

Fumigants & Pheromones

Issue 36

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1994

A Newsletter for the Insect Control & Pest Management Industry

Stressing Insects

Imagine that you have an emergency that causes you to have to run up ten flights of stairs in a hurry. After a few flights you start breathing hard and you begin to sweat. Now after nine floors you are exhausted and sweat is dripping down your back and forehead. You are breathing so hard that your chest hurts. Now you reach the top floor and open the door. Boom!!! Some big thug steps up and punches you in the nose. Do you really feel like getting up and hitting him back?

When climbing stairs we begin to breathe hard not so much to take in more oxygen but to get rid of carbon dioxide and other wastes. The carbon dioxide level is increased when we become stressed.

Warm blooded, humans can regulate their temperature better than their cold blooded counterparts the insects. Insects can be easily stressed by raising the temperature surrounding them just a few degrees. Their development can be manipulated by adjusting temperature levels just a few degrees. Flight, length of development, egg



laying, and death are just a few of the functions that temperature can affect on insects.

As humans we have a

tendency to think like humans rather than insects. The stress that is put on a human when the temperature rises from 60 degrees to 90 degrees F compared to the effects on the respiration of insects is significant. Their physical activities quicken dramatically.

Extreme temperatures (ie. heat sterilization and freezing) can be utilized in a pest management strategy.

However, reduced levels of fumigants and other insecticides can be added to sub-lethal levels of carbon dioxide and inflated temperatures.

Have you ever noticed that the effectiveness of your



treatments is better in the middle of the summer than during spring and fall weather conditions?

Hear more about how temperatures can help control insects at this year's Fumigants & Pheromones Seminar and

Workshops, December 6-8, 1994.

How Insects Breathe

Try this: Bet someone that you can take a grasshopper and place its head under water for 10 minutes and it won't drown. An insect doesn't breathe through its

mouth like humans. It breathe through small openings on the side of its abdomen called spiracles.



Spiracles control the air and moisture intake and waste removal from the insects hard exo-skeleton. After the insect brings in gases it will go through a detailed system of very tiny vessels calls tracheoles and tracheae?

If an insect knows that it is breathing a gas that is harmful to it, it may choose to close its spiracles and shut

down its respiration. This causes some insects to be more tolerant to some fumigants.

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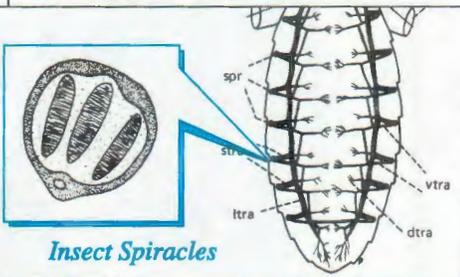
- Fumigants & Pheromones Seminar
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How Insects Breathe

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We sometimes don't think about turning on our heaters in the summer months when we fumigate. But if we raise the temperature in a building by 10°C / 18°F we can increase an insect's respiration by 2 times. Dr. Larry Murdoch research entomologist, from Purdue University states, "...as a general rule, for every 10°C you increase the insect's metabolism 2 times... 20°C / 67°F = 1 time, 30°C / 87°F = 2 times, 40°C / 104°F = 3 times, etc."



Insect Spiracles

Now double the bet that you can take that same grasshopper (ground beetle, roach, etc.) and submerge it completely underwater for 10 minutes and that it will survive. It can survive because it can shut the "window like" spiracles and stop breathing outside gases.

If they are ready to bet again, try it for 20 minutes.

After removing it from the water, the insect will wake up slowly after several minutes and fully recover in about 10 minutes.

Imagine if the insect knows that a fumigant or an insecticide fogging compound was harming it, can it shut down its spiracles and respiration to protect itself?

The function of the spiracle on either side of the abdomen of an insect is to regulate water and gases. It acts as the gatekeeper for oxygen, waste gases, like carbon dioxide, and helps the insect from drying out by regulating water vapor intake. The gases are passed on to an intricate highway system of tracheoles and tracheae that act similar to lungs for the insect.

A receptor in the insect will alert the insect when the carbon dioxide level is too high and cause the insect to fully open the spiracle to allow for the escape of (waste gas carbon dioxide.)

