

# Fumigants & Pheromones

Issue 34

Spring  
1994

A Newsletter for the Insect Control & Pest Management Industry

## Pheromone Trapping Tip

Pheromone traps don't always capture the target insect in the trap. Actually, it has been shown that in Indianmeal moth and Cigarette beetles a ratio of 1:8 is estimated. That is one insect captured for every eight that approached the traps. Often the insect will perch itself on the wall or vertical surface near the trap. They may perch for long periods of time without going any closer to the trap.

Larry Pierce of Food Protection Service in Hawaii talked in Lübeck, Germany, about a method that he has tested the last two years called: PEM--Pheromone Enhanced Mortality.

Larry places his pheromone traps near a vertical surface (ie. vertical girder, wall, etc.). Directly behind the traps, he sprays a small patch of Tempo (cyfluthrin). This two-part approach is effective to capture the insects that are willing to fly into the sticky glue and for those coy males that want to perch on the nearby wall.

Dr. Pasquale Trematerra, Professor at The Università degli Studi del Molise, Compobasso, Italy, also showed at our Lübeck Seminar that a small patch of synthetic pyrethrin; i.e., cypermethrin could be sprayed on a piece of cardboard

### Fumigants & Pheromones Technical Conference and Workshops

December 6-8, 1994

Indianapolis, University Place  
Hotel and Conference Center

More information on page 2

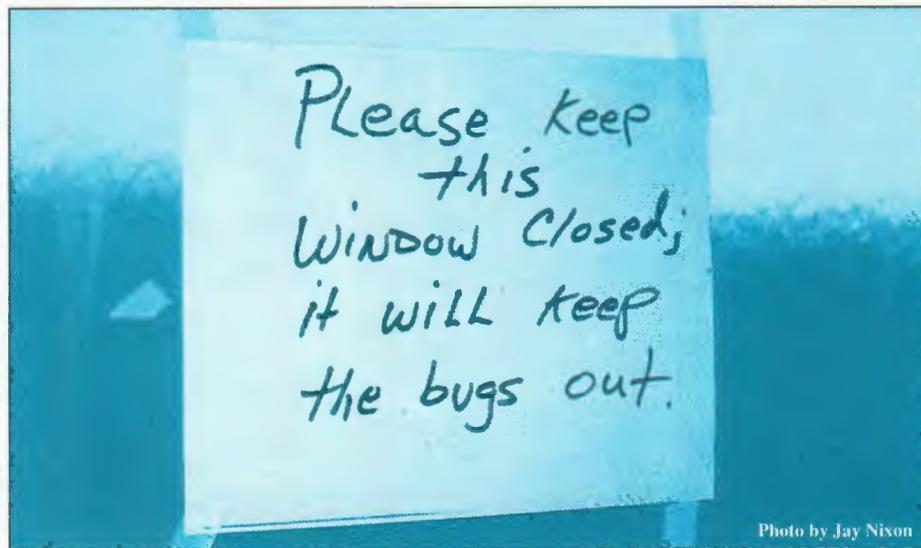


Photo by Jay Nixon

*"Sometimes IPM is as simple as closing the doors and windows."*



and a pheromone lure could be placed in the center of the cardboard. These treated pieces of cardboard baited with pheromone were placed in flour mills in Italy. This method has been so effective in Italian flour mills that the population of Mediterranean flour moths (*Anagasta kuehniella*) dropped dramatically.

The way to test if this method is working is to place a sheet of white paper or kraft

paper under the trap to capture the insects that fall to the floor.

One question that is not yet answered is how much repellency does the synthetic pyrethroid have on the insects. This can

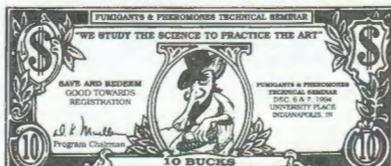
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- Methyl Bromide Phase Out
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- Resistance Management
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## Seminar Bucks

You will find a certificate for \$10. toward registration at this year's Fumigants & Pheromones Technical Conference and Workshops with each invoice over \$100 that goes to Fumigation Service & Supply, Inc. and Insects Limited, Inc. customers.



