

Fumigants & Pheromones

Issue 63

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2002

Routing:

A Newsletter for the Insect Control & Pest Management Industry

Museum Pest Management *Challenging Situational Pest Control*

Museums are treasure chests of our historical and cultural heritage. They hold varied collections, furnishings, ethnographic artifacts and objects from around the world. As humans, we view and appreciate these items for their cultural value. Unfortunately, there is an entirely different world of organisms that appreciate these items solely for their nutritional value. Wood, furs, wool, feathers, silk, paper, parchment, seeds, and plants all make up the menu for a wide variety of "museum pests."

Too often the first encounter with a museum pest is a chance



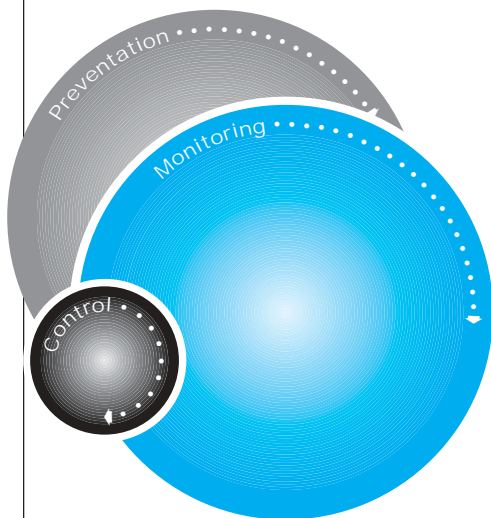
ued part of the IPM process. When the eyes are not in use, monitoring of the site with blunder traps and pheromone traps is of great value. It is a continuous process that allows discovery of problems before they get out of hand. Once you determine the species of concern (see "Bad Bugs"), the situation can be evaluated and a method of remediation can be devised.

At this point, a great deal of communication and co-operation between conservators, the pest control professional, facility managers, and housekeeping needs to be established. Conservators understand the makeup of the artifacts in question and can answer unknowns on how it may respond to exposure to temperature, gases, or other devices and chemicals. The pest control and museum professional should both

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discovery of damage to an artifact. Due to the nature of the rareness or uniqueness of museum pieces prevention of damage should be a strong component of a pest management and prevention program. Protection of museum objects requires an integrated pest management program. Integrated pest management (IPM) is the use of several strategies and techniques to control or prevent pest outbreaks and can involve the use of some pesticides.

Regular detailed inspection of artifacts in storage and on display is an essential and often underval-



Museum pest management, like school pest management requires more prevention and monitoring and less broad spectrum control methods.

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New Laboratory Service

The best way to prolong resistance to phosphine fumigants is to be proactive and monitor for the presence or absence of phosphine resistance. This can be done in a laboratory setting to screen for phosphine resistance. Such a laboratory service is now available from Insects Limited, Inc. of Westfield, IN, 1 (800) 992-1991, email: insectsltd@aol.com, website: www.insectslimited.com.

Many times a fumigation is said to be a failure and the fumigant is blamed. The real reason for the failed fumigation may be caused by low gas concentrations caused by high winds or poor sealing. The wrong dosage rate could have been chosen for those conditions. The target species could have been more tolerant than most species fumigated for in the past. The most frequent cause of fumigation failure is that the time under fumigation was not adequate for

Museum Pest Management

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have a wide scope of experience with pest control devices, chemicals, strategies and technical knowledge on how the pests will react to different options. The facility manager will have the best knowledge of the building structure, design, and capabilities for alteration. Housekeeping is the essential group for a pest free environment. "Sanitation is Pest Control." The situation determines the pest control methods of choice, and with extensive knowledge, experience, and co-operation between these groups the choices available are more numerous.

*by Alain Van Ryckeghem
Technical Director
Insects Limited, Inc.*



Insects Limited staff Alain Van Ryckeghem, Casey Price and Pat Kelley.

the phosphine to effectively penetrate the commodity and kill all stages of this pest population at that temperature...or, maybe, the insects being fumigated were genetically resistant to phosphine and a higher dose for a longer time was needed to affect a kill.

