

The Future of Urban IPM

By Dawn H. Gouge, University of Arizona, and Tim Stock, Oregon State University

Impacts of Urban Pests and Pest Management

Urban pests and pest management practices have important impacts on human health and urban environments. But urban IPM has historically received less attention than IPM in agriculture, and there has been far less coordinated effort toward wide-scale implementation.

Despite the fact that the world's urban population accounts for more than half of the total population, the percentage of land occupied by urban areas is only about 3% (Balk & Yetman, 2004). Such intense urban agglomeration results in profound environmental impacts. An expanding suburbia increases the urban/wildlife interface—and the resulting conflicts. Recent developments in pest-borne diseases like West Nile virus in the United States and Lyme disease in Europe and the United States indicate the ongoing need to address urban pests to maintain public and environmental health.

Pests and pest control practices impact human health directly in numerous ways. The following are just a few examples of the issues that impact our schools, homes, hospitals, and other urban environments.

Head Lice. There are six to 12 million cases of head lice (*Pediculosis capitis*) in the United States each year, most commonly among children 3 to 12 years of age (Burgess, 2004). Although head lice do not vector disease organisms, symptoms include itching, sleeplessness, and secondary skin infections. Head lice cases can result in extreme anxiety, embarrassment, and unnecessary absences from school. Millions of dollars are spent on remedies annually, and infestations can lead to repeated pesticide exposure. Prescription options include lindane and malathion treatments. But lindane in

particular has generated significant pesticide poisoning incidents, (FDA, 2003) and some states (e.g., California and New York) have passed bills to prevent the sale of these products (State of New York, 2007). Statistically, the safer pesticide options are pyrethrins and pyrethrum, but these products also pose risks.

Pyrethrins and Pyrethroids. Pyrethrins and pyrethroids are commonly-used indoor pesticides currently under USEPA review for reregistration. An analysis of USEPA data by the Center for Public Integrity shows that the number of reported human health problems associated with pyrethroid and pyrethrin use in the United States has increased by about 300 percent over the past decade (The Center for Public Integrity, 2008). A review of a decade of data indicates more than 90,000 reports of adverse reactions to pesticides filed with USEPA by pesticide manufacturers. In 2007, pyrethrins and pyrethroids accounted for more than 26 percent of all fatal, "major," and "moderate" human incidents in the United States. Fortunately, there are other indoor pest control options that could greatly reduce reliance on these chemicals and that are major components of an IPM program.

Asthma. The worldwide rates of asthma have been increasing in recent decades, especially in developed countries. The World Health Organization reports that the number of asthmatics in the United States has leapt by more than 60 percent since the early 1980s. Asthma is one of the leading causes of school absenteeism. There are known genetic factors that predispose people to the development of asthma, but many studies suggest that environmental factors are also key elements causing the increase in disease incidence (Institute of Medicine, 2000). Urbanization appears to be correlated with



Dawn H. Gouge, University of Arizona

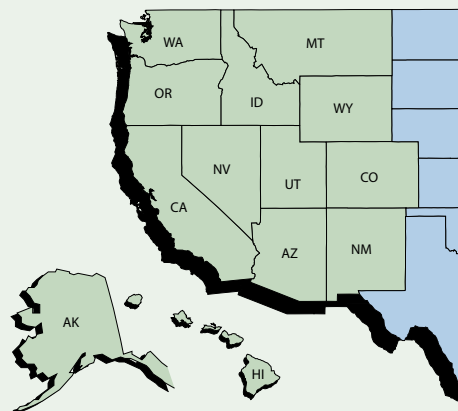
Bark scorpions are a serious pest in some schools. Children under seven who are stung require emergency medical intervention.

the increase. Asthma triggers that tend to be elevated in the city include dust mites, cockroach allergens, and high indoor pesticide levels. All can be powerful irritants and may lead to a fatal attack in asthma sufferers (Rosenstreich et al., 1997). Effective and safe German cockroach (*Blattella germanica*) management is well established, yet misuse and abuse of over-the-counter pesticides is common. Pesticides applied as foggers, bombs, and aerosols generally have the smallest particle size and thus are the most readily inhaled (National Research Council). While there are many other factors that can contribute to asthma, these triggers related to pest management can be greatly reduced through IPM approaches.

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Center Scope

The Western IPM Center 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. It serves as an IPM information network, designed to quickly respond to information needs of the public and private sectors.



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Director's Comments

While I was speaking with a potential grant applicant recently, it dawned on me that the Western IPM Center has done a remarkable job of creating a suite of funding opportunities. Our ongoing "Special Projects" grants address emerging topics that need immediate attention from experts and interested people. These one-time grants of up to \$5000 assist in getting people together to begin addressing a problem. The "Work Groups" projects are a logical next step to address important pest management issues and communicate to a wider audience. Many work groups develop collaborative proposals for research and extension grants. Funding up to \$10,000 per year may be requested for up to two years. Finally, the "Addressing Western IPM Issues" grants fund those important IPM issues in the West that are identified by our stakeholders and may be developed by our work groups. We also manage the Regional IPM Grants program for USDA-CSREES. All of our funding programs rely upon stakeholder input about IPM needs in research, extension, outreach, and on regulatory issues. Through initiatives such as Pest Management Strategic Plans (PMSPs), work groups, information networks, and special projects, we are able to identify these needs and seek funding sources.

