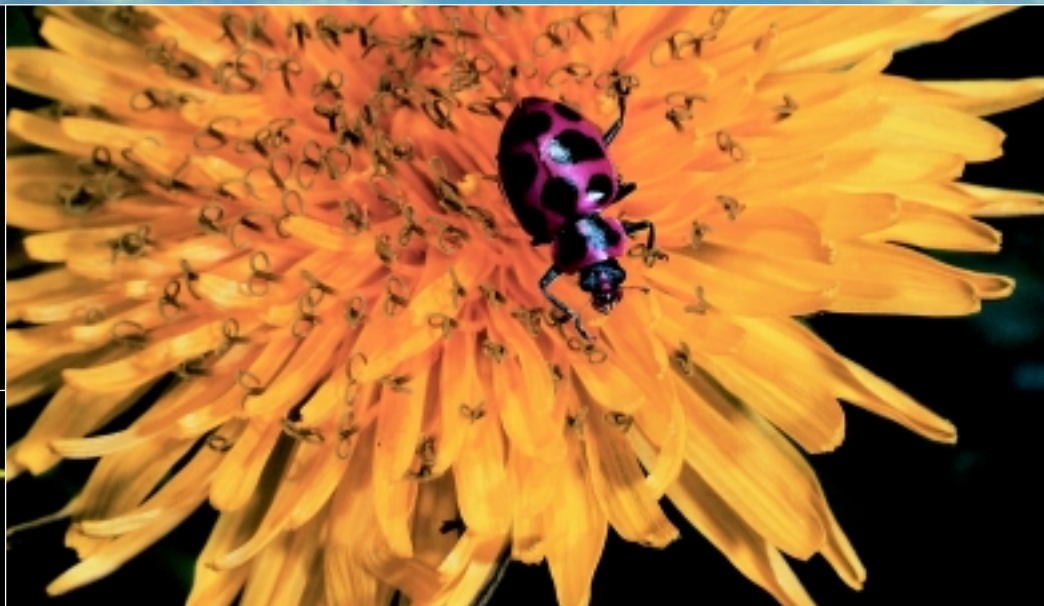
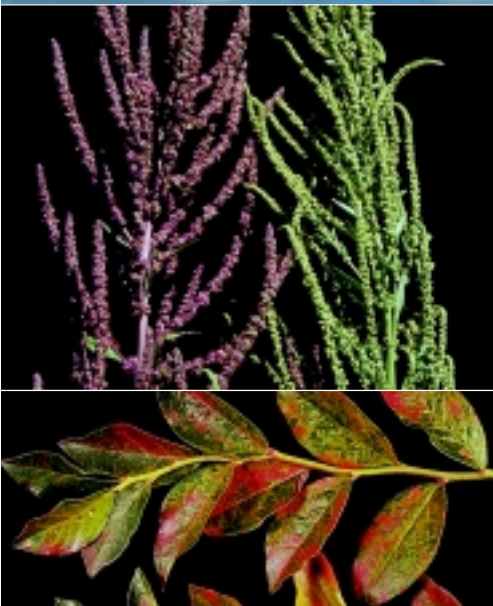


INTEGRATED *P*EST MANAGEMENT

College of Agricultural, Consumer and Environmental Sciences • University of Illinois at Urbana-Champaign



WELCOME

TO THIS NEW PUBLICATION,



Mike Gray examines a sticky trap for western corn rootworm beetles.

For over a quarter of a century, Extension's integrated pest management (IPM) programs have been a prominent feature of University of Illinois outreach efforts. The formal Extension IPM program in Illinois began in 1972 when federal support was used to launch a pilot scouting initiative in Boone County. The primary focus of this early program was promoting scouting and the use of economic thresholds for insects in corn. In that first project, an intensive scouting thrust was aimed at 115 cornfields covering 4,268 acres.

As we enter the next century, the scope and magnitude of Extension's IPM programs have changed considerably. However, a good share of the federal resources devoted to IPM efforts in Illinois continues to be targeted at managing insects, plant diseases, and weeds across about 25 million acres of field crops.

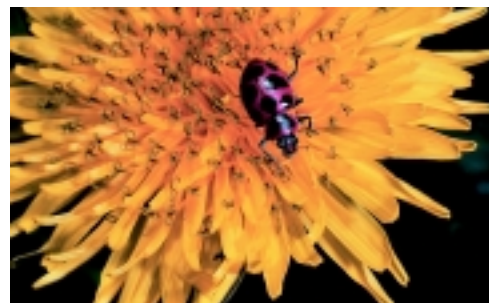
DESIGNED TO PRESENT THE MANY DIVERSE
EDUCATIONAL PROGRAMS
IN PEST MANAGEMENT
OFFERED THROUGH
UNIVERSITY OF ILLINOIS EXTENSION.

In addition, as the following articles demonstrate, many of our pest management extension initiatives are increasingly being aimed at suburban and urban audiences—a trend that also is reported by other states. Effectively delivering both urban and field crop IPM programs will require the continued close cooperation of Extension specialists and researchers from various departments and state organizations, particularly the Department of Crop Sciences, the Department of Natural Resources and Environmental Sciences (NRES), and the Illinois Natural History Survey (INHS). Teams of Extension educators and campus specialists will work together to provide a bridge for the delivery of pest management information to local clientele throughout the state of Illinois.

