

WERA-069 Annual Report 2010-2011
Meeting held April 19th-20th, 2011 in Santa Fe, NM

Minutes

Chair Tess Grasswitz opened the meeting at 7:45 a.m. with welcoming remarks and introductions.

WERA-069 administrative business - Tom Holtzer, Colorado State Univ.

The proposal submitted last year to renew the WERA-069 committee was rejected by the Western Association of Agricultural Experiment Station Directors. WERA-069 was given a one year temporary status as a development committee (WDC19). A proposal to continue WERA-069 is due May 15th, 2011. The Multistate Review Committee comments stressed that IPM is still considered a critical issue for agriculture; the reason for rejecting the proposal were primarily concerned with the objectives and a lack of focus on impact, rather than the importance of the subject matter. Because of our precarious status, it is especially important to have all WERA-069 members officially signed up through NIMSS (especially members from the Pacific Basin). In addition, the annual report needs to be submitted within 60 days of the annual meeting and needs to stress regional accomplishments and impacts.

The group discussed how best to revise and resubmit a new WERA-069 proposal. The new proposal needs to emphasize sharing between states and coordination of regional IPM research and extension programs. Other areas that were emphasized included increasing participation of western IPM research and extension faculty on the committee, and expanding coordination and collaboration with relevant state and regional agencies and organizations (e.g., NPDP, NRCS, APHIS, EPA). The proposal also needs to emphasize the positive impacts of IPM on ecosystem protection, enhanced regional collaboration on IPM grant applications, facilitate development of new pest management strategic plans (PMSPs), increase use of IPM through education and advocacy, and document impacts of IPM on agro- and urban-ecosystems. The proposal also needs to state the pest issues that impact the WERA-069 region and what the group is doing to address these issues.

Dr. Holtzer again reminded the group that everyone needs to be included in Appendix E on the NIMSS database to accurately reflect the activity of the group; registration can be approved by either Directors of Extension or AES. Each state is encouraged to have two members on the committee – one primarily representing Extension and one Research.

USDA NIFA and E-IPM Program Updates - Marty Draper (National Program Leader) & Elizabeth Ley

Dr. Draper discussed the impact of federal and NIFA budget reductions on IPM programs and gave an up-date on current IPM funding sources. The group expressed serious concern about the elimination of special research projects.

Dr. Draper suggested holding the next WERA-069 meeting in conjunction with the International IPM Symposium in Memphis, TN (26-29th March, 2012). He has already reserved a room for WERA-069 to use on the day before the symposium starts. He suggested that we select 2-3 regional projects and report them in more depth, focusing on outcomes. Dr. Draper reminded the group that the multi-state committee reports (such as that from WERA-069) are used every year as a source of reporting impacts within KA216 (IPM) and for responding to congressional information requests. The group was reminded that AD416 and 417 forms need to be completed. Reporting deadlines for last year's proposals are coming up; this is critical; new funds will not be released until these reports are received. No-cost extensions are available if requested.

Elizabeth Ley gave a presentation on the E-IPM Coordination award process and post-award actions. Her presentation covered reporting requirements, award continuation, statutory time limitations, post-award modifications, unallowable costs, award face sheet, and common 2010 application problems. The group was reminded that CRIS Form AD-421 has to be completed. Progress reports cover a 12 month period and must be submitted within 90-days of the anniversary date of the grant. However, for award continuation, they need to

be submitted as early as 90 days before the anniversary. The universities receive notification of when reports are due. CRIS reports need to reference KA 216 (for IPM). Report unique activities for each grant (i.e., don't report the same things for the extended 2009 grants and the 2010 grants). Links to publications or websites can be included in the CRIS reports.

Preparation and submission of termination reports was also discussed (choose 'final' not 'progress' at the initial input screen for CRIS Form AD-421). The report needs to include activity for the entire grant period, due within 90-days of the expiration of the grant. This is required for the grant close-out process and if not submitted, can delay the release of new money. For continuation awards, Marty Draper will send an e-mail to the PD approximately 3 months before anniversary date with instructions (similar to an RFA). The simplified proposal should be submitted through grants.gov using the same title and award number throughout the award period (the title used for the original 2010 proposal has to be EXACTLY the same in following years). PD's can ask their grants office for a copy of the award face sheet that gives approximate release dates of money and identifies any withheld funds.

Mandatory documents: SF424 – project contact and authorized representative within university, R & R Key personnel (provide updated 2-page CV for each)(can make changes in key personnel at this time), updated and accurate current and pending (include the E-IPM grant in BOTH current and pending, with the 2011 component under pending (give months)), human subject approval for surveys, SF-425 (annual federal financial report – work with your financial person to ensure that this gets submitted with the continuation proposal), budget forms and narrative for this increment only (i.e., not for years 1 and 3), CSREES Supplemental information form.

Post-award modification: can modify budget and objectives with agreement of Authorized Representative, as long as it does not change the approved scope of work, the time commitment of key personnel, or create a need for additional funding (send Marty a courtesy e-mail if such changes are made).

The authorizing language for the E-IPM Program limits the grant period to five (5) years from the start date of the award. The program allows for one year of no cost extension at end of 3 years of continuation, plus spill-over into the 5th year if approved in advance. Extensions of time beyond the maximum time limitations cannot be approved (have to spend everything 90 days before end date). Notify NIFA in writing when an extension is approved by the university's Authorized Representative.

Pre-award costs (up to 90 days) are allowable.

