Methyl Bromide...  
chapter and verse

Seven-and-a-half years ago the stored-product community and fresh fruit/vegetable industries lost ethylene dibromide (EDB) to the battleground of regulatory scrutiny. It is proposed that the last pound of methyl bromide will be used 7 1/2 years from now. Why?

The Problem

During the 1980's we lost over 80% of our fumigants in this country. The list includes such notable gasses as EDB, carbon tetrachloride, calcium cyanide, hydrogen cyanide, ethylene dichloride, methylene chloride, carboxide, and usages of chloropicrin.

The survivors of this bloodletting are metal phosphides (Phostoxin® fumigants), methyl bromide (Meth-O-Gas®), sulfuryl fluoride (Vikane®), carbon dioxide (inert gas), and limited non-food applications of chloropicrin (tear gas).

History

In the 1970's the U.S. Congress was hard pressed by the public to determine the cause of an ever growing problem with human health called cancer. This unknown caused near panic in our society. The hysteria can be compared to the fearful AIDS epidemic of this decade. The investigation into the cause of cancer focused on our diet. Congress mandated that all pesticides added to the food supply be scrutinized as fast and thoroughly as possible.

The EPA was given the task of searching for the 'bad apples' in the pesticide industry that may cause adverse effects on the public. The call went out throughout the land: "All pesticides added to the food chain are guilty until proven innocent." To prove their innocence cost money...sometimes millions. The burden of responsibility fell on the registrants (manufacturers). Many of these products were registered in the United States when less data was needed to bring a product to the marketplace. The data gaps were often wide. New technologies and better analytical equipment had become available.

If the product didn't generate in profit the millions of dollars necessary to collect the data, a decision was often made to drop the labels. Especially when the patents for these products had expired and the profit margins were sagging (ie. DDT).

Continued on next page
**Current Testing**
According to James A. Blair, Director of Government Relations, Miller’s National Federation, “The EPA is reviewing those chemicals used on food products on an individual basis to determine whether continued approval is warranted. For the reregistration of methyl bromide, EPA is requiring both residue testing and studies to determine the degree of toxicological (poisonous) effect. The registrants (manufacturers) of methyl bromide indicate the major use of the chemical is for soil fumigation with only about 5% sold for post-harvest uses including mill fumigations.”

It was estimated by Fred Whitford, Coordinator of the Purdue Pesticide Programs, that there was 350,000 pounds of methyl bromide used in Indiana alone last year. Of this total, 85% was used in soil fumigations, 5% was used for structural fumigations, 5% was used for commodity fumigations and 5% was used for space fumigations in warehouses and food plants.

Individual commodity groups will carry out the residue testing required for their commodity (ie. coffee, spices, flour, etc.).

EPA is requiring that the toxicological studies be done in phases and they will review each phase before proceeding to the next. This could take 3 to 4 years and cost 1 to 3 million dollars.

**In Short**
The fumigant, methyl bromide, is having no problems with the testing portion of the label registration process. It is having problems collecting the millions of dollars necessary to fund these studies. It is proposed that methyl bromide be used until the year 2000, and at that time it not be manufactured in the world.

This allows about seven years to find alternatives for its uses. There will be a list of emergency uses that will continue to be allowed temporarily (ie. quarantine) until adequate methods become available. It looks like it will not be a phase out situation, but a targeted future stop-use situation for the year 2000.

**Methyl Bromide and the Ozone**
Let’s make this perfectly clear...

The problems that face methyl bromide at this point in time are not caused by toxicity tests or that it may be a cancer causing agent. It is not under Special Review from the EPA. The shocking news that methyl bromide may be taken off the market is that it has been shown to be an aggressive depleter of ozone in the Earth’s Stratosphere.

Much like the other unknowns in life (ie. cancer), the fear of damage to earth’s protective ozone layer is rapidly becoming front page headlines in newspapers throughout the world on a daily basis. There is much we don’t know yet about the ozone. The next five years—or even the next NASA space flight—may help answer some of those questions.

**In the meantime... label changes**

In the next two years, the following label changes should occur with methyl bromide (check each label to make sure):

1. New 16 - 24 hour exposure time vs. old 24 hour requirement.
2. Better directions for vehicle fumigations.
3. More thorough directions for stored grain applications.
4. Precautionary statements for seeds; moisture content and duration.
5. Precautionary statement for liquid methyl bromide on flour.
6. Addition of oak logs for quarantine.

