff to clean thoroughly.
- Clear high weeds that serve as food and shelter during warm weather.



Adult deer mouse (David Cappaert, Michigan State University, Bugwood.org)

Deer mouse (6th Happiness, Wikimedia Commons)

Deer mouse (Jack Kelly Clark, University of California Statewide IPM Project)

# European Starling

Sturnus vulgaris

## Identification

- 7 1/2 – 8 1/2 inches long
- black with green-purple sheen in summer and spring
- heavily speckled with white and gold in winter
- stocky and short-tailed
- eggs: white to light blue, some with dark spots

## Nesting Habits

- nest in building cavities, ledges, vents, tree cavities or holes, nooks and crannies in and around structures, etc.
- build nests from grasses, twigs and debris lined with feathers and other soft materials
- some migrate south for winter; others remain year round

## Diets

- insects and other invertebrates
- grains, berries, fruits and seeds

## Significance

- health concern; associated with over 25 diseases and ectoparasites
- contaminate sidewalks, vehicles, buildings, etc. around their nesting sites with feces
- make loud noises that can be disturbing

## IPM Recommendations

- Once the species is considered a problem, first check federal, state and local regulations for bird management.
- Exclude birds from nesting and roosting: install plastic netting on susceptible parts of the building; use deterrents such as plastic or metal spines on ledges; modify locations in other ways.
- Reduce or eliminate feeding sites and water sources.
- See Utah Administrative Code R657-3-7 for more infomation on legal issues surrounding starling control.



European starling (Pierre Selim, Wikimedia Commons)

European starlings (Lee Karney, U.S. Fish and Wildlife Service, Bugwood.org)

Starling nest and eggs (Chris Evans, University of Illinois, Bugwood.org)

# Ground Squirrels

Ictidomys; Urocitellus; Spermophilus

## Identification

- many sizes; bodies up to 11 inches long
- tails 2 – 9 inches long and less fluffy than a tree squirrel's
- brownish-gray fur
- burrow openings about 4 inches in diameter

## Nesting Habits

- live in colonies and build underground burrow systems
- populations range from 2 to 20 squirrels per acre
- active during the day
- hibernate during cold winter months
- burrows 5 to 30 or more feet long; 2 to 6 feet below soil surface; no soil plugs

## Diet

- grasses, alfalfa, grains, ornamental plants, seeds and nuts

## Significance

- burrowing activity can destroy lawns and other vegetation, collapse ditch banks and undermine building foundations
- carry a wide range of diseases
- strip bark from young trees

## IPM Recommendations

- If populations are small, use box traps, tunnel traps or Conibear traps when squirrels are active (February – October).
- Periodically monitor for signs of infestation, such as new burrows, to manage before the population becomes too large.
- Prebait (bait traps without setting them) for a few days before setting traps.
- Bait with appropriately labeled rodenticides, if necessary.
- Remove brush piles and debris.



Wyoming ground squirrel (JTchagbele, Wikimedia Commons)

Belding's ground squirrel (Yathin S. Krishnappa, Wikimedia Commons)

Ground squirrel burrow entrance (Mary Burrows, Montana State University, Bugwood.org)

# House/English Sparrow

Passer domesticus

## Identification

- about 6 inches long

males:

- dark brown streaked with black above and gray underside
- large black patch under beak

females:

- dusky brownish gray with blackish stripes above and gray underside
- yellowish beak

## Nesting Habits

- nest in protected areas in or near buildings (e.g., on ledges, in gutters, signs and light fixtures and under eaves, etc.)
- build nests from grass, straw, feathers, string, paper and debris; frequently reuse nesting sites

## Diet

- grains, seeds, garden plants and fruit
- feed insects and food refuse to young

## Significance

- heath concern; associated with over 29 diseases and ectoparasites
- contaminate many different materials with droppings

## IPM Recommendations

- Install plastic netting on parts of the building used for roosting and nesting or use deterrents such as plastic or metal spines on ledges.
- Reduce or eliminate their feeding sites and water sources.
- Close all openings larger than 3/4 inch.
- Install slanted metal, plexiglass or wooden boards (45° angle) over ledges.



