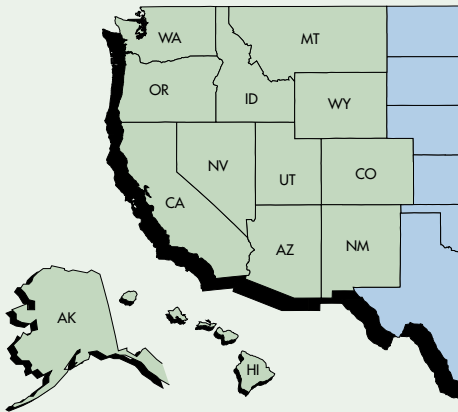


## Center Scope

WIPMC enhances communication between federal and state IPM programs in the western United States: Alaska, Arizona, California, Colorado, Hawaii and the Pacific territories, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. It serves as an IPM information network, designed to quickly respond to information needs of the public and private sectors.



## Fifth National IPM Symposium Offers Forum to Share Ideas

The Fifth National IPM Symposium, “Delivering on a Promise,” will be held April 4-6 in St. Louis, Mo. Participants can learn about the latest strategies and technologies to solve pest problems in agricultural, recreational, natural, and community settings. The Western IPM Center is one of four regional IPM Centers sponsoring the event.



The symposium begins at 8:30 a.m., Tuesday, April 4. After a networking lunch, concurrent sessions will be held in the afternoon, followed by a poster session and reception. Concurrent sessions fill the day on April 5, followed by another poster session and reception. The symposium ends at noon on April 6. Regional meetings, related programs, and informal conferences will also take place before the symposium, in the evenings, and after the symposium.

Optional field trips to the St. Louis Zoo have been arranged for April 3.

Two departure options are available to accommodate pre-symposium meetings and late-afternoon arrivals. The early afternoon departure

(around 2 p.m.) includes small-group, behind-the-scenes tours of several exhibits. The evening departure (around 5 p.m.) will arrive in time for a presentation by Monsanto Insectarium staff on its endangered species conservation program and by Orkin on IPM at the zoo. After the presentations, participants can attend a barbecue dinner with a cash bar, returning to the hotel by 9 p.m. There is an extra fee for the zoo trips.

Find more information, including registration, hotel, and a draft agenda at [www.ipmcenters.org/ipmsymposium/](http://www.ipmcenters.org/ipmsymposium/).

## What's Inside

|  |   |
|--|---|
| Director's Comments .....                          | 2 |
| Water Symposium:<br>New Priorities .....           | 2 |
| IPM Systems:<br>Tools and Techniques .....         | 3 |
| Green Manure Project .....                         | 6 |
| Employee Creates New<br>Response Tool .....        | 6 |
| Profile: Sally O'Neal Coates,<br>PMSP Editor ..... | 7 |
| Grants Program Review .....                        | 8 |
| Weather Workgroup .....                            | 8 |

## Team Evaluates Impact of IPM and Sustainable Agriculture

CSREES national program leaders Jill Auburn, Mike Fitzner, and Bill Hoffman joined 25 other scientists and program managers at a joint EPA/USDA/IPM Centers workshop to assess the impact of integrated pest management and sustainable agriculture programs in August.

Participants worked together in three areas: (1) identifying target outcomes and indicators by applying the “Logic Model” framework to the goals of the National Roadmap for IPM; (2) developing a common structure for reporting progress of funded projects toward those outcomes; and (3) sharing experiences of successful collaboration with USDA-NRCS in IPM training and implementation. The group will post its work on a Web site and continue working together on these initiatives in the coming year.

## WIPMC Focuses on Collaborations, Mid-Term Review, and Grants

By Rick Melnicoe

The Western IPM Center staff has been busy with many activities during the fall and into this winter. We funded several projects from proposals submitted last summer and are working on reviewing proposals for the Western Region IPM Grants program (see separate article).

The mid-term review for all regional IPM Centers is scheduled for mid-February. Each regional IPM Center is required to have a two-year review as part of the grant. Rather than have four separate reviews, USDA and the centers' leadership agreed to have a single review covering all centers. A national panel will review documentation on organization, programs, communications, identifying and prioritizing IPM, collaborations, funding, outcomes, challenges, and future activities. Recommendations for the next round of centers in fiscal year 2008 will be one of the outcomes of this review.