It has been gratifying to see the increased interest in our programs. During the first few years of the Center's existence, we did not receive many applications for the various grant programs. Unfortunately, some of those that were received did not meet standards that could be funded. Now we are receiving many more applications, from a wide variety of entities, that are of very high importance and quality. Our latest RFA for

"Work Groups" had nine applications, only one of which is a renewal. The "Addressing Western IPM Issues" RFA had 18 applications. Now if we only had more available funding . . .

The West has been involved in the Pest Information Platform for Extension and Education (PIPE). This program started with the pending and subsequent appearance of Asian soybean rust in the United States. It provides a system to monitor and report disease progress during the growing season. This information helps growers know whether or not they need to take action. It has saved millions of dollars in unneeded pesticide applications. However, Asian soybean rust is not a problem in the West. We started monitoring several years ago to make sure it is not progressing to the West. Now we have expanded the program to include relevant diseases of legumes for this region. This program is the *legumePIPE*, and it is providing near real-time information on diseases of importance to legume producers. Funding has been provided by the USDA Risk Management Agency (RMA), but starting next season, the RMA funding will no longer be available. Efforts are under way to secure other sources of funding. Visit the following Web sites for details about these programs: <http://sbr.ipmpipe.org/cgi-bin/sbr/public.cgi> and <http://legume.ipmpipe.org/cgi-bin/sbr/public.cgi>.

As you read through this newsletter, please notice that we have focused on state issues. *The Western Front* is a good avenue for providing updates on what is happening in the West. Our many partners should be proud of the work that is occurring in their states.

Rick Melnicoe

State Brief

PMSPs

During the past year the staff of the Hawai'i Pest Management and Regulatory Information and Notification Network (HIPMRINN) has worked on Pest Management Strategic Plans (PMSPs) that covered a wide range of pest management scenarios: a food crop (papaya), a specialty beverage crop (coffee), and an ornamental maintenance environment (turfgrass). Each of the PMSPs represented aspects of the complex and dynamic pest management situations found in Hawai'i.

Papaya: The PMSP for papaya production was completed this summer (<http://www.ipmcenters.org/pmosp/pdf/HIPapayaPMSP.pdf>). Papaya growers are facing three emerging pest management issues: papaya mealybug; a newly-reported thrips that was previously reported in Malaysia; and Internal Yellows of ripe fruit, an emerging food safety concern. **Coffee:** The Hawai'i Farm Bureau Federation provided support for a coffee PMSP, which is in progress. A pest management priority for coffee growers is control of green scale, which is complicated. Green scale is part of a complex community of organisms that includes sooty mold disease; ants, which protect the scales from natural enemies; and white halo fungus, which is beneficial and must be considered when growers choose tactics for disease control. Coffee growers are vigilant and are attempting to be proactive about another potential threat: the possible introduction of the coffee rust fungus. This disease was at first confined to Southeast Asia and Southwest Africa, but because rust spores can survive wind dissemination, and due to heavy international traffic, the fungus has spread rapidly and is now found in all coffee growing areas worldwide—except Hawaii. In areas where it occurs, the disease has resulted in expensive control measures including eradication attempts, fungicide spray programs, and resistance breeding. **Turfgrass:** After a difficult start and a second workshop, the turfgrass PMSP is making progress. This is our first inter-"state" PMSP involving Guam. In addition to planning for alternative methods to control grassy weeds after the likely cancellation of MSMA, turf managers identified worker education as a high priority. Already, work on a pest identification manual has begun, and potential partnerships for training turf and landscape workers who are non-native speakers of English have been formed. Next year, we are looking forward to teaming up with the University of Guam once again to produce a PMSP for cucurbit crops.

HAWAII and the American Pacific

Emerging Pests and Other Issues

Some emerging pests and other issues have the potential to impact a wide range of sites. The little fire ant, a relatively newly identified (1999) pest in Hawai'i, is a serious agricultural nuisance because it stings workers. In general, ants pose serious threats to native species, which evolved in the absence of ants. There is no native ant species in Hawai'i. The range of the little fire ant has been increasing on Hawai'i Island, which is home to most of the state's coffee and papaya farms. Research and education about the little fire ant is particularly important to coffee growers because of the protective role ants can play for green scale. The varroa mite is essentially ubiquitous on O'ahu, and some of its effects will be documented in the cucurbit PMSP.

The Secretary of Agriculture has declared Hawai'i Island (the "Big Island"), home to much of Hawai'i's agriculture, to be a natural disaster area due to gaseous emissions from volcanic eruptions. On Guam, a rapid increase of construction activity due to the transfer of military personnel from Okinawa is likely to bring new pests to the island. New pests are also likely to enter Hawai'i via construction equipment returning from Guam.

Pesticide Label Changes

Communication with federal regulators remains important to Hawai'i's growers and other pest managers in the American Pacific. Even with the close of reregistration, we have been in contact with the USDA's Office of Pest Management Policy regarding impending label changes to some pesticides, notably malathion. Despite its well-known problems, malathion maintains a large role in insect management, in particular in the nonstate entities of the American Pacific, because there are so few other legal insecticides available. In Hawai'i, there are a few growers who are dependent on soil fumigants (other than Telone). These growers are currently considering the ramifications of label changes announced recently in the Reregistration Eligibility Decision (RED) for the metam-sodium products. We anticipate responding to USEPA about the feasibility of implementation of these label changes by our growers. For further information contact Cathy Tarutani, University of Hawaii, at cathy@hpirs.stjohn.hawaii.edu.

