

Fumigants & Pheromones

Issue 74
Winter 2005

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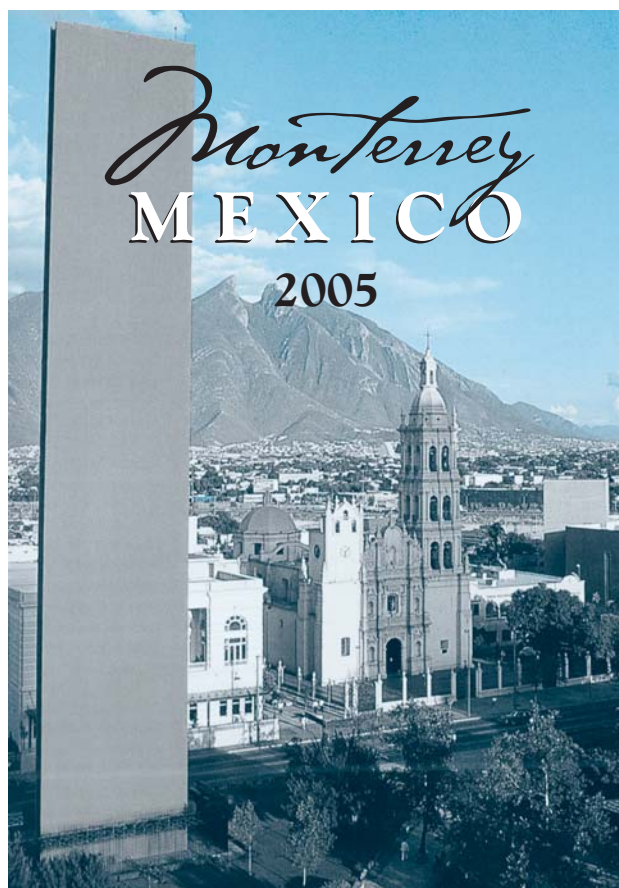
A Newsletter for the Insect Control & Pest Management Industry



1st Latin America
Fumigants & Pheromones
CONFERENCE & WORKSHOP

March 8-10, 2005 Monterrey, México.

Real solutions for real pests



grain, food processing facilities, tobacco, timber, new requirements for quarantine and pre-shipment, ships and the most current alternatives to the ozone depleting substance, methyl bromide. The theme for this meeting is **Real Solutions for Real Pests**.

The conference will be held at the Radisson Plaza Gran Hotel Ancira & Conference Hall in downtown Monterrey. The workshop will feature a demonstration on various techniques of grain fumigation, inspection, new gas monitoring equipment, pest control products, insect resistance screening, and

napolis, Thessaloniki, and most recently Copenhagen in 2003. Monterrey 2005 will be the first Fumigants & Pheromones Conference held in Latin America. Over 1200 people have attended these popular educational conferences from 37 countries in the past. This is a great place to meet people with common interests.

Speakers include: David Mueller, César Altmirano, Dr. Nahum Marban-Mendoza, Dominique Kayser, Benjamin Gómez, John Mueller, Pat Kelley, Alain Van Ryckeghem, Brian McSwigan, Frank Meek, Dr. Ted Granovsky, Jeffery Welker, Dean Stanbridge, Dr. Jürgen Böye, Ricardo Ituarte, Pedro Horn, Dr. Franciskus Horn, Fausto Martínez, Henrik Lange, Robert Baker, Jay Coleman, Roberto Tapia, Robert Ryan, Enrique Villa, and Juergen Wenzel.

For more information and details about this stored product protection conference and workshop go to www.insectslimited.com, or contact Barb Bass at e-mail: b.bass@insectslimited.com, fax: (1) 317-867-5757, tel: (1) 317-896-9300 or in Latin America contact César Altmirano at pheromones@usa.net, tel: +52 (81) 8365 7381 fax: +52 (81) 83657322

A pest management conference will be held March 8-10, 2005 in Monterrey, Mexico. The 7th International Fumigants & Pheromones Conference and Workshop will feature simultaneous translation in Spanish and English of speakers from throughout the world to discuss new techniques in protecting stored

methyl bromide alternatives. This international conference is organized by Insects Limited, Inc. of Indianapolis and Pheromones Services & Supplies of Monterrey.

