



2009 Annual Report

Western Integrated Pest Management Center

WIPMC

Director's Comments

This is the fifth annual report of the Western Integrated Pest Management (IPM) Center. During the past year the Center has received continuation funding for the third year of our current four year grant; continued the management of the Legume *ipm*PIPE (Pest Information Platform for Extension and Education) for state monitoring programs; continued to manage the Western Region IPM Grants Program; funded research and extension projects, work groups, outreach materials, surveys, and Pest Management Strategic Plans; and participated in international, national, and local meetings, workshops, and symposia.

The Western IPM Center is one of four centers in the United States. Each center is unique in the issues it addresses, but all follow the overarching guidance of the National Road Map for IPM, which identifies integrated pest management goals for agricultural, urban, and natural systems. The Road Map is available at <http://www.ipmcenters.org/IPMRoadMap.pdf>. The goal of the National IPM Program is to improve the economic benefits of adopting IPM practices and to reduce potential risks to human health and the environment caused by the pests themselves or by the use of pest management practices. The Western IPM Center, through the guidance of its Advisory and Steering Committees, has structured all of its programs to follow the Road Map, and it reports the impacts of its funded projects. Funding provided to the Western IPM Center comes primarily from the United States Department of Agriculture, National Institute of Food and Agriculture (USDA-NIFA). This funding is used to support Center activities and programs.

Pest Management Strategic Plans (PMSPs). Regional staff, along with growers, crop consultants, industry groups, and university researchers, develop Pest Management Strategic Plans. These documents are used by industry and by state and federal authorities as they try to understand pest management uses and needs in agricultural settings. The IPM in Schools PMSP involved a completely different approach and different participants from those utilized in crop PMSPs to develop a plan for IPM implementation in all K-12 schools in the United States by the year 2015.

Grants. As research and education needs are identified through the work groups and other stakeholders, the Western IPM Center is able to provide some funding via annual grant programs and through small startup grants. The small startup grants can be quickly funded to address newly emerging issues, such as a disease or other pest outbreak. Addressing Western IPM Issues grants focus on problems identified by stakeholders, work groups, PMSPs, or other documents. These grants may be research, extension, or a combination of both.

Work Groups. Focused, multi-state work groups are funded to address particular issues, such as pesticide resistance management, urban IPM, weather modeling and pest forecasting, and other topics. These work groups have been enormously successful in leveraging other funds to address issues identified as important in the West. Several large grants have been obtained by work group members as a result of the small amount of support provided by the Western IPM Center.

Advisory and Steering Committees

Two standing committees guide the Western IPM Center. The Advisory Committee provides vision and guidance. Its members represent a wide range of stakeholders that link the Center to stakeholder needs and priorities for pest management programs in the West. These advisors, integral to Western IPM Center outreach, promote awareness of the Center's resources to their own constituencies and beyond. The Steering Committee gathers input from stakeholders (including the Advisory Committee), determines broad policy goals and priorities, recommends Center budgets, and provides direction for timely and effective Center management. In the pages of this report we highlight some of the projects, people, and impacts that have made the Western IPM Center a success.

Highlights of WIPMC Grants Programs

The following highlights of WIPMC grants programs show the breadth of projects funded and the impacts made to improve the economic benefits of adopting IPM practices and to reduce potential risks to human health and the environment caused by the pests themselves or by the use of pest management practices.

Identification of a Sex Pheromone of *Prionus californicus*, and its Potential Use in Management of Hop

Principal Investigator: James Barbour, University of Idaho



(Photo by L.M. Hanks, University of Illinois at Urbana-Champaign)

Summary: The longhorned beetle *Prionus californicus* is a serious root-feeding pest of hop in the Pacific Northwest. Hop is a specialty crop produced for the female flower clusters, commonly called cones or hops, which are an essential ingredient in the production of beer. The only currently recommended method for *P. californicus* management is removal of all hop rootstock from infested fields. Only one broad-spectrum, soil-applied insecticide is currently registered for *P. californicus* management. No effective host plant resistance or biological control alternatives exist. The objectives of this project were to 1) isolate and identify active pheromone components in *P. californicus* and 2) test their effectiveness at disrupting communication between male and female beetles and the potential for their use in managing *P. californicus* in hop.

