

# Fumigants & Pheromones

Issue 57

Fall

2000

Routing:

---

---

---

---

A Newsletter for the Insect Control & Pest Management Industry

## ECO<sub>2</sub>FUME Gets Full EPA Registration

West Paterson, NJ (August 28, 2000) Cytex Industries Inc. confirmed today that the company has received full regulatory approval from the U.S. EPA to market ECO<sub>2</sub>FUME cylinderized phosphine fumigant for food applications such as raw agricultural commodities and animal feeds, feed ingredients along with processed foods, and non-food commodities. The EPA approved non-food commodities on December 20, 1999.

ECO<sub>2</sub>FUME is an environmentally friendly, non-flammable fumigant which can be easily applied to control insect pests in stored post-harvest commodities such as grains, processed cereal products, dried fruits, nuts, tobacco, and seeds.

Cytex is the leading global supplier

of phosphine and phosphine based chemicals used in a variety of specialty market segments. Cytex Industries, Inc. is a specialty chemical and materials technology company with 1998 sales of \$1.4 billion.

Cytex has been producing the cylinderized premixed phosphine and carbon dioxide fumigant called ECO<sub>2</sub>FUME for markets in Australia for the past ten years. They also supply the cylinderized phosphine for FRISIN™ fumigant in Germany, Cyprus (ECO<sub>2</sub>FUME) and China (Vaporph<sub>3</sub>os). They are the largest producer of phosphine for the semiconductor market in the world (Cypure®).

Fumigation Service & Supply, Inc. and Cytex Industries have partnered to launch this new and exciting product. The first step has been to provide a stewardship training program to ECO<sub>2</sub>FUME users. This free one-day, hands on opportunity on November 13, 2000 will explain the differences between ECO<sub>2</sub>FUME and conventional fumigants.



*John Mueller, Fumigation Service and Supply, offers Stewardship Training for new ECO<sub>2</sub>FUME fumigant.*

The second step will be for FSS and Cytex to provide technical support for this high pressure cylinderized  
*(continued on page 2)*

### ARTICLES IN THIS ISSUE

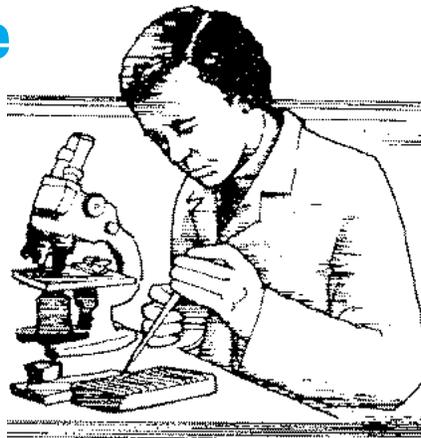
- ✦ Dave's Soapbox: **VOTE!**
- ✦ Greece 2001
- ✦ Penetrating Packaging
- ✦ Educational Workshops
- ✦ Methyl Bromide Alternatives
- ✦ James Vanness

A graphic for a technical conference. It features a stylized sunburst logo with the text "FUMIGANTS AND PHEROMONES TECHNICAL CONFERENCE" around it. Below the logo is a photograph of a person in a lab coat. The text "TRAINING FOR THE FUTURE" is written in blue. At the bottom, it says "GREECE 2001" and "March 20-22, 2001" in bold, with "Thessaloniki, Greece" below that.

## Grain Science

**D**r. Frank Arthur, a grain scientist for the USDA-ARS in Manhattan, KS has been on a roll lately. His grain research has been published often in prestigious *Journal of Economic Entomology* in recent years. Frank has a unique way of explaining something complicated in a simple and clear way. He understands the science and he understands the practical world and can communicate to both. His results from his research can be brought to the end-user for better stored product protection. Here is an example of some of his recent work:

**Insect Growth Regulator Effectiveness Tested on Concrete:** Insect growth regulators (IGRs) are chemicals that prevent larvae from reaching the adult stage or produce deformed adults that are unable to reproduce. These chemicals have potential for expanded use in modern pest control programs.



However, in most experimental studies, insects are exposed to various diets containing IGRs, which does not mimic actual exposure conditions in the field. Mature larvae (last instar) of the red flour beetle and the confused flour beetle were exposed to the IGR hydroprene (Gentrol) on concrete treated with the label rate for either 8 to 144 hours or they were continuously exposed on concrete treated with 25, 50, 75, or 100% of the label rate. Larvae were held at either 27 or 32 C/ (80 or 90 F) and 40%, 57%, or

75% relative humidity.

**Results:** Temperature effects were variable; however, the best control was obtained when larvae were continually exposed at 75% relative humidity. These results indicate that continual exposure of mature larvae to hydroprene can arrest the development of both the red and confused flour beetles in excess of 6 days may be required for maximum effectiveness.