The President has signed the 2006 fiscal year USDA budget. The Section 406 Integrated Activities funding (including IPM Centers) was returned from the National Research Initiative line. Funding for the IPM Centers is level from fiscal year 2005. However, there is a one percent government-wide rescission to the 2006 fiscal year budget. This rescission results in a reduction of approximately \$12 million in the total CSREES 2006 fiscal year appropriation. The IPM centers will lose a total of \$42,000 (a little over \$10,000 per center). By the time this goes to print, we should also know what the President proposed for the 2007 fiscal year.

The year 2005 was a good year for the Western IPM Center's collaborative efforts. We saw increased cooperation with NRCS in several states; two national weather modeling meetings involving the regional weather modeling workgroup, with one meeting hosted by Oregon State University; national efforts to develop common indicators for reporting on grants; meetings with USEPA to smooth out rough spots in the information request pipeline; and continued collaborations with IR-4, Western Sustainable Agriculture Research and Education, and the Western Plant Diagnostic Network.

In the next few months, we will be soliciting priorities for calls for proposals to be issued by the Western IPM Center. This annual call ensures that our clientele have an opportunity to bring forth pest management issues of importance in the West. Our steering committee selects categories and/or specific needs for inclusion in Center calls for proposals. This is your chance to guide us in finding solutions to important needs.

Don't forget to sign up to attend the Fifth National IPM Symposium in St. Louis on April 4-6, 2006 (see separate article).

## Participants at Regional Water Symposium Identify Priorities for the West

Nearly 80 people attended the Western IPM Center's successful "Water, Wildlife, and Pesticides in the West: Pest Management's Contribution to Solving Environmental Problems" conference. Stakeholders had a chance to help identify research and extension priorities in the West, which will be reflected in calls for proposals and other activities of the Western IPM Center.

Workshop participants identified these research and extension priorities:

- Development of economic thresholds for crops and pests where they don't already exist.
- Funding IPM metric projects.
- Economic data on the cost of implementation of IPM/BMP practices to growers.
- Outreach to growers in evaluating the risks of implementing IPM/Best Management Practices (BMPs).
- Evaluation studies on how adoption of IPM/BMPs affects water quality.
- Development of economic data on preserving endangered species.
- Research that monitors population levels of invertebrates over time and evaluates sub-lethal effects.
- Research on the effects of inert ingredients to water quality.
- Evaluation of how the flux in residue concentrations affects aquatic species.
- Research on how to make biopesticides more efficacious.
- More screening of biopesticides in the search for less-toxic alternatives.

Attendees identified many other issues and concerns during the breakout sessions, and they can be found at the WIPMC Web site, [www.wripmc.org/NewsAlerts/workshopreports.html](http://www.wripmc.org/NewsAlerts/workshopreports.html).

The overwhelmingly positive comments from attendees noted that speakers were excellent in terms of diversity, quality, and depth of information; discussions added a wealth of ideas beyond traditional focus; there was a broad perspective on a wide range of issues such as how to encourage adoption of new ideas; and the conference provided a great opportunity for learning and interaction. Participants also praised the addition of environmental perspectives and opportunities for informal communication over breakfast, drinks, and dinner, regretting only that more people weren't there to listen and learn.



# IPM Systems: Tools and Techniques to Consider How Systems Behave<sup>1</sup>

Ray D. William, Paul Jepson, and Molly Engle  
Oregon State University

Integrated pest management (IPM) functions as a system with pests, interactions, and feedback loops designed to achieve desired outcomes. In contrast, pest managers and specialists identify pests and problems with limited reference to how these factors behave within the system. This report summarizes a workshop sponsored by the Western IPM Coordinating Committee (WERA-069)

and the Western IPM Center to “Connect IPM Practices, Priorities, and Strategic Directions” using systems tools and techniques.

Workshop objectives included quickly drawing IPM systems by identifying pests, loops, and behaviors based on conversations with blueberry, nursery, and vegetable growers in Oregon. Attendees suggested that value would be added to Pest Management Strategic Plans (PMSPs)<sup>2</sup> and the National IPM Roadmap<sup>3</sup> if systems diagrams were included in these documents.

**Methods:** As blueberry, nursery, and vegetable growers described their crop and pest management systems, workshop attendees identified IPM factors or components, loops, and leverage or critical places in the system where change may occur. This technique, or ActionGram, represents steps that people use to consider systems, with initial drafts completed in 10 minutes (William, 2002).

