

Fumigants & Pheromones

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Routing:



A Newsletter for the Insect Control & Pest Management Industry

Flashpoint

In the 1960's a challenge was made to put a man into space and eventually on the moon. At the same time a challenge was made to find a way to control pests without hurting man or the environment. One generation later, both challenges have been accomplished.

The world of pesticides has changed dramatically in the past twenty years. From wide spectrum pesticides that used gallons of active ingredient to kill anything in its way to using a dosage rate of 1 mil of an insect growth regulator that stops insects from reproducing and lasting for six months is remarkable. Farmers today use 'a thimble full' of active ingredients per acre to control pests.

When I was a child it was common to hang Shell Pest Strips in our kitchen to kill flies. This Vapona impregnated strip contained the miracle of chemistry to rid our house of flying insects. Of course it hung directly above our sink where our food was prepared.

I found a couple of containers of insecticide in my wife's home that her dad used to mix a cocktail of products together in the 1960's to insure that no cockroaches would dare enter and live at 727 S. Rotherwood. The active ingredients on the containers were 50% DDT. Roach Pizen (5%



Today's pest management 'Gaucha' is using environmentally friendly products like Insect Growth Regulators to control insect pests.

DDT and 50% sodium fluoride), PESTROY 10% DDT and 0.5% pyrethrin. This was all stirred up in a bucket and generously applied to dogs, cabinets, base boards, mattresses and under carpets according to the label directions.

The amount of active ingredient of the new products that are being developed and sold today in the pest control industry is at the gram or milligram level per gallon of diluent. Agriculture has driven the pest control industry with technology and products that work well at very low concentrations.

The seed industry has traits that help control pests without the use of insecticides. The future of introducing new DNA into the new varieties allows people consuming the product to have a better quality of life. Most soybeans and much of the corn crop today have

some type of trait incorporated to manipulate the outcome. Similar to when lysine was recognized to be deficient in people in developing countries. Dr. Mertz of Purdue's Biochemistry Department found a way to produce a high lysine corn in the late 1960's. The potential of other medicines in our food will come in the near future. Thiamin, lysine, and other fortifying micro nutrients are placed in our bread today to help women and their unborn babies that need these

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Bad Bugs...

Insects that can cause problems



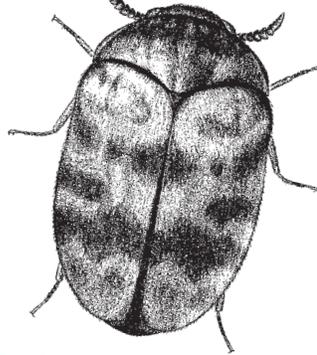
By Alain VanRyckeghem, BCE

Warehouse Beetle

Trogoderma variabile

This persistent little pest is a member of the genus *Trogoderma* which also includes the dreaded quarantine pest, the Khapra Beetle (*T. granarium*). The Warehouse beetle is a common pest of stored foods in the United States and is found in many other countries.

It is about 1/8 inch long, brownish black in appearance with elytra that have a mottled color pattern and lightly covered with hairs. There are about six *Trogoderma* species that can be commonly encountered in stored food environments. Identification cannot be easily done by visual observation alone. Careful microscopic examination is required to separate the common food pest species from the less serious ones, and from the most undesirable Khapra beetle. Can you pick out the common warehouse beetle and the Khapra beetle from the other six lesser known species? (Figure 1).



LIFE CYCLE

Adults may live only 10 days, but with food such as pollen, they may survive up to 60 days. During that time the female may lay as many as 100 eggs. Under optimal conditions of 90°F, eggs will hatch within 5-7 days, larvae will develop over 35-40 days, then pupate for another 5-7 days before emerging as adults again. Two or three generations per year are possible. The quality of food, temperature, moisture, and humidity has a significant impact on development time of the larvae. It is not uncommon for larvae to

take 1-2 years before pupating. Larvae will molt or shed their exoskeleton 5-6 times, leaving the characteristic cast skins as evidence of their infestation. Larvae have been observed to shed their skins monthly for 9 consecutive months before pupation.