Results: This project's research has confirmed the existence of a female-produced mating pheromone in *P. californicus*. Experiments demonstrated that male beetles were strongly attracted to live females under laboratory and field conditions and also to freeze-killed females and their excised ovipositors in the laboratory. Males were not attracted to excised heads, abdomens, or thoraces of females, indicating that the ovipositor was the volatile pheromone source. Analyses indicated that the basic structure of the volatile pheromone is 3,5-dimethyldodecanonic acid.

Impacts and Potential Impacts:

This is the first documented female-produced pheromone in the beetle family Cerambycidae. This research also provides the first evidence that contact pheromones play an important role in mate recognition in the Cerambycid subfamily Prioninae generally and in *P. californicus* specifically. The volatile pheromone has excellent potential to be developed into a

pest management tool for monitoring or managing *P. californicus* in hop and other crops (e.g., cherry). Several companies are investigating commercialization of the pheromone for use in hop pest management. The pheromone also has potential for managing closely-related beetles in the same genus that attack pecans in the U.S. Southeast. Cross-reaction of this pheromone with other prionine beetles could render the pheromone useful for ecological studies on the biology and geographic ranges of cross-reacting species. It may also be a useful tool for monitoring to prevent introduction and establishment of these beetles into areas outside of their native ranges.

Walnut Pest Management Alliance: Outreach and Implementation of Pheromone Mating Disruption

PIs: Carolyn Pickel and Joe Grant, University of California Cooperative Extension



(Photo by Sara Goldman Smith, University of California)

Summary: Initially funded by the California Department of Pesticide Regulation, the Walnut Pest Management Alliance's (PMA) primary goal was to move walnuts from a chemical-based IPM program to a pheromone IPM program. After 10 years of research and field validation, the PMA's focus is adoption and implementation of a pheromone-based IPM program for codling moth (CM). The project emphasizes 1) reducing the use of pesticides commonly used on walnuts that affect water quality, and 2) outreach and implementation of economical, reduced-risk walnut production. Development of reduced-risk practices for CM management could greatly reduce growers' use of broad-spectrum insecticides in walnuts. Project objectives were to 1) implement pheromone application technology for CM, emphasizing "area-wide" control using aerosol puffers, and monitor CM to watch for population increases and determine spray timings; 2) demonstrate pheromone application technologies with a high potential for use in walnuts; 3) assist with and demonstrate the use of monitoring for CM damage for growers interested in implementing pheromone mating disruption (PMD), and encourage neighboring growers to install pheromone puffers to take

advantage of large-area CM suppression; and 4) continue PMA team structure and momentum for implementation and outreach of research-based IPM strategies.

Results: Aerosol puffers appear to be the most economically feasible pheromone application method in walnuts, especially over large acreage and multiple years. Other dispensing methods continue to be investigated to decrease cost or increase application ease. Outreach and training are ongoing in the use of the "combo lure" (chemical lure plus pheromone) to more accurately monitor CM activity in or near orchards with pheromone mating disruption.

Impacts and Potential Impacts: Adoption of CM puffer use increased from 3,000 acres in 2008 to 10,000 acres in 2009. With 243,000 acres of walnuts in California using more than 350,000 pounds of cholinesterase-inhibiting pesticides in 2007, the PMD program is a valuable alternative in the drive to reduce reliance on these pesticides. Management of CM with conventional pesticides generally requires three to five applications for control over the whole season. But each acre managing CM with PMD may need only one or even zero sprays of insecticide. An acre under PMD could potentially remove 2 pounds of chlorpyrifos and 3 pounds of azinphos-methyl from the total pesticide load in the soil and water. The aerosol puffer demonstrations in 2009, covering more than 2,000 acres, potentially reduced chlorpyrifos use by 4,000 pounds and azinphos-methyl use by 6,000 pounds. When the walnut industry fully implements a pheromone-based system, broad-spectrum pesticide use could potentially be reduced by 60–75%. A major goal of this project was to validate IPM strategies that are economically realistic as well as effective. Pest management methods used in this project can be replicated by walnut growers in any location without the need of external funding.

