

What's "Bugging" You?

Have you ever noticed mysterious little holes that appear in your clothes and you can't remember ever snagging or running into something that would have caused them? You could be looking at an example of insect damage! Little tiny pesky insects, so small you hardly see them, may be doing considerable damage to textiles around your home. Generally, you won't notice them, or the damage they've done, until it's too late. And it's the babies



INSECT DAMAGE ON A CIVIL WAR UNIFORM

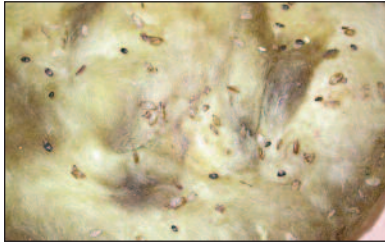
(larvae) that do the damage...to everything from sweaters, pants, and jackets, to wool rugs, and decorative needlework on your walls. The only damage the parents do is leaving behind their eggs, which hatch the larvae, which then feast on your fine items! Moths and carpet beetles were the originators of the "high protein" diet, as that's what they thrive on...the protein found in fabrics containing natural fibers.

Depending on the time of year, insect damage ranges from the 2nd to the 5th most common consumer problem related to clothing. Insect damage to textiles in the United States is estimated at \$200 million annually. According to the National Pest Control Association, fabric pests are making a comeback because most of the residual insecticides formerly used in their control (dieldrin and DDT) have been banned. This has caused those who deal with the insect damage to take a multi-faceted approach to spotting early signs of infestation, recognizing its causes, controlling the environment, understanding the life cycles of the pests and their "preferences," and developing new and creative control measures and eradication techniques, and consumer education programs.

In addition to the usual insecticides, fumigants, repellents, contact sprays and mothproofing agents, creative chemists are working on "antimetabolites" which disrupt the insect's metabolic cycle, insect growth regulators (IGRs), chemicals that control insect behavior, and biological controls through microbial pathogens that attack the insect population with bacteria or fungi, harmless to higher animals and humans, but devastating to specific insects. Some have proposed using electromag-

netic, sonic and ultrasonic radiation, gamma radiation, microwaves and radio waves for insect control.

Most people are quite aware of clothes moths and the damage they can cause, thus the term “moth-eaten.” However, the moths are just one of the top three causes of all insect damage to fabrics. The other two are carpet beetles and silverfish. References to insect damage date from very early times. There’s a biblical reference in James 5.2 “Your clothes are moth eaten.” In 400 B.C. it’s reported that Aristophanes said, “Moths were eating the feather plumes of helmets.” Actually, that term should be “larvae-eaten,” because the adult moths have imperfect mouth parts and can’t eat anything, which we’ll mention further under their life cycles below.



CARPET BEETLES IN FABRIC

Carpet beetles cause extensive damage, too! One of the big differences is that moth larvae will stay put with their food source (your fine clothes) whereas carpet beetle larvae enjoy traveling from one room to the next, from one apartment to another, and have even been found in bird and rodent nests! Knowing which insect is doing the damage will help you find and eliminate an infestation.

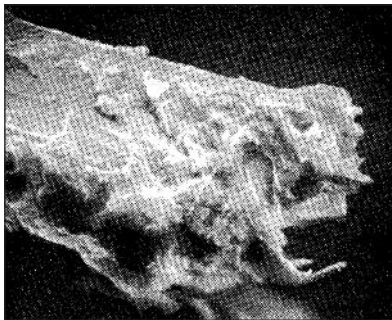
Primary Types of Insect Damage

Direct Insect Damage

Direct damage is caused by insects that feed directly on the fabric of your garment. They are especially attracted by leftover smells of food stains and body oils. Common examples are webbing clothes moths, casemaking clothes moths, carpet beetles, and sometimes termites. Damage done by silverfish is actually in the “indirect damage” classification (see below). Even if damage appears to be limited to a closet, don’t assume the culprit is clothes moths. If you don’t see moths flying, pupa casings, cocoons, or larvae, carpet beetles could easily be the problem. Once they feed they often migrate, leaving behind only the damage.

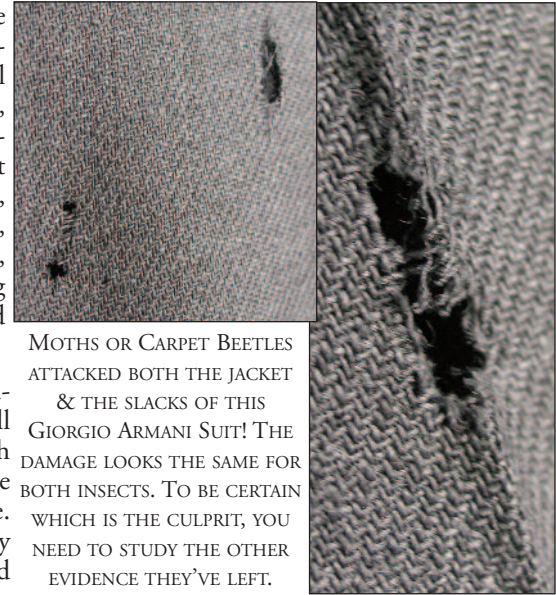
While feeding on the fabric the insect cuts or weakens the surface fibers. Often the damage is not even noticeable until after an article is dry cleaned or washed. During cleaning, the weakened fibers are flushed away, leaving damage visible on the garment. In addition, discoloration to the fabric may be caused by the insect’s droppings.

Insect damage occurs on any fabrics containing natural, cellulose, or animal fibers, including blends of wool/synthetic and cotton/wool, wool, mohair, silk, cotton, leather, natural bristles, fur (beaver, mink, seal and angora rabbit), feathers, down and even



MICROSCOPIC VIEW OF DAMAGED FIBERS

piano felt and natural bristle brushes. This includes the specialty fibers made from camel hair, alpaca, llama, guanaco, vicuna, and cashmere. Be especially cautious of articles left undisturbed for a long time, such as old military uniforms, blankets, feathered hats, tuxedos, overcoats, evening gowns, hats, antique dolls and toys, and wall hangings.



MOTHS OR CARPET BEETLES ATTACKED BOTH THE JACKET & THE SLACKS OF THIS GIORGIO ARMANI SUIT! THE DAMAGE LOOKS THE SAME FOR BOTH INSECTS. TO BE CERTAIN WHICH IS THE CULPRIT, YOU NEED TO STUDY THE OTHER EVIDENCE THEY’VE LEFT.