Problems with 2010 applications included: missing or inaccurate Current & Pending and CVs (use month and year at least, and day if possible, for C & P), AR approval for budget changes, delays in CRIS submissions, errors in CRIS submissions (Title has to match proposal, IPM KA 216 not listed, objectives not matched with award recommendations).

WIPM Center & WRIPM Grant Program updates – Rick Melnicoe, UC Davis

Several handouts were distributed showcasing the work of the Western IPM Center. The current funding for the Centers has been extended by 6 months to March 14th, 2012. Efforts to reinstate funding for the IPM centers are on-going. The last RFA issued by WIPMC lacked funds for new research activity because of the short time available. However, the second year of four on-going research projects were funded (\$99K), plus 5 working groups (total of \$42K), 11 out-reach projects (\$135K) and 2 surveys (\$19K). There is a possibility of funding short-term, inexpensive projects on a semi-competitive basis; anyone with ideas for such projects should contact Rick Melnicoe or Linda Herbst as soon as possible.

Regional IPM projects: 7 research projects, 2 research and extension and 1 extension-only project were funded (total: \$658K). An estimated \$50-\$100K may be available for such projects over the next year. WIPMC will also

provide \$5K to support mini-symposia (on outreach/regional IPM) at the next International IPM Symposium in 2012.

Both Linda Herbst and Rick Melnicoe are planning to retire in June 2012 and will not commit to managing funds after this date.

A new WERA project on regional water quality and pest management has been proposed, with the aim of enhancing collaboration between university personnel and stakeholders to reduce pesticide impacts on water quality.

The WIPMC website is currently supported by IT decision-support funds that were zeroed-out in the budget. There will be a meeting of the regional centers in June to seek a way forward. The group expressed serious concern about the possible loss of information currently hosted on the WIPM website if the WIPM center closes.

IPM Challenges in the City of Santa Fe – Robert Wood, (IPM Program Manager for the City of Santa Fe)

Mr. Wood presented an engaging and informative overview of current practices related to IPM in Santa Fe. The city has had an ordinance since 2001 requiring a variance for all activities related to pesticide applications; all contracts (from sub-division plans to spraying) are reviewed for IPM considerations and custodial service providers receive a mandatory 3 hrs/month training on IPM-related topics. However, the general public are still not very aware of IPM – this requires further outreach. Furthermore, for IPM to be adopted, it has to have a significant impact – e.g., it has to be ten times as good, or ten times cheaper, than current practices. The difficulties involved in urban pest management were well illustrated by a case study of prairie dog management within the city.

Other new items/business

The next WERA-069 meeting will be held in Memphis, TN, in conjunction with the next International IPM Symposium in March, 2012. The details and arrangement will be communicated to all members of WERA-069 by the current chair, Kassim Al-Khatib.

Deb Young, Colorado State University, was elected as vice-chair and will host the 2013 meeting in Fort Collins, CO.

The meeting adjourned at 12 noon, April, 20th, 2011.

Accomplishments

Arizona – Peter Ellsworth

Arizona's accomplishment for 2010 included the following:

Increased organizational capacity for IPM Research and Outreach

- The University of Arizona Pest Management Center recently hired three new full-time Assistants in Extension to enhance their IPM programs. These positions were made possible by leveraging Extension IPM funding with competitive grants and funds from the UA College of Agriculture and Life Sciences.

Community IPM

- This program now includes School IPM, Residential IPM, Turf IPM and Horticultural IPM. A comprehensive "School IPM – Inside and Out" program is being developed that will address the IPM needs of school buildings, grounds and recreational areas. This pilot program will serve as a model for other types of sites in the future.

Vegetable IPM

- New “Vegetable IPM Updates” were implemented in 2010 to deliver timely information to end-users via web, e-mail and smart phone. 32 biweekly updates have so far been provided on insect, disease and weed management topics. These reached over 450 Arizona and California stakeholders by e-mail, and at least 300 stakeholders via the Arizona Crop Information Site. <http://ag.arizona.edu/crops/vegetables/advisories/advisories.html>. (Past updates are archived at <http://ag.arizona.edu/crops/vegetables/advisories/archive.html>). Some updates were also distributed by the Western Farm Press and the Western Agri-Radio Network, reaching over 1,000 subscribers. A 220% increase in listserve membership for the Veg. IPM updates was achieved from Dec. 2009 to Dec. 2010.
- 14 vegetable IPM videos (4 on insects, 8 on weed control and 2 on diseases) were produced and included in a video archive webpage (<http://ag.arizona.edu/crops/vegetables/videos.html>).
- On-farm research demonstrations were conducted with grower cooperators, including 4 herbicide trial demos for melons and broccoli, 2 large translational research projects on aphid control and on monitoring the use of reduced risk insecticides.

Agronomic IPM

- A statewide IPM needs assessment was conducted for field crops (excluding cotton), identifying stakeholder priorities for IPM research and outreach.
- A national reference document is being developed for potential exotic pests of cotton.

IPM Assessment

This group focuses on the development of data and resources to help measure the adoption and impact of Arizona’s IPM programs. Two major projects are the Crop Pest Losses Impact Assessment Working Group and the APMC “1080” Pesticide Use Database. Data from these two sources have been used to respond to federal pesticide information requests and to document extension program outcomes and impacts, including adoption of reduced risk pesticides. Reduction of economic, environmental and human health risks can be inferred from these data.

