

Fumigants & Pheromones

Issue 101
Winter 2012

Routing:



EPA Award Winner
Best of the Best

A Newsletter for the Insect Control & Pest Management Industry

Dr. John Osmun of Purdue University once stated:
"If you want to be professional, then let's get professional."

Taking time to retool our skills is important in any discipline these days. Technology and regulations change fast. Join us May 16–18 to sharpen your skills and learn from international speakers with many years of experience.

Day One and Two are lecture format at the beautiful University Place Conference Center on the campus of Purdue University and Indiana University in downtown Indianapolis. The breaks, gala dinner, and open evenings offer a great opportunity to meet others from at least 30 countries on six continents with common interests. These contacts can become invaluable in your career.

Day Three will be much different. Buses transport attendees to workshop sites where multiple fumigations will be in various stages of completion. You will have a chance to talk to the fumigators as they perform their specialized jobs;



"Pest Management Around the World"

warehouse fumigation, container quarantine fumigation, and grain fumigations with EcoFume™, HDS System™ and VaporPhos™. This workshop will focus on sulfuryl fluoride (ProFume™ gas fumigant). The exciting new FAST multi-fumigant scrubber will also be demonstrated.

At this workshop you will visit a pheromone laboratory and a retail store to hear from experts on advanced uses of mating disruption and pheromone mass trapping.

It promises to be a full day of hands-on demonstrations that

will keep you moving from site to site before returning by bus to the conference center. *What a great opportunity to study your profession, spend time with colleagues, and retool your skills with updates and continuing education.*

Visit www.insectslimited.com for details on the **10th Fumigants & Pheromones Conference and Workshop**, May 16–18 in Indianapolis.

Mission Statement

In all, our aim is to strive for quality service, provide the absolute best products available worldwide, to be a respected world-class organization, and maintain profitability with innovation, alternatives, and education.

**Gain knowledge and experience by attending the
10th Fumigants & Pheromones
Conference & Workshop**

May 16–18, Indianapolis; www.insectslimited.com

VISIT US AT: www.insectslimited.com

Bad Bugs...

Clothes Moths



By **Alain VanRyckeghem, BCE**

Technical Director
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Identification: Webbing clothes moths (WCM) *Tineola bisselliella* are the most common of the moths attacking stored materials containing feathers, wool, or hair. It has a uniform shiny gold color with a reddish orange tuft of hairs on the head (figure 1). The case-making clothes moth (CMCM) *Tinea pellionella* is less common and appears as uniform silvery grey to shiny light brown, with dark grayish hairs on the top of the head and often with a small dot in the middle of the forewings (figure 2). Both moths are similar in size, about 5–6 mm (3/16") head to wingtip.

Life Cycle: The typical time to complete the life cycles for these moths can be in the 5–12 week range under optimum conditions, but as long as 16 weeks to a couple of years under adverse conditions. The WCM favors a warm environment with relative humidity (RH) in the 70% range, but can tolerate RH to 30%. The CMCM develops faster in higher RH, near 90%, and prefers cooler temperatures. The optimum temperature for WCM is 84–87° F while CMCM prefer 74–77° F. Adult WCM will live for up to 4 weeks, whereas the CMCM will only live for a week.



Tineola bisselliella



Tinea pellionella

Biology and Behavior:

Webbing clothes moths are most active indoors from April to November. They may also be caught in traps near the exterior of homes (see article about outdoor trapping of WCM). In well heated homes these moths can be caught in monitoring traps in the winter months as well. In December 2011, our room temperature lab cultures had more than 10,000 WCM in larval form and about 30% emerged as adults for the Christmas celebrations! Unlike CMCM we do not see the WCM having any significant natural breeding habitat outside of human habitation. CMCM can often be found in small nests of birds or in unheated buildings with bird activity or farm animals.

Webbing clothes moths are reluctant to fly, especially females, if located in storage areas with edible garments or antique materials with feather, hair, fur, or with woolen floor coverings. They run very quickly when disturbed and hide from bright lights. The cream colored larvae have **brown head capsules** and freely run around the infested materials, sometimes within silken tunnels. They usually produce white pupae on the infested material; leaving damage that resembles granular pepper and short trails of webbing.

