



UTAH PESTS News

Utah Plant Pest Diagnostic Laboratory and USU Extension

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The following can be found on our website:

Brown Marmorated Stink Bug

www.utahpests.usu.edu

It's Swarm Time

A honey bee swarm will alight on a branch, surrounding and protecting the queen, until a suitable cavity is found in which to make a new hive. They are not aggressive while swarming.



A honey bee swarm can be an impressive, and sometimes intimidating, sight, as a huge cloud of bees (sometimes as large as the size of a suburban backyard) flies from a crowded bee colony to a new location. There were many reports of honey bee swarms in northern Utah this spring from anxious homeowners. A better understanding of swarming behavior should alleviate concerns anyone may have when encountering a swarm.

In the spring, a honey bee colony will rapidly build up its resources and produce a lot of brood. Often this leads to cramped conditions by late spring or early summer. In response, the colony will split into two, and the new colony relocates, a process also known as swarming.

The process begins with the rearing of a new queen. Simultaneously, scouts begin looking for a suitable location for a new hive. Hollow trees are a favorite, but any

large cavity is a potential new home. About 30 to 70% of the worker bee population will engorge themselves with honey before leaving so that they will have plenty to eat as they search for and establish a new home. Once the new queen has matured, she stays with the existing colony and the old queen and worker bees leave to start the new hive. Soon after departing, the old queen will land on an object as a temporary staging area. The worker bees will orient to the queen's pheromones and surround her. The result is a huge ball of bees that can sometimes be located in a backyard tree. The scouts that had previously located potential new nesting sites try to "convince" the hive to move to their chosen site. After a few hours, a decision is reached and the swarm departs.

Witnessing the bees' arrival or finding a swarm may cause unnecessary panic. Swarming bees are actually much more docile than bees in a hive. Their main concern is keeping the queen safe and warm

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Bee Swarms, continued from previous page

and relocating the hive. The worker honey bees are still engorged and will have a difficult time stinging. I have walked right up to a swarm and held my hand within an inch of the bees with no consequence. They have no brood or honey to protect in this situation, and thus, are calmer.

Homeowners concerned about a swarm may contact the Utah Beekeepers Association (www.utahbeekeepers.com), which maintain a list of beekeepers that

are interested in collecting swarms. A local beekeeper may agree to come out to the residence and collect the swarm, to the mutual benefit of all.

-Cory Stanley, USU CAPS Coordinator

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Aphids All Around in Spring 2011

Aphid populations have been higher this spring than many can remember in years. On fruit trees we've seen black cherry aphid, green peach aphid, mealy plum aphid, leafcurl plum aphid, and apple aphids. On landscape plants: rose aphid, spirea aphid on a number of species, honeysuckle aphid, sunflower aphid on dogwood, linden aphid, elm leaf aphid, Norway maple aphid, giant conifer aphid, and many more. Not only were they abundant, but on a few host plants, egg hatch occurred very early; even before bud break. A variety of factors combined to make the "perfect storm" for the aphid eruptions.

One of the biggest factors was what happened last fall. Low-level jet winds in September blew aphids north from southern Utah and Arizona, and the long-lived Southwest Monsoon kept nighttime temperatures in the 40s through to mid November, resulting in large swarms of aphids that had plenty of time to multiply, mate, and lay eggs on overwintering hosts. The weather this spring then helped to magnify an already large starting population. Aphids are a cool-season pest, and thrive on the healthy, succulent plant tissue that has been plentiful this spring.

The good news is that many of these aphid species migrate to alternate hosts for the summer, and will be leaving the plants they are now on very soon.



The long warm fall of 2010 in northern Utah gave aphids plenty of time to mate and lay hundreds of eggs on a wide variety of hosts, making for aphid problems this spring.

Also, the abundance of prey leads to a subsequent abundance of predators, some of which were active very early this spring, including wasp parasites and larvae of syrphid flies and lady beetles.

-Marion Murray, IPM Project Leader

Hollyhock Weevils Cause Reduced Flowering

By Ron Patterson, Extension Assistant Professor and Agriculture and 4-H Youth Programs Agent for **USU Carbon County Extension**. Ron has many duties, but predominantly works with livestock producers to improve range conditions and reduce the effects of noxious weed invasion.

Hollyhock is a well-adapted, drought tolerant plant with beautiful spires of summer flowers. It is typically a biennial or short-lived perennial. To maintain a healthy flower population plants should re-seed every year. If a hollyhock planting is not re-seeding well, it may be harboring a population of hollyhock weevils.

