Fumigants & Pheromones

Issue 41

Routing:

A Newsletter for the Insect Control & Pest Management Industry

Fingerprinting Insects

Imagine a shipment of stored products being sent out of your facility to staging warehouses throughout the country. You recieve a call that a warehouse in New York has found Indianmeal moth larvae on your pallets of product. The product has been in this warehouse for 90 days. Did those insects come from your processing facility or did they come from a contaminated warehouse?

What if you had a way to determine the answer to this question?

Products at a grocery store have bar codes on them. The checkout clerk swipes the product across a scanner that quickly totals your bill. Insects have bar codes too. They are located in their DNA. Individual populations of insects have specific markers that designate the selected populations uniqueness. The New York strain of Indianmeal moth could have one of these markers that distinguishes it from the original manufacturer's population.

The first work with DNA on stored product insects has been recently done by the USDA. They have isolated markers that fingerprinted five different populations of Indianmeal moths in Kansas.

Entomologists from Syracuse have determined that a bark beetle *(Ips spp.)* has six different types of pheromones. The chemistry is different enough to determine in which part of the country these beetles originated.

The O.J. Simpson trial brought this concept center stage with the use of genetic mapping in the court room.

Like the O.J. case this laboratory technique can be questioned. Using DNA fingerprinting in litigation for insect contamination is probably still a few years off. However, using DNA fingerprinting to help investigate where a given infestation originated is happening today.

Recently Insects Limited, Inc. was asked to consult on a case where product was infested in three locations. One of those locations was a large food processing plant. Product was rejected and the product was impounded in the two warehouses located in different parts of the country. By collecting live or dead specimens of these insects (pheromone traps can be used for this step) and performing a detailed laboratory procedure, a determination of the origination of the pests was investigated.

The cost of the procedure is about $1000-$2000.

The potential for such a fingerprinting technique is incredible: mapping populations of pest insects from location to location, determining the reliability of import/export fumigations by matching DNA of international pests to domestic pests, dip stick technology (like the Home Pregnancy Test) that could make this type analysis simple and be

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ARTICLES IN THIS ISSUE

Fingerprinting

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economical is sure to come.

Innovations in pest management is progressing. If we can help you solve your pest problems...progressively, please contact us. 1-800-992-1991 or Email <InsectsLtd@aol.com> *

International News

Indian Pest Control Association- Mr. P.S. Pruthi (India) has been elected President of the Federation of Asian and Oceanic Pest Managers Association (FAOPMA) for the years 1995-1997 at its Annual General Meeting held in Seoul, South Korea. The following are the other officers: Vice President, Mr. M. Hirao, Japan; Treasurer, Mr. Stephen Ip, Hong Kong; Secretary, Mr. Ross Lackmore, Australia, President Elect, Mr. Danai Chantarapitak, Thailand. *

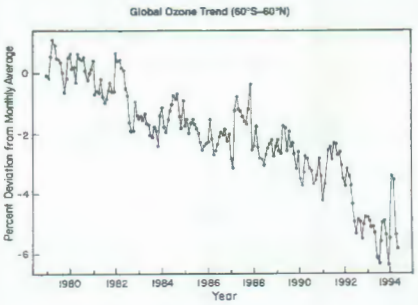
Atmospheric Ozone

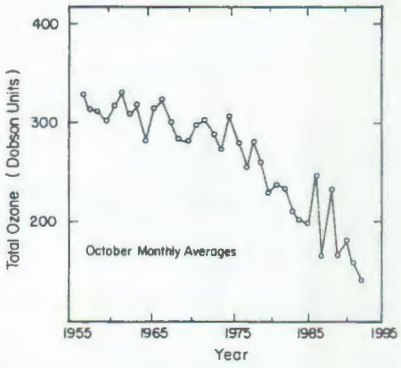
Ozone (O_3) is a form of the element oxygen (O) which has three atoms in each molecule instead of the two of normal oxygen molecules (O_2). It is formed in the stratosphere by the action of solar radiation on oxygen molecules in a process call photolysis; O_2 molecules are broken down to yield atomic oxygen, which in turn combines with molecular oxygen (O) to produce ozone.