Case-making clothes moths are considered excellent fliers and can easily move about a structure looking for new harborage sites in ideal temperature and humidity zones. The larvae have **black head capsules** and travel about

within a case of woven material that often contains the colored threads of the infested article. Damage is similar to WCM except that there will be no streaks of webbing and often the pupation may be away from the site of infestation, perhaps on a wall or a ceiling.

Monitoring and Control:

The behavior of the two moths dictates the proper choice of trap and lure. Webbing clothes moths prefer to hop and jump into a trap, with a three pheromone blend lure, sitting on a shelf, a cabinet, or floor, in a drawer or under furniture. The CMCM prefers to fly into a trap rather than land and walk into it. Hanging traps with a single pheromone lure is the best choice for this moth. While there can be some cross attraction to the lures by each moth, research has shown that best results are achieved when using the proper lure for the moth species present.

Control of these pests requires considerable effort on the part of the home owner or commercial client. Moth traps can capture lots of moths, but like food moth infestations, if the source of the moths (larvae) is not removed, treated or frozen, then the traps continue to harvest moths, while the damage caused by larvae continues to grow. Some structural treatment of the home or building and floor coverings can help reduce the activity, but a careful examination of the wardrobe and storage rooms/closets is necessary to find the hidden infestations.

Dave's Soapbox

...for what it's worth



I enjoy duck hunting in the fall and winter months. It is hard to explain why I do it but it has brought me back to the same spots every year for over 40 years. Being a fumigator limits golf, fishing, or other warm weather fun activities. Our 'small game' hunting occupies most of our time and energy at Insects Limited and Fumigation Service & Supply during the warm months.

But when the winds get cool and the ducks and geese start migrating, the dog and I get excited. The first sign of hunting season is the new Cabela's catalog with sooooo many great gift ideas.

Abraham, my fourth black lab since 1978, and I will head to the muddiest place in the county to watch the skies for those game birds that are challenging and good eating. OK, I lied, more challenging than good eating. Hunters are optimistic by nature. Hunters will sit for hours in bad weather, which they would never do in their normal life, just to get a shot at those fast flying feathered friends.

If the day is slow, the hunter still finds things to entertain him and the other hunters with whom he is bonding, like the abundance of nature in a marsh not seen by the late sleepers back home. My wife, Mary Beth, greets Abraham and me at the door when we return with a "Did you have fun?" and a sigh of relief. No, it's not about bagging your limit but more about having fun outdoors.

In the 1980's the federal government outlawed lead shot

for waterfowl hunting when a scientific study by fish and wildlife biologists surveyed 35,000 ducks and found that up to 8% of these ducks had lead poisoning from lead shot scooped up while feeding on the bottom of the waterways. Back then everyone's thought process went something like this: ignore, deny, question the science, look for alternatives that worked and were not too expensive, and finally deny being a part of the problem. Does this sound familiar?

Hunters started paying double the cost for a box of steel shot. Steel shot is less dense and travels slower causing less penetration power. The hunters were mad about the new ruling. Enforcement was heavy and fines high for the unlucky hunter getting caught with lead shot. A handy magnet would show the conservation officer and the hunter immediately if the shells had steel or lead inside. Many tricks were performed in those early days to fool the conservation officer and sneak ways to continue using lead shot.

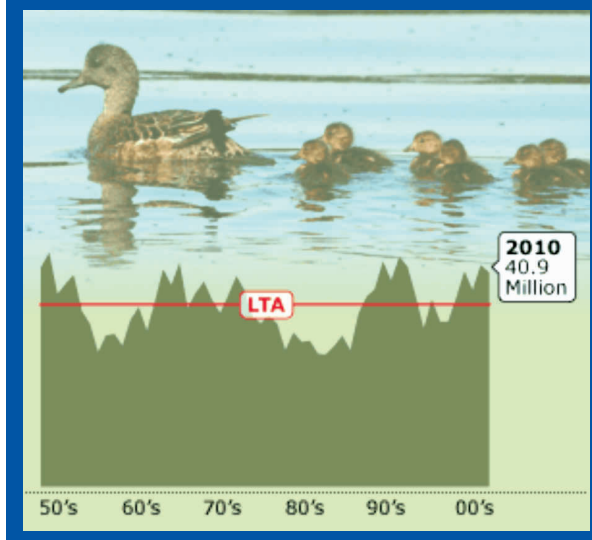
The innovators of the industry started producing more dense substances like tungsten, bismuth, and 'kryptonite' shot that were better than steel shot.

