

Fumigants & Pheromones

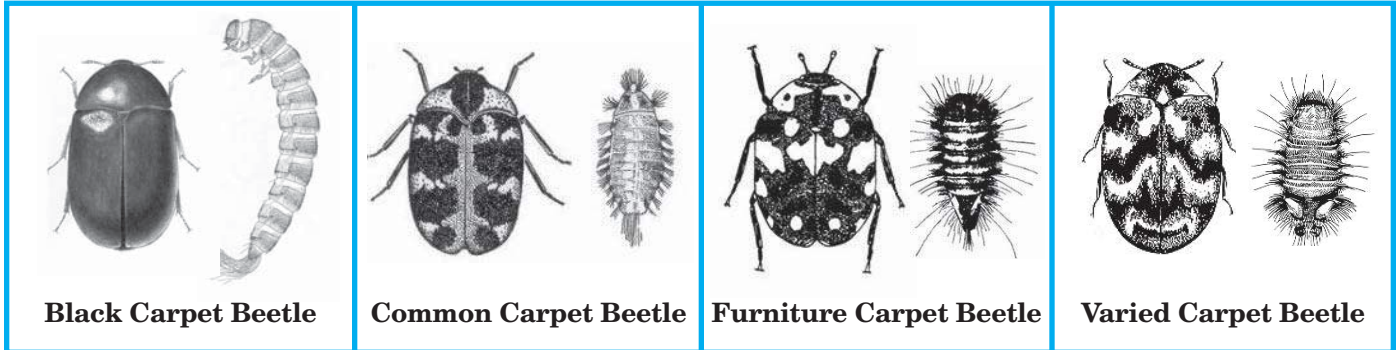
Issue 90
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Routing:



A Newsletter for the Insect Control & Pest Management Industry

Carpet Beetles Eat More Than Just Carpets



Black Carpet Beetle

Common Carpet Beetle

Furniture Carpet Beetle

Varied Carpet Beetle

by Pat Kelley, ACE

The term “carpet beetle” is frequently used in reference to the little beetles and “worms” that quietly munch away at rugs and carpets beneath our feet. The truth is that these beetles, in the family called *Dermestidae*, will eat a wide variety of materials. Their food can include processed food for human consumption, dead animals/insects, feathers, furs, and yes, they will also eat the natural fibers found in woolen rugs and carpeting.

The most common carpet beetles consist of these six species: Black carpet beetle, *Attagenus unicolor*; Brown carpet beetle, *Attagenus elongates*; Common carpet beetle, *Anthrenus scrophulariae*; Furniture carpet

beetle, *Anthrenus flavipes*; Guernsey carpet beetle *Attagenus sarnicus*; Varied carpet beetle, *Anthrenus verbasci*.

The adult beetles become active in the warming springtime of temperate climates. They can be found feeding on the pollens of Spirea flowers as well as other flowering plants. Mating often occurs outdoor, after which the females come indoor looking for food sources on which to lay their eggs. An accumulation of dead insects in attics, window wells, ductwork, or in wall voids can attract the initial females as a good food source for her young larvae. The larvae can then transfer over to carpeting or other available food sources nearby. The larval stage does the most damage to stored goods as they are

ravenous eaters. When inspecting for carpet beetles it always helps to “know your pest first.” By knowing the biology of the beetles and the wide potential of food sources for these insects, you now know that you need to look much farther than just the carpeting to find potential infestations. Pheromone traps are available but are specific for each species. Larval dermestid monitors can be used to detect for the larval stage.