Urban IPM—from page 1

Surface Water Contamination. Many municipalities report widespread contamination of surface waters due to urban pesticide applications (Heavner, 1999). Many urban areas draw their drinking water from surface sources, and concerns about the environmental fate and long-term health effects of pesticides have led city and government groups to pursue less chemically-intensive management practices.

The Effects of Global Travel. In the last few decades we have witnessed important changes in ecology, climate, and human behavior that favor the development of urban pests. One of the more obvious examples is the increase in global travel. Transient humans bring hitchhikers such as bed bugs (*Cimex lectularius*). Many hotel corporations have rigorous policies and procedures, and even some school districts have initiated bed bug policies as these blood-feeding insects occur in school facilities (bedbugger.com).

Urban IPM to the Fore

Recently, there have been significant efforts to identify urban IPM priorities, improve communication, and coordinate activities, with the aim of achieving widespread implementation of urban IPM. The most significant of these efforts has been focused on school systems. In 2007, USEPA and USDA collaborated to



Alex Latchiminsky

Sticky trap at a school with a significant mouse population. Dead mice attract flesh flies and blow flies, which larviposit or lay eggs on the mouse cadavers.

support a national team of IPM experts as they created a Pest Management Strategic Plan (PMSP) for school IPM (Green & Gouge, 2008). University faculty, state and federal regulators, pest management professionals, school administrators, and advocacy agencies participated in the construction of a document detailing pest management practices, identifying research and education priorities, and offering a blueprint for implementation of high-level IPM in all schools nationwide by 2015.

Solutions identified in the PMSP address the need for legal action, education, institutional capacity-building, and research at national and local levels. The conclusions drawn are based on the currently available evidence, but the PMSP should be applied not only in our existing school systems. It should also remain a living document, changing constantly to reflect emerging issues and the advance of science and industry.



Jerry Jochimi, Monroe County Community School District, Indiana

Ants find a sticky treat after a soda pop mop-up at a school.

In 2008, several states have initiated or expanded USEPA-funded school IPM implementation efforts (e.g., Utah and Colorado). In the past year, all four Regional IPM Centers have funded a regional school IPM work group. These work groups focus on improving the status of school IPM implementation in their regions, but they also communicate and share resources across regions. In addition, university faculty are now able to join the newly-formed Urban IPM Research and Extension Coordinating Committee (WDC13). This committee will bring together research and extension faculty engaged in a wide range of urban IPM programs with the goal of sharing broader areas of knowledge that will benefit everyone.

Members of the Western Region School IPM Implementation and Assessment Work Group (<http://cals.arizona.edu/apmc/westernschoolIPM.html>) have participated in a western regional needs assessment process. Some also participated in the creation of the national PMSP. We have strategized and piloted implementation projects, built coalitions of school IPM advocates, and formed partnerships with a growing national network of experts. We publish journal articles, extension publications, newspaper articles, and white papers (Stock, 2007). In October we are holding a regional “change agent” school IPM practicum. The term “change agent” is used to identify individuals or groups of people who are capable of and responsible for implementing change in a society or system. The essence of the practicum is to draw regional change agents together with regional IPM experts to conduct an IPM inspection of a school. Typically, such inspections reveal pest-conducive conditions, illicit pesticides, and evidence of pest infestations. The practicum participants will use the School IPM PMSP as a resource to create an IPM plan for the site. It’s a little like an open book exam, but one we hope they will remember when they return to their own communities and jobs. Practicum participants will be contacted three months after the practicum and interviewed to measure subsequent impacts.

The overarching goal of all entities involved in urban IPM should be the provision of solutions that will better protect public health by implementing improved pest and pest-related-disease management using approaches supportive of healthy living. Sound simple? In fact simplicity has to be at the heart of communities adopting any innovation, or it’s likely not to

be adopted at all. Strong coordination and effective communication nationally are critically important. The IPM Institute of North America (<http://www.ipminstitute.org/>) is the logical leader for the national effort, and if funds allow, national coordination will flow from the Institute to the established network of practitioners and stakeholders.

Learning From Agriculture

Perhaps we can look to agricultural IPM programs to get ideas on how to accelerate urban IPM adoption. In 2002 the European Commission declared that the use of pesticides in the European Union (EU) must be sustainable. European Community member states have to create the necessary conditions for implementing IPM in agriculture, which becomes mandatory as of 2014. Pesticide residues are critical indicators understood by EU consumers. Each year the European Commission proposes a number of surveys, usually of fruits and vegetables, to be carried out by all member states. The results are widely publicized, and there is much interest.

Increasing numbers of consumers in Europe are exercising the precautionary approach and selecting zero pesticide residue options (Pesticide Action Network UK, 2007). Cropping systems are adapting to consumer demands faster than the laws currently require. But without something similar to the infrastructure of the EU plan and resulting publication of empirical data, it is unlikely that the U.S. public would be so engaged. We might consider whether the determination of allergen levels in schools, homes, etc., along with pesticide residue analysis of dust samples, might generate similar empirical data in U.S. urban systems. An informed public can then choose the standards they determine to be acceptable.

Full bibliographical information for this article is available in the online version of this newsletter (<http://www.wripmc.org/newsletter/index.html>). For further information about WDC13 or other IPM in schools topics discussed here, contact Dawn Gouge, dhgouge@ag.arizona.edu, or Tim Stock, stockt@science.oregonstate.edu.

Article dedicated to John Jackman (1948–2008), an entomologist who spent each day improving the life of others.



Dawn H. Gouge, University of Arizona

Bee hive in an irrigation valve box at a school.

