

Fumigants & Pheromones

Issue 54
Winter
2000
Routing:

A Newsletter for the Insect Control & Pest Management Industry

ECO₂FUME™ Receives Registration

ECO₂FUME™, the new cylinderized phosphine fumigant received registration from the U.S. EPA on December 17, 1999. This will allow this phosphine and carbon dioxide based fumigant to be used by trained and certified applicators for **non-food items**.

This non-food registration is the first step of registration by the EPA while the full food label is being processed. Application for a full food tolerance for ECO₂FUME will follow since the EPA issued in the federal register in December their determination of "phosphine is phosphine" instead of tolerances stating: "...phosphine generated by aluminum or magnesium phosphide." This determination by EPA should now allow for ECO₂FUME to be registered in the year 2000 for all food and non-food products.

Non-food items include tobacco, empty structures, timber, wooden pallets, museum items, empty shipholds, empty grain bins, equipment, processed or unprocessed cotton, wool and other natural fibers or cloth, clothing, straw and hay, feathers, human hair, rubberized hair, vulcanized hair, mohair, leather products, animal hides and furs, wood, cut trees, wood chips and wood and bamboo products, paper and paper products, dried plants and flowers, seeds (grass seed, ornamental herbaceous plant seed and vegetable seed).



ECO₂FUME™ is a cylinderized mixture of phosphine and carbon dioxide.

Cytec Industries, Inc. is the registrant for ECO₂FUME. Brian McSwigan is the Business Director for this product. Cytec has appointed Fumigation Service & Supply, Inc. the coordinators of a stewardship program for all future users of ECO₂FUME. This stewardship program will train fumigators to use this new and somewhat different phosphine generating fumigant. The advantages of this new cylinderized fumigant are simple; ***ECO₂FUME is a fumigation management system. It can be better managed for worker safety and effectiveness.***

If you have an interest in this new and exciting fumigant, contact:

David K. Mueller at 1-317-896-9300 or insectsltd@aol.com. Stewardship programs will begin in April of 2000.

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Do Insects Speak Spanish?

I accompanied John Mueller on a study-tour to Argentina in November where we met with Fügen, a fumigation company sharing similar interests and goals with Fumigation Service & Supply, Inc. Here we worked with the phosphine producing Turbo Horn Generator. The Horn Generator has been registered in Argentina and Chile for three years. Since then, Fügen has treated millions of tons of grain and dozens of food facilities with this advanced fumigation technology.

Setting Fügen apart from Fumigation Service and Supply, Inc. is its use of a phosphine generating machine which is not yet registered in North America. The Generator is capable of producing large quantities of phosphine without requiring personnel to be inside the fumigated structure during the time of release and without the risk of 'residue' contamination onto the finished product. This technology is very exciting for those of us who are involved with phosphine fumigations. With safety regulations concerning the use of phosphine fumigants currently under scrutiny in the United States, the Turbo Horn Generator could prove to be a valuable tool.

Fügen, with main offices in Buenos Aires and Rosario, has many similarities to Fumigation Service and Supply, Inc. in that they specialize in stored-product fumigation work. John and I were fortunate enough to witness actual fumigations being performed utilizing this new fumigation equipment and advanced technologies. We traveled several hundred kilometers to each job site, I was beginning to really take note of the similarities. We noticed extensive work and care being put into making the structure as air tight as possible. It was

apparent that Fügen had a knowledgeable labor force dedicated to providing top-notch service and worker safety. After witnessing the hard work in preparation, experiencing the all-night work involved and enduring the hundreds of miles of travel, I realized exactly how much I have in common with my colleagues in Argentina.

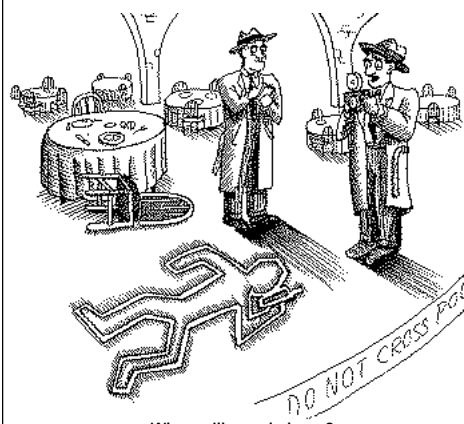
In retrospect, our visit to Argentina was a huge success. With temperatures falling and the season of winter approaching in the United States, I was able to enjoy spring-time weather with people that share common interests and goals concerning the safety of their people and of the world's food supply. Mr. Enrique E. Villa and his people at Fügen were gracious hosts. Their technicians proved to be well versed in safety regulations and fumigation techniques. *Me gustaria decir muchicimas gracias a señor Fügen para haciendo mi primera viaje afuera de Los Estdos Uninos muy agreble y con muchos recuerdos.*

Jeffery J. Waggoner
Foods Division Manager
Fumigation Service and Supply, Inc.