Development of an IPM Program for Arthropod Pests of Cool-Season Grass Hay Crops

PIs: Larry Godfrey, University of California, Davis; Douglas Walsh, Washington State University



(Photo by Holly Furguson, Washington State University-Prosser)

Summary: Hay from cool-season grasses, chiefly timothy (*Phleum pratense*), is an important crop in several western states. Timothy is highly valued for export and as

feed for horses, and marketing is based largely on visual appearance. In recent years, grass thrips and mites have caused severe damage to timothy. Thrips damage is very obvious in bales of green hay. The long-term availability of methidathion (an organophosphate), used for thrips and mite control, is unclear. Many growers use four to seven applications of malathion (another organophosphate) to manage thrips. With increased timothy acreage and market demands, the desire for organophosphate alternatives, and the crop's increasing importance to local agricultural economies, the need for and scrutiny of sound IPM practices have increased. Project objectives were to 1) investigate population dynamics and basic biology of key arthropod pests of cool-season grass crops in California, Washington, and Nevada; 2) investigate pest density-yield loss relationships, developing economic thresholds and evaluating pesticide application costs; and 3) study the applicability of selected nonchemical control measures for these pests.

Results: Project data were used to design a baseline IPM program for major arthropod pests of cool-season grass crops. Arising in part from this project, one insecticide (cyfluthrin) for thrips control and one acaricide (bifenazate) for mite control were registered and made available for growers. Limited data were developed on yield loss relationships for mites, but they appear to detrimentally affect stand persistence and yield. Thrips populations were not clearly associated with timothy yield losses but were clearly associated with hay quality and commodity prices. A hybrid economic injury level is being developed for thrips on timothy that takes into account the pest's impact on hay quality. Dormant period burning of timothy produced inconclusive effects on thrips populations. Cyfluthrin significantly flared spider mite populations when applied to second cutting hay and will need to be used carefully to mitigate this problem.

Impacts and Potential Impacts: Bifenazate and cyfluthrin will replace the currently used organophosphate insecticides. Labeling for these two products limits application to once per season in each timothy field, which places added emphasis on monitoring and waiting to treat only when populations reach economic loss levels. These products offer increased selectivity, reduced hazards to the environment, and decreased toxicity to mammals. As a result of this project's studies and presentations, stakeholders have better knowledge of the timothy agro-ecosystem and better understanding of how to protect hay quality for maximum marketability. They also have a better grasp of proper identification and monitoring of pests and beneficial arthropods, use of IPM strategies, and benefits of using reduced-risk compounds that pose less harm to beneficial

populations. In addition, nonchemical methods developed in this project can help reduce the reliance on insecticides and acaricides for IPM in timothy.

Development of Cultivar Resistance to *Iris Yellow Spot Virus* and Thrips in Bulb Onion Grown in the Western United States

PIs: Howard Schwartz, Whitney Cranshaw, and Michael Bartolo, Colorado State University



(Photo by Howard Schwartz)

Summary: *Iris yellow spot virus* (IYSV) and its onion thrips vector (*Thrips tabaci*) are immediate and serious threats to sustainable and profitable onion production in the western United States. Onion growers in the West have relied exclusively on high-risk insecticides for thrips management. Use of these insecticides has increased, leading to increased resistance in thrips populations and little effective reduction in IYSV incidence or severity. Optimizing onion cultivar tolerance to thrips feeding injury could be critical to long-term management of onion thrips, especially if it were combined with resistance to IYSV. There had been no studies to identify thrips damage tolerance levels among existing onion cultivars, so investigators proposed to screen a collection of cultivars for relative tolerance to thrips feeding. Using this information, existing onion cultivars could be categorized for relative risk of yield loss from onion thrips.

The project's overall goal was to accelerate identification and establishment of host plant resistance in management of thrips and IYSV in onions. Specific objectives were to: 1) develop methods to identify onion cultivars with resistance to thrips and establish the nature of this resistance, 2) develop methods to identify onion cultivars with resistance to IYSV, and 3) disseminate this information to breeders who could then incorporate resistance to thrips and IYSV into breeding lines, and to growers for selection of less susceptible cultivars.

Results: Ranking of onion varietal responses to IYSV and thrips in Colorado revealed that certain entries (e.g., varieties or germplasm) were less affected by thrips and disease than most other replicated entries. Varietal information on less susceptible materials was shared with onion breeders and IPM personnel.