In 1993, the Clinton Administration challenged the IPM community to implement IPM practices on 75 percent of the nation's managed acres by the year 2000. Although a great deal has been accomplished toward meeting this goal, consider-

able work remains in urban, suburban, and field crop sectors. In terms of real dollars, the federally supported IPM Extension program has lost ground during the past three decades. To meet the demand for world-class IPM extension programs well into the next century, new sources of funding will undoubtedly be required. Also, new partnerships with the private sector and other land-grant institutions will be necessary to keep our clientele throughout Illinois up-to-date on the latest pest management research and its potential implications.

Finally, I hope you'll let us know what you think of some of these University of Illinois Extension programs. Please note that we have provided numerous addresses (conventional and email), telephone numbers, and website locations to enable our readers to reach educators, specialists, and other



scientists for more in-depth pest management materials. We welcome your suggestions and comments as to how we can improve our pest management outreach efforts, and we look forward to your continued support.

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ASIAN LONGHORNED BEETLE

THE MOST CHALLENGING PEST MANAGEMENT PROBLEM ENCOUNTERED IN ILLINOIS DURING 1998 INVOLVED THE ASIAN LONGHORNED BEETLE.



Asian longhorned beetle adult on silver maple in Chicago.

In July 1998, this potentially devastating insect pest of trees was discovered in Chicago. It is believed the infestation began with solid-wood crating materials imported from Asia. Other known infestations in the United States can be found in the neighborhoods of Long Island, New York. Asian longhorned beetles, *Anoplophora glabripennis*, are very injurious to many species of healthy hardwoods. Susceptible species include maples, boxelder, poplar, willow, elm, mulberry, black locust, horsechestnut, and plum. This insect pest is of significant economic and environmental importance to the landscape and forests of Illinois and the nation. City, state, and federal officials are cooperating to implement eradication efforts.

Informational handouts were prepared by the Illinois Natural History Survey (INHS) and Department of Natural Resources and Environmental Studies (NRES) at the U of I to assist homeowners in determining if their trees have been infested by the Asian longhorned beetle. Handouts may be obtained by contacting INHS or NRES.

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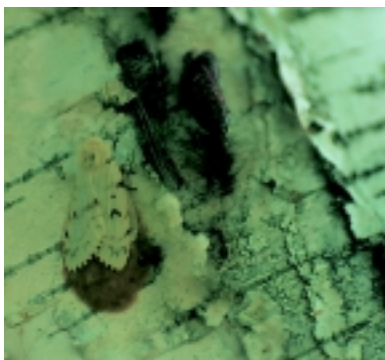


G Y P S Y M O T H

GYPSY MOTH POPULATIONS HAVE INCREASED IN NORTHERN ILLINOIS.



Gypsy moth larva.



Adult female gypsy moth near an egg mass on a birch tree.

Although their numbers are not great enough to cause obvious damage, the increases make eradication of this pest in Illinois less likely. Also, established infestations in western Michigan and scattered populations in southern Wisconsin may contribute to further infestations in Illinois. Vacationers may cause accidental infestations by transporting egg masses from infested areas to areas previously uninfested, and it is presumed that newly hatched larvae are blown across Lake Michigan on warm air updrafts.

As a result of the increased gypsy moth populations, the Illinois Department of Agriculture, in association with the United States Animal and Plant Health Inspection Service, has revised the state's gypsy moth monitoring program. Surveillance trapping will occur annually throughout Illinois, rather than biannually. Monitoring efforts will be increased in tree corridors along south-flowing rivers, with eradication efforts concentrated on "leading edge" and small disjunct populations of gypsy moth.

Scientists at the Illinois Natural History Survey are studying the



Gypsy moth pupa.

possibility of augmentative release of some gypsy moth pathogens that are established in other states and, in cooperation with the USDA Forest Service, are conducting international research efforts to identify other effective microbial enemies. University of Illinois Extension specialists and educators provide current information on the spread and eradication efforts to landscape professionals and the general public through meetings, newsletters, and the mass media.

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COMMERCIAL ORNAMENTAL HORTICULTURISTS — LANDSCAPERS, ARBORISTS, SOD GROWERS, GOLF-COURSE SUPERINTENDENTS, AND LAWN-CARE PROFESSIONALS — ARE EDUCATED THROUGH A VARIETY OF UNIVERSITY OF ILLINOIS EXTENSION EFFORTS THROUGHOUT THE YEAR.



Multiple-choice feeding tests use adult elm leaf beetles and Japanese beetles to see which elm species and hybrids these defoliating insects prefer. The tests are part of a collaborative research effort between the U of I and The Morton Arboretum.



Leaf samples are taken to better understand the within-tree distribution, larval development, and host suitability of the elm leafminer, for use in elm breeding programs.

Presentations by Extension specialists and educators are offered to members of the green industry throughout the year at the North Central Turfgrass Conference, Southern Illinois Grounds Maintenance School, Horticulture Plant Maintenance Seminar, and the University of Illinois Horticulture and Landscape Field Day. Integrated pest management (IPM) and plant health care (PHC) information is also provided through category training sessions at Pesticide Applicator Training Clinics for those green industry members who apply pesticides.

A Commercial Landscape and Turf Pest Management Handbook (revised every other year) provides current University of Illinois Extension management recommendations for insect pests, diseases, and weeds associated with professionally managed trees, shrubs, flowers, turfgrass, and other ornamentals.

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Elm foliage samples are gathered in the field and then taken to the lab to determine defoliation levels, larval development, and host preference of the elm leafminer.

MASTER GARDENERS

UNIVERSITY OF ILLINOIS EXTENSION FACULTY AND STAFF TRAIN VOLUNTEERS IN THE MASTER GARDENER PROGRAM.