This certificate can be redeemed when the registration is filled out for the conference. Program chairman David Mueller stated: "We have had some companies send two representatives to our previous conferences from saving their Seminar Bucks. It is common to get at least half off the registration fee with these certificates."

Mark your calendar for December 6-8, 1994, in Indianapolis and start saving your Seminar Bucks today to attend Pest Management University.

### Fumigants & Pheromones Technical Conference and Workshops

December 6-8, 1994  
Indianapolis, University Place Hotel  
and Conference Center

This year's conference will center around the theme of Pest Management curriculum. *The University of Pest Management* will offer some of the best speakers from around the world on the most current and cutting-edge topics for our industry. In addition to the two days of normal classroom lectures, the third day will be different. There will be a hands-on workshop on fumigation in the field. Actual fumigations using the new combination fumigation technique along with trailer, rail car and tarp fumigations will occur on December 8. A second workshop called Museum Pest Management will be held to discuss this delicate topic. There are invited speakers that work with the top museums in the world coming to Indianapolis to discuss the practice of pest management. This workshop will take place in the famous Indianapolis Children's Museum.

BIZARRO

By Dan Piraro



## Global Pest Resistance Management

M.E. Whalon, Pesticide Research Center,  
Michigan State University

Resistance to insecticides, herbicides, and fungicides is a serious global problem. Over 500 insect, 80 weed, and 150 pathogen pest species are reported to have developed resistance to chemical pesticides.

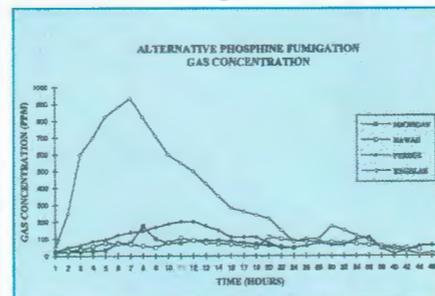
(Georghiou & Lagunes-Tajeda 1991, LeBaron 1991). Resistance often occurs because of the overuse and misuse chemical pesticides. Recent estimates have put the direct economic costs of resistance between \$400 million and \$1.4 billion annually in the U.S. alone (Harper & Zilberman 1990, Pimentel et. al. 1993). The overall negative environmental, economic and societal impact may affect the long-term sustainability of global agroecosystems. Resistance has even resulted in the abandonment of production (1/2 million acres) of cotton in the lower Rio Grande region, (Adkinsson 1972). The need for pest resistance management is therefore urgent.

*Editor's note: Dr. Larry Zettler's talk at our conference in Lübeck, German drew so many questions and comments from the international audience that the Q/A period had to be extended and we added a special one-hour session after the first day's talks. Most of the audience stayed. Insect resistance is a huge concern.*

## Methyl Bromide Alternative Update

In issue 33 of this newsletter, the research paper for this technique of fumigation was presented. Since this winter publication, much interest has been shown for this novel idea of stressing the insects with moderate levels of heat (92 - 100 degrees F) in combination with low levels of carbon dioxide (4 - 6%) to dilate the insects' spiracles and interfere with the energy producing cycle in the insect called the Krebs Cycle. This stress on the insect allows for the low levels of phosphine to effect a quick mortality for all stages of the insect life. This combination technique of fumigation shows promise as a partial replacement for methyl bromide in flour mills and food processing plants.

Further work on corrosion management is taking place. Ways to reduce the free water in the fumigated structure are being investigated to lower the possibility of corrosion from the phosphine. A grant for \$19,000. has been awarded to two scientists from Purdue University for laboratory work to vary the percent of carbon dioxide, phosphine and heat. This should lead to a better understanding of how this combination technique works.



In the meantime, another successful fumigation was conducted on the Hawaiian Flour Mill in Honolulu with the combination fumigation. A large six million cubic foot food plant has contracted for this fumigation technique in early summer. Several flour mills have asked for bids to do future fumigations. The licensing of this patented method is being assigned throughout the world. Fumigation companies in Asia, Europe, United States and Canada are beginning to be assigned licenses for the combination fumigation method.

## Dave's Soapbox



Oh, I sure caught some flak over the last soapbox (I'm scared and it's not Halloween, Issue 33). Oh, well.

