ISSUE 7
PESTWEST ENVIRONMENTAL

IN THIS ISSUE

PESTWEST 411 NEWSLETTER

DID YOU KNOW...

The fastest known fly is a horsefly, 145 km/h

Cockroaches are the fastest runners in the insect world, running at 3mph, equivalent to a human sprinting at 200mph

Fleas can leap 800 times their own body length

"CHEESE SKIPPER" IS NOT SOME NEW DIET FAD!

When you hear the name "cheese skipper," you may first think of some new diet fad. The last thing you may think of is a pest species of fly.

The name cheese skipper is the common name given to *Piophila casei*, which roughly means "loving to seek milk protein." Cheese skippers get their name from the observance that larvae move around by a sort of "skipping." Larvae have been observed jumping up to 10 inches, in addition, when disturbed, the tiny maggots or larvae can hop into the air about six inches. Larvae complete their acrobatics by bending over, grabbing onto the rears of their own bodies with mouth hooks, tensing muscles, and sharply releasing the grip. This spring action propels larvae into the air.

Cheese skippers are a small black fly, $^1/_8$ inch long with reddish-brownish eyes and a bronzy shimmer on its thorax. These flies have a long, thin body with mildly iridescent wings folding flat and lapping mouthparts similar to those of the housefly, *Musca domestica*.

Cheese skippers are found all across the U.S. and are a significant pest of cheese and meats. Cheese skipper larvae have been found living in pork products, human cadavers, and manure.

Female cheese skippers place eggs onto appropriate food sources. Larvae shun light and usually burrow into breeding media. **Under appropriate conditions, the life cycle from egg to adult can occur in as short as 15 days. Unfavorable living conditions will extend this period up to eight months.**

Adult cheese skippers feed on organic juices present in the larval breeding sources and live only a short period of time in order to mate and place eggs. Since adult flies and larvae feed upon decaying organic materials, this puts them in contact with organisms that can cause human disease. There is suspicion that cheese skippers can transmit pathogenic organisms that contaminate food products similarly to houseflies. In addition, people who eat foods that contain larvae of cheese skippers can experience intestinal irritation.

Food facilities that process, package, or store cheese and meat products are high-risk operations where cheese skipper infestations will be located. Rendering plants where livestock are processed may also experience infestations of cheese skippers.

When inspecting for media or potential breeding sources of cheese skippers you must focus upon moist environmental sources. The preferred products of infestation are overripe, moldy cheese and cured ham. Dried meats are seldom infested.

Micro-environmental deposits of grease or food trapped can support large numbers of cheese skipper larvae. Also damaged food or rework products in warehouses are often a source of cheese skippers. Locating damaged commodities can be challenging, but odorants produced by decaying food products can focus the search area. A particular focus should be given to areas where canned meat products are processed or stored.

Cheese skipper is not some new fad diet, rather a flying insect pest that can make a nice diet out of your client's valuable cheese and meat commodities. PestWest Environmental can provide you and your client with solutions to flying insect pest challenges. From our on-site CDS training program, to inspection and auditing tools, environmental range products, and advanced flying insect monitoring and control systems, we can help you and your client "skip" flying insect pressures.

Contact PestWest today at **866.476.7378** or visit our website at **www.pestwest.com.**

Sabra Fearon, PestWest USA presenting Jennifer Leggett, Lindsey Pest Control Inc with a Breast Cancer Awareness branded Mantis Uplight. This will be installed in her local hospice.

PestWest®

FLYTRAPS, UV LIGHT AND LED'S

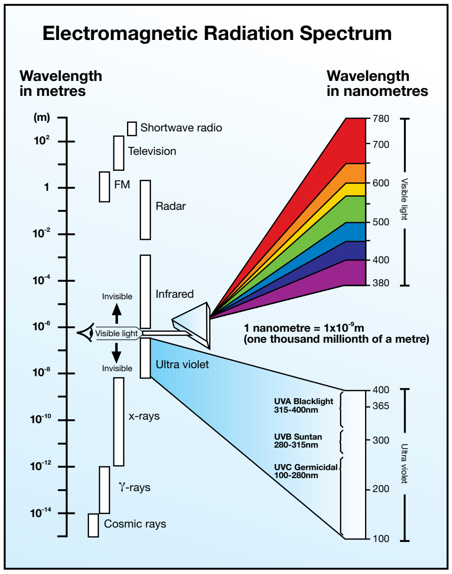
One of the greatest areas of misunderstanding concerns something we all automatically assume we know about, and that is light.