**Possible Label Changes**

- 1. Salmonella; 24-48 hour exposure @ 2-4 lbs./ 1000 ft³.
- 2. Expanded uses of Meth-O-Gas for the food industry.
- 3. Expanded uses for structural fumigations for termites.
- 4. Uses for beekeeping equipment.
- 5. Expanded uses for burrowing animals.

**The Future of Methyl Bromide**

As cooler heads prevail over the subject of ozone depletion and a real impact assessment is collected on this fumigant, one of two things will happen: 1. Just like chlorofluorocarbons (CFC), the industry is concerned that methyl bromide might harm the ozone layer which surrounds the earth and protects us from harmful ultraviolet radiation and will start phasing out their uses to prevent bad publicity. Heat sterilization in combination with carbon dioxide (and possibly reduced dosages of phosphine) will be researched as an alternative. Phosphine has, can, and will be used where methyl bromide was thought to be the only choice.

Some of the disadvantages of phosphine gas will be researched and methods will be developed to minimize them.

2. A new generation of pest management specialists will be trained at our universities, at our continued education seminars, and by themselves to be true believers in IPM: not the environmentalist’s extremism that is built on non-science, but the young breed of practitioners that truly believe that controlling pests doesn’t start with a compression sprayer, a fumigant or even a least-toxic insecticide. IPM is not a product but a philosophy of how to solve a problem. It starts with knowledge of the pest and goes on to create an environment in which the pest can neither reproduce nor survive.

**Conclusion**

A lot can happen in the next seven-and-a-half years. Alternatives to methyl bromide can be tested. Delays and plea bargaining are the norm more than not. Our industry is somewhat flexible — the EPA...
banned DDT and we adapted. It banned EDB and we adapted and we will also adapt if we lose methyl bromide.

**Possibilities to replace its uses:** good, sound, long-term integrated pest management practices from the harvested raw commodity to the food processor to the homeowner's pantry. This will include better sanitation, IGR's, chitin inhibitors, containerized baits, improved insect light traps, genetic manipulation, mating disruption techniques, mass trapping, heat sterilization, inert gases, parasitoids and predators, the dissemination of host specific pathogens and/or other bio-rational pest control methods are options that everyone should consider when designing a control program. - David K. Mueller, B.C.E.

### Politics and Methyl Bromide

**Who pushed the panic button on ozone depletion?**

So who did push the panic button, and why? The Wall Street Journal has suggested “setting science policy via press release” was a NASA strategy to put the agency on “the upside of the funding cycle.” Some think President Bush may have forced the announcement so he would look good in the upcoming Earth Summit in Rio de Janeiro in June.

Others suggest that Mr. Greenjeans himself; Sen Albert Gore, Jr., D-Tenn., who has staked his presidential hopes on being the country’s most environmentally aware politician, was the ‘Deep Throat’.

“The ‘environmental candidate’ from Tennessee, Sen. Gore was behind the premature news release according to Alston Chase, editorial columnist for Universal Press Syndicate.

The senator - who chairs the subcommittee that supervises NASA - pressured the agency to issue a premature proclamation in order to boost his dark-horse presidential bid. He is planning on running for President as the ‘green’ candidate.

Mr. Alston Chase stated in his recent editorial, “Influencing scientific research to manipulate public opinion is a way of life for bureaucrats and congressmen. Feeding at the public trough, researchers are all too willing to oblige. Science has become the handmaiden of environmental politics. This corrupt misalliance endangers the nation’s future and is a reason for all of us to be skeptical of ‘scientific’ claims generated by press release.”

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**Fax It**

**Who invented the fax machine and why?**

The fax machine has allowed us to send exact photographic messages around the world in seconds... inexpensively. It is an essential part of our daily business procedure.

Before the Fax machine was invented by a Japanese firm, we used the ol’ Telex® machine. It cabled messages in the English language only.

**Imagine this situation:**

A Japanese businessman wanted to send a printed message from Tokyo to a colleague in Osaka. He would write a letter in Japanese, someone would translate it into English, then send a Telex in English to his colleague who would receive the message (quickly) in English only to be translated back into Japanese. The subtleties and nuances in their language were often misinterpreted.

A need for a better way to send a message led to the invention of the Fax machine. (contributed by Marcel Wolff, Chemtech b.v.)

**Editor's Note:** The next time you have an idea of how to solve a problem for our industry, don't underestimate its ability to be the next Fax machine.

