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Pennsylvania Integrated Pest Management Program

PA IPM News

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Uninvited Guests

House Mice

The weather outside is getting colder, and pests like house mice are looking for a warm place with food and water to hole up for the winter. Guess what? Your house may be looking like a five-star resort to these pests!

Mice that infest houses are typically five to eight inches long (including the tail), light gray, brown or black with a lighter belly. They also have a long, hairless tail and large ears. They may look cute, but watch out, mice can carry Salmonella, a bacteria that causes

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Christmas Tree Pests Target of New Project

Cathy Thomas, IPM coordinator at PDA, checking Tedder traps with George Perry, retired Schuylkill county extension agent.

The Christmas and nursery tree industry in Pennsylvania is under increasing pressure due to an influx of invasive pests, but researchers from Penn State and the Pennsylvania Department of Agriculture (PDA) are collaborating in a project to help growers gain better control while reducing pesticide applications.

Christmas and nursery tree sales generate over $42 million in Pennsylvania, making the state fifth in the nation. According to Cathy Thomas, Pennsylvania integrated pest management coordinator at PDA, scale pests from Asia such as elongate hemlock scale and *Cryptomeria* scale cause a lot of damage to hemlock and fir trees. "Fraser, Canaan, and balsam firs see the most damage and are all important Christmas tree varieties in Pennsylvania," says Thomas. "Each of these scales has two generations per year, with adults having a waxy, armored-like covering. This makes these scales difficult to control with pesticides, which often causes growers to make excessive pesticide sprays."

According to Thomas, many of the pesticides used for control of scales and other insect pests are broad-spectrum that also kill natural predators of the scales. "Our goal is to help growers better time their pesticide applications for scales and other pests, which will result in fewer applications and substitution of safer chemicals."

In an IPM project targeting white pine weevil, Thomas helped three conifer growers in Schuylkill County reduce pesticide use by over 50 percent by using an IPM approach. "By using IPM techniques such as scouting, trapping and monitoring growing degree days, the participating growers were able to correctly time their pesticide applications," Thomas explains. "As a result, growers were able to produce high quality conifer trees while reducing their pesticide use, which resulted in improved profitability."

In a new project involving elongate hemlock and *Cyptomeria* scales, Thomas says they will be working with 6 to 8 growers in Schuykill and York Counties. "We'll collaborate with PDA

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Christmas Tree Pests (continued from page 1)

White pine weevil, adult

entomologists and plant inspectors in the field using IPM techniques such as scouting, weather monitoring and record keeping to find the relationship between scale life stage and growing degree days," says Thomas. "An IPM consultant will provide on-site training for growers on scale lifecycles and IPM techniques."

IPM informational seminars will also be available for participating growers to learn about current pest information and research, the use of biocontrols, reduced-risk products and sustainable techniques used in an IPM system to reduce broad-spectrum pesticide use. Project leaders will also gather scouting, trapping and temperature information from the growers, which will be used to follow the progress of the project each year.

In addition, Thomas plans to develop a conifer pest scouting manual to help participating and non-participating growers incorporate IPM techniques into their farm operation. "Several conifer/Christmas tree manuals exist, but none are specific to Pennsylvania. With the help of specialists at Penn State University and PDA, conifer growers will be able to directly access regionally pertinent IPM advice from experts in the industry," Thomas explains.

The project also aims to establish a crop management association to help growers transition to a system of employing IPM techniques. "A trained consultant will provide growers with professional IPM services and promote more economical and environmentally sound crop production practices," says Thomas.

The project is being funded by a grant from PDA agricultural research funds. Educational presentations of the data collected will be available for statewide use and additional training programs. The data will also be available on the Pennsylvania IPM Program's 1-800 PENN IPM hotline and the Penn State Christmas Tree Web site at http://ctrees.cas.psu.edu/default.html. For more information on Christmas tree pests, see PA IPM's Christmas Tree Pest Problem Solver at http://paipm.cas.psu.edu/259.htm. Questions about the project can be directed to Thomas by calling (717) 705-5857 or by e-mail at caththomas@state.pa.us.