Jeff Waggoner with the Turbo Horn Generator in Argentina.

Couldn't resist one more shot at cell phones . . .



When will people learn?
Cell phones and restaurants just don't mix.



I bagged this one at a performance of "Les Miserables."



¿Hablan Español los insectos?

Dave's Soapbox



The latest threat to American farmers and farm exporters comes from misinformed paranoia and trade restrictions from Europe and Japan. Consumer's anxiety over genetically altered foods has triggered panic among

European and Japanese food manufacturers. These processors are demanding soybeans, corn, wheat, and other commodities free of genetically altered ingredients, even as U.S. farmers have embraced genetically modified crops because they require less chemical fertilizers and pesticides.

America enjoys a high standard of living because they spend only 13% of their wages on feeding themselves. This allows more time and

income for non-essential items. Many countries spend nearly 100% of their time in vegetable gardens and small plots working to barely feed their families. With over 800 million people on this planet today subsisting on less than one US dollar (\$1.00) per day, how can we not look at the future and say how will all of these people and their children not go hungry? Modern agriculture and science will be called upon in the coming decade to feed a doubling population.

10,000 Years... FOOD PRODUCTION

8000 BC People decided to live in one place and grow plants as crops. They save the best of their crop to use as seed the next year.

1800 BC Yeast is used to make wine, beer and leavened bread. This is the first time people use microorganisms to create new and different foods.

1865 From experiments on pea plants in a monastery garden, Austrian botanist and monk Gregor Mendel concludes that certain unseen particles pass traits from generation to generation

1922 Farmers first purchase hybrid seed corn created by cross-breeding two corn plants. Hybrid corn helps account for a 600 percent increase in U.S. production of corn between 1930 and 1985.

1953 James Watson and Francis Crick define the structure of DNA, which shows how cells in all living things store, duplicate and pass genetic information from generation to generation.

1973 Scientists Stanley Cohen and Herbert Boyer move a gene—a specific piece of DNA—from one organism to another.

1986 The agricultural industry uses biotechnology to create soybean plants that are herbicide resistant.

1994 The first food product enhanced through biotechnology hits supermarket shelves. The FlavrSavr tomato, has a gene that slows ripening and improves shelf life.

Mid 1990's The first crops improved through biotechnology are commercialized, including insect-protected cotton and potatoes, as well as soybeans, canola and cotton with improved weed control.

1997 Eighteen crop applications of biotechnology are fully approved by the U.S. government.

1999 The European Commission and the Japanese protest GMOs as "Frankenstein Food" in an effort to restrict trade.



If the problem is related to trade restrictions between the "haves" of the world...then I can comprehend that this issue is about protectionism and pure and simple greed. But if the science of agricultural technology is slowed or eliminated because of ignorance and greed then this is self-centered insanity.



Bolivia Santa Cruz

When people say they don't want genetically modified food, they should consider that GMOs are the way we will be able to feed the **11 billion** people that will occupy this planet in the future. If people don't get food, terrible things will happen. If we want fewer pesticides in our food, improved quality and yield, then advanced food technology is needed to feed a hungry world and improve the quality of life.

D. K. Mueller

R E S E A R C H

Phosphine Corrosion Study

By Dr. Robert Brigham

Phase I

A preliminary series of steady-state exposure experiments of metals in phosphine (Phase I) was completed in 1998, which included the following parameters:

- 4 materials (copper, brass, silver, and solder)
- 3 temperatures (20°, 30° and 40°C)
- 3 phosphine concentrations (35, 135, 220 ppm PH₃)
- 4 levels of relative humidity (15, 25, 50 and 75%)
- 2 CO₂ levels (3.5 and 5%)
- 3 exposure times (12, 24, and 36 hours)

These results of Phase I and II can be found on the Internet by accessing www.insectslimited.com.

Phase II

Based on the results and recommendations of the earlier work, a second series of experiments (Phase II) was undertaken. This study focused on the following four tasks:

Task 1: Expand the database for copper and nickel at intermediate relative humidities between 25 and 50% to define closely the transition from wet to dry morphologies.

Results: *These wet/dry regimes have been confirmed in the present study and the transition from wet to dry has been found to occur in the range 35 to 45% RH with 400 ppm PH₃. No wet regime was observed at 85 ppm PH₃.*

Task 2: Expand the database for copper and nickel to 400 and 600 ppm PH₃ and 0% CO₂ to more closely reflect current technology.