Breeding Duck Population

The good news is that the waterfowl population is back. It is a manageable natural resource when people care enough.

I thought about this process that started with denying the problem at a recent meeting for methyl bromide alternatives. After the scientists determined that methyl bromide

Breeding Duck Population



The estimate in 2011 was 11% higher than 2010 with 46 million birds and was 25% above the long-term average.

was harmful to the ozone layer in the early 1990's, we followed the same journey as the duck hunters. Questioning the science, looking for alternatives, and complaining a lot before denying we were ever part of the problem in the first place.

In the past fifteen years, the world community has come together to determine what was causing harm to our planet and what we could do to solve the environmental problem of destroying the sun's harmful ultra-violet light filtering system for our planet. Costs for alternatives were higher like the steel shot and sacrifices were made voluntarily.

The next article explains how alternatives to methyl bromide have been achieved by our industry.

Dave Mueller
President/ Entomologist

BROMINE ON DECLINE

One of the ozone layer's most destructive attackers — bromine — is decreasing in the upper atmosphere, according to researchers at the Commerce Department's National Oceanic and Atmospheric Administration (NOAA). They attribute the decline of total bromine primarily to international restrictions on industrial production of methyl bromide.

In a study published in the August 15, 2011 issue of *Geophysical Research Letters*, Stephen A. Montzka and colleagues from NOAA's Climate Monitoring and Diagnostics Laboratory in Boulder, Colo., say that total bromine in the lower atmosphere has been decreasing since 1998 and is now more than 5 percent below its peak.

“The decrease is driven by a large and rapid decline in methyl bromide, a brominated gas that is regulated internationally by the Montreal Protocol,” said Montzka. The surprisingly large drop in atmospheric methyl bromide, about 13 percent since 1998, has more than offset the small increases still observed for bromine from fire-extinguishing agents known as halons. Bromine is about 50 times more efficient at destroying stratospheric ozone than chlorine, another potent ozone destroyer.

“This is welcome news for stratospheric ozone because it means that less bromine and chlorine have been entering the upper atmosphere (stratosphere),

where the ozone layer resides, for a number of years now,” said Montzka. “Furthermore, while chlorine's decline in the lower atmosphere had been slowing in recent years, these new data suggest that the overall threat posed to stratospheric ozone from all halogenated gases continues to steadily diminish.”

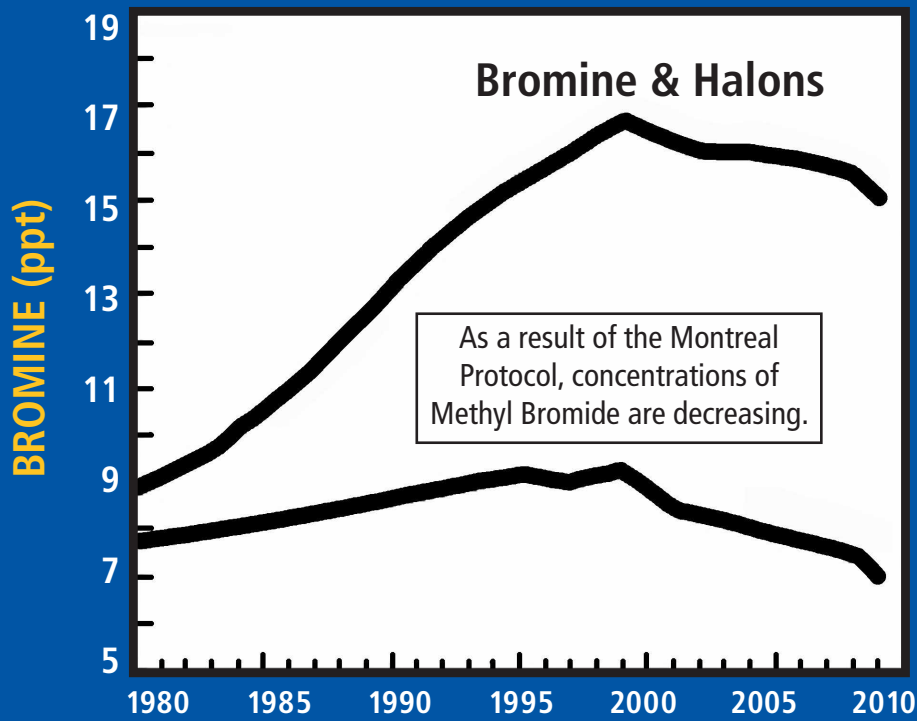
Methyl bromide is produced industrially for use as a fumigant in agriculture and in the shipment of commercial goods. It is unique among ozone-depleting substances regulated by the Montreal Protocol; however, it also has substantial natural sources including the oceans, wetlands, some plants, and burning of vegetation.