The hollyhock weevil (*Apion longirostre*) is a common reason for hollyhock patches to thin out, or not re-seed a healthy replacement crop. This small insect is approximately 1/8" – 1/4" long (which includes the long snout). Weevil snouts are adapted for chewing, with the jaw located at the tip of the snout. The snout of the female is almost as long as the body while the male snout is about half as long. The jointed antennae are located halfway along the snout. The tiny gray body is slightly hairy and the legs are yellow/orange.

Hollyhock weevil adults overwinter in the soil and duff of the hollyhock flower bed. They emerge in spring and chew irregular holes in new leaves, which is a good early indicator of activity. When the flower buds appear, the adults move up the plant and can be easily seen. They are most active at night. The female chews holes deep into the flower bud with her long snout and lays an egg in each hole. A normal flower develops, but the tiny larvae will feed inside the seed embryo and eventually consume the seed that forms from the inside out. They pupate in the seed head and the new adults will emerge about August and drop to the soil to overwinter.

Control options include mechanical and chemical practices. Scout for weevils by checking new growth on plants in the spring. The nice thing about hollyhock weevils is that they are quite host-specific—you probably won't find them on other landscape plants.

Hollyhock weevils are easily disturbed. Place a cloth under the plants and shake them down. Destroy the fallen weevils by crushing or dumping them in soapy water. Check for infested seeds and destroy them before the adults emerge.

Chemical options include soft approaches such as insecticidal soap or horticultural oil. Pyrethrin, Sevin, Orthene, or Malathion may be used as a last resort. Spraying will be most effective if done in late evening. Keep in mind that broad spectrum insecticides may also kill beneficial insects.



Hollyhock weevils are beetles with mouthparts located at the tip of a snout. The weevil uses its snout to feed on foliage and also to chew cavities deep into flower buds in which to lay several eggs. The hatched larvae then feed on the seed that develops after flowering.



Hollyhock weevils are promiscuous in the garden, and the smaller (but domineering) male will often remain with the female to keep other males at bay.

November 2010 Freeze Injured Tender Trees

The fall of 2010 was long and warm in northern Utah. Temperatures were mild up until November 20—in the 40s at night and no cooler than 45 during the day. Over the next 3 days, temperatures plummeted to the single digits for 3 consecutive nights, followed by mild to average temperatures for the remainder of the fall. Some trees growing on the “edge” of their hardiness zones such as Atlas cedar, giant sequoia, Amur maackia, Kousa dogwood, and others, experienced varying levels of dieback. Peach and sweet cherry growers reported bud injury, dieback, and tree death.

Day length and temperature are two important factors in triggering acclimation from the growing phase to the dormant phase in plants. Among other changes, water moves from within cells, where ice formation would be very damaging, to between cells, where ice masses can safely form. Trees growing in northern Utah that are marginally hardy (i.e., growing a zone 6 tree in zone 5) typically are not fully acclimated until late December. Because of the long period of warm fall days in 2010, the acclimation process to dormancy had barely begun.

Damage to evergreens (mostly conifers) was visible right away this spring, seen as dead, brown needles or scales and in some cases, dead shoot tips. Some trees looked completely dead because all the foliage was brown. Evergreens, because they retain their foliage, need water in winter to replace water lost to transpiration. Normally, the tree is able to access some water from the soil. But the hard freeze that followed the mild temperatures resulted in a situation where the lost water could not be replaced.

Damage to deciduous plants is more difficult to discern, and also is more difficult to blame on the November freeze due to the wide array of



Where the buds survived, new shoots and foliage are seen emerging on “brown” conifer branches.



Some trees, including peach and this chokecherry, expanded their spring foliage, but the loss of water transport capacity resulted in wilting soon afterward, and in some instances, tree death.

problems and the length of time it takes to see the damage. Some of what happened includes the following:

1. **Frost cracks** are vertical splits in the trunk that occurred due to uneven contraction of the wood during the drastic temperature change. Cracks or fissures may not be visible for several weeks to a month after the tree starts growth in spring, or even when secondary problems have arisen, such as entry by borers or wood-decay fungi.

2. **Branch dieback** or death of entire trees occurred due to xylem cavitation, which is when xylem vessels become air-filled and essentially non-functional due to the freeze-thaw event. Branch dieback, where the leaves never emerged, is the most common type of injury we have seen. The roots are not killed in this case, and may produce heavy sprouting.

3. **Bud/twig death** occurs when water freezes within plant cells. This damage was widespread on peaches and sweet cherries, resulting in a reduction in yield.