Results: *Weight gain (due to the deposition of oxides of phosphorus, either phosphoric acid in the wet regime or copper phosphate in the dry regime) and weight loss (due to the corrosion of copper) data have been obtained in this study for 36 hour exposures at RH ranging from*

25 to 75%.

Task 3: Repeated exposures were performed to determine the cumulative effect in terms of weight change. Exposures at 220 ppm PH₃ were carried out on copper samples for four periods of 46 hours at both 25 and 75% RH followed by 8 days of aging at 25 and 75% RH.

Results: *In all cases at this concentration, weight changes were additive with each additional cycle. The lower RH showed a higher weight gain than the higher.*

Task 4: Forced failures of electrical components were attempted to verify possible failure mechanisms.

Results: *Forced failures of computer equipment were observed first hand at high concentrations of PH₃. Circuits could be disrupted at high concentrations of PH₃. High contact resistance due to the build-up of non-conducting surface film could be achieved at high concentrations of PH₃.*

Observation by Mueller:

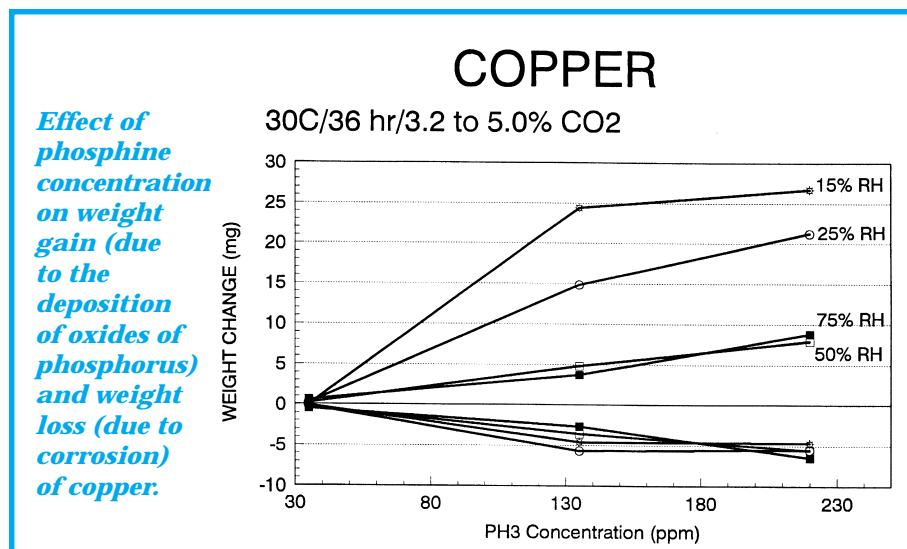
Throughout this study one important fact continued to repeat itself; despite humidity or CO₂ levels, phosphine at low concentrations caused minimum corrosion. A

concentration of 85 ppm of PH₃ showed little to no weight gain or weight loss. Another important fact is that 85 ppm of PH₃ is adequate to kill all stages of insect life when the temperature is inflated to 35°C for 24-36 hours. The combination of CO₂, heat and low levels of phosphine is a combination that could replace methyl bromide without the harmful side effects of corrosion to copper in a food plant.

Acknowledgement: *Dr. Bob Brigham, a retired metallurgist from CAN-MET, generously took two years of his time to complete this important phosphine study in Ottawa. If phosphine is to be a viable alternative to methyl bromide, questions about corrosion needed to be addressed in a scientific way. A big thank you should also go out to the many supporters of this project. This project has been conducted under the auspices of the Canada/U.S. Working Group on Methyl Bromide Alternatives under the direction of Sheila Jones.*



For a complete transcript of this study along with many data charts, look up www.insectslimited.com.



R E S E A R C H

New Phosphine Label



By John Mueller

On October 20, 1998 the U.S. Environmental Protection Agency (EPA) issued a Registration Eligibility Document (RED) for the fumigant phosphine. In this document the EPA proposed changes for 15 different items for a future revised label. These proposed changes are called Risk Mitigation Measures (RMMs). Let's focus on those RMMs that will impact our industry the most and provide a perspective on how these label changes will affect our industry.

Many of you may be well versed with these proposals (Issues 52-53) and if you are not, log on to our web site www.insectslimited.com. If you would like to see corresponding Phosphine Coalition (over 130 industry representatives challenging these proposals for the past 16 months) responses log on to www.grainnet.com.

