

Fumigants & Pheromones

Issue 94
Winter 2010

Routing:



A Newsletter for the Insect Control & Pest Management Industry



The theme for this conference is: *"Reducing Customer Complaints in Stored Products."* This starts with the pest and moves through a detailed process until the customer is satisfied. Along the way many things can go wrong and often do. Protecting the integrity of a product and the reputation of the producer is vital. The challenge of performing this job with available products and methods will be discussed in two days of lectures from 25 experts.

The hands-on workshop will take place in the Port of Valencia. José Roca and his company, Roca Defisan, will demonstrate various stored product control programs in this busy Mediterranean port. One of the highlights of this meeting will be the exchange of ideas with others who do similar work. This exchange can be invaluable.

Plan today to attend the 9th Fumigants & Pheromones Conference & Workshop in Valencia, Spain. For more information and to register on-line go to www.insectslimited.com.

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9th Fumigants & Pheromones CONFERENCE & WORKSHOP

March 3-5, 2010

Valencia, Spain

"Sharing through education is one way our industry improves. Valencia 2010 is an opportunity to learn from expert industry speakers and from hundreds of professionals from around the world who share their experiences during this conference and workshop."

VISIT US AT: www.insectslimited.com

Bad Bugs...



By Alain VanRyckeghem, BCE
Technical Director

Saw-toothed Grain Beetle

Oryzaephilus surinamensis

This beetle causes many customer complaints in stored grains, dried fruit, cereal products, birdseed, and a wide variety of other foods. This little beetle is a fast moving insect. It can climb on any surface and hide in the tiniest cracks. It frequently follows floor crevices in its dispersal from an infestation source. It is unable to penetrate food packaging by chewing, but its small flattened size makes it an excellent invader of packages with gaps, and defects. This is a difficult insect to eradicate.

Life Cycle

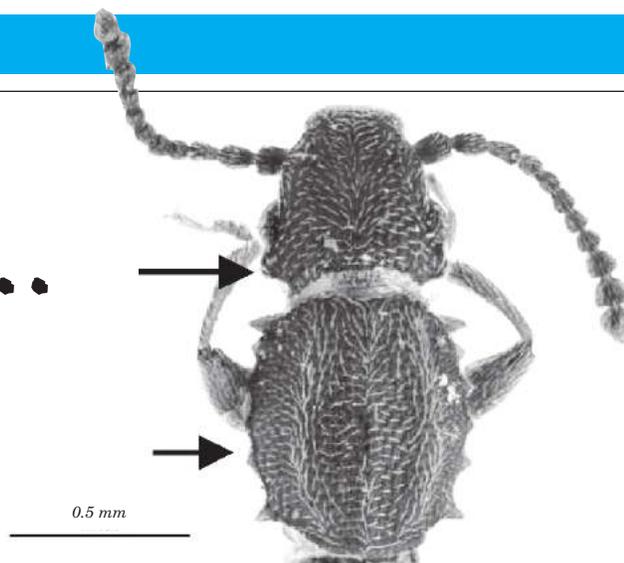
Beetles lay 6-10 eggs per day, singly or in small clusters in crevices of grains and finely ground material. Eggs hatch in 3 days at 90°F (32°C) or 16 days at 64°F (15°C). There are usually three larval stages that develop to pupation in as few as 12 days and up to 32 days at the lower temperatures. Pupation can take as few as 4 days and

as long as 16 days depending on temperature. Relative humidity extends the development time of this insect only slightly. Low relative humidity does not prevent development of this insect. Adults typically live for about 10 weeks, but can extend to 29 weeks under cooler temperatures. This insect could extend its lifespan over the winter season and be an active pest in early spring. This Saw-toothed grain beetle can survive large extremes in temperature and humidity compared to the Merchant grain beetle.