4. **Infection** by opportunistic pathogens occurred on tissue not fully hardened off or damaged by freezing. Bacterial blight was prevalent this spring on sweet and ornamental cherry, apricot, viburnum, peach, ornamental pear, and mountain-ash. Bacterial blight is caused by *Pseudomonas syringae*, a pathogen that infects cold-damaged buds in autumn. *P. syringae* contain proteins that can cause water to freeze at higher temperatures, contributing to wounding. Other opportunistic pathogens include cytospora canker on spruce, cherry, peach, and poplar, and *Thyronectria* canker on honeylocust.

Freeze Injury, continued from previous page

THERAPY FOR INJURED TREES

In general, maintain even soil moisture (i.e., do not let the tree suffer from dry conditions), and fertilize in spring.

Conifers and Broadleaved Evergreens

Evergreens should be left to recover; do not prune until next year, when it is clearly visible which branches survived and which didn't.

Deciduous trees

- Branches that have not leafed out by summer can be pruned out. (When pruning, do not leave stubs, and do not cut through the branch collar.) If more than 50% of the tree was killed, consider tree replacement.

- Thin out excessive shoots and suckers of fruit trees as well as growth that is shading fruit-bearing shoots to ensure fruit production for next season.
- Any fruit trees that have a heavy crop should be thinned more than usual to prevent stress on the tree. Thin peach fruit, for example, to about 10 inches between fruitlets.

Injury from the November freeze was unavoidable, but you can prevent injury in "normal" years by planting the right tree for the right site, avoiding late-season pruning and fertilization, watering in October when needed, and applying white trunk wrap for the winter.

-Marion Murray, IPM Project Leader, and Michael Kuhns, Professor and Forestry Extension Specialist

Peach Leaf Curl

Peach leaf curl is a disease caused by the fungus *Taphrina deformans*. The fungus is specific to peaches and nectarines and can infect leaves and immature fruit. The disease occurs during cool wet weather at the time of leaf emergence and expansion. The fungus is present almost anywhere peaches are grown, but usually goes unnoticed during years in which it is warm and dry during the period from bud swell to leaf expansion. Due to the weather conditions in spring 2011, the disease was more common than usual in Utah peach orchards.

The fungus survives as blastospores on the bark of peach trees and near buds. During wet weather the spores are washed onto emerging leaves. The spores germinate and penetrate the leaves, inducing the distorted blister-like deformation. *Taphrina deformans* does not produce fruiting bodies. It forms a single layer of asci (sac-like structures that contain sexual spores) on the surface of discolored and distorted leaf areas. It is sometimes visible as a dusty cover on the leaves. The spores are released and are blown to the bark of trees where they survive during the summer. The sexual spores eventually germinate and produce blastospores. The blastospores multiply by budding (similar to yeast) and are washed onto new emerging leaves in the spring.

Taphrina deformans induces cells on the margins of infected leaves to multiply rapidly and randomly, resulting in deformation and curling. The infected distorted leaf parts are often yellow or red colored. Infected leaves eventually turn brown and fall off. Infected fruit may drop early or show wart-like symptoms when mature. The tree will leaf out to replace the fallen leaves, which can affect tree vigor and yield.

Infections occur only during temperatures between 50 and 70°F. Disease incidence is highest and most noticeable during wet conditions. During cool temperatures, expansion of



Peach leaf curl is a disease caused by the fungus *Taphrina deformans*. Infections occur only during cool, moist conditions, causing puckered, deformed leaves. It is treated by a single application of copper or chlorothalonil at leaf drop.

young leaves is slower, allowing for a longer infection period. At higher temperatures, infection may occur, but symptoms will not develop due to faster expansion of the leaves. Once leaves have fully expanded they become resistant.

There are no management options after infection has occurred. Chemical management can be done in the fall with a single application of copper or chlorothalonil (both available for commercial and backyard plants). Cultural practices that can be used by homeowners include raking and removing leaves in the fall to remove as much inoculum as possible and using resistant varieties.

-Claudia Nischwitz, Plant Pathologist

European Earwig Functional Roles in Peach Orchards



68% of Utah peach growers have observed fruit injury from earwigs, affecting 5 to 10% of the crop

The European earwig (*Forficula auricularia*) is native to Europe, western Asia, and parts of Africa, and was first introduced to Utah in the 1930s. It is a common insect in agricultural crops and home gardens in the western U.S. Interestingly, it has omnivorous feeding habits and so can be both a plant-feeder and predator. It is a pest of many plants, including fruits, vegetables, herbs, grains, stored foods, pollen, and ornamentals. Similarly, it has been found to prey on many types of small arthropods including aphids, scales, caterpillars, maggots, and mites.

