



Pest Notes

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Itches Can Be a Complex Issue

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One of a technician's most difficult problems to deal with is "itches." These are often attributed to "cable lice," "paper fleas," and other mythical pests. This article deals with those situations where itches or bites are attributed to "insects" or "bugs" of some type. Many times the "bugs" are invisible. This article does not deal with real insect problems or delusory parasitosis (insects coming out of the body) but rather focus on causes of itching or dermatitis. Many times itches are from environmental irritants.

Itches fall into several categories. Some are caused by insects, mites or other arthropods. These are usually easy to identify and resolve. Medical issues such as allergies, skin rashes associated with diabetes, jaundice, chicken pox and circulatory problems, can also cause itches. Imaginary itches where insects are inside the body and "coming out" are medical issues and must be treated as such. The real challenges are those "bites" caused by environmental irritants and blamed on insects. Even more challenging is a combination of the above factors.

Years ago our industry would handle the environmental irritant itch case by just "spraying" or "fogging." We did this to appease the customer and it actually worked. Here's why: During cold winter months the humidity inside buildings will drop to 12%. This is a very dry environment and employees that work with materials that become airborne start getting "bites." If a company came in and sprayed and fogged the liquid would

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HACCP Spells Change for PCOs

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If you're providing pest control services to food processing facilities you better be familiar with the Food and Drug Administration's system for managing contamination risks in our nation's food supply.

Pest management professionals face many new challenges when it comes to servicing their food industry clients. For instance, the FDA's adoption of the HACCP system for managing contamination risks has increased the pressure on PCOs to deliver the highest quality pest control service in these accounts.

What is HACCP? If you're not sure, you better find out because your food industry customers are depending on you to understand the key elements of this important FDA regulatory initiative.

DEFINING HACCP. HACCP is a systematic approach to food safety that involves an on-depth analysis of all sources of hazards to determine critical points at which control can be applied to eliminate them. The word "critical" is key here, since HACCP allocates finite control resources to those points deemed necessary to reduce risk to a "statistically insignificant" level. The results of the analysis become a written HACCP plan that must be verified and periodically re-evaluated to confirm that it results in the production of safe food.

Increasing regulatory concern about pest control is encouraging closer cooperation and better communication between sanitarians and PCOs.

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actually put moisture in the air and the fogging would tie up the irritants. The customer was conditioned that there were bugs and the service technician actually killed them. Of course, when the liquids and oils evaporated and the environment changed back, the irritants once again come back and caused the "bites" and the cycle was started all over. Also, during summer months, employees are working in air-conditioned offices and humidity levels rise and fall. Air conditioning actually takes moisture out of the air. Employees may be working in yards and gardens, using sun-tanning lotions, going outside for breaks. The opening and closing of skin pores allows irritants to quickly cause dermatitis and cause a "bite."

We should always approach these itch cases with the thought that something is causing the itching and we will try to identify the cause of the problem. Always avoid using the term "bite." This implies that an insect is causing the problem. Also, we must avoid "spraying" to just appease the customer. This automatically tells them that an insect is actually the cause and we have taken on the problem forever.

IDENTIFYING THE PROBLEM. The first thing to do is meet with your customer contact for his or her assessment of the situation. If your contact is convinced insects are the problem (and they are not) you need to start the education process there. Explain that you will be making an inspection, setting out monitors and will try to determine what is causing the itches. You will need to do some fact-finding such as changes to the area (e.g., new carpets, drapes, construction, etc.). The next step is to actually meet with those employees having the problem. Explain who you are and that you are there to find out the cause of the itching. Start off by saying that if insects are causing the bites you will find and identify them and offer a solution. Also state that if insects are not present and environmental irritants are present you will address that as well. You may mention at this point some of the office situations that can cause contact dermatitis. These include: paper fibers, static electricity, new carpets and you could even mention lack of circulation. After finding out who is having the problem, perform a thorough inspection.

Cotton balls dipped in alcohol or baby oil are the best materials to take swab samples. Place out insect monitors to trap irritants or "insects" if present. You may catch some gnats or other small insects, so be prepared to discuss the biting versus the non-biting flies. A microscope set up in the area of the people being bothered proves very helpful in showing them environmental irritants. Always open a desk drawer and swab the metal or wooden guides. The cotton swab will pick up metal shavings and other debris. Put this under the scope and let the employees look at it. Explain that the metal shavings could be coming off the guides and lodging on their ankles. With humidity levels low or changing, they may rub the area and actually cause the skin to become irritated and cause an itch. Check behind cabinets that have not been moved in awhile and always swab the ceiling vents, both intakes and exhaust. If irritants are found on the supply ducts, then a problem exists in the filtering system in the heat or air-conditioning system. Always check the filters in the air-handling system. See how often the filters are changed.

The list of things that cause contact dermatitis continues to grow. It includes: static electricity (facial rashes) and dry air, carbon-less copy paper, paper fibers (tearing forms or computer paper), fabrics, insulation, drapes, upholstery, nylon (carpets and stockings), allergens (cat and dog dander), fungi (humidity and A/C systems), mold, mildew, pollen, insect parts (cockroach allergens), volatile organic compounds, polycyclic aromatic compounds, soaps, deodorants, creams and fragrances, etc.

SOLUTIONS. If an environmental irritant is causing the dermatitis, remove it through cleaning. HEPA (High Efficiency Particle Arresting) filtration may solve the problem. It may be necessary to use anti-static compounds and to adjust temperatures and humidity levels. Moisturizing the skin may also help alleviate the problem. An industrial hygienist or environmental

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hygienist may be needed for consultation. The last thing you want to do is to treat with pesticides. There are ethical, legal and liability issues with this course of action. When you treat you are admitting that insects are present and causing the problem. Could you then be required to "treat" every employee's home since you failed to "control" the biting bugs at the office or work place? Think about it. These "itch" problems seem to occur at the wrong time and usually take a lot of time and effort, but solving them brings a sense of satisfaction and customer loyalty that will be worth the time, effort and professional problem-solving process that our customers deserve.

CONCLUSIONS. It is important that all employees in your company are solving these problems in a consistent manner. Many times employees complaining of itches will put pressure on your account contact and labor issues and conflicts may arise. We all need to approach these situations as an opportunity to solve a sensitive and often complex issue for customers. The key is education, customer cooperation and a thorough inspection to find and identify the cause of the environmental irritant.

When Conducting Inspections, Follow The Lines

Dr. Robert Corrigan
PCT-Online

When conducting inspections inside and around buildings for vertebrate pests, I have a simple inspection technique for finding the high pest activity areas: Follow the lines.

Many animals in the wild (insects included), use various naturally occurring linear elements to travel. From a biological viewpoint, there are several advantages for this. Like us, animals have internal energy budgets to maintain. When traveling between nests and feeding sites, it makes sense to select those pathways which offer the paths of least resistance. Rodents and insects travel along linear tree branches, plant stems, cliff and rock edges, etc. In addition to

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Sanitarians are responsible for correcting many of the conditions that contribute to insect infestation in food processing facilities. AS a result of their expertise in this area, PCOs are in excellent position to pinpoint problem areas for sanitarians, based on the insect species and relative populations they observe when servicing these accounts.

Traditionally, industry representatives and regulators have depended on spot-checks within facilities and random samplings of final products to ensure safe food. This system, however, tends to be reactive rather than preventive and can be less efficient.