This international educational series of conferences started in 1993 in Lübeck and continued to Bologna, Chicago, York, India-

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VISIT US AT: www.insectslimited.com

Winter Workshops



Groups gather in Kansas City, Chicago, Indianapolis, Memphis, and Columbus, OH for continuing education workshops.

The FSS Traveling show hit the road in Kansas City on January 18 with four stops in Chicago, Indianapolis, Memphis, and Columbus, OH this winter to provide continued education on

“Never has there been a time when change was more obvious in our field than now.”

the latest information for fumigators and stored product pest managers. Invited speakers included: Dr. Dirk Maier, Purdue University, Kim Kemp, Nestlé Purina, John Mueller, FSS, David



Mueller, Insects Limited, Brad Sabin, FSS, Jeff Waggoner, FSS, Roger Cavisin, Cytec Canada, Brian McSwigan, Cytec Industries, Marty Morgan, Dow AgroSciences, and Larry Dean, Nestlé Purina.

Register today to attend the Winter Workshops in Memphis on February 9 and Columbus, Ohio

“I just wanted to thank you again for a very productive and enlightening day yesterday. You all do such a fantastic job training the industry. Your programs are informative, diverse, and extremely interesting. I was impressed with the interest and attention that the group was displaying for each and every speaker. This is a real testament to the quality of program that you put together for this group. As usual, the hospitality was great which is a real credit to the entire office staff. Thanks again for a great day and a job well done.”

Jeffery Welker, Dow AgroSciences LLP, Indianapolis.

Quotable Quotes

“Too many people spend money they haven’t earned, to buy things they don’t want, to impress people they don’t like.”

Will Rodgers

“The best thing about the future is that it comes only one day at a time.”

Abraham Lincoln

“Nothing would be done at all if a man waited until he could do it so well that no one could find fault with it.”

Cardinal Newman

“The nation’s success as a competitor once depended on transportation and infrastructure. Now, commerce rolls on the information highway.”

Al Gore, Jr.

“Pest management is applied ecology.”

Dr. David Hagstrum

“You can’t solve a problem until you can measure it.”

*U.S. Senator
Patrick Moynihan*

on February 16. Go to www.insectslimited.com to get details or register. Call Kalah Stocker at 1-800-992-1991 for more information.

Dave's Soapbox

...for what it's worth

2004 was a good year for many reasons, but 2005 should be even a better year.



truly say from a biased viewpoint that John, age 38, is the best fumigator that I know, period, and I have visited fumigators in over 40 countries over the past 30 years. Go on a fumigation with this guy sometime and you will not only learn many new things from him but you will likely not sleep for 36 hours either. He performed or supervised over 100 structural

family business has its ups and downs, but when it works, it is a wonderful thing to experience. The loyalty and close friendships created in a family business can be the foundation for generations to come. However, I must say the bickering that can go on between siblings can drive others in the company crazy sometimes.

Passing of the Torch

I'm not talking about bottom lines in our businesses and expansion into new territories and numbers of new products introduced. I'm talking about something more exciting than all of that. I'm talking about the transfer of leadership from one brother to another in our family business.

fumigations a year; including sealing, shooting, opening, and aerating. His safety record is nearly perfect. His humanity to his fellow workers is the best. His ability to find time for his son Will and wife Karmen is a priority that he balances with his work responsibilities.



John Mueller is now the president of Fumigation Service & Supply, Inc.

What took you so long Dave? For the past sixteen years John has shown continued growth and leadership in handling all portions of the business. He has

grown this company 300% since taking over as vice president in charge of operations in 1998. He has expanded and managed new offices in Chicago, Nashville, and helped create the new consortium of companies called Food Protection Alliance which has grown and expanded into a powerful group of like minded regional fumigation companies.

