Western IPM Center

The Western Front

NEWSLETTER OF THE WESTERN INTEGRATED PEST MANAGEMENT CENTER February 2009

Pyrethroids in California's Urban Creeks

By Dave Tamayo, Environmental Specialist, County of Sacramento Department of Water Resources

In California's urban areas, pyrethroid insecticides have replaced diazinon and chlorpyrifos not only in terms of market share, but also in causing widespread aquatic toxicity problems in urban waterways. In response, the California Department of Pesticide Regulation (CDPR) has initiated a formal reevaluation of pyrethroids (CDPR, 2006), and there is a significant level of interest in the impact of pyrethroids on the part of the State Water Resources Control Board (SWRCB), several Regional Water Quality Control Boards, and local wastewater and stormwater agencies.

The California Stormwater Quality Association (CASQA), a statewide association consisting primarily of local water agencies that are subject to stormwater permits, conducted a review of studies that have monitored pyrethroid chemical levels and pyrethroid toxicity in urban water bodies (CASQA, 2008). The review showed that toxic levels of pyrethroids and pyrethroid-associated toxicity have been found throughout California. The review focused on studies that excluded or isolated the effects of agricultural pyrethroid uses (Weston, 2006; Amweg 2005; Holmes, 2008). Detected pyrethroid concentrations, toxicity bioassays, and Toxicity Identification Evaluations (TIEs) have implicated pyrethroids as the cause of toxicity. (TIEs are a series of tests designed to identify the chemical or class of chemicals that has caused observed toxicity in an environmental sample).

Pyrethroids have a strong affinity for fine particles and organic material and have primarily been found in sediments rather than the water column (a conceptual column of water extending from the surface to the bottom sediments). Much of the observed toxicity associated with pyrethroids has been to the sediment-dwelling crustacean *Hyallela azteca*, a standard EPA toxicity test organism. Disturbingly, pyrethroid toxicity recently has been observed in the water column as well (Riverside County Flood Control District, 2008; County of San Diego, 2007). And toxicity is not limited to *Hyallela*. It has also been observed in other arthropod test organisms.

The use of pyrethroids in urban areas has recently increased, rising from 380,000 pounds of active ingredient in 2000 to 850,000 pounds in 2006 (CDPR, 2006; TDC Environmental, 2007). The most commonly applied pyrethroids in urban areas, as measured by pounds of active ingredient, are bifenthrin, cypermethrin, permethrin, and cyfluthrin. To account for differences in toxicity among various pyrethroids, it is helpful to use the concept of "permethrin equivalents." This concept relies on the fact that pyrethroids share a common toxic mechanism. LC_{50} (the concentration of a chemical that kills 50 percent of the test animals in a precribed amount of time) values for the different active ingredients are used to convert pounds applied into permethrin equivalents. For example, the toxicity of bifenthrin, based on an average of LC_{50} values from various studies, is 21 times the toxicity of permethrin. Thus, one pound of bifenthrin equals 21 pounds of permethrin equivalents. Using this method, bifenthrin and cypermethrin applications account for more than 80% of the permethrin equivalents applied in urban areas.

As the body of evidence of pyrethroid toxicity in California urban waters has grown, water quality agencies are faced with costly efforts to address the issue. Under the Federal Clean Water Act, section 303(d), when there is sufficient evidence that a "beneficial use" of a water body is impaired (such as by the presence of aquatic toxicity), the State Water Resources Control Board (SWRCB) must place it in on a list of impaired water bodies (often referred to as the "303(d) list"). Such listings often lead to additional regulatory actions, such as Total Maximum Daily Loads (TMDL), which allocate "allowable" amounts of pollutant discharge among various source categories, and National Pollutant Discharge Elimination System (NPDES) Permit requirements, which regulate point source pollution. Local agencies incur the costs for ongoing chemical and

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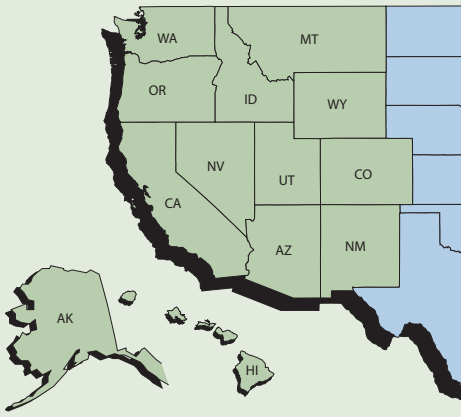
Erin Amweg, UC Berkeley

Urban drool.