Any time new labeling is written (remember the label is the law—federal law), interpretation is critical. After attending Phosphine Coalition Meetings in Washington and reading and rereading the final proposed label changes, here are some concerns that you should be aware of:

RMM #1

Notification of Authorities and On-Site Workers

Concern: Who is an appropriate on-site worker? This statement leaves the licensed applicator open for liable. Anyone near the fumigation

with a grievance or alleged exposure who was not "appropriate" could bring up a liability issue.

RMM #3

Prohibit Aeration of Railcars, Railroad Boxcars, Containers, and Other Vehicles En-Route

Concern: A copy of the Applicators Manual from the specific product you are using must be sent in advance or along with the railcar being treated. Sending this manual by mail is best. Along with this manual you should send the MSDS, any other safety information, and a letter strongly encouraging the consignee to license all personnel receiving rail cars. The new labeling requires a *trained employee* to perform the aeration process.

New labeling will no longer indicate a 48-hour ventilation period. Instead, labeling will read "*aerate the railcar and verify that it contains no more than 0.3 ppm hydrogen phosphide.*" This is an important change because many times wheat being fumigated under cold conditions has retained phosphine gas concentrations over 0.3 after lengthy aeration. Be sure to check the PH_3 concentration of the interior of the grain mass before releasing the railcars—it is a Department of Transportation and soon to be EPA label violation to send railcars in-transit with phosphine levels above 0.3 ppm without placards.

RMM #4

Placarding Fumigated Structures, Containers, and Vehicles

Concern: According to this, *licensed applicators* must placard the building and you must use placards made of "*substantial material* that can withstand adverse weather conditions." What are adverse weather conditions for a railcar traveling down the tracks

in a windy thunderstorm?

RMM #5

Establish an Incident Reporting Program

Concern: **All accidents** involving exposure to phosphine must be reported to the manufacturer of the phosphine product you used immediately or you will be subject to label and federal code violations.

Report all thefts of phosphine products immediately to the manufacturer.

RMM #8

Establish 500-foot Buffer Zone and Restricted Area Around All Fumigated Structures

Concern: A Fumigation Management Plan was agreed on instead of a 500-foot buffer zone. Fumigation Management Plan will be referred to as the acronym FMP. You may want to put this acronym in your permanent vocabulary. The Fumigation Management Plan or FMP effects RMM #1, #9, #10, #12, and #14.

FMP forces all phosphine users to administer **situational analysis**. FMP should be the end of generalized dosing and generalized application methodology. We see people over and over again using the same dosage rate and the same application methods without recognizing the ever-changing fumigation conditions of the moment.

Changing needs such as: weather, type of structure, tightness of structure, temperature, thermal dynamic, non-target structures, options in application methods, leak testing, efficacy monitoring, risk assessment and worst case scenario, and on and on... "**Nothing is consistent about fumigation accept variability.**"

—continued on page 6

Meeting of the Parties in China



Xie Zhenhua and David Mueller in Beijing.

“This exhibition will not only provide an opportunity for domestic and overseas exhibitors to exchange their views and learn from each other. It will also improve the mutual understanding between different countries and enhance co-operation on ozone protection. The event is aimed at pursuing and introducing the most advanced ozone friendly technologies and products.”



Xie Zhenhua (speaking), minister of State Environmental Protection Administration of China and Shafqat Kakahel (left) deputy executive of the United Nations Environment Programme open the International Exhibition on Ozone Friendly Technologies and products in Beijing concurrent to the 11th Meeting of the Parties to the Montreal Protocol November 29-December 3, 1999. They urged all governments and businesses to continue their ozone-protection efforts.

New Phosphine Label

(continued from page 5)

RMM # 9

Institute More Thorough Monitoring Around Commodity

Concern: Gas concentration monitoring will be necessary over a larger area and detailed in the FMP.

Through the evaluation process of this RMM we must question the credibility of Electro-chemical phosphine monitors.

RMM # 14

Monitoring Methods to Minimize Exposure.

Concern: An *Industry Hygiene Monitoring Log* must be at each site where phosphine exposures **may** occur. This is any site where phosphine is used. Determining what gets written in this log could present problems. Here is another situation where an employee with a grievance or an over reactive worker can litter a facilities record with

claims of exposure.

RMM # 15

Establish and Define Application Exposure Limits for the Label

Concern: On this issue the Phosphine Coalition is asking EPA's Office of Pesticide Programs (OPP) to work with the Phosphine Coalition to design, conduct and draw conclusions from additional animal studies to establish the final limit for phosphine. *In the meantime*, the Phosphine Coalition is asking EPA-OPP to allow 0.3 ppm to remain until this issue is resolved.

