

OHIO IPM PROGRAM



2003 Biennial Report



ECONOMICALLY EFFICIENT. ENVIRONMENTALLY RESPONSIBLE. SOCIALLY ACCEPTABLE.



All educational programs conducted by Ohio State University Extension and the Ohio Agricultural Research and Development Center are available to clientele on a nondiscriminatory basis without regard to race, color, creed, religion, sexual orientation, national origin, gender, age, disability or Vietnam-era veteran status.

Keith L. Smith, Associate Vice President for Agricultural Administration and Director, OSU Extension. Steven Slack, Associate Vice President for Agricultural Administration and Director, OARDC. OSU Extension and OARDC are part of Ohio State's College of Food, Agricultural, and Environmental Sciences.

Pest Management That's Socially and Environmentally Acceptable

In this biennial report are highlights of the Ohio Integrated Pest Management (IPM) Program at The Ohio State University over the past two years. In cooperation with Ohio Agricultural Research and Development Center (OARDC) scientists and Ohio State University Extension personnel and others across the state, region, nation and world, we continue to address the pest-management challenges facing our farmers and urban citizens. Every year, new pests, new issues and new constraints on pest-control options challenge us to develop better pest-management methods that are socially and environmentally acceptable.

Stories in this report include current research and Extension team efforts to increase **IPM adoption and awareness**—from money-saving newsletters and award-winning field guides to “treeage” diagnostic methods for garden and landscape plants.

Throughout this report, IPM information is provided that can be used by all Ohio citizens, whether conventional or organic farmers or urban residents. It is our feeling that by partnering with others, innovative IPM methods can be developed that are economically efficient, environmentally responsible and socially acceptable to the vast majority of Ohioans.

“We continue to address the pest-management challenges facing our farmers and urban citizens.”—Joe Kovach, Coordinator, Ohio IPM Program



What are the best ways to manage the pests that threaten our crops, yards and families? Discovering them—while keeping the health of people and the environment in mind—is the goal of the Ohio IPM Program.

Your Lawn: 8 Ways to Know What to Grow (and How)

There's no perfect lawn. But an Ohio State turfgrass project can help you get close. It shows you the best grass types to grow and management methods to use based on where you live in Ohio.

Regional Turf Education Plots are in place in eight counties: Clark, Lake, Franklin, Hamilton, Wood, Wayne, Crawford and Madison. Their purpose is to help homeowners, lawn-care professionals and others decide what to grow and how to manage it. Money, time and labor are saved, and pesticide use and costs are cut.

"When the drought hit southern Ohio, we had many farmers come up to us during Farm Science Review wanting to know which grasses were the best and what were the best practices to take care of their lawn," says Joe Rimelspach, OSU plant pathology Extension associate.

Though turfgrass plots have been around for years, Rimelspach said this project is the first to take a systematic approach to turfgrass selection and management.

For more information: http://ohioline.osu.edu/news/02_01/02_13_03.html

"If you mow two and a half to three inches in height, you are shading the soil as well as creating a thicker canopy and the weeds cannot get established." —Joe Rimelspach

"What a pretty lawn." Regional Turf Education Plots—and the IPM methods they demonstrate—can help you hear that more often.



How to Control Head Lice With Less Anxiety, Fewer Chemicals

Just talking about head lice makes some people squirm. But Susan Jones does it eagerly. Jones, an OSU Extension specialist for household and structural pests, teaches people about head lice: what they are, how to control them and why an infestation shouldn't cause embarrassment—although it *should* spur prompt action.

“I spend a lot of time on the phone talking to people, trying to **reduce their fears,**” Jones says. “Anyone can get head lice.”

In the course of her work, she uses IPM and teams with Judy Bozick, a Columbus-area registered nurse. One of their goals is to reduce the social stigma that prevents prompt care. Together they wrote a new bulletin, **Head Lice**, available from county Extension offices.

It's important information, Jones says, because some treatments work, some don't, many are expensive, and those that contain insecticides must be used with care.

For more information: http://ohioline.osu.edu/news/03_01/03_22_01.html

“The horror stories I hear—people pouring kerosene on their heads, using pet products, repeating treatments that are meant to be used just once.”—
Susan Jones

Found: A Fungus That Fights Turf Pests

A seed-borne fungus present in certain fescues and ryegrasses is an effective way to control certain turfgrass pests. The finding, by Ohio State's Doug Richmond, Dave Shetlar and Harry Niemczyk, offers homeowners, lawn-care workers and golf-course managers an alternative to using insecticides.

The scientists found that overseeding **endophytic perennial ryegrass** into existing stands of nonendophytic grasses and Kentucky bluegrass slowed the spread of hairy chinch bugs, bluegrass billbugs and

Turfgrass stands having 30–40 percent endophytic perennial ryegrass saw far fewer billbugs and webworms.

bluegrass webworms. Perennial ryegrass and Kentucky bluegrass were chosen for the study due to their popularity in Ohio.