- **The Crop Pest Losses and Impact Assessment Working Group** has been funded continuously by the Western IPM Center since 2004 with the goal of developing “real world” data on crop pest losses, control costs, yields and pesticide use in key crops for Arizona and the low desert region of California. Annual workshops and surveys are conducted with pest control advisors. The data obtained provide a broad view of pest management practices and needs in three key crops: cotton, head lettuce and melons. Data, reports, and presentations related to these efforts are available online: for cotton at <http://ag.arizona.edu/crops/cotton/insects/cil/cil.html>; for melons and lettuce at <http://ag.arizona.edu/crops/vegetables/insects/vegloss.html>.
- **Pesticide Use Database.** This consists of twenty years of data from diverse sources on statewide pesticide use (1991 – 2010). This work involves key partnerships with the Arizona Department of Agriculture and an industry stakeholder advisory committee.

Soil Fumigation Education

- Special funding from the EPA was obtained in 2010 to address a critical need for applicator training on new label requirements for soil fumigant products. An interdisciplinary team including university faculty, the Arizona Department of Agriculture, and industry partners developed educational resources and delivered 6 workshops to meet the needs of Arizona agricultural soil fumigation, turf fumigation, and bin fumigant applicators. More than 100 private and commercial applicators and other participants were trained at six workshops around the state, and were provided with health certification and respirator fit testing (an OSHA-requirement).

California – Kassim Al-Khatib

Despite a significant state budget cut, the UC Statewide IPM program (UC IPM) maintained its capacity to serve California's IPM community with E-IPM funding and other grants. Research, extension, and preparation of on-line and print resources supported IPM programs in agriculture, communities, and natural resources. The UC urban IPM program also continued to expand, introducing several new programs and products. Several new products were released by the agricultural IPM program, and a new program for pesticide safety training is being established. Highlights of the UC IPM program's 2010 activities included:

- A survey of 92 retail stores to determine their resource and education needs related to pests and IPM and how UC IPM could help them improve delivery of IPM information to consumers.
- Establishment of an advisory committee of stakeholders for the retail nursery and garden center education and outreach program.
- Translation into Spanish of all content (including videos, print-outs, and pest management information) on the UC IPM touch screen IPM computer kiosks. The 16 kiosk units are rotated annually across approx. 100 locations throughout California.
- Seven issues of the 'Green Bulletin' were produced (a newsletter with practical information for pest management professionals and pesticide applicators who work in urban areas).
- A pesticide hazards database was unveiled that includes information on 99 active ingredients and which is linked to 25 'Pest Notes' (publications for consumers and landscape professionals).
- Production of new guidelines for control of Spotted Wing Drosophila in home gardens, 6 new Pest Note titles and revision of 20 others. There are now over 150 Pest Notes—at least 10 of which get more than 40,000 web views annually.
- The UC IPM program contributed in various ways to the dramatic reduction in 2010 of the European Grapevine moth (EGVM) following its initial detection in several Californian counties in 2009. Work conducted by the UC IPM program included development and validation of a degree-day model for this pest; determination of the most effective insecticides and best spray timing to minimize disruption of established grape IPM programs; development of an effective EGVM monitoring system in vineyards with and without mating disruption; evaluation of winery waste as a pathway for spreading EGVM, and determination of mortality factors affecting the overwintering pupal stage. In addition, the UC IPM program has provided technical advice to government agencies, growers and the grape industry, and has worked closely with the NRCS to help growers affected by the EGVM quarantine to utilize the Environmental Quality Incentives Program (EQIP).
- UC IPM is collaborating with OSU and WSU by posting research results on Spotted Wing Drosophila on its IPM website and continuing to help growers identify and manage this pest.
- UC IPM is helping walnut and almond growers use mating disruption techniques for control of codling moth and navel orangeworm, reducing their reliance on broad-spectrum pesticides.
- A workshop on IPM tools and methods for managing almond pests was attended by more than 280 pest control advisors. Almost all who attended intended to use the methods they learned during the following growing season. The training session was focused on the UC year-round almond IPM program.
- A new web tool was released to help growers and pest control consultants assess the risk of fire blight infection in apples and pears. The program incorporates two science-based models and weather data to help growers decide if they need to treat, and if so, how to effectively time their sprays.
- Work is in progress to develop five new year-round IPM programs (for eggplant, cucurbits, peppers, corn, and asparagus), bringing the total number of such programs to 24.
- Collaborative work with the Oregon IPM program is in progress at UC Davis to increase the use of weather-driven tools for IPM decision-making, particularly in grapes.

Colorado – Deb Young

A new Center for Sustainable Integrated Pest Management has been established at Colorado State University to provide research and outreach in IPM practices for sustainable plant and animal agriculture, small and large

farms, non-crop lands and waterways, households, landscapes, schools, other buildings and communities. Highlights for 2010 included:

