PESPWire

The Quarterly e-bulletin of EPA's Pesticide Environmental Stewardship Program Fall 2013

Designing Buildings to Prevent Pests

National Pest Prevention by Design Guidelines Published

When it comes to the design of built environments, are pest problems a given? Not necessarily. The San Francisco Department of the Environment has published a free resource for designing buildings to be more resistant to common pests such as rats, termites, pigeons and cockroaches. The guidelines, titled *Pest Prevention by Design*, aim to reduce both pests and the use of pesticides for the lifetime of a building, improving indoor air quality, reducing toxics exposure, and more effectively managing pests.

These guidelines were produced as part of a two-year, national, cross-sector project funded by the US Centers for Disease Control. The project's goal was to create a trusted reference for architects, engineers, builders and the green building community on ways to design pests out of buildings. By following these recommendations at the design or retrofit stage of construction, indoor air quality can be improved and money can be saved for the life of the building.

The idea for the project came from San Francisco's Integrated Pest Management (IPM) Program, which is responsible for pest management and pesticide reduction on City-owned properties. *continued on page 4*

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Steritech: Green Before Green was Cool

The headquarters of The Steritech Group, Inc., a Pesticide Environmental Stewardship Program Gold member, are nestled on a lush, green parcel of land in an office park in Charlotte, North Carolina. It's reflective of the commercial pest management company's green-mindedness, a philosophy that has held true with the organization since it opened its doors more than 27 years ago.

Founded in 1986 by John Whitley, Steritech caters to industries where being pest-free is an absolute necessity: food processing, health care, restaurants, and hotels and lodging, to name a few. However, Whitley also recognized that broad-spectrum applications of pesticides could be just as detrimental in these sensitive environments. *continued on page 2*

Steritech

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He believed so strongly that there were safer alternatives to the "spray and pray" approach that he left his post as U.S. president of another pest management firm to start Steritech.

The fledgling company succeeded in using safer, less pesticide-reliant measures. Whitley had a keen interest in the science behind pest management, and challenged his team to use that science to develop Steritech's version of integrated pest management (IPM). That led to the development of the company's EcoSensitive® System, a 7-step processes that focuses on removing any existing pest issues in accounts and then building defenses to prevent pests from returning. The company uses inspection, detailed monitoring, structural modifications, mechanical and biological controls wherever possible, turning to the lowest-impact products possible, only when necessary to eliminate infestations.

"We like to say that we were green before green was cool," says Steritech's vice-president of technical services for its pest prevention business, Judy Black, who will celebrate her 20-year anniversary with the company this fall. "EcoSensitive is an advanced form of IPM, and one that centers on building strong client relationships to reduce conditions conducive to pest infestation. Partnership is the key to our successful reduction in pesticide use. We find there is a direct, inverse correlation between the level of cooperation we receive and the amount of pesticides we need to apply. More cooperation means fewer pesticides. "

It's a business imperative that has worked. Today, Steritech is an international company with two business units, nearly 1,100 employees, and over 60,000 clients. Its pest prevention business performed more than 450,000 services in 2012. This year, Pest Control Technology magazine placed the company number 6 on its annual Top 100 list, which ranks participating North American pest management companies by revenue.

Steritech joined PESP in 1998, one of the earliest structural pest management firms to come on board. The company believed PESP's overarching goal dovetailed perfectly with its EcoSensitive System, and company executives saw participating as not only a way to challenge itself, but also as a way to set an example for the industry.

Nearly 15 years later, Steritech is still an active member of PESP. PESP's voluntary program places the onus for setting and reaching goals on the member organizations, setting it apart from some industry third-party green programs. Black notes that the flexibility of PESP is what makes it a great fit for the company.

"PESP allows us to look at our business and see where we have the opportunity to make the most impact," she says. "For example, when we set our 2007 goals, we looked at our product usage for cockroaches and saw an opportunity to have a substantial impact by decreasing the usage of natural and synthetic liquid and aerosol pyrethroids, and promoting the use of products such as diatomaceous earth, insect growth regulators, and insect monitors."

An interesting thing happened as Steritech began to further reduce its pesticide use. From 2007 to 2009, the company saw a 3% reduction in unscheduled service calls, proof that the reduced pesticide strategy was effective. The savings in fuel, labor time, and product usage that the company realized were substantial.

The company's commitment to pesticide reduction led to its work with the IPM in Health Care Facilities Project, a partnership of Maryland Pesticide Network and Beyond Pesticides, in collaboration with Maryland Hospitals for a Healthy Environment, at Johns Hopkins Bayview Medical Center. Since 2007, Steritech has worked at the hospital to implement a program that relied on the use of low and zero impact pest

management practices. In 2011, the IPM in Healthcare Facilities Project recognized Steritech for outstanding achievement at the facility.