Some have accused me of bashing methyl bromide, being an opportunist, and trying to confuse the issue with suggestions of possible alternatives to methyl bromide. I plead guilty to one of the three charges. I also plead guilty to being pro-active in finding viable solutions to replacing this doomed ozone depleting product. Maybe it's time to stop questioning the science and denying that there is a problem and move on and be pro-

active in looking for possible alternatives to methyl bromide. It sounds like a challenge and an opportunity to me.

People are asking when methyl bromide will be gone from our tool box of pest control products. Good question.

Here's how I see it going down. Imagine if you will that someone walks into a McDonalds restaurant somewhere in Southern California (where else?) and asks the smiling manager if they use tomatoes that have been fumigated with methyl bromide on their hamburgers.

Since thirty percent of the methyl bromide used in the United States is used on tomato beds the answer will probably be yes. This manager of the McDonalds doesn't know for sure but he smiles and says politely, "I don't think so but I can ask my regional manager." Not wanting to work the counter anymore, the manager goes back to his office and calls his regional manager and asks: "Do we use tomatoes that have been treated with methyl bromide?" The regional manager asks: "Who wants to know?" The manager explains that a customer asked the question today at lunch while he was

'working' the counter. The regional manager replies: "I'm sure we don't use tomatoes that have been treated with the ozone depleting substance called methyl bromide, but I will get back to you."

Now the call goes from the regional manager in Southern California to the 'Top Hamburger' at ground zero in Chicago at McDonalds home headquarters.

Surprising enough, this manager had been called by several other regional and international managers during that week and asked the same question.

(Hint: The Friends of the Earth, a.k.a Green Peace had started the questions not only in the United States but throughout the whole world.)

He checks with his suppliers in Florida, Mexico, and California and asks the question: "Do we buy millions of pounds of tomatoes from your company that have been treated with the ozone depleting substance called Methyl Bromide?"

Now remember how MickyD's changed its appearance virtually overnight when they were 'unfriendly' to the environment because of their practices of using Styro-foam and non-recycled paper. This chameleon became green overnight. Brown packages, no Styrofoam, little kiddie drawings of the earth everywhere. McDonalds isn't stupid.

Consider that 30% of the methyl bromide in the United States is used to fumigate the soil that tomatoes are grown in and 12% of the methyl bromide is used for strawberry soil bed fumigations. That's 42% of the 66 million pounds used for two items. Now the United States uses about 35% of all the methyl bromide



used in the world. Tomatoes and strawberries (those big but tasteless strawberries, I'd rather eat the little juicy ones myself) in the United States represent about 25 million pounds or about 18% of the methyl bromide used in the whole world.

### Back to the story...

The 'Top Hamburger' at McDonalds makes a decision to stop using tomatoes that have been treated with methyl bromide fumigated soil. Can you imagine how many tomatoes a McDonalds or a Burger King uses worldwide in one day? They buy about 10% of all the fish consumed in this country. Something like 1 out of 10 people in the United States eats at McDonalds each day. The European McDonalds and Burger Kings are jam packed with people every time you enter one.

### The message:

It won't be the EPA or Brussels, the 120 signatory countries of The Montreal Protocol, or any other regulatory group that will eliminate methyl bromide or any other suspected environmental contaminant from the marketplace. It will be the consumer.

So how long will methyl bromide be on the market?

### My answer:

Not as long as we think it will.

*J. K. Mueller*

## Alternative Choices

By, James H. Shaffer, Jr.  
Micro Gen Equipment Corp.



Finally spring has arrived and the telephone has started to ring with the question: "What do we replace DDVP with?"

It is time to talk about the alternatives to dichlorvos (DDVP) since the 409 tolerances were revoked on November 3, 1993. This of course doesn't mean that DDVP can't be used; however, it does mean that it can't be used on food products.

There are alternatives! Even though none of the materials available today are as volatile, quick acting or effective.