Bug Bomb Blazes

Over 500 fires and explosions a year in the United States are caused by total release foggers, also known as "bug bombs." According to the EPA, these pesticide products contain aerosol propellants that release their contents all at once to fumigate an area to kill pests such as cockroaches, mice and fleas.

Because these aerosol propellants are highly flammable, improper use may cause a fire or explosion. Some cities, such as Philadelphia, require that before you use a fogger you notify the fire department and all occupants of the building 24 hours in advance, post warning signs, vacate the property, have approved breathing apparatus available, and post a watchman. In addition, since foggers are so flammable, all ignition sources must be turned off, including pilot lights, other open flames and electricity.

According to the EPA, many accidents involving total release foggers have occurred when homeowners release an excessive amount of fogging material and forget to turn off an ignition source. In 2003, a San Diego house was blown apart when residents planted 19 bug bombs in a house and forgot to extinguish a wall heater pilot light. Luckily, no one was hurt (including the cockroaches).

According to Steve Jacobs, extension entomologist at Penn State, the most effective way to reduce or eliminate pest problems and risks posed by pesticides is to prevent these pests from entering your home in the first place. "Around the home, remove sources of food and water, such as repairing leaky pipes, and destroy pest shelters and breeding sites by removing litter and plant debris."

Jacobs says that besides being flammable, insect foggers are potentially toxic to humans and pets. "Exposed food and dishes must be removed or covered before using a fogger, and all people, pets and plants

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IPM Profile:

Marta Hernandez

It's a story often heard in urban areas. A family moves into an apartment and discovers it's overrun by cockroaches, rodents and other pests. The residents repeatedly treat the home with pesticides and even hire an exterminator, but the problem isn't going away. What now?

As a public health educator for the New York City Department of Health and Mental Hygiene, it's a story Marta Hernandez hears often. And, as the environmental projects coordinator for the department's Asthma Initiative, she has additional concerns. "Many people are unaware pests such as cockroaches and rodents are asthma triggers, as are many of the pesticides used to treat them," Hernandez says. "Urban living conditions are often conducive to high pest infestations, and children under five are at the greatest risk of pest- and pesticide-related health problems. Poor pest control practices shift costs from the housing system to the health care system."

Hernandez stresses the best way to change people's behaviors is through education, and a public health message may accomplish more than simply advocating safer pest control. "We need to tie IPM to public health education because there are costs associated with both pest control and the health effects of pests and pesticides on residents," Hernandez explained as a guest speaker at the Philadelphia School & Community Partnership (PSCIP) annual meeting last year.

Hernandez explained that in New York City, the Asthma Initiative is partnering with pest control operators to conduct detailed demonstrations on how to control mice and cockroaches safely and effectively in 500 inner-city rental units. "We hire pest control operators to do inspections and educate residents in participating communities about pests, health and safety issues, and do any necessary remediation. We also work with doctors and case managers of the residents who suffer from asthma, who encourage their patients to participate in the program."

Hernandez says she calls residents after the inspections to check their level of satisfaction and ask them to name three things they will do to control pests more safely. "If they are satisfied and are seeing and reporting favorable results, then our work is justified."

In addition, the Asthma Initiative has begun an IPM pilot project in two NYC public schools, conducts IPM and environmental asthma triggers training available for day care staff and parents, and will conduct IPM interventions/ demonstration as part of the Asthma Center of Excellence in Manhattan which opened last fall.

The Asthma Initiative has been successful in demonstrating to the community and pest control companies how to safely and effectively control pests, shifting from a direct service to a capacity-building approach. "Community-based organizations are partnering in the project and helping to promote changes to improve the environmental health in the community, and new collaborations have also been forged between the Asthma Initiative and several other Department of Health programs," Hernandez explained. "Additionally, pest control companies are gaining experience in organizing education sessions with community-based organizations and city agencies, and health organizations are able to coordinate services to their patients and follow-up care.