Steritech is also leveraging technology to help amplify its client partnerships. This spring, the company launched its PestID App, a mobile app to help clients identify pests and take steps to prevent them. The app currently has tips available for 10 pests Steritech's clients most commonly encounter, such as German cockroaches, rats, mice, and ants, but more are coming soon, says Black.

The app is free for anyone to download in the Apple App or Google Play stores.

With all this innovation, you might think that Steritech would be content to sit on its laurels, but this company isn't one to stand still. As 2013 comes to a close, Judy Black and her team will once more take a hard look at the business and identify new, revolutionary ways of making their work safer for everyone, continuing Steritech's work to serve as example to the industry.

For more information, please visit www.steritech.com

EPA Launches Online Green Sports Resource Directory

The U. S. Environmental Protection agency (EPA) has unveiled a new online Green Sports Resource Directory that can help teams, venues, and leagues save money and reduce carbon pollution through increased energy efficiency, a key part of President Obama's Climate Action Plan.

Additionally, the new directory contains information that can help teams reduce waste and gain recognition for their programs that reduce the environmental impact of their events. The directory also offers resources on using greener products, recycling, and conserving water.

The Green Sports Resource Directory provides a link to EPA's Greener Products Portal. The portal includes information about EPA's pesticide-related programs: Design for the Environment and the Pesticide Environmental Stewardship Program (PESP). Integrated pest management in sports turf and structural facilities is promoted by PESP as a way to reduce the risks of pests and pesticides through an environmentally sensitive approach to pest management.

Currently, the Green Sports Alliance has more than 180 members and is working with more than 75 teams at both the professional and collegiate levels. They are also working with over 100 stadiums and sports venues across the country, with participation increasing daily. The Green Sports Resource Directory brings together Agency resources to support teams and their fans, stadiums, and venues interested in improving their waste management, water and energy conservation, and other sustainability efforts.

EPA compiled a Green "Scoreboard" that highlights winning efforts across numerous sports leagues and statistics on the environmental and saving benefits. The Scoreboard is available on the Green Sports Resource Directory.

Visit the Green Sports Resource Directory and view the Scoreboard: http://www2.epa.gov/green-sports

To learn about the Green Sports Alliance visit http://greensportsalliance.org/

Learn more about President Obama's Climate Action Plan: http://www.whitehouse.gov/sites/default/files/image/president27sclimateactionplan.pdf

Pest Prevention by Design

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The program reduced city government's pesticide use by 80% in its first ten years, but as the reduction trend flattened out, it became clear that poor design was a key problem, both for landscapes and buildings.

The guidelines include measures appropriate for the design stage of a new building or for renovations of existing buildings. Examples include using stainless steel mesh to exclude termites, putting caps on roof tiles to reduce bird and rat infestations, sloping windowsills to discourage pigeons, and building in hatches to permit easier inspections of foundations.

The peer-reviewed guidelines incorporate a year's worth of discussions by a national committee of experts, including architects, engineers, pest control representatives, and pest management experts. The Center for Environmental Health was contracted to coordinate the project, and the International Code Council reviewed the final document.

The guidelines are available on the San Francisco Department of the Environment's website: www.sfenvironment.org/download/pest-prevention-by-design-guidelines

For more information contact environment@sfgov.org

10 Principles of Pest Prevention by Design

1) Understand Local Pest Pressures

A rough familiarly with local structural pest species is essential in order to make the best design choices. University extension services or reputable local pest professionals are the best sources for this information.

2) Analyze the physical context for each building situation

The physical surroundings of a particular building can also be a critical design consideration; it is important to take into account the surrounding buildings, surfaces, vegetation, and underground utilities. For example, cities can face a large amount of pigeon roosting. For such a situation, architects must pay special attention to designing out semi-enclosed alcoves, flat ledges, and other pigeon roosting locations. More rural locations with dense vegetation are likely to experience intrusions from a variety of small mammals. In these situations, careful attention to screening all gaps from the foundation to the roof vents is strongly advised.

3) Design for the necessary pest tolerance level

Occasional trails of ants in the home may be a mere nuisance, but even a single ant in a surgical ward can have serious consequences. The tolerance to pest infestations varies, and ideally should be considered at the design stage. Institutional kitchens, health care facilities, and mission-critical manufacturing facilities demand detailed and careful design and planning to exclude potential pests.

4) Use durable pest-resistant materials

Selecting pest-resistant materials can exclude pests from entering a structure, or deny pests harborage once they are there. Some materials provide "resistance to pests" while other materials provide 100 percent exclusion. There are many ineffective approaches in the pest control world, so make sure to carefully research methods before application.

5) Design for easy inspection

Built-in access to critical areas, such as foundations, false ceilings, or triple wall voids, greatly assists pest control professionals in the early detection of wood-boring insects or rodent infestations, potentially saving thousands of dollars in wood

replacement and protecting the health of building inhabitants.