Its abundance and crop injury in stone fruits, especially peach, is a concern for commercial growers and home gardeners. A survey of Utah peach producers in 2010 revealed that 68% had observed fruit injury from earwigs with most categorizing the damage as 5-10% of the crop affected. The majority (61%) reported use of insecticides to control earwigs, while only 8% had tried cultural practices, and 31% had done nothing to reduce the damage.

Tree fruit researchers in Europe and Oregon developed a simple monitoring trap for the European earwig. Strips of corrugated cardboard (4 in wide by 10 in long; corrugation flute size "A") are rolled with the ridges turned inward and tied onto a tree trunk or limb. Earwigs are nocturnal in their activity and seek refuge in the cardboard traps during daylight.

We tested the refuge trap in peach orchards and found that the number of earwigs collected in a trap can provide a relative measure of abundance as the number that seek shelter in a trap is influenced by crowding (density). The traps, however, provide easy-to-gather information on phenology (timing of life stages during the season) and location preference within orchards.



A cardboard refuge trap tied to tree trunks or scaffold limbs can provide a relative measure of earwig abundance in an orchard.

Trapping in peach orchards showed similar numbers of earwigs seeking refuge in traps placed on trunks and scaffold limbs of peach trees, suggesting that earwigs spend a significant amount of time in peach tree canopies.

The European earwig overwinters as an adult, and females begin to lay clutches of 30 to 50 eggs in the soil or other moist locations in the spring. Females provide maternal care, an uncommon behavior in the insect world. There are 4 nymphal instars (immature stages with a molt of the outer cuticle between each).

The 1st instars remain primarily in the nest, and few 1st instars have been caught in the cardboard traps. The 2nd through 4th instars depart the nest and forage for food in the surrounding environment.

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Earwigs, continued from previous page



Earwigs, such as this male (*top*), can be observed at night, when they do most of their feeding. Any holes in the fruit associated with black dots (excrement) can usually be blamed on earwigs. They also feed on leaves, which is a good indicator of activity (*bottom*).

In six peach orchards in 2010, abundance of 2nd instars peaked at 300 degree-days (DD) (lower threshold for development = 44°F) while 50% trap catch of 2nd to 3rd instars, 3rd to 4th instars, and 4th instars to adults occurred at 425, 500, and 775 DD. We plan to develop a degree day model that can be used to determine when the different life stages will be active, when crop injury may occur, and optimal timing for control.

Studies so far have shown that earwigs will feed on the leaves and fruit of peach trees. In the spring and summer, adults and nymphs chew along the edges and tips of leaves. Last year, in a research orchard in Kaysville where no earwig controls were applied and the crop load was small, from 38-58% of the peach fruits were fed upon by earwigs. Fruit injury occurred from mid August to early September, most likely by adults, which were found to be the primary life stage in the orchard. Peach fruit-feeding increased with decreasing firmness (i.e., maturity) of the fruits, and the size of feeding holes substantially increased when fruit firmness dropped below about 0.2 kg/mm using a fruit penetrometer.

The earwig population size measured in cardboard traps was not correlated to fruit injury, and suggests that refuge traps may not provide an accurate measure of actual population density.

In an insecticide control study, an average of 6% of the fruit in the untreated plots had earwig injury as compared to 1% in each the spinosad (Success)- and carbaryl (Sevin)-treated plots. The insecticides were applied on August 16 just after the first earwig fruit injury was detected.

The abundance of green peach aphids in orchards this spring allowed us to evaluate the feeding rate of earwig adults and nymphs on aphids. Further research on earwig ground habitat preference (orchard cover crops, tillage, herbicide-treatments, and mulches), dispersal distances, feeding preferences throughout the season, predation rates and preference for prey types, timing of crop injury, predation feeding behaviors, phenology models, and other life history characteristics is underway. The project goals are to gain a better understanding of European earwig functional ecology and roles in the peach orchard, and how to better manage this insect to take advantage of the benefits it can bring through biological control while minimizing crop damage.

This research is supported by the USDA Organic Agriculture Research and Extension Initiative, the Utah Department of Agriculture Specialty Crop Block Grant Program, and the Utah Agricultural Experiment Station. Look for research updates at upcoming tree fruit field days, grower meetings, and Master Gardener classes.

-Diane Alston, Entomologist, and
Andrew Tebeau, PhD student in Dept. of Biology, USU

CAPS Update: Gypsy Moth

Two subspecies of gypsy moths are of concern to Utah and the entire United States, the European gypsy moth, *Lymantria dispar*, and the Asian gypsy moth, *L. dispar asiatica*. These two related moths are very similar, but the Asian gypsy moth has a broader host range. Also, Asian gypsy moth females are active fliers, while European gypsy moth females are flightless; therefore, Asian gypsy moths are more likely to spread quickly throughout the U.S.