When I started these companies in 1981, I knew I couldn't do it alone. Today we have several members of the Mueller family besides John working here. My wife Mary Beth handles the weekly payroll and various tax reporting besides listening to the "aches and pains" of her husband, nephew Nathan Stocker is following in John's footsteps with the same moxie that his grandfathers passed on to him, Kalah Stocker has tackled the pheromone production and organization of the Winter Workshops while finishing her college courses. There are three Mueller kids; Pete, Tom and Frances that have been helping ol' Dad since they were six years old. Now that they are 21, 19, and 16, they help out around the office during the summers and on weekend fumigations to receive Christmas and extra spending money.

I remember when Albert Mueller, our father, decided to leave his part time job after early retirement and help his 26 year old son out in his new venture. We would sit around the kitchen table at home in Evansville, Indiana and talk for hours about people we each recently visited or prospective business contacts to make. Finally, my mother Etta would speak up: "OK, OK, it's time to stop talking about business and time to set the table for supper." Our family reunions are more like a board of directors meeting than a social gathering. I expect most family businesses have the same problem.

It is time to pass the torch to John Mueller and try to sit back and watch. I have plenty to do with Insects Limited, Inc., the United Nations work in developing countries to phase out Methyl Bromide, public speaking, local civic responsibilities, the organization of educational meetings, and spending some more time with my family.

Anytime you have created a business from the beginning, it is hard to let go. This may be my next lesson to learn. Good luck John! You deserve the promotion and I am proud of you and looking forward to seeing what the future holds for Fumigation Service & Supply, Inc.

If you know John Mueller you will likely agree that he is one of the hardest working people you know (like his father, Albert). He simply does what it takes to get the expected results on time. I can

In no way should the value of the non-family members in our company's be underplayed. There is a chemistry between everyone that feels like a big extended family. However, working in a

J. K. Mueller



The Meeting of the Parties

Ozone, a molecule made up of three oxygen atoms, shields life on Earth from the harmful effects of the ultraviolet radiation of the sun. The increased amounts of ultraviolet radiation that would reach the Earth's surface because of ozone depletion could increase the incidence of skin cancer and cataracts in humans, harm crops, and interfere with marine life.

PRAGUE — The outcome on methyl bromide critical use exemptions is mixed and complex, but the essence is this: The international technical panel opined that exemptions for 2006 should be only about 3/4ths the size of exemptions for 2005. The US fought back to keep the same level of exemptions as they received in 2005 (37% of 1991 baseline). The Parties approved the amount recommended for 2006 by the technical panel (27% of our 1991 baseline, compared with 37% for next year) and left open an opportunity for the disputed amount. There will be another Extraordinary Meeting of the Parties, this time in July, after another round of technical review. Everyone, including producers of alternatives, will have another opportunity to contribute information and comment.

David Doniger of the National Resources Defense Council in Washington, DC stated: A US effort to change the rules for current stockpiles was rebuffed, keeping the rule that countries have to use up stockpiles to meet critical use needs before manufacturing new methyl bromide. The US offered something new at this Meeting of the Parties in Prague

in late November. They suggested if a country destroys excessive halons, an ozone depleting substance, that the country should be eligible for credits to use more methyl bromide. This will be discussed in Montreal in July.

Individuals that took the time to fill out critical use exemptions in 2003 for 2005 totaled 700 metric tones (MT) of requests. The Methyl Bromide Technical Options Committee (MBTOC) reviewed these requests and granted 482 MT of methyl bromide for the US milling and food processing industry for 2005. MBTOC has reduced this amount for the year 2006 by 20%. This amount is 386 MT. It is only available to those companies that have made applications in 2003 for 2005. One flour mill that doesn't use all methyl bromide exemptions cannot transfer its CUE to another. A sector like strawberries or tomatoes can't transfer its unused methyl bromide exemptions to the flour milling sector.

The EPA is discussing the fees for critical use nomination permits and enforcement policies including fines.

Enforcement of Methyl Bromide in 2005

The rule on methyl bromide critical use exemptions will be enforced the same way other aspects of the ozone protection program are enforced under the Clean Air Act. Fumigators selling critical use methyl bromide should familiarize themselves with the requirements in the regulation text published in the final rule CFR 40 Part 82.