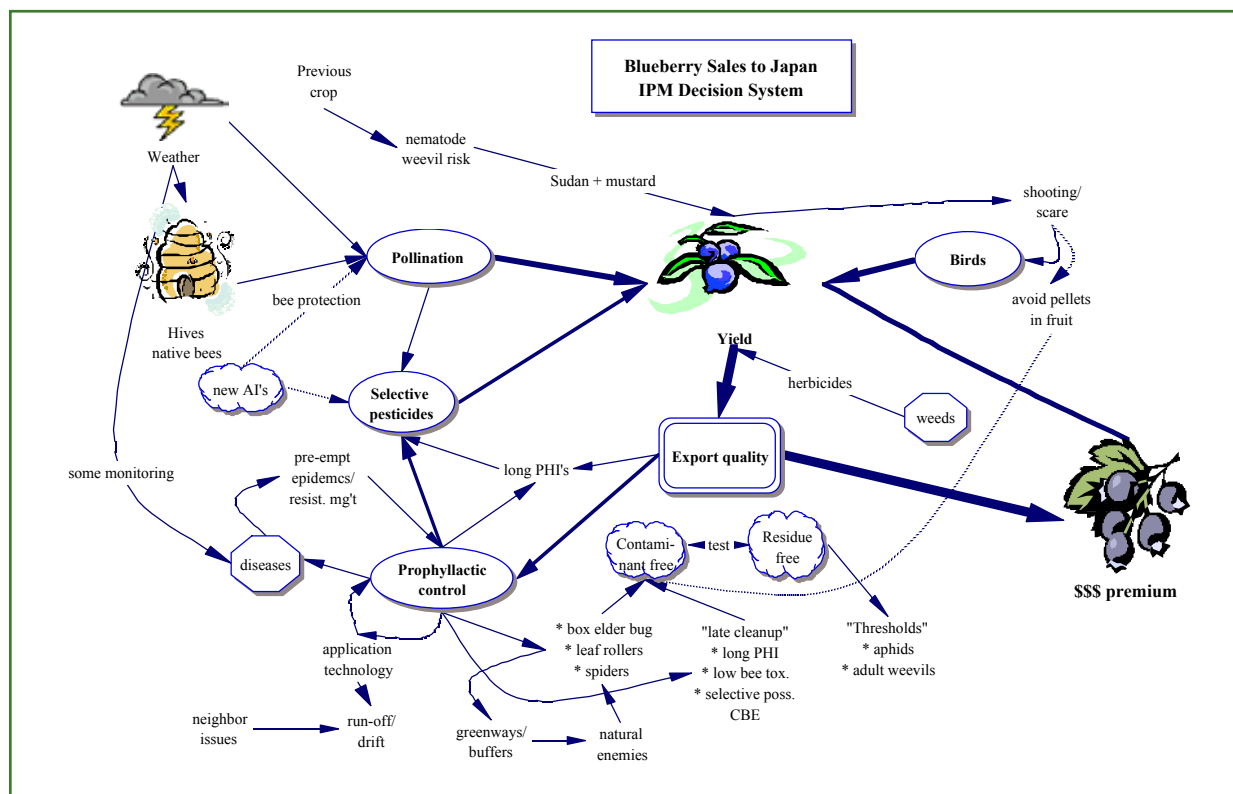


Figure 1. Blueberry pest system

Attendees synthesized drawings by tracing feedback loops so they make sense, defining behaviors such as growth, equilibrium, decline, oscillation, or cycles (Sterman, et al.) and renewal systems (Holling and Gunderson, 2002). Identifying primary drivers or leverage was considered critical. Groups considered possible benefits of adding systems drawings to complement PMSPs and other IPM documents.

**Results:** Blueberry growers described the sale of premium quality fruit to Japan, thereby ensuring pollination, fruit set, and yield with no bugs, no birds, and no residues (Fig. 1). Pest practices were chosen for low bee toxicology while preharvest intervals were doubled to ensure food safety. The primary feedback loop or driver controlling this system was selling quality fruit in Japan for a premium price.

Specimen tree production required

four years; first, to develop a root system, second, to bud and grow a straight trunk, third, to develop branches, and fourth, to finish the tree (Fig. 2). IPM practices were selected to ensure near perfect growth at key stages, such as controlling leaf-feeding insects that destroy terminal trunk growth and development the second year. Converting irrigation from overhead to drip required a couple years to adjust pest practices since the system was buffered with multiple sub-loops. Primary drivers were selling specimen quality trees with a phytosanitary certificate at time of sale.