The Asian gypsy moth was first found in the U.S. in Washington in 1991, allegedly from egg masses on ships traveling from eastern Russia. It has been found in North Carolina and Oregon as well. Several potential hosts for this pest are found in Utah, including oaks, willows, and several evergreens.

The European gypsy moth was originally introduced to the U.S. in 1869 by E. Leopold Trouvelot, who wanted to breed them as silk moths. Unfortunately, the moths escaped, and because they have no natural predators or pathogens in the U.S., they have been a troublesome defoliator in the East ever since. Utah's oak and aspen trees are potentially threatened by this pest.

The Utah Department of Agriculture and Food monitors for both subspecies of gypsy moth. Populations of European gypsy moth have been found and eradicated twice in Utah. Thus far, Asian gypsy moth has not been detected in Utah.

Both of these moths are easily spread by travelers, and people are encouraged to be aware of them, especially when traveling from quarantine areas ([click here](#) for map) to non-quarantine areas. Also, it is important that firewood is not moved from one area to another. Always purchase firewood locally once you reach your destination. In fact, movement of firewood creates a huge risk for spreading many pests, prompting the creation of a dedicated website: dontmovefirewood.org. Additionally, USDA APHIS has recently launched a new campaign aimed at educating people that are relocating to a new area about the possibility of spreading gypsy moth to their new homes. Information can be found at yourmovegypsymothfree.com.

-Cory Stanley, USU CAPS Coordinator

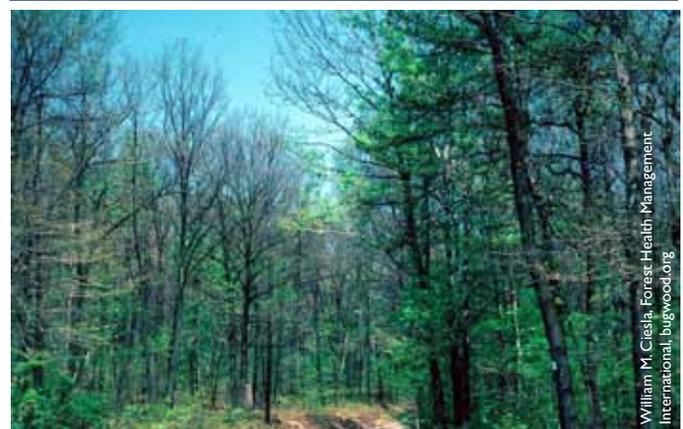
CAPS (Cooperative Agricultural Pest Survey) is a federal program, administered jointly by USDA-APHIS-PPQ and each state, whose purpose is early detection of invasive species that could threaten U.S. agriculture. In Utah, the program is co-coordinated by Cory Stanley (USU) and Clint Burfitt (UDAF).



A female Asian gypsy moth is shown on the left. Its large wings allow it to fly. The European gypsy moth female on the right is unable to fly.



Gypsy moths lay large masses of eggs, primarily on trees. But sometimes eggs are laid on cars, trucks, or trailers, leading to possible spread to uninfested areas such as the western U.S.



Feeding by gypsy moths can lead to complete defoliation of trees. Typically, trees refoliate, but when gypsy moths feed year after year, as seen in eastern forests, some trees cannot recover.

Common Household Pests: Carpet and Hide Beetles

Behind aphids, the most frequently submitted insects to the Utah Plant Pest Diagnostic Lab (UPPDL) are the carpet and hide beetles in the family Dermestidae. Dermestids are some of the most common and damaging household pests in the United States, feeding on a range of food, including leather, furs, feathers, hides, museum specimens, dead insects, woolen or silk rugs and textiles, stored food products, dead animal flesh, shed hair (human and pet), and occasionally cotton or linen.

Today, the name “carpet beetle” is largely outdated and misleading. Historically, carpets were made from animal products such as wool and were fed upon by larvae of certain dermestid species. Today, however, carpets are mostly made from synthetic materials, which are not readily consumed by carpet beetle larvae. In some situations, though, larvae can feed on synthetic textiles if they possess contaminants of nutritional value such as urine, perspiration, or food stains.

Adult beetles usually enter homes on fresh-cut flowers, through open doors or windows, or are introduced via infested food products like grains or flour. People are often concerned when they find a dermestid beetle in their home; however, finding a few beetles indoors does not mean that an infestation is present. Adult dermestid beetles are common outside where they feed on pollen and nectar of plants, while larvae are frequently found scavenging high-protein substances such as dead insects, decaying animal or plant material, or feeding in bird, mammal, bee or wasp nests.

Dermestids are some of the most common and damaging household pests in the United States.