PROFILE

Al Fournier

IPM Program Manager and Associate Director, Arizona Pest Management Center

Al Fournier, IPM Program Manager and Associate Director at the Arizona Pest Management Center, University of Arizona, is involved in many activities either sponsored by or related to the Western IPM Center. Since May 2005, he has coordinated responses to USDA and USEPA information requests for Arizona, New Mexico, Nevada, and the lower desert regions of California through the WIPMC-funded Arid Southwest IPM Network. He has been a member of the WIPMC Advisory Committee since 2006. Al is a co-PI for two WIPMC-funded work groups: the Crop Insect Losses and Impact Assessment Work Group, which documents crop pest losses and pesticide use in key low desert crops in Arizona and California through face-to-face user surveys, and the Western Region School IPM Implementation and Assessment Work Group, which promotes collaboration and sharing of resources and information among school IPM programs in the Western Region. Al has been instrumental in the planning and development of several PMSPs, including desert turfgrass, desert cotton, and school IPM. As well, Al is a PI for a Regional IPM (RIPM) Competitive Grant focusing on measuring the adoption of cross-commodity IPM guidelines in Arizona. And Al served on the panel of reviewers for the Regional IPM Centers mid-term review in 2006. About his involvement and relationship with the WIPMC, he says, "I work hard to be a bridge between the WIPMC and our local contacts (university faculty and other stakeholders in Arizona). I try to be a two-way communications conduit."

Al feels that the WIPMC has helped to advance IPM in Arizona by providing a foundation for what he and his colleagues do at the Arizona Pest Management Center (APMC). "I really think the WIPMC is a kind of organizing and motivating force for people. You can call Rick or Linda about any question or any problem," he said. And he feels that the WIPMC has been pivotal for receiving other funding. "Without the foundational support we've had through the WIPMC, I honestly don't believe we would have been successful in securing some of these other grants," he said. In 2006, the APMC played a key role in securing a 4-year, \$2.5 million USDA-CSREES RAMP grant to develop and implement reduced-risk lygus management strategies in western cropping systems, a project headed by Dr. Peter Ellsworth with 12 other co-PIs in Texas, New Mexico, and California. The APMC has provided assistance and support to faculty that have helped the Center secure a number of other significant grants as well.

Al's position of "IPM Program Manager" was created in 2005 to provide organizational structure and support for all of the APMC's programs. Where faculty focus on development and delivery of specific IPM programs, Al provides support for needs assessment and program evaluation. The APMC (1) engages with University of Arizona (UA) faculty, partner organizations, clientele, and other interested stakeholders to identify pest management needs and priorities and to promote partnerships that address them; (2) identifies and secures funding to support research and outreach programs to address pest management needs; (3) evaluates and improves IPM programs and assesses their impact on end-users and the environment; and (4) enhances communication among all IPM stakeholders, including UA faculty, state partners, clientele groups, the WIPMC, and federal IPM programs.

In response to Arizona stakeholder input, a recent issue the APMC has been working on is organizing a strategic planning session for noxious weed management. Weed management in Arizona has historically been locally organized, more or less at the county level. Al has worked with other UA faculty to build bridges among different groups that address noxious and invasive weed problems. He is collaborating with Kim McReynolds, Area Natural Resources Agent, to form a multi-state work group to develop an approach to noxious weeds on a broader geographic scale.

Another challenge that has come to the fore via stakeholder input is the need for basic pesticide applicator training in the context of limited



Al Fournier

state funding. In 2006, Al brought together a group of faculty and stakeholders to document pesticide applicator training needs in Arizona, and the APMC has worked to organize solutions, distributing limited resources to county faculty to address local training needs.

Al is excited that he has reached a stage in his work at the APMC where he is drawing more upon his research skills. His Ph.D. work at Purdue University was in the adoption and implementation of IPM in schools. He conducted a state-wide survey and developed in-depth case studies of school district programs, using interviews, observations, document analysis, and IPM inspections—the kind of qualitative analysis that helps in understanding why people do what they do. He enjoys being able to bring his research skills into play in understanding adoption of IPM in other systems. He's currently doing interviews with pest control advisers (PCAs) to understand adoption in cross-commodity IPM. Al said, "Getting the human side of the picture is what I get excited

about." He feels it is important to understand the real contexts in which people are being asked to adopt IPM. "For example," he said, "when you go into a school, it's a social system. They have ways of communicating, a chain of command, and individual perceptions and priorities that affect how an IPM program gets implemented."

Another current project is the revision of Arizona's Pest Control Adviser manual, a training manual for PCAs that is linked to their licensing. At least a dozen faculty are involved in writing the manual, which will incorporate IPM and Integrated Crop Management, and Al is coordinating all of this. He says, "So much of what I do is organizing and coordinating. I enjoy it. I like bringing people together, identifying problems, and brainstorming solutions."

Asked what he sees as the biggest current challenge to IPM implementation in Arizona, Al said, "Number one would have to be resources, because we have a big state. We're losing people. There are gaps in expertise. There are things that we don't successfully address on a statewide level, because we don't have a person to do it."