Don’t think that by using a synthetic blend that insects will stay away! Synthetic blends with as little as 10% natural fibers are not immune to insect damage. These synthetic fibers may contain residues of gum and sizing from processing, which is very attractive to insects. Some studies have found the most damage could be done to 35/65 wool/polyester and the least to 30/35/35 wool/acrylic/polyester fabrics.

What it Looks Like

Direct damage looks like tiny holes, veins or burrows in the surface of the fabric or knit. When you see this type of damage you can be fairly certain your garment has been serving as a main course for some growing larvae!

Blended Fabrics are NOT Immune from Insect Damage!

Indirect Damage

A different type of damage, “indirect damaged,” occurs when insects feed on spilled food or perspiration on the fabric. The “trails” of indirect damage follow the direction of food or beverage spills. Common examples of insects that do indirect damage are: silverfish, crickets, beetles, and roaches. Most of them feed on natural starches and glues, leaving visible damage (but not holes) on finer fabrics such as silk, cotton, linen and rayon.

What it Looks Like

Indirect damage generally leaves “trails” on the surface of the fabric. Silverfish, for example, eat at the surface leaving a “shaved” look, but will usually not leave actual holes in the fabric. They’ll do more damage to your books than your textiles!

Habits – Lifestyle, Appearance & Evidence

General Habits

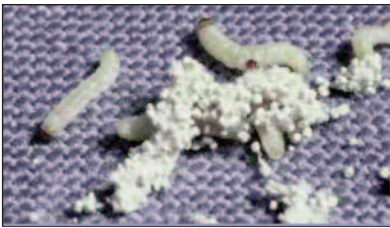
Adult insects deposit their eggs in all sorts of locations—clothing, upholstery, rugs, toys, animal skins, trophies, and even natural bristle brushes. They prefer to feed in areas that are dark and undisturbed such as closets, attics and storage boxes. Things in constant use or frequently vacuumed, rarely get damaged, but watch those unused areas of a rug next to walls or under furniture! Even air ducts are a popular breeding area! As the eggs hatch, the larvae will look for any animal-based material to feed on: silk, wool, leather, dog and cat hair, feathers, and even wool blends or synthetics that may contain food stains, urine, hair oils, sweat or body oil residue.



WEBBING CLOTHES MOTH

The eggs and larvae, as well as adult insects enter your home in a wide variety of ways – on your clothes, pets, shoes or they may fly in through an open door or window. Articles containing wool or other animal fibers, upholstered furniture, woolen fabrics and rugs are popular avenues. Be especially wary of used clothing or furniture, and items purchased at antique stores, vintage stores, yard sales or on-line auctions.

Adult clothes moths prefer darkness and hide very quickly if disturbed. They are definitely NOT the moths you see attracted to lights! Clothes moths are light tan, about 1/2” long and have very narrow wings. Adult carpet beetles, in contrast, love the sunlight and are known to feed outdoors in your garden on the pollen and nectar of flowers, especially Spirea, asters, dahlias, daisies, sunflowers, Virburnum, Caeothus, goldenrod and the flowers of wild and cultivated fruits. They’ll enter your house with these blossoms, or fly through an open window or door! The most common ones are small, oval-shaped and mostly black with varied patterns of orange and white. Carpet beetles are often mistaken for a common garden “lady bug,” but they are about 1/4 to 1/2 the size.



WEBBING MOTH LARVAE & EVIDENCE

Silverfish, a primitive-looking 1/4” long, silver-colored wingless insect, is probably related to something that crawled up on land 300 million years ago. In North America, they are almost exclusively associated with human habitation, and reside in houses and stables. They are quite prevalent in kitchens and bathrooms, for they require very high humidity or access to water. They thrive on the tiniest scraps of food. Although they prefer starchy food, they are quite able to digest cellulose and will devour your books and Christmas decorations as eagerly as the food stains on your garments!

Life Cycle, Appearance & Evidence

Webbing Clothes Moths (*Tineola bisselliella*)

Probably more common than the casemaking clothes moth, the Webbing Clothes Moths spin a silken web to form feeding tubes, which they attach to the items being eaten. The body of the adult moth is covered with shiny, golden scales and the top of its head has a tuft of fluffy, reddish-gold hairs. It has black eyes, its antennae are darker than the rest of its body, there are no spots on its wings, and females are slightly larger than the males. The female lives about 15 to 30 days and lays 40 to 50 large eggs (relatively speaking, 1/24” long). The eggs are translucent and quite vulnerable to physical damage. Her nest may be very hard to spot as she will lay a layer of camouflage web or casing over the eggs and developing larvae that blends into its surroundings, hiding it in the fabric. Look for webbing, cocoons, cases, copious amounts of tiny pellets, and even dead moths clumped into the webbing. In addition, the droppings may be the same color as the fabric being consumed, making the evidence even harder to spot. This “nest” may look like a harmless piece of lint.



CASEMAKING ADULT MOTH & EGGS

Depending on the temperature and season, the eggs hatch into larvae in 4 to 30 days. These worm-like larvae are shiny, creamy-white and about 1/2” long when mature. The larvae spin silken feeding tubes as they feed, and reach maturity in 35 days to 2.5 years. This great variation in time is dependent on food, temperature and humidity. In a warmer climate, the clothes moth larvae live for at least two months. The perfect environment for clothes moth development is 75% relative humidity in a heated, dark room. The adults don’t eat, so larvae must consume enough so the adults may complete their life-cycle. The larvae change to a pupa and live inside silken cases they make as they mature into adults. This pupal stage may last from 55 days to as long as 4 years! Under normal conditions it’s usually from 65 to 90 days. The adult emerges from the pupa to start the life cycle again, generally about 2 generations per year.