Other recent published journal articles by Dr. Frank Arthur: **Impact of Food Source on Survival of Red Flour Beetles and Confused Flour Beetles (Coleopteran: Tenbrionidae) Exposed to Diatomaceous Earth.** *J. Econ. Ent.*, Vol. 93, No. 4, pp.1347, August 2000. **Aeration Management for Stored Hard Red Winter Wheat: Simulated Impact on Rusty Grain Beetle (Coleopteran: Cucjidae) Populations.** Frank Arthur, Paul Flinn, *J. Econ. Ent.*, Vol. 93, No 4, pp. 1364-1372. August 2000. Frank Arthur, telephone: 785-776-2783; arthur@usgmr1.ksu.edu

### ECO<sub>2</sub>FUME (continued from page 1)

phosphine fumigant. This will be done through a consulting arrangement with Cytec and David and John Mueller of Fumigation Service & Supply, Inc. Both Dave and John have been working on the ECO<sub>2</sub>FUME project since 1996.

Brian McSwigan, Director of Global Phosphine, for Cytec Industries, Inc. stated: "We are glad that we have received a full registration for this phosphine technology from the EPA. Now we can move forward to provide this fumigation management system to the stored product community."

For more information about ECO<sub>2</sub>FUME see [www.insectslimited.com](http://www.insectslimited.com), or call 1-800-992-1991 or fax (1) 317-867-5757.

*A recent fumigation by FSS on large grain storage in Chicago.*



## Dave's Soapbox



...for what  
it's worth

**E**very day I look in the paper and see good news. Good news, how boring!

### 1970

Maybe we forgot about the bad times and struggles that filled the front pages in 1970 when this country was in the middle of useless dying, civil disobedience, and hatred to our fellow man.

In 1970, people were starting to talk about the environment. Earth Days and the environmental movement were being conceived. Rachel Carson's book *Silent Spring* was being read in classrooms, and people all over the world were asking questions about pesticides.

### 2000

The current economic condition, which is now entering its 10th year, has been a fantasy to most businesses in the United States. During this unique phase of U.S. economic history, we have experienced the best of all possibilities. Think of it. More than nine years of economic growth at rates well above expectations. Inflation rates that have persistently trended downward along with interest rates. Growing business profitability. Unemployment rates that recently hit 40-year lows.

***This is so boring!***

At the same time, the budget deficit, that has hung over our heads for decades and slowed government's ability to deal with economic crises, not only has been eliminated but

has turned into a surplus that now holds the potential to grow for years to come.

***This is really boring!***

The technology revolution, whose promise is just now beginning to be realized, can fuel new job growth for millions of people here and around the world. The point must be made that these trends did not happen by accident but evolved as the result of the influences of our government investment in technology, and its strong-willed citizens.

***"Hey, you are making me cry... what's your point, mister?"***

### The Point

Pull out a pen and mark the date November 7 on your calendar. It is one of the most important dates this year. November 7 is Election Day. We have some very important decisions to make on who will run this country along with our state and local governments. Thirty years ago this country was in trouble. Now most of us are enjoying unprecedented prosperity and a better standard of living. I'm not here to tell you who to vote for, but to tell you to VOTE!

### Vote for:

1. Freedom and Liberty
2. A clean environment
3. Free enterprise
4. Continued economic growth
5. No useless wars
6. The people who can lead us into the 2000's with the best plan to protect, defend, and provide for a strong democracy for America.

*A. K. Mueller*



## Trivia:

***What's the number one non-food crop in the world, with over 20 million tons produced each year?***

Answer: cotton

***What percent of all methyl bromide used in the world is used in the United States?***

Answer: 42%

***What percent of methyl bromide is used in all developing countries?***

Answer: 22%

***On January 1, 2001 what percent of methyl bromide production will be phased out in developed countries?***

Answer: 50%

## QUOTABLE QUOTES

***"It wasn't raining when Noah started building the ark."***

Howard Ruff  
Entrepreneur and Writer

W O R K S H O P S

**TRAINING  
for the  
FUTURE**

**November 13, 2000**  
Westfield, Indiana  
**ECO<sub>2</sub>FUME Stewardship  
Training Program**



**November 14-15, 2000**  
Westfield, Indiana  
**Freez'em or Fry'em  
Workshop**

**November 16, 2000**  
Westfield, Indiana  
**Workshop on Advanced  
Uses of Pheromones**

**February 7, 2001**  
**Stored Product  
Insect Identification**



**GREECE 2001**  
**March 20-22, 2001**  
Thessaloniki, Greece  
**Fumigants & Pheromones  
International Conference  
and Workshop**

Log on to  
[www.insectslimited.com](http://www.insectslimited.com)  
for more information and  
online registration.

**Stored Product Protection**  
**5th Fumigants & Pheromones  
International Technical  
Conference & Workshop**

March 20-22, 2001  
Thessaloniki, Greece  
University of Macedonia  
and the Mediterranean  
Palace Hotel

**GREECE 2001**

**Organized by:**



**AGRO SPE COM L.T.D.**

**This seminar will  
bring together  
scientists and  
industry to present  
new and innovative  
ways to control  
insects in food,  
tobacco and grain.**



*Tom Bachelor,  
Ph.D., Keynote  
Speaker for  
Greece 2001.  
Tom is the EU  
expert on  
Methyl  
Bromide.*

2 days in the classroom  
with 14 international expert  
speakers; 1 day workshop  
in the field to demonstrate  
new technologies.

