Freeze Them or Fry Them

With the winter upon us, now is the time when Mother Nature has an excellent environmentally friendly method for pest control... Freezing Temperatures.

Many grocery stores, natural food stores, pet food stores, and other places that have insect pests in the winter months need effective pest control, but they can't or won't tolerate conventional pest control methods. If a customer has a product which may be infested, now is the time to watch for the next cold snap and pack those suspect or infested products in the back of a van or a rented storage trailer and freeze them.

A Simple Guide:
The general rule for freezing is to achieve a temperature, at the site of the insect pest, of zero degrees (-18° C) for 7 days for 100% control of all stages of insect life.

The general rule for heating is to achieve a temperature of above 50° (F) / 50° (C) for 16-24 hours for complete control of insect life.

Some refrigerated trucks called "reefers" will freeze to -40 degrees. If this is not available, a meat locker storage area can be rented for a few days. Several flour mills in Canada prepare their facilities during the coldest part of the winter each year for a three day cold temperature treatment.

Obviously, care should be taken to not freeze some products, but there are

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many stored products and museum items that will take this pesticide-free technique. Heat and cold are being used successfully in pest management programs throughout the world today. — Freeze Them or Fry Them is the original title of Paul Field's talk at this year's Fumigants & Pheromones Conference.

DDVP Update

Since 1988 the Environmental Protection Agency (EPA) has been gathering information on the risk estimates for cancer and cholinesterase related problems on the widely used organophosphate insecticide DDVP (dichlorvos). Here is the latest information from the EPA's Special Review section:

There are two different issues to keep straight when considering DDVP: the Delaney side and a Special Review side for re-registration. The Delaney (Clause) refers to the cancer risks in food products and the special review side refers to risks vs. benefits.

On the Delaney side of the issue, the courts have set a time line and a date for action for DDVP: Action will occur by March 23, 1995.

This is a legal issue called "court approved decree." The timeline for products that affect food, called "409 tolerances," is six months to act after a court order. The timeline for court action for raw agricultural products, called 408 tolerances, is to have 25% finished in eight months after the court order.

The courts are scheduled to act on many Delaney products in the first quarter of 1995.

Question to EPA officials:

"What are the chances that DDVP will be on the market again in the U.S. ?"

Ms. Nilofar Nazmi, Special Review [Delaney side] for dichlorvos, (703) 308-8028 stated: "I have seen the dietary science on this product (DDVP) and the numbers don't look good. It is definitely a carcinogen... if the stay is removed on DDVP there will be a 120-day grace period on products treated with the insecticide."

Dennis Utterback, EPA Special Review [Re-registration Side] for Dichlorvos, (703) 308-8028 stated: "AMVAC (the manufacturer of DDVP) will be asked to cancel some uses of DDVP. All issues of DDVP will be reviewed starting in early 1995...not just food. This will include workers, agriculture, diet, and the home."

Editor's Note: This article appeared in the February issue of Pest Control Magazine. David K. Mueller, B.C.E. is
New Pheromone Technology

We are celebrating the 22nd birthday of the Indianmeal moth pheromone.

List of New Pheromones

Under Development
Furniture beetle (Anobium punctatum); Woodworm
Brown banded cockroach (Supella longipalpa)

A new Flour beetle pheromone (Tribolium spp.)
Webbing clothes moth (Tinea bissellii)
Varied carpet beetle (Anthrenus verbasci)
Saw tooth grain beetle (Oryzaephilus surinensis)

Available Summer 1995

Over 1000 pheromones that have been discovered for the more economical insect pests. Several new pheromones have been developed or are under development for the pest control industry in 1995.

Dave's Soapbox

... for what it's worth.

Each spring, for two or three weeks, a group from Oregon State University goes up to Lost Lake in the Cascade Mountain Range in Oregon. The group's job since 1979 has been to survey the populations of frogs and amphibians.

Since the mid-1980's, the survey notes that the frogs and toads were becoming more difficult to find. Some populations of the most common species were nowhere to be found. It seemed that amphibians were disappearing in many parts of the world, from North and South America, Asia, Africa, and Australia. Some species were even reported to have become extinct.