Ozone is destroyed naturally through a series of catalytic cycles involving oxygen, nitrogen, chlorine (CFC, HCFC), bromine (methyl bromide), and hydrogen (halons).

The stratosphere (10-50 km above the earth's surface) contains 90% of all the ozone in the atmosphere.

The southern latitudes (Antarctica, Chile, Australia, New Zealand) are affected the most by this lack of ozone *because of the extreme constant cold* in the extreme southern land masses verses the floating ice islands in the extreme north. However, the mid-latitudes that include North America and Europe are showing a 3-6% depletion of ozone.





The British Antartic Survey team base at Halley Bay.

Dr. Robert Watson, Atmospheric Scientist, NASA, stated at the Fumigants & Pheromones Technical Conference in Indianapolis: "For every 1% decrease in ozone, there is a 2% increase in the incidents of skin cancer, glaucoma, and some other human illness." This does not include the damage to the plant life and earth's fragile ecological balance.

Roger Cole

By John Mueller

Fumigation Service & Supply, Inc. has opened an office in the Chicagoland area. Chicago is an exciting and appropriate location for our first office expansion in over five years. What led us to Chicago is an increasing service customer base in both fumigation and commercial pest control for the food processing industries. A Chicago office holds tremendous potential from a close geographic location to large grain reserves to being one of the largest food processing and storage hubs in the United States.

Roger Cole has been promoted to Chicagoland area manager. Roger is a graduate of the Purdue University School of Entomology, specializing in stored product protection. He started with FSS as an intern during his junior year at Purdue and has worked in the Indianapolis office for the past year.

The capabilities of this office will be to provide pest control and fumigation services to the food, pharmaceutical processing/storage industries and museums. We are excited about this growth in our company and look forward to our future in Chicago. Good luck Roger!

Question: "Will companies and countries begin to seriously look for alternatives to methyl bromide and other ozone depleting substances?"

Answer: "I guess it depends on their level of conscious."

Source: Scientific Assessment of Ozone Depletion: 1994: UNEP, WMO, NASA, NOAA

An Industry Viewpoint

A Level of Conscious

By Steven Lucas

Change has occurred at a remarkable pace in the last fifty years. Many will resist change and some of us will even fight change but inevitably it will occur. Early in my career I attended a training session where the speaker told the story of a person claiming 20 year's experience. In reality he learned in one year and then did the same thing the same way for the remaining 19 years. One of Webster's definitions of experience is: active participation in events or activities, leading to the accumulation of knowledge or skill. Many of us in gaining our experience fail to gain knowledge or improve our skills.

Pest control in the food industry appears to be one of those activities: routine cleaning, systematic application of pesticides and periodic fumigations.

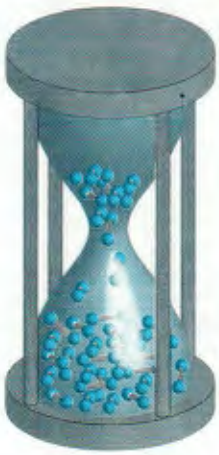
New chemicals are used but they easily conform to the same "experience." Generally the industry becomes most vocal when a chemical is being removed. Our experience should be telling us that it is time for another change instead of fighting to hold on to a chemical that should be used more sparingly and substituted with effective alternatives.

Methyl Bromide, by all accounts, has been a very cost effective and beneficial fumigant. However, it is viewed by most of the world as endangering the planet's ecosystem. When it disappears it will be missed. That should not prevent us from developing effective alternatives today. I was fortunate to have worked with an individual who was willing to pursue innovative techniques and his 45 years of experience was truly a model for education and skill enhancement. He always attempted to reduce the toxic material but his primary focus was to maintain the integrity of the product.

Our tool box today has changed, but, we also have the opportunity to lead the food industry into the 21st century by improving our products' integrity and reducing the risk to the environment. Those debating the use of alternatives to methyl bromide need to include in their perspective the experience of trying something different instead of being led by the chemical manufacturing industry's economic need.

During the 80's (and the last half century) heat sterilization was touted as being effective and could replace toxic chemicals: it works but has its limitations. Pheromones and growth regulators are having their 15 minutes of fame; they work when used appropriately. Irradiation is gaining support but has a long way to go.