Biology & Behavior

The Saw-toothed grain beetle is a common pest of processed foods in warehouse storage, retail stores, and pantries of homes. It prefers to feed on foods made from rice, corn, wheat, and other cereal grains. They do not usually attack nuts, seeds, beans, pet foods with high oil content or whole unbroken grains, but may feed on residues.

The female deposits most of its eggs in the first 2-3 weeks and will decline rapidly by the 10th week. The adult beetle is small and flat, about 1/10 of an inch (2.5mm) and has characteristic teeth on the sides of the thorax. It can be distinguished from the Merchant grain beetle (*O. mercator*) by its slightly smaller eyes and larger “temple” region behind the eye.



Control

The adults and larvae are tolerant to cold 33°F (0°C) for a few weeks, but will die within 24 hours at 0°F (-18°C). The upper range for survival in heat is about 102°F. Exposing beetles to 12 hours at 114°F (46°C) will kill all stages.

Most of the residual insecticides approved for use in food storage areas are very effective for control. Careful application in cracks and crevices and some spot application would yield the best results.

Monitoring

There are no commercially available pheromones for this insect, but it is attracted to unique food odors from grains and plants. The PC Floor Trap and lure was designed to specifically trap the grain beetles and allow them to remain alive, thus providing a natural pheromone source for more beetles to become entrapped. Floor level traps should be placed on cracks and crevices and along walls or posts near food storage. Check them weekly and clean out the traps by shaking them out over a container of soapy water. Do not clean out the trap with soap and water as this removes the natural pheromone and Teflon coating that prevents escape. Food lures should be replaced monthly. Email insecthelp@insectslimited.com.

Dave's Soapbox

...for what it's worth



Accurate measurement is important in our jobs and home life. Many times the success or failure of a fumigation, fogging, pesticide spray application depends on measuring the volume of a structure accurately.

When I was an elementary student in 1963, the year President Kennedy was shot, I remember coming home and telling my parents about what I learned at school. When we learned the metric system I was told that this would replace the traditional way we measured distances and volumes. I was told that the present system of measurement was based on the size of some ancient King of England's foot and an inch was one 12th of this King's foot size. It did not seem too scientific or logical but it was the system that the 'Colonies' adopted from the 'Mother' country who were we to question it two hundred years after we declared independence from England? I was told that it would take a few years to get everyone converted to this new system that most of the world uses.

Measurement has become confusing over the years. A few examples: There are three types of miles (geographical mile, telegraph mile, and a U.S. Survey mile) three different bushels (Imperial, U.S dry heaped, U.S dry level), six different drop measurements, five different teaspoon measurements (Canadian, Imperial, metric, US

customary, U.S. food nutrition labeling).

America has adapted to modern math, put a man on the moon, wears seat belts, gets messages on a Blackberry or iPhone instantaneously, but cannot convert temperature from Fahrenheit to Celsius, distance from feet to meters, pounds to kilos, or ounces to milliliters. Surely this is understandable; it has only been 47 years since I heard that announcement in school.

Most of the world, including our friends to the north in Canada, have adapted to the metric system that is based on basic measurements of 1-10-1000. Americans are often bashed when they attend international meetings and present their 'scientific results' in the standard King's measurements. Shouts from the audience ask if those results are in "Stones" (~14 lb) or "Bushels." What is a bushel? Is that the heaped or level bushel? (58 lbs or 4.14 stones or 6.35029318 kg) America prides itself on being an independent and somewhat isolated nation. We love our own systems and way of life. Many Americans have never traveled more than a few hundred miles from where they were born. However, we need to reach out occasionally and try to convert to universal systems and proven ways that unite us, like the metric system and maybe saving the planet from human gluttony.

When we visit a foreign country we need some basic skills to keep from getting a speeding ticket, purchase food, or know what to wear outdoors the next day.

Let's start with temperature. We simply need to understand five numbers: (see chart).