- Participation in the Legume IPM-pipe project (Schwartz). This national program monitors the outbreak and movement of legume diseases and helps pest management specialists advise crop consultants and growers on disease status and threats. It is estimated that the project prevented unnecessary pesticide applications on approx. 225,000 acres in the western states, representing an estimated saving of \$6.75 million dollars.
- A new Onion IPM Network was established (Schwartz, Tisserat and Cranshaw), with a focus on onion thrips and Iris Yellow Spot Virus (IYSV). This group is developing innovative onion disease diagnostic tools for growers.
- The wheat IPM program in Colorado (Peairs) is part of the area-wide Great Plains Wheat IPM program and includes work on Russian wheat aphid and greenbugs (role of diversified crop rotations and host plant resistance, effect of native predators and parasitoids), as well as the benefits of diversification for weed management and crop profitability.
- A new program was initiated in 2010 on managing invasive weeds on recreational lands (Beck).
- Work on Thousand Cankers disease (*Geosmithia morbida*) (Tisserat) includes screening *Juglans* and *Carya* species for resistance and documenting the distribution of both the fungus and its vector, the walnut twig beetle (*Pityophthorus juglandis*).
- The consumer/urban IPM program (Tisserat, Blunt, Cranshaw, O'Meara and Small) conducted advanced plant pest training for more than 100 Master Gardeners, while the healthy housing group (Cranshaw, Camper & Young) produced diagnostic aids for bed bugs and is evaluating trapping methods for these pests.
- The school IPM group (Young, Small, Julian, Gourd, and Walker) continued to implement and expand verifiable school IPM programs; they also produced various newsletters, factsheets, articles and a new website.

Guam – Bob Schlub

Guam's IPM activities are coordinated through the University of Guam's Plant Health and IPM Center. The center focuses on pest diagnosis and conducts outreach programs that deal with Guam's unique agricultural challenges. Most farms in Guam are small (approx. 2 acres, providing a typical annual income in the range of \$21,000); farmers rely on a few high-value crops (e.g. watermelons, other cucurbits and solanaceous crops) and often grow a wide range of minor crops, which have few registered chemicals. IPM programs in Guam are designed to minimize the environmental and economic impact of pests and pest management strategies. Guam Cooperative Extension conducts pesticide applicator training, and is involved with the National Plant Diagnostic Network and the Guam Invasive Species Advisory Committee.

In 2010, the Guam Plant Health and IPM Center had direct contact with 4,500 adults and 1,700 youth on plant health-related issues. Center staff identified over 200 plant disease and pest samples and helped implement IPM strategies to address these problems. The center conducted a half-day workshop on invasive species and a three-day training program for Guam's agricultural professionals on the role of soil and plant nutrients in disease suppression. The center also continued the work on Ironwood tree mortality that began 8 years ago. A complex of biotic and abiotic factors is responsible for the decline, and posters, brochures and interactive displays are being used at workshops to inform the public about the issue and to educate them on correct techniques to prevent the problem from spreading. The center also exhibited interactive IPM displays for teachers, students, youth, farmers, homeowners, and the general public at Guam EPA's "Earth Day" and the University of Guam's "Charter Day".

Hawai'i – Arnold H. Hara

Macadamia nuts:

- Macadamia nut producers were trained (through workshops and published materials), to recognize damage caused by the tropical nut borer (*Hypothenemus obscurus*) and three of the most common nutrient deficiency symptoms encountered in macadamia nut trees (nitrogen, magnesium and iron). Once the causal agent for these damage and symptoms were recognized, producers were able to implement effective management strategies.
- The primary causal agent of macadamia quick decline (MQD) (responsible for the death of a large number of mature trees in Hawai'i) was identified as *Phytophthora tropicalis* through collaborative research with Dr. Lisa Keith, USDA-PBARC plant pathologist. A pressurized injection system was developed to deliver phosphorous acid fungicide into the tree trunk at or near infection sites and prolong the life of trees with MQD. This has finally provided a solution to a problem that has plagued the industry for 25 years.
- Management of disease and insect pests by adjustments to harvesting protocols and post-harvest handling, together with increased availability of more effective pesticides and application methods, has reduced crop losses and increased production of high quality nuts.

Ornamental crops:

- Forty-two state and federal agents attended an Integrated Crop and Livestock Management Workshop that covered seventeen IPM practices. After the event, 89% of the attendees indicated that they would encourage adoption of the IPM practices presented, which included heat treatment of potted plants for quarantine pests, steam sterilization of potting media and use of cover crops for nematode control, natural farming for livestock, varroa mite management in honey bees, optimizing insecticide spray coverage with nozzle technology, use of compost extracts and teas in organic farming, and efficacious herbicide application methods.
- A PMSP workshop for potted orchid production was held on September 30, 2010 in Hilo, Hawai'i . Pest management strategies for blossom midge, mealybugs, scale insects, false spider mites, snails and coqui frogs were provided for the strategic plan document authored by Mike Kawate, Kelvin Sewake and Cathy Tarutani, University of Hawai'i at Manoa, College of Tropical Agriculture and Human Resources, Honolulu, Hawai'i .
- A poster was designed and published to assist agricultural producers, state and federal inspectors, extension faculty and staff, personnel at facilities involved with plant shipments, landscape workers, and the general public with identification of the 16 "Most Unwanted Pests in the United States", as designated by the USDA-APHIS Cooperative Agricultural Pest Survey (CAPS) project. Six of the 16 featured insects are already present in one or more states, but diligence and early detection can reduce their spread and damage.
- A commercial-scale hot water shower system to treat potted plants prior to transport is in constant use by six plant export nurseries. This shower system (103 to 120 °F for 5 to 15 minutes, depending on target pest) is effective against all life stages of the coqui frog as well as many arthropods. UH Extension IPM staff advised nurseries on the construction of a permanent (versus portable) on-site facility in East Hawai'i County. Approximately 63,223 potted plants were treated on the island of Hawai'i during the past nine months, resulting in elimination of over 1,200 potential causes of rejection, including 1,171 coqui frogs. Rejections of potted ornamental plants exported from Hawai'i to California has been reduced since export nurseries adopted heat as a quarantine treatment. Volcanic cinder potting media used by plant nurseries continues to be steam sterilized for reniform nematodes.