Impacts and Potential Impacts: This preliminary information has been successfully used to a) educate growers and the onion industry about the potential for identification of less susceptible onion varieties and germplasm via controlled research projects, b) adopt standardized evaluation protocols to evaluate variable onion cultivars and germplasm for reactions to these pests, and c) pursue continuing and expanded grant opportunities. (Two subsequent grants were secured to continue this research.) Potential impacts of this project include successful identification and release of onion cultivars and germplasm less susceptible to thrips and IYSV, provision of reliable criteria for onion breeders to select less susceptible parents, and improved breeding lines for future crosses and more successful varietal releases. Less susceptible varieties should require fewer pesticide applications, thereby reducing pesticide exposure and potential health threats to applicators, growers, and consumers. Fewer pesticide applications will reduce economic costs for growers, contribute to the long-term sustainability of onion production in the western United States, and reduce potential negative impacts on environmental resources including water, soil, and wildlife. In addition, IPM personnel will be able to incorporate less susceptible breeding lines and cultivars into other IPM strategies being developed to further reduce losses from thrips and IYSV.

Improving Potato Tuberworm Management with Cultural Practices

PIs: Sylvia Rondon and George Clough, Oregon State University



(Photo by Sylvia Rondon)

Summary: Potato tuberworm (PTW), *Phthorimaea operculella* (Zeller) (Lepidoptera: Gelechiidae), is one of the most important potato pests worldwide. The western states produce nearly two-thirds of the potatoes grown in the United States. PTW was detected in damaging numbers in Oregon in 2002. It is now well established in Oregon and Washington, and in 2005 was confirmed in Idaho, the nation's largest potato producing state. PTW larvae infest tubers, rendering them unmarketable. (There is zero tolerance for live PTW in fresh and processed potatoes.) Because PTW is a relatively new pest in this region, information was needed on cultural control practices in order to develop and implement effective recommendations. This project proposed to

Impacts: Special Issues

comprehensively study the control of PTW through cultural practices. Previous work demonstrated that the most critical time to control PTW is at and following vine-kill, and that leaving tubers in the field can result in serious PTW infestation. Project objectives were to 1) determine the effects of cultural management practices on PTW damage: planting depth/irrigation, covering hills (not conducted due to plots being lost to purple top disease), and desiccation/chemical application after vine-kill; and 2) communicate and disseminate information about this pest to the industry.

Results: The project's planting depth/irrigation trial evaluated the relationship of planting depth and soil moisture during the growing season to foliar and tuber damage caused by PTW. The study showed that a 10% increase in irrigation reduces tuber damage compared to low and normal irrigation. Planting depth may also significantly affect tuber damage. In the project's studies on desiccation/chemical application after vine-kill, there were significant differences among different desiccants with regard to tuber damage and mines per plant, but the number of larvae was not affected. Previous data had demonstrated that mechanical defoliation 1 week prior to harvest resulted in increased tuber infestation, as did delaying harvest for 2 to 4 weeks. Tuber infestation did not increase with chemical desiccation, which caused rapid vine death. The data from these trials support field observations that the most critical time for controlling PTW tuber damage begins at vine-kill, and that the rate of vine-dying is not an important factor.

Impacts and Potential Impacts: As a result of this project it is expected that growers will adopt more effective pest control practices and that there will be a significant decrease in insecticide use for PTW. At the beginning of this research and educational effort, economic losses on a per-field basis due to PTW ranged from 25% to 100%. Using 2006 data, this would mean that farmer losses amounted to \$3.45 million in gross sales. So in the near future this project could conservatively be worth \$1 million in savings to Oregon potato growers alone. Information on PTW and results of the research were disseminated through extension and scientific presentations, trade journal articles, and numerous interactions with growers and other members of the potato industry. This grant served as seed money to obtain additional funding for upcoming related projects, including a new research project that will add a resistance component to the IPM PTW package.

See the Western IPM Center Web site, <http://www.wripmc.org>, for further details about objectives, progress, and outcomes of WIPMC-funded projects.

Special Issues Projects Yield Results

The Western IPM Center has an ongoing call for proposals to address special IPM issues in the West. Special issues funding may be requested to convene groups of people to address emerging issues such as new pests or environmental concerns, to develop proposals for larger grants based on documented stakeholder needs, or to develop Pest Alerts. The Western IPM Center has recently funded several projects under this program. The impacts of two of these small grants (up to \$5,000 each) are summarized below:

Biodiversity Working for Farmers Tour

A tour conducted on three ecologically-rich farms in Oregon's Willamette Valley brought regional policy makers, conservationists, and industry personnel together with farmers and researchers to highlight the importance of agricultural biodiversity. Tour leaders led discussions on impacts of on-farm biodiversity, which include increased native pollinator populations, biological pest management, farm resiliency to environmental degradation, and regional contributions to local agricultural sustainability. Participants agreed on the need for increased communication to identify new policy opportunities to support conservation and promotion of on-farm biodiversity and to fund the participatory research and technological development that supports its implementation on a regional level. Shortly after this event, the tour was mentioned and had an important impact in Congressional testimony on pending food safety legislation.