The Combination Fumigation has been one of the most effective improvements that I have ever used. Like heat sterilization, it is not a panacea, and it has its limitations. I have used this method of fumigation at our facilities with over 10 million cubic feet which are loaded with computers and other sensitive electronics. The results exceeded my expectations and were better than any other fumigation ever done at these facilities. It is to be hoped that this will not be the end of pursuing innovative techniques. We need to collectively get off our past and strive or demand these types of developments in order to maintain product integrity, protect our environment, and reduce people's exposure to toxic chemicals.



Stephen Lucas
Corporate Environmental Manager
Hill's Pet Nutrition's, Inc.
Subsidiary of Colgate Palmolive

Methyl Bromide in the Balance

Meeting of the Parties to the Montreal Protocol

By David K. Mueller

Vienna- On the banks of the Danube, near what many consider the jewel of European capitals, delegates from over 150 countries met in December for the 7th Meeting of the Parties of the Montreal Protocol to discuss the current state of affairs of the atmosphere and particularly the demise of the ozone layer surrounding the earth. The meeting was sponsored by United Nations Environment Programme (UNEP). I was invited by the Austrian government to attend and display our alternative ideas to this international delegation.

In an opening speech, Dr. Martin Bartenstein, Austria's Federal Minister for the Environment stated: "The Montreal Protocol has been a model for the international handling of global environmental problems and constructive cooperation between governments, industry and science. It was the first treaty ever in which countries agreed to impose significant costs on their economies in order to protect the global atmosphere and human health against irreversible damage."

Major Issues

The single most important issue talked about at this large international conference was methyl bromide. The other issue discussed in Vienna was centered around the ozone depleting substance HCFC's (a refrigerant alternative to CFC's).

Developed Countries, What was decided...

Developed Countries will do the fol-

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Dave's Soapbox

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lowing: (ie. U.S., Japan, Europe, Australia, etc.)

Methyl Bromide - Phase down schedule:

25% by year 2001

50% by year 2005

100% by year 2010*

**This represents a nine year extension to the original U.S. phase out period.*

Temporary agricultural exemptions for methyl bromide were accepted for quarantine treatments and pretreatments. The technical committee (TEAP) will review the criteria to evaluate what constitutes a critical agricultural exemption. This report will be discussed in Costa Rica next year and delivered prior to the meeting of the Parties in Montreal in 1997.

Developing Countries, What was decided...

(Kenya, Malawi, Chile, Uganda, Belarus, Mexico, etc.)

This represents about 18% of the world's usage of methyl bromide

Methyl Bromide Freeze: Year 2002 Freeze. No phase out schedule. The amount that each country will be allowed to use is determined by the average tonnage used over the four years: 1995-1998.

One delegate commented: "This is not an issue of the environment, it is an issue of economics and trade. Now the industrial countries can dump methyl bromide in these developing countries and insure further manufacturing for years to come."

Ozone Depleting Substances Refrigerants

HCFC's are a transitional chemical used to replace CFC (freon). HCFC's also cause ozone depletion, but in a lesser amount. The United States has solidified its position along with much of the world that HCFC's will be used for now and other hydrocarbon type technologies will follow as they are better developed. The environmental groups protest this philosophy.

Fumigants

Methyl Bromide is an important chemical with over 100 labeled uses worldwide. It has no single alternative but it has replacements in some areas. Its major use is as a soil sterilant for killing fungi, insects, nematodes, and pathogens in the soil.

What does this mean ?

Over 80% of all methyl bromide used on this planet is used in developed countries (US, Japan, Europe, Australia, etc.) There were some countries that didn't want to commit to a complete phase out of methyl bromide in their country. After two weeks of discussion, an eleventh hour compromise was agreed to a complete phase out of developing countries. This will allow the richer countries of the world more time to develop alternatives to methyl bromide. It will also allow the poorer countries time to feed their hungry people while practical alternatives for their countries can be developed.

What will happen next?