Richmond says many perennial ryegrasses are infected with endophytes, fungi that share a mutualistic symbiosis with their host plant. The plant provides nutrition for the fungus, while the fungus supplies an array of defensive compounds, called alkaloids, that are toxic to many insects.

“The chinch bug, billbug and webworm all feed above ground or at the surface,” Richmond says, “so it works extremely well on them.”

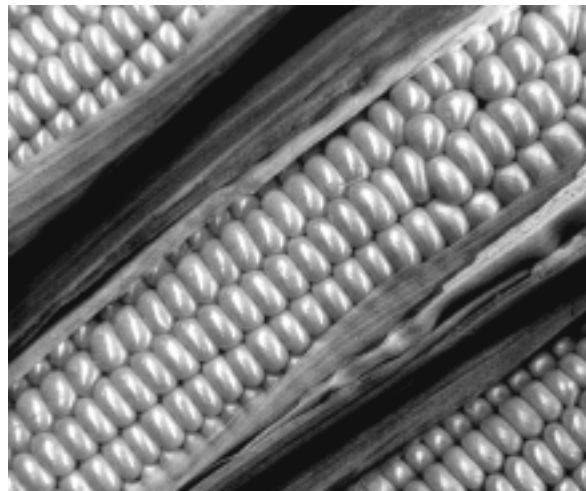
For more information: http://ohioline.osu.edu/news/03_01/03_27_02.html

☞ IPM Impact

What to Do When Weeds Won't Die

Some troublesome weeds are refusing to surrender to herbicides. First Ohio State and Purdue University scientists identified **herbicide-resistant pigweed, lambsquarters, jimsonweed and giant ragweed** in Ohio and Indiana. Now they've found **herbicide-resistant shattercane** too.

Success in growing corn like this—worth nearly \$900 million a year in Ohio—means controlling weeds. IPM offers farmers safe, effective ways to do that, even if the weeds have resistance to herbicides.



For farmers, controlling these resistant weeds may mean shifting to other herbicides, rotating crops or using other weed-control practices.

Herbicide-resistant weeds have become an important issue to consider when making weed-management decisions, the researchers say—herbicide-resistant weeds can and have developed from natural weed populations.

For more information: http://ohioline.osu.edu/news/03_01/03_30_01.html

☞ IPM Impact

How at Least One Farmer Was Kept from Spraying 75% Too Much

About two-thirds of the pesticide sprayers were adjusted wrong when an Ohio State scientist conducted **on-farm calibration clinics** last year.

Half the poorly calibrated sprayers sprayed too little pesticide, while half sprayed too much. The sprayers had been applying pesticides at rates more than 5 percent above or below the recommended rates—outside federal accuracy standards.

“One applicator would have been over-spraying by as much as 75 percent had he used the recently purchased

If ALS resistance develops, avoid reliance on the same herbicide, or or ones with similar chemical action, for consecutive years.

Calibrate often. Farmers having the fewest pesticide application errors calibrate their sprayers each time before use.



Accurate pesticide spraying—not too much, not too little—is a must, whether on grapes or any other crop. Proper sprayer calibration is key to that and is a mission of the Ohio IPM Program’s Erdal Ozkan.

nozzles that he installed on the boom,” says Erdal Ozkan, who led the effort.

Applying too much pesticide wastes money, can damage crops, and can pollute air, soil and water. Applying too little wastes time and money and may hurt yields and profitability.

For more information: <http://fusion.ag.ohio-state.edu/news/story.asp?storyid=63>

☞ IPM Impact

New Tech Helps Boost Strawberry Profits

Precision agriculture, typically applied to field crops such as corn and soybeans, is now being used on strawberries. Ohio State researchers have developed a mechanical strawberry yield-monitoring system that measures yields while strawberries are being harvested. It can be connected to a Global Positioning System (GPS) to create maps that document yield variations in fields.

Reza Ehsani, an Ohio State precision agriculture specialist and one of the project researchers, says the device can be used to boost profits.

“This machine has really improved our production and yields.”—Matt Sullivan

“The more accurately you can manage your field, the more you can increase your profits,” he says.

Meanwhile, Matt Sullivan, an OSU Extension program specialist, helped develop a **semi-automatic mechanical harvesting aid** for use on his 15-acre family strawberry farm near Columbus. He’s pleased with how it works. It increases efficiency by reducing harvest time and labor costs. It takes only half the number of people to harvest using the machine than to do it by hand.

“We’re also selling a higher-quality berry to the consumer because there are several people on the machine who evaluate the berry before it gets packaged,” Sullivan says. “Quality control is one of the biggest issues when harvesting berries.”

For more information: <http://fusion.ag.ohio-state.edu/news/story.asp?storyid=187>

Growing Grain: How to Do it Organically

Ohio farmers interested in **transitioning from conventional to organic grain production** were the audience for seminars at two locations on March 5, 2002. Presented by Ohio State's Organic Food and Farming Education and Research (OFFER) program, Innovative Farmers of Ohio, and the Ohio Ecological Food and Farm Association, the seminars were held at Clark State Community College in Springfield and at Ohio State's John Hirzel Sustainable Agriculture Research and Education Site near Bowling Green.