CASEMAKING LARVAE & CASE



CASEMAKING MOTH EVIDENCE

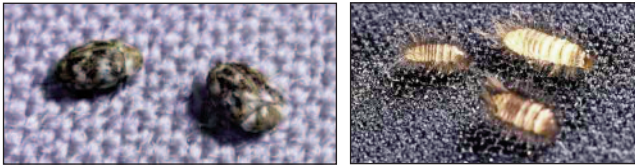
Casemaking or Case-Bearing Clothes Moths (*Tinea pellionella*)

Casemaking or case-bearing clothes moths are slightly smaller than the webbing clothes moths. The adult is light brown with 3 barely visible dark spots on each wing. The adults live for only 4 to 6 days. The females lay 37 to 48 creamy-white oval-shaped eggs, which soon turn red, and hatch in 4 to 7 days into larvae which look like cream-colored caterpillars less than 1/2” long. During the larval stage,

which lasts 68 to 87 days, they spin protective cases (using bits and pieces of items they're consuming!) and drag the cases along as they move (it's an "insect RV"!). Eventually the cases become the tough cocoons in which the pupae develop into adult moths in 9 to 19 days. Evidence of their presence is similar to the webbing clothes moths. Other less common moths include the Brown House Moth, and the Tapestry Moth, both of which require at least 80% humidity to thrive.

Carpet Beetles (*Anthrenus verbasci* & *Attagenus pelio*)

Carpet beetle adults live 20 to 60 days. The female lays 30 to 100 eggs on a surface sure to provide good nutrition for the growing larvae. Those larvae



VARIED CARPET BEETLE ADULTS & LARVAE (*Anthrenus verbasci*)

hatch in 6 to 20 days and live 60 to 325 days. The pupal stage lasts 10-17 days. The average life is about 9 months! Carpet beetle larvae measure 1/8" to 1/4" long and appear to be densely covered with tiny hairs or bristles. They molt several times during their life cycle, leaving behind skin casings, which look a lot like larvae. Their droppings look like a uniform powder made up of tiny granules the color of whatever they've been eating. They do not spin webs, nor make cocoons like the moths. They tend to burrow deep into carpets and may not always be obvious. As they mature, they shed their skins and then crawl from place to place. They are often found in areas that don't provide food for them. Their fecal matter, however, is generally found where they've been eating. Both the larval and adult stages damage fabric and also feed on seeds, pet food and cereal products in your kitchen and pantry, as well as flowers in your garden. The adults measure 1/10" to 1/3" long. They're oval shaped and vary in color from shiny black to various patterns of white, yellow, brown and orange.

Silverfish (*Lapisma saccharina*)

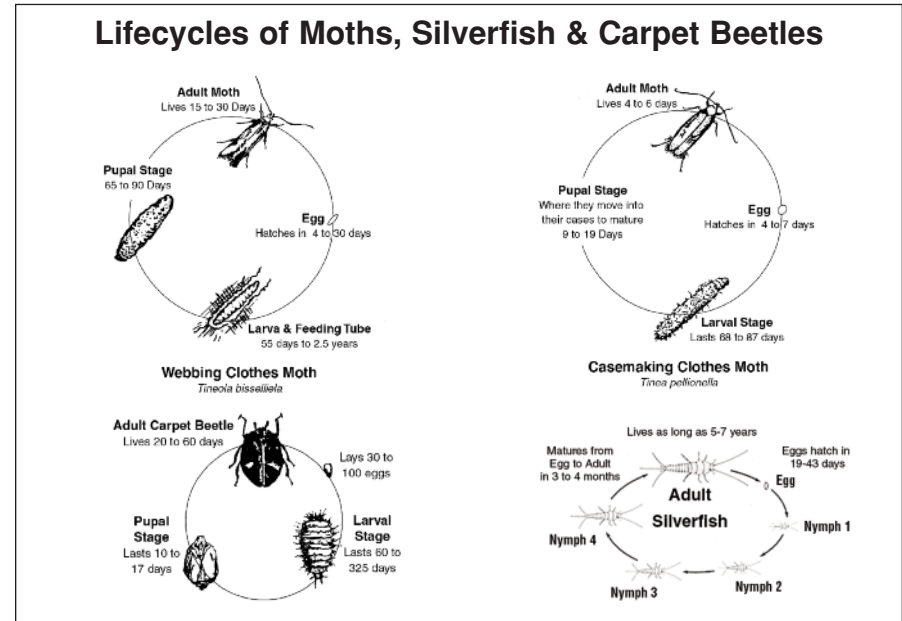
Silverfish are small wingless insects that do not have larvae in their life cycle. They lay eggs which hatch into nymphs that look like miniature adults. They molt several times as they grow leaving their cast skins to detect. Both adults and nymphs damage fabrics. They love moisture (75 to 97% humidity), cool to moderate temperatures (70 to 80° at the most), and dark places. They tend to be most active at night, and feed on starch, sugars and proteins. You'll find them in sinks and bathtubs because they enter looking for the moisture and then get trapped, unable to climb the slick, vertical walls. They also love Rayon and the glue found in book bindings and wall paper. The presence of silverfish indicates a moisture problem, but they can survive long periods of dry conditions and starvation.



Silverfish

Infested areas should be aired out and dried. They live for quite a long time compared to the moths and carpet beetles, sometimes as long as 5 to 7 years, but they are also not very prolific. A female will only lay about 20 eggs in her lifetime, depositing them in tiny cracks and crevices. The eggs hatch in 19 to 43 days and

mature from hatching to adult is 3 to 4 months. The droppings of silverfish look like very fine black pellets, somewhat like miniature mouse droppings, scattered over the surfaces in dark areas they reside. They may leave yellow stains, especially on linens.



Why Insect Damage Happens

Clothes are usually stored in dark, warm places. Insects and their larvae have a wonderful opportunity to feed undisturbed. The amount of damage that occurs is in direct proportion to the temperature and humidity in the storage area. Warm, moist areas are the ideal growing condition for insects!

Most damage occurs during the larval stage of the insect's growth. That is also when they need the most food. The adults naturally gravitate to areas of your house that contain everything they need: a food source consisting of fabrics with remnants of stains or soil, warmth, and moisture.

Examples of poor areas to store clothes: closets with exterior walls, garages or basements with concrete floors, and nice warm attics.

Inspection and Elimination

Before Cleaning

If you suspect insect damage, carefully inspect garments for holes against a good light source. A good "trick" is to hold the item so you can look toward the light from the inside of the garment looking out. After doing that turn, the garment inside out to get a look at seams and hidden areas! Damage can be masked by soil on the garment. Sweaters should be stretched to make visible any holes which

could be hidden by the construction of the knit. Look carefully for burrows or trails on areas containing food or beverage stains.