This physiological activity is important in

the success of the Combination Fumigation method. Carbon dioxide is a waste gas of which the insect is programmed to rid itself. (Much like the humans do when they run up stairs and start breathing hard.) The body needs more oxygen, but it also needs to rid itself of the waste products like carbon dioxide.

In many insects (Granary weevil is an exception), the spiracle is the gatekeeper for the insect. If you introduce carbon dioxide into the air it will open its spiracles to try to rid itself of the waste gas. This allows the low levels of magnesium phosphide to flow readily into the insect and kill the less tolerant pest. This is known as synergism. Heat and carbon dioxide act like synergists for a low concentration of gas that is exposed for a shorter duration.

The combination fumigation method depends on carbon dioxide to be effective in a shorter period of time.

Dave's Soapbox



Methyl Bromide Phaseout

Fumigation Service & Supply, Inc. made a commitment last year to begin an aggressive phaseout of the use of methyl bromide. This was done for a variety of reasons, but the most important reason was to help our present customers find a solution to a very complex problem.

It has brought us criticism; it has brought us some notoriety; but more importantly it has caused us to be focused on a goal of helping our customers control insects in an outbreak situation without the use of methyl bromide.

How have we done toward this three year phaseout plan?

In 1994 Fumigation Service & Supply, Inc. used or sold five truckloads of methyl bromide at 27,000 lbs. per truckload or about 135,000 pounds of methyl bromide. There is 65-70 million pounds of methyl bromide used in the world including the recent USSR figures. The United States uses 80 percent of its total on soil fumigations mostly in Florida and California. Canada used only about 500,000 pounds of methyl bromide last year. Fifty-percent of this was used on flour mills, ship holds and other space fumigations and most of the rest was used on strawberry fields in Eastern Canada. Of the five million pounds of methyl bromide used in the United States on structural fumigation of houses for termites, food processing plants and some grain fumigations, Fumigation Service Supply, Inc. accounts for about 3 percent of the methyl bromide used in the United States for these uses. The United States uses about 30 to 35 percent of the world's methyl bromide. So this amount that our humble company in Indianapolis uses is small...but it is a start.

1994 Methyl Bromide Usage:

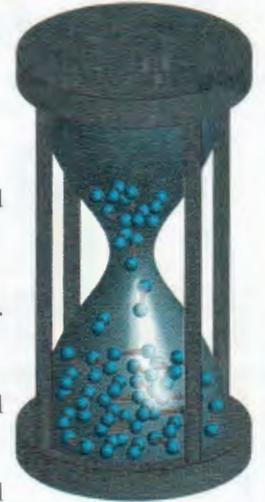
This year we have replaced the usage of methyl bromide in several large industrial fumigations; namely flour mills and food processing plants.

Our fumigation service is on the increase (15%) for 1994 but our usage of methyl bromide is down about 20%!

How did we do it?

First, we decided not to wait until the last moment before the deadline of the phaseout to start experimenting with alternatives to methyl bromide.

Second, we had several progressive companies that were good customers of the methyl bromide fumigations that became pro-active and allowed us to perform experimental and untried full-scale fumigations with their facilities.



As the success stories spread through the industry, more companies wanted to be a part of this alternative program. It got to the point where John or Dave Mueller were demonstrating or speaking about the Combination Fumigation Method to someone or some fumigation company almost every week throughout the United States. International interest is beginning to pick up and requests for demonstrations are coming in from Africa, Europe, Asia, Canada and the Caribbean.

To date, September 1, 1994, we have performed 11 heat, phosphine, and carbon dioxide fumigations (Combination Fumigation). This includes five flour mills, 3 large modern (full of electronics) pet food plants, 1 large pet food plant with phosphine and heat only, 1 seed processing plant, and 1 feed mill.

The total cubic footage for these jobs: 15 million cu.ft.

Total methyl bromide replaced with the Combination Fumigation to date: estimated 22,500 pounds. One of the flour milling companies will eliminate the three methyl bromide fumigations that are scheduled each year with two Combination Fumigations because of the increased effectiveness that they have observed. That will eliminate another 2000 pounds per year.