6) Minimize moisture

Most builders and architects know that moisture must be excluded from buildings, and many common building codes are aimed at this goal. In addition to promoting building decay, moisture also promotes serious problems with insect pests such as termites, wood-boring beetles, cockroaches, flies, carpenter ants, silverfish, and millipedes. Moisture also can draw rodent pests, as they must have a source of water to survive. Multiple procedures can be used to minimize building moisture including proper guttering, downspout placement, correct ventilation of crawl spaces, one-piece countertops, and so on.

7) Seal off openings

Most building codes require that certain intentional openings, such as crawl-space and soffit vents, remain screened to exclude rodents and other wildlife. However, effectively sealing off all openings to the building exterior, as well as openings between interior rooms, improves the odds of maintaining a pest-free environment. Many designers are surprised to learn the small size of gaps pests can penetrate. For example, the width of a pencil (about ¼") is sufficient to allow mice to squeeze under doors.

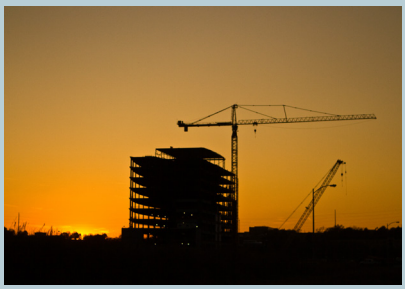
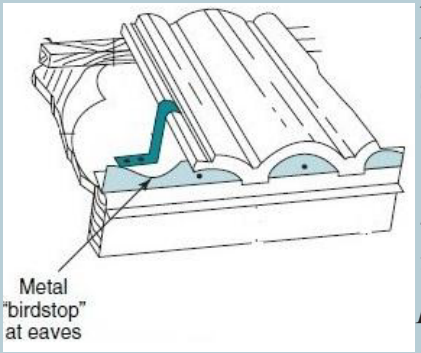


Photo: Nixter

8) Eliminate potential harborage

Pests need a place to live, preferably a hidden space where they will not be disturbed. Minimizing inaccessible spaces can therefore assist pest management efforts: false ceilings, false bottoms under cabinetry, uncapped concrete blocks, air plenums, and gaps behind permanent machinery are examples. In some cases, the material itself creates a potential harborage, as is the case when rigid foam insulation is used on the outside of foundations – where termites can burrow in and take up residence.



Graphic: Inspectapedia.com

9) Engineer slabs and foundations to minimize pest entry

The design of foundations and slabs is critical in pest prevention practices and affects a wide range of pests, including ants, termites, mice, rats, and cockroaches. Termites, in particular, will have easy access to those structures with defective foundations or slabs with improper expansion joints. Sufficient separation between the soil and a structure's wooden elements is required by most building codes to inhibit subterranean termite incursions. It is also essential to minimize concrete cracks that can allow entry of termites or other pests. A variety of tactics can achieve this goal, including the use of appropriate concrete admixtures, monolithic pours, minimization of expansion joints, use of termite-resistant mesh over joints, and the use of termite resistant barriers beneath the slab.

10) Design buildings to be unattractive to pests

What makes a building "attractive" to pests, other than food, water, and potential harborage? Excessive or poorly designed exterior lighting can attract hordes of night flying insects to doorways, windows, or exterior hallways. Roof rats, mice and squirrels find vines up the side of a building to be attractive highways and even food sources. Bushes and shrubs planted too close to building foundations become pest magnets, offering near-ideal concealment and protection from the elements.

Trees placed too close to buildings will eventually have limbs touching roofs and walls, which may become pest conduits. Poorly placed composting operations or refuse bins can similarly attract rodents to a structure, making entry that much more likely. Semi-enclosed, horizontal roof surfaces, especially near outdoor eating areas, are invitations for pigeons.

Enhancing Partnerships for Sustainable School IPM Programs

From September 10-12, 2013, the Association of Structural Pest Control Regulatory Officials (ASPCRO), the University of Florida, and EPA held a specialized, collaborative, hands-on training for IPM implementers, state regulators, pest management professionals and EPA officials (Regional School IPM Coordinators, Center of Expertise for School IPM staff, and Headquarters personnel).

EPA Region 7 School IPM Sub-Lead and Coordinator Katie Howard drills into a cement slab to prepare the area for insecticide treatment against termites. Injecting termiticide into cement slabs prior to construction helps exclude termites from the structure.

EPA's Biopesticide Pollution Division Director, Robert McNally (left), and the Lead of the CoE, Thomas Cook (right), inspect a mattress suspected of having bed bugs. Director McNally feels "School IPM is an important and key program within EPA and in time will eventually become institutionalized and a part of the nation's culture in addressing pests in a sensible way."

Hosted by the University of Florida's Pest Management University, the training included hands-on exercises that challenged participants to devise IPM solutions to several pest scenarios involving fire ants, bed bugs, cockroaches, rodents and termites. Other pertinent topics included advanced concepts in IPM, pest biology, and pesticide label navigation.