A prerequisite companion to the HACCP plan is the Sanitarian Standard Operating Procedures (SSOP), a written daily procedure designed to ensure that unsanitary conditions do not introduce various hazards into the account. HACCP specifically requires that these procedures prevent contamination from occurring in areas where food is exposed after critical control points, such as cooking. This is the juncture where HACCP and pest control converge: Pests with the ability to transfer pathogens responsible for food-borne illness (i.e., cockroaches or flies) must not have an opportunity to introduce these pathogens where they can survive and threaten consumers. Common prerequisites for HACCP programs include specifications for cleaning and sanitation, personal hygiene, chemical control and pest control.

A recent Regulatory Action Criterion from FDA makes this point quite clear. It states, "Within Hazard Analysis and Critical Control Point and other U.S. Food and Drug Administration regulatory frameworks, disease-causing flies are contributing factors to the spread of food-borne disease that require preventive and corrective actions as appropriate under Sanitation Standard Operating Procedures, Good Manufacturing Practices or pest control programs." Obviously, given this regulatory language, the FDA is not inclined to overlook pests as potential hazards.

Of course, food industry clients can keep better tabs

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on pest populations if they make it standard policy to conduct regular pest monitoring programs. Monitoring is one aspect of pest control likely to be significantly affected by HACCP's emphasis on paperwork. Until recently, regulators relied heavily on "organoleptic" inspections (using their eyes and noses) to detect unsafe products indicating unsatisfactory operating procedures.

But the more scientific HACCP method focuses on inspecting the procedures themselves rather than catching problems during periodic inspections or while taking random samples of the final product. That means examining mandatory records of the daily execution of the HACCP plan, including structural pest control procedures. Infestation monitoring data acquires added value as documentation in such a record-reliant system. And whether or not it is explicitly required in their particular HACCP/SSOP plan, you can bet your clients would appreciate having this written evidence of due diligence if it should be needed.

In that regard, pest-monitoring data may have further applications, namely, establishing objective criteria for what constitutes due diligence. Several sections in the FDA's Food Code prescribe preventive measures and call for exclusion and control of pests. Since pest control is conducted in the real world—where perfection is not a realistic standard—how exactly do regulators and those being regulated determine whether these requirements are being met? Monitoring provides numerical data that can be analyzed for trends and compared to previous results as well as results for similar facilities. This should make it much easier to answer the question, How are we doing? " Both the FDA and the food industry would benefit from the availability of an objective yardstick to measure performance.

THE ROLE OF IPM. But an even better reason for measuring performance with insect monitoring is to improve the quality of service in these accounts. Integrated Pest Management accomplishes this by using monitoring data to "target" control measures and make adjustments based on the results of the

pest control program. Therefore, IPM is likely to receive a big boost in popularity from HACCP. IPM's reliance on entomological knowledge to optimize control and reduce the need for chemicals makes it a natural partner to HACCP's systematic, risk-minimizing philosophy.

The less hazardous suppression methods such as insect light traps that IPM favors rely heavily on effective sanitation and exclusion. But preventive measures of this type also harmonize particularly well with the proactive HACCP risk management philosophy. Not only must vectors of disease be minimized on the premises, but opportunities for contamination before their removal must be minimized as well. This is best accomplished by keeping them out (via screens, weather stripping, air curtains, structural integrity, ect.), rather than a reactive strategy of knocking down their numbers after they reach unacceptable levels in sensitive areas.

CONCLUSION. Food safety awareness is steadily growing and with it the political pressure for more rigorous standards. This is the driving force behind the adoption of HACCP in the seafood and meat and poultry industries. It will shortly become law for fruit and vegetable juice producers and the first draft for the retail industry is already being considered. The phasing-in of enforcement progresses from the largest facility to "mom and pop" operations in affected industries.

PCOs can expect to see a steady increase in the percentage of HACCP accounts on their client lists. WE have speculated on a few of the possible implications for the industry: a stronger partnership between PCOs and sanitarians, and expanded role for pest monitoring, an acceleration in the trend towards IPM and an increased emphasis on preventive measures such as exclusion. But it doesn't require physic ability to predict that HACCP will cause significant changes in food industry pest control.

SIDEBAR: What is HACCP?

HACCP-an acronym for Hazard Analysis and Critical
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Control Points—involves a seven-step process to protect our nation's food supply:

-Analyze hazards. Potential hazards associated with food and measures to control those hazards are identified. The hazard could be biological, such as microbe; chemical, such as a pesticide; or physical, such as ground glass. Of particular concern to PCOs and sanitarians are pests that are capable of transmitting food-borne pathogens (i.e., cockroaches, filth flies).

-Identify critical control points. These are points in a food's production—from its raw state through processing and shipping to the consumer—at which the potential hazard can be controlled or eliminated. Examples are cooking, cooling, packaging and metal detection.

--Establish preventive measures with critical limits for each control point. For a cooked food, for example, this might include setting the minimum cooking temperature and time required to ensure the elimination of any microbes.

--Establish procedures to monitor the critical control points.

--Establish corrective actions to be taken when monitoring shows that a critical limit has not been met. For example, reprocessing or disposing of food if the minimum cooking temperature is not met, placing the public at risk to food-borne pathogens transmitted by pests.

--Establish procedures to verify that the system is working properly. For example, testing time and temperature recording devices to verify that a cooking unit is working properly.

--Establish effective record keeping to document the HACCP system. This would include records of hazards and their control methods, the monitoring of safety requirements and action taken to correct potential problems.

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energy conservation, the narrowness of certain linear elements can offer protection from larger predators that can't negotiate the same pathways. Certain animals also regularly travel along borderlines where wooded areas meet open areas. Here the protection of darkness is close at hand where light meets shadows.

LOOK FOR THE "HIGHWAYS." We can put this "linear perspective" to use on everyday accounts. Consider urban environments containing complex buildings and utility systems. Instead of inspecting a structural area only in the context of a room, stop and look around, focusing only on the lines in that area. You may notice electrical lines, water and plumbing lines, pipe chases, telephone, computer and telecommunication lines, air handling lines and many other types of conduits which are used in structural environments.

In addition to offering "highways and beltways" between nests and food, such utility lines may also offer other resources. Various conduits and air handling systems may also be warm. Or they will warm a structural void. No doubt, both warmth and coolness generated by hot and cold water lines within structural voids can offer pests attractive warm and cool microenvironments. The gurgling sound of water passing through pipes is itself attractive to rodents, and they will follow such lines in search of leaks or condensing liquids on the pipes.

REAL-WORLD EXAMPLES. Elementary examples that quickly come to mind are noting the horizontal tree branches touching a roof-of course, such conditions are highly conducive to tree squirrels, roof rats and carpenter ants gaining entry to a structure. But we must also visualize in our minds those lines which are not readily visible to us, but play as critical a connection as the tree branch roof top example.

Rats and mice in high-rise commercial buildings commonly travel between floors using various electrical conduit lines. Wires of all different shapes

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and sizes inside our buildings must appear totally natural to the commensal rodents as they have been climbing similar "lines" in their natural world for millions of years as they move up and down twigs, branches, tree trunks, vegetation stems and rock edges.