"On a national basis, there is definitely interest and growth in organic production, and economists looking at the big picture are predicting that this is not just a blip," says Debbie Stinner, organizer of the seminars and OFFER coordinator. "Organic production is here to stay."

For more information: <http://fusion.ag.ohio-state.edu/news/story.asp?storyid=323>

The market for organic products in the United States has increased at least 20 percent in the past 10 years. Economists predict the trend to continue.



Organic production of grains and more is a growing field in Ohio. IPM gives organic farmers a range of pest-management tools besides synthetic pesticides.

Nematode Slugs Slugs, Offers New Biocontrol

A common European nematode has been found to be an **effective parasite of grey garden slugs**, and Ohio State researchers hope to find the species in the United States or Canada for use as a new biological control.

The nematode *Phasmarhabditis hermaphrodita* contains a bacterium that multiplies and kills the slug when the nematode enters its host. The nematode feeds on the bacteria that are produced, multiplies, and produces more nematodes that seek and kill more slugs. Slugs die four to 16 days after infection, depending on the toxicity of the bacteria and their concentration in the host.

“It’s a pretty neat little system,” says Parwinder Grewal, an Ohio State entomologist who conducts research on parasitic nematodes.

Grey garden slugs are mollusks that feed on just about anything growing in an agricultural field—corn, wheat, soybeans, alfalfa—and are especially problematic in no-till fields where crop residue provides food and shelter for slugs to lay their eggs and multiply. Stand loss from slugs in no-till fields may range from 50–90 percent.

For more information <http://fusion.ag.ohio-state.edu/news/story.asp?storyid=326>

“What better way to control a pest than to use its natural parasite?” —
Parwinder Grewal

Greenhouse Screens Bar Whiteflies, Slash Pesticide Use

You put screens on your windows to keep out house flies. Why not do the same thing to your greenhouse for whiteflies? That’s the question a team of Ohio State and Israeli researchers asked, then answered, in defeating a major tomato disease.

The team—including Ohio State’s Robin Taylor and leader Menachem J. Berlinger of the Gilat Regional

Experimental Station, found that greenhouse **insect exclusion screens** are an effective way to prevent tomato yellow leaf curl virus. The screens, installed in vents and doors, keep out tobacco whiteflies, the vectors of the virus.

Furthermore, Taylor determined that the screens are cost-effective, too—they make economic sense for producers as well as consumers—and says there's great potential for their use in the United States.

Taylor says the screens have led to an enormous reduction in pesticide expenditures by Israeli greenhouse tomato growers and to millions of dollars in savings by Israeli consumers.

"I've seen the economics. I've seen the biology. It's a technology that makes logical sense," says Taylor, whose economic evaluation of the screens, co-authored by Berlinger and three other Israeli researchers, appeared in the journal *Crop Protection*.

For more information: <http://fusion.og.ohio-state.edu/news/story.asp?storyid=334>

"The screening is beneficial to both the public and the producer."—Robin Taylor

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What to Do When Your New Home Has No Topsoil

Organic mulches offer hope in restoring the fertility of degraded soils in residential areas. Ohio State scientists are



It's hard to grow a lawn like this if the topsoil has been taken away or been covered up by subsoil. Scientists with the Ohio IPM Program have found that organic mulches can help.

"Applying mulch may not only increase plant growth, but also improves the health of degraded soils by increasing organic matter and beneficial soil microbes." —
Dan Herms

studying the effects of **composted yard waste** and a mixture of **hardwood bark** and **composted manure** on the health of disturbed soils in ornamental landscapes.

"Topsoil is often removed when new homes are built, and the subsoil that is exposed when digging the basement is often spread over the surface," says Dan Herms, one of the project researchers. "Subsoil is virtually devoid of organic matter and nutrients, which makes landscaping and gardening nearly impossible without using pesticides and fertilizers."

In previous studies, Herms and colleagues found that certain organic mulches stimulate the growth of beneficial microbes, increase soil fertility, boost plant growth, and fight off insects and diseases. The researchers are now trying to see if organic mulches create the same effects in subsoil.

"We think certain mulches have the potential to function as organic fertilizers and pesticides in highly disturbed soils in urban landscapes," Herms says.

For more information: <http://fusion.ag.ohio-state.edu/news/story.asp?storyid=349>

 IPM Impact

For the First Time, Compost Shown to Fight Turf Disease

Incorporating compost into soils when lawns are seeded reduces the severity of leaf rust, a fungal disease that attacks perennial ryegrass.

Ohio State plant pathologists found that the amount of leaf rust on perennial ryegrass fell by 50 percent when the turfgrass was seeded into soils with at least a one-inch layer of **composted sewage sludge**. The study is the first of its kind to document the suppression of a foliar turf disease through the incorporation of compost into the soil.

