Representation in National, Regional, and State IPM Programs

Department of Entomology researchers represent the university in local, regional, state, and national IPM programs, providing leadership and expertise on IPM issues.

Ms. Sandra Sardanelli, Coordinator of the Maryland IPM Program, interacts with the various institutions that address pest management issues on a state, regional, and national level. Efforts to enhance accountability and visibility for the overall Maryland IPM Program include both traditional and novel approaches to extension, outreach, research, and teaching initiatives in IPM. A newly structured Maryland IPM Program Web site, www.mdipm.umd.edu, operates as a gateway to major IPM sites in the Maryland IPM Program and also links to related sites in the state, region, and nation via National IPM networking. The site also houses state and national IPM Program Progress Reports and highlights Maryland IPM Program events.

Dr. Amy Brown serves as the Coordinator of the Pesticide Applicator Training Program for the state of Maryland. This program helps pesticide applicators learn to use pesticides in the safest, most effective manner to control pest infestations while protecting the health of humans and the environment. Dr. Brown also heads the Maryland Agromedicine Program, a collaborative effort between Cooperative Extension, health care professionals, and the Department of Agriculture. Agromedicine is a partnership of medical and agricultural professionals promoting the health and safety of farm families, agricultural workers, and consumers of agricultural products. The Maryland Agromedicine Program extends the agromedicine approach to include nonagricultural populations exposed to environmental contaminants.

Dr. Brown is also the State Network Project Leader for the Maryland Information Network for Pesticides and Alternative Strategies (MINPAS). MINPAS is the Maryland component of the United States Department of Agriculture (USDA) Northeastern Integrated Pest Management Center's (NE IPMC) grant-funded network, designed to gather and transmit information on issues relevant to both current and transitional pest management strategies, including pesticides. MINPAS is a self-standing cooperating subunit of the Mid-Atlantic Information Network for Pesticides and Alternative Strategies (MAINPAS), a collaborative effort between the land-grant universities of Maryland, Delaware, New Jersey, West Virginia, and New York.

Ms. Ethel Dutky is the Director of the Plant Diagnostic Laboratory, which provides laboratory support to Maryland Extension faculty in the area of diagnosis of plant diseases on all crops, and which is part of a newly established National Plant Diagnostic Network. This program, which includes every land grant university and the State Department of Agriculture, facilitates communication between labs and other authorities on identification of exotic pests and diseases. The network is part of the overall effort in homeland security to protect American agriculture from bioterrorist attacks. The Plant Diagnostic Information System (PDIS) is the database system developed to facilitate activities of the National Plant Diagnostic Network. The PDIS system provides immediate, secure access to a full-scale image library, agricultural advisory systems, and the most up-to-date information on pests and diseases in today's agriculture.

Ms. Betty Marose, Extension IPM Specialist, is responsible for extension and outreach, with emphasis on economically and environmentally sound pest management. She works with agency specialists to develop educational materials, conduct training sessions, and host local and state competitions. She oversees education of farmers, crop consultants, homeowners, master gardeners, and others on topics such as weed control, response to invasive species, and genetic engineering.

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Photo by Eric Zemora

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Integrated Pest Management

Program Highlights

Photo by Eric Zemora

***IPM**, or **Integrated Pest Management**, coordinates the use of pest biology, environmental information, and available technology to prevent unacceptable levels of pest damage by the most economical means while posing the least possible risk to people, property, resources, and the environment. IPM provides an effective strategy for managing pests in all arenas, from commercial production to developed residential and public areas to wild lands.*

Photo by Eric Zemora

The IPM program at the University of Maryland's Department of Entomology (**www.entm.umd.edu**) involves cooperative survey efforts, research, public outreach, and extensive planning in the areas of Green IPM, Community IPM and Agricultural IPM. Inside, you'll find examples of the contributions the Department is making in understanding and teaching beneficial IPM methods.

Green Industries IPM

Managed urban landscapes in Maryland are highly populated areas located in environmentally sensitive watersheds. These factors make the need for the development and implementation of less toxic pest management alternatives a high priority for plant managers and the general public.

Efforts by **Dr. Paula Shrewsbury**, **Dr. Michael Raupp**, and colleagues include:

Investigating effects of pesticides on target and nontarget arthropods. Sucking pests such as the hemlock wooly adelgid, armored scales, and lace bugs damage and kill trees and shrubs in landscapes. Pesticide applications directed at these target pests often result in unexpected outbreaks of nontarget pests such as mites. Field and laboratory studies explore changes in natural enemy populations and plant-pest interactions underlying these outbreaks in landscape settings.

Evaluating feasibility of IPM for school landscapes. Many states have mandated that public schools develop and implement IPM plans for pests in and around public schools. A collaborative project with Cornell University evaluates the efficacy and cost-effectiveness of the IPM approach for insect and weed management in athletic fields, lawns, planting beds, and hardscapes.

Devising ways nursery managers can decrease their reliance on pesticides. An ongoing project involving research, demonstration, and education to compare biologically based pest management practices with conventional practices has yielded some early results, including ways to increase generalist predator populations in nursery beds and manipulating rates of nitrogen applications to plants to reduce black vine weevil populations without affecting plant growth.