Signs of insect damage and infestation include moth eggs in the form of small, white grain-like granules, and larvae in small white clusters of webs. Remember when you disturb the clothes the “live” evidence will “abandon ship” if they can, making it even harder to notice.

If You Find Evidence

- **Inspect carefully!** If you find signs of insect damage, check all susceptible items in the area carefully and try to find the primary source of the infestation. It could be an old wool scarf, a fur hat hidden in a box, or a section of wool carpeting under a bed. There could be more than one source too! Creep into those dark areas with a flashlight. Look for the telltale signs...wings, dried skins, webs, droppings, or even the live insects if you can surprise them before they can hide.

You must be willing to be “seriously inconvenienced” to control & eliminate clothing pests!

- **Carefully remove everything in the infested area.** And remember it’s not just your closets...include the closet shelves and your dresser drawers too! You **MUST** be willing to be “seriously inconvenienced” if you want to control, and hopefully eliminate, these pests! A good pest control company will insist on this!
- **Vacuum the entire house,** especially the infested areas, thoroughly and regularly. Dispose of the vacuum bags promptly in case they contain eggs or larvae! Even clean the vacuum brushes after each use! If cleaned well, you may not need to use an insecticide. If you **DO** use an insecticide, just treat the cracks and crevices in the infested areas.
- **Wash down** floors, walls, ceilings, shelves, drawers, and interior surfaces of all infested areas. What works best is antibacterial products...bleach is great, but remember that the bleach itself can damage fabric!
- **Use sprays on infested carpets,** especially along baseboards and under furniture. **Be sure to test for colorfastness before spraying anything!** Many household pesticides labeled for ants, fleas and cockroaches will work on fabric pests. You also may purchase products specifically designed for clothes moths, carpet beetles, and silverfish. The commercial websites, www.bugspray.com and www.doyourownpestcontrol.com contain a wealth of information and many pest-specific products.
 - Such insecticides generally contain permethrin, cypermethrin or deltamethrin. On areas of carpet, for example, which are out of direct sunlight, treatments may give 1 to 2 years of protection.
- **Never spray clothing** with a household insecticide. Always remove clothes before having anyone spray the insides of closets and drawers!
- **Immediately launder or dry clean everything,** even if you don’t see evidence of damage to clothing that was stored in a suspect area! Your laundry temperature

needs to be over 120°, and not all fabrics will tolerate the laundry temperatures needed to kill the insects. Don’t just move clothes to another area of the house or it could spread the infestation. If an item can be tumble dried, the added heat should help destroy the bugs.

- **Contact a reputable pest control firm** to help solve the problem if you have a heavy infestation of insects in your home. They will be able to find and effectively treat hidden and difficult-to-access areas.
- **Use traps** in addition to the above-mentioned remedies. Several manufacturers sell pheromone traps designed to attract the males of the specific species, which in turn, reduces the entire population. Traps are not meant to eliminate an infestation, but to help you monitor your success at ridding yourself of the bugs. Margaret’s offers these Clothes Moth Traps as one of our Boutique Wardrobe Products items.

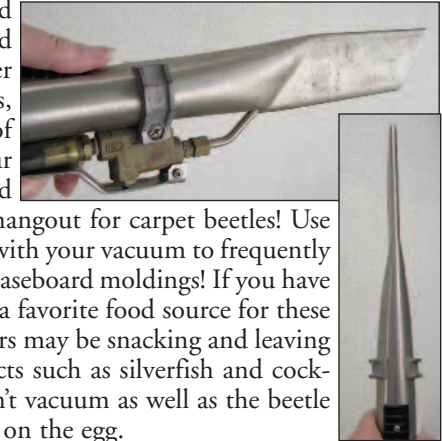


Prevention Tips & Tricks...Conquering the Critters!

What are some of the best ways to prevent insects from turning your garments into their habitat? It’s a two-part project. First you must control and eliminate the pests you already may have. Second, you need to make sure your clothing is stored in such a way that it will not be damaged should a re-infestation occur. Your goal is to make living in your house as difficult as possible for that pest! Everything you do to make **YOUR** house uninviting will keep your clothing and textiles safe from damage!

General Control of Textile Pests

- **Practice good housekeeping techniques!** If carpets and rugs are vacuumed frequently and thoroughly, eggs and larvae will be removed before damage occurs. Make sure your carpet cleaner pays special attention to crevices and uses a special crevice tool. In addition, a thorough vacuuming and cleaning of floors, shelves, walls, cracks and crevices in closets and drawers, as well as other less-frequented hiding places of insects, such as under and behind couches, couch cushions, and draperies, reduces the chances of infestation. Don’t forget to clean your window sills! The dust and deceased insect accumulation can be a favorite hangout for carpet beetles! Use crevice and upholstery tools that came with your vacuum to frequently clean corners, cracks, ducts, vents and baseboard moldings! If you have pets, clean even more often. Pet hair is a favorite food source for these pests. Be aware of where family members may be snacking and leaving crumbs of food that could attract insects such as silverfish and cockroaches. The eggs of clothes moths don’t vacuum as well as the beetle eggs because of an adhesive outer layer on the egg.
- **Spring and Fall Cleaning** where you roll up your sleeves, pull the furniture away from the walls and give the house a true going over, is a great defensive



maneuver! Remember the larvae thrive any time of the year, so your control measures must be year-round.

- **Periodically take everything out of your closets and drawers**, shake them out, brush them off, vacuum the area and put the clothes back.
- **Don't hang onto woollens you don't use.** Woolen garments, in particular, represent a potential source of infestation if you don't use them regularly. If they're worn, cleaned and brushed on a regular basis, moth problems should be minimal.
- **Brushing** clothing or other items regularly, once or twice a month, is a very effective means of moth control as it will dislodge or crush the pests. Carpet beetle eggs, especially, are very fragile and easily destroyed by brushing them off. Try to do it outside if possible, and brush all accessible areas of the garment, including under collars, cuffs, seams and pocket flaps. And don't just brush, take the clothes outside into bright indirect sunlight. This is a good mold and mildew prevention technique (Read our newsletter on this subject visit: www.margarets.com/dry_cleaning_news.htm and click on the "Mold & Mildew" link.) Be careful in direct sunlight as some clothing could fade.
- **Insecticide products intended for direct application on clothing, bedding or textiles in the home for either treatment or prevention of fabric pests are currently not available to consumers!** Insecticide products that may be used to treat cracks and crevices CANNOT be used to treat clothing or textile items.