**Conference Sponsors:**

**CYTEC**



**Media Sponsors:**

**WORLD GRAIN**

**Pest  
Control**



**GRAIN JOURNAL**

**MILLING**

**INTERNATIONAL  
PEST CONTROL**

Major topics for this conference are: Methyl bromide phase-out; Pheromones for stored products, Food plant sanitation, Advances rodent control techniques, Grain fumigation, Hands-on workshop on new fumigation technologies including the J-System, ECO<sub>2</sub>FUME and Profume (sulfuryl fluoride). Speakers will offer alternatives to methyl bromide. This ozone depleting substance is scheduled for phase-out in developed countries by the year 2005.

**Cost:** 2 day conference—\$595/person;  
1-day workshop—\$300/person.  
Total cost for three-day conference and  
workshop: \$775US/person.

Includes receptions, 2-3 lunches, coffee breaks,  
conference workbooks and more.

**Registration:** is available now on the web  
[www.insectslimited.com](http://www.insectslimited.com) or fax 1-317-867-5757.  
For more information in Europe telephone 30-  
31-543 125 or best@magnet.gr

## W O R K S H O P S



## ECO<sub>2</sub>FUME Stewardship Training

**November 13, 2000**



### Introduction/ The Purpose of Product Stewardship

Brian McSwigan  
Cytex Industries, Inc.,  
West Paterson, NJ

### Principals of Fumigation Fumigation Case Studies

Dave Mueller  
Insects Limited, Inc., Westfield, IN

### ECO<sub>2</sub>FUME Stewardship Training

Roger Cavasin  
Cytex Industries, Inc.  
Niagara Falls, Ontario

### ECO<sub>2</sub>FUME Equipment Fumigation Service & Supply Fumigation Workshop

John Mueller  
Fumigation Service & Supply, Inc.  
Westfield, IN

### Examination

**To Register:  
Call 1-800-992-1991  
or check our our  
Website—  
www.insectslimited.com**

## Freez'em or Fry'em 2000

**November 14-15, 2000**

**Freez'em or Fry'em**  
Paul Fields, Ph.D.  
Agriculture Canada, Winnipeg

**Start with the Insect First**  
Alain Van Ryckeghem  
Insects Limited, Inc., Westfield, IN

**Food Plant Heat Treatments**  
Jerry Heaps, BCE  
Pillsbury, Inc., Minneapolis, MN

**My 20 Years of Experience with  
Heat Treatments at Quaker Oats**  
Bobbie Gannon  
Quaker Oats, Inc., Danville, IL

**How to Start a Heat  
Treatment Program**  
Kim Kemp  
Ralston Purina, Inc., St. Louis, MO

**Spot Heat Treatments**  
Larry Dean  
Ralston Purina, Inc., Davenport, IA

**Case Studies &  
Practical Examples**  
Dave Mueller, BCE

*Insects Limited, Inc.,*



*Westfield, IN*

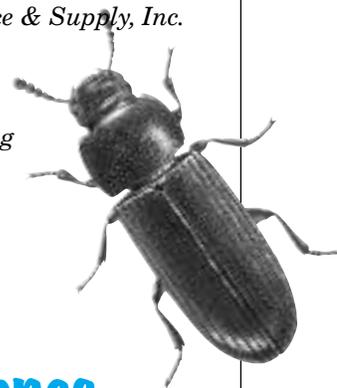
**Conditioning Grain  
with Temperature**  
Dirk Meiers, Ph.D.  
Purdue University, Ag-Engineering  
West Lafayette, IN

**PM-Luft Chillers**  
Jan Hellemar  
PM-Luft, Inc., Pt. Isabel, TX

**Hands-On Demonstration**  
John Mueller  
Fumigation Service & Supply, Inc.  
Westfield, IN

**Workshop**  
Ruffneck, Winnipeg  
Canada

**Workshop**  
Aggreco  
St. Louis, MO



## Advanced Uses of Pheromones

**November 16, 2000**



**Trapping in Grain**  
Paul Fields  
Agriculture Canada, Winnipeg

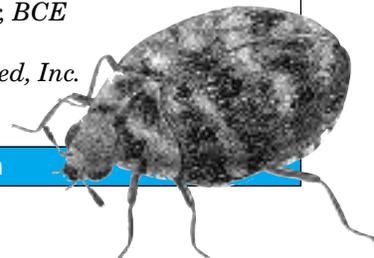
**Pierce on Pheromone**  
Larry Pierce, M.S., R.S.  
Food Protection Services, Mililani, HI

**Pheromone Chemistry 565  
Insect Biology 565**  
Alain Van Ryckeghem  
Insects Limited, Inc., Westfield, IN

**Spacial Mapping/ Flour Beetle  
Trapping with New Traps**  
Jeff Weier, M.S., R.S.  
Sprague, Tacoma, WA

**Practical Use of Pheromones  
Advanced Use of Pheromones**  
Dave Mueller, BCE

*Insects Limited, Inc.  
Westfield, IN*



## Penetrating Packaging

The first instar larva is small enough to crawl through this period (.). It vigorously searches for the smell of food and searches packaged materials until it finds a small defect in the package and then penetrates. If it doesn't find food in about two days, it will die. It is amazing to most humans how this insect finds a way into a package. However, millions of years of evolution have taught it and its offspring to find a meal or die.