In the late 1980's a pattern had emerged that showed that those amphibians that laid eggs in the shallow water were relatively unprotected when exposed to sunlight and potentially harmful ultraviolet light. After much investigation in the lab on the effects of UVb light on these amphibian's eggs showed that they could not survive an increase of ultraviolet radiation.

The mid-latitudes of the Cascade Mountain range was experiencing a gradual increase of UVb sunlight. The conclusion by this team of scientists from Oregon was that the thinning of the ozone layer was allowing more UVb radiation to enter the earth's atmosphere. This additional radiation was having a direct effect on this population of amphibians in this region.

The significance to this story is that most of the damage done from the thinning of the ozone layer has occurred in the extreme southern hemisphere. Now we could be seeing signs of damage to fragile components of the ecology in the northern hemisphere. Frogs in the Cascade Mountains don't directly affect our lives today, but it makes us think about what could be damaged next.

Extracted in part from Natural History Magazine, Amphibians in a Bad Light, by Andrew R. Blaustein. 

The Ozone Connection

The ozone layer is thinning, but how much is being lost over any particular part of the globe varies according to altitude and season. NASA photos show that significant losses have occurred over populous regions of Asia, Europe, and North America (demonstrating that the ozone hole over Antarctica is not our only problem).

Ozone is vital because it is the only component of the atmosphere that absorbs damaging ultraviolet radiation (UVb) from the sun.

The depletion of this protective layer, even by small amounts, may therefore have dire consequences for many organisms, including ourselves.

Ozone, a blue-tinged gas that is a form of oxygen with three atoms instead of the usual two, is easily broken down by the chlorofluorocarbons (CFC's), halons (fire retardants), methyI bromide (fumigants), and other pollutants that humans dumped into the atmosphere. Despite international efforts to phase out the manufacture of the most destructive chemicals by the end of the century, some of those already released will persist in the stratosphere for many decades, eating away the ozone layer faster than it can be naturally replenished. CFC-11 has a half life of over 400 years, but methyl bromide total life in the atmosphere is 1-2 years. New science by NASA shows that methyl bromide is 50-60 times more aggressive at depleting ozone than CFC-11. Thus the urgency to phase this fumigant before the turn of the century, six years from now.

Each October NASA and United Nations Organizations measure the ozone layer in the Antarctic and compare their findings with the previous years. The 1994 findings reported by NASA's atmospheric science group is that the ozone layer has gotten deeper and bigger since the last recording a year ago.

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Ozone Connection  
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This is also true for sixteen of the past seventeen years. One United Nation report calculated that even a one percent loss of ozone results in an extra 50,000 skin cancers and 100,000 cataracts worldwide.

Methyl Bromide Alternatives Conference

Orlando, November 13-16, 1994

Methyl bromide is a chemical labeled for over 100 crops with over 50 labeled applications worldwide. It is one of the world's most widely used pesticides but is being phased out in 5 years because it accounts for 5% to 10% of ozone depletion.

As the search continues for alternatives to one of the world's most widely used pesticides, scientists from 28 countries met in Orlando to compare notes on their ongoing research.

Scientists at the conference discussed over 100 prepared papers and came up with one conclusion over the three days: "No single solution is available".

"The industry has only five years to craft a comprehensive strategy", said Kenneth W. Vick, the USDA's national program leader for product losses and quarantine. "Our backs are certainly against the wall," Vick said.

The USDA estimates that if sufficient alternatives can't be found, U.S. agriculture could lose as much as $1.5 billion a year in production of fruit, vegetable, and other crops as a result of the ban.

At least three other countries, Denmark, The Netherlands, and Italy, also are accelerating the phase out of methyl bromide, but those countries use far less of it than the United States.

Representatives of the EPA said during the opening session of the three-day conference that the agency realizes the importance of methyl bromide to agriculture but must press ahead with the ban to meet Clean Air Act standards.