Looking to the Future:

We are taking this new method of fumigation from the field to the laboratory. Small scaled (1 cu.m. and 2 cu.m.) fumigation chambers have been constructed by Fumigation Service & Supply, Inc. and Purdue University. We will be able to change the three variables and dial in the exact combination that is most effective.

We will start with the insects first to let them tell us which combination affects their four stages and various species. This information will lead to better managed fumigations in the future. We have started an insect physiology study on how stored product insects react to various levels of carbon dioxide. Stay tuned.

D. K. Mueller

Carbonyl Sulfide (CS)

...New fumigant gas and possible alternative to methyl bromide

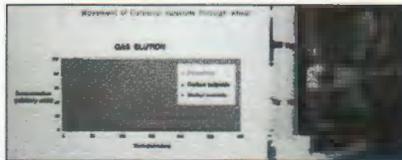
The big question mark currently hanging over methyl bromide because of its alleged effect on the ozone layer has led to a desperate search for new fumigants to take its place.

CSIRO, Australia's national science agency, recently announced that they have made application for a worldwide patent for carbonyl sulphide (CS). This fumigant has insecticidal, fungicidal, and nematocidal properties and is made up of one atom of carbon, oxygen and sulfur.

CSIRO has secured a worldwide patent for CS as a fumigant for durable commodities such as grains, non-durables such as fruit, for soil, buildings, quarantine and other applications.

In recent years, the number of registered fumigants has dropped as their toxicity to humans and the environment has been revealed. Parallel with this decline has been an increased reliance on methyl bromide. During the past 10 years, regulations governing the use of MB in Australia have tightened and it seems only a matter of time before the chemical is banned.

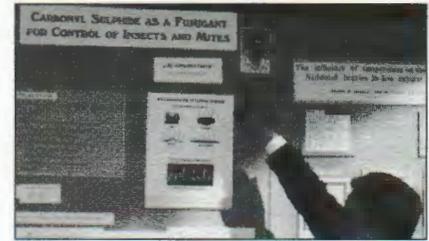
Recognizing the problem, the Australian Environmental Protection Agency provided a grant of \$400,000 for CSIRO's Division of Entomology to find an alternative to MB for quarantine applications.



Dr. Jim Desmarchelier, of the Division of Entomology, said CS occurred extensively in the atmosphere and was better for the environment as it broke down quickly and did not cause the residue problems of persistent chemicals.

He said there was still much work to be done before the fumigant could be registered for commercial use. Among other things, toxicology data needed to be gathered to meet regulations covering its areas of application.

Once the product is registered, he said its likely cost of production would be similar to that of MB.



John Mueller at CS poster display in Australia

Editor's notes: This is one of a series of articles that will cover alternatives to methyl bromide. It is important to realize that methyl bromide has 50 to 60 labeled uses. These alternatives, if registered, will only cover a few labeled possibilities.

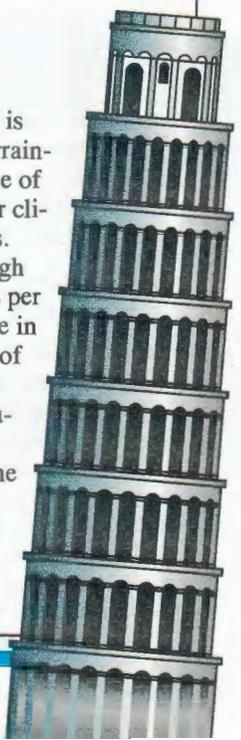
I expect to see CS used in Australia on exported grain within the next two years. CS is effective in 24 hours or less like MB. CSIRO has placed some of its best scientists on this project. In a time when the United States Department of Agriculture is closing laboratories all over this country, it's gratifying to know that some countries are cooperating to find partial solutions to this complex and very important quest instead of still denying there is a problem. Kudos to CSIRO, the Australian EPA, and Dr. Desmarchelier and his staff.

INTERNATIONAL NEWS

Italian Market

The chemical industry is strong in the Mediterranean region of Europe. One of the reasons is the warmer climates and milder winters. Insect pests can go through several more generations per year here. The agriculture in northern Italy rivals that of North America, but on a smaller scale. Italy (population 65,000,000) produces the most wine in the world, even more than France. Conventional pesticides have offered

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Italian Market

(continued from page three)

the former nice yields on small plots. The pest control and fumigation industries are very segregated in Italy. Fumigation companies and pest control companies don't cross over in their respective fields. There are about a half-dozen good middle-sized companies that compete strongly for the fumigation business. The more innovative companies are starting to provide training and seminars for their clients (ie. COLKIM). This trend will no doubt become popular with all of the grain based industries (pasta, bakeries, grain storage, grain export, cheese) in which this country specializes.