### Modified Fumigation Techniques (MFT)

**by John B. Mueller**

**What would we do without methyl bromide and/or phosphine?**

In our rapidly changing world of environmental concerns, we are finding ourselves having to look for alternatives to conventional methods of controlling insect pests.

What are some options? Fumigation Service & Supply, Inc. has been exploring Modified Fumigation Techniques (MFT) for the past two years and have accumulated experience in this area. The different MFT's available are:

I. Carbon Dioxide (CO₂)
   - CO₂ with Methyl Bromide (CH₃Br)
II. Nitrogen (N₂)
   - Nitrogen with Methyl Bromide
   - Nitrogen with Phosphine
III. Heat Sterilization
   - Heat Sterilization with Carbon Dioxide
IV. Phosphine, Carbon Dioxide and Heat

**Which modified fumigation technique is best for your facility?**

**Inert Gas**

(carbon dioxide and nitrogen)

Inert gas has been given a great deal of attention in the past ten years. The common misconception about the practical use of product is its primary mode of action to killing insects: desiccation (drying out). Only when extremely high concentrations of inert gases can be maintained and contained, will asphyxiation occur. A sealed tight structure is necessary for the effective use of these gasses. The second consideration is the time it takes to treat with an inert gas by itself. The final basic consideration is the cumbersome amount of gas it takes to treat and maintain in a facility. This also

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Fumigation Service & Supply, Inc. treating a large commercial bakery with a modified fumigation technique.
includes the tremendous amount of equipment needed. These gas mixtures may offer a more practical approach to the potential of inert gas applications in your facility. In this method, the inert gas acts as a synergist, speeding the respiration of the target pest resulting in a more rapid and complete ‘kill’. In addition, inert gasses used properly can curb the detrimental side effects of conventional fumigants (ie. odor, corrosion, reduced germination). The implementation of these techniques will provide a transitional period in determining what method best fits your facility.

**Four things to consider with Inert Gasses**
1. Tightness of structure
2. Length of treatment
3. Large amount of equipment
4. Large amount of inert gas required

Heat sterilization is the key to success when using carbon dioxide, nitrogen, and/or heat. (photo courtesy of Tanaco-Partners)

**Heat Sterilization**
*(superheating)*

Heat sterilization in food processing plants has been around for more than fifty years and has gained a great deal of notoriety in recent years. Heat is an excellent method of pest elimination because of its safety and non-residual capacities. Superheating is accomplished with the use of unit heaters in conjunction with established heating system. The effectiveness of heat lies in the fact that insects are not capable of cooling themselves. To maintain a comfortable temperature, the insect must seek out optimum conditions.

**Disadvantages**

Heat is not without fault. It is not for all types of construction or pest problems. Loosely constructed metal buildings are an example of structures unsuitable for heat sterilization. Heat is questionable on cockroaches because of their ability to run to cracks, vents and even the roof. Also there is an issue of equipment stress which must be addressed very carefully.

All-in-all, in today’s climate of environmental concerns and the threat of more pesticide eliminations, modified fumigation techniques have moved from scientific papers to practical applications. The combination of one or more of these methods offers the potential to replace fumigants we use today.

Fumigation Service & Supply, Inc. can provide the service and knowledge to implement a MFT program at your facility. For more information on this technology contact John Mueller at (317) 846-5444.

Monitoring is the key to success when using carbon dioxide, nitrogen, and/or heat. (photo courtesy of Tanaco-Partners)

Meet

**Russell Edwards**

Insects Limited, Inc., an Indianapolis based pest management company specializing in least-toxic insect control for food, grain, and pest control industries, has named Russell S. Edwards to the new position of manager.

Edwards, a 17-year veteran in the fields of biology, agricultural sales, and entomology will head up the firm’s sales of least-toxic IPM programs to the grocery store, food service, warehouse and pharmaceutical industries, and to the expansion of existing stored-product IPM programs to those firms storing grain, fruits and vegetables.

A native of Renssleear, Indiana, Russell attended Millikin University and graduated from Indiana University with a degree in Biology. He is currently enrolled part-time at Purdue University where he is pursuing a degree in Entomology.

Russell Edwards said, “I hope to get a chance to meet as many people as possible in the near future. Please feel free to call on me if I can help solve a problem your company may be experiencing in pest management.”

**Dave's Soapbox**

for what it's worth...

The world is getting smaller.

Three things will help our industry to survive and prosper: 1. Education
2. Education 3. Education.

The world is changing at a blazing pace. The information and knowledge that is used in one country will be disseminated through borders and continents as easily as a message thru a fax machine.