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.



What's Inside

Director's Comments

The 2008 Farm Bill included a requirement that USDA change the way Smith-Lever 3(d) IPM funds are distributed to the states. Previously, these funds were allocated on a formula basis. Now they must be distributed on a competitive basis. Additionally, the Farm Bill broadened the eligibility for proposals to the 1890 Land Grant institutions. State IPM Coordinators and Extension and Experiment Station Directors were notified of this change less than two weeks before the end of the federal fiscal year. There are (were) many personnel attached to these funds, so this created much consternation. The Western IPM Center, while not directly affected by this change, hosted two conference calls with state IPM Coordinators to discuss concerns and reply to USDA. USDA held a listening session in Washington, D.C. on October 6 to hear stakeholder concerns and to hear responses to several questions they had asked stakeholders about how the new competitive program might be managed. Some western states provided testimony at the meeting, and others provided written comments afterwards. The Western IPM Center provided a letter outlining concerns about such a dramatic change and addressing each of the questions asked by USDA. The letter was a general consensus of western concerns, but did not necessarily represent each state's views on each issue. In summary, the letter stated that the RFA should be designed to support local IPM infrastructure, reward good programs, and encourage development of new initiatives and collaborations. It also stated that funding should initially be for a one- or two-year period and subsequently for 4 years at a time. The RFA was released on November 20, 2008 and incorporated most of the recommendations from the West. USDA fast-tracked the RFA for these funds and hopes monies can reach successful applicants by March. The long-term effects of this change are uncertain. Strong state programs will continue. But smaller programs may not, or they might be assisted by neighboring states. Uncertainty about future funding will make it difficult to maintain basic infrastructure.

Another change required in the Farm Bill is to broaden the eligibility of applicants for the 406 Integrated Activities programs. 1994 Land Grant institutions and Hispanic-serving agricultural colleges and universities are now eligible to compete for these funds. This change should increase participation of these institutions in traditional USDA programs. It is unclear if all existing grants will have to be re-competed prior to their end dates. If so, this means the Regional IPM Centers with current end dates of September 14, 2011 will have to resubmit for a new grant this year.

The WIPMC released two competitive RFAs last summer, one for "Addressing Western IPM Issues" grants and one for work groups. There were many excellent applications, and the Center funded those with the highest technical merit (see related article). Unfortunately, monetary limitations did not allow funding of all worthy projects. As one can see by the titles, the Center has provided funding to projects that meet western needs and that address basic goals of the National Roadmap for IPM.

Rick Melnicoe

Pyrethroids—*from page 1*

toxicity monitoring of multiple water bodies as well as for source control efforts to reduce pesticide use by the public and industry. Thus, local agencies, pre-empted by state law from regulating pesticide use, are nonetheless subject to liability for pesticide toxicity under the Clean Water Act. That liability includes possible enforcement actions (and fines) by the state, as well as third-party citizen suits that can result in large monetary settlements against the local agency. Since the pyrethroid toxicity data are recent, no 303(d) listings or TMDLs for urban pyrethroids have yet been established, but they are highly probable in the next few years as the regulatory agencies catch up.

Products that have the potential to replace pyrethroids in the structural pest control market are also of concern to California water agencies. Fipronil and carbaryl, for example, which have the potential to negatively impact water quality, have shown recent increases in reported uses for structural pest control (CDPR, 2006). Fipronil in particular is becoming increasingly popular among pest management professionals for argentine ant control (Rust, 2008; van Steenwyk, 2008), and limited data already show fipronil occurring in some urban water bodies (Oki, 2008).

Donald Weston, UC Berkeley

Regional Water Board staff sample an urban creek for the presence of pyrethroids.

The replacement of one toxicity problem for another, following a dramatic change in use patterns, highlights the need for the pesticide regulatory process to include consideration of the impact of likely replacement products. In addition, the USEPA Office of Pesticide Programs (OPP) should introduce a number of improvements to its evaluation of the potential water quality impacts of chemicals that are labeled for urban uses.