Each user of CUE's must **certify in writing** that they are in compliance with this rule and all

invoices will be kept for a three year period.

Who will enforce these rules?

EPA's lead person on this subject is Hodayah Finman. She stated: "The regulation hasn't been devolved to the States so I would be surprised if state inspectors got involved but we aren't precluding them from doing so. As for the frequency of federal enforcement inspections, I really couldn't tell you."

A copy of the final rule is available on the web at www.epa.gov/ozone/mbr. Contact person at EPA for MB Critical Use Exemptions: Ms. Hodayah Finman 202-343-9246 (tel) 202-343-2338 (fax).

Conclusion

The remaining international policy for methyl bromide's phase out is complex because this is new ground. There has not been anything like the Montreal Protocol before. It is a blueprint for the world's first international environmental treaty. The world is a big place with people that have "can do" and "can't" do attitudes about change. In the end, the Montreal Protocol will help phase out ozone depleting substance throughout the world. The world will benefit from this treaty and offer future generations a better planet on which to live. The phase out of methyl bromide was characterized by David Doniger as a step by step procedure: 1. First you deny there is a problem. 2. Then you question the science 3. Next you look for alternatives 4. You then replace methyl bromide with alternatives 5. Finally, you deny that you were ever a part of the problem.

I guess the real question is, **"Where are you in the methyl bromide phase out process?"**

Human Interactions with Insects



by Adam Keyes, Junior Entomologist
Age 10 (almost 11), Zionsville, Indiana

Insect, what does the word mean to you? The way people see insects is different than how people see other animals. For some of us it means a small gross creature that eats your food, stings you, or buzzes annoyingly around you or to other people it means those giant monsters you see in horror movies. But for me and other entomologists it means an incredible, complex creature that opens up the passageways of life.

It is common for people to say, "Bigger isn't always better." People frequently act differently because they naturally feel dominant over insects. People show respect for dogs, cats, and other animals, yet they show no respect for insects. A person will feel sympathy for a raccoon hit by a car but feel no sympathy when an insect is squashed; they merely proceed to scraping the dead creature off their shoe.

People tend to like insects they consider to be more human-like better than others. For example, a person will impulsively swat a fly, and even though they easily could, few would ever think of snapping a praying mantis in half or swatting a butterfly out of the air.

It is interesting to me that people feel dominant over insects. Really, insects have been the most successful creatures on the planet. They make up over half the population of animals. But still, people have prejudice feeling toward insects, and our behavior shows just how prejudice we really are.

Ethyl Formate



Robert Ryan,
BOC Australia

A fumigant that can disinfect equipment in 2-4 hours would make a good alternative to methyl bromide in structures.

The development of alternative fumigants

has a high level of importance because of threats to the widely used fumigants, methyl bromide and phosphine. Specifically, methyl bromide is an ozone depletor (quotas enforced by the Montreal Protocol) and there is increasing phosphine resistance in insects. Alternative fumigants should be efficacious against a wide range of insect pests, safe to consumers and workers, but not damage the product.

Ethyl formate is a fumigant that satisfies these requirements. Its advantages include natural occurrence in food, rapid kill of insects (2-4 hours), fast breakdown of residues to natural products, low human toxicity. However, EF exhibits poor penetration characteristics.

It would make a very good spot fumigant for milling equipment

What is Ethyl Formate?

EF: HCOOC_2H_5

Molecular weight: 74.08

Boiling Point: 54.1° C

Solubility in Water: 14.5% (w/w)

Flammability in air: 2.8-16.5% (v/v) or 90-540g/m³

similar to ethylene dibromide (EDB).

Ethyl formate is currently registered as a fumigant for dried fruit treatment in Australia. High doses of EF (>120 g/t of grain) are, however, required to control internal developmental stages of rice weevil (*Sitophilus oryzae*), which are higher than the flammable limit of 85 g/t. Therefore, it is necessary to enhance EF toxicity by mixing it with other natural products like carbon dioxide or vacuum to reduce the effective dosage and flammability.