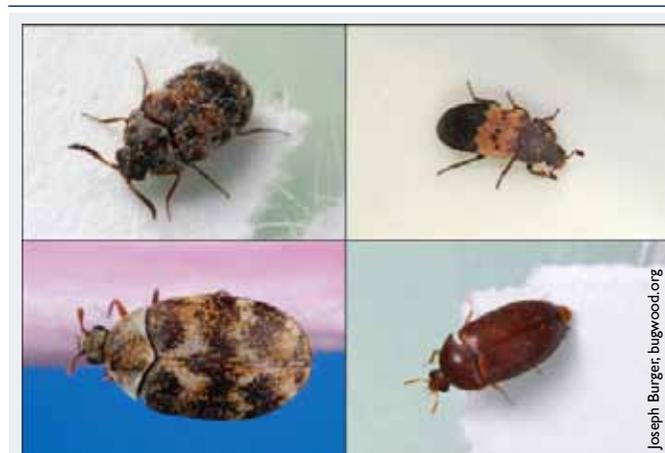
Of the 123 species occurring in the U.S., 12 species from five genera have been identified by the UPPDL from Utah homes. The most common Utah dermestids include the varied carpet beetle (*Anthrenus verbasci*), black carpet beetle (*Attagenus megatoma*), larder beetle (*Dermestes lardarius*), hide beetle (*D. maculatus*), and the warehouse beetle (*Trogoderma variabile*).

Indoors, dermestids are commonly found in the pantry, kitchen, bathroom, or in window sills. If large numbers of beetles are found, control measures

should be taken to limit damage. The following steps can eliminate a dermestid infestation from homes:

1. **Identify beetles.** Given the long list of dermestid food, understanding the feeding habits of the pest beetle can help create a targeted inspection.
2. **Locate beetle source.** The key to eliminating dermestid beetles is to find where the larvae are feeding. Stored foods, animal hides/materials/textiles, under carpeting, baseboards, and furniture, under seat cushions of upholstered furniture or anywhere hair, lint, dead insects, food crumbs, etc., 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. Remember to search for both larvae and adult beetles.

3. **Eliminate infested products.** Once the infestation is located, remove infested items from the home.



Adult carpet and hide beetles common in Utah homes: (top left) *Trogoderma* sp., (top right) larder beetle (*Dermestes lardarius*), (bottom left) varied carpet beetle (*Anthrenus verbasci*), and (bottom right) black carpet beetle (*Attagenus brunneus*). Adult beetles are small, ranging in size from 2 mm to 10 mm.



Immature dermestid beetles (larvae) can grow up to 13 mm in length depending on the species, and can be mistaken for duff millipedes or other immature insects. Have your larvae identified to discern which insect is present.

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Carpet Beetles, continued from previous page

Infested clothing can be dry-cleaned or washed. Options for non-food items include:

- freeze for 2 weeks at temperatures below 18° F
- heat treat for at least 30 minutes at 120° F
- fumigate in sealed container using a resin strip (dichlorvos).

Infested food should be discarded. Some dermestid larvae have many arrow-shaped hairs (hastisetæ) which can cause irritation of the digestive tract.

4. **Clean and vacuum.** Thoroughly clean the area of infestation. Make sure to vacuum all adult and immature beetles to prevent future infestations. Discard vacuum bag after cleaning.
5. **Properly store food.** Store all newly purchased food items (primarily bulk items) in air-tight, insect-proof containers. Susceptible clothing or textile items should also be properly stored.
6. **Exclude beetles.** Keep dermestids out of the house from the start by using screens and weather stripping to secure windows and doors, and appropriately sealing insect entry ways into the home.

Insecticides can be used to augment a thorough inspection, cleaning, and exclusion program where dermestids are infesting non-food products. For insecticidal control of dermestids, consider the following:

1. Treat cracks, crevices, and voids with inorganic dusts such as silica aerogel or diatomaceous earth; pyrethroid dusts may also be used. Areas under carpet edges in infested rooms can also be treated with an insecticidal dust.

2. Spot treatments with liquid or aerosol pyrethroid insecticides (bifenthrin, cypermethrin, deltamethrin, permethrin, tetramethrin, etc.) may be needed; avoid broadcast applications. Some insecticides may stain or discolor carpets, rugs, and textiles; test products on target material before applying.
3. For tough-to-clean or larger items, mini-fumigations can be performed using resin strips (dichlorvos) in a sealed garbage bag or other air-tight container.
4. When storing susceptible items, use moth balls, flakes, or crystals that contain naphthalene or paradichlorobenzene (PDB) or resin strips; avoid direct contact of these materials with plastics as they can soften and melt into fabrics.
5. Carefully read and follow the information on the product label for safe and legal use.
6. Homeowners should consider hiring a pest control professional to help in managing a dermestid infestation.