Vegetable growers described capital, land, people, and global markets as critical factors (Fig. 3). One family described production of turnips and other root crops requiring an immense knowledge of cabbage maggot and other pest life cycles that function beyond fields and years. Pest occurrence, life cycles, and turnip production were described in concentric rings to show complexity

and how the system functions. Primary drivers identified practices to produce turnips, rutabagas, and radishes that consumers wish to buy, thereby covering capital costs and profits for family livelihoods.

In addition to the ActionGram, attendees were introduced to mapping (topo, hydro, and other maps), transect analysis (enroute to farms), and mind maps as tools to understand IPM systems. Each technique was diagrammed in a workbook (William, et al., 2005).

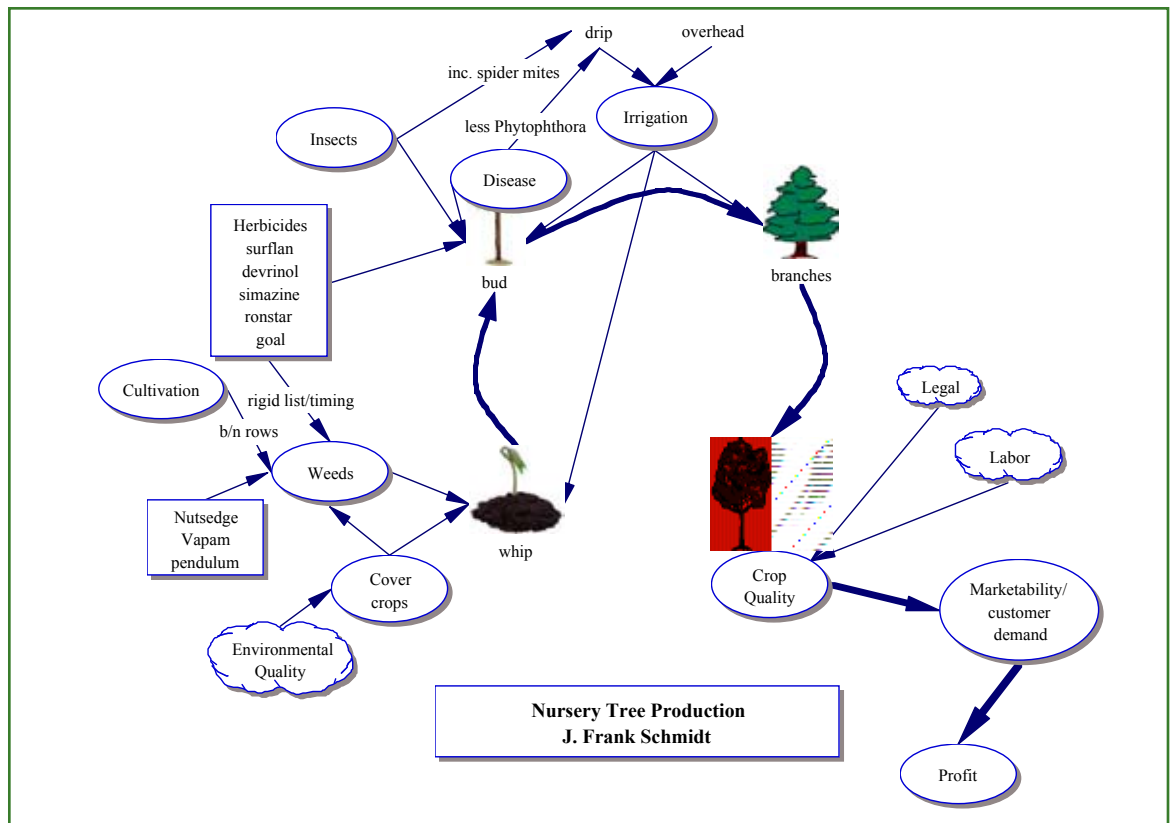


Figure 2. Nursery production cycle

**Discussion:**

Attendees reported either knowing or intention to use both ActionGrams and mind mapping to understand IPM systems, while disciplinary specialists expressed slightly less acclaim for utility of systems diagrams to complement PMSPs or the IPM Roadmap (Table 1). Respondents expressed mixed results for maps and transect tools, although almost no time was allocated to exploring these tools within the workshop. The blueberry diagram provided clear evidence of systemic behavior with primary drivers (leverage), while detail shown in the concentric rings for root crop production displays the complexity of decisions required to prioritize pest practices