Global industrial production of methyl bromide has declined in recent years in response to restrictions outlined in the amended Montreal Protocol, say the researchers. The Montreal Protocol, which limits production of ozone-damaging compounds, was originally signed by the United States and 22 other nations in 1987, and has been strengthened through revisions and amendments since then.

The NOAA scientists were able to discern this reversal in the long-term upward trend for bromine based on their ground-based measurements of methyl bromide and halons over the past eight years at 10 stations across the globe, including Cape Grim, Tasmania; the South Pole; Mauna Loa, Hawaii; and Barrow, Alaska. Methyl bromide and halons together account for nearly all of the human-released bromine that reaches the stratosphere.

Source: Geophysical Research Letters, Stephen A. Montzka and colleagues from NOAA's Climate Monitoring and Diagnostics Laboratory in Boulder, Colo., August 15, 2011.

World Meteorology Organization (WMO)



2010 Methyl Bromide Levels in the Atmosphere

NOAA

Invasive Insects

Fresno, Calif. — Dozens of foreign insects and plant diseases slipped undetected into the United States in the years after Sept. 11, when authorities were so focused on preventing another attack that they overlooked a pest explosion that threatened the quality of the nation's food supply. At the time, hundreds of agricultural scientists responsible for stopping invasive species at the border were reassigned to anti-terrorism duties in the newly formed Homeland Security Department — a move that scientists say cost billions of dollars in crop damage and eradication efforts.

The consequences come home to consumers in the form of higher grocery prices, substandard produce and the risk of environmental damage from chemicals needed to combat the pests.

An Associated Press analysis of inspection records found that



Left: Damage to a tree by emerald ash borer.



Right: Jeff Waggoner, FSS general manager, surveying a log to be shipped from Indiana.

border-protection officials were so engrossed in stopping terrorists that they all but ignored the country's exposure to destructive new insects and infections.

“Whether they know it or not, every person in the country is affected by this, whether by the quality or cost of their food, the pesticide residue on food, or not

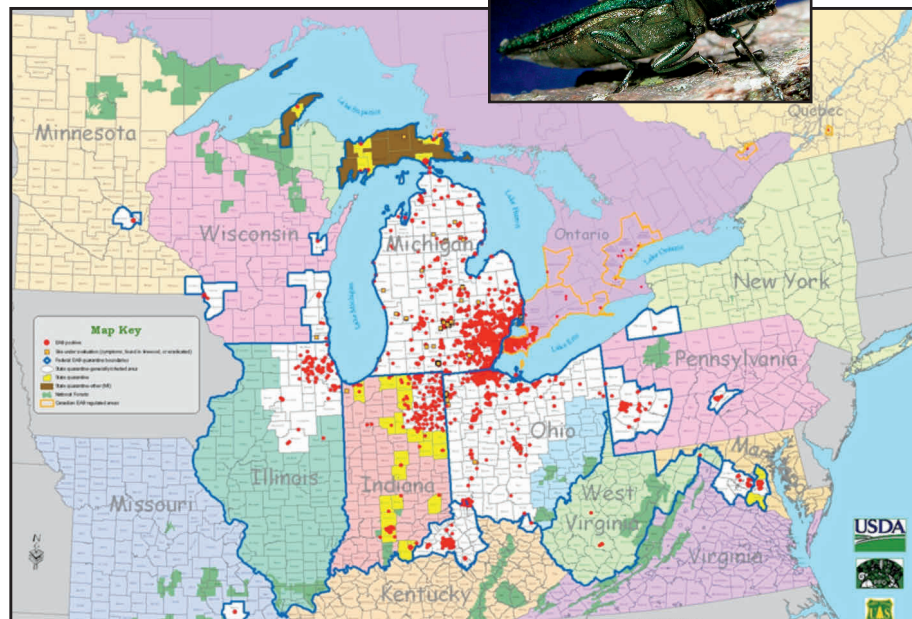
being able to enjoy the outdoors because beetles are killing off the trees,” said Mark Hoddle, a specialist in invasive species at the University of California, Riverside.