Pheromone usage and scientific knowledge to implement this innovative pest management technique is quite advanced in Italy. Dr. Suss and Dr. P. Trematerra have developed the interest through superior field research and pest management training. Dr. Trematerra will be a featured speaker at this year's Fumigants & Pheromones Technical Conference and Workshops in Indianapolis. Come hear how Dr. Trematerra has used pheromones in flour mills in Italy to help suppress pest populations. ■

DDVP Update

An 11th hour stay to revoke the 409 food additive tolerances for dichlorvos (DDVP) was issued by the EPA on March 11, 1994 in the Federal Register. This puts this organophosphate fogging and residual insecticide's future in question.

Dennis Utterbach, EPA Special Review, product manager for dichlorvos had few answers and many questions about what can happen next in a long drawn-out drama for this controversial pesticide.

In our last episode of 'As the EPA Turns':

November 10 - The EPA publishes in the Federal Register that dichlorvos has had its 409 (food and packaged food residues) Tolerances revoked. Essentially that means that starting November 11 this powerful insecticide could no longer be used in the food industry. The word went out and most companies recognized that their products could be seized by the

FDA if there were any significant residues (0.5 ppm) of dichlorvos. That meant imported food product and domestic products too.

March 11 - A stay for revoking the tolerances for dichlorvos is issued in the Federal Register. Amvak, the California manufacturer of dichlorvos, requested a stay which is allowed under the provisions of the previous ruling and it is granted by the EPA.

Question Time?

Can we still use dichlorvos in food plants? EPA's response: we don't know.

If we use dichlorvos again will the residues that are accumulated on the product be exempt if the EPA lifts the stay? EPA's response: we don't know. What will be the effective date for this stay? EPA's response: we don't know. Who does know? EPA's response: Doug Camp's replacement Don Barolo, Director of Pesticide Policy, EPA, Crystal City and the EPA's lawyers.

Latest DDVP News: Oct 2, 1994

Dennis Utherbach: "The revocation is still stayed for D.D.V.P."

"If we (the E.P.A.) do lift the stay, we would allow a 120 day period to remove D.D.V.P. residues."

Stay tuned for more on this pesticide drama and we will see if the FAT LADY sings an encore. ■

"Elementary My Dear Watson."

Case Study...

After finding two live varied carpet beetles (*Anthrenus verbasci*) on a bright white roll of Tyvek in a textile storage area of the museum, I was called in to investigate the extent of this infestation. The collection of these precious textiles was to be moved in the coming months to a more permanent and larger area. The concern that they would be moving infested items into this protected storage area warranted further entomological investigation.

The Bug Hunt

For 30 hours over a four week period of

time, we meticulously searched for tell-tale signs of this destructive museum pest.

Throughout the search we asked many, many questions of anyone connected to the case... "What's this and where does this lead, how long has this been here?" We read our Mallis and other pertinent museum articles about the suspected varied carpet beetles and what they liked and where they wanted to be and "not to be".

We searched all the obvious places like the furs and animal protein materials and all the window sills where we could get a fair assessment of the numbers of cast skins and dead adults that had accumulated throughout the years. The quite pretty scales on the elytra (wingcovers) gave their relative age away. There seemed to be two areas where we found the greatest accumulation of cast skins and dead adults. We never found a live varied carpet beetle in the collection.

Pheromone Traps

The new pheromone traps for varied carpet beetle and the webbing clothes moth were placed throughout the collection and outdoors away from the mansion. The traps were checked daily. Pest monitoring glue boards were placed every 30 feet on the perimeter of the collection area.

No moths or beetles were found in the traps.

Tally Ho! On with the hunt...

On the third week we observed many old paper wasp and bird nests on the outside windows of this "Great Gadsby" type house. These are areas in which these type insects like to over-winter and thrive.