Mike Boehm, one of the scientists on the project, says the compost adds nitrogen that helps ward off the disease: "We know that some fungi, like leaf rust, like to attack turf

"Compost is packed with microorganisms that have plant-enhancing characteristics." —
Mike Boehm

that is growing under nutrient-stressed conditions. The perennial ryegrass grew so well with the additional nitrogen that the pathogens were not able to attack it.”

Perennial ryegrass was chosen for the study since it is most susceptible to leaf rust and is a common turfgrass in Ohio. Leaf rust is recognized by a yellowing of turf blades, followed by reddish or orange-colored streaks on the leaves. The disease is most active under continuous warm days with dry conditions. Fungicide applications are currently the most effective means of controlling it.

For more information: <http://fusion.ag.ohio-state.edu/news/story.asp?storyid=355>

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Pumpkin Pest: New Chemical, Chemical-free Ways to Fight it

Pumpkin patches stricken with **bacterial wilt** are bound to have beetles to blame. The disease, carried by the **striped cucumber beetle**, takes its toll on Buckeye pumpkins in cool spring weather, says Celeste Welty, an Ohio State entomologist.

“Pressure is immense in the early season, right around Memorial Day,” she says. “Without chemicals, the beetles have the potential to devour the plants.” Fields planted early without pesticides can have a 40-percent crop loss, not including losses from bacterial wilt.

While growers have been hesitant to try a new pesticide, Admire, which costs \$75 to \$125 per acre, the pesticide proved its worth in an Ohio State study. It’s worth the price to most producers, Welty said.

Other methods of beetle control are being tested for pumpkin growers who don’t use pesticides. One involves planting a trap crop around pumpkin patches to draw away beetles from the pumpkin plants. Several different trap crops have been tested using squash, the beetles’ favorite plant.

For more information: <http://fusion.ag.ohio-state.edu/news/story.asp?storyid=603>

Ohio growers and Ohio State scientists are reviewing pumpkin pesticide recommendations. Their goal: To find the smallest amounts necessary to control striped cucumber beetles.

Bacteria Offer Biocontrol of Soybean Root-rot Diseases

In the struggle to protect soybean plants against root-rot diseases, one Ohio State scientist is taking the fight below the soil surface.

Brian McSpadden Gardener, a plant pathologist, is studying biological control of root-rot pathogens—including **Phytophthora, Pythium, Rhizoctonia and Fusarium**—using beneficial bacteria that colonize plant roots. The goal is to identify the distribution of soil bacteria across Ohio to determine which soybean fields would be ideal candidates for biological control applications.

“We know that some bacteria can promote plant growth, but what we don’t know is how much of those beneficial bacteria are in individual fields or how widely distributed they are across any defined geographical area,” McSpadden Gardener says. “The ultimate goal is to find out if there is a way to assay a field and say, ‘OK, there are very low populations of beneficial bacteria here, so this would be an ideal spot to apply biological control.’”

For more information: <http://fusion.ohio-state.edu/news/story.asp?storyid=630>

Crop Rotation Key to Cutting Weeds

Stubborn weeds in your wheat? Then take a look at your rotation practices. Ohio State scientists have found that **rotation, not tillage system**, is the most important factor affecting the size, effect and composition of weed seedbanks in major field crops.

“Most research indicates that tillage is the main determinant of seed density in the soil,” says John Cardina, a researcher on the project. “However, our research shows

Seedling diseases costs U.S. farmers nearly 750,000 tons of seed a year and more than \$150 million in losses.

that rotation will ultimately determine what kind of weed problems your crops are going to have.

“Farmers who work with three or more crop rotations will end up having more weed species in the soil,” he says. “But none of them will be as dominant and problematic as they would where there is no rotation at all.”

For more information: <http://fusion.ag.ohio-state.edu/news/story.asp?storyid=637>

“The best thing to do is switch rotation and tillage systems from time to time.” —
John Cardina

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How to Get More Than 300 Days of Weed Control

Weed control is one of the biggest challenges in the nursery and landscape industries. Not only is it expensive, but not all products—standard mulches, for example—are completely effective, and multiple chemical applications tend to raise environmental concerns.

But Ohio State scientists have found that **herbicide-treated mulches** may be the ticket to safe, effective, inexpensive weed control. The researchers have discovered that some products control weeds for more than 300 days with a single application, more than 170 days longer than in previous trials.

“To get nearly a year of weed control with one application in a nursery container is just mind-boggling,” says Hannah Mathers, a researcher on the ongoing project. “Imagine how long the application would last in the landscape.

“The clients of landscape professionals have very low tolerances for weeds, and the landscaper needs to have access to a one-time application product,” Mathers says. “However, that product is not currently commercially available. So providing it would be a big deal to the industry.”

For more information: <http://fusion.ag.ohio-state.edu/news/story.asp?storyid=659>

Extended weed control will benefit the landscape industry and give nursery container producers a marketing advantage.

Build Your Own Ladybug Trap for Less Than \$10

Joe Kovach has built a better ladybug trap—simple and inexpensive to make—and Ohioans may soon beat a path to his door, or at least to his Web site.