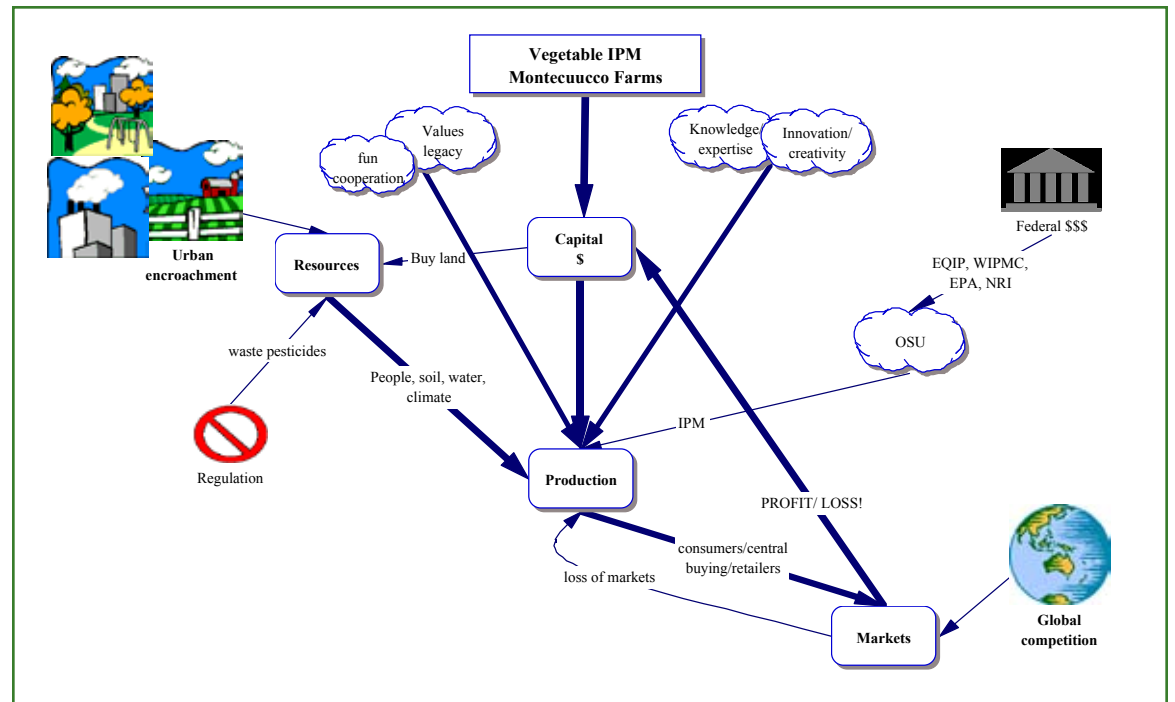


Figure 3. Montecucco vegetable farms

within cropping systems.

Comments to include systems diagrams and instructions within PMSP guidelines resulted in “yes, let’s try it” to concerns that adding another step to a very busy process may not be possible. However, the group agreed to experiment with adding a diagram

to future PMSPs in Oregon with an evaluation of time requirements and value added.

**Conclusion:** Diagrammed IPM systems enhance understanding of function while complementing descriptions and detail contained in PMSPs and the National Roadmap for IPM. With practice, IPM

systems can be drawn quickly, helping visual processing of drivers and priorities or places in the system where maximum change may occur. We agreed to experiment with adding these techniques to a PMSP analysis in 2005-06 in Oregon.

**Workbook Reference**

William, R.D., M. Engle, and P. Jepson. 2005. Connecting IPM Practices, Priorities, and Strategic Directions: Workshop sponsored by WERA-069 IPM Coordinating Committee, Western IPM Center, and OSU Integrated Plant Protection Center, April 19-21, 2005.

**References**

Gunderson, L.M. and C.S. Holling. 2002. Panarchy: Understanding transformations in human and natural systems. Island Press, Wash.

Holling, C.S. 2001. Understanding the complexity of economic, ecological, and social systems. *Ecosystems*. 4:390-405.

Sterman, J.D. 2000. Structure and behavior of dynamic systems (Chap. 4) in *Business Dynamics: Systems Thinking and Modeling for a Complex World*. McGraw-Hill Comp, Inc., Columbus, Ohio.