Simple Temperature Conversion

| Celsius | Fahrenheit |
|---------|------------|
| 0°C | 32°F |
| 10°C | 50°F |
| 20°C | 68°F |
| 30°C | 86°F |
| 40°C | 104°F |

Examples: If the temperature is between these numbers, you simply guess. 25° Celsius would be half the way between 68° and 86° or about 77° Fahrenheit. The range that humans normally live in is between freezing and tropical hot or 0–40°. So these five numbers will get you close enough to start converting Fahrenheit to Celsius. Just remember 32°F is zero, 50°F is 10°C, 68°F is 20°C, 86°F is 30°C, 104°F is 40°C.

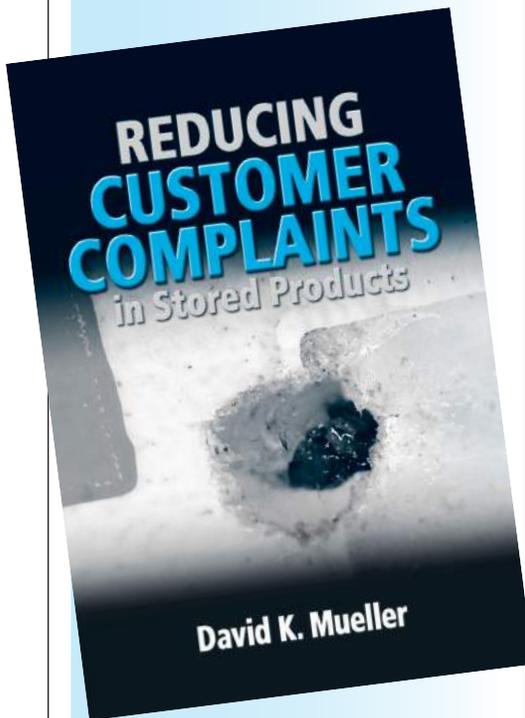
Now let's practice. The next time you are driving down the road and see the local bank thermometer flashing the temperature in Fahrenheit, remember those five numbers and estimate the temperature in Celsius.

Finally, we are never too old to learn, even the metric system. My Mother told me as a kid growing up in Evansville, Indiana: "Where there is a will, there is a way." Many times our ability to learn is not based on some level of intelligence but on our willingness to prioritize a goal or task.

Mom was right, let's challenge ourselves in 2010 to get smarter.

A. K. Mueller

New Book



Reducing Customer Complaints in Stored Products

By David Mueller

Chapters include:

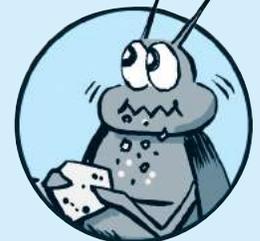
- *Reducing Customer Complaints*
- *Insect Pests in Stored Products*
- *Next Generation Pest Management* by Kim Kemp
- *Mice and Birds*
- *Case Studies, Practical Tips, and Solutions*
- *Organic Pest Management*
- *Pheromones* by Alain VanRyckeghem and Patrick Kelley
- *Control*
- *The Montreal Protocol*
- *Mating Disruption*
- *Mites*
- *Flashpoints*
- *Quotable Quotes*

REDUCING CUSTOMER COMPLAINTS in Stored

Products is different than other resources about protecting food products from pests. Case studies, practical tips, and solutions to reducing customer complaints are outlined throughout this well illustrated book by stored product entomologist David Mueller with chapters from Kim Kemp, Alain VanRyckeghem, Pat Kelley, and illustrated by Tom McCain.

This new book discusses practical stored product pest management from the time of harvest until when homeowners consume these food products. The process of managing pests begins with managing their environment. Take away food, harborage, and ideal temperature conditions, and insect pests will quickly reduce their ability to thrive, survive, reproduce, and more importantly their ability to cause customer complaints. We simply must become better observers and ask different questions in a professional planned order.