The dry cleaning process effectively rids clothes of any living larvae much better than normal laundering.

NOTE: Insecticide treatments are best performed by professionals. The information provided below is designed to inform you of some of the options available so you can question and converse with a pest control provider. Discussions with several of the larger companies provided mixed information regarding whether Clothes Moths or Carpet Beetles were more prevalent. Results vary tremendously in different areas of the country. BE AWARE OF THE INDICATIONS and ACT PROMPTLY to minimize damage! To summarize, BOTH insects are quite common and EITHER one may be the cause clothing damage. Complete eradication is difficult and usually requires multiple treatments and dedication by the homeowner as well as the pest control company.

- **Insecticides typically used by professionals** to treat areas or objects, other than clothing, include the following fumigants: Naphthalene, which acts as a repellent, Paradichloro-benzene, which acts as a larvacide, and Vikane, which kills adults and larvae, but not necessarily the eggs. A second fumigation after 20 to 30 days is often needed for severely infested areas.

Other insecticides may be used as fogging agents and contact sprays and are available for consumer use. These include the following classes: organochlorines, organophosphates, botanicals, pyrethroids, dicarboximides, thiocyanates, and carbamates. The active ingredients are: Allethrin, bifenthrin, boric acid, carbaryl, cypermethrin, deltamethrin, esfenvalerate, permethrin, D-phenothrin, prallethrin, propoxur or resmethrin. Remember that extreme care must be taken

in handling all insecticides. Individuals may be sensitive to them even if they ARE approved for general consumer use.

- **Freezing** can also be used as a way to control fabric pests. Items must be stored at 0°F for a minimum of 48 to 72 hours. This works best for small items such as stuffed animals, feather accessories or things difficult to launder or dry clean.
- Guidelines for freezing items:** Place in polyethylene bags, squeeze out excess air and seal tightly. After removing from the freezer, place item in the refrigerator to thaw slowly before finally bringing them to room temperature. Remove items from their bags after you've brought them to room temperature. To guarantee a complete "kill" of the insects, repeat the entire process before removing from the bag.
- **Buy items that are labeled "Mothproof."** If you know you have a problem, or have had one in the past, purchase items that have been treated by the manufacturer to resist clothes moths and carpet beetles. Many high-quality garments, especially those containing wool, will be labeled "mothproof" (or at least moth-resistant) on their label if the fabric was treated.

What is mothproofing?

- Mothproofing is a chemical treatment given to fabrics that provides protection from insects without leaving objectionable odors, as do mothballs. The mothproofing agents can be either synthetic or natural plant-derived insecticides. Currently there is no mothproofing product available for consumer application. It must be done when the fabric is manufactured. If an item is labeled "mothproof" or "moth resistant," the protective chemicals were applied by the manufacturer, and the process is considered permanent. There are mothproofing chemicals available that can be applied during dry cleaning, however, they are highly regulated and tend to contaminate the solvents. The dry cleaning process itself effectively rids the clothes of any living larvae much better than normal laundering. Many high-quality fabrics containing wool are treated with a moth-proofer during their manufacture.
- Synthetics contain permethrin, tetrametrin, deltametrin and methoxychlor.
- Plant-derived insecticides contain pyrethrins, which, because they break down rapidly under light, are stabilized or intensified by piperonyl butoxide.



MOTH CASES

Forms of mothproofing:

All chemicals used in mothproofing are regulated and must be approved by the EPA. None are currently available for consumer use. There are two forms of mothproofing.

- **Solvent-based chemicals** are most effective when applied in the form of a dye bath. This can be done when the fabric is manufactured or during dry

cleaning. These solvent-based mothproofing chemicals may be used in PERC or petroleum dry cleaning systems. It is added to the solvent and to the garments to be treated and processed through a regular dry cleaning cycle. Extremely low concentrations are needed to provide protection until the next cleaning. **Margaret's does not offer this service because we don't want our solutions and filters to be exposed to such chemicals. They are difficult to completely remove and would affect ALL the clothes being cleaned.**

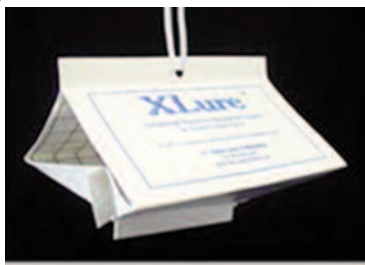
- Water-based residual pesticide sprays, should only be applied to surfaces in your home and not to the garments themselves. Such treatments, however, are rarely effective as they do not penetrate the material where the moths hide.

Information Specific to Clothes Moths

Once you have determined you have a clothing moth infestation, you will need to employ the best control methods available. This depends on the location, the extent, and the level of control needed. Some areas are easier to control than others and will need nothing more than an aerosol and some traps. Others will need an ongoing extensive liquid treatment program.

The first tool that will prove helpful for any level of infestation is to install some Clothes Moth Traps. These are pheromone-based traps that use female sex pheromones to lure males. According to the manufacturer, the attractant is much stronger than natural pheromones and emerging males will not be able to resist the smell. Once they get to the trap, a board of non-drying glue awaits them. They land, get stuck and are prevented from impregnating females. Traps will last several months and though they won't prevent larvae from feasting, they will cut down the adult male population dramatically, which will in turn prevent future egg laying and aid in overall control. The traps also serve as a good monitoring device. If your traps are catching more moths than you would like, more treatments are needed. Locate them in closets, around carpets or behind furniture and inspect them at least once a week. Margaret's carries a variety of clothes moth trap in our Boutique Wardrobe Products.

Once you have traps in place, aerosol or liquid treatments can be done. In order to prepare for these applications, it is best to do the thorough house cleaning mentioned above...vacuuming, laundering or dry cleaning of infested AND non-infested items. Vacuuming will help to remove larva, adults and their frass but eggs and pupa are almost impossible to remove. Glue-like excretions and the cocoon spinning process does a good job of affixing eggs and pupa in place. The same holds true for carpeting. Thick carpets need a good vacuuming. Area rugs and hand woven rugs need to have their top and bottom sides cleaned. Topside treatments may not penetrate far enough to get the bugs. Once you have cleaned closets, clothing, rugs, carpeting, furniture, or anything else with obvious moth activity, you are ready to treat. The simplest thing you can do is use some of the aerosols which are available. For closets, the aerosols are both effective and practical.