(Photo by Steven Riley, Oregon Department of Agriculture)



School Integrated Pest Management—A Change Agent Practicum

Through classroom instruction and on-site inspection and evaluation of a school facility, the 2-day practicum, held in Denver, Colorado, informed state and tribal officials (community "change agents") about pest management strategies in schools. Participants gained knowledge to support and promote implementation of IPM in their own state or tribe and to facilitate partnering with in-state and regional IPM experts. Seventy percent of the practicum's participants indicated they would change their current practices as a result of attending the event, and 100% said they would like to attend more advanced training on school IPM.

See the final reports for these projects at <http://www.wripmc.org/centerprojects/specialprojects.html>.

Addressing Western IPM Issues

Newly Funded Projects

The Western IPM Center funded three "Addressing Western IPM Issues" projects, totaling \$113,335 in the fall of 2008.

The projects:

- Invasive Plant Inventory and Survey Methods for Land Managers: A Web Seminar Series
Principal Investigators: Elizabeth Galli-Noble and Mary McFadzen, Montana State University
- Integrating Biological Control and Targeted Sheep Grazing to Suppress Spotted Knapweed
PIs: Jeffrey Mosley and Rachel Frost, Montana State University
- Biology of the Walnut Twig Beetle (*Pityophthorus juglandis*) and the fungus *Geosmithia* Associated with Walnut Mortality in the Western United States
PIs: Ned Tisserat, Whitney Cranshaw, and William Jacobi, Colorado State University; Steven Seybold, USDA Forest Service; C. Reed Funk, Improving Perennial Plants for Food and Bioenergy

(Photo by Rick Melnicoe)



Further information is online at <http://www.wripmc.org>.

Collaborations

Western Region Sustainable Agriculture Research and Education Subregional Conferences

The Western IPM Center has maintained a close relationship with the Western Sustainable Agriculture Research and Education program (Western SARE). The two programs cover the same states and territories and greatly benefit from collaboration. Rick Melnicoe is a member of the Western SARE Administrative Council, and Phil Rasmussen (Western SARE Coordinator) is a member of the WIPMC Advisory and Steering Committees.

Western SARE has held a series of subregional conferences to showcase the first 20 years of accomplishments and to ask for guidance on where they should be headed during the next 20 years. Rick has attended four of the six conferences and plans to attend the final conference in March 2010.

Invent participants to these conferences include farmers, ranchers, and a broad cross-section of other stakeholders, such as extension personnel, nongovernment organizations, and land-grant universities. The desired outcomes are 1) to identify and prioritize emerging and

unmet research and education needs in sustainable food, fiber, and energy systems; and 2) to increase stakeholder and policymaker awareness of the accomplishments of the Western SARE program and its projects. In the medium and long

term, outcomes will include more producers having knowledge and skills that enable them to adopt and profit from sustainable farming and ranching approaches.

Western SARE will use the stakeholder input to develop a plan to achieve greater integration among its Research and Education, Professional Development, and Farmer/Rancher grant programs and to implement ways to close the gap between research results and delivering this information in the West.

Attendees at each conference are asked to consider these questions:

1. What will be needed to create stronger local food systems that are less reliant on imports from elsewhere?
2. What are the local and regional consumption and production trends in your area?
3. The SARE program was commissioned, by Congress, to get its research results to the farmer and rancher. Why has this been a success or failure in your specific subregion?
4. What types of research, education, and development projects will be needed over the next 10 years to help economically sustain farming and ranching and the environment?
5. If Western SARE received (from Congress) an additional \$1 million per region, what types of projects should be targeted or emphasized?
6. How can we (Western SARE) overcome barriers that may prevent underserved groups, including socially disadvantaged groups, from applying for and receiving SARE funding?

The WIPMC recognizes the significance of stakeholder input in developing these priorities. As such, those priorities that require further research or extension may be eligible for funding by WIPMC grants programs. Our RFAs now include a link to the Western SARE subregional priorities as evidence of documented stakeholder need. Western SARE has released targeted RFAs immediately after each conference to address subregional needs and is incorporating other needs into its annual RFAs.