Mud Dauber nest



Anthrenus verbasci (Coleoptera : Dermestidae) larva

The gorgeously landscaped grounds had greenhouses and rose gardens along with thousands of annuals blooming nearby.

Anthrenus verbasci uses nectar in its diet. The emergence in the springtime of the adults (May, June, and July) corresponds to the availability of flowering plants.

On the last day of this bug hunt the bug sleuth started thinking micro instead of macro. That is important when you are 6 feet tall and the prey is 2 mm long. The attic of this turn of the century mansion was above the collections area. What was in the attic? Let's go fish.

The maintenance man led me through a small 2 foot by 1 foot hole in the closet. This is one of the spots where the most accumulation of the cast skins were



Anthrenus verbasci (Coleoptera : Dermestidae) adult

found in the hat boxes (hint: feathers on old hats). The attic was dark and quite and undisturbed. The bright flashlight searched high and low. The slight movement in the corners made me look closer. What did I see?

Mud daubers, lots of mud dauber nests, years of accumulation of finely sculptured mud that had little holes in the abandoned nests.

Start with the insect first

Mud daubers are unique insects in that they provide for their young in absentia. The adults capture copious amounts of insects that are carefully stuffed into the chamber with the blessing of eggs that will hatch to a feast of protein-rich insects. So many dead insects that they often can't eat them all. (Hint, what a great place for an animal protein loving insect to lay its eggs when the chamber is abandoned and allow their offspring to be protected and well fed.) Eureka, the mother load!

"I accuse the varied carpet beetle, in the attic, with the mud daubers nests."

After carefully taking a few mud dauber nests down and examining them under the microscope we found lots and lots of *Anthrenus spp.*, *Trogoderma spp.* and *Attagenus spp.* cast skins. Hundreds of cast skins that allowed this insect to live and thrive undisturbed in protected areas near the beautiful nectar sources that the surrounding gardens supplied for the adults to reproduce. And, near a priceless collection of textiles that just happened to be one floor below.

Recommendation

Remove the mud dauber nests, remove the paper wasp nests, remove the bird nests, make the windows tighter, place "Window Fly Traps" at the bottom of each window, beef up your mouse control program, use the new pheromone trap for varied carpet beetle and the webbing clothes moth in the collection and change them every eight weeks. Place pest monitoring glue boards every 30 feet on the perimeter of the collections area. Put a door sweep under one of the critical entrances to the museum.

Take Home Message: Start with the insect first. Be as persistent as the insects. A tiny crack or hole is like the Lincoln Tunnel to an insect. Learn to think like a bug.

By David K. Mueller, B.C.E.

Fireside Lecture with

Dr. Tom Turpin



America has the highest standards in food quality in the world. Europeans and Americans don't tolerate insects in their food supply.

In a recent campfire presentation by Dr. Tom Turpin of Purdue University, Tom delighted the audience by eating insects. Yes, he has done it many times before and the crowd always loves seeing him slowly build up the show until they can't wait to see him cook these mealworm larvae in vegetable oil in a wok, all the time explaining how insects are part of the diet of over 80% of the people on this earth, how locust in Africa are a delicacy, how lobster and shrimp are no more than bottom feeders (much like the cockroaches), that we love the fat juicy tails of a lobster and that a cockroach has much the same protein level and consistency.

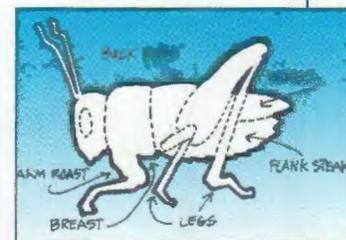
Tom now holds up jars of peanut butter, pizza sauce, and spinach and explains the F.D.A.'s food defect levels and how we can have 51 fruit fly larva in a sample of spinach but not 52. That's considered filthy.

Tom slowly picks up a fork and scoops up about a half dozen fried larvae from the bottom of the sizzling wok. He opens his mouth wide open and wiggles his tongue slightly. The crowd moans with anticipation. He slips these mealworms in his mouth and a shriek comes from one 6 year old in the front row.

Imagine it, here is a full grown college professor. He travels all around the state of Indiana and beyond sometimes three times a week and over 100 times a year to show people how to eat insects!