TYPICAL CLOTHES MOTH TRAP

Aerosols are also effective for treating furniture, taxidermy mounts or tapestries. There are several which are all used for different situations.

The following items are suggested by the www.bugspray.com website. NOTE: Margaret's Cleaners does not have specific experience with these chemicals and does not endorse the website. This is purely to give you an idea of what types of measures can be used to control moths. All of the commercial web sites noted in our references appear to carry similar products to control fabric pests. Be SURE to read labels and follow instructions carefully! Some of these may require professional application.

- ECO PCO is a food grade aerosol that is labeled for use in restaurants and homes. It has a fresh odor and effective for clothes moths. It can be applied directly to carpeting or furniture. It uses the latest active ingredients which have low mammalian toxicity yet are active on insects.
- Permethrin has long been used as a chigger, mosquito and insect repellent and can be used to provide some protection from clothes moth attack. It is odorless, won't stain (but TEST it first on a small area; use of any chemicals directly on clothing is not recommended) and will provide months of protection in dark protected areas. Permethrin is advertised as better protection than moth balls and easier to use.
- If you have areas where you want continuous protection, you should install a battery operated Aerosol Dispenser. It contains a metered aerosol which provides a one second blast of aerosol every 15 minutes. The refills last a month and do a great job of killing both larvae and adults. Eggs and pupa will remain in tact and it takes several months for these to hatch. This system works well for small areas like closets and is maintenance-free if you keep the canisters filled.
- Larger areas can be treated with aerosols as well. With the use of a variety of foggers, you can treat large areas quickly and effectively. These machines convert water-based formulations into aerosols that project the mist 20 to 30 feet. The best approach is to use both a growth regulator and an adulticide. Nylar is the latest Insect Growth Regulator (IGR). An IGR is essentially a protein. When certain insects are exposed to it early in development they are not able to properly mature into eating or reproducing adults. Nylar will last several weeks per application; it is odorless and will stop the cycle of clothes moths. Be sure to add an adulticide as well. Exciter is one that works well. It uses Pyrethrin as the active ingredient. Pyrethrin has no residual and will break down within a few hours of application. However, it is very safe, low to no odor and kills moths quickly. Use the two together and treat at least once a month if you have valuable rugs to protect or other items in large areas.
- Dusting is another option of treatment and works best when you have infestations in wall-to-wall carpeting. If moths have moved under the moldings they are protected from both liquid treatments and aerosols. Dust is best suited for such treatments and one commonly used is Deltamethrin Dust. It is odorless and should be applied with a Hand Duster. This device allows you to get proper coverage under the molding where larva and adults will be active. Its effectiveness it will last 6-12 months, which insures that any eggs will die as they hatch.

Deltamethrin Dust works well and has long term residual effectiveness, but it is too messy for use out in the open. Because of this drawback it is best suited for areas like under moldings, in dry storage where boxes are stored or in other inconspicuous locations.

Information Specific to Carpet Beetles

Controlling carpet beetle infestations can be difficult. This is true for several reasons. First, they are likely to be active in small areas, but there are usually several such areas throughout the home. Second, they tend to be active in hidden areas. Third, the cycle of the carpet beetle enables them to have a built in defense mechanism against treatments. Although larva and adults are easily killed, eggs and pupa are not. When you treat, it is likely you will kill adults and active larva, however, eggs and pupa that hatch after the residual treatment has worn off, can easily reestablish the population. To prevent this from happening, it is important to treat at least twice and in some cases as many as four times. Though every case may have specific keys to getting success, here are some guidelines for treating:

- Be sure to treat all carpets, including the tops and bottoms of area rugs.
- Treat all fabric woven furniture. Be sure to turn pieces upside down and get the bottom.
- Don't skimp on chemical applications. Because carpet beetles tend to be deep in carpeting, it is important to have the product penetrate. If you try to "stretch" the application over a larger area, this will make the whole treatment ineffective.
- Since eggs and pupa are impervious to the chemical treatment, they will continue to live. After 30 days, they may hatch and thrive as if you never treated the area. This is why you must treat at least twice. Depending on the product used, you may need to treat once every month for 4-6 months.
- Clothing where infestations have been discovered need to be inspected and cleaned. At the very least, vacuum ALL your clothes for a quick and effective way to remove adults, larva, eggs or pupa. Be sure to throw away badly infested pieces.
- Vacuum your home thoroughly before treating. This helps remove some of the beetles as well as get them lifted up or moving where they are active. Your treatment will prove to be more effective if they are stirred up.



CARPET BEETLE (*Attagenus pelio*)

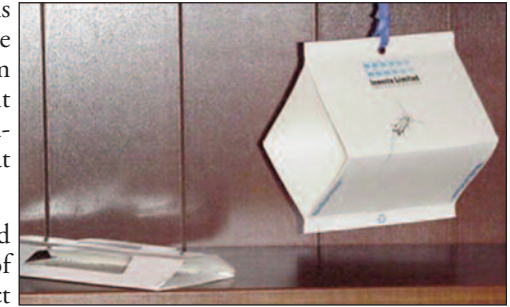
Once you have vacuumed, you are ready to treat. Treatments suggested include custom sprayers which spray in a flat uniform fan shape. Permethrin is used for mild infestations, is odorless and lasts 2 to 4 weeks and is the safest thing to use. Cyfluthrin is also odorless and a treatment will last 4 to 6 weeks. Multiple treatments over a period of a two to six months are needed to get all growth stages of the beetles as they mature. Even a pest control



VARIED CARPET BEETLE

company will have to come back to the home several times to do the job completely. For more specific instructions and information on the process, visit www.bugspray.com.

Following treatments, install some Carpet Beetle Pheromone Traps to both monitor your success and reduce the risk of future infestations. Set a trap up in any area you have seen evidence or any area where you want to protect. They are only effective, however, about 3 months of the year, because of the lifecycle of the carpet beetles. Inspect them once a week during the treatment phases and if you find adults accumulating, you know it's time to treat again for the larvae.