House sparrow (Greg Bartman, USDA APHIS PPQ, Bugwood.org)

Sparrow and nestlings (Jim Occi, BugPics, Bugwood.org)

Sparrows (Deena Shron Chadi, Bank Street College of Education, Bugwood.org)

# House Mouse

Mus musculus

## Identification

- brown to gray colored fur with a lighter colored belly and large ears
- tail is naked and about the same length as the head and body combined
- 5 – 8 inches long, including tail

## Nesting Habits

- prefers to nest in protected areas near a food supply and and heat
- indoors: dark corners, especially behind appliances that produce heat

## Diet

- stored food products, human food, seeds

## Significance

- contaminate food, damage property, spread disease
- scare people

## IPM Recommendations

- Install tight-fitting door sweeps.
- Seal exterior cracks, crevices and areas around pipes and electrical conduits that enter buildings through walls.
- Reduce clutter indoors and outdoors.
- Minimize nesting habitat around property.
- Move dumpsters at least 50 feet from buildings.
- Keep all exterior doors closed.
- Store food in pest-proof containers.
- Monitor with non-toxic bait blocks in tamper-resistant bait boxes.
- Use snap traps placed with triggers toward the baseboards, especially in dark corners.
- Use multiple baits: peanut butter, hot dogs, floss, etc.
- Clean food preparation areas thoroughly.

House mouse (Wikimedia Commons)

House mouse (Xocolatl, Wikimedia Commons)


House mouse (Jack Kelly Clark, University of California Statewide IPM Project)





Vertebrate Pests

# Norway Rat

Rattus norvegicus

## Identification

- average length is 16 inches
- gray to reddish brown; typically grayish brown

## Nesting Habits

- nest in burrows in the ground
- like low-growing vegetation, rock piles, etc.
- very common under concrete slabs

## Diet

- highly varied: any food product, trash, carrion, etc.

## Significance

- can transmit disease; human health concern
- ruin stored food products
- nuisance in and around buildings

## IPM Recommendations

- Install tight-fitting door sweeps.
- Seal exterior cracks, crevices and areas around pipes and electrical that enter buildings through walls.
- Reduce clutter indoors and outdoors.
- Remove weeds and low-growing ornamentals/covers.
- Move dumpsters at least 50 feet from buildings.
- Keep all exterior doors closed.
- Store food in pest-proof containers.
- Use snap traps placed with triggers toward the baseboards, especially in dark corners and behind objects, in drop ceilings, and areas with droppings, etc.
- Use multiple baits: peanut butter, meat, candy, etc.
- When trapping, put traps out with bait, but do not set the triggers. Desensitize the rats for a week before setting the triggers.
- Clean food preparation areas thoroughly.

Norway rat (National Park Service, Wikimedia Commons)

Norway rat (Tomas Cekanavicius, Wikimedia Commons)

Norway rat (David Shankbone, Wikimedia Commons)





Vertebrate Pests

# Pocket Gophers

Geomyidae

## Identification

- 6 – 13 inches long
- light brown to brownish black fur
- short, hairless tails
- incisor teeth always visible

## Nesting Habits

- construct underground burrows and leave fan-shaped mounds of excavated soil at the surface
- active year round
- usually only one individual per tunnel system except during mating season or when females have offspring

## Diet

- prefer dandelion roots, alfalfa, grasses, shrubs, roots and trees

## Significance

- damage lawns, gardens, sports and agricultural fields
- damage underground utility cables and irrigation pipes
- harm trees by stripping bark and chewing on roots

## IPM Recommendations

- Trap pocket gophers using two-pronged pincer traps in lateral burrows and closed box-style traps in main burrows.
- Surround trees and shrubs with 3/8 inch hardware cloth.
- Consider flood irrigation to help control gopher populations, if applicable.
- Bait larger populations by placing bait directly into burrows.
- Monitor problem areas to ensure trapping and baiting were successful and to quickly control new populations.
- Carefully read and follow the pesticide label when using rodenticides.



Pocket gopher (Ian Silvernail, Wikimedia Commons)

Pocket gopher mounds (USDA Forest Service, Bugwood.org)

Pocket gopher burrow entrance (Gerald Holmes, California Polytechnic State University, Bugwood.org)

# Rock Pigeon

Columba livia

## Identification

- variable in color, but most are bluish gray with two black bands on the wings and a black tip to the tail
- most have rainbow-like throat feathers
- 12 – 15 inches long

## Nesting Habits

- build nests out of twigs, grasses and sticks to form a crude platform
- nest on flat, covered surfaces such as sheltered cliff ledges, bridges and building surfaces

## Diet

- primarily grain and seeds
- garbage, livestock manure, insects or other food provided for them intentionally or unintentionally by people

## Significance

- pigeon droppings may pose a health hazard when allowed to accumulate
- infest unprotected ventilation ducts/exhaust units
- major nuisance pest

## IPM Recommendations

- Exclude pigeons with bird netting.
- Close building openings with wood, metal, glass or rustproof iron mesh.
- Keep outdoor areas clean and eliminate water sources.
- Use deterrents such as metal or plastic spikes, monofilament and steel lines, coils, and sloped surfaces.