In supermarkets and office complexes, rodents will travel and nest within the various computer and register systems. These wire chases are critical zones and must be checked. In high-rise buildings, mice will travel vertically following the electrical lines and associated chases and voids that support heating systems. The house mouse is particularly uncanny in its ability to squeeze through and live within the linear voids of buildings. Such areas must be inspected to implement effective long-term rodent control programs. Norway rats travel sewer lines and drainage systems. These subterranean systems offer food, water and protection from many of the above ground predators.

But it is the roof rat that offers one of the best examples of thinking linearly when attempting to identify rat-active areas. This rat has origins in the jungle where it maintained an arboreal existence. Thus, when inspecting for roof rats, instead of looking first for droppings, I first let my eyes relax, and I allow the various horizontal and vertical lines in a particular area catch my eyes. Long straight tree trunks, outside exterior electrical and telephone lines, fence lines, telephone poles, tree branches contacting roofs and the various horizontal ledges as formed by construction practices are key locations when inspecting for roof rats.

NOT JUST RATS AND MICE. Thinking linearly also pays off when inspecting for other pests, for example, moles and raccoons. Moles are typically active along the line created where wooded areas meet open areas. They also routinely follow along the linear edge of fencerows, concrete walkways, driveways and building foundations. These linear areas are excellent for placing mole traps. The raccoon, while traveling through urban and

Suburban neighborhoods and yards, also uses the linear border created where yard landscaping meets open yard areas.

When conducting inspections, add another dimension to your thinking when attempting to analyze a pest situation. Follow the lines to see where pests are active in and around buildings. By doing so, you, like the animals, can use the short route for gathering resources. In this case, the resource is pest information.

Practical Rodent Inspections

Dr. Robert Corrigan/PCT-Online

This article emphasizes the importance of quality rodent inspections and provides some inspection techniques for diagnosing rodent signs and estimating the severity of a rodent infestation.

VALUABLE INFORMATION. A rodent inspection is important for more than just telling you that rodents are present, and whether or not it's rats or mice! The information obtained during the inspection will pay dividends over and over again in your rodent control programs. The most successful rodent control programs begin with complete and diligent inspections and should always be conducted before any control work is begun.

The inspection provides you with three valuable pieces of information:

--*The extent and severity of the infestation.* Is the problem localized in one areas of the building? Are the rodents infesting several floors or wings? How severe is the infestation? By accurately gathering this information prior to any control efforts, much time and money can be saved by you and your client in the months ahead. For example, one of the most common mistakes made in rodent control is to underestimate the severity of an infestation either in numbers of animals or by the area infested. This results in under-baiting which leads to callbacks.

--*The location of rodent harborage and activity areas.*

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By inspecting for various rodent signs, clues can be gathered as to the location of nesting areas, as well as where and how the rodents travel from nests to their food and water. By intensifying your control efforts at these locations, greater control can be achieved.

--*The safest and most appropriate control strategies.* In some situations you will have a wide range of control tools and strategies from which to choose. In other cases, however, your control options may be limited due to food exposure, safety precautions for children and non-target animals and various environmental factors. All this can be determined through your inspection. Of course, the goal is not only an effective control program, but one that is safe.

INSPECTION TECHNIQUES. PCOs should follow some strict guidelines when inspecting a structure and the surrounding areas for rodents. These include:

Identify the rodent entry areas. For every rodent job, an inspection of both the outside and inside of the building should be conducted. This will aid in identifying possible source areas, as well as pinpointing access to the structure.

Areas to carefully inspect include all utility lines that enter the structure through the walls. For example, all openings around water lines, air-conditioning ducts, drain pipes, vents and electrical conduits should be inspected. Of course, the spaces beneath doors are one of the most common entryways for rodents. Doors should be checked to ensure the lower edge is not more than ¼" from the floor. Broken basement windows and unscreened vents also are common invasion routes.

In the case of roof rat inspections, roofs should be checked to see that shingles are sown right and sheathing is complete. In addition, check roof ventilators, screen vents and louvered in-wall vents and chimneys.

--*Locate the rodent zones.* The key to effective inspection is to identify the primary harborage, feeding and activity (i.e., "the rodent zones") to get the best results from your efforts. In some cases, such as in commercial accounts, the areas to be inspected may be large and complex, making it impractical to inspect every corner and beneath every shelf for possible rodent signs. Typically, rodents build their nests near food sources. Therefore, the rodent zones are those areas between the nest and feeding areas.

When conducting inspections it's a good idea to think in terms of the rodent's requirements first. Survey the building and list all of the areas where food is available. Compared to insects which can get by on extremely small amounts of food and water, rodents are physical giants when it comes to their food, water and space requirements. When you consider an adult rat requires up to 1 ounce of food and water daily to survive, food has to be readily accessible. Keeping this in mind during your inspections, begin by locating all areas within the account that provide food for rodents. This is especially useful when inspecting accounts where there is a minor infestation and the rodent zone is difficult to pinpoint.

Once suspected food sources have been identified, try to locate nearby harborage sites. Inside structures, a few of the more common rodent harborage locations include the following:

-Secluded corners (remember rodents follow wall surfaces and prefer corners because these areas provide them with a sense of security).

-Beneath cabinets

-Beneath and within furniture

-Beneath large appliances

-Floor cabinet voids in kitchens

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-Base voids in dresser bureaus

-Wall voids

-Ceiling voids

-Sill plate areas on top of basement and crawl space foundation walls.

Analyze the rodent signs. Once you have identified these zones, you can inspect for various rodent signs which will enable you to assess the current infestation and determine what corrective measures need to be taken.

These are 10 rodent signs you should look, smell or listen for during a rodent inspection: 1) droppings (feces); 2) gnawing marks; 3) burrows; 4) runways; 5) tracks; 6) grease marks; 7) urine stains; 8) visual sightings or live or dead rodents; 9) rodent sounds; 10) rodent odors (especially for mice). A brief review of several of these follows:

Droppings. Droppings are the most frequently encountered, and therefore, the most relied upon rodent sign.

Gnawing damage. Evidence of recent gnawing and/or damage as a result of gnawing is an excellent sign for determining the presence of rodents. In fact, the word rodent means "to gnaw." Rodents possess a pair of incisors which grow constantly at a rate of 0.3 to 0.4 mm per day. Rodents constantly gnaw with these incisors on many different objects within their activity range. (Contrary to popular belief, rodents do not have to gnaw on objects to keep their incisors filed down. They accomplish this by grinding the upper and lower incisors against each other).

By examining the size of the two shallow, parallel grooves left by incisors on the gnawed object, you can determine whether it is rat or mouse damage. The incisors of mice leave a mark 1-2 mm wide, while the Norway rat's mark measures about 4 mm in width.

Rodents gnaw on many items including aluminum,

mortar, plastic, lead and any other items softer than the enamel of their incisors. Rodents seem especially fond of gnawing on electrical wires found throughout buildings. For this reason alone rodents can be extremely destructive pests in computer facilities.

Rats commonly gnaw on wooden structural members such as door corners, floor and ceiling joists and wall studs. Recently gnawed wood will have a light colored, rough and splintered appearance. Wood shavings are usually evident below the damaged area. Over time, the gnawed area darkens and the rodents will continue to gnaw the edges until the wood is smooth with rounded edges.

When rats gnaw holes in cartons and boxes, the holes typically measure about 2" or more in diameter and often contain rough, torn edges.