The non-flammable VAPORMATE™ [16.7wt% ethyl formate in liquid carbon dioxide] overcome the flammability, improves efficacy and penetration of ethyl formate. The VAPORMATE is now a registered pesticide in Australia & New Zealand—typical VAPORMATE dosage:

Situation	Insects	Application rate/g/m ³	Critical Comments
Cereal grains and oilseeds in sealed storage	Adult stages of: Rice weevil [<i>Sitophilus oryzae</i>]; Lesser grain borer [<i>Rhyzopertha dominica</i>]; Flour beetle [<i>Tribolium castaneum</i>]; Book lice [<i>Psocids—various species</i>]	420 g/m ³ (24 hours exposure)	Only apply VAPORMATE with BOC LIMITED approved equipment. Only apply VAPORMATE into a gas-tight closed system for the exposure time period.
Grain storage premises and equipment	Adult stages of: Rice weevil [<i>Sitophilus oryzae</i>]; Lesser grain borer [<i>Rhyzopertha dominica</i>]; Flour beetle [<i>Tribolium castaneum</i>]; Book lice [<i>Psocids—various species</i>]	420 g/m ³ (6 hours exposure)	VAPORMATE is dispensed via fixed high pressure pipe installation into sealed gas-tight chamber to allow the volatile ethyl formate active ingredient to penetrate deep into the commodity being treated for the recommended exposure period. The storage volume (m ³) needs to be calculated so correct VAPORMATE dose can be accurately dispensed.
Horticulture produce (post harvest only)—fruit, vegetables, flowers in sealed storage.	Pacific spider mite (<i>Tetranychus pacificus</i>), western flower thrips (<i>Frankliniella occidentalis</i>), omnivorous leafroller (<i>Platynota stultana</i>), aphids (eg: <i>Macrosiphum euphorbiae</i>), mealybugs (<i>Pseudococcus longispinus</i>),	420 g/m ³ (4 hours exposure)	The treatment area should be completely shut for the recommended exposure period (a minimum of four hours) to allow the VAPORMATE to act. The storage should be thoroughly ventilated of ethyl formate vapour (less than 100ppm) and CO ₂ (less than 5000 ppm) before out loading or re-entry.

Advances in Attracting Female Moths



Patrick Kelley
Insects Limited, Inc.

Recent improvements in attractants that work on female stored product moths add a new tool and excitement to the world of insect trapping and monitoring. New attractants that work in conjunction with the biology and habits of female stored product moths, namely Indian meal moth (*Plodia interpunctella*), are a major breakthrough in attracting these economically damaging pests.

Development of Attractant: Staff members Tom Phillips, Christian Nansen, Charles Konemann and Jack Dillworth of Oklahoma State University/ Entomology Department in the United States discovered and developed a natural product blend that lures pregnant female stored product moths into traps. The adult moth's main function is not to eat, but to mate and lay eggs. Adult moths basically exist to have sex and reproduce.

"Pheromones used to lure and kill male moths have been around for decades, but it only takes a single male moth to impregnate up to six females, and a pregnant female can lay 200–400 eggs during her short life," Phillips said. "Once the eggs hatch, it's the worm-like larvae that do most of the actual damage to food or grain."

Moth traps designed to capture only male moths may capture up to 200 moths, but can easily leave behind enough males to mate all of the female moths. But catch one female that might lay 400 eggs and 400 feeding larvae have been effectively removed from the population.

"Insects communicate mainly through odors. We call the field 'chemical ecology.' In our research, we get the insects to tell us what scents attract them and then use those scents as a means of pest suppression or control," Phillips said. "As scientists, we're concerned with conducting research that hopefully will make



Dr. Tom Phillips, Dr. Jack Dillworth, and Charles Konmann of Oklahoma State University.

a difference in people's lives."