These volunteers, members of the general public, educate fellow citizens who are interested in information about landscaping, gardening,



A Master Gardener landscaping project is enjoyed by visitors.

and pest control. Many trained Master Gardeners provide educational information through displays, shopping mall shows, and garden club talks and by answering queries directed to local Extension offices. Each Master Gardener receives several days of training and then is asked to contribute at least twice as many hours in volunteer service.

Integrated pest management training is provided to Master Gardeners at a number of sites across Illinois annually. Each session represents six to seven hours of training in general IPM, turfgrass insects, woody ornamental insects, and household insects. *The Homeowners' Pest Management Guide* was published in 1998 to address specifically the pest management needs of the general public. The guide contains information on managing weeds, diseases, and insects of turfgrass, flowers, trees, shrubs, vegetables, fruit, and household insect pests.

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During a field training session, a Master Gardener discusses vegetable gardening.



Master Gardeners explain their programs to a Brownie troop touring a demonstration plot.



INSECT CARDS

THE GOOD, THE BAD, AND THE UGLY: RECOGNIZING INSECTS JUST GOT EASIER!

Through a University of Illinois Extension–IPM minigrant program, staff members of the Illinois Natural History Survey (INHS) collaborated with Purdue University to create a set of laminated identification cards, *The Good Guys, Natural Enemies of Insects*. The cards are designed to help home gardeners learn to recognize beneficial insects. The photos and information

on each card provide sight identification of the organism or group of organisms considered beneficial in controlling insect garden pests. The cards are designed not for species identification but only to point out general categories of insects and animals that should be nurtured in the home garden. The positive response to the beneficial insect cards prompted the INHS and the Department of Natural Resources and Environmental

Sciences at the U of I to produce a second set of cards, *The Bad Guys! (Set #1: Garden Pests)*.

The cards are available for \$8 per set. For more information, contact:

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P ESTS IN APPLES

IPM MINIGRANTS THAT HAVE SUPPORTED THE ILLINOIS FRUIT AND VEGETABLE NEWS (NEWSLETTER) OVER THE PAST FEW YEARS HAVE INCLUDED FUNDING FOR FRUIT INSECT PHEROMONE TRAPPING EFFORTS.

These efforts have helped to demonstrate the value of regular monitoring, and they have provided up-to-date information for the newsletter. In 1997 and 1998, orchard visits associated with the trapping program led to the discovery of two “new” insect problems in southern Illinois orchards.

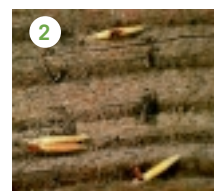
In one apple orchard in Madison County in southwestern Illinois, the ribbed cocoon maker, *Bucculatrix pomifoliella* Clemens (Lepidoptera: Lyonetiidae), caused serious defoliation in 1997 and 1998. The first-stage larva of this small moth mines leaves (tunneling between the upper and lower surfaces), then exits and spins a silken molting cocoon on the upper surface of the leaf. Later stages feed externally on the upper surfaces of leaves; only the lower epidermis of the leaf remains intact. Larvae pupate in silken cocoons that are longitudinally corrugated or ribbed. At least three generations developed in southwestern Illinois in 1998.

This insect was described as a pest of apples in 1860, but it had virtually disappeared since the first use

of synthetic insecticides in apples. The recently monitored infestation occurred in a managed orchard that received regular applications of organophosphate insecticides, causing the suspicion that this population may have developed resistance to Guthion (azinphosmethyl) and Imidan (phosmet). Detailed studies on the biology and management of this insect are planned for 1999.

In addition, the tufted apple bud moth, *Platnota ideaeusalis* (Walker) (Lepidoptera: Tortricidae), caused serious damage to fruit just before harvest in at least one location in Union County in far southern Illinois in 1998. Although this insect is a common and serious pest in states to the east of Illinois, it has not caused notable losses here. It, too, occurred in a managed orchard, and there is concern that organophosphate resistance (common in this species in eastern states) may be the reason for the outbreak we observed. Growers in this area were advised to modify their insecticide choices to control this insect in 1999.

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1. Damage to apple leaves caused by the larvae of the ribbed cocoon maker.
2. Ribbed cocoon maker larvae first mine or tunnel within leaves, then exit and spin molting cocoons.
3. Older larvae feed on the upper surface of leaves, skeletonizing the foliage.
4. *Bucculatrix* larvae pupate within cocoons that are longitudinally corrugated or ribbed—hence the name, ribbed cocoon makers.

P LANT CLINIC ACTIVITIES

THE UNIVERSITY OF ILLINOIS
PLANT CLINIC SERVES HOMEOWNERS
AND GRAIN EXPORTERS.



Often, examinations by microscope are necessary to identify fungal structures, insects, abnormal growths, or soybean cyst nematodes.

Operating from May to September, the clinic offers plant problem diagnostic services to the public, including disease identification, insect and insect injury identification, visual assessment of herbicide injury on field crops, plant identification, nematode analyses, and nutritional and cultural problem assessment.

The Illinois Department of Agriculture phytosanitary inspection program requires field inspections before grain can be exported. An important function of the clinic is to assess the plant samples collected by field scouts for diseases, and to evaluate field crops for potential exportation. In 1998, the Plant Clinic conducted over 1,000 of these inspections for the Illinois Department of Agriculture. For more information, contact:

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**University of Illinois Plant Clinic
1401 W. St. Mary's Road
Urbana, IL 61802
(217)333-0519**



Disease identification is one of many services provided by the U of I Plant Clinic.



Two pathologists discuss possible diseases while examining a pine tree sample.