Kovach, coordinator of the Ohio State IPM program, and colleagues recently developed and evaluated a new home trap for **multicolored Asian lady beetles**—just one part of a much-wider program aimed at the non-native bugs.

In the past 10 years, multicolored Asian lady beetles have become a major headache. Hundreds or even thousands of them swarm into people's homes in fall. Living, crawling clusters form in attics, corners and basements.

Until now, the bugs were thought to be simply a nuisance. But research by Kovach and team showed that 25 percent of the people who live with high populations of multicolored Asian lady beetles report an allergic reaction to them. Furthermore, it's also now known that the beetles bite people, although, fortunately, not too often.

The new trap catches seven out of 10 ladybugs in a room—25 percent less than commercial traps but up to \$190 less expensive.

Joe Kovach with two of the ladybug traps that he and his team developed. All that's needed to build one are a clamp-on lamp, two plastic milk jugs, several sheets of clear plastic and hardware.



The new trap requires less than \$10 worth of materials. It catches about 70 percent of the lady beetles in a room, which can add up to an awful lot of insects. Commercial traps, costing up to \$200 and up to 99 percent effective, also are available.

Plans are available from the IPM program, (330) 263-3846, from county Extension offices, and at <http://ipm.osu.edu/lady/blt1.htm>.

For more information: <http://fusion.ag.ohio-state.edu/news/story.asp?storyid=685>

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New in Print: Award-winning Guide to Scouting Crops

A new OSU Extension publication has been recognized by the American Society of Agronomy (ASA) for its excellence as an educational material.

The ***Corn, Soybean, Wheat and Alfalfa Field Guide***—a pocket guide to crop management, fertilizer and harvest recommendations, and weed, insect and disease control—received a certificate of excellence in ASA's educational materials competition.

Bruce Eisley, the Ohio State entomologist who led the guide's development, says it's meant to give growers, Extension agents and consultants quick reference information when scouting crops in the field.

"It has reference material about weeds, insects, diseases, herbicides, no-till," he says. "If you see something in the field that doesn't look right, you can pull the book out and figure out what's going on."

The 239-page pocket guide contains everything from diagrams, graphs and charts to calibration and conversion formulas to color photos.

It's available at county OSU Extension offices for \$4.50 or is free on-line at <http://ohioline.osu.edu/b827/>.

For more information: <http://fusion.ag.ohio-state.edu/news/story.asp?storyid=721>

"The guide should be valuable for anyone who scouts fields on a regular basis." —Bruce Eisley

How to Know When a Sick Plant Needs Help

Pest problems and environmental stresses can team up to overwhelm **landscape and garden plants** as well as the people who try to keep those plants healthy.

But a new plant management system, designed by Ohio State horticulturists, may help landscape professionals and homeowners better diagnose and treat plant problems.

"Every problem has its place under 'treeage.' You can diagnose whether something is a problem or isn't based on this method." —
Joe Boggs

Called **'treeage,'** a play on the medical term "triage," the practice involves categorizing the severity of insects, diseases or stresses on plants to determine which plants require treatment and which ones don't.

"People tend to panic when one problem compounds another. Time and limited resources get used up on plants that may be lost causes, and treatable problems go ignored," says Joe Boggs, an OSU Extension agent in Hamilton County. "Treeage is a sorting methodology that focuses attention on plant problems that are treatable and away from problems that waste time and money because they don't need treatment or are untreatable."

For more information: <http://fusion.ag.ohio-state.edu/news/story.asp?storyid=660>

Which ones are sick and need help, and which are sick and don't? The process of "treeage," developed by Ohio IPM Program scientists, shows you—and in the process saves time, money and plants.



How IPM is Helping Ohio Schools

The Ohio State IPM Program is working with Ohio school districts to help them deal with their pest problems by developing effective pest-management plans with **minimum reliance on pesticides.**

“It’s been a great experience,” says Margaret Huelsman, OSU Extension entomology program manager. “School administrators have been very receptive to the ideas we have presented.”

The Ohio School IPM Program has put together training sessions for school administrators in different parts of the state. Participants are introduced to the concept of IPM and learn about the principles of IPM planning, building inspections and record-keeping to better assess problems.

The program has been successful in establishing pilot projects in the **Worthington City Schools** and the **Columbus Public Schools.**

“We have helped the Worthington schools write and adopt an IPM plan as well as inspect their 22 buildings,”

The Ohio School IPM Program is working with schools in Columbus and Worthington, among other places.



What’s being sprayed in our schools? And how can we keep what’s sprayed to a minimum—for the sake of our kids as well as school budgets? The Ohio IPM Program works with Ohio schools to answer those questions.

Huelsman said. “Our next effort will be to meet with the district’s curriculum supervisors to develop ways to incorporate IPM lessons into various instructional units.”

The Ohio School IPM Program has also helped the Columbus schools prepare an IPM contract, as the district was looking for a new pest-management service provider. Other work includes the development of notebooks to be used as pest logs for each of the district’s 160 school buildings.

