

California Hosts First-Ever Global Biocontrol Federation Meeting

— by Rick Melnick and Michael Braverman

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Aligning the biocontrol industry on a global scale was the goal of the first-ever meeting of the International Biocontrol Federation in Fresno, Calif. March 2-3.

The symposium drew 121 industry representatives from the US and around the world and was cast by a group of international biocontrol trade associations to share common vision, opportunities and challenges and to develop action plans to get its message onto the international stage.

“We wanted the theme of our first meeting to be action,” said Rick Melnick, board chairman of the US-based Biopesticide Industry Alliance and Global Brand Manager for Valent BioSciences Corporation. “We wanted to leave this meeting having discussed all of the major issues put forth by our members. We can’t solve

everything, but what we can do is prioritize and act in those areas where we can make the most impact.”

The biocontrol industry, which develops, manufactures and distributes biological products for pest control, public health, forestry and crop productivity, promotes awareness on the usefulness of their biocontrol technologies to growers and other consumers. The attending organizations also act as liaisons for several private, governmental and non-governmental groups. Eda Reinot, BPIA board vice-chairman and Director R&D Seed Solutions, Americas, Functional Crop Care, BASE, said that the benefits of the Federation extend into areas where limited resources can be optimized and expertise can be leveraged. “Combined as a global industry we have an incredible team of experts,” Reinot said. “Together we are allies in communicating the proven benefits associated with biocontrols to assist regulators,

policy makers, and private groups seeking to learn more about these technologies. We are proud of this.” David Cary, executive director of the International Biocontrol Manufacturers Association (IBMA), ended the day’s proceedings by summarizing take-away action items for each of the sessions. Cary’s summary included:

- Focusing on the “positives”
- Standby statements for key issues
- Improved communication with the World Health Organization (WHO) and other International

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Dear Friends


I often use this section of the IR-4 newsletter to provide an update of IR-4's fiscal challenges. For this issue, I will focus on a different challenge namely, the significant number of looming retirements and how this loss of experience effects IR-4's succession. This situation is broadly effecting IR-4 as well as our peers within EPA, USDA, industry and many of the applied pest management scientists at the State Agricultural Experiment Stations.

During the 1990's, IR-4 funds were increased and we expanded our staff. At the time IR-4 was a huge beneficiary of the mergers and downsizing of the crop protection industry, and we were able to hire qualified scientists who once worked with American Cyanamid, Rohm and Haas, Rhone-Poulenc, Merck/Novartis and other legacy companies.

Today, many of these highly qualified IR-4 employees are approaching the time to consider retiring from full time employment. This affects IR-4's regional offices, analytical laboratories, field research centers as well as IR-4 Headquarters. Some retirements have been publically announced including Marty Marshall (Southern Region Director), Edith Lurvey (NE Region Field Research Director), Reed Olszack (Southern Region Field Center Director). Others have been privately discussed and are expected. When these professionals depart, they will leave a huge void. However, there will be great opportunities for the next generation of agriculture scientists, who may have fresh ideas, different skill sets and the drive to push the remaining "old dogs" (including yours truly) to rethink and hopefully improve on how we do things. Our greatest challenge will be finding these scientists, when the competition for their talent is high.

Expanding on rethinking how we do things, IR-4 will convene a panel of independent pest management experts who will critically review IR-4's human and infrastructure assets. We are expecting this panel will provide recommendations on how we can focus our limited resources to meet the existing and future needs of IR-4's specialty crop stakeholders. This review was first proposed in the IR-4's Strategic Plan: Vision 2020. Preliminary planning has begun with the review expected in spring 2016.

As far as IR-4's government funding goes, at the time of this writing, Congress has had preliminary discussions of the 2016 Federal appropriations and it is unknown what Congress will appropriate for fiscal year 2016. Many members of IR-4's Commodity Liaison Committee (CLC) had productive visits with key Congressional Representatives/Staff during IR-4's annual meeting in early March, while others were cancelled due to a snow storm. IR-4's CLC Chair, Rich Bonanno, submitted written testimony to the House and Senate Appropriations Committees explaining the need for additional government funding. To be continued...