Analysis of pesticide use reports and pesticide sales data indicates that in 2006 approximately 97% of urban uses of pyrethroids in California were for structural applications (TDC Environmental, 2008). Other studies indicate that the majority of pyrethroid applications conducted by residents and by structural pest control operators in California are for argentine ant control (Flint, 2003; Sacramento County, 2006; Baker, 2007). The Urban Pest Management Working Group (UPMWG), an advisory group convened by CDPR, recognized the significant potential of perimeter sprays (a common method for ant control) to contribute to water quality problems, especially when applied to impervious surfaces. Recognizing that viable alternatives are available, its recommendations to CDPR included promotion of existing alternatives to perimeter sprays and working with industry to further develop practices to reduce pesticide runoff (CDPR, 2008). In California, stormwater agencies are among the strongest supporters of IPM outreach programs such as "Our Water Our World" and the University of California Statewide IPM Program's "Quick Tips." CDPR and the Structural Pest Control Board have funded research in this field (Klotz et al., 2008), and a workshop of ant researchers, funded by the Western IPM Center, was recently convened to identify additional research priorities for improving ant IPM practices (Rust, 2008).

Donald Weston, UC Berkeley

Sampling for pyrethroids.

Full bibliographical information for this article is on page 9 of this newsletter. Dave Tamayo can be contacted at **tamayod@saccounty.net**.

Alaska's Kids Are Extraordinary Weed Pullers

By Diane Claassen, Alaska Cooperative Extension Service

Diane Claassen

Schoolchildren (a.k.a. weed warriors) gather outside Creamer's Dairy for the big weed pull.

September 4, 2008 was an important date for Creamer's Field Migratory Waterfowl Refuge. On that day, an all-out attack was conducted to rid the sanctuary of aliens.

A total of 125 first and second graders converged on Creamer's Field with one goal in mind: kill vetch. Coordinated by Diane Claassen, an IPM technician from Alaska, and other parents, the troops were able to keep their focus on the aliens.

In the week prior to this event, Diane and Katie Villano visited the schools and instructed the first and second graders on what bird vetch (*Vicia cracca*) looks like and how it behaves. Much like getting to know the enemy, the classes watched and listened to a presentation and then worked with the vetch itself. They inspected the enemy with hand lenses and drew pictures of the flowers, seeds, and leaves. They also used words to describe the plant parts of the bird vetch. The class learned why alien, invasive plants like bird vetch are bad for Alaska. By the time the class was over, they knew everything they needed to know about their enemy.

Diane Claassen

"The kill" at the end of the 90-minute attack consisted of 157 bags of bird vetch, weighing in at a whopping 1,100 pounds. Way to go, kids!

This was an extremely successful event, with 157 bags of bird vetch pulled in 1-1/2 hours. The bags were weighed at the landfill, and the weight was 1,100 pounds! This is the largest known single weed pull in Fairbanks!

Needless to say, many adults were surprised to learn we have such an effective force against aliens in Fairbanks, Alaska! Congratulations to the weed warriors of Fairbanks!

Diane Claassen

A total of 125 weed warriors converged on Creamer's Field to attack bird vetch.

PMSP Update

New in 2009:

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

Ongoing:

- **Caneberry (Oregon and Washington):** Workshop held November, 2008
- **Citrus (California)**
- **Winegrape (California)**
- **Desert Turf (Arizona, Nevada, and Southeastern California)**
- **Turf (Hawaii)**
- **Coffee (Hawaii)**
- **Low Desert Cotton (Arizona and Southeastern California)**
- **Grass Seed (Idaho, Oregon, and Washington)**

Completed:

- **Organic Potato (California, Oregon, Washington, Idaho, and Colorado):** Completed November, 2008
- **IPM in Schools (United States):** Completed December, 2008

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

Western IPM Center 2008 Funded Projects

The Western IPM Center funded three "Addressing Western IPM Issues" grants and four work groups in 2008.

Addressing Western IPM Issues

Invasive Plant Inventory and Survey Methods for Land Managers: A Web Seminar Series
PI: Elizabeth Galli-Noble, Montana State University

Integrating Biological Control and Targeted Sheep Grazing to Suppress Spotted Knapweed
PI: Dr. Jeffrey Mosley, Montana State University

Biology and Host Range of the Walnut Twig Beetle (Pityophthorus juglandis) and Geosmithia Associated Black Walnut
PI: Dr. Ned Tisserat, Colorado State University

Work Groups

Increasing Regional Communication to Improve Orchard Spray Application Efficiency
PI: Dr. Franz Niederholzer, University of California

Invasive Plants in Natural Areas: Connecting Regional Centers Across the U.S.
PI: Elizabeth Galli-Noble, Montana State University

Snail and Slug Management in Ornamental Crop Production Work Group
PI: Cheryl Wilen, University of California

Western IPM Center Work Group on Weather Systems
PI: Dr. Walter Mahaffee, Oregon State University

Highlights of Western IPM Center 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.