There are challenges, however. "There are a limited number of pest control operators who have the ability and/or are interested in participating in the project, and it can be difficult to recruit building management companies who are willing to adopt IPM practices for their tenants," Hernandez says. Nonetheless, they plan on overcoming these obstacles and will increase their efforts to promote IPM reimbursements by HMO's, ensure health codes are modified to assure the adopting of IPM by building owners, and increase allergy testing for those with asthma.

For more information on the Asthma Initiative, contact Hernandez at (212) 690 -1905, ext. 203, by e-mail at mhernan1@health.nyc.gov, or visit http://www.nyc.gov/html/doh/html/asthma/asthma.shtml.

PA IPM News

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The Pennsylvania IPM Program is a collaboration between Penn State and the Pennsylvania Department of Agriculture aimed at promoting integrated pest management in both agricultural and urban situations.

PA IPM Supports Farm Bill for Specialty Crops

The last few years have been challenging for growers of specialty crops such as tree fruit, greenhouse-grown vegetables and Christmas trees due to low prices and adverse weather conditions. Specialty crops are those grown on less than 300,000 acres nationwide. The Pennsylvania IPM Program helps growers of these crops through its support of research projects and USDA Farm Bill grower reimbursement programs.

Former agriculture Secretary Mike Johanns unveiled the U.S. Department of Agriculture's 2007 farm bill proposals last year. The more than 65 proposals correspond to the 2002 farm bill titles with additional special focus areas, including specialty crops. Nearly $5 billion in funding is being earmarked to support specialty crop producers by increasing nutrition in food assistance programs, including school meals, through the purchase of fruits and vegetables, funding specialty crop research, fighting trade barriers and expanding export markets.

"Unlike the commodity crops such as corn, soybeans, cotton, etc., specialty crops have not received much in the way of government support," explains Ed Rajotte, PA IPM coordinator at Penn State. "However, international competition and the importation of cheap fruits and vegetables caused the specialty crop industry to approach Congress for some help to offset these competition inequities. Congress is beginning to respond through Farm Bill legislation and other mechanisms to help out the specialty crop industry in terms of marketing, productivity research and risk reduction. As the Farm Bill is passed and funded, more government help for the specialty crop industry should emerge."

Tree Fruit

Predatory apple mite, T. pyri

For specialty crops such as tree fruit, PA IPM supports researchers and growers to ensure their crop is the highest quality while reducing the use of pesticides and their impacts on the environment. According to Dr. David Biddinger, biological control specialist at Penn State's Fruit Research and Extension Center in Biglerville, Pa., the center conducts research to help growers adopt more ecologically-based IPM programs that include scouting, biocontrol, weather and pest forecasting as well as choosing pest-resistant varieties.

One research project conducted at the center demonstrated that apple and peach pests can be controlled using reduced-risk tactics as well as IPM programs using conventional pesticides, but may be up to 85 percent more costly for growers to apply. "Our goal is to build upon our previous research and develop reduced-risk tactics that are more profitable and sustainable," says Biddinger. "We are also examining the possibility of developing eco-labels for fruit managed with reduced risk tactics to provide consumers with a choice and give an economic advantage to growers."

The researchers are refining of their use of new insect growth regulators (biologically-based insecticides and pesticides that target one or two pest life stages) to reduce environmental impacts and to enhance biological control. The researchers are also using a "whole-farm" approach in which the entire orchard, not just certain blocks, are under a reduced-risk management program. These changes, along with more selective pesticides, cost effective pheromone delivery systems, and biological mite control are leading to higher profitability.

Greenhouses

Another specialty crop is the greenhouse industry, with Pennsylvania ranked sixth in the U.S. with over $175 million per year in the production of vegetables, flowers and herbs.