- What is the target pest?
- Where did the product come from?
- When did the customer complaint occur?
- What was the 'Best By' date?
- Do you use pheromone traps correctly?
- How often do you check your traps?
- Is your pest management provider certified?
- Can I see your Pest Sighting Log?
- Did the insect enter the package from the outside-in or the inside-out?
- How do we prevent it from happening again?



A trend is developing worldwide that will set standards to trace food products from the place it was grown and travels along every step in the supply chain throughout the world. Traceability is the process to follow the movement of a food product through all stages of the supply chain including storage, processing, transportation, retail, and especially the consumer. This book is written for anyone working in these areas of the supply chain.

To the right, a female saw-toothed grain beetle laid her eggs through the hole in this food package. The small size hole (0.1 mm) restricted the beetle from entering the pack-



Photo: Sharon Mallory, Esquire

age but she carefully placed her eggs inside the food product to protect them from predators and to offer the emerging larvae an immediate food supply to help them survive. Survival is some-



Consumers often file complaints to retail store managers and manufacturers after they find messy webbing and fecal pellets that Indianmeal moth larvae leave on food products. This is the number one customer complaint on stored products. How do you prevent this customer complaint from happening?

thing that insects know how to do well. It is this survival ability that makes the job of pest prevention such a challenge.

Customer complaints often originate from the eggs that are laid on the finished product waiting to be shipped to the next location in the food chain. If the pest manager will follow the egg, he will understand why an infestation appears in that particular area. He will see that many customer complaints occur because the female lays eggs near a food source. This egg then emerges as an aggressive larva that searches for a place to feed. The food product that allows this small larva entrance will likely become a customer complaint.

Law suits between two companies over a customer complaint may come down to understanding the complete biology and habits of insect species and the probability of one side having those conditions that caused the complaint where money and reputation is lost.

Federal governments use insects and rodents as indicators for other serious food contamination issues. The crisis that food borne illnesses can cause is frightening. Added pressure from the government regulatory agencies like FDA, Homeland Security, and EPA, will add layers of extra work, worry, and expense each time another tragedy occurs. The food auditors step up their vigilance and the food plant gets penalized for things that were not mentioned in the past. Deaths and injuries, caused by poorly prepared and stored food must be eliminated to restore the confidence of the modern consumer.

Pest management is more like a mental path, a process, improvement of continuous quality, and less about scheduled chemical treatments. It requires diligence, knowledge, continuous training, ownership, and especially time.

Reducing Customer Complaints in Stored Products

offers the global experience of a stored product entomologist who has been helping solve pest related problems in the food and grain industries since 1975. David Mueller is a board certified entomologist who works daily with pest issues and their solutions. His companies Insects Limited, Inc. and Fumigation Service & Supply, Inc. have approached their business model from two completely different directions. The former will offer pest management programs that offer a menu of solutions from a non-toxic or less toxic strategy. Fumigation Service & Supply, Inc. has a "Big Hammer" approach to solving pest problems when companies are looking for reactive control treatments in outbreak situations. No matter which approach is required, the outcome is the same: Reducing Customer Complaints.

Order your copy of REDUCING CUSTOMER COMPLAINTS in Stored Products

by David Mueller

This colorful hardback book is fully illustrated with case studies, practical tips, and practical solutions to help you understand and solve pest issues in stored products.



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Correction: Issue 93,
Page 6: 1 ppt = 1 gram of
residue in 1,000,000,000
grams of food; 1 inch in 16 mil-
lion miles, 1 second in 32,000
years; 1 sq. ft of floor tile on a
floor the size of Indiana.

An Overview of the Meeting of the Parties to the
**Montreal Protocol and its Impact
 on Methyl Bromide Usage**

By Jeffrey A. Moorhead

In early November of 2009 I attended the 21st Meeting of the Parties to the Montreal Protocol Conference (MOP21) in Port Ghalib, Egypt. This meeting was designed to evaluate the global efforts to reduce the levels of ozone depleting gases in the atmosphere and to discuss ways to continue their decline.