Europe is open! In February I had the privilege to travel in the New European Community (EC). Travelers can move through borders without stopping to show passports. These 12 countries have a combined population of over 360 million people (consumers).

The New Germany is a very strong country. As they combine the talents of the Old GDR and the other Eastern European countries, they have the potential to dominate the European economy. They have taken on the huge responsibility to help re-build the infrastructure of a group of countries that are starving for stability and not necessarily freedom. The cost is staggering, but their investments should reap rewards in the future. The Germans are aggressive, sports-oriented, technology driven people with a quest for a superior quality of life.

I attended a meeting of the Public Health (pest control) Industry of the EC in Amsterdam. The organization is trying to organize the 12 member countries into one voice in order to address their needs and concerns to the EC headquarters in Brussels. They were a sharing group of pest control distributors and very large chemical manufacturers.

The chemical companies in Europe are becoming enormous in size. Hoechst (Germany) has added divisions from ICI (England) and Roussel (France) that will allow them tremendous leverage in the field of worldwide public health.

These large mega-chemical companies (ie. Ciba Geigy, Bayer, Hoechst, Sandoz, etc.) don’t really seem to want to see the philosophy of Integrated Pest Management implemented. Why should they? They make money selling chemicals, not least-toxic pest control or the knowledge to reduce chemical dependence. So they will embrace IPM technology with the same lip service that our country’s government gives to reducing taxes. “It’s what the people want and it is the correct approach...but it doesn’t pay the light bill.”

Future:
As these mega-chemical companies band together, look for a resistance to change. It will be the small niche companies who offer a needed benefit, along with good customer service that will survive and progress. This can only be accomplished by focusing on the three items that bind us together with a common cause in a common language... 1. Education 2. Education 3. Education.

Pheromone Trap Tip
Wiggler are fishing worms but it is also the term used for freshly captured moths and beetles in a pheromone trap.

When examining the pheromone traps to record the number of pest insects captured, take care to notice how many insects still have their antennae moving. These are called ‘wigglers’.

If you check the traps every one to two weeks, you can tell how many of the insects have been captured in the last 24 to 36 hours. If the numbers are high, this could indicate a new generation or a ‘hatch’ taking place. A sudden increase in population growth will alert the pest manager that it is time to react with control methods.

CAF Seminar
The next International Conference on Controlled Atmosphere and Fumigation (CAF) in Grain Storages will be held at the Delta Winnipeg Hotel, Winnipeg, Canada, from Thursday to Saturday, June 11-13, 1992.

Chemical grain fumigants have provided the primary control methodology for insect infestations in bulk stored grain for more than 50 years; however, recent regulatory actions have prevented the continued registration of some post-harvest fumigants and insecticides, and have altered application and degassing procedures of the remaining fumigants. This has stimulated increased interest in the use of controlled atmospheres (CA) as an alternative to conventional chemical treatments. CA technology will play an ever increasing role in the protection of stored agricultural products, especially when "chemical free" treatments are required.

The conference will provide an exceptional opportunity for grain handlers and food processors considering the integration of CA techniques into their pest management strategies to learn about current CA research activities throughout the world. Fumigant marketers and commercial fumigators, and companies who are

Malathion Update
The manufacturing of the insecticide malathion for use on food and grain products stopped April, 1991. The existing product that has been labeled for these uses can continue to be used at this time. Over the course of the next three years, those uses will be phased out.

The Food and Drug Administration (FDA) tests show that more than 20% of all food samples show a presence of malathion. The EPA believes that residues from malathion on wheat make up more than 50% of the so-called Acceptable Daily Intake (ADI) of the chemical. It is also expected that the National Academy of Sciences study on the diets of infants and children, scheduled to be released in 1992, will take a very negative view of malathion residues, particularly on grain products.

James Blair, Director of Government Relations, Miller’s National Federation stated at the AOM meeting in Kansas City, “The study has the potential to cause serious public relations or consumer problems, despite the fact that its use will have been cancelled by that time. The Executive Committee of the Millers’ National Federation passed a resolution discouraging the use of malathion in the wheat foods chain prior to processing and encouraging millers to continue monitoring inbound grain for the presence of malathion residues and reject shipments found to have excessive levels.”

Substitute: Reldan®, Insecto (diatomaceous earth), Beneficial insects, Bacillus thuringiensis (Bt), or combinations of these products.
evaluating the market potential of CA technology will learn about current fumigant research activities throughout the world. 