Homeland Security officials acknowledge making mistakes and say they are stepping up agricultural inspections at border checkpoints, airports and seaports. Invasive species have been sneaking into North America since Europeans arrived on the continent, and many were established long before Sept. 11. But the abrupt shift in focus that followed the attacks caused a steep decline in agricultural inspections that allowed more pests to invade American farms and forests.

Using the Freedom of Information Act, the AP obtained data on border inspections covering 2001 to 2010. The analysis showed that the number of inspections, along with the number of foreign species that were stopped, fell dramatically in the years after the Homeland Security Department was formed.

Over much of the same period, the number of crop threatening pests that entered the U.S. spiked, from eight in 1999 to at least 30 last year.

Sources: Tracie Cone, Associated Press, and the USDA



Forests in parts of Indiana, Illinois, Kentucky, Michigan, Maryland, Missouri, New York, Ohio, Pennsylvania, Virginia, West Virginia, Wisconsin, Minnesota, and Canada are affected by the Emerald ash borer (EAB) which arrived here from the orient. The red dots show where EAB are a problem. Over 20,000,000 ash trees have died in the Detroit Metro area alone. These dead trees are cut down and the firewood is moved to non-infested locations. Timber being exported from these areas is required by federal law to be fumigated under strict standards.

PHEROMONES

Pheromones for important stored product insects are being discovered, synthesized, and field tested each year by Insects Limited's chemist and entomologists. Here is our most recent list of pheromones and kairomones available.

For more information about these insect pheromone lures and attractants, contact Pat Kelley at p.kelley@insectslimited.com or go to www.insectslimited.com.

Pest Insect		
Almond moth	Fruit fly*	Mediterranean flour moth
Angoumois grain moth	Granary weevil	Merchant grain beetle*
Black carpet beetle	Guernsey carpet beetle	Mold mites*
Brown carpet beetle	Hide beetle	Red flour beetle
Brown house moth	Indianmeal moth	Rice weevil
Cigarette beetle	Indianmeal moth (female attractant)	Saw-Toothed grain beetle*
Casemaking clothes moth	Indianmeal moth (mating disruption)	Tobacco moth
Confused flour beetle	Khapra beetle	Varied carpet beetle
Drugstore beetle*	Larger grain borer	Warehouse beetle
Dermeidid larvae*	Lesser grain borer	Webbing clothes moth
Furniture carpet beetle	Maize weevil	

*Denotes kairomone attractants. Kairomones are mimics of the pest insect pheromone or a preferred food attractant.

Webbing Clothes Moth: A City or Country Moth?



Patrick Kelley

Authors Rudy Plarre and Bianca Krüger-Carstensen, in their paper titled: "Outdoor trapping and genetical characterization of populations of webbing clothes moth *Tineola bisselliella* (Lepidoptera: Tineidae) in the broader area of Berlin" published in *J. Ent. Acaral. Res. Ser. II,43(2):129-135, Sept. 2011*, make several intriguing discoveries in their trapping tests. Their research consisted of trapping webbing clothes moths in 13 locations in both urban and countryside locations around Berlin, Germany for approximately eight months in 2010.