*Inspecting Indianmeal moth pheromone trap.*

After finding food, the larva eats and starts to grow. It then spins a single silken thread from spinnerets under its mouth. This webbing has several purposes. It helps the larva crawl across surfaces. This could be the surface of grain or a burlap bag. The IMM webbing left by the larva acts as an oviposition site (egg laying) for females to cue in on an area that other moths have used to survive and grow. In the winter months the thick webbing acts as a blanket and can help the moths stay warm, continue growing, propagate; and it forms a protective layer against its natural parasitic enemies.

During the sixth instar (molting stage) the IMM larvae needs to wander from this site. This inherent



need to wonder causes it to chew its way out of the bag that it once penetrated as a small first instar larva. The IMM larvae will graze across a plastic bag, testing it occasionally for weakness. When it finds a weak spot, it will begin the laborious task of slashing at it with its rasping mouthparts (like a sickle). After hundreds of slashes it may break through or go on to another location. This is much like a man trying to dig a hole in the ground. Some locations are hard and rocky and some are soft and easy. The larva will then crawl through the round hole and may find a nice safe cardboard fluted box or a 90-degree angle to secure itself. The pupa stage is a defenseless quiescent stage that is vulnerable to attack by natural predators. The larva carefully chooses a safe perch to start pupation. This will be the location where the IMM adult will dry its wings when it emerges from its transformation to take the first flight of its life, perhaps into a sticky pheromone trap.

The first generation of IMM in much of North America emerges from the overwintering (large) larva in April-May. In the tropical regions of the United States it can stay active most of the year. This moth doesn't like to fly when the temperatures are below 62-65° F. Pheromone traps should be placed when temperatures reach 60° degrees F/ 17° C or higher.

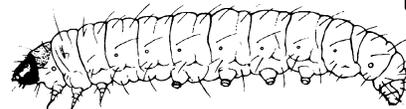
The IMM goes through a new generation every 4-6 weeks during the warm summer months and 5-8 weeks in the cooler months. In the insect rearing lab at Insects Limited, Inc. we can shorten a generation of IMM to 18 days when the temperatures are set for 29 C/ 85 F



*Cigarette beetle adult penetrates a plastic bag.*

and 60% relative humidity on a special diet.

In the Midwest we normally have 3 generations per year (400 x 400 x 400 offspring). In warm summers like the ones we have experienced in the past five years, we are getting 4 generations per year (400 x 400 x 400 x 400 offspring). The reproductive potential then is 26 billion IMM from one pair. With the number of 90-degree weather days doubling last year in many parts of the country, one can see how this moth has been such a nuisance.



The IMM does not carry diseases known to man nor causes health problems like mosquitoes, bees, or flies. It is a nuisance pest that contaminates food in your home and your factory with its presence or its webbing. It can live outdoors naturally and feeds on grass seed and cereal protein.

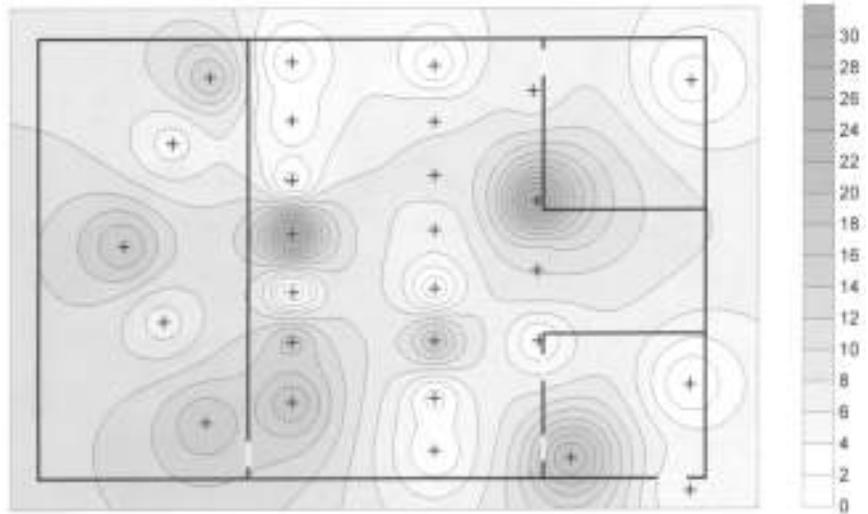
In a survey conducted by Dr. M. Hirao of Japan, over 95% of the 200 households survey from around Japan had IMM indoors and also outdoors.