-Ryan Davis, Arthropod Diagnostician

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Amendment to Spring 2011 Article on Bark Beetles

The following information is an amendment to the information in the article entitled "Tree Killers: Bark Beetles and Their Control" ([click here](#) for article) regarding application of preventive insecticides on non-bearing trees:

Preventive insecticides should be applied just prior to beetle flight. (Some products are labeled for trunk applications to infested trees to kill beetles as they emerge; those are not discussed here.) Select products that contain the active ingredient carbaryl, bifenthrin, or permethrin. For homeowners, select a general use product labeled for trunk or bark application to ornamental trees in residential areas (for example, Hi-Yield 38 Plus Turf, Termite & Ornamental Insect Control Containing 38% Permethrin). For individuals with a pesticide applicator license, a wide variety of products containing

the above active ingredients are available for ornamental trees and shrubs. Fewer products are registered for bark/trunk applications on forested areas, such as forests, tree plantations, planted Christmas trees, parks, rural shelter belts, and rangeland trees.

Select a product that is labeled for the intended site and situation of application. Avoid use of these chemicals on flowering trees during bloom to prevent bee death. For full protection, additional sprays may be needed (reapplication interval is sometimes provided on the label). Time the applications properly to cover the pest beetle adult flight period to minimize excess spraying. Contact your local Extension office or the UPPDL for guidance when selecting a preventive bark beetle insecticide.

Here's a Good Cause: Preserve Predatory Insects

Predatory insects contribute to natural pest control by eating unwanted pests and helping to maintain pest populations at non-damaging levels. By conserving and encouraging predator populations, plants can be protected from excessive damage.

A common group of beneficial insects are the generalist predators that feed on a wide variety of insect prey. Generalist predators capture and kill their prey immediately and eat many prey individuals during their development. Some of the most abundant generalist predators include damsel bugs, big-eyed bugs, and lady beetles. Each of these predators is found in many different habitats, from backyard gardens to large agricultural operations. These predators overwinter as adults, becoming active and producing eggs in spring.

EXAMPLES OF GENERALIST PREDATORS

Damsel bugs are slender, soft-bodied insects with long antennae and legs. A key characteristic of these predators is their enlarged front legs modified for grasping their prey (also known as raptorial legs), similar to a praying mantis. Damsel bugs use a sit-and-wait hunting strategy, capturing prey that comes within reach. They kill by inserting their piercing-sucking mouthparts into their prey and sucking up the body contents.

Big-eyed bugs also have piercing-sucking mouthparts and feed in a similar way. Big-eyed bugs have large bulging eyes and excellent vision. Although they are very small predators (3/16-inch or less), they are very fast, active hunters that eat large numbers of prey. Their diet consists of small prey, like insect eggs, mites, aphids, and young larvae and nymphs, but they also feed on plants to sustain their populations. (Feeding on plants does not result in noticeable plant damage.) The advantage is that big-eyed bugs can remain in an area and feed on plants when prey are not abundant.

Lady beetles are perhaps one of the most recognizable predators. However, their eggs and voracious larvae are often overlooked. Lady beetles typically deposit their clutches of bright yellow eggs on the undersides of leaves. Larvae are active hunters that seek out their prey and kill with their chewing mouthparts. The larvae have very large appetites and can attack large prey. Unlike lady beetle adults which can fly, the larvae are wingless and are more likely to stick around an area with insect prey to complete their development.

Beneficial insects can be conserved by reducing broad-spectrum pesticide use and selecting pesticides that are "soft" or selective and specifically target the pest. Predatory insects



Top: Adult damsel bugs wait for insects such as aphids to approach. *Middle:* Big-eyed bugs eat eggs, mites, aphids, and other small insects. *Bottom:* Lady beetle larvae are colored black to dark purple with spots of orange.

can be encouraged by providing them with alternative food resources and shelter. In general, diverse cropping systems and flowering plants may be a way to enhance predator activity. When sampling and monitoring pests it is important to also monitor predator populations and incorporate them into an integrated pest management program.

Look for fact sheets highlighting these and other beneficial insects in the near future.

-Ricardo Ramirez, Extension Entomologist

In the National News

UTAH RESEARCH FINDS THAT INSECTICIDE INCREASES BEE MORTALITY

The eggs and larvae of alfalfa leafcutting bees, *Megachile rotundata*, have been shown to have at least 84% mortality when female bees have been exposed to the insect growth regulator novaluron (Rimon), which is often used to control lygus bugs. It is thought that use of novaluron in alfalfa grown for seed could contribute to decreasing populations of bees. The full article, published in the most recent Journal of Insect Science, can be read by [clicking here](#).