In addition to wires, mice gnaw on plastic items, cardboard, waxy substances and wood. In homes, mice shred paper and gnaw holes in the corners of food boxes and bags. Mouse damage holes are typically small, measuring about 1.5" in diameter and clean cut. In bathrooms mice often gnaw on bar soap stored in cabinets.

Runways, tracks and grease marks. Runways are usually evident in rodent infestations because rodents repeatedly use the same pathways between their nests and food sources.

Runways are easier to detect with Norway rats than for mice or roof rats. Outdoors, fresh rat runways are smooth, well packed and free of vegetation. Indoors, runways along the floors or rafters are identified by clean paths and often appear along wall areas. Grease marks may also occur around the bottoms of joists where rodents have been traveling along beams or sill plates, on stairways or around burrow openings in walls, floors and ceilings.

Track marks, like incisor marks, indicate whether you are dealing with rats or mice. The key identifying character of a rodent track is its size. In most cases

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you will be looking at the prints of the hind foot because this is where most of the weight is placed as the animal travels about. Rat tracks are relatively large measuring between $\frac{3}{4}$ to $1\frac{1}{5}$ ". The mouse's hind foot track is considerably smaller measuring only about $\frac{3}{8}$ " or less.

Both rats and mice have the same number of toes on their front and hind feet; five toes on the back, four on the front. Both rats and mice also leave "tail drag" marks which will appear as a thin line between their footprints. In many cases, it is the older members of a colony which tend to drag their tails.

Burrows/eating spots. Burrows are an obvious sign when dealing with the Norway rat in outdoor infestations. Rat burrows measure about 3" in diameter and may be found next to walls, foundations, or beneath debris or shrubbery. Around the outside of residences, two of the most common areas to inspect for rat burrows outdoors is adjacent to bird feeders and/or dog houses. Pay special attention to woodpiles and storage sheds located in these areas.

Active rat burrows are usually clear of vegetation, and the burrow entrance appears compacted and smooth. In some instances fresh soil will have been recently kicked out of the burrow. To verify an active burrow, wads of paper can be stuffed into the opening or the burrows can be caved in with dirt, then re-check these closed burrows the following day for signs of activity.

House mice living near buildings typically do not burrow unless conditions are right and a suitable food source is nearby. Mouse burrows measure about 1" in diameter. Occasionally homeowners inquire about small burrows in and around ornamental plantings and beneath decorative fruit trees. In most cases, these burrows are made by deer mice or moles and not by house mice.

Secluded spots near runways or tunnels are often used for eating-places and piles of debris accumulated in corners are indications of rodent infestations.

Urine stains and odors. Rodent urine is often deposited on their runways and other frequented areas. Under ultra-violet light, rodent urine will fluoresce yellow on

burlap bags and pale, blue-white of various packaging paper. Thus, PCOs and food industry personnel often use black lights to inspect for rodent urine contamination of packages. However, some skill is required using black lights because other items such as food starches, glues, dyes and some cleaning agents also fluoresce. The key to an accurate diagnosis when using black lights is to first notice the pattern of the area fluorescing. As rodents often urinate while moving, their patterns appear as a line of fine drops or streaks, whereas chemical spills or food items tend to be large patchy areas, or uniformly spread out. There are also test kits available to chemically verify urine stains.

Rodent odors are often detectable in well-established infestations as both rats and mice produce characteristic odors from their urine and various body glands. Rodent odors may be particularly pronounced in large mouse infestations and may persist for prolonged periods.

Rodent sightings and sounds. Obviously, seeing live rodents during an inspection is a sure confirmation or an infestation. But most rodents are nocturnal and/or tend to be very secretive animals, especially if there is a lot of human activity in their area. Generally, if rodents are seen regularly during the day in different locations, there is a heavy infestation. If a quick confirmation of a rodent infestation is desired, then a night inspection will be most valuable.

Various sounds produced by rodents and their young such as high-pitched squeaks, gnawing and scratching sounds, and sounds of rodents fighting can be heard if you conduct the inspection quietly and listen carefully. With rats, the best time to hear these noises is during an evening inspection.

ESTIMATING RODENT NUMBERS. Clients frequently inquire, "How many rodents do you think are present?" But other than estimating in general terms (i.e., "a few", "not too many," or "a lot"), it is difficult or impractical for the PCO to attempt to estimate rodent numbers with any degree of accuracy. Generally, when rodent signs are fresh and found in abundance,

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you can assume there is a heavy population present. When signs are old and few in number, the infestation may consist of only one or a few rodents. But in the cases where there are clearly more than just a couple of rodents, it is better to over estimate the infestation. Underestimating a rodent infestation often results in not placing out enough traps or baits, which then may lead to a series of expensive callbacks, delayed results and unhappy customers.

SIDEBAR... "TELLTALE" SIGNS OF RATS

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--Rats constantly leave droppings in areas they frequent. Fresh droppings are dark in color and soft in texture. After three days, they harden and lose their dark color.

--Rats urinate in areas they frequent. Since urine gives off a fluorescent glow under ultraviolet light, a black light can be a useful tool for locating areas of rat contamination (Remember though, that other materials also fluoresce and can cause confusion).

-Rats always travel the same runways and leave "smudge marks" --a buildup of dirt and oil from their fur- along walls, pipes, gnawed openings and particularly beams and rafters for roof rats.

-Rats keep indoor runways, or well-used paths, free of cobwebs, debris, and dust. Norway rats' runways are usually well defined paths at floor level next to walls and other vertical surfaces. Roof rats' runways are above on rafters, pipes, etc.

-Outside, roof and Norway rats' runways appear as narrow paths through vegetation.

-Rats make sounds when climbing, gnawing and moving.

-Footprints and tail drags can be seen in dusty locations. Use non-toxic tracking dust such as talcum powder or flour to determine if rodents are frequenting certain areas.

-Gnaw marks are a sure sign of rats. On wood, the older the gnawing, the darker the wood.

-If dogs or cats unexplainably get excited, rats are probably moving about in wall voids or ceilings.

-Rats produce a distinctive musky odor. An experienced rodent-control person can tell the difference between mouse and rat odors.

-Nests are another sign. Norway rats usually burrow, but nests under concrete slabs, in rag piles or in lumber piles are not unusual. Roof rat's nests are usually up high and are often difficult to find. Sometimes nests are similar to tree squirrels' nests, consisting of leaves, twigs and vines.

Estimate the population after finding signs. A good flashlight is necessary as well as the need to get down on your hands and knees.

Light infestation (Less than 20). A few fresh droppings found in out-of-the-way areas. Fewer than 30 droppings can be found in any one place, and the number of dropping locations is less than six.

Medium infestation (20-50). Fresh droppings seen in 20 to 30 locations. Old droppings and fresh gnawings found. One or more rats seen at night; no rats observed during the daytime.

Heavy infestation (greater than 50). Fresh droppings seen in numerous locations along with old droppings or various sizes, indicating an increasing population. Fresh tracks, gnawing, smudge marks and three or more rats noticed at night, or rats seen in the daytime.

Rodent Trapping In Forklift Areas

Dr. Robert Corrigan/PCT-Online

Inside warehouses and other commercial accounts where preventive perimeter "curiosity" mousetraps are needed, it can be frustrating, difficult and costly to maintain standard metal or plastic mouse traps in areas subject to high forklift activity. In these areas the traps are regularly bumped, nudged or "totaled" by forklifts.