"These numbers should continue to increase because greenhouses allow growers to extend the growing season to serve urban and suburban markets with fresh, locally produced food and plants," says Cathy Thomas, Pennsylvania integrated pest management coordinator at PDA. "In addition, many farmers are shifting to greenhouse production as a minor crop to replace or supplement income lost from low market prices in other crops."

In an ongoing project, Thomas is showing vegetable greenhouse growers how a successful IPM/biocontrol system can replace traditional pesticides. Through use of biologically compatible pesticides combined with biological controls,

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Univited Guests: House Mice (continued from page 1)

food poisoning. Recently, Hantavirus, a potentially deadly organism, has been discovered in the urine, droppings and saliva of mice. Mice can also transmit other parasites to humans and pets such as ringworm, mites, tapeworms and ticks. In addition, they urinate over several thousand times a day!

You may find evidence of mice at any time of the year, but you are more likely to spot them in the fall when they are looking for the things mice need to survive, such as food, water and shelter. They can wiggle their way into the tiniest of openings around windows, doors, roofs, piping, and air ducts. Any hole you can stick a pencil in is an entry way for a mouse!

For more information on house mice and other animal pests, go the Pennsylvania IPM Program's Pest Problem Solver at http://paipm.cas.psu.edu/481.htm.

Three Steps to a Mouse-Free House

Step One: Find out what kind of pests you have to make sure they are mice and where they are coming from.
- Look for holes in walls that are ringed with a dirty, oily rubbing.
- Look around the outside of the house to determine how the mice may have originally gained access.

Step Two: All pests look for food, water and/or shelter. If you understand what they want, you can take it away. This is the most important step in IPM and prevention!
- Clean up food scraps and store foods appropriately to prevent easy access to food. All pet foods should be stored off the floor and in sealed hard containers with tight-fitting lids.
- Keep living areas clean and uncluttered.
- Keep yards and vacant lots maintained by mowing and utilizing regular trash pickup.
- Repair holes and cracks in walls, windows, and screens.
- Seal routes of pest entry using caulking, copper mesh, or other pest-proof materials for gaps in walls, pipes, pavement and other surfaces.
- Share information with neighbors. Pests like mice do not stay in one place.

Step Three: Set mouse traps in those areas where most of the mice droppings are found.
- Bait the snap traps with peanut butter, place them facing the wall and remove any captured mice by picking the trap up using a plastic bag turned inside-out. Use a series of traps where the mice are being caught.
- Disinfect the site with bleach or another disinfecting solution.
- It is not advisable to use rodent baits in residential settings due to the risks of poisoning children and pets and the potential for rodents to die in walls or other enclosed areas. The dead rodents will stink and attract other pests.
- If you do use a bait, make sure it is not the pellet kind. Use the solid block-type with a hole drilled through so it can be tied down. It is preferable to place the bait within a bait box.

Bug Bomb Blazes (continued from page 2)

must be removed from the house."

If a homeowner has a severe pest infestation and residents' IPM tactics aren't working, Jacobs recommends they forgo using "over the counter" foggers and seek assistance from a professional pest control company. "Experienced companies know about the biology of the pests and what to look for, are schooled in proper pest management techniques, and have an assortment of management tools at their disposal."

Jacobs says when choosing a pest control company, make sure the company meets all the legal requirements that qualifies them to service your home. This includes a Pennsylvania Pesticide Applicator Certification or Registered Technician card, a business license and general liability insurance coverage. "You should also ask for a list of local references so you can learn about their past performance in treating pest infestations. They should be able to answer your questions in regard to the pest and its treatment." For more information, visit http://pubs.cas.psu.edu/FreePubs/pdfs/uo219.pdf.

In addition, many people are unaware pests such as cockroaches and rodents are asthma triggers, as are many of the pesticides used to treat them, including foggers. "Indoor air quality has a big effect on asthma sufferers, especially children who spend most of their time indoors at home and at school," says Lyn Garling of the Pennsylvania IPM program. "One component of indoor air quality includes the levels of pests and pesticide use inside buildings," For more information on pests and pesticides and their effects on public health, visit the PA IPM Program's Web site at http://www.paipm.org/ and click on "Public Health".