Rock pigeon (Alpsdake, Wikimedia Commons)

Rock pigeons (Terry Spivey, USDA Forest Service, Bugwood.org)

Rock pigeon (Lee Karney, U.S. Fish and Wildlife Service, Bugwood.org)





Vertebrate Pests

# Skunks

Mephitidae

## Identification

- about the size of a housecat
- black fur and two broad white stripes running the length of the body; spotted skunks are black with white markings and about half the size of a housecat
- release odorous spray (distance of 8 – 15 feet) when disturbed or cornered

## Nesting Habits

- build dens in brush piles, open irrigation pipes, storage areas, sheds, under structures, etc.
- solitary animals, except for mating and during winter
- most active at night

## Diet

- wide range of plant and animal material including berries, fruits, vegetables, insects, small rodents, reptiles, eggs and young birds

## Significance

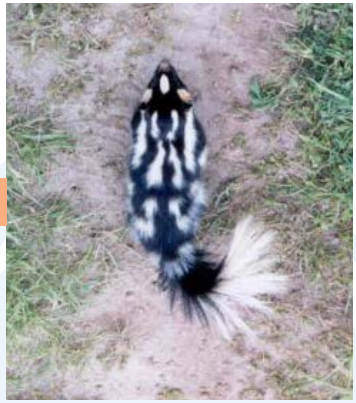
- known carriers of diseases, such as rabies, and a variety of parasites
- may damage lawns and athletic fields by digging for food; leave bare patches and small cone-shaped holes
- odorous defensive spray

## IPM Recommendations

- Check local regulations for skunk management prior to control.
- Eliminate potential den sites and food sources outdoors.
- In buildings without concrete foundations, seal all holes with a fine wire mesh to prevent skunks from denning under the structure.
- If a skunk enters a structure, do not harass or disturb it. Leave exits open to allow it to leave on its own.
- Contact a professional to trap and remove the skunk.



Striped skunk (Alfred Viola, Northeastern University, Bugwood.org)



Western spotted skunk (National Park Service, Wikimedia Commons)

Skunk damage to lawn (Ohio State University Extension)

# Tree Squirrels

Sciurus spp.

## Identification

- head and body 6 – 15 inches long
- tail 4 – 14 inches long
- white, grayish, yellowish, reddish or brownish above with pale or dark underside
- short, thick fur and bushy tail

## Nesting Habits

- build nests in tree cavities or on tree branches
- occasionally enter attics and garages for food and shelter or to nest

## Diet

- mainly feed on nuts and acorns, seeds, berries, tree bark and fungi

## Significance

- minor health concern; carry diseases, but transmission to humans is rare
- can enter buildings and damage walls, wires and insulation

## IPM Recommendations

- Exclude squirrels by blocking entrances into buildings with hardware cloth.
- Keep squirrels from climbing trees by installing a 2-foot-wide collar or metal 6 feet off the ground around the tree, or using 2 foot sections of 2-3 inch pipe over utility lines (consult the electrical company for assistance if placing sleeves over electrical wires).
- Use live traps to remove squirrels from buildings, seal entry points and then release outside. Lethal traps are also available for squirrel control.

Fox squirrel (Joseph Berger, Bugwood.org)

Red squirrel (Michael Mengak, University of Georgia, Bugwood.org)

Tree squirrel nest made from leaves and twigs (NatureServe, Flickr.com)

# Voles

Microtus spp.

## Identification

- 3 – 6 inches long
- hairy tail with short hairs
- make runways/tunnels in turf, mulch, etc.

## Nesting Habits

- burrow in the ground along runways
- prefer areas of heavy ground cover

## Diet

- plants, tubers, bark

## Significance

- cause damage to turf and ornamental plantings
- occasionally enter buildings by accident, but do not become established indoors

## IPM Recommendations

- Install tight-fitting door sweeps.
- Seal exterior cracks, crevices and areas around pipes and electrical conduits that enter buildings through walls.
- Reduce clutter indoors and outdoors.
- Keep all exterior doors closed.
- Use snap traps placed with triggers in vole runways.
- Eliminate weeds, ground cover, mulch and dense ornamental plantings that provide food and shelter during warm weather.
- Rodenticides may be necessary for control in large areas.

Vole size comparison (Manuel R., Wikimedia Commons)

Vole damage to bark (USDA Forest Service, Bugwood.org)

Vole damage in turf (Ryan Davis, Utah State University Extension)





Vertebrate Pests

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University of Nebraska

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For help with your pest-diagnostic needs, please call the Utah Plant Pest Diagnostic Lab at 435-797-2435 or visit utahpests.usu.edu.

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