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Even a minor “bump” by a forklift truck usually results in a trap with warped panels, gaps or split plastic panels. Keep in mind that gaps of only ¼” will allow a mouse to escape from the traps and such “minor” gaps render a trap ineffective. Moreover, “dinged” traps are difficult and annoying for the technician to service and also are time consuming when they need to be repaired.

Heavy metal protective covers for the curiosity traps are available from manufacturers or machine shops. These covers significantly protect the mousetraps from the occasional minor contact. However, upon direct collision or heavy contact with a forklift truck, both the cover and the trap are usually demolished, resulting in a 20-lb lump or scrap metal (although they then make a good boat anchor).

For those areas with high forklift activity, there may be a better way-PVC. Heavy-duty 1.5” diameter PVC pipe cut to approximately 12” lengths with an inexpensive cardboard glue trap placed inside produces a sturdy mouse and insect trap (as well as offering monitoring capabilities). The beauty of the PVC pipe is, of course, its strength. It can withstand repeated typical forklift truck contact. In warehouses that have constant forklift truck/mouse trap interactions, the PVC trap can offer significant savings throughout the course of a year, as well as ensure that a working trapping device is always in place.

Furthermore, because of its shape and size, the PVC trap also fits snugly against the wall/floor junction where mice and insects typically travel. Like cockroaches, rodents prefer to travel along walls and between objects. They also gravitate toward corners and other protected areas for feeding, grooming and harborage. The PVC trap can also be installed on ledges, overhead beams and other locations where conventional traps and monitors do not fit.

PRACTICAL APPLICATION. Here are some specific tips for using the PVC trap: To affix the trap in place and prevent it from being easily moved, two 1” strips of heavy-duty Velcro fabric can be attached to both ends of the trap. The opposite faces of the Velcro can be glued to the wall surface.

A self-adhesive inspection label (available with many of the standard multiple-catch traps and bait stations) can be affixed to the outside of the trap. The label should be affixed to the rear side of the trap to facilitate lifting and closely inspecting the trap interior in order to initial the service date.

The glueboard should be recessed into the PVC pipe so that approximately 1.2’2” of the floor of the PVC pipe entry area remains uncovered by the glue trap. In this way, a mouse that is cautiously exploring this new “hole” in its path will not be initially repelled by a sticky surface grabbing the mouse’s facial or leg vibrissae (the sensory organs responsible for exploratory touch mechanisms in the rodent).

The PVC trap is also ideal for use in locations where repeated minor wetness beneath the bases of the metal traps causes corrosion and eventual malfunctioning of the metal mousetraps. Substantial wetness, however, will render the PVC glue trap ineffective due to the moisture neutralizing the glue surface.

The PVC trap is not appropriate for cold storage areas, as the glue does not perform adequately in cold temperatures.

If the PVC trap is installed into areas subject to a significantly amount of floor dust or debris, the traps will need to be checked weekly to replace any dusty glue boards.

It is also important to point out that the PVC trap is not an appropriate trap for the entire warehouse. This is because glue traps in general tend to be less effective than non-glue traps. Still, in most warehouses, where the occasional mouse is the typical scenario, a PVC glue trap in working condition in high forklift activity areas is certainly a more effective mousetrap than a beat-up, warped, spun-out or gappy curiosity trap.

For every technician who has had to “wrestle” with damaged metal traps time after time due to careless (or determined?) forklift drivers, the PVC trap may

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(Forklift...Continued from page 11)

offer a small personal victory while conducting the tedious work of running hundreds of mouse traps inside large warehouses. Think of the PVC trap as an “anti-forklift trap.”

How To Put A Halt On Trojan Horses

Dr. Robert Corrigan/PCT-Online

In a large food plant recently, the warehouse received and signed off on a pallet of food ingredients. Unbeknownst to plant personnel, the pallet contained a nest of mice within one of the boxes. To the concern of the employees, when they moved and disturbed the pallet the next day, the mice emerged and ran in all directions, disappearing inside the plant.

As most of us know, this scenario and ones similar to it are not uncommon. Infested goods, supplies and equipment are admitted into our stores, warehouses, restaurants, schools, hospitals, homes and many other everyday accounts on a regular basis. I refer to these infested goods as “Trojan Horses.” That is, we often allow infested items into buildings and operations. Over time, the pests “sneak out” of the supplies and hide within our buildings. These Trojan horse events can change the pest profile of an account from being pest-free to pest-infested overnight. What’s more, recipients of Trojan horses assume “ownership” of the pests once they have signed off on the delivery.

LOCATING TROJAN HORSES. Pest Trojan horses typically involve infestations of rodents and arthropods hidden inside boxes, bulk food, equipment or furniture. Certainly, live mice (and less frequently, rats) are perhaps the most serious concern as they can quickly disperse deep into the facility. But rodent carcasses and droppings within boxes, or on pallets, are also of concern as these contaminants can potentially find their way into production areas as the contaminated product is transferred.

Pallets themselves can also be Trojan horses. Pallets are frequently stored outside and on the ground until they are needed. Wood is a natural and attractive material for many insects and small mammals. Thus, wooden pallets sitting on the ground for days or weeks at a time are regularly invaded by pests.

I am constantly amazed how many commercial accounts that are otherwise pest-free and clean accept and sign off on deliveries placed upon filthy and dilapidated pallets, which are prime Trojan horse candidates. But even “clean” pallets may deliver pests into buildings. Carpenter ants and powder post beetles occasionally occur within pallets. Psocids, spiders and various other small arthropods are also routinely introduced within the crevices of wooden pallets.

Semi-trailer trucks can also serve as Trojan horses. Trailers used to transport food goods are usually kept clean and thus do not pose much of a Trojan horse threat. But food plants and warehouses routinely allow “cardboard/trash trailers” to dock directly to open shipping and receiving bays for prolonged periods. These trailers are often dirty and frequently contain pests or pest droppings within the trailer walls and floors. Pests living within these trailers docked at open bay doors can detect the warmth or food odors from the warehouse or food plant and invade.

Trojan horses are not only a concern for the food manufacturing and warehousing industry. Commercial accounts, such as restaurants, supermarkets, hospitals, hotels and schools receive hundreds to thousands of boxes or various supplies on a monthly basis, year-round. Yet, for the most part, these accounts usually do not inspect incoming deliveries. Cardboard boxes serve as one of the most universal German cockroach and pharaoh ant Trojan horses.

PREVENTING TROJAN HORSE EVENTS. No one can prevent Trojan horses completely. It is not very practical to inspect every box or item of the thousands that are delivered each year to commercial accounts. But as pest management professionals, we should educate our clients as to the possibility of Trojan horses, and thus the need for regular incoming inspection programs. Such programs will help to limit the frequency and severity of new infestations.

Additional suggestions:

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(Trojan horses...Continued from page 12)

--Incoming product on trucks and railcars should be visually inspected prior to unloading and again halfway through unloading for signs of pest activity.

-Random inspections of the contents of boxes and goods (e.g., 10% of product) should be conducted periodically. The frequency of inspections might range from weekly to monthly or longer depending on the amount and diversity of material received.

--For large commercial accounts, pallets can be selected randomly and visually inspected, as well as black-lighted for rodent urine and droppings.

--For many food and pharmaceutical plants, it is a wise policy to notify vendors that deliveries will not be accepted if products are placed on dirty pallets and pallets will be inspected and rejected if they are not clean.