In summary, although the new phosphine labeling proposals are not final, it appears that all label changes are workable (provided we end up with a 0.3ppm TWA). Does this Phosphine RED significantly increase the safety of Applicators, Workers, and Bystanders? In my view—NO. The outcome of this

RED has extended accountability and liability to phosphine applicators—farmers, grain handlers, millers, food processors, and professional fumigators taking liability off the manufacturers. These 15 issues do increase safety awareness and the FMP, if designed properly, will produce better fumigations.

It is important for everyone to recognize those who fought to keep phosphine over the last year and four months: The tobacco industry has taken the lion's share of the financial burden while Degesch America, Inc. provided an excellent Washington DC consultant (Daniel M. Barolo) and countless hours of steady attention. The Farm Bureau Federation (Adam Sharp), GEAPS, National Grain and Feed Assoc., North American Millers Assoc. and many others including Fumigation Service & Supply, Inc. contributed money and time and thought to this important cause.

Montreal Protocol

By David Mueller

Every two years representatives of over 180 countries meet to advance the international treaty on environmental protection called the Montreal Protocol. The 11th Meeting of the Parties that signed the Montreal Protocol took place November 29-December 3 in Beijing. Over 1,000 representatives from some 180 countries and organizations participated in this world forum.

The Montreal Protocol represents the first time this world has sat down and discussed its common environmental problem that affected all of them because the ozone layer knows no boundaries. Future environmental protocols, like that in Kyoto (greenhouse gases), have followed the blueprint set down by the Montreal Protocol.

The Montreal Protocol is working. Since scientists first discovered the thinning of the protective ozone layer that envelopes our planet in the mid-1970's over 75% of all ozone depleting substances (chlorine and bromine compounds) have been phased out. Most of this was in the refrigerant industries where major conversions of chlorine based chemicals were replaced permanently in air conditioners and refrigerators. This was completed by July 1, 1999.

Now the focus of this Montreal Protocol meeting is on the more difficult question of how to phase out methyl bromide. With over 100 labeled applications and no real way to permanently convert all uses, methyl bromide will be "center stage" for this policy making group and its many scientific, technical committees, and experts. Over 200 projects are being funded by the Montreal Protocol in developing countries to replace methyl bromide

for soil, post-harvest, and storage applications.

Imagine a developing country that has found a way to grow more food on worn out soil full of weeds, pathogens, nematodes and insect problems only to have some international group ask you to not use this "magic" chemical anymore. The United Nations, its funds, and its reputation have found a way to work with developing countries to solve this problem. Many developing countries are phasing out methyl bromide earlier than first world countries because of this U.N. encouragement.



Dr. Tom Bachelor, Co-chairman of the Technical Options and Assessment Panel to the Montreal Protocol, presents recommendations of his committee.

The important debate at this meeting in Beijing was not if methyl bromide should be phased out, but how to eliminate more of the exempted uses. Pre-shipment is the treatment of commodities leaving a country or area that may have a pest not found in other countries. A rice purchaser in the US may insist that a pre-shipment application of methyl bromide be applied on all rice prior to being loaded. This

recommendation will be limited to "official" requests within 21 days of shipping.

Quarantine treatments of methyl bromide are exempt because of the need for such a complete eradication of pests like Med. flies and Asian longhorn beetles. Many fumigations with methyl bromide for quarantine could be replaced by alternatives or recycle/recovery methods if restrictions or caps were placed on quarantine exempted uses of methyl bromide.

It was estimated in Beijing that 20-24% of all methyl bromide used for post-harvest is for pre-shipment or quarantine. Much of this is used in developing countries that increased from 18% to 25% of all methyl bromide used in recent years. The 2005 deadline for developed countries and the 2015 deadline for production and shipment of methyl bromide to the developing countries were not changed at this meeting. No new dates were discussed. The real push in the future is encouraging alternatives by funding projects in developing countries.

I predict that countries like Jamaica, Vietnam, Malaysia, Cote d'Ivories, Philippines, Thailand I have worked with recently for the United Nations will be the breeding grounds for new alternatives that can be taken back to countries like the U.S., Europe, Australia and Japan to wait on the desk on some Environmental Protection Agency to hopefully become registered by January 1, 2005. We, the largest users of methyl bromide in the world, can then hopefully comply with our obligations under this international treaty called the Montreal Protocol.

Personal Note:

This was the third Meeting of the Parties in which I have participated. I get "Goosebumps" when I observe the process of international negotiation at these meetings.