William, R.D. 2002. Whole Systems ActionGram: A Diagramming Tool that

**Table 1. Attendees response to “know/intend to use technique for IPM” within discipline, PMSPs, or IPM Roadmap at the end of workshop (n=9).**

| Diagram technique  | Evaluation | Pest discipline | PMSPs | IPM Roadmap |
|--------------------|------------|-----------------|-------|-------------|
| Maps (topo, hydro) | +/+        | 3               | 3     | 2           |
|                    | +/-        | 2               | 1     | 2           |
|                    | -/-        | 2               | 3     | 3           |
| Transect analysis  | +/+        | 1               | 3     | 0           |
|                    | +/-        | 4               | 3     | 3           |
|                    | -/-        | 3               | 2     | 5           |
| Systems/ActionGram | +/+        | 7               | 6     | 5           |
|                    | +/-        | 1               | 3     | 3           |
|                    | -/-        | 0               | 0     | 1           |
| Mind map           | +/+        | 7               | 4     | 4           |
|                    | +/-        | 0               | 3     | 2           |
|                    | +/?        | 1               | 2     | 1           |
|                    | -/-        | 0               | 0     | 2           |

+/+ Know and intend to use systems diagram techniques in IPM  
 +/- Know but do not intend to use  
 +/? Know but do not know if will use  
 -/- Do not know; therefore do not intend to use

enhances Systemic Inquiry and Action. *NACTA Journal*. 46:8-11.

William, R.D. (*in review*). Whole systems inquiry: Designing large educational events such as the IPM Symposium. *Electronic J. of Extension*.

**Footnotes**

<sup>1</sup>Workshop sponsored by WERA-069, Western IPM Center, and OSU

Integrated Plant Protection Center held in Wilsonville, Ore., April 2005.

<sup>2</sup> Pest Management Strategic Plans (PMSPs) [www.wripmc.org/CropProfiles.index.html](http://www.wripmc.org/CropProfiles.index.html)

<sup>3</sup> National Roadmap for Integrated Pest Management, [http://northeastipm.org/whatis\\_ipmroadmap.pdf](http://northeastipm.org/whatis_ipmroadmap.pdf)

## Making Sense of Acronyms: Smile When You Say Them

Are EDSTAC and ICCVAM on your schedule? Oh, I'm OTL. What's the ETA for our BLT?

If none of this makes sense, except for “out to lunch” and the “estimated time of arrival” for your “bacon, lettuce, and tomato” sandwich, then be sure to check out the acronym list compiled by WIPMC director Rick Melnicoe and assistant director Linda Herbst on the Western IPM Center Web site.

The list will help you move through the forest of acronyms — and without a GPS (global positioning system).

Rick and Linda gleaned the list from acronyms frequently used in EPA and USDA documents. To access it from the WIPMC home page, click on “Other News/Announcements” and then look under EPA or

Pesticide Updates for “Acronyms in EPA, USDA, and Other Documents.” ([www.wripmc.org/NewsAlerts/acronyms.html](http://www.wripmc.org/NewsAlerts/acronyms.html))

Editor Paul Guillebeau of the Georgia Pest Management newsletter recently praised the list. “You no longer have to remain in the dark about acronyms. You can impress your friends with pseudo-words like SFIREG (State FIFRA Issues Research and Evaluation Group) and PHED (Pesticide Handlers Exposure Database). Just be careful how you pronounce them, and it's a good idea to smile when you say them.”

Have you guessed yet what the acronyms in the first paragraph mean? Here it is: Are the Endocrine Disruptor Screening and Testing Advisory Committee and Interagency Coordinating

Committee on the Validation of Alternative Methods on your schedule?

A final note — Once you finish reading the acronyms, you can say you've reached your POD. That's point of departure.





## Company Grateful for Special Uses Grant

By Dennis Searle

Sugarbeet cyst nematode is a parasite in sugarbeets. The treatment of choice has been chemicals. Green manure crops, specifically oil radish and mustard varieties that have been developed to control cyst nematode, are also another proven way of control. However, producers have been reluctant to use green manure crops because chemicals are easier to use.

To prove to producers that green manure crops are economical and that they do the job as well as or better than chemicals, we as an industry need a way of taking the technology to the field.

That is where the Western IPM Ongoing Special Uses Grant helps. We applied for and received a small grant in 2005 that allowed us to work with three growers, growing 30 acres each. Each grower has a hands-on experiment on his farm that he can show his neighbors and prove to himself that green manures are worth the effort.

We, as a company, like the small grant. It is enough money to help give the producer an incentive, but not so large that the paperwork and obligations are overwhelming. It is a very useful tool for us to use in promoting IPM practices.