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VISIT US AT: www.insectslimited.com

Gatekeeper

by *Dustin Corlett,*
Chicago Regional Manager

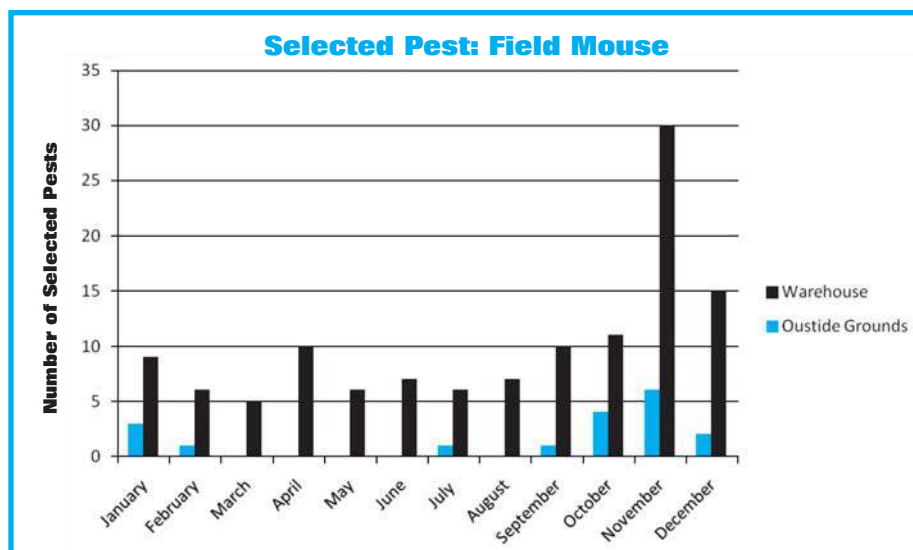
Over the last decade the advancement in technology has been changing the way we live our lives as well as the way we work. Laptops, portable printers, handhelds, G.P.S's, cell phones, and barcoding programs have turned our work trucks into virtual offices. Because of new technology, our customers also have a higher sense of expectations regarding the service that we provide and do not want to have to wait to receive proposals or reports. To arise to these new challenges, industries need to stay in touch with new technology and programs that will give them the ability to respond to such demands.

For the past 5 years, barcoding has become the cornerstone of the pest management service that Fumigation Service & Supply provides for its customers. The industries that we provide service to have an elevated sense of expectation concerning the data that our service provides as well as their ability to access this data immediately. An auditor or product recall will not wait a few days for an updated trend report. Time is of the essence and a reliable system is needed for providing this data during times of crisis.

Choosing the right barcoding program is difficult and many considerations should be taken when deciding on which one to use. The most basic function for the right program should be vendor verification. The program should give customers the ability to see that services are being

performed completely and they are getting what they pay for. Service providers also need to have the ability to record activity and illustrate it in reports that are useful to the customer and service provider. Finally, customers need to have the ability to access the data with ease at the time in which it is needed. Almost all of the programs that have been created have been done with considerations of the service

available. With Gatekeeper, one barcode is on the wall and the other is in the pest control device. For that device to be serviced, both barcodes have to be scanned. Only management has access to the wall barcodes which takes away the possibility of an unethical employee scanning barcodes from his truck. The customers also have the ability to pull up a missed trap report which will inform them about any devices that are not being serviced. The data side of Gatekeeper is the real meat of the program. Gatekeeper takes the data from the pest control inspections and generates it into countless types of reports, trending, and maps. This



Gatekeeper is truly a data monster that trends pest activity, sanitation maintenance issues, pesticide usages, and even keeps track of pest control devices that are getting damaged.

provider rather than the customer. Unfortunately, these programs are the most widely used.

Taking all of these factors into account, FSS found that the only program that meets all customer's qualifications is Utrap-It, designed by Inquizit Software, which we have dubbed 'Gatekeeper.' Gatekeeper is the only double barcode program on the market which in turn gives the highest level of vendor verification

report gives the ability to look at a specific facility from an aerial view to see specifically where the activity is.

In conclusion, barcoding is part of the evolution of our industry and choosing the right program is essential to keeping yourself at the forefront of service. Always remember that the best barcoding data system is the one that takes your customers needs as the basis of the program!

Dave's Soapbox

...for what it's worth

The mouthparts of the tsetse fly have a thin pin that holds the victim while the 'chain saw' like blood sucking mouthparts penetrate the victim. This fly can get blood out of an elephant's ear. It can transmit sleeping sickness too.



The Wonderful World of Insects



Control of Tsetse Flies in Africa

Dark striped blankets impregnated with insecticide to kill tsetse flies are placed under trees in Tanzania's Serengeti National Park where people may gather.