We see light and that is the end of it! Or is it?

In actual fact it most certainly is not. The light we see is just a small part of the electromagnetic spectrum that bathes us and is emitted not only by the sun but is also provided in man made forms through radio's, TV's, mobile phones and a host of other sources.

The white light we see is actually made up of a range of colours, and from our school days many of us will recall using a glass prism to split this light up into its constituent colours from red through to yellow, green, blue to violet etc. The same thing is repeated in the atmosphere by water droplets after it has rained which form a rainbow, under the right conditions.

But what about the "light" outside of the range visible to humans?



At the red end of the spectrum light advances into Infra-red (IR) and beyond, as its wavelength gets progressively longer. This can be seen when using remote controls for TV's, garage doors etc. These employ semiconductor emitters that generate IR radiation to activate electrical equipment.

Similarly at the violet end of the spectrum where the wavelength is shorter the light becomes invisible to us once again. However some species of life are able to "see" this light whereas we humans cannot. Many flying insects belong to the organisms able to see this light which we term Ultra Violet.

This phenomena has been exploited for over 50 years by using UV emitters to attract flying insects. The vast majority of such insect traps employ fluorescent tubes to generate light from the UV part of the spectrum.

JUST BECAUSE THE TUBE IS LIT DOESN'T MEAN TO SAY IT IS STILL PRODUCING ENOUGH UV TO ATTRACT INSECTS

The physical processes involved in producing this light also produce blue light, which of course can be seen by humans. However, what is often not appreciated is that the blue light, we see, is not the prime attractant for the flying insects, it is the UV light, which is important.

Because fluorescent tubes employ the shorter wavelength of UV light and these create certain types of phosphors in the tubes, the output of UV light decreases more rapidly than the equivalent "white light tubes". Therefore, just because the tube is lit and we can see light, doesn't mean to say it is still producing enough UV to attract insects.

There have also been rapid advances in devices called Light Emitting Devices (LED's). LED's were originally developed as red or green indicators, through a careful selection of the elements used in their construction. Over the years the range of LED's has been expanded to cover the whole of the visible spectrum and additionally their power levels have advanced dramatically.

Recent advances in "white light" LED technology have enabled efficiency levels approaching, and in some instances exceeding, those achieved by the best fluorescent tubes. When coupled to the lower voltage requirements of these devices, LED's make attractive alternatives to fluorescent tubes as a lighting source. Furthermore, the light emitting junction of an LED is much smaller than an equivalently rated fluorescent tube and the surface brightness is many times greater, making it an attractive option for many compact applications.

An obvious application for UV LED's is of course flying insect units and in recent years a number of companies have been tempted to produce fly control products using this technology. However, for the same reasons that constrain UV fluorescent tubes, the production of highly efficient LED UV emitters has until recently proven difficult. This has meant that the power levels of UV light emitted by individual LED's remained orders of magnitude below even the poorest of fluorescent tube.

Research at the University of Birmingham, UK, sponsored by PestWest has shown that most urban flying pest insects respond to the UV range 340-380nm. The majority of UV LEDS, currently available, have their centre spectrum output well above this, typically around 400nm.

The relatively high cost of LED's compared to UV tubes and factors such as rapid fall of output against time, their susceptibility to high operating temperatures, electrostatic discharge etc. has kept responsible manufacturers from going down this route until better devices became available.

Undoubtedly the situation will change as technology advances and PestWest has actively been and continues to conduct research in the potential of LED technology for use in flytraps.