Determination of Alternatives to Current Pesticides for Controlling Wireworms

Principal Investigators: Juan Alvarez, University of Idaho; Thomas Kuhar, Virginia Polytechnic Institute and State University

Juan Alvarez

Summary: Potato is the most important vegetable in the United States and the fourth most important world crop (after rice, wheat, and corn). Wireworms (Coleoptera: Elateridae), the immature stage of click beetles, are the most significant soil-dwelling pest of potatoes, feeding on potato seed pieces and burrowing into developing tubers. U.S. losses total millions of dollars annually. Growers depend on preventive soil insecticide treatments, using the few registered insecticides (all organophosphates or carbamates) with only moderate success. EPA, in the reregistration process, could eventually cancel the use of some or all of these insecticides on potatoes. The study's objectives were to (1) compare the efficacy and economic feasibility of new and non-registered insecticide chemistries with those of the currently used organophosphates; (2) optimize control strategies by determining the timing of wireworm peak activity and the feasibility of a novel baiting method to predict wireworm infestations and related tuber damage; and (3) disseminate research results to potato growers in the Pacific Northwest and mid-Atlantic regions.

Results: Researchers discovered that of all chemistries evaluated, fipronil, an insecticide not labeled for potatoes, consistently provided the lowest number of burrow holes per tuber and the lowest percentage of affected tubers. This confirmed results from previous efficacy trials conducted by the researchers. Because of these results, fipronil (Regent 4 SC) now has a supplemental label registered for in-furrow use for wireworm on potatoes. Researchers also determined that most tuber damage occurred after mid-June, indicating that insecticides are applied prematurely (at planting or preplant). This could be why insecticides used against wireworms have been only partially effective at reducing damage.

Impacts: Project results on the timing of peak wireworm activity could impact registration of new materials for wireworm control, will help chemical companies and growers determine the best application timing for new control measures, and will allow growers to know how long preplant chemicals need to last in the field to prevent damage. The registration of fipronil (Regent), which is more effective than currently registered insecticides, benefits all potato growers affected by this insect pest in the United States.

Effective IPM Strategies for Parks Maintenance Staff in the Pacific Northwest

P.I.s: Megan Kemple, Northwest Coalition for Alternatives to Pesticides; Tim Stock, Oregon State University

Samantha Chirillo, NCAP

Summary: In the Pacific Northwest, park landscapes are managed using a combination of cultural and chemical controls. Because of a growing public concern about the health and environmental effects of pesticides, including insecticides and herbicides, there is an increasing interest by parks maintenance staff to control weed and other pest problems without the use of pesticides. Innovative IPM techniques that do not involve the use of pesticides are being implemented by some parks maintenance staff in cities throughout the Pacific Northwest. When this project was developed there was no system for sharing information about effective IPM techniques among parks staff. In order to build upon the previous success of innovative parks departments in managing problem vegetation without herbicides, the project compiled and disseminated this existing information. The overall goal of the project was to reduce human health risks and environmental effects from pesticides used in parks. Specific objectives were to (1) have 30 parks maintenance staff from Oregon, Washington, Montana, and California identify their top weed control challenges and then choose five of the top challenges based on overlap and priorities; (2) identify and document at least 10 effective non-herbicidal IPM strategies employed by the collaborating parks maintenance staff that address these top five weed control challenges; and (3) distribute the collected practices and techniques to parks staff throughout the Pacific Northwest.

Results: Researchers compiled information about the non-herbicidal strategies and how they are implemented in a series of four reports entitled Effective Non-herbicidal Weed Control Strategies Implemented by Parks Staff in the Northwest, covering turf, tree wells, hardscapes and fence lines, and shrub beds and other landscaped areas. The reports were distributed to parks staff by mail, email, and downloadable PDFs. Oregon Recreation and Parks Association and California Parks and Recreation Society (CPRS) supported the project by publicizing the reports to their members. The strategies were also presented by the National Coalition for Alternatives to Pesticides (NCAP) and parks maintenance staff in a series of five trainings throughout Oregon. A total of 683 pest control operators, including approximately 164 parks staff, attended the trainings.