Regarding future directions for the APMC, Al said, "We are developing new tools and resources to better assess the impacts of our IPM programs." Part of this involves the development of an Arizona pesticide use reporting database that can provide insights into adoption of specific technologies and IPM recommendations. "If we can better document the impacts of our programs on real people, using both quantitative and qualitative research tools, we can help people understand the value of IPM in their lives. I believe this is essential to the future of IPM in Arizona and everywhere. And this is one of the things the APMC is focused on doing—something that individual faculty could not easily do on their own." When asked about the future of Cooperative Extension, Al commented, "I think there's always an important role for face-to-face contact with people. I'd really like to see us do more of the old-fashioned extension than we've sometimes been able to accomplish." He added, "I think it's really important to get out in front of people." He wants to do everything possible to increase the APMC's role as the "go-to" resource for people. "Keeping that connection with our clientele and stakeholders is really important. How to accomplish that is more complicated," he said, again citing the shortage of personnel working on the issues. "What would really help us to move strongly into the future would be more feet on the ground, literally," he said.

Al was born and grew up in Royal Oak, Michigan, a suburb of Detroit. He holds a Bachelor of Science in biology from George Washington University, a Master of Science in entomology from the University of Maryland, and a Ph.D. in entomology from Purdue University. Contact Al at fournier@cals.arizona.edu, and visit the APMC Web site at <http://cals.arizona.edu/apmc/index.html>.

New Turf IPM Advisory Offered by Utah State University Specialists

Dr. Kelly Kopp, Extension Water Conservation and Turfgrass Specialist, and the UTAH PESTS staff, are offering a new IPM advisory subscription service. The Turf IPM Advisory will be sent on a periodic basis, depending on pest activity and turf management needs. The goal of the advisory is to alert homeowners and the green industry of pest activity and seasonal maintenance. To subscribe to the new advisory, go to <http://lists.usu.edu/mailman/listinfo/pestadvisory-turf>, or <http://utahpests.usu.edu/ipm>.

Red Fire Bugs Are the Next Nuisance in Utah

By Erin Hodgson, Extension Entomology Specialist, Utah State University

Earlier this spring, an observant citizen in the Sugarhouse area of Salt Lake City noticed brightly colored insects in his backyard. He questioned Christy Bills, Entomology Collections Manager at the Utah Museum of Natural History, about these bugs. She had never seen them before and therefore took specimens to the Utah Department of Agriculture and Food for a positive identification. In May 2008, they were confirmed as *Pyrrhocoris apterus* (Heteroptera: Pyrrhocoridae) by Tom Henry, a national specialist at USDA-APHIS. *Pyrrhocoris apterus*, also known as the red fire bug, was not known to occur in North America until now. Because the red fire bug is a new record in North America, much of the life history is unknown and must be extrapolated from European publications. Red fire bugs are native to central Europe, but are also found in western Siberia, southwestern Mongolia, India, and northwestern China. In their native range, red fire bugs feed on seeds from a wide range of plants. Like all true bugs, they have a piercing sucking stylet that removes fluid. The most common host plant family is Malvaceae, which includes mallow and linden. Some cannibalism and predation on other insects have also been reported. As with all true bugs, red fire bugs go through simple metamorphosis (egg, nymph, adult). Typically they have one generation per year, and the adults are the overwintering life stage.

So far, no one can explain how the red fire bugs were introduced into the Salt Lake City area, but it is likely they were brought in on host plant material. These bugs have similar behaviors to boxelder bugs in that they like to congregate under leaf litter or sun themselves on structures. The red fire bug is not expected to become a significant economic problem, but it will probably be considered another nuisance pest for homeowners. If you suspect red fire bugs in your area, please collect specimens or take pictures for the Utah Plant Pest Diagnostic Laboratory. We would greatly appreciate knowing more about the distribution in Utah and other observations you may have about this new insect. For more detailed information, go to <http://extension.usu.edu/files/publications/factsheet/red-fire-bug08.pdf> for the red fire bugs fact sheet. For further information, contact Erin Hodgson at erin@biology.usu.edu.

UC Statewide IPM Program Director Search

After months of delays, interviews were held for a new UC IPM Program Director during September and early October. We are awaiting word on who is the successful candidate and when he will begin.

New Rulings on VOC Emissions

Under a federal district court order, the California Department of Pesticide Regulation (DPR) adopted regulations in January, to control volatile organic compound (VOC) emissions from field fumigations. On August 20, the Ninth Circuit Court of Appeals reversed the federal district court action, finding it had no jurisdiction to issue its order. This ruling provides an opportunity to approach DPR's complex clean air mandates in a more thoughtful, thorough way. However, it should not be interpreted as a complete reversal of state air policy for pesticides. As a followup to the court ruling, DPR has filed, and the Office of Administrative Law has approved, the regulation to phase in pesticide VOC reductions for Ventura County. This regulation is in effect immediately. DPR has instructed the Ventura Agricultural Commissioner to begin issuing revised fumigant allowances to growers, consistent with the amended regulations (DPR e-mail, September 5).

Symposium of Agricultural Research and Extension Held

In June, the University of California cosponsored a "Symposium of Agricultural Research and Extension." This event was well attended by commodity organizations, federal partners, and university personnel. Dr. Gale Buchanan, Under Secretary for Research, Education, and Economics at USDA, provided commentary on four challenges facing agriculture: achieving sustainable energy, understanding global climate change, water availability and quality, and food security and food safety.

Nearly all of the speakers discussed the huge benefits that have come from investments in agricultural research, especially at the Land-Grant Universities. However, declining funding is hampering efforts to sustain these agricultural gains. The new Farm Bill provides opportunities for specialty crops that are important to California. For further information, contact Rick Melnicoe at rsmelnicoe@ucdavis.edu.