"...times they are a changing." A quality pest management program should be your first consideration. Eighty-five percent of your program should be sanita-



tion, rotation, source reduction, non-chemical (Vector fly system (s), pheromone traps, screens, air curtains, etc.), whereas chemicals should only be used when your monitoring systems and/or inspections justify it. When you choose your chemicals, consider the following:

**Pyrethrum**

Pyrethrum is extracted from the flowers of a chrysanthemum grown in Kenya, Africa, and Ecuador, South America. It has an LD<sub>50</sub> of approximately 1500 mg/kg and is one of the oldest insecticides available. Because general safety to humans and domestic animals and its effectiveness against practically every known crawling and flying insect pest, pyrethrum has more uses approved by the EPA than any other insecticide, numbering in the thousands. Supplies of pyrethrum are plentiful and come in a variety of concentrates. Micro-Gen's BP-50 (.5%) and BP-100 (1%) are recommended for flying insects and BP-300 (3%) is recommended for the crawlers.

**Synthetic Pyrethroids**

Pyrethroids (R-50, R-300, R-400+1), are classified in four categories or generations. Resmethrin (1967), a second generation pyrethroid is more stable than pyrethrum and less expensive. Resmethrin decomposes fairly rapidly on exposure to air and sunlight. As always, check your labels for requirements.

**Hantavirus**

Since the Hantavirus outbreak, spread by rodents, which occurred in the Four Corners region (the area where New Mexico, Arizona, Utah, and Colorado come together) last summer, many PCO's have expressed concern about their possible risk of exposure to this disease. Indeed, their concern is understandable, with recent cases being reported in the press from not just the western U.S., but Florida, Rhode Island, Indiana and Missouri as well. The rodent responsible for

the Four Corners version of the disease is the Deer mouse (*Peromyscus maniculatus*). This rodent is slightly larger than a House mouse, ranges in color from pale gray to reddish brown and has white fur on its underside. They are typically found in rural or semi-rural areas and are frequent invaders of cabins, particularly if often unoccupied. The Hantavirus itself has been around for probably more than a century, with various strains found all over the world, all carried by rodents, including the commensal species. One strain, found in Korea, was responsible for the deaths of nearly 400 American soldiers during the Korean War. Various strains have been isolated in most areas of the U.S., in different rodent species, with each strain having differing levels of toxic effects on man and somewhat different symptoms.

The Four Corners disease begins with respiratory flu-like symptoms, followed by nausea, and then rapid onset of respiratory distress from the lungs filling with plasma. More than half the cases are fatal. The incubation period in humans can be 5-42 days, but is usually 12-16 days.

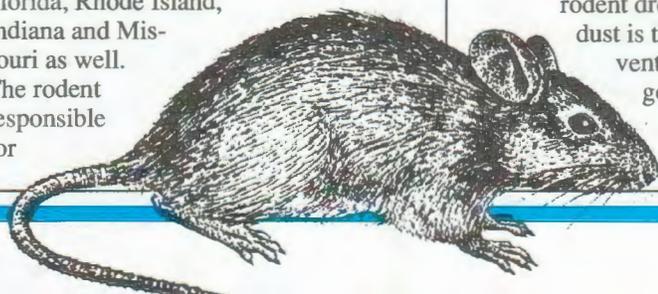
The primary route of exposure is the inhalation of aerosolized rodent feces, urine, or saliva. The disease Hantavirus has no apparent ill-effects on its rodent hosts and has not been shown to be transmitted from human to human. PCOs who are treating rodent infestations or contacting their droppings are advised to wear a respirator with a DEPA (high efficiency) filter and gloves during control and clean-up operations. A disinfectant made by putting 3 tablespoons of bleach in a gallon of water can be used to spray feces before cleaning up as well as disinfecting dead rodents, traps or infested areas. Most standard type household disinfectants are also effective. Gloves should be rinsed with disinfectant before discarding. In control efforts, glue traps, rather than mechanical traps will minimize contact. Traps and captured rodents should be dipped in disinfectant before reusing or discarding.

Minimizing contact of humans with rodent droppings and associated dust is the key. The best prevention is, of course, a good rodent control program which focuses on rodent exclusion,

augmented with an effective trapping and baiting program.

Other information on this important subject can be obtained by contacting: "Hantavirus Infection-Southwestern United States: Interim Recommendations for Risk Reduction", CDC MMWR July 30, 1993, Vol. 42, No.RR-11, From: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-9325, tel. 202-783-3238. The CDC has a Hantavirus Hotline at 800-532-9929.