Impacts: Through this project, NCAP highlighted 63 effective non-herbicidal weed control strategies that are not yet widely adopted by parks staff. Training evaluations submitted by 37 parks staff showed that 84% of respondents gained knowledge about non-herbicidal weed control strategies, and 81% of respondents indicated they had the resources and information needed to implement these new strategies. Report evaluations submitted by 22 parks staff showed that 85% of respondents believed the information will be helpful in reducing

pesticide use in the parks they manage. Report evaluations also showed that 61% of parks staff who responded have implemented or intend to implement techniques they learned about in the reports. In addition to the non-herbicidal weed control strategies being implemented, the researchers have built a network of parks maintenance staff who can share resources with each other. This network was created through training sessions provided by parks staff as well as through their participation and collaboration in the reports NCAP published. Contact information for all parks departments involved in the reports was included in each report so that parks staff can easily connect with each other in the future. The connection with CPRS established during the project has resulted in a new collaborative partnership.

Best Practices for Local Government IPM Contracting Tool Kit

P.I.: Jennifer Krebs, San Francisco Estuary Project

Summary: The overall goal of the project was to develop and refine an IPM contracting tool kit for local governments wishing to implement structural IPM programs. The tool kit 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. Objectives were to (1) provide guidance for local governments on developing and implementing an IPM policy, (2) develop a primer on the IPM bid process, (3) offer guidance on appropriate language to use in contracting with qualified Pest Control Operators, (4) develop written guidance for IPM contracting, (5) provide guidance on local government responsibilities, (6) get Western IPM Center support of materials, (7) develop both Web and print versions of the materials, (8) conduct outreach to present the materials to stakeholders, and (9) evaluate the project.

Results: The new *EcoWise IPM Contracting Tool Kit for Developing a Structural IPM Program and Contracting for Structural IPM Services* was posted as a PDF file to the EcoWise Certified Web site (***http://ecowisecertified.org/toolkit/toolkit.pdf***) in June, 2008. Hard copies are also available. Emails were sent out to announce the materials. Recipients included local government staff, Regional Water Quality Control Board staff who oversee local government stormwater programs, EcoWise Certified providers, and others. Presentations about the tool kit were also made, with the goal of reaching at least 100 people by the end of 2008.

Impacts: The impacts of this Tool Kit will be improved knowledge of IPM by local government officials and an improved understanding of how to hire a contractor and what specifications the contractor should meet in order to truly implement IPM for the client. Contractors will need to meet these standards for their bids to be considered.

Wheat Seed Quality Effects on Competitive Ability with Wild Oat

P.I.s: Robert Stougaard and Qingwu Xue, Montana State University, Bozeman; Joe Yenish and John Burns, Washington State University, Pullman

Rick Mehnicoe

Summary: Wild oat management systems have evolved to the point that producers rely on herbicides to the virtual exclusion of all other strategies. While generally effective, herbicide use erodes profits and poses environmental concerns. Moreover, despite the intensive use of herbicides, wild oat populations continue to persist. Wild oat seed dormancy and variable herbicide efficacy contribute to this problem. However, this situation is worsened by the widespread occurrence of herbicide resistant biotypes. A strict reliance on herbicides for wild oat management has not been sufficient. Investigators have pursued development of integrated weed management systems that shift the focus to the crop rather than the weed and emphasize improving crop competitive ability. This project evaluates the interactive effects of seed size, protein content, and gibberellic acid (GA) seed treatments on spring wheat's ability to compete against wild oat. All three factors contribute to enhanced wheat emergence, seedling vigor, and developmental rates, and investigators hypothesize that their integration will enhance their individual attributes, stabilize their cumulative impact on wild oat, and provide for a more durable weed management system. Investigators will add suppressive rates of herbicides to enhance the cumulative effect on the weed. Specific project objectives are to (1) determine the interactive effects of seed size, protein content, and GA seed treatments on spring wheat competitive ability for the suppression of wild oat; and (2) determine to what extent seed quality factors influence the effects of variable tralkoxydim rates on wild oat control, wheat yield, and economic returns.

Interim Results: Improved spring wheat seed quality significantly increases crop competitive ability and weed control. Seed size appears to be the most important factor, having affected all of the early growth traits. Protein content also impacts crop competitive ability. However, the effect of seed protein may vary depending on soil nitrogen concentrations and wheat market class. With the exception of a slight GA effect on enhanced seedling emergence, GA treatments do not appear to measurably affect any early growth traits. Nonetheless, the 2008 percent control data indicate that herbicide efficacy improves as seed quality increases.