## New Green Manure Project is Direct Outcome of Sugarbeet PMSP

Talk about a fast start. Even before the latest pest management strategic planning process produces a final plan, a new grant project has already been submitted and secured by the Amalgamated Sugar Company. With funding from the American Farmland Trust, the Amalgamated Sugar Company will implement green manure cropping into the sugarbeet rotations of 10 growers and share the findings with the grower-owned processing company's 1,100 growers.

This past December, the sugarbeet industry met in Boise, Idaho, to develop the Sugarbeet Pest Management Strategic Plan. The industry identified educational outreach on the economics of green manure cropping as a high priority. Research on green manures, including the economics of green manures, role for pest control, and impacts on soil nutrition, was also identified as a high priority.

One of the Western IPM's steering

and advisory committee members, Jennifer Miller of the Northwest Coalition for Alternatives to Pesticides, assisted Dennis Searle of the Amalgamated Sugar Company in developing the grant proposal. During the first day of the PMSP process, the Amalgamated Sugar Company staff and others expressed their concern that green manures had not been sufficiently explored or used as an IPM practice in sugarbeet production. During the social hour, Sandy Halstead of EPA, Jennifer Miller, and Amalgamated Sugar Company staff discussed the possibility of submitting a grant to the FQPA/Strategic Agriculture Initiative Program Grants EPA Region 10, administered by the American Farmland Trust.

The Western IPM Center's investment in developing a PMSP has already helped the industry to seize an opportunity and increase their IPM efforts.

## Employee Offers Computer Training for New Information Requests Tool

Representatives from the regional IPM centers recently learned to use a Microsoft Access-based program to help them standardize their responses to inquiries for federal agencies. Jane Thomas, Pacific Northwest comment coordinator, developed the database tool and led the daylong training in Portland, Ore., on Oct. 31. (See February 2005 *The Western Front* for a profile of Jane.)

Participants learned to log crop and pesticide information, contacts, and resources using the software. The program generates thorough reports in a standard format, useful for replying to USDA and USEPA requests for information. Al Fournier in Arizona, Cathy Tarutani in Hawaii, and Rick Melnicoe in California are among those in the West who are adopting the format.

Trainees had a chance to practice using the system and ask questions as Jane led them through scenarios and exercises. She also provided the software, test files, and an extensive manual, and she is willing to provide additional training, if needed. Plans are under way to make the program available on the Web.

USEPA and USDA officials give high marks to the thoroughness of reports generated by the program. When the USEPA, USDA, and others request information about a specific pesticide, WIPMC representatives gather information from growers, commodity groups, and extension personnel to respond to the queries. The information is vital for evaluating pesticides for registration.

## Sally O'Neal Coates PMSP Editor

"You know the little guy with the broom and the dustpan who comes in and tidies up the office when everyone else has gone home? That's sort of what I do," says Sally O'Neal Coates about her function as editor of Pest Management Strategic Plans (PMSPs) for Pacific Northwest (PNW) states including Alaska, Idaho, Montana, Oregon, Utah, and Washington.



Sally's colleagues might argue that she does a great deal more than that. Those involved in PMSPs (grower-driven, collaborative documents that outline and prioritize critical needs in pest management) realize the value of having a "second set of eyes" review them. PMSPs are complex, lengthy, detailed documents with multiple contributors. The authors (see profiles of Joe DeFrancesco and Lisa Downey in the September 2005 edition of this newsletter) collate

large volumes of information and make multiple passes at each PMSP. By the time the document nears completion, it's tough to be objective and see the little mistakes, redundancies, and inconsistencies that can creep in. It's also difficult to produce a document that reads as though it were written with "one voice." Sally tries to make sure these issues are addressed, along with editing for basic grammar and syntax.

Working as an editor of research publications at Washington State University since 1998, Sally became involved with PMSPs in 2002 when her supervisor Catherine Daniels (director of the Washington State Pest Management Resource Service) spearheaded the U.S. and Canada Pulse Crop (chick peas, lentils, dry peas) PMSP. In that same year, she assisted University of Idaho colleague Ronda Hirnyck by editing the PNW Potato PMSP.

Funded by a WIPMC grant beginning in 2004 and renewed for 2005 and 2006, Sally now edits all PMSPs generated in the Pacific Northwest. Her knowledge and perspective on what constitutes a well-written PMSP document increased after organizing and writing a PMSP of her own for Washington State wine grapes.