I predict that in two years these Parties will meet again in Montreal and the most current atmospheric science will be presented by the TEAP committee. As chlorine levels continue to drop in the stratosphere and bromine levels continue to increase, a decision will be proposed to ratchet up the phase out date that was set in Vienna in 1995. Now every two years this scenario will play out again. If bromine's continue to increase the Parties will decide to ratchet up or down. The Parties of the Montreal Protocol in Vienna established a consensus that methyl bromide must be phased out. Now we will negotiate the details every two years.

How About the Clean Air Act ?

The clean air act (CAA) in the United States superseded the Montreal Protocol proposals in the past. After the Vienna Meeting it seems that the Montreal Protocol supersedes U.S. domestic law which stated that any ozone depleting product with an ODP level of over 0.2 would be phased out in seven years (January 1, 2001). Expect an amendment to the Clean Air Act which would not allow the provisions of the U.S. domestic law to be more strict than the Montreal Protocol (Sen. Michael Bilirakas, North Carolina, Environmental Committee, Rep. Lauch Faircloth, Florida, Environment and Public Works Committee) Expect the environmental groups to be very vocal about this relaxing of policy and an expected amendment to the Clean Air Act.

In Conclusion, the 1995 Vienna Conference was all about commitment and compromise and conscience. It was also about trade and funding and occasionally it was about the environment.

The conference was also about countries that are willing to make a commitment to improve the global environment. This commitment was an acceptance that a problem exists. The problem can only be solved if all countries agree to participate in the solution.

Insect Rearing

By Angie Richards, Entomologist

There are several reasons why it may be important to rear insects. By rearing an insect pest, you can learn things about its biology and habits that you might not pick up in the field. For example, Red and Confused flour beetle *(Tribolium spp.)* cannot climb up a slick surface. Such information can help you to use an integrated approach to manage the insect. Did you know flour beetles need some texture in order to walk on a surface ? Did you know that Indianmeal moth are most active at sunset and Mediterranean flour moths are most active at sunrise? Did you know that Rice weevils are most active at mid day?

Why is this important? Bioassays can be used to test the effectiveness of your fumigations. If you are doing a fumigation to control Indianmeal moth, why use bioassays for Flour beetle? If your bioassays contain the insects you are targeting, you can get a better idea of how that fumigation affected that particular species and stage. If you are trying to kill all stages of a population, why use only adults to check your efficacy when you could be testing eggs, larvae, pupae, nymphs, as well as adults?

Try this:

Capture some Indianmeal moths or other target pest insects and release them in your office. Now observe their habits during the day. Place a variety of grains and milled products around the room. Notice which diet they prefer. You would be amazed what you can learn by living with insects. Warning: You will get some pretty strange looks from your colleagues.

Diet

Diet is the most important of the factors listed above. Insects eating a good diet will usually develop even if the temperature and humidity are less than optimum.

Selecting the correct diet may not be as easy as it would seem. Indianmeal moth which seems to do well on many different grain based foods in its natural environment, can be difficult to raise in captivity.

Temperature

In general, most insects should be reared at 20-30 C (68-86° F). If it gets too high, you can unintentionally perform a heat treatment and lose your colonies. The best way to maintain your temperature is to use an environmental chamber; however, this may not be practical for everyone.

Humidity

Maintaining the proper humidity will help insects grow at the optimum rate. Stored product pests do best with high humidity. There are several different ways to maintain the humidity in colonies. We use a Percival environmental chamber, but if this is not practical for you there are alternatives.

At Insects Limited, Inc. we raise insects for fun and business. As you visit our office you may see any number of insects flying or crawling freely. We live with these insects to learn more about them. You too can better appreciate these pests that readily eat your possessions. They even make good pets –they don't bark, they don't stain the carpet, they don't eat that much, and you can leave them when you go on vacation.

Ladder Safety

By Bob Kelly

"On fumigations, more people get injured from ladders each year than from fumigants."

The use of ladders is necessary in many different kinds of work. People who use ladders in their daily activities are very aware that ladders are potentially one of the most hazardous aspects of their work. Any fall from a ladder, even a step ladder, can cause serious bodily injury and the proper precautions should always be taken.

Many times a ladder does not reach as high or as close as needed, this is a time when we often are challenged with the option of either going back down the ladder and repositioning it or choosing to take a risk over safety.