Western Region IPM and Water Quality

Linda Herbst, Associate Director of the WIPMC, is a member of the IPM/Water Quality Planning Committee for a one-day Symposium during the Pacific Branch Entomology Society Meeting on April 13, 2010 in Boise, Idaho. This effort is the culmination of a 2-year collaboration among the Regional Water Quality Programs, IPM Coordinators, and the Western IPM Center. This Symposium will feature a keynote speaker from USDA–National Institute of Food and Agriculture as well as a variety of IPM, water quality, and social science experts from around the western region. It will also feature small group discussions to determine emerging



(Photo by Rick Melnicoe)

issues and potential joint projects. Small groups will help to determine outputs, desired outcomes, and potential impacts of new projects and explore possible funding opportunities. The objective of this effort is to bring researchers and extension personnel working in IPM and Water Quality together to foster collaborative projects.

National IPM Evaluation Group (NIPMEG) Subcommittee

NIPMEG's National IPM Evaluation Subcommittee has developed a Web site that is home to 16 IPM Logic Models. These models were developed by the subcommittee and peer reviewed by many IPM Coordinators, researchers, and other specialists. The models are an IPM planning and evaluation tool, using as examples the objectives stated in the National Roadmap for IPM. This is the culmination of a huge effort involving participation by Regional EPA Strategic Agricultural Initiative Programs, USEPA, Regional IPM Centers, USDA–NIFA, USDA National Sustainable Agriculture Research and Education Program, and American Farmland Trust. The logic models are referenced by USDA in many of their competitive grant Requests for Applications. There have been three video conferencing workshops to assist people in the use of logic models and how to utilize the information found on the Web site. The models can be found at <http://www.ipm.gov>.

Legume ipmPIPE

Legume *ipmPIPE* (Pest Information Platform for Extension and Education) is built on the same platform as the soybean rust *ipmPIPE*. Using the same principles of monitoring and reporting, both systems enhance the role of extension specialists in IPM by providing near-real-time access to observations, model output, pest management information, and diagnostic images at <http://legume.ipmPIPE.org>.

Specialists can customize information for clientele using built-in communication tools. Diagnostic cards are continually being developed to provide growers, consultants, and extension specialists with high quality, easy-to-carry information on key pests of legumes. Educators and stakeholders can easily obtain information on pathogens and pests identified in a specific area or general region and track seasonal development of these pests.

WIPMC Collaborations with Western Region IPM Coordinators

The WIPMC works closely with state IPM Coordinators in the West to provide programmatic and informational support. Tom Holtzer, WIPMC Co-Director, is the administrative advisor for WERA-069 (a multistate project coordinating IPM research and extension/educational programs for the western states and Pacific Basin Territories), helping to link the two projects. WIPMC leadership participates in WERA-069 meetings, providing updates on regional and national IPM issues. The WIPMC routinely provides notifications of funding opportunities and guidance in grant applications. Grants support IPM activities through work groups and other projects. We also provide letters of support for grant applications and help identify potential collaborators for specific projects. The WIPMC home Web page maintains links to state IPM Web sites.

WIPMC Joins Collaboration on Use of Green Manures for Biofumigation in Potato Production

A 2009 project that reduced the use of synthetic fumigants in potato production in Idaho using green manures as biofumigants showed the power of many different groups of varying sizes working together and leveraging funds. Collaborators in this project included the Western IPM Center; Potato Growers of Idaho; Region 10 EPA; Northwest Coalition for Alternatives to Pesticides (NCAP); Shoshone-Bannock Tribes and Tribal Land Use Department; Natural Resources Conservation Service (NRCS); Kurt Cates, NRCS; Amalgamated Sugar Company LLC; Three Rivers Resource Conservation and Development Program (RC&D); Paula Jones, Three Rivers RC&D; Pacific Northwest Regional Water Program; University of Idaho (UI); Danielle Gunn, UI Extension; and John Taberna, Jr., Western Ag Research. A poster describing the project's issues, outcomes, and impacts can be viewed at <http://www.wripmc.org>.