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**PHEROMONE TRAPS/LURES**



Indianmeal moths  
Warehouse beetles  
Flour beetles  
Cigarette beetles

Lesser grain borer  
Angoumous grain moth  
Yellowjacket traps  
Pheromone Monitoring Software Version 3.0



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**Methyl Bromide Phase-Out**

In December 1991, the National Resources Defense Council, Friends of the Earth, and the Environmental Defense Fund petitioned EPA to add methyl bromide to the Clean Air Act's Class I list of ozone-depleting substances. Under the CAA's 1990 amendments, any compound with an ozone depletion potential

(OPD) of 0.2 or greater must be listed as a Class I substance and be phased out within seven years of listing. After determining that methyl bromide's ODP is 0.7, EPA in a November 30 ruling exercised its authority under the CAA to list methyl bromide as a Class I substance. This listing means that in 1994 the levels of methyl bromide production and importation will be frozen at 1991 levels, with a complete phase-out of production and importation by the year 2001.

Eighty percent of methyl bromide produced is used for soil fumigation, The balance is used for commodity and quarantine treatment (15 percent) and structural fumigation (5 percent). \*

Source: *Pest Management, Vol. 13, No.2*

### If You Think The EPA Is Bad...

Lord's Prayer .....	56 words
10 Commandments .....	296 words
U.S. Declaration of Independence .....	1,300 words
European Economic Countries Directive on the export of Duck Eggs .....	27,000 words

## Software Clips n' Tips

by Patrick Kelley

The new version of Pest Monitoring Software 3.0 offers many options which can be an asset to any pest monitoring program.

This new spot in our newsletter will hopefully give insight to some of the capabilities of the software that may go unnoticed.



### Software Tip

When maneuvering around the different menu selections in Pest Monitoring Software, you can tell exactly what each menu selection will do for you by glancing into the On-Line Instant Help Box in the lower portion of the screen. This box will give you a quick breakdown of the main functions of the highlighted menu selection.

(P.S. If you want a more detailed description of the highlighted menu selection just hit the right mouse button or type ^H (Ctrl H) to see the "More Help" box. in which you can either read the extended description or put the description in your own words.)

This box will give you a quick breakdown of the main functions of the highlighted menu selection.

For more information on Pest Monitoring Software, contact Pat Kelley. \*

## Fumigator's Tip

by John Mueller

### Corrosion Management

Phosphine has been overlooked by many as a warehouse and processing facility fumigant due to its potentially detrimental effect (corrosive) to precious metals such as copper, copper alloys, gold, silver, and brass. On the benefit side



of phosphine, it is desirable particularly in situations where static material needs to be penetrated such as palletized bagged product and super sacks. Those choosing to use phosphine in these areas struggle with the problem of protecting phosphine sensitive equipment such as computers, phones, metal detectors, forklifts, film, other electronic equipment and the list goes on and on.

Here is a tip on protecting phosphine sensitive equipment which the Service Division of Fumigation Service & Supply, Inc. has been utilizing for the past two years. By utilizing compressed nitrogen or carbon dioxide you can create a positive pressure atmosphere under poly sheeting to exclude phosphine.

Here is how: Enclose the sensitive equipment in polyethylene and seal with tape. Place poly tubing into the sealed area and attach the other end of the poly tubing to a nitrogen or carbon dioxide flow meter,

mount the flow meter to the cylinder of compressed gas and set the flow meter to your desired rate (depending on the volume of the protected area). It is important to remember that anytime you decompress pressurized cylinders you get a cooling effect with a possible



risk of freezing your flow meter. When using standard or economy flow meters, a flow rate of 10 cubic feet per hour or more will freeze these devices. When pressurizing larger volumes one should consider using electric flow meters and multiple cylinders. Remember you should still monitor the phosphine levels inside these protected areas to insure proper function of the flow meter as well as proper flow rate.

Note: If possible, sensitive equipment should always be removed!.