TYPICAL CARPET BEETLE TRAP – TRAPS ARE ONLY EFFECTIVE AROUND 3 MONTHS OF THE YEAR BECAUSE OF THEIR LIFE CYCLE.

Another product that can be added to the mix when treating with any of the above chemicals is an Insect Growth Regulator (IGR) This IGR lasts about 3 months and will work with many different insects. Its function is to stop larvae from developing into adults.

Information Specific to Silverfish

Controlling silverfish can be accomplished one of two ways. There have been many recent improvements in products available for silverfish over the last few years. Although you may think that spraying is the most effective way to treat, it usually won't work as well as dusting or baiting.

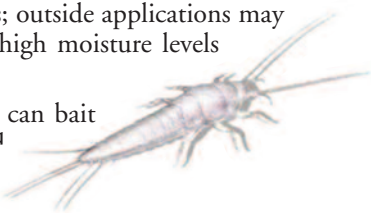
If you only occasionally see them inside your house, perimeter treatments may stop them. One formulation for silverfish is Esfenvalerate. This concentrate is easy to work with. It mixes readily with water, does not have an odor and will last a month or more per application with a sprayer. It can also be used inside the house. It works well on a variety of pests but is particularly effective against silverfish. For more information on use and application techniques both inside and outside the house, visit www.bugspray.com.

If the infestation is past the point of having an occasional invader, you may need to do more than just spray. Once the silverfish move under wood and vinyl siding and have established themselves in your attic, they will move into your living areas. Dusting and baiting will be a better option.

- Drione Dust is a silica-based material that works as a desiccant on insects. Silverfish, as well as other insects, cannot live where it is applied. Drione can be used both outside and inside. It should be applied under siding, around entries to the house, in storage boxes, light fixtures, electric outlets, and broadcast throughout the attic. A variety of dust applicators, aerosol cans and hand dusters are available to help achieve uniform distribution of the dust. Most

indoor applications will last 6 to 12 months; outside applications may only remain active for a few months since high moisture levels will tend to break the dust down.

- If dusting sounds like too much work, you can bait for silverfish as well. Niban FG has been used several years for crickets, ants and roaches. It also works well for silverfish. Niban uses boron as the active ingredient so it is safe to use around children and pets. It does not have an odor, can be applied inside and outside and will last a long time. Niban should be applied the same way as Drione. Treat cracks and crevices where the silverfish are entering the structure. For proper application and coverage, a proper bait applicator should be used. Niban uses a food base to attract silverfish. The advantage of using bait instead of dust is that the silverfish will always be out looking for food (bait). You only have to be close to the nest for it to work. If you are dusting only, the silverfish may be able to avoid treated areas and thrive if you miss their nest. Local populations will just move around your treatment areas.



Once you have done your treatment, give it time to take effect. As with moths and carpet beetles, traps are also available that target silverfish. Good locations for traps include bookcases, cabinets, pantries, closets, filing cabinets, or any place you've seen them. Inspect them every couple weeks and change them about every 3 months. If you're still finding silverfish in areas you've treated, you know that further treatment is necessary.



SILVERFISH TRAP

Storage Suggestions

- **Store only clean garments.** Make sure ALL food and beverage stains are thoroughly removed! Even if you only wore something once, clean it before storing it. The invisible remnants of body oils and perspiration could be enough to attract insects. Effective cleaning discourages insect infestation. Dry cleaning effectively kills all stages of clothes moths on fabrics. If you have a major clothes moth infestation, dry clean all susceptible garments, woolen rugs, and tapestries, at the same time as you have your dwelling professionally treated.
- **Store your clothes in a cool, dry place.** When storing out of season bedding or clothing, use wood or archival boxes or chests that can “breathe.” Don't use plastics dry cleaning bags or air-tight plastic containers for long-term storage. Moisture can accumulate and cause mold and mildew damage to the items or leave clothes with a musty odor. (See our FashionableCare Newsletter, “A Mold and Mildew Primer,” on our website.) Remember basements are too moist and attics are too warm. Summertime attic heat can actually “cook” clothes causing fibers to become brittle and break.
- **Use breathable storage solutions.** Margaret's carries a selection of breathable bags, sweater bags, tie boxes, shoe bags, purse bags, and comforter bags, specially designed to keep your



BREATHABLE COMFORTER BAG

belongings safe during long-term storage. They are constructed of a poly-bonded non-woven waffle-stamped material containing no protein and completely inedible to fabric pests.

- **Fine nylon netting** wrapped around storage boxes will prevent the entry of insects such as silverfish. Nylon also contains no protein and is non-digestible to the bugs.
- **Brush your clothes** (see more information above) to help remove eggs and larvae from clothes that you don't want to have cleaned. Remember they're so small you probably won't be able to see them! It's also important to store items that you DON'T have cleaned separate from those that HAVE been cleaned, just in case you've missed an infestation.
- **Use mothballs sparingly.** Also called paradichlorobenzene (PDB) or naphthalene crystals—mothballs do not kill larvae or insects unless the area is tightly enclosed to achieve a high concentration of the odor. Trunks, air tight garment bags, boxes and chests, if tightly sealed and taped, can be effectively used to fumigate clothing. The length of exposure needed to kill moths or carpet beetles will vary with the temperature, the size of the larvae, the type of insecticide use, and its concentration. To be certain you've killed all stages of the insects, plan on 2 to 3 weeks of treatment. At lower concentrations, the offensive odor of mothballs acts as a mild repellent only. Thorough airing or cleaning may be required after storage to remove the residual odor of the mothballs. Mothballs are primarily designed to use for long term archival and should not be used on items that you are planning to use in the near future.



BREATHABLE GARMENT BAG

Other notes regarding the use of mothballs:

- Many specialists in clothing storage do NOT recommend the use of mothballs because of the difficulty in actually creating an effective sealed environment and their toxicity, noted below.
- These chemicals are toxins, which can be absorbed into the body if vapors are inhaled over a period of time. They are toxic to children and pets. People sensitive to these products and should avoid using them, especially those with asthma or breathing sensitivities.
- Do not place mothballs directly on to fabric. Some fabrics and dyes could be adversely affected. Place instead between layers of paper.
- Store clothing loosely so fumes can filter throughout the storage area.
- The vapors created by mothballs are heavier than air. Always place them in the storage area ABOVE the items being stored.