Invigorating dialogue throughout the meeting emphasized the shared desire and approaches needed to make school IPM sustainable for programs throughout the nation. Participating organizations identified their unique role and specific actions that could be taken in support of this goal.

Throughout the course of the training, EPA's school IPM team was able to identify key steps to achieving sustained IPM practices in schools. More than twelve panel discussions highlighted specific actions that willing partners can engage in to advance our shared goal of reducing pest problems and pesticide hazards in our nation's schools.

University of Florida's Dr. Faith Oi (left) and EPA's Lorry Frigerio participate in a training exercise role-playing a pesticide spill. Training participants learned the necessary steps to take, should a spill occur, to reduce risk and promote safety.

EPA School IPM Team Partners with U.S. Department of Education Green Ribbon Schools

For the past two years, the U.S. Department of Education has recognized schools that are models of healthy and sustainable learning environments through its Green Ribbon Schools program. The Department of Education partners with EPA and other federal agencies to more effectively improve the health of students and staff.

In 2012, EPA Region 5 (IL, IN, MI, MN, OH, and WI) was home to 15 Green Ribbon Schools and one award-winning school district. Region 5 School IPM Coordinator Seth Dibblee and Senior Environmental Employment (SEE) Enrollee Mike Smith find that Green Ribbon Schools are also candidates for IPM adoption if they are not already practicing IPM, since they are already making investments in sustainability and healthy learning environments.

The U.S. Department of Education Green Ribbon Schools program is based on three "pillars":

- Reducing environmental impact
- Promoting healthy facilities and practices
- Environmental education and citizenship

Each year, the Department of Education solicits school nominations from state education agencies, states may also nominate one district for a district-wide sustainability award. In turn, states may establish their own nomination process, in which schools may submit competitive applications, showcasing their efforts under each of the pillars.

Coordinating with EPA's Office of Children's Health Protection, EPA programs—such as IPM—help the Department of Education to develop guidance for state programs and criteria for recognition. The School IPM team also participates in the timely review of nominations, providing written highlights and/or potential compliance issues, so that winning schools are announced on Earth Day each year.

In August, EPA Region 5 staff members joined the "Built to Last" U.S. Department of Education Green Ribbon Schools sustainability tour in Wisconsin, which included schools in Kenosha, Cedarburg, and all the schools in the Fort Atkinson school district. The tour was an excellent opportunity to see sustainability in action and to identify more opportunities to advance IPM in schools. IPM typically involves multiple stakeholders in a school, including the custodial and cafeteria staff, as well as teachers and the school nurse or health technician.

Region 5 School IPM Coordinator Seth Dibblee (far left) and members of the local coalition examine exterior features of an elementary school.

The Wisconsin Department of Public Instruction also promotes sustainable facilities management, along with its own environmental education award. Participating schools welcome the recognition for their success in this area, which is often secondary to academic performance.

Together with the Wisconsin Association of School Business Officials and local chapters of the U.S. Green Building Council, Region 5 has been able to promote IPM as a way to increase attendance (especially as related to reducing asthma triggers and symptoms) and to support effective learning.

For more information on Green Ribbon Schools, please visit: http://www2.ed.gov/programs/green-ribbon-schools/index.html

More than Tiny Vampires

Integrated Pest Management for Bats

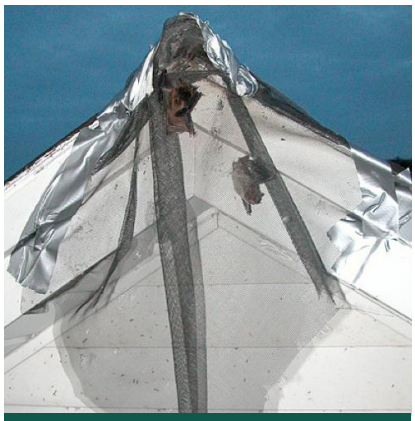
Bats have a reputation for being spooky or even dangerous, but they are some of the most beneficial animals to people. They are the primary predators of night flying and crop insects. Bats are also the most misunderstood and needlessly feared of the world's creatures.

Many bats species are insectivores that spend their nights eating pests such as mosquitoes, moths, termites, ants and roaches. A single little brown bat can eat 3,000 mosquito-sized insects per night. Agricultural pests consumed by bats include corn earworms, cucumber beetles, leaf hoppers and stink bugs.

Bats are essential to maintaining healthy ecosystems and economies. Some bats are primary pollinators for fruits and other produce and help to disperse seeds of plants vital for natural restoration of forests.

Evening emergence at Frio Cave, TX.
Photo: Jon Reichard

Got bats in your attic, belfry, barn or school? During the day bats prefer to roost in tight crevices such as cracks in rocks, under exfoliating tree bark and in awnings of buildings. Bats can enter buildings, especially near parks and fields, through openings as small as one-half inch in diameter. Bats may roost in attics, soffits, louvers, chimneys and porches; under siding, eaves, roof tiles or shingles; and behind shutters.