"We keep fine tuning," Sally says of herself and her author colleagues Joe DeFrancesco (PMSP coordinator) and Lisa Downey (PMSP research assistant). "Every single PMSP is unique — there can never be a true template for documents like these. Each one we produce increases our knowledge about what to include and what not to include."

Sally takes great satisfaction in producing documents that have real-world impacts for the growers they represent. PMSPs on which she has worked (including alfalfa and clover seed, blueberry, caneberry, onion, potato, snap bean, small grains, and sugarbeet) helped to identify critical issues that have been addressed by regulatory agencies and researchers. PMSPs currently under way include rangeland beef cattle and sweet cherries; workshops for revisions of the potato and pulse PMSPs and a new forage PMSP are scheduled for winter 2006. And, you can bet Sally will swoop in with her broom and dustpan to clean things up a little before these documents are released to USDA, EPA, and the general public.

Sally can be reached at [scoates@tricity.wsu.edu](mailto:scoates@tricity.wsu.edu). Completed PMSPs are available at [www.ipmcenters.org/pmsp/index.cfm](http://www.ipmcenters.org/pmsp/index.cfm).

## Review Panel Approves Funding for Projects

The Western Region IPM Center (WIPMC) proposal review panel met Sept. 27, 2005, in Portland, Ore., to make funding recommendations. Five WIPMC Workgroup projects and four IPM Issues projects were funded. More information regarding the specific projects will be included in the June 2006 newsletter.



## Learn to Translate Pesticide Terms

Have you ever wondered how to translate pesticide terms from English to Spanish? The California Department of Pesticide Regulation has developed an English/Spanish list of pesticide terms. This handy guide can be found at [www.cdpr.ca.gov/docs/license/glosary/glossengl.htm](http://www.cdpr.ca.gov/docs/license/glosary/glossengl.htm).

# Western IPM Regional Grants Program Review Panel Considers Proposals

Proposals for the Western IPM Regional Grants program were due Dec. 15, 2005. Approximately \$655,000 is available for IPM research, research and extension, or extension only grants. Forty proposals were submitted, however two were returned because of ineligibility, and five will not be reviewed due to failure to submit the required relevancy statement. One proposal failed to provide a Conflict of Interest statement. Researchers for the remaining 32 proposals requested a total of \$3,188,848. Proposal reviews for relevancy and technical merit will occur in late January and early February 2006. Recommendations for funding will be forwarded to USDA as soon as possible after the review. Principal investigators will be notified of recommendations by the end of February.

## Weather Workgroup Members Foster Teamwork

Collaborations fostered by the WIPMC-sponsored Weather Systems Workgroup paid off when a joint proposal submitted to the USDA National Research Initiative competitive grants program was approved.



Len Coop, Paul Jepson, Chris Daly, and George Taylor, Oregon State University, along with Walt Mahaffee, USDA-ARS, will lead the project, "Taming uncertainties in multi-scale pest and disease models and decision support tools for plant biosecurity." Several other members of the workgroup will cooperate on the project.

In November, the workgroup met with scientists from other regions of the U.S. and CSREES administrators to discuss the concept of a nationally supported program related to pest modeling and weather monitoring and forecasting.

An expected outcome of the meetings is collaborative work on research aspects of such a system, as well as brainstorming for operational design.

## Mark Your Calendar

### 2006 January

- Western Plant Diagnostic Network Annual Meeting, Jan. 26-27, Hilo, Hawaii
- Pacific Northwest Potato PMSP workshop, Jan. 27, Pocatello, Idaho

### February

- Using Climate and Weather Information in IPM Decision Making, iSNAP workshop, LaGrande, Ore., and Toppenish, Wash., in conjunction with the Yakama Indian Nation (date pending, mid-February)
- Organic Pacific Northwest Onion PMSP workshop, Feb. 16, Buhl, Idaho
- Forage PMSP workshop, Feb. 22, Boise, Idaho
- Pulse PMSP workshop, Feb. 27-28, Spokane, Wash.

### March

- Western Society of Weed Science Annual Meeting, March 14-16, Sparks, Nev.

### April

- Fifth National IPM Symposium, "Delivering on a Promise," April 4-6, St. Louis, Mo.

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



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

Director:  
Rick Melnicoe, (530) 754-8378  
E-mail: [rsmelnicoe@ucdavis.edu](mailto:rsmelnicoe@ucdavis.edu)

Editor:  
Stephanie Klunk,  
UC IPM Program

Design:  
Marianne Post, Repro Graphics, UC Davis

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