PMSP Update

New in 2008:

- **Christmas Trees (Oregon and Washington):** Workshop planned in 2009

Revised in 2008:

- **Citrus (California):** Workshop held March, 2008
- **Winegrape (California):** Workshop held May, 2008
- **Caneberry (Oregon and Washington):** Workshop planned fall, 2008
- **Nectarine (California)**
- **Peach (California)**
- **Plum (California)**

Ongoing:

- **Organic Potato (California, Oregon, Washington, Idaho, and Colorado):** In final editing stage
- **IPM in Schools (United States):** Out for final review August, 2008
- **Desert Turf (Arizona, Nevada, and Southeastern California):** Workshop held July, 2008
- **Turf (Hawaii):** Followup workshop held July, 2008
- **Coffee (Hawaii):** Workshop held April, 2007
- **Low Desert Cotton (Arizona and Southeastern California):** Workshop held April, 2007
- **Grass Seed (Idaho, Oregon, and Washington):** Workshop held February, 2007

Completed:

- **Hops (Washington, Oregon, and Idaho):** Completed July, 2008
- **Papaya (Hawaii):** Completed June, 2008

See completed PMSPs on the National IPM Center's Web site at <http://www.ipmcenters.org/pmisp/index.cfm>.



Western IPM Center-Funded Project Yields IPM Contracting Tool Kit

By Jennifer Krebs, San Francisco Estuary Project

EcoWise Certified's new IPM Contracting Tool Kit for public agencies and businesses provides a one-stop, step-by-step resource for developing a structural IPM program or contracting for IPM services. The Tool Kit covers elements to include in an IPM policy, outlines roles and responsibilities, and details how to hire IPM service providers. The Tool Kit also includes the EcoWise IPM Process, sample IPM policies, and key resources from established programs, from San Francisco to Boston. The Tool Kit was funded by a Western IPM Center "Addressing Western IPM Issues" grant and was developed by EcoWise Certified, the Bio-Integral Resource Center, and the Urban Pesticide Pollution Prevention Program. EcoWise Certified is an independent, third-party IPM certification program. Find the Tool Kit at www.ecowisecertified.org/toolkit, or call (866) 858-6386 for more information.



State Briefs

New School IPM Work Group

The Colorado Department of Agriculture and Colorado State University have formed a School IPM work group. The goal of the work group is to increase adoption of school IPM in Colorado. The work group has received funding from EPA Region 8 to conduct a two-year pilot implementation project in three schools in a Colorado school district. For further information, contact Sandra McDonald, Environmental and Pesticide Education Specialist, Colorado State University, at sandra.mcdonald@colostate.edu.

Arizona Pest Management Center Hires Database Specialist for Pesticide Data Project

By Al Fournier, Program Manager and Associate Director, Arizona Pest Management Center

Quantitative data on pesticide use is one of the most valuable tools available for evaluating the adoption and impact of our IPM programs and recommendations. The Arizona Pest Management Center has recently hired a database specialist, Richard Farmer, who will be working with us to develop 18 years worth of Arizona Pesticide Use Reporting (PUR) records into a functional database for research, education, and evaluation purposes. Although Arizona does not have a 100% use reporting requirement, many types of applications are reported, by law, to the Arizona Department of Agriculture (ADA), including all custom and aerial applications, which represent a high proportion of applications for certain crops and pests. University or Arizona faculty members spearheading this project are Al Fournier, Peter Ellsworth, Yves Carrière, John Palumbo, and Russ Tronstad. We have partnered with the ADA and other local stakeholders to form an advisory committee that will provide input on database development.

The many potential uses of these data include improved IPM program evaluation, identification of pest management needs and priorities, and improved responses to federal information requests. These quantitative data are also complementary to economic and yield-loss data collected through Pest Control Advisor (PCA) surveys as part of our Crop Pest Losses and Impact Assessment Work Group. When combined, these data provide powerful tools for assessing changes in our major cropping systems. These data may particularly benefit the specialty crops industry, since Arizona is a major national production center for winter lettuce, melons, broccoli, vegetable seed crops, and other vegetable crops. In the future, we hope to integrate other data sources with the PUR data to further enhance the research capacity of the database. This could include integration of GIS maps, economic data such as crop values, and data on genetically modified crops or organic production. Access to these data may provide opportunities for growers to exploit new markets and address burgeoning trends in consumer preferences by helping them to more quickly transition to alternative production practices, such as organic or transgenic production. For further information, contact Al Fournier at fournier@cals.arizona.edu.

Expanding IPM Web Page

The Washington State University (WSU) Extension IPM Web site (<http://ipm.wsu.edu/>) is continuing to add new sections, such as Seed Crops. An issues-based team with members in entomology, plant pathology, and weed science, as well as county educators and a communications specialist, organized in 2007 for the purpose of protecting and enhancing the seed industries of Washington State. Reports, articles, presentations, and databases relevant to seed crop issues are all brought together, forming a library of resources for clientele.

Pesticide Notification Network

The Pesticide Notification Network (PNN) is a grant-funded partnership between the Washington State Commission on Pesticide Registration and the WSU-based Washington State Pest Management Resource Service. The purpose of the PNN (<http://ext.wsu.edu/pnn/>) is to inform Washington State pesticide users of registration and label changes for products of interest to agriculture. The system does this by distributing information via email to commodity groups/commissions, growers and grower groups, Extension personnel, and others involved in Washington State's diverse agriculture. In 2007, more than 31,000 email notices were distributed to more than 270 subscribers. The same information is also available on the Web page, in both list and searchable form. Average monthly traffic on the Web page exceeded 8,300 in 2007. In the 10 years the PNN has been in operation, it has steadily grown in popularity and is now considered a primary information tool for Washington growers. For further information, contact Catherine Daniels, Pesticide Coordinator, Washington State Pest Management Resource Service, Washington State University, Puyallup, at cdaniels@wsu.edu.