The cost for this laboratory service is prorated upon how many samples and replicates necessitate a good level of confidence. This laboratory service costs about \$200-300.



Pat Kelley has established an Insect Resistance Monitoring Laboratory and protocols to provide valuable information about fumigant resistance.

Laboratory Services:

- Insect bioassays (various species and stages available)
- Insect identification
- Insect fragment identification
- Stored product insect teaching specimens
- Insect packaging testing
- Gas chromatograph phosphine residue analysis
- Electronic phosphine monitoring equipment calibration
- Phosphine resistance testing

Continuing Education:

- International Fumigants & Pheromones Technical Conference
- Skill building hands-on workshops
- Respiratory equipment fit testing and training
- Fumigation certification examination training
- Stored product on site inspection
- Methyl bromide alternative on site review

For a free colored brochure of our laboratory services, call 1-800-992-1991 or explore www.insectslimited.com

Dave's Soapbox

...for what it's worth



"I have this round yellow beetle with spots throughout my home, my car, and my summer cottage, everywhere...do you do homes?"

If you ask my friends what I do for a living the answer is:

"Oh, I'm not really sure, something to do with bugs. I think he is like the 'Orkin Man' or something."

with a degree in Entomology. That's 27 years of trying to help improve the quality of the food supply by creating strategies that control insects without harming the environment...and 27 years of trying to find an identity.

Well, maybe we take ourselves too seriously. Wouldn't it be nice to just say: I'm a baker...or, I'm a teacher...or, I'm a mortician.

No, people want to know more when you tell them you work with insects...much more. Later on I hear the following chatter: "You mean you can make a living doing that?"

D. K. Mueller

What do you do for a living?

All my adult life I have had a problem describing to other people what I do for a living. I am occasionally invited to social events and inevitably the conversation turns



Dave Mueller

to: "Dave, what do you do for a living?" I say to myself, O.K. Dave, now don't panic, this should be easy...O.K., try to make it easy and move on."

If you ask my three kids what their father does, my dear children answer:

"My dad kills bugs and is gone a lot."

Wow, I have been working as a stored product entomologist since I left Purdue University in 1975

Try one of these:

"I work with insects."

"I am a problem solver."

"I own a small business in Westfield that does pest management for stored products."

"I study insects that attack stored products."

"I am a food safety specialist."

"I'm a stored product Entomologist,"

"I'm an applied Entomologist."

"We are a group of about 25 people working to solve insect problems in food and grain."

None of these work...the old screen saver comes over their faces and inevitability this turns into a few minutes of describing the type of customers we work with, the type of insects that bother them at home and this question:

Man and Insects



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I hope that you will take a few minutes and read the following prose of famous entomologist Herbert H. Ross. Dr. Ross was a Professor of Entomology at the University of Illinois. In 1948 he wrote *A Textbook of Entomology*. Here are some excerpts:

"Man has always had his troubles with insects. When he first emerged as man he already had fleas and lice and was fed on by mosquitoes and pestered by flies. In those early days, when human populations were scattered and sparse, man's struggle was on a primitive plane-to find natural food from day to day and to escape the onslaughts of predatory animals. In fact, insects were probably of great help, because termites, grasshoppers, grubs, and the like could be found and eaten when other foods were not obtainable.

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Man and Insects

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From primeval conditions man's progress has been based essentially on changing various factors of his environment and making it better suited for his own survival and reproduction. But every change that benefited man also benefited a host of insects. Gradually, as the more stark enemies of primeval life, such as leopards and tigers, ceased to be a great threat to primitive man, insects became increasingly important as a challenge to his success.

When large cities arose, they were repeatedly swept by outbreaks of lice and flies, in the same way that Imperial Rome was decimated by bubonic plague in the second century A.D.

Insects became a real factor with food as with health. When man began to store food, it was attacked by a host of insects, which before had been of no significance in the human environment. In the tremendous food-storage organization of today, insects destroy thousands of tons of food annually in spite of widespread and expensive control programs.