Impacts: Investigators concluded that wheat seed quality can be manipulated to favor the crop over the weed. The resultant improvement in competitive ability improves weed control, reducing yield losses and dockage penalties in the process. This technology correspondingly improves herbicide efficacy. In turn, this could reduce herbicide input costs and environmental contamination and could slow the development of herbicide resistance. If robust associations between these seed quality factors and competitive ability are realized, all three traits could ultimately be used to initiate a breeding program directed toward the development of competitive small grain varieties.

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IPM in Schools PMSP Issued

On January 7, *School IPM 2015: A Strategic Plan for Integrated Pest Management in Schools in the United States* was posted on the Regional Integrated Pest Management Centers national Web site. The Regional IPM Centers and USDA's Cooperative State Research, Education, and Extension Service (CSREES) funded the development of this document. The effort involved collaboration with USEPA, university specialists, national organizations representing school interests, private pest control experts, and many others. The PMSP provides guidance to those interested in implementing IPM practices in schools. More than two years in the making, the PMSP was created to reduce pest and pesticide-related hazards to children in U.S. public schools by 2015. Tom Green of the IPM Institute and Dawn Gouge of the University of Arizona were the project directors.

State Briefs

CALIF.

New Sustainable Ag Major at UC Davis

A growing student interest in sustainable food and farming systems that are good for people and the environment has led to new classes and development of a new major at UC Davis.

Sustainable food and agricultural systems that integrate environmental health, economic profitability, and social and economic fairness are becoming universally recognized as the direction society must go, according to UC Davis researchers implementing the new major.

Starting this year, new freshman-level courses in food systems and sustainable agriculture and an upper-division course in agroecology, the study of the ecology of the entire food system, are being offered.

The new major is expected to be approved within the next 18 months. It is a collaborative effort by the UC Davis Agricultural Sustainability Institute and affiliated faculty and staff, and will provide students with a broad background in sustainable agricultural and food systems, according to Institute director Tom Tomich.

"The skills and knowledge gained through this broad, interdisciplinary curriculum will prepare graduating students to become leaders in sustainable agriculture in California and throughout the nation," said Tomich.

Will Horwath, professor of soil science, is chair of the sustainable agriculture major implementation committee.

While a formal major in sustainable agriculture and food systems is a new initiative for UC Davis, both field-based and classroom-based interdisciplinary sustainable agriculture learning opportunities have been available to students at the UC Davis Student Farm for more than three decades, said Farm director Mark Van Horn.

By Pat Bailey, UC Davis News Service. Reprinted with permission.

Two Organic Potato Field Days Are Outgrowth of Organic Potato Production PMSP

By Jennifer Miller, Northwest Coalition for Alternatives to Pesticides

When Pacific Northwest potato growers planned to update the Potato Production Pest Management Strategic Plan (PMSP), they wanted to add organic potato production. An increasing number of growers in the region were considering transitioning some of their ground to organic production, having heard of the financial gain and the long-term benefit to soil health. However, because of the differences between organic and conventional growing methods, PMSP work group leaders Ronda Hirnyck, University of Idaho, and Jennifer Miller, Sustainable Agriculture Coordinator at the Northwest Coalition for Alternatives to Pesticides (NCAP), determined a separate plan was needed, along with a separate meeting of farmers and researchers with experience in organic potato production. To reduce the need for pesticides, organic potato farmers rely heavily on preventive methods and a different set of tools to manage pests, including long and diverse rotations, avoiding fields with known pest problems, and others.

Jennifer Miller

Organic potato field day at Fred Brossy's farm near Shoshone, Idaho.

The meeting, with organic potato growers and researchers from California, Colorado, Idaho, Oregon, and Washington, convened in January. After studying the issues and hearing from the meeting's attendees, Miller and Hirnyck quickly learned that a pest-by-pest approach was needed and that an organic potato PMSP would require an integrated approach.

The organic farmers identified a number of educational needs during the strategic planning session. To address these needs, Idaho work group participants organized two field days. In September, two Idaho organic potato farmers who had participated in developing the PMSP invited other farmers and agricultural professionals to their fields. Long-time organic potato farmer Fred Brossy of Shoshone, Idaho, spoke about the importance of rotating his crops to deal with nutrient and pest management issues. Kris Taylor of Idaho Falls shared his relatively new methods of organic farming. He had just finished his second year growing organic potatoes.

Jennifer Miller

Discussing organic potato production at Kris Taylor's farm.

NCAP partnered with the two organic farmers, as well as the grower organization Potato Growers of Idaho and the potato supplier Potandon Produce, Inc., to hold these field days. These organizations continue to use the information gained through the PMSP process to help potato growers, including at a November workshop in Idaho Falls and in sessions at the University of Idaho's annual Potato Conference in January, 2009.