The first day of the conference was dedicated to an overview of methyl bromide (MB). Since the early 1990s when the restrictions on MB usage first began, global usage of MB is down 70% from its original base line and there has been an 8% reduction in MB in the atmosphere. Today there are about 9 ppt (9 parts per trillion) of MB in the atmosphere. This is a significant reduction.

The global usage of MB for quarantine and pre-shipment has gone up about 30% due to the increase in global shipping. The top five areas for MB critical use exemptions (CUE) are logs 21%, soil 14%, wood products 13%, rice 12% and structures at 8%.

Some of the alternative fumigants that were discussed were Carbon dioxide (CO₂), Sulfuryl Fluoride (SF₆), and Phosphine (PH₃) these fumigants were recommended for structures and commodities like logs, grains, fruits and nuts. Methyl Iodine was suggested as an alternative for soil. Heat treatments, kiln drying, plastics and cardboard were suggested for



Overall the parties seemed to be pleased with the MB reductions that have taken place and the focus moved to what other alternatives were available to replace MB for quarantine and pre-shipment and critical usage exemptions.

wood products and for ISPM15 (pallets and wood used in global shipping). Some of the parties suggested that there were other non-fumigant options such as heat treatments, cold treatments, warm water baths and radiation that could be used on commodities.

While some parties indicated that they intend to try and eliminate their usage of MB altogether in 2010, a member of the United States delegation made the point that when it comes to quarantine, the standard is that the commodities are completely free of insects and that it is imperative that more studies be done on these alternatives before they could be used as a replacement for MB in quarantine fumigations. He also

stated that the United States has implemented many of these alternative methods of treatment to replace MB in the area of critical usage fumigations and that the United States has reduced its critical usages exemptions of MB by 75%. The parties agreed that further studies may be needed to see what alternative fumigants could meet the standards required to replace MB for quarantine and pre-shipment and that further MB reductions were still needed in the area of critical usage.

The question was raised about the high global warming potential (GWP) of some of the alternative fumigants and the use of Hydrofluorocarbons (HFCs) with their high GWP as a recommended replacement for Chlorofluorocarbons (CFC's) (an ozone depleting gas that was used in the refrigeration industry). The concern was acknowledged and a committee was set up to look into whether or not the parties should be addressing GWP at all as a part of The Montreal Protocol.

In conclusion, I would expect that for now the current exemptions will remain in place for quarantine and pre-shipment while studies are done on possible alternatives. I do think that we will see further restriction put on the use of MB in the area of critical usage exemptions and I would not be surprised to see the exemption for MB usage for pallets and wood used in global shipping (ISPM15) removed completely in the near future.

Preserving Our History

The Exclusion Conclusion

By Patrick Kelley, ACE

In a pest management program exclusion of pests from the outside can be one of the most important factors for maintaining a pest free environment. External pest pressure is a major threat for both urban and rural museums. The pest entry of a single rodent can cause significant damage in a short period of time and diminish the previous hard work that went into the program. This leads one to the conclusion that an exclusion program is an essential component in IPM.

A thorough inspection of the exterior of a facility and some simple supplies can provide a permanent solution to most areas of pest entry. Listed below are some of the more common conditions that allow rodent and insect entry and some recommendations for repair. Please note that most of these treatments will also benefit your energy conservation by better preventing heat loss in the winter and the loss of cool temperatures in the summer.

Gaps beneath doors: This is the single most common condition that allows the easy entry of insects, rodents and even birds into structures. Warmth and food odors can migrate outdoors through these gaps and draw in pests of all types. Remember that rats only need a 1/2 inch (12.7 mm) gap for entry, mice need 1/4 inch (6.35 mm) gap and many museum insect pests can enter through a 0.08 inch (2 mm) gap or even less. A quality door sweep will remove any gap beneath the door. The best type of door sweeps are strips made from

ex-clude: to prevent or restrict the entrance of.