The Egyptian writers of the time of Rameses II (1400 BC) commiserate with the peasant that "Worms have destroyed half of the wheat, and the hippopotami have eaten the rest; there are swarms of rats in the fields, and the grasshoppers alight there."

Man's efforts to combat destructive insects and control beneficial ones form a field called applied entomology. Entomology, the study of insects, has developed into a very large division of biology owing to the proportions and importance of the applied field.

by Herbert H. Ross



Purdue University sponsors an event called Bug Bowl each spring. This is a time when spring is in the air; trees are budding; people start wearing fewer clothes; people are glad to be outdoors and wear a smile on their faces. It is also a time when insects are waking up from their long winter sleep.

Spring brings Bug Bowl to Purdue. Purdue's Bug Bowl 2002 was attended by over 25,000 people on April 13-14. Programs such as Bug Bowl allow children and parents alike to explore, learn, and have 'just plain fun' while taking part in activities that inform them about insects and the role they play in the environment.

Insects Limited, Inc. was the sponsor of the world famous CRICKET SPITTING CONTEST.

This year the world record was broken: 37' 7" set by Jake Ivankonig, a student from Purdue. In asking Jake what his secret for breaking the record was, he replied: "Just luck I guess." Some say that he had been practicing hard for this year's event. A new competition field called Fabre Field named after the famous French entomologist/writer Henri Fabre was closely manicured and bleachers circled the field. Cricket Spitting Officials carefully enforced the rules for fair competition.



Hundreds of young girls, boys, moms and dads took part in this year's Cricket Spitting Contest.

QUOTABLE QUOTES

"The first sign of spring: mulch at the gas station"

"You can't get religion if you can't read the bible, (Mallis Handbook of Pest Control)"

Kim Kemp, Nestle Purina PetCare

"EPA is big on product stewardship...we are the stewards."

Bob Richardson, General Mills at AOM, May 2000

Did you know:

The cost of raising a medium-sized dog to the age of eleven is \$7,200.

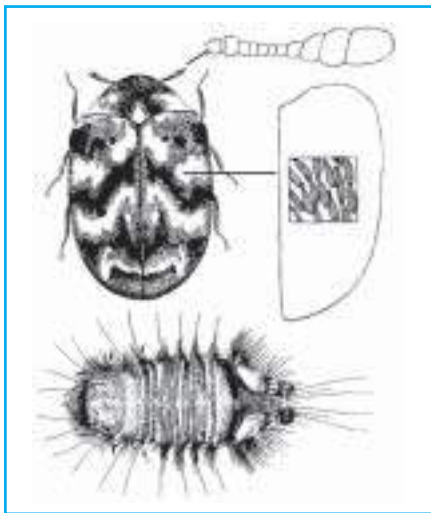
The most expensive part of a pig is its ears—\$20/pound to give to our pets.

Bad Bugs...

Varied Carpet Beetle

Anthrenus verbasci

This small (2-3 mm) cosmopolitan beetle is recognized by the presence of tiny flat, elongated white, yellow and brown scales on the elytra (the hardened 1st pair of wings on a beetle). The antennae have 11 segments of which the last three form an enlarged club. It is the larval stage that causes the damage. They are small, very hairy and have tufts of hairs clustered at the rear end. A pheromone is available for this pest.



The varied carpet beetle (*Anthrenus verbasci*) is a Dermestid beetle that occurs naturally outdoors in wasp and bird nests. It is commonly encountered in Museum environments. It can be found in older homes, where it is often established in the attics, feeding on remains of dead insects. Over time, these beetles work their way down into the living areas and feed on fabrics, carpeting or rugs made of wool or silk. It will also feed on the fur, hair or feathers of taxidermy displays, skins, and clothing or furniture

made with these materials. Adults feed on the pollen of small white or pink to purple flowering plants such as Spirea and Lilacs.

A new pheromone is available from Insects Limited Inc. to monitor this fur and fabric pest. It is a female sex pheromone which attracts the male beetle. The pheromone is not as volatile as the Indianmeal moth pheromone and, thus, will attract beetles from a shorter distance.