A high degree of control of the potentially deadly tsetse fly can be achieved by trapping. This is mainly because of their *adenotrophic viviparity*, and consequently very low intrinsic rates of population increase. Calculations based on life table data have shown that it is only necessary to catch 1-4% of the female population per day in order to achieve effective control. This is at least 8 times less than that required for malaria carrying *Anopheles albimanus*.

Royal blue is highly attractive, and strongest landing responses are induced either on dark striped surface or those strongly reflective in the ultraviolet. A cocktail of all known attractants can increase trap captures of tsetse flies by 15-20 times. The new generation of 'unsaturated' traps, or so-called targets, or insecticide-impregnated blankets attract flies, can be highly effective for controlling



Maasi children in front of a termite mound that are susceptible to the Sleeping Sickness.

tsetse populations. However, the problem with tsetse control is primarily one of sustainability, in particular the problem of economically containing the threat of re-invasion of areas cleared of the fly.

Another successful method of eliminating tsetse flies in Africa is the release of millions of sterile males. Since the tsetse fly only mates once in its life, mating with a sterile male has controlled fly populations over large areas. This method is called SIT (Sterile Insect Technique) and this method has

Adenotrophic viviparity

Name means "gland fed, live birth." This is the reproductive mode of many insects such as tsetse flies, gnats, moths, fleas, and mosquitos. Eggs, with a chorion are retained within the female's body and are nourished through "milk glands" until the developed larvae are ready to pupate. The larvae are then 'larviposited' and immediately pupate.

This is one way insects avoid predation during their most vulnerable life stage.

been used to successfully control screw worms in cattle in the southwestern states in the US.

Conclusion

This is important to know in a pest management strategy. By attracting and killing the adult female, you kill the offspring too.

Source: A.M. JORDAN

A. K. Mueller

Well Deserved Promotion



Pat Kelley

Insects Limited, Inc. recently promoted Pat Kelley from General Manager to Vice President. In 1986, Pat joined Insects Limited/ Fumigation Service & Supply and became the General Manager after obtaining a Bachelor's Degree at Purdue University. Pat is an Associated Certified Entomologist specializing in the area of stored product insects. With his knowledge, he works with pheromone formulations and pheromone dispensing. He also plays a part in the research development.

Pat is a regular speaker at our International *Fumigants & Pheromones Conferences* as he has prepared hundreds of presentations on the topic of stored-product pest management both nationally and internationally, including Germany, Greece, Denmark, Mexico, and India. He currently heads the IPM strategies for several large museums and is a consultant to the food and grain industries and museums.

New 2009 Catalog

Insects Limited, Inc. recently published a new **Product Catalog**. These colorful 16 pages contain detailed photos of stored product insects, pheromones, traps, bookstore, and our lab/consulting services. Also included are several **New Pheromones** including Hide Beetle, Brown House Moth, a variety of Carpet Beetles, and Mite Traps. Insects Limited proudly supports customers with Insect Identification, educational resources, training and instruction on how to use the products that we sell. Support can be found through our highly qualified staff by visiting www.insectslimited.com, our newsletter *Fumigants & Pheromones*, or by simply calling 800-992-1991.



"Hard to Find" Catalog

Fumigation Service & Supply has released a new catalog entitled **Hard to Find Fumigation Equipment**.

Our purpose is to provide Hard-to-Find items used for the unique niche of fumigation. The fumigation market has changed greatly over the past 10 years and continues to change. Finding the needed equipment and devices can be very time consuming and trial and error proves to develop adequate products can be very expensive. Items in this catalog represent those efforts and trials we and others made over the past 23 years.

In addition to the sales of these products, we provide consultation, site specific system development, onsite installation, and annual maintenance packages. Large projects include fixed central gas application systems and multipoint fixed monitoring systems with access to data. Please challenge us with ideas you have and we will work with you to provide solution.