BIOLOGY AND BEHAVIOR

These adult beetles are excellent fliers and are attracted to UV lights, pheromone traps, and food odors. *Trogoderma* beetles are common insects outdoors and can fly considerable distances (e.g. 1/4 mile) on the trail of food odors. The larvae are not attracted to light and favor dark cracks and crevices in walls and floors. Larvae feed on high protein foods, including processed wheat, corn, and other cereal grains, fish meal, milk powder, dried spices, nuts, and processed pet foods. It can also sustain itself on dead animal carcasses and insects.

CONTROL

Trogoderma spp are difficult to control with cold temperature.

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Figure 1 (See end of article on page 4 for answers)

Photo: Pest and Disease Image Library.

Dave's Soapbox

...for what it's worth



a clear appearance for the old formulation." Other Insect Growth Regulators like hydroprene and methoprene also have caution warning statements on these products.

NyGuard's activity keeps working for about seven months. The insects ingest the IGR when it eats

grain beetle, Warehouse beetles, Cigarette beetles, and Dermestids among other stored product insects.

In warehouses, NyGuard may be used as a general surface, fog, spot or crack and crevice treatment in food and nonfood storage warehouses. NyGuard can be mixed in foggers to treat

NyGuard™ Label Changes

An insect growth regulator is a unique insecticide. It stops the insect from completing its life cycle and this insect eventually dies without reproducing: "A birth control for bugs." The larva or pupa stages stop development and never become reproductive adults.

Insect Growth Regulators (IGR) are for control of stored product pests, fleas, roaches, crickets, litter beetles, and flying insects. They are labeled for use in food and non-food areas including food processing plants, food warehouses, grocery stores, tobacco plants and warehouses, outside building perimeters, closets and clothing storage, and many more labeled applications.

The recent label changes on the NyGuard IGR Concentrate label is significant. The signal word on the old label was "WARNING." The new signal word is "CAUTION." Caution is the lowest hazard issued by the US Environmental Protection Agency (EPA) pesticides. According to Francisco Manzano, manufacturer representative for MGK in Minneapolis, "The reason the Warning signal was replaced with the Caution label was that the carrier for the active ingredient was 90% of the formulation. The new carrier is less toxic to mammals than the old one. The active ingredient has not changed. The new inert carrier has a yellowish appearance verses



FSS employee fogging a seed warehouse.

particles of food or crawls through areas treated with this unique insecticide. One unique feature of this IGR is that it can be sprayed outdoors with your adulticide to give control of occasional invaders around the building. Most insecticides are affected by the ultraviolet light and breakdown readily.

INSTRUCTIONS FOR USE:

Mix 11 milliliters (about 5 teaspoons of concentrate; of which only 1/2 teaspoon is active ingredient) from the 3.72 ounce (110 mls) 'Tip and Pour' bottle per gallon of water. One bottle will treat 10 gallons of general spray or fog 120,000 cu ft. Insects listed on the label include: Indianmeal moth, Red flour beetles, Confused flour beetles, Lesser grain borers, Sawtoothed

large spaces. Apply NyGuard as 11 milliliters concentrate to one gallon of fogging insecticide to treat approximately 12,000 cu ft. When using NyGuard alone in water or petroleum distillates, leave the building closed for 30 minutes or longer. It is important to cover or remove all food and food processing surfaces. All pesticide labels will list that you thoroughly wash all food processing surfaces before reuse.

Finally, it is amazing to see the results of new insecticides and IGRs on the market today. The menu of control tools and alternatives to remove toxic and environmentally risky products is expanding.

A. K. Mueller

Bad Bugs

(continued from page 2)

They are cold tolerant. Eggs will not survive -2°F (-19°C) for 10 days or more. Control can be easily achieved with heat at 122°F (50°C) after 12 hours. Fumigation is one of the most effective ways of killing all stages of this insect in commodities and buildings. Fogging with a 3% pyrethrin is recommended, but this method will only kill exposed stages. Larvae, eggs and adults which are hidden in product or cracks and crevices of walls and floors will not be controlled with a pyrethrin fogging. Use of esfenvalerate (Conquer) and insect growth regulators in a fog will give longer lasting effects.

MONITORING

Warehouse beetles are excellent fliers, and thus hanging traps with pheromones are useful and effective at attracting male beetles. Note: Not every *Trogoderma* beetle in Figure 1 is attracted to the same pheromone lure. Insect light traps can however, attract both sexes and most *Trogoderma* species to the glue boards. Interpretation of population activity within an area can be more difficult due to the long range of flight of the beetles. These beetles could fly several hundred feet from the source to fly into a light trap.

Monitoring of larvae can only be achieved by the use of floor level pitfall traps, or a uniquely designed wall trap. Larvae will be attracted to the food baits in these traps and not the pheromone. The most important fact to know about monitoring for this group of beetles is that the Khapra beetle (*Trogoderma granarium*) adult **does not fly** and thus monitoring for this pest is done only with pitfall and wall traps with both

Questions & Answers

Dear Insects Limited,

*We are monitoring a plant for *Trogoderma variabile*—lots of dust floating around—our winged traps don't last long. Do you have a trapping configuration that might work better—protect against the dust a little longer? Thanks.*

MJL

Michael,

Thanks for your pheromone question.

*The *Trogoderma* pheromone is different than others. The beetles live outdoors and indoors. They need a nectar dinner to help with egg laying and longevity (maybe even double their adult life span).*

*For this reason, I recommend that you use the *Trogoderma* pheromone outdoors and not indoors. You can pull beetles from the inside out, (look at their hair for signs of food they have been crawling around in last). The milk cartoon stock traps will hold up in the weather for 1-2 months. The beetles fly well and will find the sticky trap outdoors at any height. Borderline fences next to outdoor bait stations are a good place to hang the traps.*

Michael, here is a case study: I fumigated a pet food plant one summer. We opened the building to air out the fumigant and the next morning I had 200 plus male adult beetles in the traps near the middle of the facility. The beetle flew in from over 200-400 yards to get there.

*I do like the *Trogoderma* traps indoors as spot checks. One week check in the ceiling, move to the brick walls and move again to the electrical room where the steel lines run throughout the plant, but to put traps permanently in a warehouse, determine if you have WB. When the warehouse gets warm, above 75°F, they fly. If it is under 75°F, they don't. The traps only detect flying males.*

*I do like a *Trogoderma* lure on the clipboard of the inspector. They will come while one is inspecting the warehouse.*

food and pheromone attractants.

In summary, the Warehouse beetle is a small beetle that resembles many other species, of which some are very important, and others less so. Do not base your monitoring and control programs

on a "guess." Get a positive identification.

*Answers to Figure 1 on page 2: (left to right) 1st Row: *T. versicolor*, *T. granarium*, *T. ornatum*, *T. inclusum*; 2nd Row: *T. grassmani*, *T. variabile*, *T. simplex*, *T. sternale**

Preserving Our History

Carpenter Bees & Carpenter Ants... Chewing Away at Historic Structures

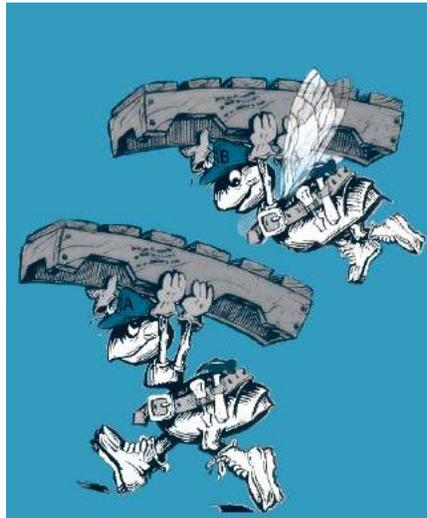


By Patrick Kelley, ACE

As you sit on the wooden porch of the historic home built in the early 1900's, the buzzing and chewing sounds of the carpenter bees working high up in the fascia board dominate the quiet morning. Each spring brings the return of these large solitary bees. Every year they bore perfectly round, dime-sized holes into exposed wood surfaces, leaving piles of freshly chewed wood below.

Carpenter bees and ants are a major threat to the integrity of historic structures across North America and abroad. Although neither pest actually eats wood, both can cause structural damage if they are left to carve out their nests in the wood siding and supports of a wooden structure. Here is a little bit of information about each.

Carpenter bees. The female carpenter bee will choose an area of exposed wood that is generally un-painted and in an area that is protected from the rain. The female will bore straight into the wood for a couple of inches and then will make a 90-degree turn to the right or left for 6-8 inches. She eventually will lay several eggs in the tunnels that she has created. The male bee hovers outside of the hole guarding it from preda-



tors. The males may dive-bomb a person when they get too close to the hole, but remember the males cannot sting. Most activity is in the late spring. Often times, woodpeckers will cause the majority of damage in the wood as they seek out the juicy bee larvae.

Carpenter ants: These large black ants will generally nest in dead trees, injured trees or old firewood outdoors. They create clean galleries within the wood, dropping sawdust and dead insect parts into a pile beneath the nest. Mature colonies can have up to 4,000 ants and will send off winged "swarmers" a few times a year to set up satellite colonies. A large colony outdoors can eventually lead to an infestation within a structure. Carpenter ants prefer soft or moisture damaged wood to make their nests and will travel up to 100 yards in search of food.

Locating and treating the nests for these pests is essential for control. Contact Insects Limited for more information on treatment options.

Flashpoint

(continued from page 1)

minerals to stay healthy.

Wide spectrum products like chlorinated hydrocarbons and organophosphates were used post World War II to control pests with vast continuous use over large areas. Rachel Carson in her book *Silent Spring* mentioned that a band 15 miles wide and 50 miles long was applied on the Illinois border to try to stop the Japanese beetle from spreading west. The beetle spread anyway. The Mother of the environmental movement described modern man as "conquers of nature." The mentality still exists in our world that the best way to solve a problem is to reach for the big hammer and continue hitting until it goes away without regard for the long term consequences.

Today's modern society has chosen smaller and smaller hammers to help solve the pest problems in a civilized way. Rachel Carson would be happy to see our progress in using biologically selective tools that find the chinch in the armor of the insect. Doing this without harming the environment or people is truly an accomplishment.

Tools like baits, pheromones, mating disruption, heat, cold, IGRs, and educated pest managers who identify the pest first and find what the pest likes and doesn't like is the direction in which we are heading. More prevention, monitoring, and education is needed to accomplish today what we did with indiscriminate use of wide spectrum chemicals in the last generation.

With this said, there are always going to be situations where the outbreak is discovered too late and the small hammer approach will not solve the problem. Having a big hammer is important to have in our arsenal but today it should not be the first tool that we reach for in managing pests.

Metal Phosphide Disposal



By John Mueller

Disposal can be a high risk process and should be performed by a trained person with the proper equipment.

With all the changes going on in the fumigation market these days the oldest fumigant of them all keeps plugging along with little change—metal phosphide. Metal phosphide comes in two forms: aluminum phosphide and magnesium phosphide. They are both solid material that when exposed to atmospheric moisture generate phosphine gas. This chemical reaction is referred to as hydrolysis. When this reaction is complete, 1/3 of the metal phosphide weight comes off as phosphine gas and 2/3 remains as a dusty solid.



Phosphine being disposed in a drum of water.

Pre-packaged metal phosphide formulations are designed to release phosphine gas while retaining the dust by-product left behind. The dust retention packaging is made of a cloth type permeable material or Tyvek™. This is more formally referred to as a dust retention

method. This pre-packaged fumigant method allows materials like flour, corn meal, finished rice or other grain fractions to be treated with metal phosphide while eliminating or reducing the risk of product contamination by dust.



Highly flammable! Please dispose of properly!

Dust retention is used in several applications but mostly on rail car fumigations. Once the dust retention products have been used and the fumigation is terminated an additional step is required—residual solid waste disposal.

Residual solid waste disposal of phosphine is directed by the US EPA federal pesticide label. Disposal can be a high risk process and should be performed by a trained person. If you are not familiar with metal phosphide then you need to understand that this product is flammable when wet. Oddly, one method of metal phosphide disposal is to immerse the COMPLETELY spent fumigant in water and detergent. This is the standard operating procedure for disposing of metal phosphide for our company. Doing this in a controlled environment will help mitigate potential flashes that have occurred when correct disposal procedures are not followed.

If you are now horrified—don't be.



This has been done for the last 30 years and when managed properly by a trained person it is safe and effective. Fumigation

Service & Supply uses phosphine disposal systems. Here are the steps to this disposal process:

Step One: Take properly deactivated metal phosphide pre-packaged material and place in a dry deactivation drum. Let sit for at least seven days.

Step Two: After at least seven days, remove spent material from drum and submerge in a mixture of water and detergent. Let sit for seven days.

Step Three: After the second seven days, the waste material is ready for normal disposal in a dumpster or land fill. Currently this product is neither a “Special Waste” or “Hazardous Waste.”

For more information on this system go to FumigationZone.com, click on Catalogs, and scroll down to Hard-to-Find Fumigation Tools. This is currently a PDF document and disposal systems can be found in the metal phosphide section of the catalog.

Pyrethrin Shortage Update



Pyrethrin daisies grow in Kenya.

The pyrethrin insecticide shortage will continue through 2009 about the same as 2008. This means this natural botanical insecticide made from daisy like plants grown mostly in Kenya and Tanzania will be scarce and expensive.

Pyrethrin comes in various concentrations from 0.2% fly spray to dual synergized 3.0% ready to use spray for mills, and food processing facilities. Pyrethrins are labeled for various applications in food process, warehouses, and homes. PyGanic™ is a concentrated pyrethrin that comes with an organic label.

Francisco Manzano, of MGK in Minneapolis stated, "2010 will see more availability of pyrethrin. The new pyrethrum field plants in Eastern Africa will start producing new pyrethrin from the 40,000 farmers that grow and hand pick this natural insecticide on contracted

land. It takes about 18 months from planting to harvesting the first flowers on the pyrethrum plants. There will be 2-3 cycles of new flowers before these fields will need to be replanted."

This shortage of natural pyrethrum was caused by the political upheaval in Kenya where most of the pyrethrum fields exist. Over 700,000 people in Kenya were involved in government controlled pyrethrum production. With the political difficulties in 2007 the pyrethrum farmers were not getting paid by the Kenya government and the farmers had to turn to sustenance farming to survive. Thus the pyrethrum fields went unmanaged.

Insects Limited continues to source available pyrethrin stocks from various manufacturers for our customers.



New Fumigation Technology

Fumigation Service & Supply, Inc. of Westfield, Indiana and Spectros™ Instruments of Hopedale, Massachusetts have formed a partnership to provide basic to advanced fumigation monitoring instruments, equipment and software. This agreement focuses on the North American post harvest fumigation market and will provide advancements in safety, performance, reliability and improved fumigation management.

These two companies have worked together for six years focusing on product development and field trials. Dennis Glennon with Spectros Instruments says, "This technology is proven to be accurate and sound, but making sense of this in a market as diverse as the fumigation industry has been the challenge. The modular components, software, and flexible remote access to information is fulfilling obvious needs and bridging gaps in the fumigation market place." John Mueller from Fumigation Service & Supply, Inc. says, "This equipment has taken us into the 21st century and is providing us with improved worker safety and more accurate data to make better decisions. This technology will also provide a continued stream of improvements and capabilities in the future—this is very exciting."

Fumigation Service & Supply, Inc. [FSS] will provide the marketing and sole distribution for Spectros Instruments to the North American post harvest fumigation market. In addition, FSS will provide basic repair and maintenance of instruments and equipment.

Please contact us today if you would like to receive an Insects Limited Product Guide.

Visit www.insectslimited.com or email info@insectslimited.com



MEETING CALENDAR:

- * July 28-29
NFGA/GEAPS Operations,
Management & Technology
St. Louis, Missouri
- ** November 11-13
(New England Museum
Association) NEMA 2009
Annual Conference
Nashua, New Hampshire
- * September 30 - October 3
National Hardwood
Lumberman's Association
(NHLA)
Boston, Massachusetts
- ** December 13-16
Entomological Society of
America Annual Meeting
Indianapolis, Indiana
- * October 26-29
Pest World 2009
Las Vegas, Nevada
- *** March 3-5 2010
9th Fumigations & Pheromones
Conference
Valencia, Spain

See You There!

*we will attend, ** we will speak,
*** we will organize this meeting



Quotable Quotes



*All days are good...some
are just more interesting
than others.*

*Coming together is the
beginning, keeping together
is progress, working
together is success.*

—Henry Ford

9th Fumigants & Pheromones CONFERENCE & WORKSHOP



March 3-5, 2010

Valencia, Spain

Fumigants & Pheromones is published by Fumigation Service & Supply, Inc. and Insects Limited, Inc. We hope that the information that you receive from this newsletter will help you in your business, and you, in turn, will support our business efforts. If you have an associate who would be interested in receiving this newsletter, please contact the address below. We would welcome any comments or suggestions for topics. Address correspondence to: Kalah Stocker, Fumigation Service & Supply, Inc., 16950 Westfield Park Rd., Westfield, IN 46074 USA.



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