Now here comes the take home message. Are you ready?

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Tom Turpin*(continued from page five)*

Because Americans enjoy the privilege of having the most pure, insect free food in the world we often compromise this standard by having high levels of pesticides in our food too. Those pesticides are there to protect the food against unwanted insects and other pests.

Take Home Message: For the most part the insects we eat really don't harm us. 80% of the world's population seems to relish the thought of eating certain insect caviar and termite patties to name a few insect delicacies. If we really don't want pesticide residues in our food supply today, we may have to tolerate a little more flour beetle fragments in our flour or microscopic fruit fly eggs in our pizza mix. It's a trade off.

Which one would you rather have in your food?

Calendar Schedule

Hope to see you there:

*Pest, Insect & Fungus Management, A Museum Conference, Boston, October 22-23, 1994

National Pest Control Association, Honolulu, October 23 - 27, 1994

*1994 International CFC and Halon Alternatives Conference, Washington,

D.C., October 24-26, 1994

*Alternatives to Methyl Bromide Workshop, Orlando, November 15-17, 1994

*** Fumigants & Pheromones Technical Conference and Workshops, Indianapolis, December 6-8, 1994

***Purdue Pest Control Conference, West Lafayette, IN, January 3 - 6, 1995

* Georgia Pest Control Association "What's New With Fumigants" Athens, GA, January 11-14, 1995

*** Fumigants & Pheromones International Technical Conference, Bologna, Italy, February 1996

* Speaking ** Displaying *** Speaking & Displaying

QUOTABLE QUOTES

Tom Peters On Today's Business Climate

Excerpts from a Weaver Popcorn Company sponsored seminar in Indianapolis:

"This is not change we are experiencing in business, it's a revolution."

"Your skills in business will be obsolete in six years."

"Asia is breaking loose."

"We are going to sell more and more intelligence, and less and less material."

"Microsoft's only factory asset is the human imagination."

"This is the age of homework, we can't stop learning."

"Nintendo has \$6,100,000 in sales per employee."

"IBM invests over 200 hours in training in each employee per year."

"Commodity is a state of mind. Margins will erode if you think your products are a commodity."

"You get good margins in this world when you do special things."



**Fumigants & Pheromones
Technical Seminar & Workshops**
December 6-8, 1994 • Indianapolis

Sharing Through Education

The world is definitely getting smaller and smarter. The European Community is finally starting to show some unity. The new directive from Brussels to require certification for the pest control industry will have the same effect it did in the United States; a more professional industry and a vehicle to offer sharing across state boundaries. The educational programs flourished for our industry to offer an outstanding forum for sharing through education. Members of the pest control and food protection industries are quickly meeting each other at conferences like N.P.C.A. (National Pest Control Association), Fumigants & Pheromones Technical Conference, The Cambridge Meeting, Eurocido '94, Canberra Meeting, and other international congresses.

As we meet each other on a common ground of education, we can compare our products and methods. "I'll show you mine if you show me yours" is what makes us more modern and advanced in our professions.



John and Dave Mueller on a recent hunting trip to Texas

If you haven't received a conference program, please send for one.

We hope to see you in Indy in December.

Better Gas Monitoring

FSS and Dräger are now introducing the new Pac II, a first-class technology in gas measurement.

When personal monitoring and records are required, gas monitors are needed which are capable of providing more information such as:

- the calculation of short term exposure values (STEV) ($PH_3 = 1.0$) and time weighted average levels of exposure ($PH_3 = 0.3$).
- the possibility of storing and recording measured data through a computer interface (down logging) with software supplied for data evaluation.



New Pac II gas monitoring device for phosphine at a range of 0 - 1.0 ppm. This device is good for personal monitoring and venting railcars. Call FSS for more information.