IPM for Animal Agriculture

- Nuisance flies, odor levels and egg and chick predation by mongoose and rodents have all been significantly reduced in backyard and small scale commercial poultry operations by adoption and

dissemination of a waste management concept from Korea that incorporates indigenous micro-organisms, use of natural ventilation and solar positioning for cooling and drying. Three workshops on the system were held in 2010 (50 participants) and more are planned.

Idaho – Ed Bechinski

E-IPM funding awarded to the University of Idaho supports three primary activities: (i) statewide IPM programming coordination; (ii) IPM outreach projects in urban landscapes, cereals (barley and wheat) and sugar beets; (iii) support for weed and insect diagnostic laboratories.

Faculty are organized into “Topic Teams,” statewide working groups of County Extension Educators and State Extension Specialists who are broadly charged with extension program planning, action and assessment. These teams are organized by subject-matter (e.g. specific crops) or issues (e.g. water quality).

Principal achievements of the landscape, cereals and sugar beet IPM groups for 2010 are as follows:

Urban landscape IPM

- Seven fact-sheets and bulletins on stinging insects, spiders and their relatives were published, with two new titles currently in preparation: *Homeowner IPM Guide to Insects in Backyard Vegetable Gardens* and *Guide to Beneficial Natural Enemies*. Clients purchased 1863 copies of four printed IPM manuals, which placed them among the best-selling University of Idaho extension publications in 2010.
- New print and online IPM resource materials for homeowners are combined with local delivery of on-site IPM workshops, particularly for Master Gardeners, landscape professionals and homeowners. Nearly 60-hours of IPM educational workshops were conducted over the past two years; a total of 425 Master Gardeners were trained, and these in turn extended IPM recommendations to thousands of local residents. Mean gain-in-knowledge among the trainee Master Gardeners was 62%.
- Funding from the Western Integrated Pest Management Center is supporting a shelf-survey of retail outlets for homeowner pesticides which will be used to generate an online database of recommended products for backyard gardens.

Cereal IPM

- Twelve IPM seminars were conducted in Idaho and Washington for cereal producers and industry field staff (more than 600 attendees in total). Subject-matter included field scouting methods, degree-day models, economic injury levels, cultural and biological control, and judicious pesticide use.
- An online extension bulletin and IPM resource materials (PowerPoint show and handouts) on *Noctua pronuba* (a new exotic (European) cutworm) were used at 5 extension workshops (355 attendees) to educate commercial grain growers and their advisors on the identification, damage and management options for this insect. Surveys for another exotic pest, *Sitodiplosis mosellana* (wheat midge) are planned for 2011.
- An interview on IPM for cereal pests on the Northwest Ag Information Radio Network reached thousands of commercial growers in Idaho, Oregon and Washington.

Sugar beet IPM

- The sugar beet team identified important weed and diseases issues and set priorities to address them.

Montana – Berry Jacobson

Agronomic crops

- Ten 4-hour IPM workshops for agronomic crop producers were held, with a focus on plant pathogens, weed and insect management (total of 278 attendees).
- 68 “Ag Alerts” dealing with IPM issues were developed.

- The High Plains website has been continuously updated for all crops with formatting help from Bugwood.

Sugar beets, Dry Beans, Potatoes (Jacobsen)

- Sugar beet Seed Selection/IPM workshops were held in conjunction with the Western Sugar Cooperative, with 93% of growers attending.
- In collaboration with OSU IPPC (Integrated Plant Protection Center) and the USPEST.org group, 12 MT potato IPM weather stations were incorporated into the USPEST.ORG database.
- Entomologists in the MSU IPM Team coordinate a cutworm monitoring program each year in collaboration with Montana growers and county agents. Three species are monitored: the army cutworm (*Euxoa auxiliaris*) and the pale western cutworm (*Agrotis orthogonia*) are perennial pest of several crops grown in Montana (including wheat, barley, alfalfa, canola, peas and sugar beets), while damage by the dingy cutworm (*Feltia jaculifera*) has been increasing, particularly in Eastern Montana. Monitoring data is incorporated into the cutworm.org website, along with data from other states and provinces in the region. This system provides regional risk warnings that are also used by other Western States. An annual summary is also circulated as an "Ag. Alert" through the Great Plains Diagnostic Network (Contact: Kevin Wanner)

Plant Diagnostic Services

- The Schutter Diagnostic Lab processed 2151 samples in 2010 (1022 disease, 482 plant/weed ID and 647 arthropod). Two pathogens new to Montana were identified: Pine wilt nematode and Coin canker of green ash. Four new weeds were identified: white bryony, yellow star thistle and Bohemian and Japanese Knotweed. No new arthropod pests were found. Primary users of diagnostic services were county agents, crop consultants, landscape managers and service industry personnel and homeowners. 78% of users indicated that they used the diagnostic service for specialized testing and verification of initial diagnosis. 94.5% of users were completely satisfied with the service.