SOYBEAN CYST NEMATODE

RANKED ANNUALLY AS THE MOST DAMAGING PEST OF SOYBEANS THROUGHOUT THE MIDWEST, THE SOYBEAN CYST NEMATODE (SCN) IS COSTING ILLINOIS PRODUCERS \$18 TO \$20 MILLION EACH YEAR IN CROP LOSSES.

Yield losses of 5 to 15 bushels per acre are possible and may occur without any above-ground symptoms. University of Illinois field and campus-based staff cooperate with representatives from several organizations and sponsors in an effort to increase producers' knowledge of this pest. Those organizations include the Illinois Soil Testing Association, Illinois Soybean Checkoff Board, and various private organizations and state agencies. At these educational sessions, soybean producers have been encouraged to submit soil samples. On average, 70 percent of

the samples from northern Illinois have tested positive for this pest. Over 80 percent of these positives also have above-economic levels of mature cysts. Only implementation of IPM strategies for this pest offers producers hope of producing competitive soybean yields.

Educational programs aimed at improving the management of soybean cyst nematodes were conducted at 23 locations and involved 3,365 face-to-face contacts with farmers, crop consultants, and agribusiness representatives. Besides these contacts, news releases, radio presentations, bulletins, and other Extension publications reached an estimated audience of 12,000.

Twenty-five years ago, only a few SCN-resistant public varieties were available. Today, through the efforts of public and private breeders, over 400 resistant lines can be grown in Illinois. In 1998, four new resistant varieties were released by soybean breeders at the University of Illinois. These varieties have greater yield potential and, for the first time, offer resistance to more than five races of this pest.

University of Illinois management recommendations for SCN

Use of SCN-resistant soybean varieties is an effective means of improving plant health and yield.



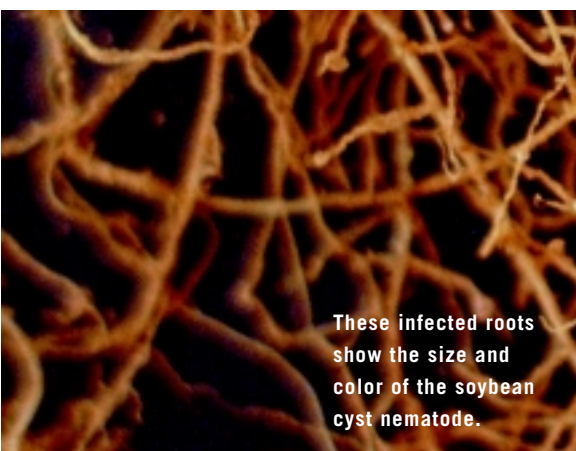
include an integration of the following strategies:

- Detection through scouting procedures involving root examinations and soil sampling
- Crop rotation utilizing nonhost crops and resistant soybean varieties
- Maintaining proper soil fertility and pH
- Managing other soybean pests
- Proper planting methods

Costly nematicides are no longer recommended as a management approach.

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These infected roots show the size and color of the soybean cyst nematode.

EVALUATIONS OF THE ECONOMIC IMPACT OF SIGNIFICANT PESTS OF CORN AND SOYBEANS WERE INITIATED AT FIVE UNIVERSITY OF ILLINOIS RESEARCH AND EDUCATION CENTERS.

The pests monitored included European corn borer, gray leaf spot, soybean cyst nematode, brown stem rot, and western corn rootworm. Differential varieties for the specific pests were planted in replicated trials to

determine yield losses caused by damage from European corn borers, soybean cyst nematode, and brown stem rot. In recent studies, yield loss was significant at Monmouth (northwestern Illinois) for SCN and European corn borer and at Perry (west-central Illinois) for gray leaf spot.

Comparisons between untreated corn and corn treated with a systemic fungicide will be used to assess the impact of gray leaf spot on yield. Foliar disease ratings for gray leaf spot and brown stem rot also have been taken at each research center. In addition, infestation levels of SCN were determined at each site. At the conclusion of the

growing season, yields will be determined.

To assist in tracking the spread of the biotype of the western corn rootworm that lays eggs in soybean fields (as well as corn fields), four outlying University of Illinois Agricultural Research Centers participated in a project in cooperation with the Illinois Natural History Survey. The research centers involved in the vial-trapping project are located outside the current problem area. Soybean fields and corn fields, adjacent to one another, were sampled using this method. Western corn rootworms were scarce in the soybean fields but were found in all the adjacent corn fields. Vial-trapping at two Champaign County locations, in the current problem area, found a greater abundance of western corn rootworms in soybean fields than in corn fields. For information on this project, visit our website at www.staff.uiuc.edu/~s-isard/index.html.

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Corn, soybean and leaf samples provide valuable data for impact-assessment evaluation.

WESTERN CORN ROOTWORM

A CHANGE IN THE EGG-LAYING BEHAVIOR OF THE WESTERN CORN ROOTWORM HAS RESULTED IN SEVERE DAMAGE IN FIRST-YEAR CORN ROTATED WITH SOYBEANS IN EAST-CENTRAL ILLINOIS.



Western corn rootworm male and female.

After three years of research, a preliminary economic threshold and scouting procedures have been developed and were described in an insect information fact sheet published

by University of Illinois Extension. About 5,000 copies were disseminated through mailings and at educational meetings. In addition, the fact sheet was available on the worldwide web and distributed with the *Pest Management & Crop Development Bulletin*.

Producers who were interested in reporting their scouting observations to University of Illinois Extension cooperators also used the worldwide web to access a scouting report form.

By taking advantage of this new information and implementing



Western corn rootworm larvae feed on corn roots.