For more information on this CAF conference, circle #5 or contact Dr. S. Navarro, 919-693-5151.

The Book Store
(a.k.a. Grey Matter Gymnastics)

"Sixty percent of the households in America didn't buy one book last year."

Management of Grain, Bulk Commodities, and Bagged Products


In 200 pages, 29 short chapters, dozens of colored pictures and over a hundred illustrations, this brand new (February 1992) is easy to read. It explains the way to prevent losses in stored products. The book is inexpensive at about $10.00. There were 20,000 copies printed.

This publication was made possible by the efforts of the USDA's Grain Insect Interagency Task Force (GIITF), a committee whose function is to promote good grain quality through policy development and education. The manual was developed to provide information on grain marketing and management practices to growers, handlers, processors, inspectors, and buyers. Clear, concise chapters containing relevant information on the market system and management practices can be used to improve product quality and food safety.

Newcomers to the stored-product industry would greatly benefit by reading and learning what this book has to offer. Standard practices and methods in the grain industry are explained in the beginning of the book. Later in the book there are good guides about progressive techniques in pest management.

Chapter 12, Stored Grain Management Techniques by Ronald Nooyes and Gerrit Guperus of Oklahoma State University and Rick Weinzierl of the University of Illinois is one of the best explanations of how to store grain...in eight pages or less. Following their blueprint would make losses to pests and spoilage minimal.

David K. Mueller, Insects Limited, Inc., wrote Chapter 22 entitled: How to Use Insect Traps in a Warehouse. Mueller stated: "The care that Margi Stone and Gerrit Guperus, OSU, and Vera Krischik, USDA-FGIS took to make this a useful guide for our industry was enormous. They picked people from industry, government, and universities who specialized in some facet of stored-product protection to write chapters. They personally added their knowledge and commitment to this endeavor to blend together a working blueprint for the Management of Grain, Bulk Commodities, and Bagged Products. They should be commended for their effort."

In short, this is not a 'put up on the shelf' hardbacked reference manual, it is an inexpensive, sit down, read, and learn book.

This book can be purchased from The Book Store for $10.00/copy plus $3.50 S/H. Circle #1

Insect and Mite Pests in Food: An Illustrated Key

J. Richard Gorham, Editor

Cost: $65.00 for the two-volume set
Order by circling #2 on the reader response card

"For the first time, the combined expertise of leading specialists in the United States has been marshaled to produce a comprehensive and fully detailed manual for quick and positive identification of more than 600 species of pests encountered throughout the many facets of the food industry. No manual of this kind has ever been published before in the United States..." 

Lloyd Knutson, Director, Biosystematics and Beneficial Insects Institute, ARS, USDA

Precise identification of pests and suspected pests is essential in the food industry. This handbook will increase the efficiency of food inspection not only in the United States but also in other countries.

The manual can be used as a reference tool and/or instructional aid by food inspectors, quarantine officers pest control operators, and others in the food industry field, as well as by scientists.

This publication, presented in two volumes, is devoted to the identification of food-contaminating insects. It provides the user with a rapid and accurate means of identifying more than 600 species of pests encountered throughout the food industry. There are over 2,300 illustrations of both adult and immature stages.

Editor's note: "Dick Gorham has devoted his career to helping guarantee food purity in this country and throughout the world. This two volume set is an enormous effort spanning his career with FDA. Insect and Mite Pests in Food: An Illustrated Key is a must for every food plant because knowing the pest is half-the-battle in controlling it."

Insect Mounts

Insect reference sets are now available from Insects Limited, Inc.

These drymounts are great for training because they are light in weight and don't take up much room. When one sits down to identify a 1/8" long stored-product insect, it helps to have a 'real' specimen with which to compare it.

Twenty of the most popular stored-product insect pests are individually set in a 2" x 2" clear drymount. This enables you to look at the top and bottom of each insect specimen. This set of twenty is stored in a plastic slide holder page which fits in a three ring binder.

The reference mounts include: red flour beetle, confused flour beetle, Indianmeal moth, saw-toothed grain beetle, merchant grain beetle, drugstore beetle, cigarette beetle, 2 spider beetles, the German cockroach, warehouse beetle, black carpet beetle, lesser grain borer, ground beetle, foreign grain beetle, flat grain beetle,
cowpea weevil, granary weevil, and bean weevil.