IPM for Consumer and Urban Environments

- The first 20 IPM-Certified Landscape Professionals completed their training. This certification is provided in cooperation with industry and the MT State Department of Agriculture.
- An online training program is under development and a website developed: <http://www.msuextension.org/urbanipm>.
- Two statewide training programs with 170 attendees were conducted and a needs assessment survey of clientele was completed. A clear message from the survey is that user education is critical to drive demand. (Contacts: Mary Burrows or Barry Jacobsen)
- Master Gardener training is conducted at three levels with more than 1200 individuals receiving 10+ hrs of IPM instruction. (Contact: Toby Day)

School IPM (in cooperation with MT State Department of Agriculture and Region 8 EPA)

- Our first School IPM training took place on May 18 and 19, 2010 in Bozeman. Dr. Dawn Gouge of the University of Arizona and Ricardo Zubiate, Salt Lake School IPM coordinator were featured speakers.
- Pilot training programs in three schools have been conducted over the last year.
- Montana K-12 schools are currently being surveyed on their perceptions of pest occurrence and pesticide use. (Contact: Ruth O'Neill)

Pesticide Applicator Training

- Approximately 5000 Montana applicators received IPM training during the recertification process.
- A Montana IPM/Pesticide Newsletter has been developed and is published both as hard copy and on-line. Depending on the issue, this information source reaches 400-500 people each quarter. (Contact: Cecil Tharp)

Nevada – Lisa Blecker

The University of Nevada Cooperative Extension's IPM team consists of Jay Davison, Statewide IPM Coordinator and Area Forage and Alternative Crops Specialist, and Lisa Blecker, the IPM Educator. The team has traditionally focused on IPM in Agronomic Crops and IPM in Recreational Lands, but now plan to expand their activities into urban IPM. They also collaborate with IPM personnel in Arizona, California and New Mexico as part of the Arid Southwest IPM Network. Program highlights for the past year include the following:

- IPM principles were taught at 37 workshops throughout the state, and the results of research projects were presented at 2 field days and 6 field tours. These activities were attended by over 2,385 agricultural producers, public land managers, Extension personnel, and other pest managers. Topics discussed included weed identification and prevention, scouting, and integrating chemicals with other control tactics.
- Continued development of the Nevada Early Detection and Rapid Response (EDRR) Program for identifying and eradicating new invasive weeds. Distribution and abundance maps were developed, along with preliminary "Weeds to Watch" lists and full-color posters of potential new invaders for each individual county.
- Publication of the results of a statewide survey of all Nevada agricultural producers and public land pest managers on the current level of IPM implementation and future educational and research needs.
- Publication of a pocket weed identification and management booklet entitled, "Nevada Noxious Weed Field Guide" (Creech et al., 2010). This details IPM tactics for all of Nevada's 47 noxious weeds, including biological, chemical and mechanical controls. 7,500 of these pocket guides were initially distributed and funding has since been secured from the BLM to print an additional 15,000 copies. This publication won the APEX Award for Publication Excellence for graphic design, as well as the Extension Educational Materials Award from the American Society of Agronomy.
- Research results on the cultural practices necessary to establish several native plant species on abandoned farmlands/disturbed rangelands were presented at two field days (attended by 76 stakeholders) and three field tours (29 stakeholders); additional oral presentations were made at two international symposia (115 attendees), the Nevada Weed Management Association Meeting (56 stakeholders) and a two-day forage workshop (22 attendees). A poster presentation was seen by an additional 63 stakeholders.

New Mexico – Tess Grasswitz

General:

- Several hundred Master Gardeners and other home gardeners were trained in IPM and related topics, including weed, insect and disease identification and management.
- An additional several hundred pesticide applicators were trained in the same topics, and a wide variety of pest-related information was delivered to the state's growers at workshops and conferences for specific crops, including fruit, hay, nut crops, chile, landscape and organic systems.

Agronomic crops (alfalfa and cotton) (Contacts: Jane Pierce, Scott Bundy)

- Research continues on determining the seasonal phenology of four different strains/populations of the Alfalfa weevil (*Hypera postica*) to determine proper timing of management tactics.
- Current work on blister beetles (Meloidae) is aimed at determining the regional prevalence and distribution of different species in NM alfalfa and their respective cantharidin content in order to better understand and manage the risk posed to livestock by ingesting beetle contaminants in hay.
- An extensive survey of the size and extent of pink bollworm populations in eastern NM and west Texas was conducted in conjunction with Texas A & M university. This survey was undertaken in response to

captures of pink bollworms (PBW) in 2009 in the PBW eradication zone between El Paso and the Pecos River.

Specialty crops

- Current IPM efforts in nut crops include determining (i) the extent and impact of biological control in pecan orchards, (ii) the underlying causes of higher levels of damage by pecan nut case bearer in small versus larger trees, and (iii) assessing the phenology and current level of activity of Navel Orangeworm in the pistachio-growing part of NM and its effect on crop quality.
- Education and outreach activities were conducted to alert New Mexico nut growers to new risks from leaf-footed plant bugs (*Leptoglossus clypealis*) and late-season infestations of Conchuela stink bugs (*Chlorochroa ligata*) in pistachios, and hickory shuckworm (*Cydia caryana*) and the pecan serpentine leafminer (*Stigmella judlandifoliella*) in pecans. (Contacts: Jane Pierce, Richard Heerema, Carol Sutherland).
- In Chile, the three main foci of current IPM efforts are: (i) developing integrated control strategies for managing the southern root knot nematode in the presence of weed hosts; (ii) evaluating the impact of economically important flea beetles and understanding their associations with weed hosts, and (iii) the potential of RNA interference (RNAi) gene silencing as a viable option for controlling *Phytophthora capsici*. (Contacts: Steve Thomas, Jill Schroeder, Scott Bundy, Natalie Goldberg)