A 50 pound cylinder of carbon dioxide holds 436 cubic feet of gas. At a flow rate of 5 pounds of carbon dioxide per hour this cylinder will give approximately 87 hours of continuous flow. \*

## Bio-Assays for Fumigations

One of the most important ways to evaluate a fumigation is to use live insects in test cages (Bio-Assays). In the past we have had only Confused flour beetles to use. Now, Insects Limited, Inc. has cultured other species of stored-product insects to use and their immature stages. Here is a list of available fumigation bio-assays:

### Insects Available For Fumigation Monitoring

Adults: Saw-toothed grain beetles  
Merchant grain beetles

Red flour beetles  
 Confused flour beetles  
 Lesser grain borer  
 Rice weevil

**Adults and larvae only:**

Warehouse beetles

**All Stages (egg, larva, pupa, and adult) Available:**

Red flour beetle  
 Confused flour beetle  
 Indianmeal moth  
 Mediterranean flour moth

Always check for availability. Please allow a lead time of two to three days for laboratory preparation and separation.

**Cost:**

Adults \$52.50/ pack of 15 vials, 10 insects/ vial

Immatures 78.00/ pack of 15 vials, 10 insects/ vial

Freight is U.P.S. Next Day Air within the United States.

**Wendell Burkholder Scholarship**

Mejha N. Parajulee, Department of Entomology, University of Wisconsin-



sin was the recipient of this year's Dr. Wendell Burkholder Student Travel Scholarship. Dr. Parajulee is a visiting student from Nepal. He will use the money received from this scholarship to attend and present a paper at the 6th International Working Conference on Stored-product Protection in Canberra, Australia this spring.

Insects Limited, Inc. will be awarding more student travel scholarships in the future.

**Pheromone Trapping Tip**

(Continued from page 1)

be answered by looking at the number of insects that are killed with one type of pyrethroid vs. another. Some are talking about the possibility of this method being used in the near future to disseminate IGR's, viruses, bacteria, and fungi, to the attracted carrier insect to spread throughout the host colony.

This year, take advantage of this tip. Always make sure the products you use are approved for that type area and always read the label.

Hear more about this attracticide method at the 1994 Fumigants & Pheromones Technical Conference and Workshop. Dr. P. Trematerra is an invited speaker.

Current Books Available from

**THE BOOKSTORE**

No.	Title	Price
1.	<b>Earth in the Balance,</b> Al Gore, Jr.....	25.00
2.	<b>Mallis Handbook of Pest Control,</b> 7th ed. (out of print) .....	89.00
3.	<b>A Field Guide for the Management of STRUCTURE-INFESTING FLIES</b> By Stoy A. Hedges.	



This new publication is written for the progressive industry professional and provides an in-depth look at the three classes of flies frequently encountered by PCO's: small flies, filth flies and nuisance flies. As he did with his first book, "Field Guide for the Management of Structure-Infesting Ants," Stoy has created a very valuable 'ready reference'.

Included in the 150-page soft cover publication are tips for basic identification, a brief taxonomic key, management strategies, a special chapter discussing insect light traps, over 20 case histories involving fly control and a list of leading fly control product manufacturers. The guide also includes a special color slide section, helpful inspection tips, steps to more accurate identification, key biology points and effective management strategies. Cost: \$9.95

4.	<b>Scientific Guide to Pest Control Operations,</b> 4th ed., Bennett, et al (text for Purdue Correspondence Course).....	65.00
5.	<b>Common Sense Pest Control,</b> Least-toxic solutions for your home, garden, pets, and community, Oikowski.....	65.00
6.	<b>PCT Technicians Handbook,</b> Christensen.....	4.95
7.	<b>Managing Service for Success,</b> J. Beck, Pest control business self-help manual .....	30.00
8.	<b>Principles of Food Analysis for Filth, Decomposition and Foreign Matter,</b> FDA .....	85.00
9.	<b>Ecology and Management of Food-Industry Pests,</b> FDA, J.R. Gorham .....	185.00
10.	<b>Silent Spring</b> by Rachel Carson .....	\$16.95

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Degesch America, Inc. has developed a more environmentally friendly package for its Phostoxin(tm) pellets and tablets.

**Advantages:** No flask to rinse and dispose of as hazardous waste.

No extra weight to carry out of a fumigated bin

Easier disposal of aluminum pouches.