PROFILE

Lori Berger

Executive Director, California Specialty Crops Council

Lori Berger, Executive Director of the California Specialty Crops Council (CSCC), based in Tulare, CA, has participated in and been very supportive of the work of the Western IPM Center in a number of ways over the years. Working with the CSCC's commodity groups, Lori has assisted in the development of 14 specialty crop Pest Management Strategic Plans (PMSPs), garnering funding for these projects through EPA Region 9, a Pest Management Alternatives Program (PMAP) grant, and a CDFA Block Grant, requiring only minimal support from the Center. She has assisted the Center in responding to information requests from USEPA and USDA and has put Center staff in touch with technical experts who could provide additional information. Lori has also participated on a number of national committees that have been supportive of the Center.

Lori Berger

The CSCC's overarching purpose is to "work together to foster a positive regulatory environment focusing on pest management and stewardship that supports the success of CSCC growers." Specialty crops include fruits, vegetables, tree nuts, dried fruits, and nursery crops (including floriculture). In her role at the CSCC, Lori works with more than 18 different organizations and commodity groups. She says there is no "average day." She said, "Every day is truly different," and added, "There's nothing about this job that is regular or 8:00–5:00."

The CSCC (originally called the California Minor Crops Council) was created in 2000 to provide a technical forum for a broad diversity of California specialty crops. The Food Quality Protection Act (FQPA) and related reregistration issues were the original driving force behind the group's formation. Since then, however, a host of other issues have become important. The CSCC's current priority areas include minor use pesticide registration through the IR-4 Program, international Maximum Residue Levels (MRLs), reduced-risk pest management, environmental stewardship, food safety, fumigants, methyl bromide/ Critical Use Exemptions, endocrine disruptors, endangered species, and other issues. The CSCC has identified five key strategy areas. These are to

- Support proactive strategies for pesticide registration and pest management needs
- Monitor and interact on regulatory issues impacting specialty crop production
- Identify regulatory drivers and create linkages with key organizations and individuals
- Promote awareness of technical needs/regulatory challenges of CSCC growers
- Provide technical support in the event of crisis to protect interests of CSCC commodities

Through outreach and by providing an education forum across commodities, the CSCC endeavors to proactively bridge the gap that can exist between the people who make regulations in federal and state agencies and the technical realities of how things are done in the field.

Lori feels the CSCC provides a unique opportunity for diverse commodity groups, who tend to be absorbed in their own issues, to come together and communicate across commodities. She said, "Once we get a few of these commodity people together, there are such great synergies that happen. That's always extremely positive to see." Asked what most excites her about her job, Lori said, "I work with a lot of great people that are technically extremely competent and have a passion for agriculture."

Asked about the biggest challenges facing specialty crops right now, Lori replied, "Profitability. It's just really hard to stay in business—the price of fertilizer, the price of fuel, etc." She added that there are fewer farm advisors and extension specialists to help the commodities. However, this is where the PMSPs are really helpful, she said, because they identify the short- and long-term issues for a commodity. It can be a challenge, though, for the PMSPs, which are living documents, to keep pace with the changes commodities experience. A number of the existing PMSPs are in need of revision to reflect things like new pests, cancelled products, new reduced-risk products, international standards, secondary certification systems, etc. It's difficult for commodity groups to set aside the time to come together to revise existing PMSPs, and the same can be said for the creation of new PMSPs. But once a commodity group gets a PMSP together, Lori says, they are really glad they did it.

Lori said that through the 2008 Farm Bill, there are going to be significant opportunities for specialty crops. She hopes to work with the Center and with the Natural Resources Conservation Service to bring opportunities to specialty crop growers and develop new practices that allow for profitable agricultural production while at the same time being protective of communities. Two additional future areas of focus for the CSCC, Lori said, are food safety and how it has been driving a lot of natural resources management, and endangered species.

Lori feels that specialty crop agriculture has advanced tremendously in terms of IPM and sustainable practices over the last 10 years. She would like to see specialty crop growers and PCAs receive more credit for the practices they use that are reduced-risk and that support good environmental practices. Lori says, "Specialty crop agriculture has made great strides in those areas, but we are having a hard time communicating to consumers what we are accomplishing and what the value is." She added, "That's a huge challenge for all of agriculture, but especially in California where we have such an extensive urban/rural interface." Lori observed that consumer trends regarding sustainability are a movement, a set of values that people are taking on, rather than a fad. She said, "The issues have gone from controlling insects to managing complex systems. Effectively handling communication about this is a huge challenge."