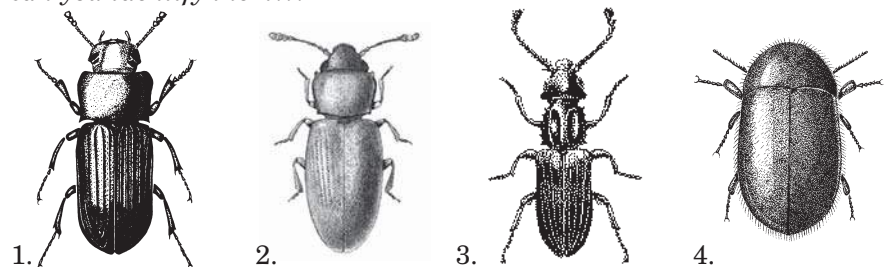
Oops!

In the most recent *Fumigants & Pheromones* newsletter, Issue 89, there are corrections: Page 4, under the "Test Your Knowledge," #1 should read 'Red flour beetle' and #2 should read 'Foreign grain beetle'. We apologize and hope that this has not BUGGED you.

Thank you for your readership!

Test Your Knowledge:

These insects are commonly found and misidentified this time of year—can you identify them?!?



Answers: 1. Red Flour Beetle, 2. Foreign Grain Beetle, 3. Saw-toothed Grain Beetle, 4. Cigarette Beetle.



Temperature Effects on Biology of Common Stored Product Insects



Low Temperature Effect Temperature for Population Growth High Temperature Effect

| Insect Species | Extreme 100% Kill | Moderate 100% Kill | Lower Limit | Optimum Temperature | Upper Limit | Moderate 100% Kill | Extreme 100% Kill |
|--|--------------------------|-------------------------|-------------|---------------------|--------------|----------------------------|-----------------------------|
| Granary Weevil <i>Sitophilus granarius</i> | 5°F / -15°C 24 hours | 18°F / -8°C 14 days | 52°F / 11°C | 81°F / 27°C | 82°F / 28°C | 105°F / 41°C 12 hours | 130°F / 54°C 30 minutes |
| Rice Weevil <i>Sitophilus oryzae</i> | 5°F / -15°C 24 hours | 18°F / -8°C 3 days | 59°F / 15°C | 84°F / 29°C | 93°F / 34°C | 102°F / 39°C 17 days | 105°F / 41°C 1 hour |
| Lesser Grain Borer <i>Rhyzopertha dominica</i> | 14°F / -10°C 4 hours | 23°F / -5°C 10 hours | 64°F / 18°C | 93°F / 34°C | 100°F / 38°C | 109°F / 43°C 4 days | 131°F / 55°C 1 hour |
| Cigarette Beetle <i>Lasioderma serricorne</i> | 14°F / -10°C 8 hours | 23°F / -5°C 4 days | 63°F / 17°C | 90°F / 32°C | 97°F / 36°C | 109°F / 43°C 4 days | 122°F / 50°C 24 hours |
| Warehouse Beetle <i>Trogoderma variabile</i> | -2°F / -19°C 10 days | 14°F / -10°C 30 days | 64°F / 18°C | 90°F / 32°C | 104°F / 40°C | 113°F / 45°C 30 hours | 122°F / 50°C 12 hours |
| Sawtoothed Grain Beetle <i>Oryzaephilus surinamensis</i> | 14°F / -10°C 24 hours | 23°F / -5°C 15 days | 63°F / 17°C | 90°F / 32°C | 102°F / 39°C | 113°F / 45°C 12 hours | 125°F / 52°C 1 hour |
| Red Flour Beetle <i>Tribolium castaneum</i> | 23°F / -5°C 24 hours | 37°F / 38°C 28 days | 68°F / 20°C | 97°F / 36°C | 97°F / 36°C | 113°F / 45°C 30 hours | 122°F / 50°C <30 minutes |
| Confused Flour Beetle <i>Tribolium confusum</i> | 21°F / -6°C 24 hours | 32°F / 0°C 9 days | 63°F / 17°C | 90°F / 32°C | 90°F / 32°C | 111°F / 44°C 24 hours | 122°F / 50°C <30 minutes |
| Indianmeal Moth <i>Plodia interpunctata</i> | -2°F / -12°C 1 hour | 108°F / -12°C 7 days | 64°F / 18°C | 86°F / 30°C | 95°F / 35°C | 113°F / 45°C 2 hours | 131°F / 55°C 30 minutes |
| Mediterranean Flour Moth <i>Anagasta kuehniella</i> | 0°F / -18°C 1 day | 14°F / -10°C 10 days | 46°F / 8°C | 77°F / 25°C | 82°F / 28°C | 113°F / 45°C 30 minutes | 131°F / 55°C <30 minutes |