A mesh one-way door allows bats to escape but not re-enter
Photo: J. Chenger/batmanagement.com

Bats are rarely aggressive, but they may bite in self-defense if handled. Bats can also carry rabies, and should be approached with caution. As with any wild animal, bats should never be touched with bare hands.

Proper sealing of all holes is an essential step in IPM, including bat exclusion. Caulking, flashing, screening or heavy-duty mesh can be used to bat-proof most openings. If bats inhabit an undesirable location, it is important to use proper eviction methods to remove them. Every state has unique laws related to bat protection, and it may be illegal in your state for anyone, including animal control officers and exterminators, to kill certain bat species.

If bats are roosting in an undesirable location, such as an attic, do not simply wait for bats to fly out at night to seal the openings. Not all bats leave the roost at the same time and some may stay inside for the night, especially the young. Consult with a professional as to the best way to evict all of the roosting bats – often one-way doors can be used that allow the bat to leave, but not return. All evictions or exclusions should take place prior to mid-May or after mid-September to avoid trapping young.

There are no pesticides licensed for use against bats. It is a violation of federal law to use a pesticide in a way not described on the label. If evicting bats from a building, it is important to provide a near-by shelter, such as a bat house, for the bats to inhabit. Install the bat house a few weeks prior to the actual bat exclusion, to allow the bats time to find the new shelter. Trees are generally not good places for mounting bat houses, as they become accessible to bat predators, such as raccoons. If a tree must be used, then install a metal protector guard. A pole mount in a garden or field is the best location.

For further information about bat exclusion please visit: http://www.dnr.state.mn.us/livingwith_wildlife/bats/exclusion.html

Evening Bat
Photo: batconservation.org

Tick Quest

Ticks in the winter?

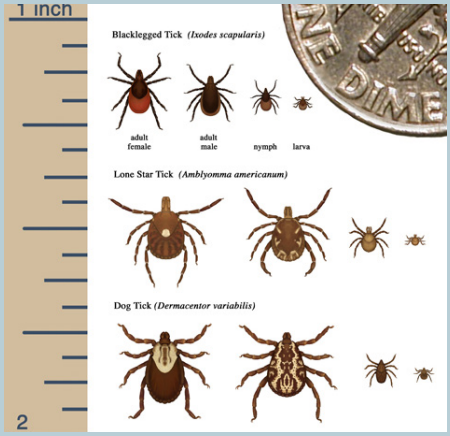
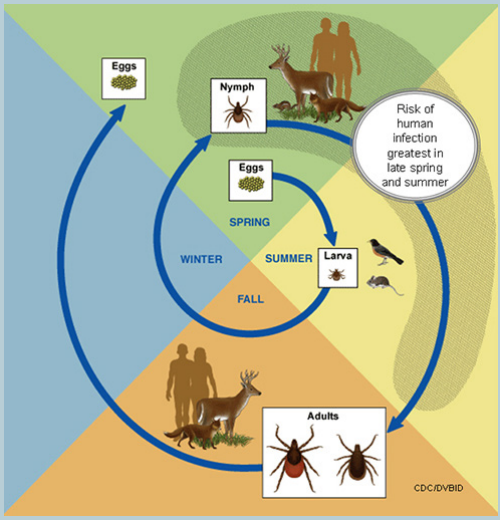


Figure: CDC

Ticks can still be found questing for hosts during the winter months. While questing, ticks hold onto leaves and grass by their third and fourth pair of legs, with their first pair of legs outstretched. When a host brushes the spot where a tick is waiting, it quickly climbs aboard. In general, ticks prefer cool, humid arboreal and deciduous forests. Some species, however, can adapt to arid habitats. Tick development is tied to temperature as their developmental phases shorten with increasing temperatures. Cold temperatures impact them less than many people realize.



Black-Legged Tick Lifecycle
Figure: CDC

Many find it surprising to learn that 99% of all ticks will seek hosts once temperatures exceed 4 degrees centigrade (or 39 degrees Fahrenheit). A New York study indicated that, regardless of winter conditions, more than 80% of ticks survived and that winter conditions do not necessarily restrict tick populations or, correspondingly, the risk from tick-borne diseases.

Depending on the habitat and weather preferences of a tick species, a tick may quest year-round. Therefore, precautions for prevention should be considered during the winter months.

What should you do during the winter months to reduce tick populations in your yard?

- Remove leaf litter, brush, and weeds at the edge of the lawn.
- Keep grass mowed to less than 3”.
- Clear ground cover and vegetation around stonewalls and wood piles.
- Stack wood neatly and in a dry area to discourage rodents.
- Keep playground equipment, decks, and patios away from yard edges and trees.
- Discourage unwelcome animals (such as deer, raccoons, and stray dogs) from entering your yard by constructing fences.
- Remove old furniture, mattresses, or trash from the yard that may give ticks a place to hide.