Useful Web Sites and Information

Entomological Digital Library - Database of teaching materials
http://www.entlibrary.org:80/

Children's Health and the Environment - Series of articles from A&WM Association
http://www.awma.org/publications/em/nov2007_onlineexclusive.html

Indoor Air Quality Tools for Schools Initiative
http://www.lunginfo.org/air

Junior Pest Investigators - Four lessons and support materials from Orkin
http://www.juniorpi.com/

Upcoming Events:

January 23-26, 2008 - **28th Annual Ecological Farming Conference**, Asilomar Conference Center, Pacific Grove, CA. http://www.eco-farm.org.

February 7-9, 2008 - **Pennsylvania Association for Sustainable Agriculture (PASA) 17th Annual Farming for the Future Conference**, Penn Stater Conference Center, State College, PA. http://www.pasafarming.org/.

March 17-20, 2008 - **23rd Vertebrate Pest Conference**, San Diego, CA. http://www.vpconference.org/VPC08.htm.

May 18-21, 2008 - **National Conference on Urban Entomology**, Tulsa, OK. http://ncue.tamu.edu/

March 24-26, 2009 - **The Sixth International IPM Symposium**, Portland Convention Center, http://www.ipmcenters.org/.

PA IPM Supports Farm Bill (continued from page 4)

growers can slow pesticide resistance in target pests, create a safer working environment for the family and farm workers, and maintain quality crops while increasing profitability when marketed as "pesticide free."

According to Thomas, growers meet with an IPM/biocontrol specialist on a weekly basis starting at the beginning of the growing season. They're taught pest-scouting techniques and identification, lifecycles of pests and biocontrols, and proper record keeping to monitor pest populations and determine pest thresholds. "The program allows growers to identify pest problems specific to their location and develop a practical plan of control that fits into the production constraints of their own farm," Thomas explains.

In addition to its support of greenhouse projects, the PA IPM program has helped to develop many resources for greenhouse growers, including the "Pest Problem Solver" Web site (http://paipm.cas.psu.edu/317.htm) and the manual, *Greenhouse IPM with an Emphasis on Biocontrol* (http://resources.cas.psu.edu/ipm/ghmanual/entire.pdf).

Christmas Trees

Christmas and nursery trees is another specialty crop, generating over $41 million per year in Pennsylvania, with the state ranking fifth in the nation. Christmas trees are attacked by a number of insect and disease pests. The white pine weevil (WPW) is the major insect pest of many of these trees. According to Thomas, the weevil is native to Pennsylvania forests and prefers nurseries because of the large fields planted with a single species. The WPW kills the growing tip, or leader, causing the tree to be misshapen and decreasing its value. "Across the state, WPW causes major financial losses to Christmas tree growers each year," says Thomas. "In order to control the pest, large quantities of typically used pesticides are applied, which can negatively impact non-target organisms and cause pesticide resistance." To read more about this and other Christmas tree projects, see article "Christmas Tree Pests Target of New Project" on page 1.

In addition, Penn State is partnering with the National Resources Conservation Service (NRCS) through "green" programs such as Agriculture Management Assistance (AMA), Environmental Quality Incentives Program (EQIP), and the Conservation Service Program (CSP), which reimburses growers for the cost of various conservation practices, including IPM in tree fruit, grapes, sweet corn and Christmas trees. Such IPM practices include biological mite control, reduced risk IPM, pheromone mating disruption, IPM scouting, precision application technology, and remote weather sensors to improve spray timing. The most successful program to date has been with Pennsylvania fruit growers under the AMA program, which has awarded over $1.2 million in IPM contracts. For more information on the program, visit their Web site at http://www.nrcs.usda.gov/programs/ama/ or the PA IPM Web site at http://paipm.cas.psu.edu/65.htm.

Have Something to Contribute?

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