\$10.00 savings per pail

**Disadvantage:** You must use the whole pouch after opening it.



The New Degesch America Phostoxin Pouches are now available from Fumigation Service & Supply, Inc. Degesch America is the innovator in fumigant packaging.

## QUOTABLE QUOTES

A Dutch proverb goes "Goed koop is duur koop," or "the cheap purchase is the expensive purchase."

"Integrity is kind of like virginity, you only lose it once." Gil Rankin, VP, Operations, Countrymark Grain, Indianapolis.

"Science is only as strong as its integrity."

Science research is based on trust and integrity." Dr. Richard Horton, USA Today Cover Story

## Have Slides Will Travel

New Presentations for Organizations, Company meetings, Conferences and International congresses:

- The Current Status of Methyl Bromide and Its Alternatives
- Practical Application of Pheromones
- Innovative Ideas in Grain Fumigation
- IPM; What it Means in the 90's
- The Creative Use of Pheromone Technology
- A Worldwide Perspective of Pest Management
- A New Method of Fumigating Using Heat, Carbon Dioxide, and Low Levels of Phosphine
- The Development and Practical Use of the Clothes Moth Pheromone
- IPM Alternatives for Controlling Pests in Stored Grain.
- Looking to the Future
- *In-house training, sanitation audits and consultation*

## Seminar Calendar

We hope to see you there...

April 17 - 23  
Canberra, Australia  
National Convention Center  
**6th International Working Conference on Stored-product Protection**  
oral presentation, poster display

May 5  
Bologna, Italy  
Bologna Holiday Inn Towers  
**Fumigants & Pheromones Conference**  
Sponsored by: Colkim  
oral presentation (interpreted)



May 11-15  
St. Louis, MO  
Missouri Botanical Gardens  
**Society for the Preservation of Natural History Collections**  
SPNHC  
display

May 18 - 21  
Aguascalientes, Mexico  
**ANCPU- Convention, Mexican Pest Control Association**  
oral presentation (interpreted)

May 24 - 25  
Condesa, Mexico  
**econtrol**  
Fumigation Workshop (continued)

## Stinger

Stinger, from Streamlight, is only 7 inches in length and 9 ounces in weight. Stinger can put out a blinding 15,000 candlepower beam from a xenon

halogen bulb that is more than a match for much larger lights. It's one of the most versatile flashlights available. The rechargeable nickel cadmium battery

offers 1000's of charges and one hour of continuous charge. Light weight, dependable and bright...Stinger. \$79.00 ea.

Shown actual size



## PEST PROBLEM COLLECTION CARD

Please capture the one 'BUG' you may see, even if it's dead, and collect any pest signs you see; tape it to this card. Call your Supervisor or Plant Sanitarian immediately. Phone : \_\_\_\_\_

Scotch Tape "Bag-Baggie" Here



Found by \_\_\_\_\_ Bldg. Found \_\_\_\_\_

Area \_\_\_\_\_ Floor \_\_\_\_\_

In or on What Product (Name & Lot No.) \_\_\_\_\_

Date Found \_\_\_\_\_ Alive or Dead \_\_\_\_\_

Have you seen any more "pests" in the area? \_\_\_\_\_

Save and send to INSECTS LIMITED, INC. for positive ID.

### Fumigants & Pheromones Technical Conference and Workshop

December 6-8, 1994

University Place Hotel & Conference Center, Indianapolis/USA

oral presentations, display, workshop



Fumigants & Pheromones is published by Fumigation Service & Supply, Inc. and Insects Limited, Inc. for the professional applicator. 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., P.O. Box 40641, Indianapolis, IN 46280.



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### Seminar Calendar

(Continued from page 6)

June 6

Calgary, Alberta, Canada  
Association of Operative Millers  
oral presentation, display

June 4 -8

Syracuse, New York  
International Society of  
Chemical Ecology  
corporate contributor

June 9-11

Nashville, TN  
American Institute for Conservation (AIC)  
display

September 22

Toledo, Ohio  
A.O.M. District Meeting  
oral presentation

September 17-22

St. Louis, MO  
Whitmire Institute of Technology  
oral presentation

September 18-21

Manhattan, KS  
The National Stored Product Workshop  
oral presentations

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