Should you still need to consider personal protection in the winter?

Yes, personal protection including light colored long pants, long sleeve shirts, boots, etc are a good idea year-round when entering tick habitat. Perform tick personal tick checks and apply pesticide products when appropriate. More information can be found at http://www.cdc.gov/ticks/avoid/on_people.html. Efficacy of repellents applied to human skin can be found at http://cfpub.epa.gov/oppref/insect/.

Maryland Healthcare Facilities Implement Integrated Pest Management

Maryland Pesticide Network and Beyond Pesticides, in collaboration with Maryland Hospitals for a Healthy Environment (MD H2E), have been working to implement sustainable integrated pest management (IPM) programs in Maryland healthcare facilities. This project, titled "IPM in Healthcare Facilities", began in 2005 after the results of a study indicated that people were being exposed to unnecessary levels of pesticide use in sensitive environments with vulnerable populations such as hospitals and medical centers. The program aims to work with Maryland healthcare facilities to significantly reduce pest pressures and pesticide exposure.

The IPM in Healthcare Facilities Project offers a variety of support and resources to facilities interested in implementing IPM. For example, they offer IPM training to employees, vendor contract review, model IPM policies, and other implementation assistance. The Project also plays a critical role in oversight by conducting regular walk-throughs with pest control technicians, reviewing the log books, and providing reports to key staff. Project partners include Broadmead Retirement Community, Forbush Schools, Greater Baltimore Medical Center, Howard County General Hospital, Johns Hopkins Bayview Medical Center, Lifebridge Health System, Medstar Health System, Mercy Medical Center, Sheppard Pratt Hospital, Springfield Hospital Center and University of Maryland Medical Center.

The IPM in Healthcare Facilities Project ensures the sustainable implementation of successful IPM programs by focusing on two key elements: changing the cultural and behavioral practices of the facility to support IPM practices, and assigning an on-staff IPM coordinator at the facility. By working with healthcare facilities to change the cultural and behavioral practices of the facility, sustainability is ensured despite turnover in staff and vendor contracts. For example, an effective IPM program changes the role that staff plays in pest management. Instead of calling their pest management company upon sighting a pest, staff learns to call maintenance or housekeeping to report pest-conducive conditions. The staff also learns to rely on IPM recommendations from the pest management company. These recommendations are well-documented in logbooks that note pest pressures and the conditions that have led to the pest problem or that might create one in the future.

Also essential to a long-term IPM program is the existence of an on-staff IPM coordinator at the healthcare facility. The IPM in Healthcare Facilities Project works closely with facilities to put an IPM coordinator in place. The IPM coordinator is often from maintenance, facilities, or environmental services, but could be any staff member at the facility. The IPM coordinator has direct contact with the pest control company, hospital green team, housekeeping, environmental services, and maintenance. The role coordinates the efforts which comprise a

Examples of IPM Tactics in Healthcare Facilities

- Systematic pest monitoring
- Sanitation, especially of all food preparation areas
- Structural maintenance
- Changing schedule of taking out trash
- Cleaning, maintaining and adding covers to dumpsters
- Ensuring all openings into the building are properly sealed
- Establishing a tolerance threshold for pests in outside environment
- Manage attractants outside the building (trashcans, benches where people eat, vegetation near the buildings)
- Remove any debris, especially from loading docks, custodial storage, and utility rooms
- Remove all cardboard and replace with plastic or metal storage containers
- Fix all leaks and manage other sources of moisture

holistic pest management plan, and makes sure all involved are working together towards a successful IPM program.

Project staff continually work with health care facilities to guide them towards IPM programs, with a focus on non-chemical techniques that exclude pests from the building. They are working to expand the number of health care facilities in the project to the sensitive populations in geriatric facilities and special needs schools.

The IPM in Healthcare Facilities Project is also investigating routes to encourage implementation on a national level. In addition, they are piloting a "New Moms" project at the University of Maryland Medical Center. The project works with nurses to educate new parents on safer baby care, cleaning and pest management products. Educational materials, DVDs, and sample products are provided to new parents prior to discharge.

The IPM in Healthcare Facilities Project has paved the way for reducing risks from pests and pesticides throughout sensitive environments in Maryland, and continues to spread a new culture of sustainable pest management!

For further information contact Matt Wallach, Project Director mwallach@beyondpesticides.org

www.beyondpesticides.org/

www.mdpestnet.org/projects/ipm-in-health-care-facilities-project/

www.mdh2e.org

Springfield Hospital: Sustainable Pest Management Award Winner

The Integrated Pest Management in Health Care Facilities Project presented its first IPM award in 2010 to Springfield Hospital Center (Sykesville, MD) and their contracted pest control company, Angel Pest Control, for creating a "green pest management" campus through the adoption of IPM principles and practices that minimize the use of chemicals in controlling pests.