Freez'em or Fry'em

A two-day workshop on cold and heat treatments was held November 3-4 in Westfield, Indiana. Excellent speakers offered advanced knowledge in this rapidly growing technology for alternatives to methyl bromide. Topics included: The effects of heat and cold on biology of insects; Manipulating stored food insects with temperature; Development and implementation of a heat program; So you want to do a heat treatment?; Perspectives from Europe; Cold temperature treatment in a refrigerated trailer; Monitoring and integrating heat with other pest management strategies; Heat, CO₂ and phosphine treatments; Panel discussion from experts.

The hands-on workshop included demonstrations from commercial heating and cooling companies in the food industry, research demonstration on the chilling of various density of commodities, and an on-site heat treatment tour of a large food plant.



Alain Van Ryckehem, Technical Director for Insects Limited, Inc. demonstrates new equipment during hands-on workshop.



This sold out workshop is an example of future skill-specific training that Insects Limited, Inc. can offer. People traveled from as far away as Austria, Germany, Israel, Mexico and The Netherlands to attend this alternative workshop. If there is more interest, this workshop will be offered again in the future. Please contact our office if you would like to attend.

Start with the Insect First

INSECT IDENTIFICATION WORKSHOP

Urban Insect Identification

Basic Level / March 8, 2000

Upon completion of this workshop the student is expected to be able to identify more than 75 commonly encountered insects in the structural pest control field. Emphasis will be on the identification features but will include basic biology, conditions conducive to infestations, damage and detection, collecting, and preserving field-collected insects. Course materials include ID aids for on the job use. Quizzes will be used to reinforce ID features.



Topics Include: Insect anatomy, Cockroaches, Stored food insects, Fabric pests, Flies, Ants, Ectoparasites, Stinging insects, Wood-boring insects, Inspections, Collecting/preserving.

Instructors: Alain Van Ryckeghem, David Mueller.

Stored Food Insect Identification

Advanced Level / March 9, 2000



Upon completion of this workshop the student will be able to use a variety of tools to identify a selection of common and lesser known stored food insects.

Emphasis will be on the use of dichotomous keys, and microscopic work to identify adult and immature stages of food infesting moths and beetles, insect

damage to food and packaging, and identify insects from fragments. Course materials will include a 2 volume USDA publication on Insects in Stored Food, which is currently out of print and specimen handling tools. Insects or damage from your site for ID are welcomed!

Topics Include: Morphology, Keys to identification, Entomology tools, Fragment analysis, Collection methods, Monitoring tools, Pheromone trapping, Analysis of insect damage.

Instructors: Alain Van Ryckeghem, David Mueller.

Insect Resistant Packaging

March 15, 2000

This workshop will focus on the characteristics of packaging that are used for food storage, and resale. The advantages and disadvantages of package and material design and the subsequent susceptibility to insect attack will be demonstrated through presentation, and display material. Developments in packaging research will be discussed. The ability to damage packaging by various species of stored food insects will be demonstrated. Techniques for examining and analyzing packaging suspected of having been attacked by stored food insects will be shown. Prevention is the future of insect control.



Instructors: Mike Mullens, USDA; Curt Hale, General Mills; Jade Vardeman, KSU; Jan Crum, Exxon-Mobil; Alain Van Ryckeghem.

Registration

- Urban Insect Identification
\$350.00
March 8, 2000 (*Basic level*)
- Stored Food Insect
Identification \$395.00
March 9, 2000 (*Advanced Level*)
- Insect Resistant Packaging
\$495.00 March 15, 2000

Total US \$ _____

*Make checks payable to Insects Limited Inc.
Group Discounts are available.*

Please copy and fill out for
each registrant and fax to
1-317-867-5757

| | |
|---|-------------|
| Name _____ | |
| Company _____ | |
| Address _____ | |
| City _____ | State _____ |
| Country _____ | Code _____ |
| Phone _____ | |
| Fax _____ | |
| Email _____ | |
| <input type="checkbox"/> Visa <input type="checkbox"/> MasterCard <input type="checkbox"/> American Express | |
| Card No. _____ | |
| Expiration _____ | |
| Name on Card _____ | |
| Signature _____ | |

Confirmation: A letter will be sent to each person confirming his or her registration. Your confirmation letter will outline the details for the workshop. Bring your confirmation letter to the registration desk upon arrival.

Location: All classes will occur in the classroom of Insects Limited Inc. at Westfield, Indiana. 1-317-896-9300

Accommodations: The closest hotel available for convenience is the Best Western Westfield Inn at US Highway 31 and US Highway 32. Please call 800-528-1234 to reserve rooms.

One of the world's biggest mysteries is...



By Brian Simons, FSS Grain Manager

Popcorn is grown mostly in Indiana, Illinois, Ohio, Nebraska, Kansas, and the newest area found to grow a good popcorn crop is Argentina. The popcorn industry handles its product with the utmost level of care and safety because—popcorn is an agricultural commodity with very few steps from farm to the end consumer. As the rest of the world catches on to this favorite American snack we will all see more of those odd looking short corn fields.