Roots are rated according to the amount of larval injury.

the pest management recommendations, producers in east-central Illinois can significantly reduce their use of soil insecticides applied at planting. The economic and environmental benefits are potentially significant.

Producers from 26 counties used the scouting procedure the first year of implementation. Over 200 producers forwarded scouting data to University of Illinois Extension specialists for summarizing and distributing statewide.

Cooperators will dig roots from over 75 fields scouted last summer and participate in the 1999 Root Rating Program. Producers

will dig roots from check strips (control) in treated fields or from untreated fields, and Extension educators will collect and transport roots to campus, where Extension specialists will wash and rate the roots.

Information obtained from this cooperative effort may allow further refinement of the economic threshold. In 1999, an additional 3,000 Pherocon AM sticky traps have been distributed to producers interested in scouting their soybean fields.



Pherocon AM trap.

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SCOUTING REPORT FORM SITE:
www.aces.uiuc.edu/ipm/field/com/imr/wcrscout/wcrscout.html

WESTERN CORN ROOTWORM INSECT
INFORMATION SITE:
www.aces.uiuc.edu/ipm/field/corn/insect/wcr.html

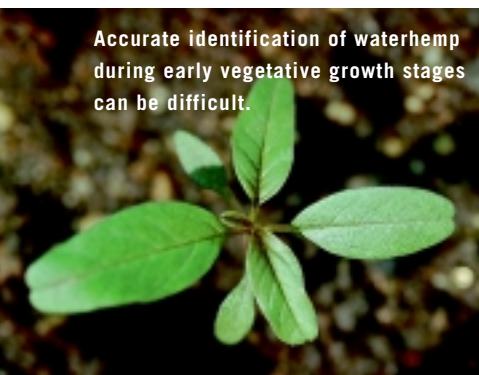


ATERHEMP MANAGEMENT PROGRAM

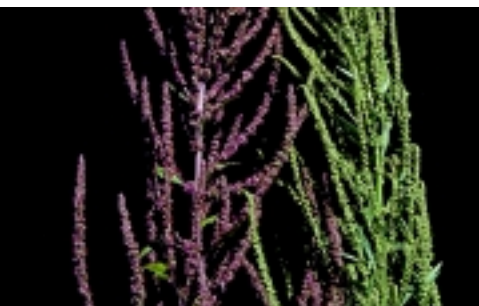
**DURING THE PAST FIVE YEARS,
COMMON AND TALL WATERHEMP HAVE BECOME
A SIGNIFICANT PROBLEM FOR ILLINOIS
CORN AND SOYBEAN PRODUCERS.**

Common and tall waterhemp (*Amaranthus rudis* and *A. tuberculatus*, respectively) are members of the Amaranth or pigweed family. Factors contributing to the increased severity of waterhemp infestations include selection for herbicide-resistant biotypes, changes in tillage

Accurate identification of waterhemp during early vegetative growth stages can be difficult.



The genetic diversity of the waterhemp population contributes to a wide range of morphological characteristics.



and residue-management programs, and misidentification (and hence, improper or no control attempts). Accurate identification and herbicide selection are essential for management of these species.

Improper herbicide selection or misidentification of waterhemp may necessitate additional herbicide input costs for rescue treatments, in addition to the initial herbicide costs. The economic and environmental costs associated with improper herbicide selection and inaccurate identification are significant.

In Warren, Henderson, and Mercer counties in northwestern Illinois, 240,000 acres of soybeans are produced annually, with an average yield of 43 bushels per acre. Loss from waterhemp can range from 1 to 50 percent. Current estimates indicate that 30 to 50 percent of the soybean acres in these three counties are infested with waterhemp, with about 3,000 acres considered heavily infested. Soybean yield losses in the most heavily infested fields are estimated at 64,500 bushels. At a market price of \$7 per bushel, the economic loss from waterhemp in these counties is estimated at \$451,000.

With waterhemp infesting increasingly more acres, producers and others involved in agricultural pest management needed information about the biology of waterhemp species, as well as recommendations for management. To help meet this need, a research and demonstration program was conducted in 1997 at the Northwestern Illinois Research and Demonstration Center for 125 producers and agricultural suppliers. That same year, an IPM publication describing the identification, biology, ecology, and management of waterhemp in agronomic crops was published. This publication, *Waterhemp Management in Agronomic Crops*, was a collaboration of U of I Extension-IPM faculty and staff of the Department of Crop Sciences, the Department of Natural Resources and Environmental Sciences, and the USDA.

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S NAPBEANS, WEEDS, AND IPM

WEEDS DO NOT EXIST IN ISOLATION— THEY CAN INFLUENCE OTHER ORGANISMS WITHIN CROP ENVIRONMENTS.

Putting the research spotlight on weed biology can aid development of better integrated pest management practices for snapbeans, a crop widely grown in the Midwest.

Crops can tolerate varying degrees of weed competition without adverse effects on crop growth and yield. Because weed–crop competition is affected by both the timing of weed emergence and weed density, these factors are part of a study to develop economic thresholds for two troublesome weeds (redroot pigweed and large crabgrass) affecting snapbean production. These weeds are prolific seed producers, emerging from May to September during the main cropping season for snapbeans. At densities greater than two plants per row foot, redroot pigweed and large crabgrass emerging with the snapbeans reduce yield. Later-emerging weeds do not significantly affect yield. Weeds also can affect insect pests. Populations of two insect pests, potato leafhopper and bean leaf beetle, are being monitored as well to determine if

changes in weed density affect the potential influence of these pests on snapbean production.