Proper Selection

The proper selection of a ladder is a very important key in using a ladder in the proper and safest way. The most common ladders are made of wood, fiberglass, or aluminum. Wood ladders are usually poor conductors of electricity and are strongly recommended to be used any time you are working around any electrical wires, electrical equipment, or substations. Wood ladders tend to be heavier and more cumbersome to move around than aluminum ladders.

Fiberglass ladders are preferred because of their OSHA classification and durability. They are usually heavier and more expensive than wood or aluminum ladders.

Aluminum ladders are generally lighter, easier to take down, and they can be purchased in many different shapes and lengths.

Don't base your decision in purchasing a ladder on price. Base your decision on what is best for the type work you will be doing. Some food plants will not allow improper ladders on their property.

Inspect Your Ladder

Inspection of your ladder is important every time it is used. Look at and test rungs to make sure the side-rails are not split or loose and that the ladder itself is not bowed or bent.

Wooden ladders should never be painted due to the fact that the paint can cover any cracks or splits that are present.

The feet of all ladders should have some type of non-skid type surface on the bottom that is placed on the floor plus the feet of a ladder should be placed on a level and firm foundation before any attempt to climb or descend.

By being aware and cautious with the proper ladder selection, you can make your next trip up a ladder a safe one.

Bob Kelly is a fumigator for Fumigation Service & Supply, Inc. and located in Indianapolis. Bob performs over 100 fumigations per year .

Safety Tips

- A ladder that extends too high will increase the risk of sliding out from underneath you, especially when it is placed on a slick surface (sealed concrete or hardwood floor).
- When using any ladder the two top steps on a step ladder or the top three rungs of an extension ladder are not for standing.
- When using a ladder to get to such places as roofs or a mezzanine be sure that the ladder extends three to four feet above the edge of the structure. This enables you to hang onto something as you are stepping on or off the ladder.
- Shoes should be free of dirt, grease, or any debris that might make your trip unsafe and your hands slippery on the return trip.
- Use both hands when climbing up or down a ladder and never carry anything up or down a ladder. Using a bucket, duffel bag, or a rope to pull your tools up is the safest bet.
- When storing ladders, make sure that they are in proper working order for the next person.
- Make sure that any ladder that is stored on a vehicle is strapped down to prevent any damage to people, following in vehicles, and to protect your investment in a good quality ladder.

Pest Management In Cyberspace

By Pat Kelley

It's time to throw out your B&G sprayers, your hand dusters, your bait guns and anything else that you can touch for that matter, cause we're going pest huntin' computer style.

Welcome to the world of cyberspace: where your eyes are a computer monitor, your ears are something called Soundblaster and your only sense of touch is through an ergonomically correct keyboard pad.

In this day and age of IPM instead of 'Pest Control', and where the "educated" approach is surpassing the spray and pay attitude, our biggest asset as pest problem solvers is our knowledge and information. As the age of computers continues to roll on, we literally have mountains and mountains of information at our fingertips. It's our job as pest professionals to tap into this vast amount of research and practical applications to make us better at our jobs. Hopefully, this article can show you where and what resources are available to us on the Internet.

The Web - It's Not Just For Super Scientists

There's been a lot of talk about the coming of the Information Superhighway or the "Infobahn" as it's now called. Well, the Infobahn is *now* and it's running right through our homes and offices in the form of the World Wide Web. Most of us, who only dabble in the art of computers, imagine the Web as a vast, amorphous blob of text, images, audio and video data scattered across networks of computers worldwide. It may help some to first know a little history of the World Wide Web to make this image a tad bit clearer.