In 1998 varied carpet beetles were observed flying indoors on March 15 and were being caught in the No Survivor Trap™ traps with the new Bullet Lure™, until mid April. Outdoors, varied carpet beetles were being caught in the first week of April and continued until late June. Outdoor traps were catching 1-2 beetles per day with higher counts on very warm days and on traps near flowering plants such as Spirea and Lilac. Very few beetles were caught when the temperature was below 70°F. While several species of carpet beetles were on the flowering plants, only male *Anthrenus verbasci* were caught.

A new pheromone and food attractant trap for varied carpet beetle is now available from Insects Limited, Inc. The pheromone for this museum and stored product pest is synthesized in the Westfield laboratory by pheromone chemist Alain VanRyckeghem. The first batches have been successfully tested in museums and pet product warehouses.

Indoor pheromone and food traps caught beetles and larvae. Catches

of more than 10 beetles in a 1-2 week period would indicate a heavily infested item is nearby. Traps in rooms with large windows caught more beetles than traps in a dark room because of the beetles' biological need to fly to light in search of feeding and mating sites.

It is recommended that one indoor trap be placed for every 100-125 ft² and placed on the ground near a window. Pheromone and food traps should be replaced every 4-6 weeks when indoors. Traps can be placed outdoors near flower shrubs and bushes to determine the pest pressure from the outdoors. Dermestids are notorious for moving from a nectar source outdoors to an animal protein food source indoors and back again.



Asian Lady Beetles

Camphor effectively repels the multicolored Asian lady beetle and could be a way to repel the insects as they attempt to overwinter indoors, Agricultural Research Service scientists report in a recent published paper. The results may help researchers balance the need for protecting this beneficial insect against the public's concern for the nuisance the beetles create when they congregate in people's homes and businesses. The research was published in the November 2000 issue of the Annals of the Entomological Society of America. The multicolored Asian lady beetle, originally from China, was introduced to the United States in 1916. The beetle has been an effective biological control agent for aphids and scale insects.

Methyl Bromide Alternatives



by John Mueller

Systems Fumigation

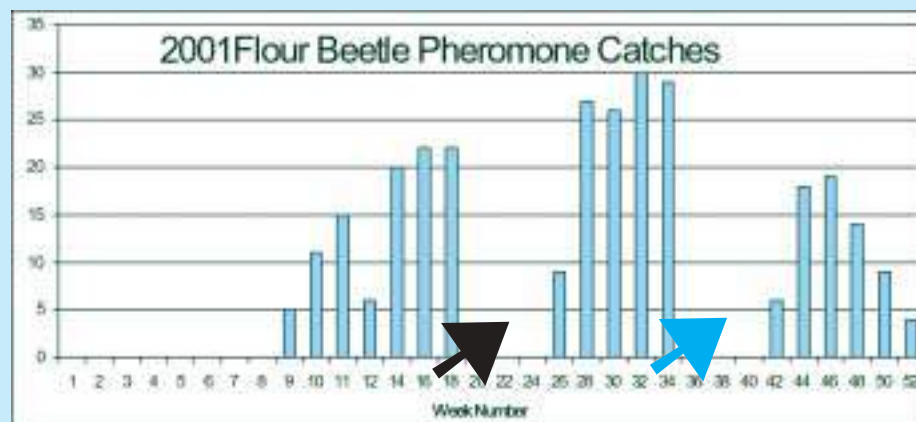
Fumigation companies are under increased pressure to help customers find creative ways to limit or eliminate the need for methyl bromide fumigations. One success we have had in 2001 was using an old method with a new product.

The milling industry has performed spot fumigations for decades. Ethylene dibromide (Dawson 37/73) formulations were used prior to 1984 extensively throughout the milling industry. This eliminated the need for methyl bromide or phosphine. Using Degesch Magnesium Phosphide Spot Fumigant™, mills would place varying amounts of fumigant in milling equipment such as: sifters, roll stands, and spouting. This process has worked well but is labor intensive, involves prolonged applicator exposure to rapidly releasing fumigant, and produces potentially dangerous solid waste fumigant disposal problems.