Reduced tillage–high residue systems can prevent soil erosion, improve soil tilth, and suppress weeds in vegetable crops. By changing the crop environment, these alternative production systems also can affect other pests and may lower crop yields. Recent small-plot research with cereal rye cover crops has shown that these systems provide effective weed control through midseason, decrease the incidence of white mold disease on snapbean, and reduce some insect pest problems (that is, leafhoppers). Snapbean yield was reduced in reduced-tillage systems due to soil compaction and allelochemical release by the rye. The use of strip tillage was found to reduce much of the adverse effects of cover crop mulches on vegetable crop yields, but additional modifications are needed to reduce risk and increase snapbean yields in reduced-tillage rye mulch systems.

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1. Snapbeans growing in rye mulch.
2. Snapbean plot with pigweed.
3. Snapbeans with large crabgrass.

IMPROVING URBAN PEST MANAGEMENT

IN CHICAGO AND 20 SUBURBAN COMMUNITIES, METHYL PARATHION, A HIGHLY TOXIC INSECTICIDE USED PRIMARILY FOR CERTAIN FIELD CROP INSECT PESTS, WAS ILLEGALLY SPRAYED IN HOMES AND SOLD TO RESIDENTS FOR THE CONTROL OF COCKROACHES FROM 1992 TO 1997.



The tool kit used to control roaches through IPM contains a caulking gun, caulk, duct tape, and steel wool for sealing cracks and crevices; clothespins for sealing food packages; and chemical resistant gloves for handling the included cockroach bait.

More than 900 of these homes have been sampled for insecticidal residues, and 100 homes have required extensive interior demolition and reconstruction. Involved in this regulatory investigation was the use of pesticide wipe sampling and analysis, urinalysis of residents, relocation of families, location of temporary housing, and renovation of homes. Over \$10 million has been spent on these remediation efforts.

University of Illinois Extension responded to this situation by providing educational programs designed to prevent this tragedy from ever occurring again. News releases and brochures that describe appropriate cockroach management strategies were distributed. Also, educational programs were delivered to representatives from many groups and organizations, including the U.S. Environmental Protection Agency (US-EPA); State of Illinois Department of Public Health; Cook County Department of Public Health; Chicago Housing Authority; and the Chicago Departments of Public Health, Environment, and Consumer Services. The educational programs were taught by

cooperating instructors from the US-EPA, U.S. Agency for Toxic Substances and Disease Registry, Safer Pest Control Project, and University of Illinois Extension.

Educators at the programs were provided with fact sheets, English and Spanish brochures on cockroach management, flip charts, and IPM tool kits for demonstrations. These materials were designed for use by the educators as they teach members of the general public. The IPM tool kits were funded by the University of Illinois Extension IPM Program and contained materials to demonstrate the exclusion of cockroaches through caulking, taping, and using steel wool. Bait stations also were included in the kits, and their proper use was demonstrated.

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PESTICIDES SURVEY

IN 1996, UNIVERSITY OF ILLINOIS EXTENSION CONDUCTED A SURVEY OF 650 RETAIL STORES SELLING PESTICIDES IN ILLINOIS.



A majority of pesticide retailers agree—more employees should attend pesticide-handling workshops.

Retailers were asked about store personnel who make pesticide recommendations, the source and type of training provided, and resources that are used to help customers with pest management decisions. Of the retail stores surveyed, 43 percent identified specific employees who make pesticide recommendations. Only 34 percent of the retail stores surveyed provided any employee training related to pesticide use.

For employees who do receive training, fewer than a third receive information about integrated pest management and the economics of pesticide use. More than three-fourths learn about selecting pesticides, identifying pests, and handling and disposing of pesticides; slightly fewer learn about protective equipment and proper timing of pesticide application.

When asked about attending a local educational program on understanding pesticides, safe handling practices, and making recommendations, 83 percent of the retailers indicated they would participate or send an employee.

Partly in response to these findings, a training program was developed and implemented in



Consumers can avoid garden failures by following pesticide recommendations and safe handling practices.

Knox County by staff from Agriculture and Natural Resources Management and the Extension IPM teams. The Urban Integrated Pest Management and Pesticide Safety Workshop covered weed, insect, and disease identification and management alternatives; understanding pesticide labels; proper use of pesticides; and calibrating homeowner equipment. Pest management-related materials are available through University of Illinois Extension.

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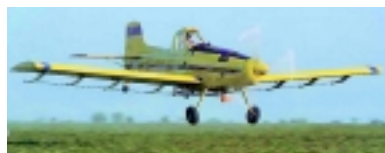
P

ESTICIDE APPLICATOR TRAINING

PESTICIDE APPLICATOR TRAINING (PAT)
EDUCATES 45,000 COMMERCIAL AND PRIVATE
APPLICATORS DURING EACH THREE-YEAR
LICENSING CYCLE.

Clients receive instruction in pesticide safety and proper application, integrated pest management, pesticide resistance, environmental impact, drift minimization, and pesticide laws and regulations.

Farmers and other private applicators who need to apply restricted use pesticides on land that they own or lease are trained by a total of 43 trainers at roughly 150 training clinics yearly. These Ex-



Aerial applicators attend an Operation Safe Fly-In workshop to adjust and optimize their planes before the application season gets under way.

tension trainers are updated and provided with educational training materials by campus-based Extension staff. During each three-year licensing cycle, 22,000 farmers and other private applicators are trained. Based on surveyed samples of this group, 91 percent adopt pesticide-safety practices as a result of the training sessions.