The first strands of the World Wide Web began as the brainchild of Tim Berners-Lee and his colleagues of high energy particle physicists employed at CERN in Geneva, Switzerland. This group of researchers and academic professionals used resources from other scientists dispersed over the entire globe. The tedious and cumbersome task of retrieving this data was overwhelming for the group at CERN, so in 1989 they formulated the first design activity that ultimately led to the World Wide Web's introduction in 1991.Throughout 1991, the Web was solely used by people associated with CERN, but they developed interfaces to incorporate many different computer languages into the Web so all of their associates would be able to use this new resource of information.It wasn't until 1992 that CERN began promoting the Web to outside firms.The popularity of this new means of communication has never been surpassed. According to the work of one MIT student and Web Master, Michael Gray, "the Internet carries more Web data in one six hour period today, than it did for the entire year of 1992!" This represents an annual growth of over 200,000 %. (see: <http://netgen.com/info/growth.html> for a detailed layout of Michael Gray's study)

Web Growth

Year	No. Of Net Sites
1992	5,000
1993	50,000
1994	500,000
95-96	?????b.5

So How Does the Web Relate to Me?

Now that we know all about the Web and its origins, how can we access these loads and loads of information. Well first of all, assuming that you have a decent Personal Computer (PC) and an on-line carrier (such as America On-Line, Prodigy, Compuserve etc.) there are several Web sites that you can start resourcing pest info. Listed below are some of the most informative sites that may prove valuable to you.

<http://thorplus.lib.purdue.edu/reference/index.html> This fine web site does not specifically serve the Pest Control Industry, but offers great general information from dictionaries in every language to periodic tables and on and on.

<http://info.aes.purdue.edu/entomology/entmwww.html> Purdue University Entomology Department's home page is just an example of how the general public can access valuable university resources and information.

<http://www.ent.iastate.edu/list/ > This web site, set up at Iowa State University has the potential of being one of the best all-around references for entomology related topics. It's a must see!

<http://www.epa.gov/docs/ozone/mbr/mbrqa.html> This is the EPA's Methyl Bromide Home Page. Bill Thomas, of the EPA has done an excellent job of setting up this valuable Web site to keep us all updated on the current status of methyl bromide and its regulations.

<http://www.csiro.au/> The Web site offers an international perspective on many pest related topics as covered by CSIRO of Australia. Oodles and oodles of information.

<http://www.aphis.usda.gov/> This is our own USDA's Animal and Plant Health Inspection Home Page. I found it somewhat difficult to get around in their site, but with some work on their part, it may be a valuable source of information to pest operators.

Insects Limited and Fumigation Service and Supply's Home Page: **<http://www.surf-ici.com/insectslimited,inc>** Yes, we too have just recently gone on-line. Visit our new home page from the above address or we can currently be reached by E-mail at: insectsltd@aol.com We would value any and all feedback from our readers!

So now you too are ready to trek the realms of cyberspace, but beware! There's more junk information floating around out there than the valuable stuff. Make a mental note to yourself before you log on to the Web to stay focused on the information you are after. It's all to easy to get bogged down in the masses of unrelated topics and never get back to what you originally logged on for. Good luck and May The Force Be With You!

Upcoming Conferences & Workshops

British Pest Control Association, Fumigation Diploma Course**
February 23, 1996
Slough, UK

Hands-on Fumigation Workshop, Indiana Certification Program**
March 19, 1996, Categories 7D-E
Purdue University, West Lafayette, IN

Pest Control in Museums
March 25-29
Sydney, Australia

The International Conference on Controlled Atmosphere and Fumigation in Stored Products*
April 21-26, 1996
Nicosia, Cyprus.

Eurocido 96, German Pest Control Association**
April 24-26, 1996
Dortmund, Germany.

Pest Control in the 21st Century, Joint International Conference of FAOPMA-CEPA (Asia and European Pest Control Associations)**
May 8-10, 1996
Tel-Aviv, Israel

Fumigants & Pheromones Continuing Education Seminar***
June 11, 1996
Cedar Rapids, IA

The 2nd International Conference on Insect Pests in the Urban Environment**
July 7-10, 1996
Edinburgh, Scotland

XX International Congress of Entomology**
Florence, Italy
August 25-31, 1996

Fumigants & Pheromones Technical Conference***
March 18-19, 1997
Chicago

Insects Limited, Inc. believes in sharing through education. I hope that you can join us at one or more of the upcoming conferences.

* We will be attending

** We will be giving a presentation

*** We will be organizing the Conference and giving presentations

Sharing Through Education

Second International Fumigants & Pheromones Technical Conference

Bologna, Italy - Over 175 people from 25 countries came to ancient Bologna to discuss new technologies in stored product protection. This two day conference was organized by Insects Limited, Inc. of Indianapolis along with Colkim s.p.a. of Bologna.