Outreach

WIPMC Information Network:

- Received 7574 “hits” on Web site since inception
- Web site is considered the pesticides information resource for Alaska
- Responded to Pacific Northwest Comment Coordinator Jane Thomas on five pesticide issues
- 2008 State Vegetable Conference: EPA/Vegetable Pesticides Update Presentation
- 2008 State Potato Conference: EPA/Potato Pesticides Update Presentation

WIPMC Center-funded (half-time) Alaska Pest Management Program Assistant, Janice Chumley:

- Coordinated Five Local Invasive Weed “Weed Pulls”
- Presented WIPMC/Alaska Pest Management Program information booth at Greenhouse and Nursery Conference
- Presented WIPMC/IPM Program Information Booth at Ninilchik, Alaska State Fair, August 2007 and August 2008

State Crop Profile Revisions

2008

- Wheeler, R.A., T.R. Jahns, and J.I. Chumley. Trees as Crops in Alaska Profile. Western IPM Center, Alaska Pest Management Program, UAF-Cooperative Extension Service, University of Alaska Fairbanks, pp. 1–18.

2007

- Jahns, T.R. and J.I. Chumley. Alaska Potato Crop Profile. Western IPM Center, Alaska Pest Management Program, UAF-Cooperative Extension Service, University of Alaska Fairbanks, pp. 1–5.

- Jahns, T.R., R. Leiner, and J. Chumley. Alaska Mixed Vegetable Crop Profile. Western IPM Center, Alaska Pest Management Program, UAF-Cooperative Extension Service, University of Alaska Fairbanks, pp. 1–8.
- Quarberg, D.M. and T.R. Jahns (Editor). Alaska Cereal Grains Crop Profile. Western IPM Center, Alaska Pest Management Program, UAF-Cooperative Extension Service, University of Alaska Fairbanks, pp. 1–8.
- Quarberg, D.M. and T.R. Jahns (Editor). Alaska Perennial Forage Crop Profile. Western IPM Center, Alaska Pest Management Program, UAF-Cooperative Extension Service, University of Alaska Fairbanks, pp. 1–6.

Regional PMSP Development

- Pest Management Strategic Plan for Non-Rangeland Forages (excluding Alfalfa) in the Western States: Lead Author (2007)
- Pest Management Strategic Plan for Pacific Northwest Potato Production—Revision: Lead Editor for Alaska Section (2007)

Supporting Activities

- Alaska State IR-4 State Liaison Representative (SLR): FY 2007–2008 (through May 30, 2008)
- WERA-069 Chair: FY 2007–2008
- WERA-069 Annual Meeting Host, Fairbanks, Alaska: Spring 2008
- WIPMC/PNW Work Group Meeting Participant: Corvallis, OR: Spring 2008

For further information, contact Thomas R. Jahns, Program Coordinator (fftrj@uaf.edu), and Janice Chumley, Program Assistant (rnjic@uaf.edu), Alaska Pest Management Program.

Alaska Invasive Plant Educational Outreach

By Janice Chumley, Program Assistant, Alaska Pest Management Program

The Kenai Peninsula in Alaska is fortunate not to be overrun with invasive plants that threaten much of the lower 48 states. In order to help prevent further infestations, “Cooperative Weed Pulls” have been a great way to educate folks while removing unwanted plants. Partnerships among the University of Alaska Fairbanks Cooperative Extension Service, Soil and Water Conservation Districts, Kenai National Wildlife Refuge, Kenaitze Indian Tribe, Kenai Watershed Forum, and a local bookstore have recruited weed warriors from the Master Gardener Program, local garden clubs, high schools and elementary schools, and concerned citizens for numerous weed identification workshops and pull parties throughout this growing season.

Bird vetch (*Vicia cracca*) and narrowleaf hawksbeard (*Crepis tectorum*) have been targeted, and plants have been removed from the Kenai National Wildlife Refuge in two areas near the Kenai River and surrounding watersheds. In addition, roadside infestations of narrowleaf hawkweed (*Hieracium umbellatum*) have been greatly reduced through educational outreach and pulling. On one pull, we removed 35 bags of this aggressive spreader! More citizens are becoming aware that Alaska is not immune to invasion by problem plants and that while they are

pretty, the problems they present need to be addressed while still small enough to control. The pull parties may not remove all the unwanted plants, but they are a great way to educate, inform, and hopefully change thinking to help keep our state the beautiful place it is. Contact Janice Chumley at rnjic@uaf.edu.



Janice Chumley

Cooperative Weed Pull earlier this year to pull hawkweed.

WIPMC Sponsors Discussion on Standardizing Resistance Management

The Western Integrated Pest Management Center recently sponsored a conference call involving directors of several IPM programs across the United States on the topic of resistance management. Clive Kaiser, Oregon State University, proposed that reporting and adoption of insecticide, fungicide, and herbicide resistance management be standardized across the United States, and this proposal was unanimously accepted. Most of such efforts until now have been piecemeal, and usually either state- or region-specific. To date, there is no overall policy or recommendation regarding which system to adopt, though several of these regional and state publications have used the global Insecticide Resistance Action Committee (IRAC), Fungicide Resistance Action Committee (FRAC), and Herbicide Resistance Action Committee (HRAC) classification systems. Others have used the Weed Science Society of America (WSSA) classification system. But non-mainstream, organic, and some other chemistries used in agriculture in the United States generally are not dealt with in the IRAC and FRAC classification systems. Conference call participants proposed that the IRAC, FRAC, and WSSA classification systems be adopted but tailored to the United States. In addition, participants suggested that for ease of standardization, the color codes adopted for chemistries used in some mid-Atlantic states be adopted for the entire country. Finally, participants proposed that WERA-060 be approached to adopt and disseminate this policy and to encourage standardization across the country.