--For grain processing facilities and warehouses, pheromone traps can be installed in receiving areas to provide an early warning of possible stored product pest infestations within incoming materials.

--Of course, infested incoming products should be rejected. But if the infestation is discovered after the delivery is accepted, the product should be isolated and contained (e.g., on a trailer). The vendors from whom Trojan horses were received should be notified and all future deliveries from these vendors should be carefully monitored.

--Sometimes employees in restaurants and commercial kitchens panic when, upon opening a box of supplies, they discover it is infested with cockroaches or ants. Trying to spray or kill the pests in some fashion may cause the pests to quickly disperse. The best strategy is to carefully close the box and isolate the box from the area. Providing the box isn't too large, it can be installed and sealed inside a black plastic bag. The bag can then be either placed in a freezer, or if it is during the summer, the bag can be placed out into the sun. After the insects are "frozen or fried" the supplies can be removed from the box.

Pest Trojan horses are something every commercial and residential account certainly wants to avoid. Still, when they do occur, these events serve as a salient reminder to the public and to our commercial clients as to the need of having pest management professionals nearby to quickly respond to these emergencies. In other words, we are Trojan horse insurance policies.

PEST MANAGEMENT OPINIONS

Focus on the Hole: Methyl Bromide Phaseout and the Ozone Layer

David Mueller/Insects Limited

As the next years get frustrating when all quotas of methyl bromide (MB) are gone by October, people will start getting desperate when an unscheduled structural fumigation is badly needed and there is no MB available, and the price of MB increases to over \$15.00/lb. Then it will be important to stop and ask why we are doing this and focus on the hole in the earth's ozone layer.

In September 2000, the ozone hole in the Southern Hemisphere was at an all time record size and depth. It covers an area bigger than the United States and for the first time it is over the city of Rio Gallegos in southern Argentina. This means that anyone going outdoors in this region has no protection against the sun's damaging UVb light. As Dr. Jonathon Banks of Australia stated: "The people in southern Argentina have a hole above them that goes straight to the sun."

At the recent Controlled Atmospheres and Fumigation Conference (CAF) in Fresno in October, Mr. E. Villa of Fugran Fumigation Company in Argentina stated that he was outdoors working in the yard for a day prior to coming to the conference. He showed the people at the table the skin on his sunburned arms. Mr. Villa is a dark complected man who is used to the strong sun in Argentina. He stated, "I know the ozone hole is real" as he showed his peeling arms.

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Countries, like Australia, where 90% of the population is within 20 miles of the coast, are seeing the effects of this ozone hole. Since many of the original settlers of this continent came from Scotland, Ireland and other northern countries, their skin is not prepared for the sun's forces. Skin cancer is a very serious health risk in Australia and New Zealand. Children are not allowed out during the school recesses unless they wear a full covering hat and/or sunscreen.

Medical doctors say that for every one- percent decrease in the ozone layer, there is a two- percent increase in human health effect. Imagine if there is 100% decrease in the ozone layer.

There is some good news to this story. This year the ozone hole closed earlier than ever before. Atmospheric scientists explained this by the fact that the Southern Hemisphere was unusually warm this year and the frozen skies over Antarctica were not ideal for a prolonged ozone hole. The accumulation of chlorine in the stratosphere has leveled off and the ozone layer is starting to show signs of recovery. Recovery is possible by 2050 if we stay the course and follow the guidelines of the Montreal Protocol. This will prevent future generations from having to suffer from something their parents caused in the late twentieth century.

The other good news to this story is that fumigators from all over the world are coming together to discuss the alternatives to methyl bromide. These conferences and workshops are allowing the exchange of useful information. The result of this will be an improved industry of problem solvers that can tackle problems with reasonable solutions.

Finally, when things get a little crazy in the coming years, maybe we should stop and review our reasons for phasing out methyl bromide. And then focus on the hole, the ozone hole that protects the Earth from harmful radiation from the sun.

(Pest Notes: Although methyl bromide is a small part of the collection of processes responsible for ozone depletion, it is refreshing to hear a common sense perspective from an individual who makes a living with the chemical).

IN THE NEWS.....

Plague Prediction: The UK's foot and mouth epidemic could become eight times greater and last for months, say government scientists.

NewScientist: 03/23/01

Any hope of a quick end to the foot and mouth epidemic currently devastating UK livestock was dashed on Friday when three groups of epidemiologists predicted it would last "many months."

By June, there could be as many as 4100 outbreaks, say the Ministry of Agriculture's own group of epidemiologists, led by John Wilesmith. This is eight times the 501 cases reported so far.

Two other groups, one led by Roy Anderson at Imperial College London and the other by Mark Woolhouse at the University of Edinburgh, expect outbreaks to spread throughout the nation unless measures to stamp out the disease are stepped up.

Already, 4800,000 animals have been killed or earmarked for slaughter. This is 50,000 more than all the animals killed in Britain's most recent large outbreak in 1967.

Ben Gill, president of the National Farmers Union, says that the bleak new predictions have alarmed farmers already at the breaking point. "It was quite a shock," he says.

Speedier end

But the epidemiologists have also recommended ways to bring a speedier end to the crisis.

Most important is reducing the time lapse between the reporting of the disease and the slaughter of the animals. "If we can reduce it to 24 hours, the epidemic can be brought under control very effectively," says David King, the government's chief scientific adviser.

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Currently, the report to slaughter time can be several days. This gives time for the virus rich blisters and sores to develop and burst on the hooves and mouths of infested animals, enabling the virus to spread to neighboring livestock.

Nick Brown, the Agriculture Minister, says that the 24-hour target has already been reached in many areas, notably in one of the "hot-spots" in Devon. But the process was still taking too long in many key areas, particularly Cumbria where the epidemic originated.

Firewall strategy

The other key step, once a new outbreak has been identified, is to establish a "firewall" by killing all animals within 3 kilometers of the stricken farm. This would both purge the infection at the source and box it in to prevent secondary spread.

This step has already been adopted in Cumbria. Whether it would be extended to all other outbreaks has yet to be decided by ministers. Roy Anderson, head of the Imperial team, believes adoption of this measure could cut the size of the epidemic by 80 per cent.

Adopting this "scorched earth" approach would mean the sacrifice of more healthy animals than at present and would be deeply unpopular with farmers. "The epidemiology shows that the more animals you kill, the quicker you exterminate the disease," says Brown.

Vaccination option

He said ministers are also considering very limited use of vaccines. One possible use is to "dampen down" areas where the virus is rife but slaughter has not yet begun. Vaccinated animals do not develop virus-producing sores.

The other possible use is as part of the "firewall" strategy to box-in infections, allowing more time for slaughtermen to reach the area. In both cases, all vaccinated animals would ultimately be slaughtered.

However, the preferred option remains to "slaughter-out" the disease without using any vaccines. If all animals were vaccinated, farmers would lose exports worth 570 million pounds in the two years it would take for Britain to recover its "disease free" status.

Does A Deadly Spider Hold The Key To Eco-pesticides?

Mark Robbins and Michael LePage: NewScientist

Viruses given a gene for a toxin from one of the world's deadliest spider could replace chemical pesticides, say researchers in the U.S. They plan to carry out field trials, although there are fears about the wisdom of releasing such viruses.