Twenty four speakers covered a variety of topics on stored product protection. Topics on methyl bromide and its future were widely discussed during this conference. Alternatives to this ozone depleting substance, which is used extensively thought the world for stored product protection, were discussed and debated in the packed lecture hall and after the day sessions in the fine Bolognese restaurants.

Promising new technologies included a new cylinder phosphine gas presented by Dennie Smithman of BOC while David Mueller showed the latest research on his Combination Fumigation method. Mr. Cris Watson of IGROX in England delivered a thought provoking talk on Methyl Bromide and World Politics. Dr. Georgio Domenichini showed stunning evidence through electron microscopy that stored product insects and mites that can carry and spread the pathogens listeria and salmonella, both serious food born diseases. Robert Corrigan, Ph.D. of Purdue University provided useful information about rodent control for a large Mediterranean Region audience that views rodent control with much greater importance than most of the

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CURRENT BOOKS AVAILABLE FROM

THE BOOKSTORE

NEW

Post Harvest Tobacco Infestation Control, Edited by L. Ryan,
155 Pages $62.75

Engineering for Food Safety and Sanitation...A Guide to the Sanitation Design of Food Plants and Food Plant Equipment, by Tom Imholte,
282 Pages $74.00

Field Guide for the Management of Urban Spiders, by Stoy Hedges & Dr. Mark Lacey, 220 pages.....$9.95

Field Guide for the Management of Flies, by Stoy Hedges,
150 pages.....$9.95

Nutritional Ecology for Insects, Mites, Spiders, and Related Invertebrates, by Slansky & Rodriguez
1016 pages.....$215.00

Museum Pest Management, 3rd ed., by David Pinniger, 58 pages $14.95

Proceedings of the 6th International Working Conference on Stored Product Protection, held in Canberra, Australia in April 1994, 2 volumes,
1274 pages.....$325.00

Mallis Handbook of Pest Control, 7th ed., Storey et. al, 1152 .....$89.00

Truman's Scientific Guide to Pest Control Operations, by Bennett, et.al.,
494 pages.....$64.00

Earth in the Balance, by Al Gore,
407 pages.....$25.00

Stored Product Management, by Oklahoma Cooperative Extension Service,
242 pages.....$15.00

Insect Management for Food Storage and Processing, Edited by Fred J. Baur, 384 pages.....$92.00

At Fumigation Service & Supply, Inc. we are dedicated to helping helping you solve pest problems safely, effectively and without harming the Ozone Layer.

Recipient of the 1995 Stratospheric Ozone Protection Award

"For recognition of exceptional contribution to global environmental protection."

If we can help you, please call: 1-800-992-1991

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Sharing

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world. Bobby Jenkins challenged the audience with his advanced and successful program of organic pest control. Pheromone presentations by Paul Cogan, Prof. Pasquale Trematterra, Rudy Plarre, Ph.D. and Larry Pierce updated the audience with the latest research findings from their institutions. In a country where processed grains are eaten more in their pastas and breads than North Americans, practical topics on grain fumigant and protection were presented by Paolo Guerra of SO.DA.RA spa., Paul Fields, Ph.D. of the Canadian Grain Commission and John Mueller of Fumigation Service and Supply, Inc.

David Mueller, Program chairman stated: "This European version of the Fumigants & Pheromones Conference is gaining in popularity. The first conference in Lübeck Germany in 1993 drew 120 curious attendees from 27 countries. Many of those same people ventured to Indianapolis in 1994 to continue the 'I'LL show you mine if you show me yours' program. It seems that sharing through education education has opened the way for people all around the world to gather once a year to present, listen and question the developing technologies that surely will make us all better at our job of protecting stored products."

The next Fumigants & Pheromones Conference will be held in Chicago on March 18-19, 1997 and in York, England in 1998.

Much of the education was gathered after the formal conference in the evenings. Bologna has some of the finest food in the world.

NEWSLETTER

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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ALBERT F. MUELLER
1508 S. RED BANK RD.
EVANSVILLE IN 47712-

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