Organic Potato PMSP

The University of Idaho has partnered with the Northwest Coalition for Alternatives to Pesticides (NCAP) to develop an Organic Potato PMSP. The document has been reviewed by the Organic Potato PMSP work group and revised based upon their comments. It is currently in the editing phase and will be released shortly. University of Idaho Center staff, along with Jennifer Miller, NCAP, have worked over the past two years and held two work group meetings to complete this PMSP. Because it is the first organic PMSP to be developed, a different approach was used. There is a long introductory section describing the foundation practices for organic potatoes. Since each pest is not managed in isolation and pest management is viewed more holistically with a cropping system approach, the PMSP is organized by pest type instead of by crop stage. All factors affecting pest management are discussed, and tables containing many cultural practices are listed in the appendices. The PMSP covers the states of California, Colorado, Idaho, Oregon, and Washington. Two NCAP organic potato field tours are scheduled in Idaho this fall. The farmers who head the operations to be toured both participated in the PMSP workshops.

OnePlan IPM Planner

The OnePlan IPM Planner is moving forward. The Idaho group working on the prototype is Dee Carlson, Idaho Natural Resources Conservation Service (NRCS) Water Quality Specialist; Wayne Newbill, Idaho Association of Soil Conservation Districts; and Steve Reddy, Jerry Neufeld, and Ronda Hirnyck, University of Idaho Extension educators. The team has just completed development of a pesticide application recordkeeping (PAR) component for the OnePlan. We worked with a small group of local growers to be sure we included farmers' needs. The PAR allows growers to keep site-specific records about pesticide applications and worker protection safety information, and it helps them with pesticide resistance management.

Potato Scouting Manual, Homeowner Pesticide Information Online, Water Quality Collaboration

The IPM Potato Scouting Manual in Spanish and English, written by Lisa Downey-Blecker, Ronda Hirnyck, Wayne Jones, and Juan Alvarez, is currently being printed. Copies should be available for distribution in late October. The University of Idaho (UI) Pest Management Center is continuing collaborative efforts with University specialists to publish homeowner pesticide information for the UI Landscapes and Gardens Web site. The Center is also continuing the collaboration with the Region 10 Water Quality 406 program. For further information, contact Ronda Hirnyck, Extension Pesticide Coordinator, Idaho Pest Management Center, University of Idaho, at rhirnyck@uidaho.edu.

Mark Your Calendar**2008****November**

- 2008 Sustainable Ag Expo, November 13–14, Monterey, California.
<http://www.vineyardteam.org/events/agexpo.php>
- Entomological Society of America Annual Meeting, November 16–19, Reno, Nevada.
<http://www.entsoc.org/am/index.htm>
- National Schools Working Group Meeting, November 20, Reno, Nevada.
<http://www.2008schoolmeeting.com/>

December

- IR-4 Strategic Planning Conference, December 9–10, Crystal City, Virginia.
<http://ir4.rutgers.edu/StrategicPlanningConference/index.html>

2009**February**

- 2009 USDA-CSREES National Water Conference, February 8–12, St. Louis, Missouri.
<http://guest.cvent.com/EVENTS/Info/Summary.aspx?i=acc30817-0724-4300-87dc-7ea9b4f75ce9>

March

- Sixth International IPM Symposium, March 24–26, Portland, Oregon.
<http://www.ipmcenters.org/ipmsymposium09/>

For more information, see "Other News/Announcements" and "Funding Opportunities" on the WIPMC Web site.

Collaboration Proposed: Water Quality and IPM

Linda Herbst, Associate Director of the Western IPM Center, is working with other IPM specialists and regional Water Quality Program leaders to plan a future symposium on water quality and IPM.

The first two conference calls, with Reagan Waskom, Bob Maher, and Doug Walsh, have taken place, and there are plans to continue discussions next March at the IPM Symposium in Portland, OR, during the WERA-069 breakout session. The goal of that discussion is to begin working toward an IPM/Water Quality Regional Symposium in 2010 or 2011, preferably scheduled during another major meeting. The hope is to develop a subcommittee of IPM and Water Quality representatives to work on the agenda for the symposium. The major questions to be discussed are, What do IPM practices do to enhance water quality, and What does the water quality program do to complement IPM? What are the types of data or indicators the two fields collect or develop that show impacts on water quality?

The output from the symposium would be proceedings and a possible journal publication. Possible meeting sites suggested were Logan, UT, in 2010, or the Pacific Branch Entomology Meeting during the last week of March, 2010, in Boise, ID. For further information, contact Linda Herbst at llherbst@ucdavis.edu.

The Western Front is published three times a year by the Western Integrated Pest Management Center (WIPMC) at 4249 Meyer Hall, University of California, One Shields Ave., Davis, CA, 95616. The newsletter is available online at www.wripmc.org. The WIPMC is supported by a grant from USDA-CSREES.

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Acknowledgements:
Banner images: wheat field, Rick Melnicoe, WIPMC; Seattle skyscrapers, Denny Fleenor, Washington State University; and creek in foothills, Suzanne Paisley, ANR Communication Services.



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