Enhancing the golfcourse habitat to favor beneficial insects and suppress insect pest populations. Researchers found that this objective can be achieved by planting flowering plants and ornamental grasses (which act as conservation refuges).

Studying the effect of paclobutrazol on deciduous shade trees. Paclobutrazol, a plant growth regulator that has the potential to alleviate drought stress, can affect resource allocation, insect resistance, disease resistance, and stress tolerance in these types of trees.

Research-Based Education

IPM researchers collaborate with state officials to provide the following groups with timely, accurate information to manage pests in landscapes in effective and environmentally responsible ways:

Professional and institutional landscape managers. Landscape IPM training of more than 1,500 members a year involves a 50-hour short course that includes training on the biology and management of pests and information on business aspects of IPM; a conference featuring presentations by nationally recognized authorities; and a series of presentations at local, regional, national, and international meetings held by professional societies and organizations.

Photo by Thomas Wright

Master gardeners and homeowners. Lectures on general entomology, pest identification, beneficial insects, biological control, and IPM.

Professional managers of nurseries, greenhouses, landscapes, and turfgrass. In addition to learning through short courses and meetings held by professional organizations and societies, professional managers are reached through professional newsletter publications, articles in association magazines, and weekly pest updates through electronic media (e-mail and Web).

Experts from industry, government, and universities. The annual Interstate Pest Management Conference features technical presentations given to hundreds of structural pest management professionals about topics ranging from whole house fumigation to general pest control in food service facilities.

Educators. IPM programs are mandatory for all public schools in Maryland. Researchers are developing a training manual, training materials, lesson plans and IPM equipment package for high school teachers in Maryland that enables them to develop an IPM program for growing plants in greenhouses using IPM.

Community IPM

Providing IPM technology to the citizens of Maryland's diverse communities requires a continued and elevated commitment of resources. IPM activities continue to successfully support a number of advances in educational outreach and information-delivery stategies. These IPM research-based education activities involve intra-state, inter-state, and regional networking.

Efforts by **Dr. Barbara Thorne**, a member of the United Nations' Expert International Advisory Group on Termite Biology and Management, and colleagues include:

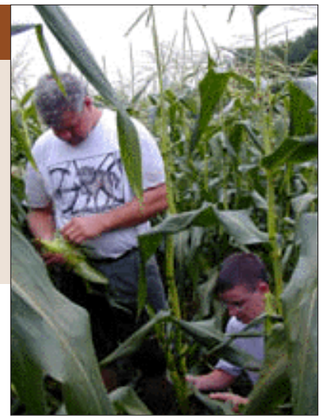
Detecting and controlling termites. Subterranean termites are the most significant structural pest in Maryland and most of the United States, causing more than a billion dollars in treatment and repair costs annually. New discoveries regarding their biology assist in the design and implementation of detection and control methods that precisely target termites with effective and environmentally safe technologies.

Studies focus on major questions involving subterranean termite colony structure, reproductive dynamics, foraging biology, and species discrimination. One study developed a way to apply distinctive coloration to termites using nontoxic liquid dyes dissolved in water. Researchers also cooperate with pest management professionals and manufacturers to test new technologies that are being developed for possible commercialization.

Detecting head lice. Head lice are a significant issue for children and their families. Millions of cases are reported each year in the United States, and lice infestations are a problem worldwide. Conventional methods of detection, based on visual inspection of lice eggs ("nits") are time consuming, difficult, and unreliable because they do not always signal an active infestation. This is a major problem and frustration for parents and people such as school nurses who have responsibility for head lice screening in institutions. Dr. Thorne invented and patented a hexagonal comb that provides a simple, effective, nonchemical option for early and accurate detection as well as chemical-free treatment of human head lice (live lice rather than nits).

Agricultural IPM

The agricultural portion of the IPM program conducts innovative research collaboratively and on an interdisciplinary basis. Applied research and demonstration projects focus on sustainable practices and alternative management strategies useful to producers of fresh and processed vegetables and agronomic crops. Economically feasible and biologically sound research-based IPM technology derived from exploration of innovative areas in cover cropping, rotation schemes, risk reduction for old and new pesticides, and resistance management are transferred through on-site demonstration and training.



Efforts by **Dr. Galen Dively** and colleagues include:

Evaluating the efficacy of organic insecticides against insect pests. Researchers conducted field tests with a variety of crops to determine the lowest rate, optimum timing, and minimum number of pesticide applications required for economic control.

Monitoring changes in Colorado potato beetle susceptibility to imidacloprid. The Colorado potato beetle is the most serious insect pest on potatoes in North America and has developed resistance to most classes of insecticides. In the last ten years, use of the popular insecticide imidacloprid has led to shifts toward resistance to imidacloprid. As a first step to combat this problem, researchers monitored changes in Colorado potato beetle susceptibility to imidacloprid in Delaware, Maryland, Long Island, and New England.

Optimizing environmental benefits of riparian buffers. Riparian buffers have the potential to be propagation areas for insect populations that could have negative or positive effects on agricultural production. Researchers are evaluating the effects of width, vegetation composition, and timing of mowing on both pest and beneficial insect populations. Continued research will determine if pest outbreaks are linked in any way to the grass buffers and ascertain if changes in buffer design and management can minimize these problems without sacrificing the primary water quality functions.