Many fabrics retain the odor of mothballs even after dry cleaning!

- Do not use mothballs in plastic containers or with plastic hangers, buttons, belts or trims. Plastics may react and be permanently damaged by PDB vapors.
- **Note:** Many fabrics retain the odor of mothballs even after dry cleaning! So unless you LIKE the odor of mothballs in your clothes, it's best to avoid their use entirely!
- **Use cedar chests.** To be at all effective, cedar closets or chests should be AIR-TIGHT and KEPT CLOSED at all times. The cedar scent tends to repel insects, but the airtightness is actually what is protecting the garments. Because of the insufficient seal to maintain a concentration of the odor, cedar chests are seldom completely effective in preventing insect infestations. The cedar oils may kill clothes moth larvae, but not the older moths or eggs. Keep in mind that cedar is not effective against carpet beetles. Thorough airing or cleaning may be required after storage to remove residual cedar odors. Over time, the oils that provide the protection dry up and lose their effectiveness, and cedar chest need to be sanded and a fresh treatment of cedar oil applied about every two years.
- **Use natural repellents.** Other natural materials thought to repel insects are cedar, eucalyptus, pennyroyal, lavender and tansy. Read labels and follow instructions with these products, too, as many can be toxic. Lavender, for example, will repel clothes moths but do nothing about the eggs or larvae.
- **Control the humidity of your house and closets** with small dehumidifiers. Margaret's has 4 sizes of closet dehumidifiers available for purchase. Low humidity slows the development of moths and will keep them in their cocoons longer, but it won't eradicate them. If you wish to control mold and mildew as well as fabric pests, a relative humidity of 45 – 50% or less, at 68 – 72° is ideal. More than 50% humidity will provide a good growing environment for pests. Moths love 75% humidity.
- **Constant light** in a closet may discourage moths, along with tight-fitting doors and floor-to-ceiling cotton drapes to keep dust and moths off the clothing. Keep in mind, however, that the light can fade your clothing.
- **Cold storage** (at 40°F) is often recommended as a means of protecting uninfested furs and other items from insect damage. Cold storage is recommended for furs, in general, as it prevents the skins from drying out. Constant cold storage prevents the larvae from feeding but it does not kill larvae or eggs that may already be present.



DEHUMIDIFIERS AVAILABLE IN MULTIPLE SIZES DEPENDING ON SIZE OF SPACE

Things Your Cleaner Can Do to Help

- Be sure to let your cleaner know if you suspect your clothes could have insect damage so he or she can inspect them before cleaning. Keep in mind that even if you inspect BEFORE cleaning, damage may only show up AFTERWARD when damaged fibers have been washed away!
- Dry cleaning is by far the best way to remove food, beverage and body stains and odors from your clothes so as not to attract the insects to begin with.
- Both dry cleaning and laundering effectively kill all stages of fabric pests that may be present in your clothes. Always dry clean or launder susceptible fabrics before storing for a long period of time.
- Some companies provide mothproofing and cold storage services.

Sell Products Such as:

- Breathable storage bags to protect your garments
- Closet de-humidifiers of a variety of sizes
- Insect traps to monitor problems

Our storage bags are constructed of "polypropylene fibers that are heat rolled into polypropylene non-woven. The material is breathable, dust proof and ECO friendly."

Is it Possible to Repair Insect Damage?

For special garments, and depending on the amount of damage, it is sometimes possible to repair your garment through reweaving, reknitting or custom alterations. These are topics for a future newsletter.

Resources

"Preventing Damage from Clothes Moths and Carpet Beetles," Guide C-504, by Susan Wright, Extension Consumer Education Specialist, published by Cooperative Extension Service, College of Agriculture and Home Economics, New Mexico State University.

"Insect Damage", Bulletin #646, published by the International Fabricare Institute, 12251 Tech Road, Silver Spring, MD 20904.

"Clothes Moths and Their Control," Guide G-316, by L.M English, Extension Entomologist, College of Agriculture and Home Economics, New Mexico State University.

"Tips for Successful Garment Storage," by Annette Scriber, IFI Analyst, International Fabricare Institute Technical Operating Information Bulletin #662.

"Fabric Insect Pests: Clothes Moths & Carpet Beetles," Publication IP-50, by Bette Jo Dedic, Extension Clothing Specialist and Mike Potter, Extension Entomologist, University of Kentucky, College of Agriculture.

"Guide to Control of Clothes Moths and Carpet Beetles," CSIRO Textile and Fibre Technology, Victoria, Australia.

"Storage Tips Protect Out-of-Season Clothes," by Nancy Peterson, Communications Specialist, Kansas State University Research and Extension.

"Clothes Moths," by William F. Lyon, Ohio State University Extension Fact Sheet HYG-2107-97.

"Insects and Wool Textiles," Smithsonian Museum Conservation Institute.

"Eradication of Insects from Wool Textiles," by Barbara Reagan, Journal of the American Institute for Conservation, 1982, Vol. 21, No. 2.

"Silverfish and Firebats," by John Jackman and Phillip Hamman, Extension Entomologists, Texas A&M University, 1997.

Insect Damage

“NCA’s Mini Guide to Moth Prevention & Control,” National Cleaners Association.

What’s That Bug? www.whatsthatbug.com. An excellent resource if you’d like to figure out what bug you’re looking at. Great pictures of various stages of common pests.

COMMERCIAL COMPANIES:

Informational Websites with Resources and Solutions (listing these here does not constitute Margaret’s Cleaners endorsement of their products.) Each site has a great deal of information about various pests and their habits, sells a variety of specialized chemicals for control and eradication, and traps to help detect and control reinfestation.

- Do-it-Yourself Pest Control, www.pantrypest.com.
- ePestSupply, www.epestsupply.com
- U-Spray, Inc., www.bugspray.com
- Bugaboopest, www.bugaboopest.com
- Professional Pest Control Products, www.pestproducts.com
- Critter Ridders, www.critterriders.com
- Cedar Closet Linings, www.cedar-closet-linings.com
- Vermont Country Store, a source for various natural repellent products such as cedar oil, www.vermontcountrystore.com
- Mountain Home Cedar, source for materials for cedar closets, www.mountainhomecedar.com
- And many more!



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