Illustration by J. Crocker, taken from *Rodent Control: A Practical Guide for Pest Management Professionals*, with permission from GIE Media

A 1/4 inch (6.35 mm) gap is enough space for an adult mouse to enter a structure.

nylon brush material. They have outstanding abrasion resistance and they remain flexible at a wide range of temperatures. Once the bracket that holds the brush strip is mounted, the brushes themselves can be changed quite easily. Contact Insects Limited for more information on brush strips.

Gaps around the frame of a window: Window frames on the exterior of a building can often have gaps that allow pest entry on either side, above or below the frame. A professional foam material (E.G. Pur-Black Foam applied through a Pageris Foam Gun) should be applied in any gap.

Gaps around a pipe chase: The point of entry where a plumbing, HVAC or electrical pipe passes through an outside wall and into a structure is called a pipe chase. Often, after the hole is drilled through the wall and the pipe is installed, the gap between the pipe and the wall is not sealed or it is incorrectly sealed. Also, sealing material can shrink with age and an area that was once sealed can become a pest highway. Professional foam sealants will deter insect pests. Also, if rodents are an issue, copper gauze can be stuffed around the pipe and foam sealant applied to secure it in place.

Windows and doors left open by staff: When staff members

become hot or cold, they will often open doors and windows to adjust their temperature. A better temperature-controlled work environment and a written policy preventing doors and windows from being left open will help alleviate this problem.

Broken or insufficient screen material: A metal screen that becomes missing or torn should be quickly replaced or repaired. Also, screening with a mesh size that is too large will allow pest entry. The size screening recommended for insect pests is Tyler Mesh size—16 mesh or higher. Screens with a larger gap than this should be replaced.

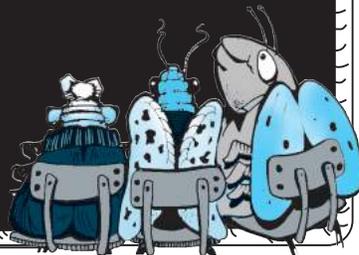
Cracks in concrete foundation: Broken or cracked concrete at the base of an exterior wall will often allow pests easy access into a wall void or directly into the structure itself. Cleaning and removing the crumbled concrete material and replacing it with sound concrete will solve most issues

Gaps around the roof-line and beneath shingles: Often, older historic homes with slate roofs have small gaps at the roof line where wasps, Asian ladybird beetles, boxelder bugs, and cluster flies can enter.

Contact p.kelley@insectslimited.com for more information.

MEETING CALENDAR:

- * February 20-23, 2010
Grain Elevator and Processing Society
GEAPS Exchange
Wichita, KS
- *** June 27-July 2, 2010
10th International Working Conference on Stored Product Protection (IWCSPP)
Lisbon, Portugal
- *** March 3-5, 2010
9th Fumigants & Pheromones Conference and Workshop
Valencia, Spain
- *** July, 2010
Fumigation Workshop
Bloomington, IL
- ** April 7, 2010
GEAPS Conference
Angola, IN
- See You There!**
*we will attend, ** we will speak,
*** we will organize this meeting
- * April 19-23, 2010
International Association of Operative Millers
IAOM 114th Annual Conference & Expo
Las Vegas, NV

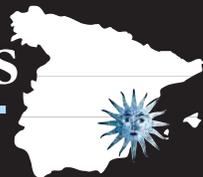


Quotable Quotes

“The Next Generation rodent management program is a system that allows a professionally trained technician to leave the wall, and its designated number of mechanical devices and engage in pro-active, customer specific inspections. It is inspection focused, correctional analysis, and solutions centric.”

— Kim Kemp
Senior Food Safety Director
Nestlé Purina

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 Schmitz, Fumigation Service & Supply, Inc., 16950 Westfield Park Rd., Westfield, IN 46074 USA.



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