*The temperature data are derived from laboratory reared insect cultures. Insects acclimated to cold temperatures will require colder temperatures and/or longer exposure times. From Paul Fields (1992), Tom Strang (1992)

John Mueller, president of FSS stated:

“Cold temperate fumigations are often unsuccessful. Why? Stored product insects have the ability to shutdown their respiration, hibernate, and tolerate phosphine for up to 10 days at low temperatures. Warm grain and structures offer better conditions for 100% mortality of all stages of insect life. The insects can shut down their bodies during the cold winter months and survive sub-zero temperatures outdoors by creating a glycol antifreeze to lower the freezing of liquids in their bodies. A fumigant label may say that you can use the product below 60°F / 15°C but this takes much longer to be effective. The difference of a complete kill with 200 parts per million of phosphine at 90°F / 32°C and 40°F / 5°C may be 10 times longer for the colder temperature. Fumigation failures often occur because applicators don't allow for the correct duration to allow the solid phosphine formulation to break down, penetrate the grain, and affect a kill. Not only the insect adults but the tolerant eggs and pupae stages are not as active and thus don't inhale the fumigant as much. Remember the saying when using phosphine: **The longer the better.**”

Bin Cleaning



*By Nathan Stocker,
Operations Manager*

Bin cleaning is an integral part of ensuring product quality and pest management in a milling or baking operation. This is often a step that is overlooked, but American Institute of Baking (AIB) and other auditors are placing a new priority on the portion of inspections. Documentation of sanitation, inspections, and tailings reports are the backbone of this section.

The on-site inspection of bins by the auditor will be another portion of the audit. Auditors are taught to look at the top inspection / entry port, dust collection systems, and discharge tube for insects and black mold. Bottom 'Skirts' of the bin and 'Dog Houses' on top of the bin are also areas of importance. These areas are where mold, chipping paint, and properly meshed vents will be inspected. If bins are located outdoors, the auditors are trained to check that the drier system is working properly.

Generally, a brush down of the top 15-20 feet of your bins while they are empty is sufficient. This will require entering the bin on a pre-erected platform in the bin, or a cage or bozens chair lowered with an approved tripod. The bottom discharge tube will need to be disconnected and debris vacuumed out. If the driers quit working to optimal capacity, a wet clean method is needed with steam and



Familiarity with full protection equipment is essential to bin cleaning procedures.

an approved sanitizer. This is a much more labor intensive job. Along with all bin entry situations, confined space, fall protection, and air quality monitoring, training, and documentation is required. There is no set schedule to perform bin cleanings, but annually would be the least amount accepted

by most inspection agencies. The longer time period between cleanings, the longer it will take to complete the task. Documentation, inspection, and regular cleaning will be the key to keeping your customers happy and inspection scores high—which is what we are ALL aiming for!



Cleaning exterior of bin is an integral part of the pest management programs.



Bin entry supervisor is monitoring our quality for confined space point.



Exterior Silo Before



Exterior Silo After

Preserving Our History

ART CONSERVATION

By *Hélène Gillette-Woodard*

At the Indianapolis Museum of Art, newly acquired art is isolated from the collection and treated as needed for infestation before it comes in contact with any other art. Recently, a large air-tight and pest-tight silver envelope sat in the middle of a basement storage room. Attached to the envelope through a group of tubes, bottles, valves and measuring



If you would like to learn more and watch this IPM work, please visit <http://www.flickr.com/photos/imaitsmyart>

Photo: "Courtesy of Indianapolis Museum of Art"

instruments was a nitrogen gas canister. Inside the envelope, a newly acquired painting was receiving an anoxic (oxygen deprivation) treatment before the painting could be allowed to join the collection. This treatment was designed to kill any insects that may have hidden in the painting before they could move into the museum and eat on the collection.