(Photo by Ron Daires, Western SARE)



Work Groups

Western IPM Center Sponsors Eight Work Groups

In 2009, Western IPM Center funding supported eight issue-based work groups involving:

- Crop pest losses and impact assessment in Arizona and California cotton, melons, and other crops
Principal Investigator: Al Fournier, University of Arizona, fournier@ag.arizona.edu
- Western region school IPM implementation and assessment
PI: Dawn Gouge, University of Arizona, dhgouge@ag.arizona.edu
- Technical work group that discusses and refines standards and protocols for the collection, analysis, and Web delivery of weather data for IPM purposes
PI: Walt Mahaffee, Oregon State University, mahaffew@science.oregonstate.edu
- Pacific Northwest coalition that collaborates on a multitude of issues
PI: Catherine Daniels, Washington State University, cdaniels@wsu.edu
- Connecting invasive plant centers across the United States to focus on invasive plants in natural areas
PI: Elizabeth Galli-Noble, Montana State University, elizabeth.gallinoble@montana.edu
- Functional agricultural biodiversity group that focuses on conservation biological control
PI: Gwendolyn Ellen, Oregon State University, gwendolyn@science.oregonstate.edu
- Increasing regional communication to improve orchard spray application efficiency
PI: Franz Niederholzer, University of California, fniederholzer@ucdavis.edu
- Snail and slug management in ornamental crop production
PI: Cheryl Wilen, University of California, cawilen@ucdavis.edu

(Photo by Rick Melnicoe)



Center Staff



Rick Melnicoe

Rick Melnicoe, active in pest management issues for more than 30 years, serves as the director of the Western IPM Center (WIPMC), headquartered at Meyer Hall, University of California, Davis.

Co-director is entomologist Tom Holtzer, department head of Bioagricultural Sciences and Pest Management at Colorado State University, Fort Collins, and associate director is Linda Herbst of UC Davis. Diane Clarke of UC Davis serves as writer/editor.



Tom Holtzer

The WIPMC enhances communication between federal and state IPM programs in the western United States: Alaska, Arizona, California, Colorado, Hawaii and the Pacific territories, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

The WIPMC serves as an IPM information source, designed to quickly respond to information needs of the public and private sectors.

Contracted WIPMC staff includes regional comment coordinators located throughout the region and an IPM regional grants manager.



Linda Herbst



Diane Clarke



Leveraging

Competitive grants provided through the Western IPM Center yield data and results that have then been used in acquiring additional funding for the advancement of IPM in production agriculture; residential, urban, and institutional settings; research and extension programs; natural resource and wildland spaces; and public areas throughout the United States. Since 2004, Western IPM Center funding has resulted in at least \$11 million in leveraged funds, representing a \$2 return for each \$1 awarded.

Pest Management Strategic Plans (PMSPs) and Crop Profiles

PMSPs and Crop Profiles funded by the WIPMC have yielded more than \$2 million in leveraged funding through WIPMC's Addressing Western IPM Issues program, the Oregon Raspberry and Blackberry Commission, and the USDA–National Institute of Food and Agriculture (USDA–NIFA) Crops at Risk program and Regional IPM Program (Western Region).

Work Groups

Leveraged funds resulting from WIPMC-funded work groups have totaled more than \$8 million via the Western Sustainable Agriculture Research and Education program (WSARE), the Southwest Consortium on Plant Genetics and Water Resources, USDA's National Resources Conservation Service, WIPMC's Addressing Western IPM Issues program, and USDA–NIFA's Specialty Crop Research Initiative program, National Extension Integrated Pest Management Special Projects program, Agriculture and Food Research Initiative program, Regional IPM Program (Western Region), Risk Avoidance and Mitigation Program, and Specialty Crop Research Initiatives program.

Special Projects

WIPMC funding in the Special Projects grants program has leveraged more than \$500,000 through USEPA Region 10, the Washington Specialty Crop Block Grant program, WIPMC's Addressing Western IPM Issues program, and USDA–NIFA's Regional IPM Program (Western Region).