Last year we found a way to utilize ECO₂FUME phosphine fumigant™ or cylinderized phosphine to perform successful spot fumigations. Cylinderized phosphine allowed us to lesson or eliminate some of the negative sides of magnesium phosphide spot fumigant and make for a more practical fumigation application. The challenge was to develop a device to distribute the cylinderized phosphine gas. This

patent-pending technology provides for small amounts of phosphine to hundreds of remote pieces of equipment. The amounts of gas delivered can easily be regulated.

should be removed, treated under tarp or in a sealable trailer. Overhead beams should be cleaned. The cleaner the facility prior to treatment the better the



Methyl Bromide Alternative: Trap results after System Fumigation on week 18 and a methyl bromide fumigation on week 35.

This graph shows how a systems fumigation, a methyl bromide fumigation and a fogging influenced the pest population for a large food processor with heavy insect pressure. The system fumigation was performed after the 18th week. The methyl bromide fumigation was on the 35th week and another fogging was performed after week 46.

In this example, the ozone depleting methyl bromide fumigation used 5,900 pounds of chemical verses the system fumigation's 450 pounds of total pesticide [fumigant, fogging material, and residual].

This revived equipment fumigation method involves a total process for success.

First: Inspection—Understanding the dynamics of the sites pest population is critical. A pre-fumigation inspection of the facility, a review of pest control records, a review of sifter tailing counts for the past months, and an interview of facility sanitation personnel is performed a week before the actual treatment.

Second: Cleaning—The facility must schedule a thorough cleaning immediately prior to the treatment. All dense materials [floor sweepings, waste totes, shop vacuums, bagged ingredient]

results of the treatment.

Third: Residual Insecticide Application—Your inspection should identify “hot spots” and map on a floor by floor schematic for residual pesticide application to non-food contact surfaces. Treat cracks and crevices, footings, voids and any other problem areas. Popular and effective residual insecticides used includes Tempo, Gentrol and Conquer.

Fourth: Equipment Fumigation—Apply phosphine to all equipment, transfer systems, dust collectors, feed systems, regrind—everything—comprehensively. Some sealing will be needed on

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ECO₂FUME Training

June 27, 2000

ECO₂FUME is a new formulation of phosphine fumigant. This cylinderized fumigant requires special knowledge in handling to be safe and effective. This carbon dioxide and phosphine mixture is under pressures of over 900 PSI. Fittings and hoses are much different than those used by for methyl bromide or Vikane. Each cylinder weighs over 200 lbs. and has special handling and shipping needs.



ECO₂FUME has shown to be an improvement over solid formulations of phosphine and methyl bromide fumigants. Disposal issues, exact dosing, dosing a structure to manage corrosion, re-dosing a grain bin to maintain effective concentration for an effective duration, shorter fumigations, fumigating from outside and other worker safety issues are definite advantages for today's fumigators.

This one day hands on training program will spend the first half of the day in the class room and the afternoon working with live gas in various field situations. John Mueller and David Mueller will conduct the training program. The training will be held in Westfield.

You must be a current certified fumigator to enroll in this training program. Attendance will be limited. Register early. Registration is \$250. per person. Call 1-317-96-9300 to register with Barbara Bass.

Methyl Bromide Alternatives

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dust systems, exhaust vents, sifter inlets and outlets and others you identify through your evaluation process.

Fifth: **Fogging**—Choosing the proper fogger is critical. We have found that the Micro-Gen E-44 which delivers the optimum sized particle for effective hang time and distribution of the insecticide. These units can be set up with timers to minimize applicator exposure. We commonly use Conquer mixed w/formulating oil and the insect growth regulator Gentrol or 3% Pyrethrin with Gentrol. Some companies are even reverting back to Vapona to help substitute for methyl bromide applications. Vapona requires a 24-hour shutdown whereas pyrethrin requires only 4 hours.

Sixth: All silos and bins containing powdered ingredient, flour or other bulk commodities should be run low or preferably empty when treated with phosphine. Bin wall should be thoroughly cleaned.