The results of this study demonstrated that the webbing clothes moth is found to be abundant in the city and lacking in the rural areas of Berlin. The authors state, "A high-density housing in urban areas like Berlin not only offers a higher probability for infestation around the trapping location than the countryside but also more beneficial climate due to the heat island effect." Their data suggests that these moths have a synanthropic (benefiting from an association with humans occurrence). Insects Limited has seen this city trend as well in the United States.

In other European regions, reported at a recent museum conference in London, expert David Pinninger suggested that the increase in webbing clothes moth activity in the UK could possibly be tied to climate change. Imagine if a slight change in the temperature was

enough to produce two generations of moths a year rather than one

Finally, like the bed bug explosion throughout the world, clothes moths seem to be increasing in importance too. If it is an insect that has one generation per year in normal conditions, imagine if you double the numbers by allowing the second generation per year to develop in warmer climates or warm homes and buildings. Mankind seems to be creating perfect breeding environments for a few select pests. What will the future hold for the clothes moth?



Webbing clothes moth

New Container Fumigation Facility

Heyworth, Illinois — Fumigation Service & Supply has purchased a 16,000 sq. ft. building in Central Illinois to help stock materials, act as a regional office, and offer fumigations of shipping containers, trailers, and palletized commodities like seed. This facility is located in the center of Illinois and near several major interstates and highways. This facility is USDA approved for quarantine and preshipment (QPS) treatments. Pete Mueller is the manager for this quarantine fumigation facility and can be reached at 309-830-9386, (p.mueller@fumigationzone.com)

This is the second USDA approved fumigation facility for FSS. The other is in Westfield, IN. It has been open for six years and treats hundreds of containers of logs bound for Asia, India, and Europe.

A quarantine treatment is required when certain items are shipped out of a region, state, or country. An example of this is logs that are grown and harvested in an Emerald ash borer or Asian long horned beetle quarantine zone. Millions of trees have been destroyed from these destructive invasive pests. This quarantine pest could be under the bark

of the logs and could spread to other countries or regions of the country. The USDA has on premises oversight of these treatments and strict standards are enforced.

In addition to the USDA quarantine of listed commodities and invasive insects and nematodes, the FOA in Rome

has an international standard for wood packaging to be treated before leaving a country. This International Standard on Wood Packaging Materials (ISPM-15) requires any containers using wood packaging material, like wood pallets. ISPM-15 treatments are policed by agencies appointed by the federal government to oversee the treatments and their records.



FSS has two facilities for fumigating seed, logs, and other stored products year round.

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CALENDAR OF EVENTS:

*** **March 28, 2012, GEAPS/IAOM:**
Regional Meeting and Fumigation
Continued Education Program, Angola, IN



"Pest Management Around the World"

*** **May 16-18, 2012,**
10th Fumigants & Pheromones
Conference and Workshop, Indianapolis

** **October, 2012, CAF (Conference,
Controlled Atmosphere and Fumigation
International Conference), Turkey**

- * attend
- ** present
- *** organize



“Quotable Quotes”

“The whole debt ceiling/deficit reduction debate process is an example of why Mark Twain said: ‘The only two things people should never watch being made are sausage and laws’.”

— Bill Clinton



“It is not the critic who counts: not the man who points out how the strong man stumbles or where the doer of deeds could have done better.

The credit belongs to the man who is actually in the arena, whose face is marred by dust and sweat and blood, who strives valiantly, who errs and comes up short again and again, because there is no effort without error or shortcoming, but who knows the great enthusiasms, the great devotions, who spends himself for a worthy cause; who, at the best, knows, in the end, the triumph of high achievement, and who, at the worst, if he fails, at least he fails while daring greatly, so that his place shall never be with those cold and timid souls who knew neither victory nor defeat.”

— Theodore Roosevelt, 26th U.S. President from 1901-1909

*“Minds are like parachutes,
they work better when they are open.”*

— Dr. Tim Gardner

*“When you are outside the box
you are not trespassing.”*

— Dewitt Jones, National Geographic photographer

NEWSLETTER

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: Peggy Rutkowski, Fumigation Service & Supply, Inc., 16950 Westfield Park Rd., Westfield, IN 46074 USA.



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