Small Farm/Urban IPM (Contact: Tess Grasswitz)

- Twenty-six presentations were made on the principles of IPM for approx. 700 home gardeners, landscape professionals and small-scale growers
- A series of organic IPM farm walks and IPM "Bug nights" were conducted for a total of approx. 150 attendees.
- A table-top display of beneficial insects was exhibited at six events attended by a total of approx. 16,250 people.
- Applied research projects are being conducted on squash bug biology and control, and organic control of several fruit pests (codling moth, peach twig borer, and peach tree borer).
- A new outreach and demonstration project funded by a grant from the WIPMC on using native plants for pollinators and other beneficial insects was initiated in collaboration with Dr. Dave Dreesen of the NRCS's New Mexico Plant Materials Center.
- Six school IPM outreach activities were conducted to train approx. 120 facilities managers in IPM techniques. With assistance from the Western School IPM working group, four NM public school districts and two independent schools were assisted in implementing IPM on their campuses.

Weeds (Contact: Jamshid Ashigh)

- A series of workshops were conducted on the prevention, detection and integrated management of herbicide resistant weeds. Resistance has now been confirmed in both kochia (*Kochia scoparia*) and Palmer amaranth (*Amaranthus palmeri*).

Invasive Species/Diagnostics (contacts: Natalie Goldberg, Jason French & Carol Sutherland)

- In 2010, the plant diagnostic clinic processed 1414 plant disease or disorder samples, 1064 insect samples and 150 plant/weed samples. *Phytophthora nicotianae* was found for the first time in the state (on onion and tomato). This is the first report of this pathogen on bulb onions in the US. A new host for New Mexico (peach) was also discovered for the bacterial pathogen, *Xylella fastidiosa*. In addition, *Labyrinthula terrestris*, the causal agent of rapid blight of turf grasses, was found in New Mexico for the first time.

Utah – Marion Murray

- Outreach is a top priority for the Utah IPM Program. In 2010, tens of thousands of clientele were reached through lectures and workshops (23), fact sheets (11), grower field meetings (21), radio (6), Utah Pests quarterly news, Utah Berry Growers Association Newsletter (2 articles), trade magazines (1 article), newspapers (1 article), and online materials. Two major accomplishments were the publication of a collaborative Utah-Colorado Tree Fruit Production Guide by 9 authors, and a new outreach project for fruit growers in northern Utah. The Utah IPM Advisory program continued to grow, with an additional 1000 subscribers in 2010. Twenty tree fruit, 3 landscape, and 5 vegetable advisory newsletters were produced. A survey of advisory recipients indicated that 55% of respondents have reduced their use of broad-spectrum insecticides and 47% have switched to using only selective/soft/organic materials as a result of receiving the advisories. Most (85%) now monitor for pests before spraying, and 35% reduced their pesticide spray and labor costs.
- In collaboration with the Utah Climate Center, data from 16 weather stations is linked to various pest management tools including Utah TRAPs (Timing Resource and Alert for Pests, <http://climate.usurf.usu.edu/pest.php>). TRAPs programmers have updated two models in the system, added graphs showing current weather conditions, and created a frost alert tool with a new map interface.
- A survey of tree fruit growers was conducted in collaboration with the National Agriculture Statistics Service to assess their use of IPM practices. Although only 21% of growers considered themselves IPM practitioners (14% organic), at least 30% regularly used at least seven of the 22 listed IPM practices, and 78% monitored regularly for pests. Those that practiced IPM reported greater pesticide reduction in the last 5 years than those that practiced conventional or organic agriculture.
- School IPM is a growing component of the Utah IPM Program; the latter is a member of the Utah School IPM Coalition which meets twice a year to train teachers and staff. Utah IPM staff also updated and edited the educational component of the newly-formed “iPestManager” for the Salt Lake City (SLC) School District and contributed to the district’s “Pest Press” newsletter. These efforts helped the SLC district to renew their IPM Star Certification, and leverage funding for further improvements.
- Two IPM workshops were conducted in collaboration with the NRCS for CSA vegetable growers. Attendees were mostly organic growers, but 75% were unfamiliar with, or did not use, IPM practices. By the end of the training, 80% of the growers reported that they would use much of what they learned.
- In collaboration with Western Sustainable Agriculture Research and Education (WSARE), IPM mini-grants are offered to USU Extension faculty. In 2010, four projects were funded that addressed control of beet leafhopper to reduce curly top virus, IPM techniques to reduce squirrel damage in alfalfa, backyard poultry production to reduce weeds and insects, and comparison of trunk treatments for flatheaded borer management in peach trees.
- Last year, applied research projects focused primarily on fruits, and included the use of attract-and-kill stations to manage cherry fruit fly; European earwig biology and mass trapping; currant clearwing biology and mating disruption; molecular techniques to detect fire blight; a disease survey of stone fruit, and evaluation of crop rotation schemes and reduction in nitrogen for management of onion thrips and iris yellow spot virus. Since the stone fruit survey failed to find brown rot, growers will be able to forego the fungicide sprays that they have previously been applying for this disease. Similarly, those growers that participated in the fire blight detection service saved, on average, \$50/acre for each spray eliminated. In onions, reducing nitrogen applications from 300 lb/acre to 120 lb/acre reduced onion thrips densities and transmission of iris yellow spot virus. Onions planted after corn had fewer thrips compared to a rotation following wheat. Corn also consumed more soil nitrogen than wheat, and thus fewer onion thrips developed on onions in these plots.