BIOCONTROL AGENTS FOR EMERALD ASH BORER

USDA Agricultural Research Service scientists have released three parasitoid wasp species (*Oobius agrili*, *Tetrastichus planipennis*, and *Spathius agrili*) in six mid-western and eastern states for control of emerald ash borer. The wasps are still being evaluated for winter survival in northern states, although *T. planipennis* has already been found to persist in Michigan sites. It is also the most abundant wasp species attacking the borer a year after release. Scientists are also looking at the fungus, *Beauveria bassiana*, as a possible biocontrol. It has been shown to kill the adults when sprayed on infested trees, persists on the bark, and is safe on the predator wasps.

POSSIBLE NEW PREDATOR FOR INVASIVE STINK BUG

The brown marmorated stink bug, introduced from Asia, has become a serious

pest in the eastern U.S., where its feeding on fruit in the mid-Atlantic region resulted in \$37 million in losses in 2010. They are becoming difficult to treat with insecticides, and native predators appear to avoid them. Recently, however, USDA Agricultural Research Service entomologists identified four species of *Trissolcus* wasp that feed exclusively on the brown marmorated stink bug in China, Japan, and Korea. These parasitoids target stink bug eggs, laying their own eggs inside, where the developing larvae feed on the stink bug egg contents until pupation. The behavior of the wasps is currently being studied in the lab. Release of the wasps into infested sites may be a possibility in about 2 years.

NATIONWIDE EFFORT AIMS TO CURB HONEY BEE LOSSES

A national network will soon be formed called the Bee Informed Partnership, thanks to a \$5 million USDA grant to Penn State University. The project will focus on a number of activities to reduce losses due to Colony Collapse, including the development of best management practices, a variety of surveys, an alert and reporting system, and a dynamic honey bee health website. Thirteen other universities and agencies across the U.S. are part of the project.

STUDY FINDS NATIVE BEES ARE PICKY

Scientists are realizing the importance of native bees in agriculture and wild settings. Very little is known about the distribution of native pollinators, and

a recent U.S. Geological Survey study found that the location of certain native solitary bees is not related to plant community composition, which is not as one would suspect. The study identified close to 5,000 bee species in five different habitats in Indiana. They found that local factors and micro-habitats, such as abundance of dead wood, soil characteristics, whether the area had burned, etc., are as important as diversity of plants in determining bee diversity. The total number of bees found was lowest in wooded areas and highest in recent burns. Bee diversity was highest in less wooded areas that had a high plant diversity and abundance of nesting locations. The study will continue in national parks to see how climatic variation affects native bees.

PLANTS “IDENTIFY” INSECT ATTACK

For the first time, the interaction between insect feeding and subsequent plant host defenses has been identified. USDA scientists in Gainesville, Florida, have identified a mechanism in plants that triggers a defense response to insect feeding. Some insects secrete saliva as they feed, and after the first feeding on a host plant, the saliva will contain plant proteins that are recognized by the plant. Identified as an amino acid called inceptin, the protein in the insect secretion acts as an SOS, launching plant defense chemicals. This discovery could lead to the development of plants with improved protection against insect pests.

Useful Publications and Websites

- Pest Management Professional published a new online edition of their magazine which focuses on the management of ants. [Click here](#) for the publication.
- A recent publication from the Iowa State University informs small fruit growers how to harvest and store their crops at the peak of quality and flavor. [Click here](#) to access the site.



Featured Picture

Green fruit beetle larvae feed on decaying matter in compost or manure piles, where they can be very numerous. An interesting characteristic of the grubs is that they crawl on their backs, moving up and down through the debris pile as they feed.

This image was created using LAS EZ Montage software and a Leica MI65C microscope. The scope has an auto-focus mechanism that takes many photographs through the depth of field and the software compresses the images into one, so that the entire specimen is in focus. The system is a new addition to the diagnostic lab to aid in diagnostics and to create an image database, thanks to funding from the Utah Dept. of Ag. and Food and the USDA-APHIS Cooperative Agriculture Pest Survey program.

-Image by Ryan Davis, Arthropod Diagnostician

UTAH PESTS' New Websites

The websites under the UTAH PESTS' domain have all been re-designed to make browsing easier and more efficient. They are full of information related to insects and plant pathogens. A new site has been created, focusing on BEES! They can be all accessed from utahpests.usu.edu, or directly at: bees.usu.edu, ipm.usu.edu, upddl.usu.edu, and caps.usu.edu.



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