The IMM does not like hot weather. They are seldom found in the tropical areas like Southeast Asia or Hawaii. Found there are related

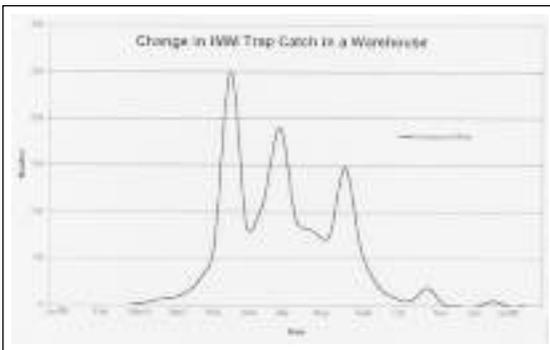
cousins like the Rice moth or the Cocoa moth. The temperate region of the world is where the IMM survives best.

One characteristic that Alain Van Ryckeghem of Insects Limited, Inc. recently discovered is that the IMM adults like to stay near the walls. The pheromone traps near the center of the room capture fewer adult males than the ones near walls. The adult moth seems to prefer resting on the walls in a vertical posture.

Pheromone traps are very effective in locating IMM. The traps should be placed in a convenient location away from children or fork truck operators. Write the date on the trap when they are first placed and again when the



*Spatial mapping of pheromone trap catch can be useful information for a pest management program.*



## Advanced Pheromone Technology

### Timing Treatments

*Notice the peaks recorded from pheromone traps.*

lures are changed. The lures should be replaced every 8-10 weeks indoor and 4 weeks outdoors. The traps should be changed when dust accumulates on the sticky surface or the numbers of moths make change necessary. Check the traps weekly if possible and remove all captured insects. Keep excellent records and maps of trap location. Predicting future population trends will be possible by closely evaluated and mapping the collected data.

Pest management begins with prevention and monitoring. The pheromone traps for stored product insects shouldn't be considered a control tool but rather sensitive detection and monitoring tool. The accumulated data will help predict future populations for pest insects and better determine the best time for directing a pesticide control

program. After several years of collecting data a pest manager can fine-tune his/her pest management program to compensate for unusually warm weather or other circumstances that arise. The Indianmeal moth is predictable; programmed through 1000's of years of evolution. It is a controllable nuisance pest of stored products. It all starts with knowing the pest... "Knowing the pest is half the battle in controlling it."

## Job Opportunities

### **Food Plant Pest Management Specialist:**

Fumigation Service & Supply, Inc. is seeking individuals to work full time as food sanitation specialist. A good understanding of Good Manufacturing Practices, HAACP, AIB audits, entomology, pest biology, food plant ecology is preferred. Some travel is required for this job. Base salary, monthly commissions, vehicle provided with generous benefit package included medical and profit sharing pension plan and paid training available. Job is based out of Indianapolis Area. This is an opportunity to work in a beautiful new building with friendly people that always strive to be better. This is also a great opportunity to live in an affordable area of the country with excellent schools and family oriented benefits. Fax your resume to John Mueller (317) 867-5757. Confidentiality insured.

### **Fumigation Technicians:**

Fumigation Service & Supply, Inc. is seeking individuals to work on seasonal fumigation crews (May-October). Full time positions are often offered from these positions. Fax or send resumes to: FSS, 16950 Westfield Park Road, Westfield, IN 46704, 317 867-5757, email: insectltd@aol.com



# Alternatives to Methyl Bromide

**Stored Grain,  
Wood, Seed,  
Dried Fruits  
and Nuts,  
Food Processing  
Facilities,  
Other Stored  
Products**

## ECO<sub>2</sub>FUME™

A mixture of carbon dioxide (98%) and phosphine (2%) in a cylinder. This is an extremely effective and rapid acting alternative that can be easily applied in a number of grain storage and food processing situations. This recently registered fumigant in the U.S. is an improvement over the conventional phosphine (see below) as a shorter amount of time and less fumigant are required, and better management of the concentration in the facility is possible. It is registered in a number of countries for stored product protection. This is considered by some to be a drop-in alternative for many stored grain and mill methyl bromide uses. Because phosphine is such a good penetrating gas, this material may prove superior to methyl bromide disinfection of flour mills and storage areas. The price is favorable to today's price of methyl bromide: (ECO<sub>2</sub>FUME: \$2.06-\$5.16/1000 ft<sup>3</sup> vs. methyl bromide: \$3.10-\$9.30/1000 ft<sup>3</sup>).

## Sulfuryl Fluoride

(*Profume*®) / (*Vikane*®) currently used for the fumigation of structures to control termites and other wood-destroying pests. The registrant, Dow AgroSciences, is currently working to register this material for food uses, specifically targeting flour mills and dried fruits and nuts. EPA registration is expected by 2003. This should be an especially good



**This 24,000 lb. carbon dioxide vessel is used to fumigate structures in combination with heat and phosphine.**

alternative to methyl bromide for stored walnuts, as it does not leave an off taste as phosphine can. The treatment time for sulfuryl fluoride is less than methyl bromide, and the price is undetermined.