Here is a list of popcorn facts that may be interesting and surprising to you:

- Today, Americans eat over one billion pounds of popcorn a year.
- Over 70 percent of popcorn is consumed in bulk, microwaveable, and carmel popcorn.
- Over 30 percent of popcorn is consumed in movie theaters!
- Microwave popcorn has produced 240 million dollars in annual U.S. sales in the 1990s.
- Americans consume 17.3 billion quarts of popped popcorn each year and the average American eats 68 quarts.

Interesting Popcorn Websites:

- Popcorn.org
- PopcornLovers.com
- JollyTime.com

Popcorn is an interesting challenge for pest managers. You start with a commodity straight out of the field and with only a few steps you have a finished food product requiring zero insect tolerance. The Indianmeal moth is the target pest for popcorn. Advanced pest management is a high priority with the popcorn industry.

Super Bowl Numbers



800 million: Number of people who will watch the Super Bowl on TV worldwide.

8 million: Pounds of popcorn it is estimated that fans will eat watching the Super Bowl.

345: Weight in pounds, of the defensive tackle Gilbert Brown of the Green Bay Packers (1996-98)

24: Languages in which the game will be broadcast, including Icelandic and Turkish.

72,000: Number of fans who will fill the seats of the Georgia Dome for Super Bowl XXXIV.

3,500: Number of halftime-show performers at the Super Bowl.

QUOTABLE QUOTES

“The only thing worse than training employees and having them leave, is not to train them and have them stay.”

Mike Stevens

“Nothing is consistent about fumigation accept variability.”

John B. Mueller

“Does every ear of corn have an even or odd number of rows of kernels?” [even]

USA Today

“How many acres is the average farm in the U.S.?” [467]

USA Today

A Professor's Prayer: “Heavenly Father, we invoke your blessing at this time. At a moment in history when the food supply of the world is important and in the future will be critical, we ask special support be given those attending this timely conference. May their insight and decisions lead to research and actions for the good of all Mankind. Bless this food to our use and us to your service. Amen.”

Dr. John V. Osmun
Professor at Purdue
University Stored
Product Conference,
09.30.99

“We have a policy in our company, sweep it and paint it.”

Ronnie Cline
Southern States
Park City, Kentucky

“We don't want that meat with our bread.”

Company policy for
receiving infested wheat
at Sanford Milling
Company in North
Carolina.

“75% of what you will need to know by the year 2010 has not yet been yet discovered or invented. 10% of what you know now will be able to be used in 2010.”

Superintendent Keen
Westfield Schools

NEW ON THE WEB

Bookmark this...

In an effort to give our customers access to the most up-to-date scientific data available, www.insectslimited.com has recently added several scientific reports performed under the supervision of the Canadian Government. These reports give in-depth insight into the hot topics of **Phosphine Corrosion** and **Methyl Bromide Alternatives**. Add these to the existing reports of **Cylinderized Phosphine**, **ECO₂FUME Gaseous Fumigant** and the **Regulatory Status of Phosphine** and you have one of the best references of fumigants on the web. To view these interesting scientific reports, simply visit www.insectslimited.com and click on the Fumigation Service & Supply web site and "bookmark" it for future retrieval. We've also added an "Interactive Soapbox" in keeping with the popular "Dave's Soapbox." In this forum, anyone can climb on his/her soapbox and express feelings and ideas on the soapbox topic of the day. **Visit us today and let us help serve you better!**



Pat Kelley, Web Master

Sites Found at www.insectslimited.com:

- New Insects Limited Catalog
- Bookstore
- New Soapbox
- Pest Identification & Information
- Pheromones for Use in Your Home
- Health Food Store Insect Problems
- Seed and Popcorn Industry Outline
- How To Use Pheromones
- Pest Monitoring Software
- Cigarette Beetle Study
- Controlling Insects Without Pesticides
- Fumigants & Pheromones Newsletters
- Topics on Phosphine & Methyl Bromide Alternatives
- Phosphine Corrosion Study (New!)
- Canadian Study on Methyl Bromide Alternatives
- Cylinderized Phosphines Effect on Stored Product Pests
- EPA's Proposed RMM's for Phosphine
- Meet the FSS Staff (New!)
- Alternatives to Traditional Fumigation
- Seed and Popcorn Industry Outline
- New Job Opportunities with FSS (New!)
- 2000 Training Conferences (New!)
- New Pantry Patrol Trap
- Our Favorite Hot Links
- Pet Store Insect Problems
- Food Industry Pests
- Museum Industry Pests
- Technical Support
- Pheromone Tips
- MSDS Sheets
- Fumigator's Tips

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Our World . . .