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How IPM is Helping Developing Nations

Plant pests make no distinction of borders or nationalities. That’s why Ohio State scientist Sally Miller is working to manage diseases and increase crop yields where help is needed the most: in developing countries.

Miller serves as principal plant pathologist in **Bangladesh** and the **Philippines** for the Integrated Pest Management Collaborative Research Support Program (IPM-CRSP), an initiative of the U.S. Agency for International Development (USAID).

The Ohio IPM Program works in Ohio, naturally, and in other places, too—in developing regions where IPM expertise is needed to manage pests, protect the environment and feed people.



Under Miller's direction, the IPM-CRSP project in the Philippines has developed strategies to reduce the effects of root-knot nematode on onions. Project scientists are also combining host-resistance and grafting technology to manage bacterial wilt of eggplant on small farms.

In Bangladesh, Miller is providing leadership in the development of IPM approaches to manage bacterial wilt of eggplant and tomato, late blight of tomato and potato, and soil-borne diseases of eggplant and cucumber.

Bangladesh is one of the poorest countries in the world, and the program's efforts focus on improving vegetable yields and quality, reducing inappropriate use of pesticides, and improving the infrastructure of agricultural research institutions.

In **Ukraine**, Miller and Ohio State colleague Pat Lipps have worked with scientists from the D'nepropetrovsk State Agricultural University to upgrade laboratory facilities and develop research projects on wheat and tomato disease management.

Ohio IPM scientists help in Ukraine, Bangladesh and the Philippines. Their goals: Use IPM to control plant diseases, boost yields and feed more people.

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Growers, Scientists Team Up for Statewide IPM Network

Ohio growers, scientists and Extension personnel are working together on pest-management plans thanks to funding from the **North Central Region Pest Management Center** (NCRPMC) that helped Ohio build and maintain an effective pest-management network.

"We've been able to share information on how IPM is used for specific crops," says Margaret Huelsman, OSU Extension entomology program manager. "Growers have been involved in the process of creating pest-management strategic plans and have provided important feedback for us to determine how management decisions might affect production."

The development of a pest-management strategic plan

A new pest-management plan for Ohio's nursery and greenhouse industries aims, among other things, to minimize workers' exposure to pesticides.

for **peppers** proved to be a successful experience. Growers, researchers, commodity group representatives and OSU Extension personnel teamed up for this project and found the process beneficial in order to outline priorities in research, regulations and education.

Work under NCRPMC has also included a survey of pesticide use by lawn-care workers on **residential and commercial turf**. A partnership with the Ohio Agricultural Statistics Service has been established to develop a systematic method of obtaining pesticide-use data.

That information, Huelsman says, will be used to draft a pest management strategic plan for Ohio's blooming **nursery and greenhouse industries**—paying special attention to pesticide exposure of workers.

Pesticide-use data has also been used to update the IPM profiles of crops such as sweet corn, processing cucumbers, fresh-market tomatoes and pumpkins.

Floriculture crops, like these flowers, earn Ohio growers nearly \$190 million a year, while nursery crops—trees, shrubs and more—bring in more than \$100 million. Ohio's greenhouse, nursery and floriculture industries benefit from the findings of the Ohio IPM Program. So do their products, customers and workers.



4 Ways to See What's New in IPM (and Use it to Save Money)

Four weekly Ohio State newsletters are putting IPM right where it belongs: in the hands of growers.

C.O.R.N. (Crop Observation and Recommendation Network), **BYGL** (Buckeye Yard and Garden Line), **Ohio Fruit ICM News** and **VegNet** provide Ohio producers with timely, useful tips on insect and disease management, crop production, weather, pesticide recommendations, research results, and event information.

"It's very important to have access to the best information for those producers who want to remain competitive," says Steve Proschaska, an OSU Extension agent in Crawford County and an editor of *C.O.R.N.* "Our job is to provide research-based information on problems and needs of our clientele, and we have done that through the newsletter."

A survey conducted by the OSU Extension Agronomy Team indicated that *C.O.R.N.* saved Ohio farmers and agri-businesses more than \$11.2 million in 2001 in reduced pesticide and herbicide costs and increased crop production.

BYGL has been a hit, too. Managers of commercial nurseries, garden centers and landscape businesses, as well as homeowners who want to keep their landscape looking good, benefit from the newsletter's weekly updates between April and October.

Ohio Fruit ICM News and *VegNet* are packed with the latest information on variety trials, innovative pest-management techniques, marketing tips and opportunities for professional development.

The *C.O.R.N.* newsletter has saved Ohio farmers and agri-businesses more than \$11 million in a single year.

For more information: *C.O.R.N.*, <http://corn.osu.edu>; *BYGL*, <http://bygl.osu.edu>; *Ohio Fruit ICM News*, <http://www.ag.ohio-state.edu/~ipm/fruit>; *VegNet*, <http://vegnet.osu.edu>

Fruit Team

Using black or white plastic to control weeds was found to save money over not using plastic.