In summary, this is integrated method provides very good control while lowering methyl bromide usage. The cost for this treatment is much less than a methyl bromide fumigation. We do not profess that this process is as effective as methyl bromide fumigation but when performed properly you will learn a great deal about your pest dynamics. With the proper level of effort and commitment you can solve tough pest problems and reduce your dependency on methyl bromide.

THE BOOKSTORE

Pest Management in Museums, Archives and Historical Houses



by **David Pinniger**
Third Edition, Archetype Publications, pp:113, 2001
cost: \$46.00

This book is a practical working handbook for the conservator and all persons concerned with the care and management of collections. An essential guide to the recognition of insect, rodent, and bird pests with advice on the practical steps required to prevent and control damage to collections, it incorporates the many recent developments in Integrated Pest Management (IPM) in the heritage sector.

“A major influence for change has been the concern regarding the use of pesticides and their effects on objects, staff and environment. It is recognized that IPM applied to museums, archives, and historical houses is not only safer but also more cost-effective.”

Dave Pinniger is the main lecturer and workshop leader at the 2-day pest management conference for museums, historical houses and archives in Indianapolis on May 13-14 sponsored by Insects Limited.

To purchase this and many other books, visit The Bookstore at: www.insectslimited.com

MEETING CALENDAR:

- *** May 13-14, 2002 2-day Museum Pest Management for Museums, Historical Houses, and Archives, Indianapolis, Indiana Historical Society, www.insectslimited.com, Barb Bass. 1-800-992-1991.
- June 22, 2002 Setting Up a Low-Cost Anoxic Pest Eradication System, Minneapolis Institute of Arts, Minneapolis, Minnesota, USA, Melinda Marcel, 612-870-3128
- *** June 27, 2002 ECO₂FUME Training program Westfield, IN. Contact Barb Bass 1-317-896-9300, Insectsltd@aol.com
- * July 7-10, 2002 The 4th International Conference on Urban Pests, Charleston, SC, Contact: Richard Cooper, rcooper@cooperpest.com or fax: 609-799-3859
- * July 22-26, 2002 8th International Working Conference on Stored Product Protection, University of York, Contact: Nick Price www.csl.gov.uk or fax 44 1904 462252
- ** Oct. 16-19, 2002 National Pest Management Asso., Orlando, FL, Gaylord Palms Resort & Convention Center, contact: www.pestworld.com
- * Mark your calendar:
*** June 3-4, 2003 6th Fumigants & Pheromones International Technical Conference and Workshop, Sharing Through Education, Copenhagen, Denmark, Contact: David Mueller, www.insectslimited.com, tel. 1-317 896-9300, fax 1-317-867 5757 or Henrik Lange, lange@tanaco.dk



Indiana Historical Society



The Børsen (Royal Stock Exchange Building and Conference Center)

* we hope to see you there ** we are an invited speaker *** organized by Insects Limited, Inc.

Combination Fumigation Update

FSS continues to replace methyl bromide with the patented Low Concentration Fumigation Method (no. 5,403,587). The most recent flour mill to use this method was Mennel Milling Company, in Dowagiac, MI. This was FSS's 64th Combination Fumigation. The results from the gas readings and bioassays showed excellent results. This mill had been fumigated 2-3 times a year with methyl bromide prior. If you are interested in replacing your methyl bromide fumigation, call John Mueller for more information.

Denmark has approved the experimental use of the Combination Fumigation. Henrik Lange, President of Tanaco A/S will use ECO₂FUME phosphine fumigant for the first time in Denmark to perform this heat, CO₂ and phosphine fumigation. Henrik trained with FSS last summer on this methyl bromide alternative. FSS has licensed the technology to Henrik to start doing fumigations in Scandinavia. Denmark phased out of methyl bromide in 1998 and is actively looking for a replacement for this ozone depleting substance.

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: David K. Mueller, Fumigation Service & Supply, Inc., 16950 Westfield Park Rd., Westfield, IN 46074 USA.



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