"Knowing the pest is half the battle in controlling it."
Cost: $87.00/set
Order by circling #3 on the reader response card

Pest Spotlight

In the spring of the year, outdoor Woods cockroaches wander indoors. This insect is often misidentified as one of the urban cockroaches that we dread. Woods cockroaches are usually only occasional invaders of houses and food processing facilities. Woods cockroaches are common in woodpiles and under crawl spaces. The males fly to lights at night and brightly painted white walls. This is a different behavior than the urban cockroach that scurries to a dark crevice when lights are turned on. As man prefers to live in wooded settings and decorate his home with wood mulch and chips, he should recognize that he is offering favorable conditions for these outdoor occasional invaders. The key to pest management is to create an environment in which these pests don’t want to live.

Vector Fly System

The Future in Fly Control is here Today.

The Micro-Gen Equipment Company introduces the latest product in its commitment to high technology solutions for pest control problems...Vector Fly Systems.

This newly developed technology, J-tronics, was developed by the world’s largest private entomological research facility, S.C. Johnson Wax. It effectively traps and kills flying insects, with no chemicals, no “zap” and no contamination, right where you need it most - right where the fly control problems are the worst, right over and around the food handling areas!

How Does It Work?
The J-tronics technology sends a safe, low-voltage pulse through the grid once every eight seconds. Rather than electrocuting and exploding the insect, like traditional insect light traps, this low-voltage pulse disrupts the insect’s nervous system, causing the insect to fly straight down onto the non-toxic adhesive trapping board. Circle #7 for more information.

Collect & Redeem Your Seminar Bucks

Please send me the following:

- Management of Grain, Bulk Commodities, and Bagged Products. Cost $10.00
- Insect and Mite Pests in Food: An Illustrated Key. J. Richard Gorham, Editor. Two volume set. Cost $65.00
- Insect Specimen Drymounts. Twenty stored-product insect pest specimens mounted and in a plastic three ringed binder holder. Cost $87.00/set
- Fumigants & Pheromones Technical Conference program and registration form.
- CAF Conference program and registration form.
- Fumigants & Pheromones International Conference program and registration form; (when it becomes available.)
- Vector Fly System, product information.
- Silent Spring, by Rachel Carson. Cost $16.95
- Mallis Handbook of Pest Control, 7th ed. Cost $89.00
- Scientific Guide to Pest Control, 4th ed. Cost $59.95
- Common Sense Pest Control; Least-toxic solutions. Cost $59.95

Send to: Insects Limited, Inc., The Book Store, P.O. Box 40641, Indianapolis, IN 46283-1451 USA. A check or money order for $ is enclosed (under $50.00, please prepay). My purchase order number is ______ (over $50.00 orders can be billed with a company PO). Includes shippingPOSTAGE/UPS*Please add $3.50 per domestic order and $1.00 per additional book ordered. All others add $5.00 per order and $2.00 per additional book.

Postage/UPS: Please add $3.50 per domestic order and $1.00 per additional book ordered. All others add $5.00 per order and $2.00 per additional book.

Quantity rates available upon request. Please allow 2-4 weeks for delivery.
WE STUDY THE SCIENCE TO PRACTICE THE ART

Fumigants & Pheromones Technical Seminar, December 15 & 16, 1992, University Place Hotel and Conference Center on the Campus of Indiana University/Purdue University at Indianapolis.

This conference is designed to update persons in the grain industry, food processing industry, urban and industrial pest control industry, and all professional pest management people on the subject of pest management.

As professional fumigators and pest management specialists, we must keep ourselves informed of the new products and methods of controlling pests. This seminar will focus on the quote that Dr. John V. Osmun left with us as the Keynote speaker at our 1990 Fumigants & Pheromones Technical Conference: "We Study The Science To Practice The Art"

Registration will begin July 1, 1992. Limited seating (250) is available.

The health and safety of the public is the highest law.” Cicero, X Laws of Rome.

“Chinese Words for Crisis... Danger and Opportunity”, Bob Russell, NPCA opening ceremony.

“Children are leading their parents into a more natural way of caring for the land around their own homes.” Mike McGrath, editor of Organic Gardening.

“Non-chemical control methods are generally more dependent on an understanding of insect ecology than are chemical control methods.” David Hagstrum and Paul Flinn, USDA-ARS, Management of Grain, Bulk Commodities, and Bagged Products. Chapter 26, p.183.

“Americans are motivated by the impossible dream, crisis, opportunity, challenge, and breakthrough.” Joshua Hammond. American Quality Foundation.


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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