## Heat

This is an efficacious and fast treatment for flour mills, wood, food processing facilities against stored product pests. Quaker Oats, Ralston Purina, General Mills and Pillsbury currently use heat to treat about 10% of the flour mills and food factories in the U.S. The price of heat is higher than methyl bromide (\$14.00/1000 ft<sup>3</sup> vs. methyl bromide: \$3.10-\$9.30/1000 ft<sup>3</sup>) plus capital costs.

## Cold

Purdue University has shown that grain chilling in silos is a potential alternative to methyl bromide against a variety of stored product insect pests. In high value storage, cold can also be used to treat organic food. However, this method takes longer and is significantly more

expensive than methyl bromide (\$1200.00/1000 ft<sup>3</sup> vs. methyl bromide: \$3.10-\$9.30/1000 ft<sup>3</sup>) plus capital costs.

## Controlled Atmosphere

The replacement of oxygen with carbon dioxide or nitrogen in a chamber, shipping container or under a sealed tarp is an effective way to control stored product insects (treatment time: 4 to 14 days). This technique is often combined with heat, cold, or pressure to increase efficacy and decrease the time necessary for control (treatment time can be to 2-3 hours). Cost is variable, depending on what gas is used—a general price estimate is \$25.00/1000 ft<sup>3</sup> vs. methyl bromide: \$3.10-\$9.30/1000 ft<sup>3</sup>).

## Phosphine

This is a very common fumigant for stored grain. Used correctly, it is very effective against stored product insects. It can be combined with recycled carbon dioxide and heat to lower amount used and increase effectiveness. It is not usually used

in food processing facilities due to concern over corrosion on sensitive metal surfaces. However, this can be managed by protecting computers and switches with carbon dioxide gas and by making sure the  $\text{PH}_3$  concentration is controlled to a low level. The cost is less than methyl bromide (\$2.54-\$7.62/1000 ft<sup>3</sup> vs. methyl bromide: \$3.10-\$9.30/1000 ft<sup>3</sup>).

### Irradiation

Assuming public acceptance of this method, USDA and the food industry have defined dosages and use protocol over the past several years. Used correctly, this is an extremely efficacious alternative to methyl bromide. A cost comparison using microwave irradiation shows this to be more expensive than methyl bromide (\$2.05/metric ton vs. methyl bromide: \$0.20/metric ton).

### Inert Dusts

A very effective product against stored product insects in stored grain. This is usually used with other control strategies in an integrated pest management program. (\$11.60-\$116.00/1000 ft<sup>3</sup> vs. methyl bromide: \$3.10-\$9.30/1000 ft<sup>3</sup>).

### Other Potential Alternatives

Currently in a research stage: propylene oxide, carbon disulfide, carbonyl sulfide, ethylene oxide, and better IPM techniques.

**Pests in a Flour Mill**—*Most of the problems associated with flour milling infestations can be directly attributed to contaminated wheat. Better fumigation of incoming grain can prevent many of the infestations that give rise to needed space fumigation. In addition, simple sanitation in the mill (cleaning up flour dust and spilled grain) is critical to insure that pests do not have the necessary sites and resources to generate an infestation.*

## Laboratory Services



**Alain Van Ryckeghem, technical director for Insects Limited, Inc., sorts through a recent request for 10,000 stored product insect bio-assays for a new fumigant field trial.**

### Pheromone Synthesis:

Insects Limited, Inc. has recently set up its own chemistry laboratory for synthesizing pheromones. Alain Van Ryckeghem has spent the summer learning how to make these insect semiochemicals. This lab will allow Insects Limited to supply large quantities of the poplar pheromones that they offer now and start working on some of the minor use pheromones that people have been requesting. This laboratory is a large commitment to the pheromone field. We hope to be a reliable and quality manufacturer for your pheromone needs now and in the future.

Insects Limited offers a number of laboratory services that can help you solve your pest problems:

### Insect Bioassays

Live insects are used to determine the effectiveness of fumigation, ULD fogging, heat treatment or cold temperature treatment. Insects Limited supplies 10 insects in a breathable vial attached to a useful data card. These cards are then shipped to the customer to place in the treated areas. Insects Limited

supplies adults, pupae, larvae, and egg stages for the following species: Indianmeal moths, Warehouse beetles, Red flour beetles, Confused four beetles, Mediterranean flour moths, Saw-toothed grain beetles, Almond moths, and America spider beetles.

### Insect Identification:

Often someone needs a particular insect identified by an expert entomologist. The insect will be identified promptly and a sheet of information of this specimen will be faxed to you. This service costs \$50.

Insects Limited has been active in trials for new products, cold treatment, legal opinions, food plant inspections, writing articles, public speaking, organizing conferences, offering in-house training, yellow jacket control programs for festivals and parks, pheromone program evaluation, and more. We work hard to help you control your insect and pest problems. We consider ourselves problem solvers for stored products. These laboratory services can be a benefit to your pest management program.

# James “Lil Jimmy” Vanness

## “A graduate of the school of hard knocks”

**M**r. James Vanness, age 84, knows a few things about controlling insects, about agriculture in good times and bad, and about life in general. Jimmy isn't a big person standing at 5'2", he doesn't have a degree from college, he doesn't own a computer or cell phone, but he does have 52 years of experience in growing popcorn, corn and soybeans.