Mary Frances Lowe, an EPA program administrator for policy and special projects, told the estimated 300 attending the conference that the agency will speed up the approval process for alternatives whenever possible.

Methyl bromide is thought to be responsible for up to 10% of the loss of ozone, an atmospheric chemical that provides a protective barrier against the harmful effects of ultraviolet light on plants and animals, including humans.

Source: Orlando Sentinel

Seminar Breaks New Ground

What started out to be a continuing education program in 1978 for customers of Fumigation Service & Supply, Inc. for hard to find fumigation credits has turned into an international training ground for stored product protection with international speakers and over 200 participants.

"The workshops this year on the third day were extremely well attended," stated David Mueller, Program Chairman. "We expected 20-30 to sign up for the hands-on fumigation workshop and we ended up with over 100. We had over 40 for the Museum Pest Seminar and Workshops Technical Seminar & Workshops December 6-8, 1994 • Indianapolis

Fumigants & Pheromones

An Alternative to Methyl Bromide

12 Combination fumigations (3-5% CO2, 100° (F), 50-100 ppm PH3) have been completed to date.

THE TOXIC ACTION OF PHOSPHINE: ROLE OF CARBON DIOXIDE ON THE TOXICITY OF PHOSPHINE TO SITOPHILUS GRANARIUS (L.) AND TRIBOLIUM CONFUSUM

K.P. Kaski and E.J. Bond
Research Institute, Agriculture Canada, London, Ontario N6A 5B7, Canada

Abstract — Carbon dioxide was found to potentiate the action of phosphine against a normal strain of Tribolium confusum and normal and resistant strains of Sitophilus granarius so that the length of the exposure period could be reduced. Studies on respiration showed that there was a 20 percent increase in oxygen consumption in the presence of 4% carbon dioxide but no further increase up to 64% carbon dioxide level. Phosphine uptake on the other hand, increase steadily with increase in carbon dioxide level and there was a concurrent increase in toxicity up to three-fold. Carbon dioxide enhanced toxicity when applied simultaneously with phosphine but not when applied before or after phosphine treatment.

Management Workshop. People seem to want to not only learn by hearing but by also experiencing.

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Seminar
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The fumigation workshop featured nine different types of fumigations.

Participants helped perform each step in the fumigation process including the new Combination Fumigation using heat, carbon dioxide, and low levels of phosphine, in combination.

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Smile, Have a Good Time... That's What it's All About
by Barb Bass

When I joined Fumigation Service & Supply in mid September, preparations were well under way for our seminar "Fumigants and Pheromones" to be held in Indianapolis in December.

Guest speakers had been arranged six months prior and over fifteen thousand brochures and invitations mailed. Hotel accommodations at University Place had been made and The Indianapolis Children's Museum was reserved for the special reception and workshop.

In October reservations began arriving from attendees worldwide. The seminar was on everyone's mind while we attended to our daily duties at Fumigation Service & Supply and Insects Limited, Inc. I was looking forward to the seminar but all the "old-timers" who had been through it before were dreading the work ahead.

In November reservations poured in on a daily basis. Barbara Brookie, Program co-chairman, stayed busy making hotel and airline reservations. Barbara also managed the growing workshop and reception registration lists, four in all. She handled hundreds of phone and fax requests for information and reservation confirmations. Barbara was also coordinating the catering of the reception at The Children's Museum and fine tuning the many small details that would make the event a success. Barbara spent considerable time on these preparations along with her regular duties. I still don't know how she did it!

Pat Kelley, who compiled the Seminar notebooks along with the help of Angie Richards. One day Pat came back from the printer with over 200 notebooks of 244 pages each. This was no small feat!

As the days became more hectic with last minute details Dave Mueller would remind us all, "smile - have a good time - that's what it's all about." Easy for Dave to say as we all thought of one more thing that wasn't finalized.
Finally, December 5th was here. Seminar registration day. Everyone was excited and nervous about not forgetting anything on our long lists. But it was still business as usual at the office. Our service division was still doing fumigations up until D-day. Finally about 2:00 pm we left for the University Place Hotel and Conference Center. As we walked out the door Dave's last comments were "Smile - have a good time - that's what it's all about."