Commercial pesticide operators and applicators are trained by 20 campus-based and off-campus Extension staff members from various disciplines. The 32 annual clinics are attended by 23,000 commercial operators and applicators over each three-year licensing cycle. Surveys show that 93.9 percent of attendees adopt pesticide-safety practices as a result of the training sessions. In-depth category training (for applicators) covers cultural controls, pest identifica-

tion, and correct and timely pesticide application where appropriate. Category training is provided in the areas of field crops, grain facility, seed treatment, demonstration and research, rights-of-way, turf, ornamentals, plant management (interiorscapes), and mosquito control.

In addition to training the persons being licensed to apply pesticides, the Pesticide Applicator Training Team provides pesticide-safety information to the public through news releases, a bi-monthly newsletter (*Illinois Pesticide Review*), fact sheets, displays at the Illinois State Fair and other venues, as well as (indirectly) through the Master Gardener Program. To learn more about this program, visit the Pesticide Safety Education Website at <http://www.aces.uiuc.edu/~pse>.

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Proper nozzle selection and sprayer calibration help ensure accurate applications.

THE PESTICIDE IMPACT ASSESSMENT PROGRAM
(PIAP) COLLECTS AND DISSEMINATES INFORMATION
ABOUT THE IMPACT OF PESTS AND PESTICIDES
ON AGRICULTURAL PRODUCTION.

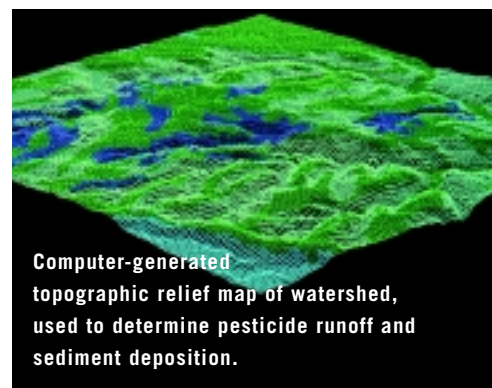
These databases are used to support pesticide regulatory decisions. Summary reports are forwarded to the USDA, the US-EPA, and other organizations involved in regulatory actions. David Pike represents the PIAP program at the University of Illinois and coordinates input from specialists within Illinois who are called upon to contribute to these activities.

Since its passage in 1996, the Food Quality Protection Act (FQPA) has resulted in an accelerated review schedule by the EPA for the organophosphate insecticides and the triazine herbicides. As a result, the Illinois PIAP program has focused on developing crop profiles for Illinois crops that may rely on these pesticides, and on reports of organophosphate and triazine use in the 12 states of the North Central Region.

Crop profiles contain information that is useful to the USDA and the US-EPA in evaluating the importance of each pesticide and the suitability of possible alternatives. Such information includes where the crop is grown in the state, total crop area, average yields, the distribution and impact of pests, pesticide use, and nonchemical pest management op-

tions. As profiles are developed, they are posted to the University of Illinois PIAP website for comment and review (<http://ext.agn.uiuc.edu/piap/>) and then submitted to the EPA. Profiles currently under development include field corn, soybeans, rye, oats, wheat, sorghum, alfalfa, snapbeans, sweet corn, hogs, dairy, beef, and poultry.

Other reports also have been prepared to address issues related to the possible loss of organophosphate and triazine pesticides. A summary of organophosphate insecticides for field corn solicited input from entomologists throughout the North Central Region to address the suitability of alternatives for soil insecticides on field corn. The PIAP report suggested that canceling a number of organophosphate uses was warranted; however, for a limited number of uses, alternatives were less efficacious and might actually increase insecticide use and insect resistance development. A report on triazine herbicides examined the costs and returns of herbicide use from more than 5,000 experimental treatments in states throughout the Midwest. Findings from the study suggest



Computer-generated topographic relief map of watershed, used to determine pesticide runoff and sediment deposition.

that some herbicides, applied postemergence, can optimize economic returns while permitting the farmer to decrease the amounts of pesticide used.

Information on insecticide use for livestock also is a high priority. The Illinois Pesticide Impact Assessment Program conducted a survey of pesticide use on beef and dairy cattle in north-central states. This study is one of the largest and most intensive surveys of insecticide use on cattle ever conducted and presents a realistic model from which plausible assumptions may be drawn. These reports are available over the Internet at <http://ext.agn.uiuc.edu/piap/>.

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ILLINOIS CROP PROTECTION TECHNOLOGY CONFERENCE

THE ILLINOIS CROP PROTECTION TECHNOLOGY CONFERENCE, THROUGH A COUPLE OF NAME CHANGES, HAS BEEN HELD ANNUALLY AT THE UNIVERSITY OF ILLINOIS FOR MORE THAN 50 YEARS.

Conceived by Pete Petty, the first Illinois Custom Spray Operators Training School was held in January 1949. The school was intended for agricultural pesticide applicators, a burgeoning industry at the time. The objective was to promote the safe, timely, and judicious use of pesticides in agriculture, within a framework of pest management. The school quickly became so popular that it was moved onto campus. In 1987, the name became the Illinois Agricultural Pesticides Conference, to reflect the more

modern content of the program, with a

greater focus on current issues in agriculture and the environment. The 1998 conference was the 50th anniversary, with a theme of “50 Years of Serving Agriculture and the Environment.” In 1999, the name was changed to the Illinois Crop Protection Technology Conference, again to reflect the content of the program more accurately and to accommodate the rapidly expanding biotechnology industry.

The Illinois Crop Protection Technology Conference is a multidisciplinary conference for leaders in the agricultural industry. Speakers include University of Illinois Extension and research specialists in entomology, plant pathology, weed science, and agricultural engineering.