Early Test Results: In two different lab studies at Insects Limited in 2003 and 2004 the female attractant produced notable results. The results are as follows:

Study No. 1 (2003): Approximately 70 *Plodia* pupae were sexed and identified as female and placed into a 12m x 10m x 2.6m test arena. 55 of the pupae emerged as adult females, the remaining pupae did not emerge



and died in their pupal cases. The study area was composed of tables with 20 sticky traps (8mm x 16mm) containing the female attractant. 44% of the emerged females were captured on the traps containing the female attractant lures in 7 days.

Study No. 2 (2004): Study Number 2 was done in the same

environment as Study Number 1. Approximately 400 adult *Plodia* of mixed sex were released into the arena. In this study, alternating sticky traps of control (no attractant) and traps containing the female attractant were placed on the tables. There were 10 total control traps and 10 traps containing the female attractant. After 90 hours the control traps had captured 10 female moths and 2 male moths. The traps containing the female attractant had captured

127 female moths and 5 male moths.

Oklahoma State University found that the female lures remained effective for up to 4 weeks. The results in actual field studies were not nearly as dramatic. The lab studies had no other viable food source for the females to lay their eggs. The field studies were often in environments with lots of filth. Often, the females chose the alternative oviposition sites when they were given the opportunity.

Evaluating Food Safety Programs



Jeff Waggoner
Food Safety Specialist



It is that time of year again. No, not time to pay off the credit cards, they can wait. It's time to evaluate last year's pest management and food safety program and make plans to improve it for 2005.

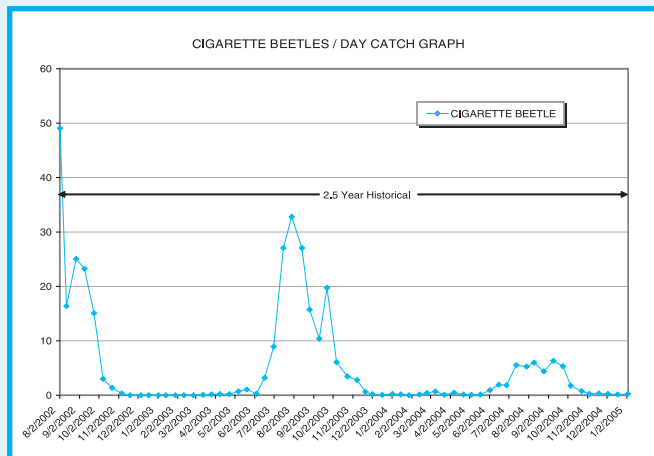
How do you go about measuring performance in a Food Safety Program? Let's look at several years of data and analyze performance. Here are some case studies to introduce and describe exactly how you can evaluate performance and then put a dollar amount on that type of service.

Case Study 1-Pet Food Processor: This one was really tough. We had conditions not conducive for sanitation and conditions were ideal for rapid insect reproduction and the building was massive. The species of insects targeted were Warehouse beetle and Red flour beetle.

The first step was identifying the trouble spots (patches) and concentrating control efforts in those areas immediately. Second was to control the spillage and increase sanitation efforts. Third was looking at long-term control by making structural or system modifications and atmospheric control

methods to reduce rate of reproduction and eliminate harborage areas. This chart shows insect counts from pheromone traps utilized from inception of the Food Safety Program up to one year later.

Case Study 2-Food Processor (Bakery): The second study is dealing with a very determined and tough little insect known as the Cigarette beetle, Chart 1, and also public enemy number one, the Indian meal moth, Chart 2. This data shows progression from inception through several years of active sanitation and structural improvements, increased pheromone trapping / monitoring, use of