The Seminar was a great success. My most memorable event of the seminar was meeting and enjoying all the people we had from the United States and all the people from other countries around the world. It does make me smile to see that no matter what country or nationality we all have common goals and purposes in our lives. That is what it is all about.

Insect of the Year...

**Tyrophagus putrescentiae**

by Angie Richards, Entomologist

Okay, it's not really an insect! *Tyrophagus putrescentiae*, "the Mold mite" is a mite rather than an insect.

**What Makes a Mite?**

Although mites and insects are closely related, mites are in a class all their own. Insects, members of the class Insecta have three pairs of legs, three segmented body parts (head, thorax, and abdomen), and a single pair of antennae. Mites on the other hand, are members of the class Arachnida. This class includes such creatures as spiders, scorpions and ticks as well as mites. Members of the class Arachnida differ from insects in having four pairs of legs, two body parts (Cephalothorax and abdomen), and lack antennae.

**What Do Mold Mites Look Like?**

Mold mites are very small, although they are visible to the naked eye once you know what you are looking for. They move slowly and their soft bodies appear shiny and white. If you look at them under a dissecting microscope, you can see long "setae" or hairs on the end of the abdomen.

**So Why Worry?**

The mold mite is a common pest of high protein stored products including cheese, grain, flour, and seeds. It is found in environments which promote the growth of fungi. The optimum conditions for rapid growth of this mite are 64-77°F (18-25°C) and 77-90% relative humidity. Therefore, they can become a serious problem in such products as soft moist pet foods. Due to their small size and short life cycle, the population can easily go undetected until there is an explosion. When this occurs, millions of mites can be seen as a moving dust on the product or outside the container.

**What Can Be Done?**

Serious infestations of this mite can be prevented by using several methods. Because *Tyrophagus* mites require high moisture and temperature, effective manipulation of these factors are important. These mites hide in cracks and survive by feeding on tiny bits of food. Therefore, sanitation is very important as well. A new trap based on a food source that is highly attractive to stored product mites and several other insects is now available. When fighting mite infestations, knowing the biology of the animal, is half the battle in controlling it.

Source: Mallis, Slansky & Rodriguez

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- Mallis Handbook of Pest Control, 7th ed., by Storey et al., 1,152 pages ................... $89.00
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Every year in America, individuals and businesses spend more than 80 billion dollars on direct litigation costs and higher insurance premiums. When you include the indirect costs, it may add up to more than 300 billion. In 1989 alone, more than 18 million civil suits were filed in this country.  

The Indianmeal moth is the German cockroach of stored product insects.  
Insect pest control has taken a different turn in the past few years from reactive to preventative.  
Be daring, be safe, be different, and be fair." The first article of the Statement of Purpose by the employees of Insects Limited, Inc.  
Effective Pest Management is not treat first evaluate later." by Stay Hedges, B.C.E., Terminex International, Purdue Pest Control Conference  
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Budapest, Hungary  
April 26-29, 1995  
Fax: (36-1) 267-8692  
Dr. Daniel Bajomi, President  

Pest-Ex 95 British Pest Control Association  
London, England  
18-21 June, 1995  
Fax: (44-1) 1332 295904

Fumigants & Pheromones Technical Conference  
Bologna Meeting  
February 14-16, 1996  
Holiday Inn Tower, Bologna, Italy, sponsored by: Insects Limited, Inc. Colkim  
14-16 Febbraio 1996 Holiday Inn Tower-Bologna via Lenin n.43 Convegno Infestazioni dei Prodotti Alimentari Ruolo dei Fumiganti e dei Feromoni con il patrocinio di: Colkim Insects Limited, Inc. Programs and registration forms will be available Fall of '95.

New Staff Announcements for Fumigation Service & Supply, Inc. and Insects Limited, Inc.:  
Barbara Bass  
Office Manager  
Tim Hodgson  
Shipping & Handling  
Roger Cole  
(Entomology, Purdue 12/94)

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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