After developing and maintaining a top-notch IPM program, Springfield Hospital Center also became the first health care facility in the nation to earn the prestigious Green Shield Certified® Platinum for Health Care Facilities, a certification program recognizing IPM excellence managed by the IPM Institute.

"We started our IPM program for the safety of our patients, particularly to prevent spraying products when we have patients with respiratory problems," according to Springfield's IPM coordinator.

Springfield Hospital Center has an exceptional IPM policy that clearly outlines a commitment to IPM. The policy includes a schedule for inspection and monitoring of buildings. The schedule is tailored for areas requiring more frequent inspections, such as the food service center and waste disposal areas, which are inspected weekly. Springfield has approved a list of pesticide products to be used when non-chemical methods have failed. However, as a result of diligent IPM practices, the hospital has not applied pesticides in more than three years.

By implementing advanced IPM practices, Springfield Hospital Center has reduced health risks including pests, pest-related allergens, asthma triggers and pathogens, and improved sanitation, energy conservation and communication between administrators and pest management providers.

Other recipients of the award include:

2012: University of Maryland Medical Center; Home Paramount Pest Control

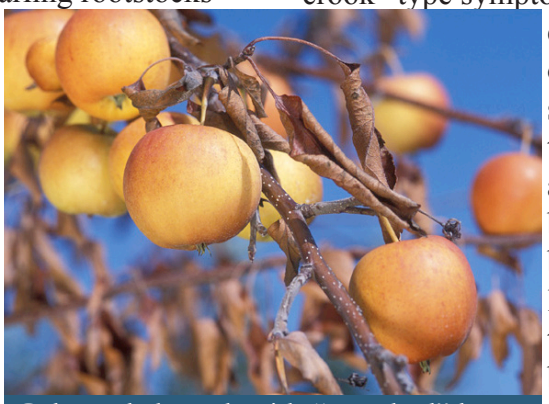
2011: Johns Hopkins Bayview Medical Center; The Steritech Group, Inc.

Fire Blight's Effect on Apple and Pear Production

Fire blight, caused by the bacterial pathogen *Erwinia amylovora,* is a devastating disease problem and a limiting factor to apple and pear production throughout the world. The significance of fire blight includes both current season yield loss due to flower infections and systemic infections leading to rootstock blight and tree death. *E. amylovora* is capable of infecting blossoms, fruits, vegetative shoots, woody tissues and rootstock crowns, leading to blossom, shoot, and rootstock blight symptoms (Fig. 1A and 1B). Young orchards of susceptible apple cultivars are particularly vulnerable to tree losses due to fire blight (Fig. 1C).

Disease epidemics are stimulated by conducive weather conditions and injuries due to extreme weather events, such as hailstorms, that cause outbreaks termed trauma blight. The diversity of host tissues, combined with the limited number of management tools available to control the disease, has made it difficult to stop or slow the progress of fire blight epidemics.

Fire blight is particularly difficult to manage, and the situation is exacerbated by three major problems: (1) most of the popular apple cultivars selected by growers are either rated as susceptible or highly susceptible to fire blight; (2) many of the popular dwarfing rootstocks utilized in Michigan are also highly susceptible to fire blight; and (3) the few chemical control options available are further limited by the development of streptomycin resistance in some areas of Michigan.



Gala apple branch with "scorched" leaves after a severe fire-blight infection
Photo: Peggy Greb USDA-ARS

Initial symptoms of fire blight in the spring are observed during flowering. Blossom blight infection is most severe when temperatures are in the 70s and 80s during bloom. The bacteria spread internally in the tree following flower infection and can re- emerge from trees as bacterial ooze; this usually orange- or amber-colored goo contains pathogen cells in a sugar matrix. Ooze can also emerge from fire blight cankers on branches. The pathogen can spread very quickly from ooze to actively-growing apple shoots causing the shoot blight phase of the disease.

Wilting stems form a "shepherd's crook" type symptom, and blackened leaves on these shoots give the appearance that the branches have been burned, leading to the name fire blight. The pathogen is disseminated by wind, rain, and insects. Strong storms are significant in spreading of fire blight as high winds and hail can cause damage to trees while simultaneously introducing fire blight bacteria to these wounds. In some cases, the amount of disease symptoms in orchards can rapidly increase from 0% trees infected to 100% trees infected within 1-2 weeks after a hail storm.

Fire blight is the most feared disease problem to apple growers in Michigan and in particular the midwestern and eastern United States. The disease can spread

Fig. 1. Fire blight: (A) blossom blight symptoms, (B) shoot blight symptoms; and (C) tree death and removal due to fire blight (6 trees in foreground denoted by arrows and 10 trees denoted by line).

rapidly, causing devastating damage in infected trees. In addition, infected trees grown on fire blight-susceptible rootstocks can ultimately be killed by fire blight, as the pathogen moves through the tree down to the rootstock and kills the tree. Tree death in orchards is highly significant due to the number of years necessary to grow trees prior to achieving an economically viable harvest.