If the Earth's population were shrunk to a village of 100 people—57 would be Asian, 21 European, 14 from the Western Hemisphere, and 8 African;

- 70 would be people of color;
- 70 would not be of the Christian faith;
- 70 would be unable to read;
- 50 would suffer from malnutrition;
- 80 would live in substandard housing;
- 1 would have a college education; and
- 6 people from the U.S. would own half the world's wealth.

Source: CSRESS

Job Opportunities

Immediate Opening...

Food Plant Pest

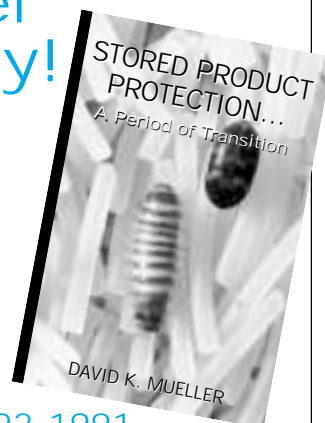
Management Specialist:

Fumigation Service & Supply, Inc. is seeking individuals to work full time as food sanitation specialists. A good understanding of Good Manufacturing Practices, AIB audits, entomology pest biology, and 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 who 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 46074, 317 867-5757, email at: insectltd@aol.com.

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■ **January 10-14, 2000**

Purdue Pest Control Conference, West Lafayette, IN*

■ **January 17-19, 2000**

Indiana Agri Business Expo, Indianapolis Convention Center

■ **February 3, 2000**

McCall Services, Food Plant Pest Management, Jacksonville, FL,**

■ **February 7-9, 2000**

Food Processing Sanitation and Pest Management, Cornell University, Rochester, NY **

■ **February 20-22, 2000**

Grain & Feed Asso. of Illinois, Crowne Plaza, Springfield, IL*

■ **February 20-22, 2000**

Kentucky Grain & Feed Assoc., Galt House, Louisville, KY*

■ **February 26-29, 2000**

Grain Elevator & Processing Society (GEAPS), Kansas City, MO*

■ **February 28, 2000**

NPCA Legislative Day, Washington DC*

■ **February 29, 2000**

Indiana Fumigation Certification Training, West Lafayette, IN**

■ **March 8, 2000**

Start with the Insect First, Basic Level Workshop, Westfield, IN***

■ **March 9, 2000**

Start with the Insect First, Advanced Level Workshop, Westfield, IN***

■ **March 15, 2000**

Start with the Insect First, Insect Resistant Packaging, Westfield, IN***

■ **March 20, 2000**

Pennsylvania Pest Control Assoc., 17th Annual Training Seminar, Pittston, PA

■ **March 23-24, 2000**

First Pest Management Canada 2000, Toronto, Canada**

■ **March 28, 2000**

Acheta's Pest Ventures, England**

■ **April 2-4, 2000**

NPCA's Management Institute, Cambridge, MA*

■ **May 6-10, 2000**

Association of Operative Millers (AOM), Kansas City, MO*

■ **May 11-13, 2000**

PEST-EX, Stuttgart, Germany

■ **May 17-19, 2000**

PESTA 2000, Al-Khobar, Kingdom of Saudi Arabia

■ **June 21-23, 2000**

2nd International Pest Control Convention & Exhibition in Singapore**

■ **October 3-5, 2000**

Kentucky Pest Control Meeting, Lexington, KY**

■ **October 29-November 3, 2000**

International Conference on Controlled Atmosphere and Fumigation in Stored Products (CAF), Fresno, CA*

■ **September 2-6, 2001**

3rd European Vertebrate Pest Management Conference, Kibbutz Ma'le Hachamisha, Israel, www.orta.com

DENOTES:

*attending

**invited speaker

***organizer

The Big Purge:

Each year we ask you to respond if you would like to continue receiving this newsletter. Thank you to the many who filled out your "Response Cards." If you *didn't* respond in Issue 53 you may be purged from the mailing list if you do not respond *immediately*.

Contact insectsltd@aol.com
or tel. 1-317-896-9300
or fax 1-317-867-5757
if you want to continue
receiving this newsletter.
From return card, Issue
53 we heard...

Last Call!

Dear D.K. Mueller!
Thank you very much for your sending to me
the Fumigants & Pheromones Newsletter. This
information is too important for me as well
as my colleagues to miss.

Sincerely,
G. Zakladny, Professor
Russian Research Institute
for Grain and Grain Products

THE 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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