Work Group Impacts

Invasive Plants in Natural Areas: Connecting Regional Centers across the United States

A 2-day meeting of six regional invasive plant centers was held in Indianapolis in January to consider establishment of a national network of organizations focusing on invasive terrestrial and aquatic plants in non-crop areas. The hypothesis was that working together these organizations could offer more comprehensive services more efficiently. Facilitated by the Center for Invasive Plant Management (Montana State University), the meeting provided a forum to explore ideas about how to build an efficient information-sharing network and possibly collaborate on multi-regional or national projects. As a result of the meeting, the National Network of Invasive Plant Centers (NNIPC) was formed, a Web site was established (www.invasiveplantcenters.org), and monthly conference calls are being held. The NNIPC has written several grant proposals to fund projects that the partners agreed were high priorities nationally. Project topics have included early detection and rapid response/mapping, cooperative weed management areas, economics of invasive plants, and education. The NNIPC allows streamlined access to information about 297 cooperative weed management areas nationwide (used by at least one federal agency to help prioritize projects).

Additional potential impacts include decreased redundancy (and therefore costs) in services provided by regional centers; aggregation and synthesis of invasive-plant-related data, potentially including IPM

approaches and results; increased training opportunities; increased communication and technology transfer among scientists and natural resource managers nationwide; increased networking among centers, institutions, nongovernmental organizations, and agencies involved in invasive plant management to enhance efficiencies and capitalize on existing resources; and coordinated, streamlined access to information and resources for natural resource managers nationwide. The NNIPC will continue to pursue funding to build its capacity as an organization and to aggregate and synthesize regional information and programs for the benefit of national resource managers, educators, and policy-makers nationwide.

IPM for Spanish-Speaking Landscape Workers

The number of Spanish-speaking landscape workers in the western region continues to rise as the Hispanic population increases and the green industry grows. Language and cultural barriers can hamper the ability of Spanish-speaking landscape workers to learn about IPM, environmental protection, and personal safety in their use of pesticides. The work group's goal was to coordinate the development of an IPM curriculum for these workers. The 10-member work group was comprised of stakeholders in six states in the western region and included university specialists, state Department of Agriculture staff, and landscape industry personnel. This targeted education was expected to result in fewer unnecessary pesticide applications, reduced potential pesticide exposure for both workers and the public, and decreased impact on the environment from pesticides.

Twenty-two Spanish-speaking landscape workers representing seven landscape companies participated in the two-day pilot workshop in Seattle. In a facilitated discussion at the end of the training, attendees stated that they had learned a lot about IPM, including pest identification, in the hands-on training. They commented that they would 'view their jobs differently now,' that they would think more about the problems, and try to get the problems identified. They were excited about the training



(Photo by Rick Melnicoe)

opportunity and wanted to know when there would be more classes in the future.

All of the training materials developed for the pilot training are available and can be requested from the work group members. (Contact Rebecca Maguire Hines, hinesre@wsu.edu.) Many of the presentations and activities contain more information than may be pertinent to a particular training location or audience. The material is provided for the trainers to use and modify as they see fit for their particular training, with credit given to the original authors of the training materials.

Snail and Slug Work Group Yields Additional Funding

Research needs and goals identified in early 2009 by the WIPMC-funded Snail and Slug Management in Ornamental Crop Production work group have contributed to additional funding. One of the research needs identified by the group was development of safe, effective pre- and post-harvest drench treatments for eggs of slugs and snails infesting potted plants. The Western IPM Center has awarded \$70,000 for a project that will focus on controlling slug and snail eggs in the growth medium of potted plants using emulsions of essential oils in pre- and post-harvest drenches. The two-year project, which will involve researchers in Hawaii and California, will test a variety of essential oils and their components to determine which chemicals provide the best control. Anticipated impacts include provision of an additional tool for controlling slug and snail problems, reduction in the number of molluscicide treatments necessary to completely rid plants of infestation, reduction in costs, reduction in the number of shipment rejections, and applicability to all states in the Western Region.

Visit <http://www.wripmc.org> for further information about WIPMC-funded work groups.

(Photo by Les Mehrhoff, University of Connecticut)



Western
IPM
Center

For more information on the Western Integrated Pest Management Center, see

<http://www.wripmc.org>

Rick Melnicoe
Director
(530) 754-8378
rsmelnicoe@ucdavis.edu

Tom Holtzer
Co-Director
(970) 491-5843
thomas.holtzer@colostate.edu

The Western IPM Center is headquartered at:

4249 Meyer Hall
University of California
One Shields Avenue
Davis, CA 95616
Phone: (530) 754-8378
Fax: (530) 754-8379

Linda Herbst
Associate Director
(530) 752-7010
llherbst@ucdavis.edu

Diane Clarke
Writer
(530) 752-7011
dmclarke@ucdavis.edu