Insects make up more than half of the known living organisms on our planet. Mostly we ignore them and just consider them to be a fact

of life, but when they get into a museum collection they become a huge problem because they don't like to leave. Think about it, the museum environment is carefully regulated to keep an average temperature of 70°F/21°C and relative humidity level of 40% to provide a safe environment for the art and the human museum visitors...but these conditions are also perfect if you are an insect. A wide range of materials tasty

to insects are commonly found in artwork...from wood and textiles to feathers and seeds. Add to these factors the lack of competition for territory and food and you have a great insect environment! When we find weevils in our cereal or fruit flies on our bananas at home, we toss

out the problem food and anything else that might be contaminated and the insect problem is taken care of. Throwing out the art is not an option!

What museums do to solve the problem is use an approach called Integrated Pest Management. IPM looks at preventing, locating and eradicating pest infestations. By conducting this anoxic treatment, the IMA prevented the possible infestation of the collection so that it can be enjoyed by future generations. The National Park

Quotable Quotes

You have to learn the rules of the game. And then you have to play better than anyone else.

—Albert Einstein

A business that makes nothing but money is a poor business.

—Henry Ford

In a difficult business, no sooner is one problem solved than another surfaces—never is there just one cockroach in the kitchen.

—Warren Buffett

If I had to do it over again... well, I would spend the rest of my life studying a scoop of dirt from my back yard.

—E.O. Wilson, Pulitzer Prize winning Harvard Entomologist

Insects are a symptom of the problem.

—David Mueller

Learning is the profit of education.

—Dr. Mark Keen

Always bet on the pest.

—Greg Bauman, NPMA

Service and the Northeast Document Conservation Center have good information on this approach.

This treatment implemented and brought to you by Hélène Gillette-Woodard, IMA Senior Conservator-Objects, Kathryn Campbell, IMA Graduate Conservation Intern-Paintings, and Pat Kelley, Insects Limited, Inc., General Manager.



Insects Limited / Fumigation Service & Supply will be speaking, attending, or organizing the following:

February 4-5

Indiana Hardwood Lumberman's Association (IHLA)
Indianapolis, IN

February 28 - March 3*

Grain Elevator and Processing Society (GEAPS) Exchange
St. Louis, MO

March 3**

Food Plant Pest Management Conference
University of Minnesota

PestWorld

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NPMA Annual Meeting Recap—Fall 2008

Our nation's capitol was a fitting setting for the most recent 75th National Pest Management Association (NPMA) annual meeting called "PestWorld 2008." Insects Limited and Fumigation Service & Supply attended this major conference that concentrated on both new products and new regulations of existing products. The speaker's topics ranged from fumigation regulations to controlling specific pest species. The large exhibit hall allowed for the introduction of any new products to the industry as well as catching up with old friends and business acquaintances. This meeting had the added benefit of attracting a large international base of attendees, many who are friends to Insects Limited and FSS. Being in the "electric" atmosphere of Washington DC immediately before a major presidential election spurred lots of healthy discussion of where the industry may be going with the incoming presidential administration.

April 15-17*

International Congress of Fumigation
Mar del Plata, Argentina

April 27 - May 1*

International Association of Operative Millers (IAOM)
Grand Rapids, MI

October 26-29*

Pest World 2009
Las Vegas, NV

March 3-5, 2010**

9th Fumigants & Pheromones Conference
Valencia, Spain

*Attending **Organizing



9th Fumigants & Pheromones

CONFERENCE & WORKSHOP



March 3-5, 2010

Valencia, Spain

Fumigants & Pheromones is published by Fumigation Service & Supply, Inc. and Insects Limited, Inc. We hope that the information that you receive from this newsletter will help you in your business, and you, in turn, will support our business efforts. If you have an associate who would be interested in receiving this newsletter, please contact the address below. We would welcome any comments or suggestions for topics. Address correspondence to: Kalah Stocker, Fumigation Service & Supply, Inc., 16950 Westfield Park Rd., Westfield, IN 46074 USA.



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