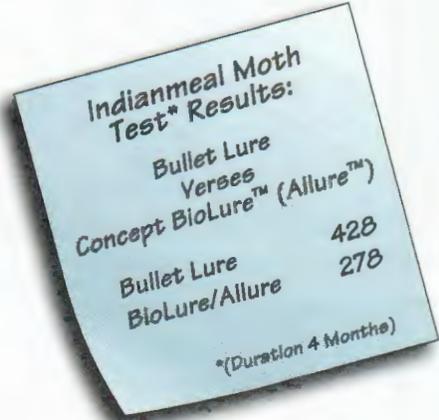
Fumigator's Tip

WILL IT HOLD GAS?

by John Mueller

Over the years, fumigations have been performed on a hit or miss basis with many fumigators holding their breath until the gas levels peaked. Without a case history of a structure (be it a mill, grain storage, sea container, or truck trailer), how do we know if it will hold gas to our efficacious standards. The truth is we have only guessed and sealed to the best







WHERE THE BOYS ARE.

Not All Pheromones Are Created Equal.

Insects that are short-lived as adults, (such as these Indianmeal moths), usually have sex pheromones that attract the opposite sex. Most beetles are long-lived, need to feed to reproduce, and have male-produced aggregation pheromones that attract both males and females.

Not All Pheromone Lures Are Created Equal.

Insects Limited, Inc. offers the highest purity pheromone blends

available. Insects Limited's year-round testing facility in the tropics insures a standard of consistent quality.

Not All Pheromone Companies Are Created Equal.

Insects Limited services its customers with quarterly newsletters, educational seminars and workshops, new Pest Monitoring Software, educational materials, interpretation of trapping results, insect identification, and fast

delivery worldwide. For your FREE Insects Limited Catalog, Call Toll Free: 1 (800) 992-1991 or circle the reader response card # below.



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of our ability. Through this bull dog approach, insufficient gas levels resulted due to poor sealing or inadequate structures which in turn leads to insect resistance and costly gas loss.

Pressure testing can take the guess work out of applying fumigants and make our jobs more predictable and professional. There are three types of pressure tests ; pressure decay, equilibrium pressure

flow, and tracer decay test. Pressure decay tests are preferred due to the relatively short testing time (approximately 1 hour or less). This process involves drawing air out or forcing air in, measuring the maximum pressure, and timing the pressure decay. Ideally, a pressure decay time of 5 minutes or greater is what you are looking for.

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Fumigator's Tip

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Bob Kelly performing a pressure test

Supplies Needed to Pressure Test:

Pressure testing device

Stop watch

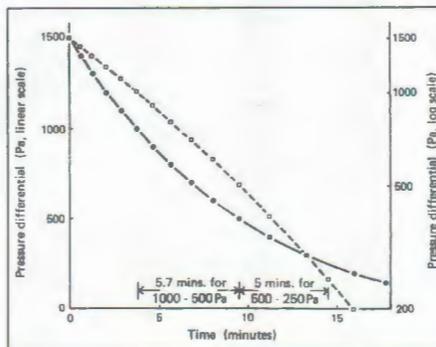
Specially designed fan (with known cfm, a complete shut off-valve and mount on a false 36" door)

In Germany, this test is mandatory under the direct observation of a government official.

This year the Service Division of Fumigation Service & Supply, Inc., is performing pressure tests on those structures which do not have a case history.

We feel pressure testing for sea containers and truck trailers will greatly benefit most of the problems surrounding these

applications. As more and more of these containers are being treated due to their loose construction, the frequency of failures increases as well. There is a new device called the Contester by Trans



An idealized pressure decay curve

Monitor which tests, times, and establishes the half loss time for you. They even have a special purge adapter for insuring pressure under a closed/locked door using an air compressor as your pressure source. For More information on the Contester call John B. Mueller at 317 846-5444.

Bob Kelly

"Employee of the Year"

If there is a harder worker on a fumigation on this planet, I want to meet him.

Bob is a fumigator. He sometimes may perform 10 fumigations a week in the summer time. In three months of 1994 he

sealed, "gased," and de-fumigated over 100 million cu.ft. of buildings in a ten state area. This has occurred with no injuries or complaints!

Congratulations to Bob and his fumigation crew. Bob, his wife Shelly and their three young children receive a trip to Orlando, Florida. After asking Bob what he thought about being named Employee of the Year, Bob said, "I'm going to Disney World!"



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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New Fumigation Catalog

Now Available

- New illustrated layout
- Expanded product line that includes over 300 products including many hard to find fumigation supplies
- Stored-product insect identification section
- Easy to find index
- 1-800-992-1991 Customer Service



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Yes! Please send me:
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