Pest management experts from other states, as well as regulatory and environmental authorities from Illinois and elsewhere, are invited to participate every year. The conference is sponsored by University of Illinois Extension in the College of Agricultural, Consumer and Environmental Sciences. Additional sup-

port for the conference is provided by the Illinois Natural History Survey, the Illinois Department of Agriculture, Illinois Environmental Protection Agency, and Illinois Fertilizer and Chemical Association. About 1,000 people from Illinois and surrounding states attend the conference annually.

Topics discussed during the conference address many scientific issues, including the mode of action, degradation, and interaction of pesticides; management issues related to agricultural pests, alternative control measures, decision-making thresholds, and risk assessment; environmental concerns such as pesticide contamination of ground water and public water supplies; and legislative and regulatory issues. More recently, the use of transgenic crops in agricultural pest management has been a featured focus during the conference. The program provides an annual forum for educating agricultural clientele within Illinois, the Midwest, and the nation.

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THE UNIVERSITY OF ILLINOIS IS A MEMBER OF THE CONSORTIUM FOR INTERNATIONAL CROP PROTECTION (CICP), WHICH WAS ESTABLISHED IN 1979. NEARLY 6,000 PARTICIPANTS FROM MORE THAN 45 DEVELOPING COUNTRIES HAVE BENEFITED FROM THIS TRAINING.



An example of multiple-cropping in Columbia.



Chinese scientists take notes while studying crops in Urbana, Illinois.



A farmer weeds his rice field in Java.

CICP is composed of eleven major universities and the U.S. Department of Agriculture, all of which focus on major program efforts in IPM. On January 1, 1999, the headquarters office of CICP was moved to the University of Illinois at Urbana-Champaign.

The major emphasis of CICP has been to provide technical assistance and training, including numerous research collaboration initiatives. Its most valuable contributions to agricultural development and environmental safety have been educational programs (of one day to eight weeks) offered worldwide in English, Spanish, or French.

Major topics are

- Pesticide safety, management, application, and legislation
- Pesticide residue analysis
- Diagnosis and treatment of pesticide poisoning
- IPM and computer use in modeling crop-pest interactions, and for communications
- Plant-resistant breeding
- Weed management
- Plant disease diagnosis
- Entomology and biological control



Studying IPM practices in the mountains of Indonesia.

CICP has produced extensive training materials for use in the developing world, including an IPM directory for the Internet and the monthly *IPMnet News*, which currently is used in 109 countries (<http://ipmwww.ncsu.edu/cicp/brochure.html>).

A major IPM textbook, coordinated by Edward Radcliffe, University of Minnesota, is available on the Internet (www.ipmworld.umn.edu) and receives outstanding reviews. It is widely used both in the United States and abroad.

These international activities provide IPM experts and scientists from each member institution, including UIUC, an invaluable, stimulating opportunity to study and to educate abroad.

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PEST MANAGEMENT & CROP DEVELOPMENT BULLETIN
ILLINOIS FRUIT AND VEGETABLE NEWS
HOME, YARD & GARDEN PEST NEWSLETTER



Pest Management & Crop Development Bulletin

(www.ag.uiuc.edu/cespubs/pest) is a compilation of articles submitted by IPM educators and faculty and staff in the Department of Crop Sciences. Articles focus on managing insects, weeds, and plant diseases and provide updates of research progress and status reports of pest and crop development in a timely manner. The *Bulletin* is distributed weekly during the growing season to about 3,000 subscribers. During the “off season,” five additional issues are mailed to subscribers.

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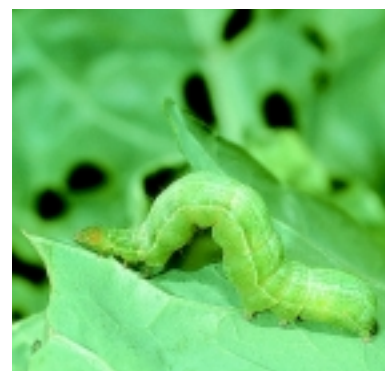


Illinois Fruit and Vegetable News

(www.aces.uiuc.edu/ipm/news/fvnews.html) is a weekly newsletter, offered during the growing season, that covers production and pest management issues for commercial fruit and vegetable growers.

Campus-based specialists in entomology, plant pathology, horticulture, and weed science, along with field-based educators in IPM and horticulture, cooperate to produce this newsletter. From May to September 1998, commercial fruit growers across the state participated in a pheromone monitoring program for key insect pests in apples and peaches. Their observations were reported weekly in the newsletter.

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Home, Yard & Garden Pest News-

letter (www.ag.uiuc.edu/cespubs/hyg) addresses pest issues relating to trees, shrubs, turf, and other landscape plants for commercial horticulturists. University of Illinois Extension specialists and educators provide updates and recommendations regarding current disease, weed, and insect pest problems. Previews of seminars and training programs are included in the newsletter.

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EXTENSION CENTERS UNIVERSITY OF ILLINOIS



The University of Illinois IPM program produces many publications, videos, CDs, and related materials for both urban and agricultural pest management.

A list of current publications available for purchase may be found online at www.ag.uiuc.edu/~vista/catalog/catintro.html, or you may call (800)345-6087.

In addition to printed materials, some publications are now available on the Internet via the IPM website (www.ipm.uiuc.edu) and at www.ag.uiuc.edu/~vista/pubs.html.

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State, county, local groups, U.S. Department of Agriculture cooperating.

University of Illinois Extension provides equal opportunities in programs and employment.

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