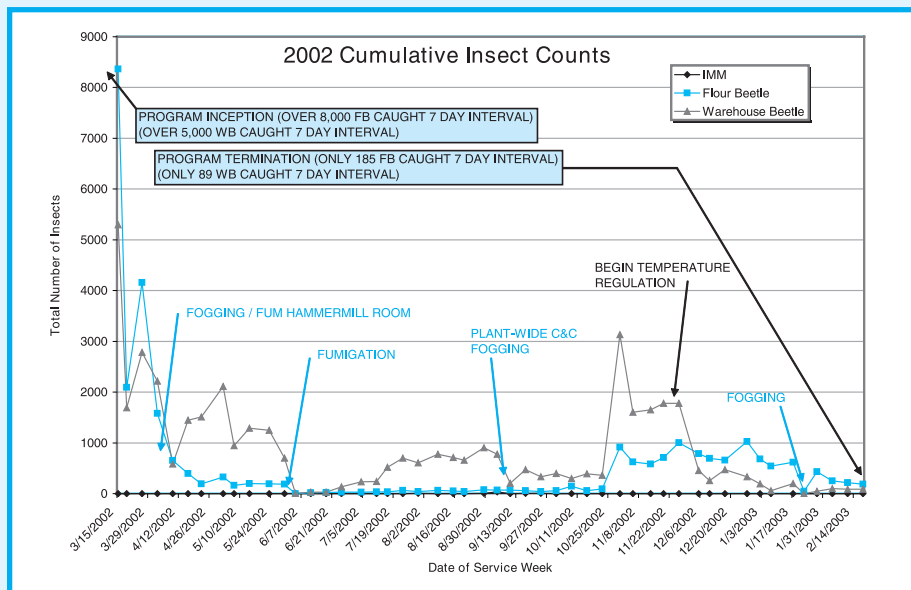
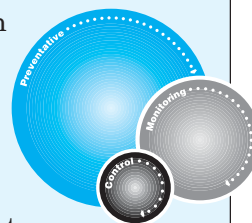


"You can't solve a problem if you can't measure it."

Moth Suppression, growth regulators, fogging schedule modifications, chemical rotation and targeted residual applications. No general fumigations were performed on this structure.

We worked closely with the sanitation coordinator in establishing pest management expectations. Each week we produce a chart that shows the status of the pest in relation to the year(s) prior. This is a powerful tool when making decisions to allot time and resources for a fogging during scheduling meetings.

Conclusion: Each year food safety goals should be established, measured, and evaluated. A pest management program should not only control pests but offer a way to get better by looking at past performances and fine tuning the program along the way. Most of the time, effort, and resources in a food safety program should be with **prevention** and monitoring. If raw inbound ingredients are closely monitored for insect activity, new infestations will be minimized. The future of food safety is with a balanced approach to pest management that includes prevention, monitoring, and control...in that order.



This is a good visual representation of progress & performance in a detailed program.



...hope to see ya there!

ON-SITE TRAINING

If you would like to have a speaker or complete training session tailored to your needs, call Insects Limited at 1-800-992-1991

February 9, 2005

Fumigation Seminar***

Memphis, TN, USA, Contact: Kalah Stocker: k.stocker@insectslimited.com, Phone: (800) 992-1991 www.insectslimited.com

February 16, 2005

Fumigation Seminar***

Columbus, OH, USA, Embassy Suite in Dublin, 5100 Upper Metro Place, Dublin, OH 43017, tel: (614) 790-9000 Contact: Kalah Stocker, k.stocker@insectslimited.com Ph: (800) 992-1991 www.insectslimited.com

March 8-10, 2005

7th International Fumigants & Pheromones Conference***

Monterrey, Mexico
Poster Displays and Corporate Sponsorships are available. Contact Insects Limited for details p.kelley@insectslimited.com www.insectslimited.com

March 17-19, 2005

Kentucky Feed & Grain Assoc., Annual Meeting**

Louisville, KY, Galt House, Buena Bonds, KGFA@gte.net

May 1-5, 2005

AAM Annual Meeting & MuseumExpo™**

"A Defining Moment, Museums at the Crossroad," Indianapolis, IN
Contact American Association of Museums for information www.aam-us.org email: AAM's Registration Department, Ph: (202) 289-1818

July 22, 2005

Grain Fumigation Re-Certification Training***

Western Kentucky, Contact: Kalah Stocker: k.stocker@insectslimited.com Ph: (800) 992-1991

*attending,

**speaking,

***organizing



1st Latin America
Fumigants & Pheromones
CONFERENCE & WORKSHOP



Real solutions for real pests

March 8-10, 2005** Monterrey, Mexico

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



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