REDUCING WEEDS WITH BLACK OR WHITE PLASTIC IN EASTERN STRAWBERRY PRODUCTION. D. Funt, Horticulture and Crop Science. *Purpose:* Determine the amount of **weed control** between no plastic and plastic-covered raised beds, yield, and costs between treatments. *Results:* Black or white plastic yields were not different from the no-plastic control. Black (54 percent) and white (71 percent) plastic were less costly than the no-plastic system because of hand-weeding labor costs.

ENVIRONMENTAL FACTORS THAT MAY AFFECT SULFENTRAZONE SELECTIVITY ON NEW STRAWBERRIES. D. Doohan, R. Figueroa, Horticulture and Crop Science. *Purpose:* Determine **strawberry sensitivity** to sulfentrazone under varying soil pH values and delineate relative sensitivity of weeds found in strawberries. *Results:* Plant growth was less in sulfentrazone-treated soil of pH 7 than in soils of pH 5. The cultivar Allstar showed higher sensitivity. It may be necessary to restrict sulfentrazone use when soil pH is close to 7.

MOVING PREDATORY MITES INTO APPLE ORCHARDS FOR BIOLOGICAL CONTROL. C. Welty, Entomology. *Purpose:*



Why study apples? Because people like to eat them. And they earn Ohio farmers nearly \$24 million a year.

Evaluate movement methods, establishment and tolerance to pesticides of two species of predatory mites (*Typhlodromus pyri* and *Zetzellia mali*) in **commercial orchards**. *Results:* *T. pyri* establishment was successful in all three orchards using burlap/tree wrap bands. For *Z. mali*, seeding orchards via shoots in mid-summer was better than banding. *Z. mali* was unaffected by Acramite or Avaunt; its populations were suppressed by early season applications of Danitol/Agrimek but recovered by mid-summer. Savey did not affect *Z. mali* but did affect *T. pyri*.

USING ATTRACTANT-BASED TRAPS TO DETERMINE THE EFFECT OF GENDER RATIO OF CODLING MOTH. Ron Becker, OSU Extension, Wayne County. *Purpose:* Evaluate feeding-attractant-based traps compared to pheromone traps for **codling moths** and relate that to the Michigan Codling Moth Model. *Results:* The study was unable to demonstrate any reliability of molasses-baited Multipher traps. In addition, the Michigan spray model validity was questioned under circumstances where moth counts are historically high throughout the season.

TRANSITIONAL ORGANIC STRAWBERRY PRODUCTION. J. Kovach, L. Harper, S. Wright, Ohio IPM Program. *Purpose:* Evaluate six different cultivars and three types of compost for suitability to **organic strawberry production** in Ohio. *Results:* From harvest evaluations conducted in 2002 (the first fruiting year), there were no differences in strawberry fruit quality (no disease or insect problems) or yield between compost treatments (dairy barn, yard waste, vermicompost) and the commercial fertilizer standard or between cultivars (Earliglow, Honeoye, Idea, Jewel, Northeast, Seneca).

Switching from conventional fertilizer to organic fertilizer on strawberries didn't hurt yields and didn't lead to more insect or disease problems.

TASTING DIFFERENCES BETWEEN CONVENTIONAL AND ORGANIC STRAWBERRIES. J. Kovach, L. Harper, Ohio IPM Program. *Purpose:* Determine if consumers can detect differences in appearance, smell or taste between **strawberries** that were fertilized using organically approved methods (dairy

barn compost) or conventional synthetic fertilizer. *Results:* Consumer judges could not detect any difference in appearance, aroma or taste between organically and conventionally grown strawberries within the same cultivars (Seneca, Jewel or Idea). However, the panelists could tell the difference between cultivars for appearance, aroma and taste.

Some growers report a 2,500-percent return on their investment in the North-central Ohio Apple and Peach IPM Program.

NORTH-CENTRAL OHIO APPLE AND PEACH IPM PROGRAM. Ted Gastier, OSU Extension, Huron County. *Purpose:* Provide weekly pest monitoring to **apple** and **peach** growers in north-central Ohio. *Results:* Sixteen apple and nine peach growers representing 700 acres were enrolled in the program. This is the 12th year of the program, and some growers have suggested a 2,500-percent return on their investment of program fees because of savings in material, time and machine costs over the years. This year, apple evaluations yielded unusually high codling moth damage.

Agronomic Team

FIRST-YEAR CORN ROOTWORM TRAPPING PROGRAM. Bruce Eisley, Entomology. *Purpose:* Monitor **first-year corn rootworm**, a biotype of the western corn rootworm. *Results:* Sixty-four fields in 20 counties were monitored. Beetle numbers were higher than in previous years. Only one field in Van Wert County exceeded the threshold of two beetles per trap per day.

CROP OBSERVATION AND RECOMMENDATION NETWORK (C.O.R.N.) GIS PEST-MONITORING PROJECT. G. LaBarge, N. Watermeier, A. Sundermeier, C. Hutson, B. Ward, J. Barker, A. Kleinschmidt, S. Prochaska, G. Wilson, J. O'Brien, OSU Extension. *Purpose:* Test the usefulness of **hand-held GPS units** for data recording, increase knowledge of agents in using the technology, and build a model for statewide data collection and on-line pest reporting. *Results:* Nine agents were trained in three in-service programs, and by the end of the summer all agents had submitted data via FTP to a

central data-collection server for European corn borer and wheat head scab. Proposed maps for the soybean aphid were not done because of extremely low populations of this pest.