Oregon – Len Coop

Oregon’s IPM program worked on several projects last year, including one on using cover crops to increase populations of natural enemies. Other projects included Spotted Wing Drosophila, School IPM, Watershed-scale IPM, PRIME (Pesticide Risk Mitigation Engine), Western Specialty Crop PIPE, and IPM guidelines for the NRCS.

They are also developing various weather models to predict the spread of a number of pests and diseases and aid in their timely treatment.

Washington – Doug Walsh

Spotted Wing Drosophila

- Research and extension efforts on this pest were spearheaded by Lynell Tanigoshi, Elizabeth Beers, Doug Walsh, Tim Smith, Gwen Hoheisel and Todd Murray. Information on SWD was added to WSU's main IPM website (<http://ipm.wsu.edu>), the WSU Mount Vernon website, (<http://www.mountvernon.wsu.edu/ENTOMOLOGY/pests/SWD.html>) and a comprehensive WSU Extension Spotted Wing Drosophila website (<http://extension.wsu.edu/swd/>). Walsh, Tanigoshi, and many others worked with Drs. Vaughn Walton, Amy Dreves, and Denny Bruck of Oregon State University and USDA-ARS in implementing a \$4.9M interstate SWD project funded by USDA-NIFA's Specialty Crop Research Initiative. Dollars were leveraged from numerous industry commissions to expand this research.

AgWeatherNet

- More than 5000 members now subscribe to this free weather-based decision-aid service. The network includes 134 weather stations across the state and several linked tools that assist users in making agriculture management decisions based on the real-time weather data.

Orchard Biocontrol

- Vince Jones and colleagues at the WSU Tree Fruit Research and Extension Center in Wenatchee completed the second year of their *Enhancing Biocontrol in Western Orchards* project. This collaborative project between WSU, University of California (Berkeley), Oregon State University, USDA-ARS and USDA-NIFA addresses biocontrol in the apple, pear, and walnut industries in Washington, Oregon, and California. Its objectives are to improve the long-term sustainability of the apple, pear, and walnut industries in the western U.S. by enhancing biological control of pest insects and mites, and to synthesize the information developed in the project to provide outreach tools needed to change grower practices. Outputs from this project include six peer-reviewed publications, over two dozen public presentations, and the creation and maintenance of two dedicated websites, <http://enhancedbc.tfrec.wsu.edu> and <http://das.wsu.edu>. Over \$750,000 in additional grant funds have been leveraged to support specific aspects of the project.

Hops and mint

- A bilingual (English/Spanish) of the *Field Guide for Integrated Pest Management in Hops* was published in 2010. The small-format *Field Guide for Integrated Pest Management in Hops: Pocket Version (Guía de campo para el manejo integrado de plagas en el lúpulo: Version de bolsillo)* was also printed on water- and tear-resistant paper stock and wire-bound for use in the field.
- \$1.8M from USDA NIFA's Specialty Crops Research Initiative was awarded for a multi-state (Washington, Oregon, Idaho), multi-institutional (WSU, OSU, U of I, USDA-ARS), transdisciplinary Coordinated Agricultural Project on the impacts of certain biotic (spider mite, aphid, powdery/downy mildew, weed) and abiotic (water-shortage/ drought) stresses on hops and mint.

School IPM (Contact: Carrie Foss)

- Two School IPM coalition meetings were held in Bellevue and Vancouver with representatives from twenty school districts from Washington and Oregon attending.
- IPM STAR re-certification evaluations were conducted at Vancouver School District and South Kitsap School Districts while follow-up on previous assessments continued with Sedro Woolley, Portland, and Pasco School Districts. WSU also assisted the Yakama Nation with IPM implementation at their tribal school.

- WSU hosted a Seattle Rodent Academy with Dr. Robert Corrigan. School district maintenance personnel, Extension educators, pest management professionals and regulators from the Western Region were invited to learn IPM for rodents from this international expert.

Consumer IPM (Contact: Carrie Foss)

- Two websites, Hortsense (pep.wsu.edu/hortsense) and Pestsense (pep.wsu.edu/pestsense) serve as the core of WSU's Extension consumer IPM education resources. During 2010, Hortsense received 1.4 million hits (24% increase over 2009) and 66,808 total visitors while Pestsense received 202,779 hits and 20,979 visitors (21% increase over 2009).

Professional Pest Manager IPM Training (Contact: Carrie Foss)

- During 2010, 4,073 pesticide applicators attended pre-license and recertification training in western Washington with 607 attendees participating in hands-on IPM training for turf and landscape professionals, pest management professionals and structural pest inspectors. The pest management professional trainings were expanded to include training on bed bug inspections and a beetle identification workshop.

IPM for Parks and Natural Areas

- The WSU Urban IPM Program continued its collaboration with Salmon-Safe, a non-profit organization working to restore agricultural and urban streams and the species that inhabit them. WSU conducts assessments of IPM practices in urban parks, corporate and university campuses, and golf courses. Salmon-Safe has worked at more than 20 corporate and institutional sites in Washington and Oregon, including the Port of Seattle Parks, City of Walla Walla Parks, the Olympic Sculpture Park, the University of Washington's Seattle and Bothell campuses, and REI's headquarters, Seattle store, and West Coast distribution center in Sumner, WA.