Glenn King of the University of Connecticut Health Center in Farmington and his colleagues recently identified a unique family of toxins in the venom of the funnel-web spider. These neurotoxins are lethal when injected into insect tissues, yet have no effect if eaten by insects or other animals.

King's team is now engineering the gene for one of these toxins into baculoviruses, common viruses that infect certain moths and butterflies, and have long been used as "bio-pesticides." When the modified baculovirus infects an insect, the insect's cells should start to produce the toxin, killing it faster than wild viruses. Because the host dies quickly, before much virus can replicate, the modified virus shouldn't persist in the environment, say the researchers.

"I welcome a potentially environmentally friendly pest control but it's abundantly clear we need to be more firm about the risk issues," comments George McGavin, an entomologist at Oxford University. "If we are not 100% sure, it shouldn't be in the field."

There have already been several field trials worldwide of baculoviruses given a gene for scorpion toxin. However, most of the scorpion toxin made in infected insects fails to fold into the correct shape, says King. By contrast, tests in bacteria suggest that almost 100% of the spider toxin should fold properly, making the virus deadlier.

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King thinks engineering toxin genes into viruses is preferable to adding them to plants, such as Bt maize. Not only does it mean that people do not have to eat plants that produce insecticidal toxins, but only the target insects will be affected, he says. "These viruses can be exquisitely specific, right down to infecting individual species," King claims. "This means that only the pest insects will be killed whilst beneficial insects such as bees remain unaffected."

However, critics fear that the virus will spread into the environment and affect other kinds of butterflies and moths. "A containment environment could not possibly hold a virus," say McGavin, who opposed trials of a scorpion toxin in Oxfordshire in the 1990s. "If you could get a specific baculovirus it would be great, but baculoviruses do pass on [to other species]."

There are also fears that the toxin gene might be transferred to other viruses. "There is no instance of a toxin gene jumping from virus A to virus B," says Bruce Hammock of the University of California, Davis, who is also working on modified baculoviruses. "But if it jumped, the new virus would become less effective."

Jenny Cory of the Centre for Ecology and Hydrology in Oxford agrees transfer of the toxin gene is unlikely, but thinks further tests would be helpful. "It's a vicious circle," she says, "you have to do risk assessment before you do the experiment but we don't know all the risks without doing field experiments in the first place."

Miami Springs High Invaded By Rats

MSNBC: 03/21/01

The talk at Miami Springs High isn't about the SATs. It's about the r-a-t-s.

The little critters are in the halls, the libraries and the cafeteria. Rat droppings are easy to spot in corners and ceilings.

School officials say the severe drought in South Florida sent rodents in search of water. The lack of citrus due to the canker eradication project has left the rats hungry

And looking for food. The school was the perfect place for the animals to feast.

"It was quite challenging taking care of the rats here because you can't use poison because we're inside a school," said John Schuster, spokesman for the Miami Dade Public Schools.

School officials called exterminators. They used beef jerky to lure the tiny critters into mouse traps.

(Pest Notes: If any of you have lived or visited Florida, you know that the rats aren't "tiny little critters.")

California Approves QuikStrike

Pest Control Magazine: 03/21/01

QuikStrike Fly Abatement Strip from Zoecon Professional Products has been approved for use in California.

The QuikStrike Fly Abatement Strip is a unique, self-contained product that targets and controls nuisance flies, including houseflies (*Musca domestica*) and lesser house flies (*Fannia* spp.).

The key active ingredient in QuikStrike is nithiazine.

Two feeding attractants and a fly sex pheromone provide triple attraction for bringing flies to the strip. Designed to be placed within fly breeding areas like garbage cans, compactors, dumpsters and livestock areas, QuikStrike can be used outdoors and in protected indoor areas, such as stables, kennels, dairy barns, loading docks, etc. to provide up to eight weeks of fly management.

Catalyst To Undergo Label Change

Pest Control Magazine: 03/17/01

Zoecon Professional Products has announced that its Catalyst insecticide product will undergo a label change to reflect an agreement between Zoecon's parent company, Wellmark International, and the

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the Environmental Protection Agency (EPA). The active ingredient in Catalyst is propetamphos, an organophosphate.

The agreed-upon changes allow pest management professionals (PMPs) to continue using Catalyst for cockroach control in commercial applications. Catalyst has long been regarded as the most effective clean-out product for commercial infestations requiring fast remediation. Although the label revision will eliminate residential uses of Catalyst, the EPA decision makes Catalyst the only remaining organophosphate approved for internal pest control and it is the only OP left for rotation of chemical compounds.

Catalyst will continue to be sold by Zoecon under the current label through June 2001. Distributors of the product can continue to sell current-label Catalyst product through April 2002, and PMPs can continue to use current label Catalyst product until their inventory is exhausted.

Industry Says CDC Exposure Report May Be Misleading

Amanda Paskiet/ PCT-Online: 03/27/01

Many in the pest control industry are concerned about how the public will interpret a report released by the Centers for Disease Control and Prevention that contains data on human exposure to 27 substances—including pesticides, lead, mercury, plastics and a variety of chemicals.

The report presented the amounts of 27 chemicals found in blood and urine samples taken from a 1999 national health survey, which will become a baseline for future studies by the CDC. However, the report lacked any assessment of potential health effects as a result of exposure to these chemicals.

“Releasing raw data on chemicals without any evaluations or conclusions is misleading to the public,” said Allen James, president, Responsible Industry for a Sound Environment. “The general public has only a moderate understanding of chemistry and virtually no understanding

Of what chemical detection in the human body actually has on one’s health.”

According to James, the detections of pesticides by the CDC that were mentioned in the report could have come from a variety of sources. “Some of the ‘pesticides’ detected may not even be true pesticides at all. They could be chemicals that are derivatives of other substances, some of which are naturally occurring,” he said.

Dr. Angelina Duggan, director of science policy, American Crop Protection Association—an organization that represents manufacturers, formulators and distributors of crop protection, pest control and biotechnology products—so said that she believes the CDC report is misleading to the public. She said that it’s not unusual for trace amounts of man-made and natural substances—such as pesticides—to be present in the blood and urine. “But trace amounts of those substances do not indicate harm to the body,” she said.

James said the release of the report also provides fodder for ant-pesticide groups to use to scare the public. “They will definitely take advantage of the fact that the average person won’t understand this type of report,” he said.

Questions have arisen in the pest control industry over how the report will affect the Environmental Protection Agency Administrator Christie Whitman’s promise to regulate pesticides based on scientific data and sound science.

“I don’t anticipate this report to be used very much by EPA at all,” James said. “There are good scientists at the Agency and these people know that miniscule detections based on the advanced technology the CDC has access to do not indicate harm to humans.”

James said the EPA would most likely view the report in the same manner as the pest control

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industry. "they'll see the report as an issue worth watching and will probably try to make evaluations from the data, which is what the CDC should have done before releasing the report."

Neither Duggan nor James said they believe that the CDC intended to mislead the public with the release of the report. "The CDC has even stated that the data provides a baseline for further study and that it does not want to raise public alarm about any of the data," Duggan said.

"They were required to conduct a certain activity and they did it. What they are guilty of is not having the proper resources to evaluate the information before releasing it," James said.

On The Web

Bayer Unveils New Site for PMPs

Pest Control Magazine

Bayer Corporation introduces a customized we site devoted exclusively to professional service providers. Pest Management Professionals (PMPs) can go to www.BayerProCentral.com for tailored information on Bayer products, programs and resources based on their needs.