Nursery, Landscape and Turf Team

CALIBRATING A BIOLOGICAL CALENDAR FOR TIMING IPM DECISIONS FOR ORNAMENTAL PLANTS ACROSS OHIO. J. Chatfield, C. Young, J. Boggs, E. Draper, D. Herms, D. Shetlar, P. Bennet, OSU Extension. *Purpose:* Monitor the **phenology** of key plant indicators and insect pests throughout Ohio. *Results:* The phenology of more than 40 pests and 94 plants were monitored at the Secrest Arboretum in Wooster and in nurseries in Lake County. In 2002, the sequence of plant and insect events in Lake County corresponded almost exactly with the sequence in Wooster, supporting the development of a statewide biological calendar.

SURVEY OF PESTICIDE USE ON TURFGRASS GROWN IN OHIO. C. Young, J. Kovach, S. Prochaska, Ohio IPM Program. *Purpose:* Determine pesticide use on **turfgrass** grown in Ohio. *Results:* Of the nearly 1,300 surveys mailed to commercial pesticide applicators in three geographic areas of Ohio in 2002, 20 percent were returned, representing 30,762 acres. Herbicides made up 88 percent of the total

An accurate “biological calendar” helps growers time their spraying. Less pesticide is used yet pest control is the same or better.



Knowing more about pesticide use on turfgrass can help us use exactly what's needed—no more, no less. That benefits all of us as well as our water and wildlife.

pounds of active ingredients (a.i.). Insecticides were 8 percent and fungicides were 4 percent of the total. The mean quantity of pesticides applied per year was 4.2 pounds a.i. per acre.

Vegetable Team

Now being tested is a prototype kiosk—packed with research-based gardening information on IPM and more—for use in Ohio garden centers.

GARDEN CENTER KIOSK PILOT PROJECT. J. Jasinski, C. Welty, S. Jones, D. Shetlar, M. Riedel, M. Ellis, B. Precheur, M. Riofrio, P. Bennett, OSU Extension, Plant Pathology, Horticulture and Crop Science, Entomology. *Purpose:* Develop an informational kiosk to be placed in garden centers to provide information to homeowners on a range of **garden topics**, including landscape, fruit and vegetable production, entomology, and pest-management decisions. *Results:* The kiosk has been developed—with the content reviewed for accuracy by OSU Extension specialists—and is currently under customer evaluation at a Siebenthaler's garden center in Centerville.

DEMONSTRATION AND EVALUATION OF CUCURBIT PEST- AND CROP-MANAGEMENT SYSTEMS. J. Jasinski, J. Kovach, Ohio State; C. Petzoldt, Cornell University; R. Hazzard, University of Massachusetts. *Purpose:* Educate farmers, Extension specialists, Extension agents and agribusiness people about the need to adopt sustainable IPM/ICM production techniques for **cucurbits** (squash, pumpkins and the like).

Scientists with the Ohio IPM Program are teaching farmers sustainable ways to grow pumpkins and other cucurbit crops. Their goals include decreased pesticide use, better pest management and greater profitability.



Results: Ohio participated in this project by providing six pumpkin fields—two organic, two conventional, one IPM-present and one IPM-future—on which production practices were evaluated.

USING TRAP CROPS AND KAIROMONE TRAPS IN PUMPKIN PEST MANAGEMENT. J. Jasinski, C. Welty. *Purpose:* Combine two non-chemical pest management strategies, trap crops and kairomone traps and reduce cucumber beetle damage to **pumpkin** seedlings and fruit. *Result:* Although several thousand cucumber beetles were killed by the systemically treated trap crop and were captured in the kairomone traps, there were no significant differences among treated and untreated plots for either seedling or fruit damage.

PEPPER PEST-MANAGEMENT STRATEGIC PLAN. J. Jasinski, S. Miller, C. Welty, C. Hoy, B. Prechaur, M. Bennett, J. Felix, J. Kick-Raack, M. Huelsman, L. Harper, T. Sachs, B. Vantil, D. Roll, J. Stearns, W. Wickerham, J. Cunningham, R. Danhoff. *Purpose:* Bring growers, regulatory officials, the Ohio Vegetable and Potato Growers Association, and Ohio State scientists together to discuss the critical issues facing **pepper production in Ohio**. *Result:* After two days of discussion, several action items under research, regulatory and education headings were developed with the intent of being addressed soon to reduce barriers to pepper production.

Cucumber beetles hurt Ohio pumpkin production. Efforts are underway to use IPM to control them.



How can Ohio grow more peppers, which already earn more than \$7 million a year? A project of the Ohio IPM Program teams farmers, scientists and others to find new ways to boost production.

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