BULB RECYCLING

By diverting waste from landfills, facility managers can help the environment and move toward sustainability

BY PAUL WALITSKY, CHMM

A recycling program is one way facility managers can contribute to the reduction of the mercury released into the environment. And a critical mass in the number of U.S. states requiring removal of most mercury containing lamps from the commercial waste stream may soon be reached.

On July 12, 2005, New York State will join the ranks of seven other states that require all commercial facilities to recycle mercury containing lamps, whether or not the lamps are designated as hazardous waste. The other states that require commercial facilities to recycle these lamps are Minnesota, Vermont, Maine, Connecticut, Rhode Island, California, and Florida. In New York, households and very small generators of lamp waste are exempt from the new rule.

Prior to the start of the New York mandate this summer, only lamps which fail the toxicity characteristic leaching procedure (TCLP) are required to be recycled. TCLP is a test used by the U.S. Environmental Protection Agency (EPA) to determine if an item is hazardous waste. The procedure is designed to simulate how much of a toxic chemical (in this case, mercury) would leach from the product if it were put into a landfill.

The movement in New York requires every mercury containing lamp to be recycled, regardless of whether or not it passes TCLP. This steps up the action to reduce the emission of mercury into the environment.

Mercury Issues

Fluorescent and high intensity discharge lamps need mercury to operate. Their energy efficiency comes from the ability of the mercury to generate ultraviolet energy.

In 2003, lamp manufacturers used some 13 tons of mercury, of which about seven tons ended up in lamps. The other six tons were left in equipment and other channels involved in the various stages of manufacture.

This is not an insignificant amount. But is it enough to raise concern?

When lamps break, a small amount of the mercury is in the vapor state and can add to the atmospheric burden. With some 600 to 650 million mercury containing lamps sold in the U.S. each year, even these small amounts of mercury vapor can add up significantly.

The threat of mercury toxicity has been widely reported. Occurrences related to mercury happen almost every day. Therefore, the need for recycling as a means of keeping mercury from entering the ecosystem becomes urgent.

A recycling program for the facility can significantly reduce the threat of mercury. However, the mitigation of environmental consequences can begin earlier in the life cycle of the bulb.

For many years, the EPA has offered a hierarchy of options for those involved with waste management, and this list is applicable to the mercury situation.

Source Reduction

This is often considered the first line of defense against mercury related pollution events. It is much easier to put less of something into a product initially than it is to clean up more later.

Lamps manufactured with low mercury content enable facility managers to satisfy the source reduction approach. When shopping for lamps, facility managers can ask suppliers about the mercury content level in the product.

Additionally, facility managers can access reference materials on source reduction from INFORM Inc., an independent, nonprofit organization focused on solutions to environmental and health related problems, and the U.S. Green Building Council (USGBC) LEED-EB Ratings System. (See Web resources at the end of this article.)

Reuse

In the case of mercury containing lamps, this second exercise in the pollution prevention hierarchy is directed toward manufacturers. Those organizations can reuse the mercury generated by the lamp recyclers after triple distillation is performed. Triple distillation is a treatment used to purify the mercury back to a level that can be reintroduced into lamps.

The glass from a used lamp, however, cannot be used to manufacture new lamps. During the recycling process, the old glass acquires tiny bits of metal, which would cause problems in the manufacturing process.

Recycling

Applied to lamps, recycling is an excellent way to prevent mercury from entering the ecosystem. In 1991, there were only five or six lamp recycling facilities operating in the U.S. currently, there are more than 40 such operations.

The Association of Lighting & Mercury Recyclers (ALMR), formed in 1999, represents approximately 80 % of the lamp recyclers in the U.S. For a list of the members, visit the ALMR Web site or **www.Lamprecycle.org**, a site developed by the lamp section of the National Electrical Manufacturers Association.

Those interested in USGBC LEED-EB certification should note that while a recycling program for fluorescent lamps alone will not earn credits toward certification, such a program does meet part of the "Occupant Recycling" requirements.