"BayerProCentral.com is the only address PMPs need to access Bayer information on the Internet," notes Renee Holmes, Bayer's communications manager. "Updated information will help them make informed decisions regarding their customized Bayer programs."

Wildlife Management Resource Available Online

Pest Control Magazine

The Internet Center for Wildlife Damage Management (ICWDM) was designed to be a forum for ideas, techniques and issues; establish a deposit of science-based resources; and coordinate research and extension efforts in the growing wildlife damage

Management field. Located at <http://wildlifedamage.unl.edu>, the ICWDM is a grant-funded venture between four universities to establish a clearinghouse for businesses, academics, agencies and others involved in wildlife damage management.

Below are descriptions of some of what is available:

-Your University Publications: Linked to publications of wildlife extension personnel or other authorities at more than 40 Universities or Colleges. In choosing this menu selection, users can have access to resources at their nearest institution.

-Proceedings: Allows users to read PDF or MS Word full-text articles from many of the pest proceedings of wildlife damage management conferences

-Professional Corner: Provides those in industry, academia and others with employment and training opportunities and some unique products or services.

-Products, Services and the New Registry and Search for Pest Management Businesses: Allows users to locate and search the wildlife damage management industry for products and services or to register one's business at the web site. A public listing for pest management professionals (PMPs), wildlife management businesses and others to place their products and services on the site is free of charge.

Aventis Introduces Vector Web Site

Pest Control Magazine

Aventis Environmental Science has launched www.mosquitocontrolonline.com a site designed as a comprehensive internet resource for vector professionals. Features include Aventis vector product information as well as an online newsletter.

"The new web site not only offers vector professionals useful information about the complete Aventis line," says Robin Slatter, business manager for vector control. "It is also a valuable resource to learn about key issues being discussed by organizations like the CDC, FPA and RISE."

Vector-Borne Disease Of The Month

Viral Hemorrhagic Fevers **CDC**

What are viral hemorrhagic fevers?

The term viral hemorrhagic fevers (VHF) refers to a groups of illnesses that are caused by several distinct families of viruses. While some types of hemorrhagic fever viruses can cause relatively mild illnesses, many of these viruses cause severe, life-threatening disease.

How are hemorrhagic fever viruses grouped?

VHFs are caused by viruses of four distinct families arenaviruses, filoviruses, bunyaviruses and flaviviruses. Each of these families share a number of features:

- They are all RNA viruses, and all are covered or enveloped, in a fatty (lipid) coating.
- Their survival is dependent on an animal or insect host, called the natural reservoir.
- The viruses are geographically restricted to the areas where their host species live.
- Humans are not the natural reservoir for any of these viruses. Humans are infected when they come into contact with infected hosts. However, with some viruses, after the accidental transmission from the host, humans can transmit the virus to one another.
- Human cases or outbreaks of hemorrhagic fevers caused by these viruses occur sporadically and irregularly. The occurrence of outbreaks cannot be easily predicted.
- With a few noteworthy exceptions, there is no cure or established drug treatment for VHFs.

In rare cases, other viral and bacterial infections can cause a hemorrhagic fever; scrub typhus is a good example.

What carries viruses that cause viral hemorrhagic fevers?

Viruses associated with most VHFs are zoonotic. This means that these viruses naturally reside in an animal reservoir host or arthropod vector. They are totally dependent on their hosts for replication and overall survival. For the most part, rodents and arthropods are the main reservoirs for viruses causing VHFs. The multimammate rat, cotton rat, deer mouse, house mouse, and other field rodents are examples of reservoir hosts. Arthropod ticks and mosquitoes serve as vectors for some illnesses. However, the hosts of some viruses remain unknown—Ebola and Marburg viruses are well-known examples.

Where are cases of viral hemorrhagic fever found?

Taken together, the viruses that cause VHFs are distributed over much of the globe. However, because each virus is associated with one or more particular host species, the virus and the disease it causes are usually seen only where the host species lives. Some hosts, such as the rodent species carrying several of the New World arenaviruses, live in geographically restricted areas. Therefore, the risk of getting VHFs caused by these viruses is restricted to those areas. Other hosts range over continents, such as the rodents that carry viruses which cause various forms of hantavirus pulmonary syndrome (HPS) in North and South America, or the different set of rodents that carry viruses which cause hemorrhagic fever with renal syndrome (HFRS) in Europe and Asia. A few hosts are distributed worldwide, such as the common rat. It can carry Seoul virus a cause of HFRS; therefore, humans can get HFRS anywhere the common rat is found.

How are hemorrhagic fever viruses transmitted?

Viruses causing HF are initially transmitted to humans when the activities of infected reservoirs

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(Vector-borne disease...Continued from page 19)

or vectors and humans overlap. The viruses carried in rodent reservoirs are transmitted when humans have contact with urine, fecal matter, saliva, or other body excretions from infected rodents. The viruses associated with arthropod vectors are spread most often when the vector mosquito or tick bites a human, or when a human crushes a tick. However, some of these vectors may spread virus to animals, livestock for example. Humans then become infected when they care for or slaughter animals.

Some viruses that cause HF can spread from one person to another, once an initial person has become infected. Ebola, Marburg, Lassa and Crimean-Congo HFV are examples. This type of secondary transmission can occur directly, through close contact with infected people of their body fluids.

What are the symptoms of VHF?

Specific signs and symptoms vary by type of VHF, but initial signs and symptoms often include marked fever, fatigue, dizziness, muscle aches, loss of strength and exhaustion. Patients with severe cases of VHF often show signs of bleeding under the skin, in internal organs or from body orifices like the mouth, eyes, and ears. However, although they may bleed from many sites around the body, patients rarely die because of blood loss. Severely ill patient cases may also show shock, nervous system malfunction, coma, delirium and seizures.

How can cases of VHF be prevented and controlled?

With the exception of yellow fever and Argentine HF, for which vaccines have been developed, no vaccines exist that can protect against these diseases. Therefore, prevention efforts must concentrate on avoiding contact with host species. If prevention methods fail and a case of VHF does occur, efforts should focus on preventing further transmission from person to person, if the virus can be transmitted in this way.

Because many of the hosts that carry HF viruses are rodents, disease prevention efforts include:

-Controlling rodent populations

-Discouraging rodents from entering or living in homes or workplaces

-Encouraging safe cleanup of rodent nests and droppings.

For HFV spread by arthropods, prevention efforts often focus on community wide insect and arthropod control. In addition, people are encouraged to use insect repellent, proper clothing, bed nets, window screens, and other insect barriers to avoid being bitten.

For those HFVs that can be transmitted from one person to another, avoiding close physical contact with infected people and their body fluids is the most important way of controlling the spread of disease. Barrier nursing or infection control techniques include isolating infected individuals and wearing protective clothing. Other infection control recommendations include proper use, disinfection and disposal of instruments and equipment used in treating or caring for patients with VHF, such as needles and thermometers.

PESTS OF THE MONTH

See if you can identify the following pests. Last month's pests: A) Brown-banded cockroach; B) Oriental cockroach; C) Blue bottle fly

A)



B)



C)



Parting Shots.....

That's all for now. Remember that we are here to address your pest management concerns. Give us a call at DSN 686-8122, commercial (510) 337-8122 or drop us a line at paa5245@exmail.dscp.dla.mil

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