Jimmy was born in 1916 in the front room of the farmhouse he and his brother Floyd now occupy near Hobbs, Indiana (about 30 miles north of Indianapolis). They inherited their farmstead of 200 fertile acres from their parents. Jimmy says “Land prices have been pretty steady in recent years— \$3000 per acre “give or take.”

In 1948 Jimmy started growing high quality popping corn under contract. Jimmy's customers are processors, theaters, ballparks, basketball games, bars, and concession stands.

Jimmy says, “The high quality popping corn had an increased popping volume and tasted better.” Jim along with a man named Orville Redenbacher helped pioneer popcorn in those early days. Orville Redenbacher did plant breeding for over 26 years in southern Indiana to find his famous “Gourmet Popping Corn” genetic breed. Jimmy states: “I bought seed from Orville for 23 years. He had good genetic breeds of seed.”



*James “Lil Jimmy” Vanness, Indiana’s other popcorn legend.*

Says Jimmy, “Indiana is the largest state for growing popcorn.” Popcorn is now exported worldwide with 143 million lbs. of processed popcorn export last year and 755 million lbs. of processed popcorn sold in the United States and Canada. The popcorn industry has grown to become a major snack food industry. But it wasn't always that way. Today much popcorn is grown outside of the United States mostly in Argentina.

Microwave popcorn made it convenient for the homeowner. Very few teenagers today can remember when popcorn came in a 1 lb. see-through bag. Many don't even know what a kernel of popcorn looks like before it is popped.

### **Fumigation:**

Jimmy went to Purdue and took his fumigation course at age 65. Before

then, farmers didn't need a license to buy fumigants. “Back then we used DowFume, Tetrafume, EB-5 and Larvacide.”

Jimmy advises that the key to storing grain is to condition it with aeration. “Anywhere you have grain you will have grain insects. Weather will make some years worse. Popcorn is human food and Dent corn is mostly for feed. You always have to be conscious of that.”

Jimmy's hobbies are visiting neighbors and friends. Jim drives his ‘Crown Vic’ to Elwood, IN almost every morning for breakfast at the local Jim Dandy restaurant

where all the waitresses say “hello” to Jim as he walks in the door.

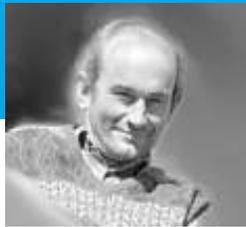
### **Advice:**

When asked about any advice he would like to offer, he said: “We need to learn from the school of “Hard Knocks” and the University people to work for better agriculture for tomorrow.”

### **Editor's note:**

*Jim Vanness answers his telephone with: “Cheerful Good Morning” even when his severe arthritis is acting up. His smile will light up a room wherever he is. He is not afraid to walk up and stick out his hand and shake your hand even if you are a stranger. Jim is a genuine person and that's a very good thing in this day and age. Thank you for your advice Jimmy, I always listen.*

## “But How Does Phosphine Work?”



Steven Pratt  
CSIRO Australia

Insect resistance to phosphine is on the increase, some dosage rates are being increased to compensate, but at the same time regulations and health concerns are driving acceptable workspace levels down. These were the themes of several presentations at a recent grain storage conference in Adelaide, Australia. During question time, a farmer cut to the chase, asking, “Does anyone actually know how phosphine works?” There was a short silence, before a biochemist in the audience answered, “Well, sort of: it creates free radicals from oxygen. They damage the cell’s **“molecular machinery”** until the organism dies.”

So, what are free radicals? And how does knowing about them help the safe storage of grain?

Free radicals are fragments of molecules that have been broken apart, and desperately ‘want’ to become whole—and stable—again. This means they will react with just about anything they happen to bump into. They can randomly vandalise delicate biological molecules, like proverbial bulls in a china shop. Free radicals are produced normally in all living things, but natural detoxification systems and antioxidant vitamins prevent or limit free radical damage. Free radicals seem to be involved in the ageing process and many types of disease, such as cancer, heart disease, diabetes and arthritis. Phosphine turns oxygen into free radicals. If there are enough, they swamp the insect’s defense systems, and go on the rampage, damaging delicate molecules until the cell, and the insect, dies. Break one plate in a china shop, and it’s not a major problem, but break enough, and the shop goes out of business.

Some scientists think that phosphine-resistant insects can survive high doses—enough to kill an ordinary insect - because they have extra detox ‘equipment’ to destroy free radicals. Others think they pump phosphine out of the cell before it can do damage.

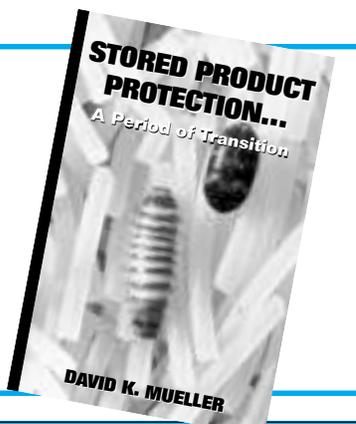
By learning more about how phosphine kills, and how some insects have learned to counteract it, we may think of better ways to fumigate, and maybe how to beat phosphine resistance before it becomes so bad that phosphine is useless. This knowledge may also provide an antidote to save people who have been poisoned by phosphine.