Taking Action

Whether the facility manager is mandated by law to recycle, or if the action is voluntary, the question of implementation remains: how do facility managers institute lamp recycling programs? A conversation between the facility manager and the lamp distributor is a good starting point.

In several areas around the country, lamp distributors are offering reverse distribution. This means the delivery truck that brings new lamps also takes back the old ones, for a recycling fee. Since the truck would otherwise return to its site empty, this is a very efficient way to recycle the lamps.

From an environmental standpoint, it also makes sense. Transportation is reduced and extra handling is eliminated. The recycler then travels to the distributor to pick up the lamps instead of going to each customer individually.

Some distributors may not have the room to store extra product while awaiting the arrival of the recycler. As an alternative, distributors often make arrangements with recyclers to service their customers.

Another alternative is the pre-paid box program. For isolated or low volume facilities, this can be an attractive method. The distributor or recycler sells empty boxes on which the freight has been pre-paid back to the recycling facility. When the box is full, the user calls the local express pickup designated by the recycler, and the box is picked up and delivered to the recycler's facility.

A fourth choice is to deal directly with the recycler. These companies have sales personnel available to talk with facility professionals who want to start a program.

While costs for recycling services vary, freight distance and volume play a large role in the pricing structure, prices generally run from 6¢ to 10¢ per foot (or 24¢ to 40¢ per four foot lamp).

Regulation

There are regulations in place designed to make recycling hazardous waste items easier. Established in 1995 by the Federal Government, the Universal Waste Rule (UWR) applies to lamps deemed hazardous by virtue of the TCLP. The UWR, a subset to the Resource Conservation and Recovery Act, applies to a variety of waste (including, but not limited to, fluorescent lights, high intensity discharge, neon, mercury vapor, high pressure sodium, and metal halide lamps).

The rule was created to ease the regulatory burden on businesses that generate the specified waste and choose to recycle. Adopted by all of the states, UWR established and outlined requirements for shipping, labeling, length of storage allowed, training requirements, and record keeping (only for destination facility, but common sense says the shipper should keep the bill-of-lading). Individual states may impose their own regulations on the rule as well.

Often the UWR is also used to handle lamps which are deemed non-hazardous. This is because TCLP does not measure how much mercury is actually contained in a product or how much may be released under non-landfill conditions. Therefore, just because the lamp is not deemed hazardous by TCLP does not mean it is free of mercury.

The Recycling Process

During the recycling process, the lamps are sent through a closed chamber in which a vacuum is generated. The lamps are crushed, and the material is moved through a series of screens. Air flow, vibration, and size of the particles determine where each of the materials ends up in the recycling equipment. At the top are the largest pieces (usually the lamp bases), below are the glass pieces, and at the lowest level is the phosphor, which is the white powder seen on the inside of the lamp tubes.

This part of the process is where a good deal of the mercury is gathered. The phosphor is removed from the chamber in trays, put into a retort, and heated. The mercury vaporizes, cools, and recondenses into a container. At 99.7 % pure, it is commercial grade but not lamp grade. This is where the triple distillation process mentioned earlier occurs.

What happens to the glass and metal bases?

The glass goes to various end uses such as fiberglass making and roadway material. The aluminum bases are sent to an aluminum smelter for recycling, and the zinc plated iron is sent to scrap metal handlers. There is mercury attached to each of these materials. How much mercury will depend on the individual process. At present, there is only one lamp recycler that heats up the entire lamp, thus recovering as much of the mercury as possible.

Currently, mercury lamp recyclers gather approximately 23.3 % of the mercury containing lamps disposed of each year, most from commercial installations. This means the remainder is disposed of in solid waste. That, coupled with the mercury left on the metal and glass parts, means only a small percentage of the mercury in lamps is actually recovered.

This fact contributes to a rationale for coupling source reduction with recycling. By combining both approaches, it should be possible to recover a significant part of the mercury currently ending up in solid waste landfills.

The time to start a mercury lamp recycling program is now. Facility managers who implement a recycling program in conjunction with source reduction in their purchasing are making an effort. It is possible to begin reversing the environmental damage, and it all begins at the facility management office.

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