When fire blight epidemics occur, the impacts on growers are extremely significant. For example, in 2000, a fire blight epidemic in southwest Michigan resulted in the death of over 400,000 trees and a complete loss of 20% of the apple acreage in this region. The overall economic impact of this epidemic was > $45 million in lost revenue, orchard removal costs, and orchard replanting costs. Since this 2000 epidemic, Michigan apple growers have lost an additional $15 million to fire blight disease.

There are currently a limited number of tools available for fire blight control. There is no known source of fire blight resistance in apple scion cultivars; however, resistant rootstocks are available. These, unfortunately, do not protect the flowers and shoots from infection.

The best management strategy currently involves the use of antibiotics targeting the blossom blight phase of the disease. Dr. George Sundin, Michigan State University, notes that the antibiotic kasugamycin, is the only one that provides consistent, commercially acceptable levels of control. Because of widespread resistance to the antibiotic streptomycin in Michigan and the associated economic losses EPA granted the state a Section 18 specific exemption for the use of kasugamycin.

Fire blight disease forecasting models are available to help growers properly time antibiotic applications and use them only when they are necessary. In Michigan, the forecasting model is used in conjunction with a network of weather stations which works very well in assisting growers with proper spray timing.

Biological control materials are also available for blossom blight management, including a bacterium, *Bacillus subtilis*, and a yeast organism, *Aureobasidium pullulans*, that appear to block the infection site in the flower. More research is needed to optimize the use of these biopesticides in humid growing regions such as the midwest and eastern U.S.

Cultural controls, such as pruning and removing infected branches, are of critical importance in limiting overwintering fire blight. Research needs include the hunt for new control agents. Scientists are using genetic approaches to understand requirements for pathogenesis in the fire blight organism such that growers can target a determinant and potentially block disease occurrence in the field. Research is also needed to optimize biological control agents for effective use by both organic and conventional apple growers.

Fire blight may never be solved because the apple cultivars that are most popular with consumers, such as Gala and Fuji, are highly susceptible to this disease. However, the continued discovery of new information about the pathogen and its spread fuels changes in disease management strategies and tweaks in IPM implementation that continue to give growers the best chance to manage this disease in years to come.

Special thanks to Dawn Drake, Michigan Processing Apple Growers, and Dr. George Sundin, Michigan State University, for their contributions to this article.

Upcoming Events

Entomology 2013: Entomological Society of America Annual Meeting
November 10-13, 2013
Austin, TX
www.entsoc.org/entomology2013

Texas IPM Affiliate for Public Schools (TIPMAPS) Annual Statewide Conference
November 13, 2013
Austin, TX
http://tipmaps.org

Ag Retailers Leading Improvements in Resource Management for Water Quality
December 12, 2013
Toledo, OH
www.ipminstitute.org/Ag Retailer Meeting Announcement.pdf

Green Schools National Conference
March 27-29, 2014
Sacramento, CA
http://conference.greenschoolsnationalnetwork.org

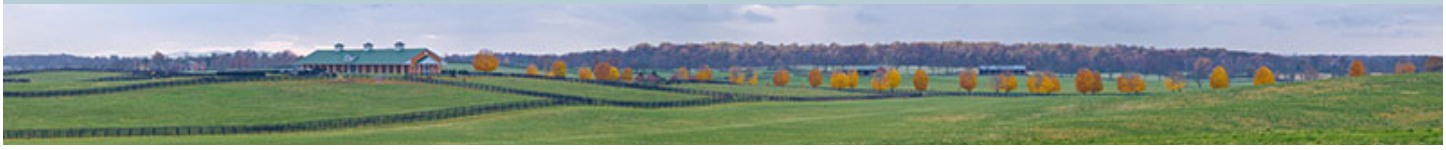
National Conference on Urban Entomology
May 18-21, 2014
San Antonio, Texas
http://ncue.tamu.edu/

Association of Structural Pest Control Regulatory Officials (ASPCRO) National Meeting
August 24-27, 2014
Missoula, MT
www.aspcro.org/

Entomological Society of America National Meeting
November 16-19, 2014
Portland, OR
www.entsoc.org

Mark Your Calendars!
8th International IPM Symposium
March 24-26, 2015
Salt Lake City, UT
www.ipmcenters.org/ipmsymposium15/

Grant Opportunity

IR-4 Solicits Biopesticide and Organic Support Grant Proposals

The IR-4 Biopesticide Research Program has extended the grant proposal deadline to December 9, 2013. The Program requests proposals for biopesticide efficacy research in 2014. IR-4 is especially interested in projects that use biopesticides to manage pest resistance. The primary objective of IR-4 is to further the development and registration of biopesticides for minor uses or for use in specialty crops. Typical awards range from $5,000 to $25,000. http://ir4.rutgers.edu/Biopesticides/biograntannouncment.htm