*Stephen Pratt, CSIRO, is a Ph.D. student in Canberra, Australia, investigating the mode of action of phosphine in stored grain insects. Learn more about phosphine at [www.phosphine.com](http://www.phosphine.com)*

# Order today!

1-800-992-1991

Visit the BookStore at:  
[www.insectslimited.com](http://www.insectslimited.com)

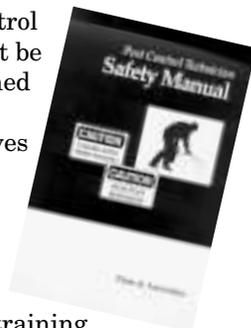


## New Books

by Pinto & Associates

### Pest Control Technician SAFETY MANUAL

By law, pest control technicians must be adequately trained to identify and protect themselves from hazards on the job. This brand new 245 page softcover/illustrated book provides safety training in plain English, and with plenty of illustrations to reach workers of all reading levels. The book covers more than 50 safety hazards that technicians can face on the job. cost: \$45.



### Regulatory Compliance— a Practical Guide for Pest Control Firms

This 300-page illustrated book will guide you through the steps necessary to comply with federal regulations on safety and health, environmental protection, employee relations, and consumer protection. It includes comprehensive checklists for compliance and sample policy statements, report forms, and agreements that you can use to run your business. cost: \$73.



### techletters

Every two weeks for the past 15+ years a useful four page training aid has been sent out by Pinto & Associates to pest control operators. This well illustrated and timely newsletter will take about ten minutes to read and provides useful tid-bits of knowledge that will make you better at your job. This training newsletter makes for a good “pass around” the office item. Call 301-884-3020 and ask for Sandy.

## New Pheromone Display

Insects Limited, Inc. now has resale packaging for its pheromone traps. The convenient point-of-sale packs for **Pantry Patrol**® and **Moth Patrol**® are designed for resale to the homeowner.

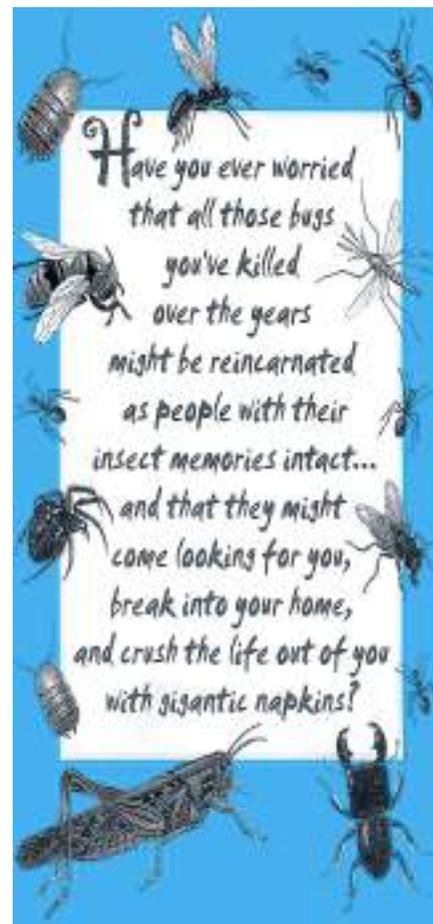
The **Pantry Patrol** pop-up case contains 12 attractive boxes with 2 traps and two vials of pheromone in each box. This product is designed to be put in a kitchen, pantry, or in floor corners to trap stored product insect pests. It contains five different pheromones for both beetles and moths and has been found to capture over 20 species of pest insects. These traps last for 2-3 months.



The **Moth Patrol** homeowner package for Indianmeal moth, Mediterranean flour moth, Almond moth, and other stored product insect moths contains two moth traps and two moth pheromone NoSurvivor® sticky traps. The handy instruction card has all the information necessary to install these traps in a home. The Moth Patrol can be specially ordered for the Webbing clothes moth also.

If you have walk in traffic in your company and would like to begin selling your customers an effective pheromone trapping product like Pantry Patrol and Moth Patrol, contact Insects Limited, Inc. for wholesale pricing. 1-800-992-1991

## A Fumigator's Hell...



credit: Carlton Cards



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.



© Copyright 2000 Fumigation Service & Supply, Inc. All rights reserved. No part of this publication may be reproduced or transmitted by any means without permission of the editor.

### Fumigation Service & Supply, Inc.

16950 Westfield Park Road  
Westfield, IN 46074-9374 USA  
(1) 317-896-9300 voice  
(1) 800-992-1991 toll free  
(1) 317-867-5757 fax  
e-mail: insectsltd@aol.com  
web site: <http://www.insectslimited.com>

Bulk Rate  
U.S. Postage  
PAID  
Carmel, Indiana  
Permit #14

Attention Mailroom Personnel (or Addressee)—Please Reroute if Necessary