"Once we get a few commodity people together, there are such great synergies that happen. That's always extremely positive to see."

Lori was born in St. Louis, Missouri and grew up in Missouri and Texas. She earned her B.S. in Crop Science from the University of Wyoming, her M.S. in Entomology from Oklahoma State University, her Ph.D. in Entomology from Texas A&M University, and her M.B.A. from California State University, Fresno. Lori is a Certified Crop Advisor and Pest Control Advisor. She has been affiliated with a number of professional organizations and is currently a member of the Minor Crop Farmer Alliance Technical Committee, a board member of the California Chapter of the American Society of Agronomy, and a member of the IR-4 Commodity Liaison Committee. Lori has volunteered for many organizations, including as a Big Sister with the Big Brothers/Big Sisters of Tulare County. In her spare time she enjoys camping, swimming, cycling, golf, reading, music, cooking, meeting people, travel, and church and community activities. Contact Lori at ***lori@specialtycrops.org***. Visit the CSCC Web site at ***http://www.minorcrops.org/***.

Highlights—from page 5

Effect of Primary Tillage Sequence, Insecticides, and Weed Seed Placement on Seed Predator Conservation, Efficacy, and Weed Emergence

P.I.s: Ed Peachey and Carol Mallory-Smith, Oregon State University; Dan McGrath, Oregon State University Extension; and Rick Boydston, USDA, Prosser, Washington

Ed Peachey

Summary: Summer annual weeds continue to trouble row crop producers in the Pacific Northwest. Producers have been successful in using available weed management tools to prevent crop loss from weed competition, but they have not succeeded in reducing the need and level of intervention. The investigators point out the need to move beyond controlling weeds to controlling weed seed. Regulation of seed density over time has been erratic. Herbicides, tillage, and cultivation are commonly used to bridge the gap between the number of weeds that are expected to emerge and weed control objectives. These weed control practices often produce unintended consequences such as herbicide loss to groundwater and soil erosion. Effective regulation of soil weed seed banks with biologically based strategies is essential to the long-term success of sustainable, integrated weed management programs in food systems. The long-term goal of this project is to develop sustainable, profitable, and practical methods of intervention to restrict the economic impact and spatial range of summer annual weeds such as wild proso millet and Powell amaranth in vegetable row crops. Investigators seek to meet this goal through development of cropping systems that conserve seed predators and enhance weed seed predation. Specific project objectives are to (1) determine the effect of tillage system and sequence, insecticide use, and weed seed position in the soil on weed seed predation, subsequent weed seedling recruitment or emergence, and weed seed mortality and dormancy, (2) survey the species diversity and estimate the activity-density and seed predation potential of adult ground beetle and seed bug populations in vegetable crop rotations in western Oregon and eastern Washington, and (3) evaluate the seed predation potential of the Julid millipedes, seed bugs, and other potentially key maritime Northwest seed predators in the laboratory.

Interim Results: This 3-year study is in its second year, and research is producing the data needed to develop agricultural systems that will maximize biological suppression of weed populations. Tillage rotations put in place in 2006 impacted both winter and summer annual weed abundance in 2008. Enhanced activity-density of seed predators appears to be the cause, but data collection for 2008 is still in progress. This is the first report that the study's investigators are aware of that has linked crop rotation and cultural practices with changes in weed density due to carabid beetle activity-density.

Impacts: Consumers expect high quality food with low risk of exposure to pesticides. Increased weed seed predation enhances weed control efforts and reduces the need for additional intervention. This strategy, coupled with other integrated practices, should decrease herbicide use. Enhanced seed predation may also have economic benefits because of the need for fewer weed management inputs, but this will need to be balanced against additional inputs that may be required to enhance seed predator density. Reduced herbicide use benefits the environment, reducing the potential for herbicide runoff and leaching into groundwater.

Mark Your Calendar

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/***

May

- Western Region Pesticide Meeting, May 12–14, Sioux Falls, South Dakota. ***http://pep.wsu.edu/wrpm/***

August

- North American Pesticide Applicator Certification & Safety Education Workshop, August 10–13, Charleston, South Carolina.

September

- IR-4 Food Use Workshop, September 15–16, Cleveland, Ohio. ***http://ir4.rutgers.edu/***

2010

- 24th Vertebrate Pest Conference, March, Sacramento, California. ***http://www.vpconference.org/***

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

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