All the best— Jerry 

DG: Mr. GT

— by Stephen Flanagan. WSR Assistant Regional Field Coordinator

The Western region presented an outstanding service award to Dan Groenendale, the Field Research Director (FRD) at Washington State University in Prosser, Washington. Dan has been the FRD at the WSU Field Research Center since 2007

and comes to this award as "Mr. Go to."



What does it

take to be Mr. Go to? Dan personifies the can do attitude and flexibility of a field researcher extraordinaire.

Every field research site is familiar with that moment in the season when the hours are long, the studies are piling up, and along comes yet another request. In Dan Groenendale's world that request might be Becky Sisco asking how the wasabi's coming along, Doug Walsh wondering when the beer's been brewed, or various personnel at WSU looking for help with any number of software or reporting questions. Dan takes these calls, or replies to the voice mails in a thorough, professional and practiced manner.

The regional coordinators at IR-4 are charged with balancing a field site's resources and completing any season's allotted studies. As Becky Sisco (Western Region IR-4 Field

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WSR RFC, Rebecca Sisco, and Washington State Univeristy's Extension Entomologist, Doug Walsh, present Dan with the Outstanding Service Award at the WSR SLR meeting.



Coordinator) says “Dan has demonstrated his dedication multiple times over, stepping in and taking that last minute trial that someone else couldn’t do; he is the go to researcher. Having a researcher with Dan’s ability to figure out an unusual crop or study is invaluable for successfully completing a season’s work.”

Dan came to IR-4 and WSU with extensive experience in greenhouse management which has served the regional program. With the wasabi project Dan sleuthed out a foliar feeding program that was critical for successfully growing the crop at WSU and OSU. Although the Prosser station is the center of activity for hops, tree fruit and row crops, Dan and his assistant Wilson Peng travel as far afield as Long Beach, Washington (300 miles), Hood River, Oregon (140 miles),

Paterson, Washington (a mere 30 miles) and Wenatchee, Washington (130 miles).

And what’s that about beer making? Dan has set up beer brewing capabilities at WSU to test sensory effects of different mite control programs directed by Dr. Doug Walsh who is the Integrated Pest Management Coordinator at Washington State. Maybe the next time you see Dan at a meeting you can ask him about hop crop stress levels and the 7 point hedonic scale for sensory analysis. Just be prepared for a thorough and complete answer if you ask. Maybe there is a bit of payback for the long hours and juggling multiple responsibilities at a field research center.

In Doug Walsh’s words; “Dan is extremely important in the day-to-day activities of the WSU

Environmental and Agricultural Entomology Laboratory. Dan has taken a leadership approach to entomological research activities on crops including hops, grapes, alfalfa seed, vegetables and ornamentals. Most notably Dan has propagated hundreds of hop plants that he has used to rehabilitate the experimental hop yards for the hop entomology research program, which Dan supervises in the field.”

The Western Region IR-4 is a geographically diverse and disperse region which requires a keen knowledge of local growing conditions, crops, and cooperators for successful research. These multiple layers of research challenges are what Dan rises to. Dan is known for his pluck and determination to complete challenging tasks, and in his own words “I love the challenge of something new and different.”



The Western Region IR-4 is pleased to honor Dan’s efforts with this outstanding service award. We look forward to many future “challenges” and Dan’s exemplary role in tackling whatever new twist comes down the research road. 🌿

A Decade: What has Changed and What has Stayed the Same for Weed Issues?

Third of three retrospectives on the IR-4 Ornamental Horticulture Survey.
 — by Cristi Palmer, IR-4 Ornamental Horticulture Manager

Over the last decade, the IR-4 Ornamental Horticulture Program has conducted a survey of growers, extension personnel and people allied with the “Green Industry”. While the survey is not perfect, it has given a snapshot of the major pests, pathogens, and weeds with which growers battle. The intent is to find the holes in the management tool box – those issues where control options are limited or non-existent – so that we can address problems where our limited resources would have the most regulatory impact. This update focuses on weeds along with a request for participation in the 2014/2015 survey.

Individual weeds of concern have varied quite a bit since the survey began (Table 1). Concern about nutsedge management has dominated the rankings over time, but the other weeds are variable.

Bittercress, oxalis, and liverwort were the other consistently listed weeds. Spurges were included in the top 7 with the exception of the last survey. