

# Fumigants & Pheromones

Issue 77  
Autumn 2005

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A Newsletter for the Insect Control & Pest Management Industry

## Woolly Bear Caterpillar... A Winter Predictor or Not?

Most people in the Midwest or New England have heard at one time or another that if you want a forecast for the upcoming winter, you should just look for a woolly bear (black at both ends and a reddish brown or rust colored in the middle) or fuzzy bear caterpillar. This same caterpillar is called the woolly worm in southern United States. They are often found in the autumn after they have left their food plants (variety of grasses and weeds including plantain, dandelion, and nettles) in search of a dark and sheltered spot where they can hibernate as larvae for the winter.

According to folklore, the amount of black on the woolly bear in autumn varies proportionately with the severity of the coming winter in the locality where the caterpillar is found. The longer the woolly bear's black bands, the longer, colder, snowier, and more severe the winter will be. Similarly, the wider middle brown band is associated with a milder upcoming winter. The position of the longest dark bands supposedly indicates which part of winter will be coldest or hardest. If the head

*The woolly bear caterpillar has even been known to survive an entire winter completely frozen in an ice cube.*



*The Woolly Bear (Pyrrharctia isabella) Caterpillar is found across the United States, Canada, and Mexico.*

USDA photo

end of the caterpillar is dark, the beginning of winter will be severe. If the tail end is dark, the end of winter will be cold. In addition, the woolly bear caterpillar has 13 segments to its body, which traditional forecasters say correspond to the 13 weeks of winter.

As with most folklore, there are two other versions to this story. The first one says that the woolly bear caterpillar's coat will indicate the upcoming winter's severity. So, if its coat is very woolly, it will be a cold winter. The final version deals with the woolly bear caterpillar's direction of travel. It is said that woolly bear's crawling

in a southerly direction are trying to escape the cold winter conditions of the north. On the other hand, woolly bear's crawling on a northward path would indicate a mild winter.

The popularity of the woolly bear caterpillar has resulted in several festivals honoring them. In Vermilion, Ohio (east of Cleveland), the residents hold the annual "Woolly Bear Festival." It is claimed to be the largest one-day festival in Ohio. Festivities include a parade, woolly bear races, and an

"official" analysis of the woolly bears and forecast for the coming winter. Also, every 3rd weekend in October the annual Woolly Worm Festival is held in Banner Elk, North Carolina.

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# Woolly Bear Caterpillar

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Even though it is widely believed that the woolly bear caterpillar can predict the upcoming winter's severity, the truth is that this caterpillar can't predict what Old Man Winter has in store for us in the upcoming winter. The woolly bear caterpillar's coloring is based on how long a caterpillar has been feeding, its age, and species. The

better the growing season the bigger it will grow. This results in a narrower red-orange band in its middle.

Thus, the width of the banding is an indicator of the current or past season's growth rather than an indicator of the severity of the upcoming winter. Also, the coloring indicates the age of the woolly bear caterpillar. The caterpillars shed their skins or molt six times before reaching adult size. With each successive molt, their colors change, becoming less black and more reddish. In addition, there are approximately 260 species of tiger moths (the adult of the woolly bear caterpillar) in North America, and each species has slightly different color patterns and hair coverings. As a result, some of the color variations that we see each fall may be just a result of seeing a different species.

As far as the story about the woolly caterpillar's coat, the caterpillars are just wearing a heavy coat in anticipation of the

winter cold. This is how Mother Nature has helped it survive winter. All animals go through this same process in the autumn. This ability to adapt to cold shows up particularly in the Arctic, where they can survive to temperatures as low as -90°F. Most caterpillars live for two to four weeks before becoming moths. The Arctic woolly

worms, however, spend at least 14 years in the process! The woolly bear caterpillar has even been known to

survive an entire winter completely frozen in an ice cube. As far as the woolly bear caterpillar's travel goes, they are simply moving about in search for that perfect spot to curl up and spend the winter. This is usually under bark, a rock, or a fallen log.

Even though there is great interest in its caterpillar stage, very few people know what it grows up to be. Each fuzzy, 1½ inch caterpillar becomes an Isabella Tiger Moth. After wintering in its chosen spot, the caterpillar awakens on a warm spring day and continues to feed. Soon it forms a cocoon and pupates. In about two weeks, an orange-yellow moth with 1½- to 2-inch wingspan emerges. The wings lack distinctive markings but the abdomen is spotted with three longitudinal rows of small black dots. These moths are active at night throughout summer.



*Image of Isabella Tiger Moth*  
(*Pyrrharctia isabella*)

Source:

Jeff Boyne, NWS La Crosse Forecaster

## Quotable Quotes

**“What we get is living, what we give is life.”**

Winston Churchill



**“Don't sell your brain for nothing.”**

Eitan Amichi



**“The penalty for the illegal use or transfer of methyl bromide critical use exemptions under the US Clean Air Act is \$25,000 per 200 lb. cylinder.”**

Wayne Ausk,  
Methyl Bromide Manager,  
Great Lakes Chemical Corp.



**“The challenge of statesmanship is to have the vision to dream of a better, safer world and the courage, persistence, and patience to turn that dream into reality.”**

President Ronald Reagan



**“Finally Madame Co-Chairman, if you calculate the tonnage of exempted Methyl Bromide for quarantine and pre-shipment, calculate the worldwide tonnage for critical use exemptions, and calculate the Methyl Bromide being stockpiled, we are concerned that the Montreal Protocol is not going forward, but going backward.”**

November, 2004 Nairobi, Kenya,  
David K. Mueller, as presented in an  
Open Letter series by Albert S. Marulli  
(Correction)

## Dave's Soapbox

...for what it's worth



The Internet has been such a beautiful tool to communicate with today we have almost everything at our fingertips, except an original thought. We Google Search a topic we need referenced and "Cut and Paste" the thoughts of others that have copied their thoughts from others, and re-copy those

forum for exchange of original ideas is becoming scarce.

In our daily life it seems that electronic devices such as cell phones, Blackberries, PDA's, and the Internet have not become tools to make our lives better and more efficient but to make us electronic slaves to take more time to complicate and stress our lives. If you don't believe me, leave your electronic 'buddies' at home this week. When was the last time you saw a colleague smile and look relaxed when their cell phone rang?

So, take a deep breath, think about something you see and hear and try not to be someone else's idea. The 'Cut and Paste Mentality' will only express someone else's thoughts and not our own original thoughts. Who knows, we may even entertain ourselves again.

*D. K. Mueller*

## Original Thoughts

It is important that people with different view points exist to balance and debate issues such as the environment, the usefulness of pesticides, whether Raquel Carson was correct in her book *Silent Spring*, or about the war in Iraq and more. Debate is the way people exchange ideas and shared original thoughts that lead to doctrine. However, the conservative and liberal think tanks in this country continue to breed the very "Cut and Paste Mentality" that many seem to thrive on without an original thought to carry them through the day.

thoughts without raising a hand to interject an original thought.

Recently I taught a class on Insect Ecology at Purdue University. I asked several questions of the students and did not get a response. Afterward, I asked Dr. John Osmun and Dr. Steve Yannick why this was. They responded that the students today don't take notes or ask questions, but go home and search the subject on the Internet when they study. I'm afraid that interaction between the student and teacher has been replaced with the Internet in many cases. The

## Weevil Bucks

Starting December 1, 2005, a program for our customers will begin to redeem coupons called 'Weevil Bucks' for training registration fees. Each time you order from Insects Limited, Inc. or Fumigation Service & Supply, Inc. we place a certificate for \$10.00 off the price of registration for an Insects Limited conference, workshop, or seminar. The Weevil Bucks don't expire so save them and cash them in for valuable training and continuing education.

CONTINUING EDUCATION PROGRAMS



**Good Toward  
Registration**

*D. K. Mueller*  
D.K. Mueller  
Program Chairman





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WEEVIL BUCKS

## Wood Fumigations; ISPM-15



**John Mueller**

A new international regulation requires treatment of all wood products used for export. Any commodity or good leaving the US with wood packaging materials [WPM] must be treated with heat or methyl bromide. This regulation is outlined in the international standard: ISPM 15. Items such as wood pallets, wood bracing material, wood crates, and others are closely regulated in the ISPM 15 rule.

The purpose of this rule is to protect foreign borders from non-indigenous wood infesting pests such as—Emerald ash borer, Asian long-horned beetle, Pine wood nematode, Wood wasp, and other invasive pests. These pests are destroying mature trees in places like Chicago, Detroit, and New York where trees in neighborhoods are being cut down.

ISPM 15 requirements are being managed in the US through Timber Products Services [TPS]. TPS runs a formal program of defined treatment procedures and documentation with monthly audits. Once wood is treated it must be marked with a specific stamp provided by and controlled by TPS. Each stamp is coded specifically for each fumigation or heat treatment company.

**All wood leaving country must bear this stamp:**



Most exported material leaving the U.S. is transported in containers. The number of containers used globally for import/export is so large it is difficult to comprehend. (See chart below.)

As you convert these massive numbers, try to understand how many of these shipping units contain wood packaging materials. What is the total number of fumigated containers even if only a small percentage of these containers are fumigated? This is all



**Asian Longhorned beetle**

wooden pallet or dunnage after manufacturing is completed. A potential future alternative to methyl bromide is sulfuryl fluoride. Currently sulfuryl fluoride cannot be used on WPM because it does not have international acceptance [CODEX] and total international approval. Early testing shows that sulfuryl fluoride does work on foreign invasive wood pests and further testing is being conducted by USDA Forestry Service for alternative controls to wood and wood products.



**This global chart shows the flow of cargo containers (x one million) from continent to continent. Source NATO.**

new for this year.

What does this mean to the flow of trade? It appears that ISPM 15 could slow the exchange of trade. I believe with winter upon us and the need for warmer fumigation conditions (51.8°F/ 11°C) we could see a frenzy of activity just to keep a free flow of trade.

Currently methyl bromide is the only chemical which can be used to treat these WPM's. A heat treatment that reaches a temperature of 56°C/ 144°F in the center core of the wood is also acceptable. Many times this is not possible if the product is already strapped to the

Work is being done at this time on scrubbing the methyl bromide with a patented process that eliminates 99.4% of the remaining methyl bromide at the end of the container fumigation. More on the results of these trials will be forthcoming in later editions of *Fumigants & Pheromones*.

This change in our industry is all very exciting and confusing at the same time. A complete understanding of this market is still not clear but as you are reading this article, fumigators around the world will be frantically working out the details—stay tuned.

# Fumigation of Museum Specimens

## *Preserving Our History*



**Pat Kelley**

Museum collection pieces are often the target of damaging insect pests. Insect infestations within a collection storage area can quickly spread to multiple pieces and cause irreversible damage. When insect populations like this are discovered, many times the quickest and most effective means of treatment is fumigation with a toxic gas.

*Please Note: Before any treatment is performed, each article and all of its components must be closely examined to see if there will be any reactivity with the fumigant being used.*

Outside of inert gas fumigations and anoxia treatments, the friendliest fumigant to delicate artifacts is sulfuryl fluoride (SF). SF becomes a clearer choice as methyl bromide's governmental restrictions rule it out and phosphine's corrosive effects to some metals make curators apprehensive. Over the past several years, Insects Limited and Fumigation Service & Supply have performed numerous SF fumigations on a wide variety



*Animal mounts from the Frazier Historical Arms Museum are prepared for a fumigation with Sulfuryl Fluoride.*

of museum pieces in our specialized fumigation chamber. Some of these items include:

- Animal mounts of all sizes
- Textiles infested by webbing clothes moths
- Oil paintings in wooden frames
- Wooden furniture with brass, copper and stone components
- Wooden carvings with feather and plant material components
- Herbarium collections

When done correctly, a fumigation using SF can rapidly eliminate an insect infestation with no damage to the infested article. In Germany,

a progressive company has developed a filtering system which takes out the small amounts of impurities in SF that can cause reactivity, making it, as Jim Druzik of the Getty Conservation Institute in Los Angeles, California, put it, "The choirboy" of these three fumigants: Methyl Bromide, Phosphine, and Sulfuryl Fluoride.

Insects Limited works with museums around the world to help solve pest problems. Please contact Insects Limited for consultation or custom treatment of museum or antique pieces.

Fumigant	Effect on Materials
<b>Methyl Bromide</b> <i>(As of Jan, 2005 can only be used for export and quarantine)</i>	Can cause a disagreeable odor with sulfur containing materials. Do not use with items containing hair, hide, feathers, fur, wool, latex or foam rubber, carbonless copy paper or cinder blocks.
<b>Phosphine</b>	Corrosive to copper and copper alloys. Also reacts with silver, nickel, gold and ultramarine
<b>Sulfuryl Fluoride (Vikane™)</b>	Purest form of gas is un-reactive to most museum pieces. Trace by-products of the gas synthesis can cause tarnish to unprotected metals. Condensation from misapplication of the fumigant can also cause damage

## FlashPoint.



Dave Mueller

In the coming issues of *Fumigants & Pheromones* there will be a section devoted to **FLASHPOINTS**. A **Flashpoint** is any event that affects our lives for ten years or more. Examples of **FLASHPOINTS** are: The book *The Jungle*, Splitting the Atom, The book *Silent Spring* by Rachel Carson, The Cuban Missile Crises, Earth Day 1970, The EPA, banning DDT, EDB cancellation, Methyl bromide phase out, Mandated IPM in schools, and the Internet.

Human misery usually causes change. Think of the changes that were caused by hurricane Katrina, Three Mile Island, September 11, 2001, Chernobyl, Hiroshima, Polio to name a few.

Traditionally humans are not good at predicating future **Flashpoints**. Think about the recent hurricane in the Gulf Coast and how people reacted verses how people in Houston acted several weeks later to hurricane Rita. Think in your own company how you worked before and after a federal or state violation was imposed or a good customer dropped his account with your company. There are **Flashpoints** in business and in our personal life too.

We all can recall an incident in our lives that we feel years later. It could be the lose of a brother or sister to cancer, a pet being hit and killed by a car, or the day you won the lotto.

What I hope to show by writing this column on **Flashpoints** is that these moments in time happen and will continue to happen. If we are not prepared for them then we can lose control over our lives or our business. If we can predict or react to the **Flashpoint** when it happens, we then can use this change to our advantage and prosper from it.

In business we have **Flashpoints** that cause our lives to change regularly. ISPM 15 is an international wood packaging regulation (see page 4) that recently changed our business tremendously. There are over 120 million containers that move commerce within North America to Europe and China each year. Many of those containers contain wood packaging materials like pallets and dunnage. Each manufacturer and freight forwarder must have that wood stamped to show that it has been treated with methyl bromide or heat under strict standards and international guidelines. Many people saw this ISPM-15 regulation coming for 12 months or more. But human nature waited until the last minute to act and the current cold weather will likely disrupt the flow of containers throughout the world.

***If we want to be better at understanding the future, we need to remember our past experiences and take control of those sudden Flashpoints before they control us or our companies.***

### Flashpoint Number 1:

Upton Sinclair's *The Jungle* is a vivid portrait of life and death in a turn-of-the-century American meat-packing factory. This grim indictment led to government regulations of the food industry. It is a tale of the struggles of a family that immigrated from Eastern-Europe in the late 19th Century to Chicago with dream of jobs and freedom. Their dream could only be possible for this family if they sacrificed everything. This included their health, sanity, and their soul. The tale that Pulitzer Prize winner Upton Sinclair paints can be mirrored to the continuous flood of immigrants to America that want a better life for themselves and their children. The cost is high for the immigrant, but their future generations that settle in this country become the labor force that builds the country and makes up its fabric. Lithuanian-American, German-Americans, Italian-Americans, Irish-Americans, African-Americans, Jewish-Americans, Polish-Americans, Mexican-Americans, and all those other immigrants that started in cities like Chicago, New York, Los Angeles, Miami now make up America. The struggles of Jurgis, Ona, Marija Berczynskas, Teta Elzbieta, little Sebastijonas, and the cast of characters in *The Jungle* express how life was in Chicago's Packingtown during the turn of the century. The constant flow of immigrants were used like grease in a bearing to make the machine turn, only to be discarded when they wore out. *The Jungle* is about human misery and socialism.

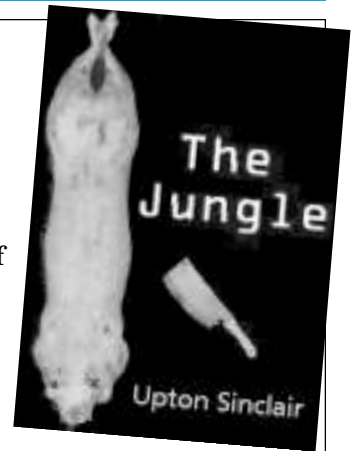
Sinclair's fiction, *The Jungle* influenced the U.S. Government into evaluating the food safety and labor laws in this Country and gave a view of capitalism at its worst. It launched a government investigation of the meatpacking plants of Chicago and created the food laws we have today.

### Quotes from *The Jungle*:

"The line of the buildings stood clear-cut and black against the sky; here and there out of the mass rose the great chimneys, with the river of smoke streaming away to the end of the world. It was a study in colours now, this smoke; in the sunset light it was black and brown and grey and purple. All the sordid questions of the place were gone—in the twilight it was a vision of power. To the two who stood watching while the darkness swallowed it up, it seemed a dream of wonder, with its tale of human energy, of things being done, of employment for thousands upon thousands of men, of opportunity and freedom, of life and love and joy. When they came away, arm in arm, Jurgis was saying, "Tomorrow I shall go there and get a job!"

• • • • •

"He is a beef-boner, and that is a dangerous trade, especially when you are on piecework and trying to earn a bride. Your hands are slippery, and your knife is slippery, and you are toiling like mad, when somebody happens to speak to you, or



you strike a bone. Then your hand slips up on the blade, and there is a fearful gash. And that would not be so bad, only for the deadly contagion. The cut may heal, but you never can tell. Twice now; within the last three years, Mikolas has been lying at home with blood poisoning—once for three months and once for nearly seven. The last time, too, he lost his job, and that meant six weeks more of standing at the doors of the packing houses, at six o'clock on bitter winter mornings, with a foot of snow on the ground and more in the air. There are learned people who can tell you out of the statistics that beef-boners make forty cents an hour, but, perhaps, these people have never looked into a beef-boner's hands."

• • • • •

"We will pay them all somehow. I will work harder." That was always what Jurgis said. Ona had grown used to it as the solution of all difficulties—"I will work harder!"

• • • • •

"The men who worked on the killing beds would come to reek with foulness, so that you could smell one of them fifty feet away; there was simply no such thing as keeping decent, the most careful man gave it up in the end, and wallowed in uncleanness. There was not even a place where a man could wash his hands, and the men ate as much raw blood as food at dinnertime."

• • • • •

Sanitation—"The "Union Stockyards" were never a pleasant place. They were not only a collection of slaughterhouses, but also the camping place of an army of fifteen or twenty thousand human beasts. There were not merely rivers of hot blood, and car-loads of moist flesh, and rendering vats and soap caldrons, glue factories and fertilizer tanks, that smelt like the craters of hell—there were also

tons of garbage festering in the sun, and the greasy laundry of the workers hung out to dry, and dining rooms littered with food and black with flies, and toilet rooms that were open sewers."

• • • • •

"There would be meat stored in great piles in rooms; and the water from leaky roofs would drip over it, and thousands of rats would race about on it. It was too dark in these storage places to see well, but a man could run his hand over these piles of meat and sweep off handfuls of the dried dung of rats. These rats were nuisances, and the packers would put poisoned bread out for them; they would die, and then rats, bread, and meat would go into the hoppers together. This is no fairy story and no joke; the meat would be shoveled into carts, and the man who did the shoveling would not trouble to lift out a rat even when he saw one—there were things that went into the sausage in comparison with which a poisoned rat was a tidbit."



#### 1906 Food and Drug Act:

Many forces combined to create the need for the 1906 Food and Drugs Act but the book *The Jungle* likely played the biggest role. In 1906 when Upton Sinclair published his socialist novel, *The Jungle*, he aimed at people's hearts but hit their stomachs

instead. His few pages describing filthy conditions in Chicago's packing plants, widely reported and confirmed by governmental inquiry, cut meat sales in half, angered President Roosevelt, and pushed a meat inspection bill aimed at protecting the domestic market through the Congress.



Amidst the meat crisis, when the House leadership seemed again determined to give the food measure the silent treatment, Roosevelt called the speaker in and insisted that the bill be brought to the floor. On June 30, 1906, President Theodore Roosevelt signed into law the Food and Drugs Act.

The 1906 law forbade interstate and foreign commerce in adulterated and misbranded food and drugs. Offending products could be seized and condemned; offending

persons could be fined and jailed. The law prohibited the adulteration of food by the removal of valuable constituents, the substitution of ingredients so as to reduce quality, the addition of deleterious ingredients, and the use of spoiled animal and vegetable products. Making false or misleading label statements regarding a food or a drug constituted misbranding.

The law sought to protect the consumer from being deceived or harmed, mainly by following a favorite assumption that

the average man was prudent enough to plot his own course and would avoid risks if labeling made him aware of them.

Upton Sinclair's *The Jungle* was a **Flashpoint** in the food processing industry in the United States and around the world.



### January 24, 2006

#### Start with the Insect First

Basic Insect Identification Workshop, Upon completion of this workshop the student is expected to be able to identify most of the common stored product insects associated with food processing, grain, and museums. Emphasis will be on the identification features but will include basic biology, conditions conducive to infestations, damage and detection, and collecting field insects. Quizzes will be used to reinforce ID features, Stereomicroscopes will be provided. Topics include: Morphology, entomology tools, collection methods, pheromone trapping, and 25 stored product insects.

**Workshop Fee:** \$295 (after January 1, \$325) includes lunch, three breaks, and a manual.

**Instructors:** Alain Van Ryckeghem, Patrick Kelley, Dave Mueller

### January 25, 2006

#### Advanced Insect Identification

Upon completion of this workshop the student is expected to be able to identify more than 75 commonly encountered insects in the structural pest control field. Emphasis will be on the identification features but will include biology, conditions conducive to infestations, damage and detection, collecting, and preserving field-collected insects. Course materials include ID aids for job use. Quizzes will be used to reinforce ID features. Topics include: insect anatomy, cockroaches, stored product insects, fabric pests, flies, ants, ectoparasites, stinging insects, wood-boring insects, collecting/preserving. Stereomicroscopes will be provided.

**Workshop Fee:** \$350. (after January 1, \$395) includes lunch, three breaks, and a manual. Both days \$575.

**Instructors:** Alain Van Ryckeghem, Patrick Kelley, Dave Mueller

### January 27, 2006

#### Initial Fumigation Training

This one day training program is designed to train fumigators that need to take state fumigation exam. The Indiana State Chemist's Office will offer the fumigation exam (category 7d) at the end of the training program. This is the only fumigation certification training program offered in

Indiana. People desiring training for other state fumigation training can attend. This is not a re-certification training program but an initial fumigation training program.

**Workshop Fee:** \$185 per person

**Instructors:** John Mueller, David Mueller, Pat Kelley, Nathan Stocker, Brian Wendell

#### Location:

Insects Limited Training Center:  
Westfield, Indiana

#### Registration:

Call 1-800-992-1991 or on-line at  
[www.insectslimited.com](http://www.insectslimited.com) for details.

### Bremen 2007



### 8th Fumigants & Pheromones Conference

March 6-8, 2007  
Bremen, Germany

## NEWSLETTER

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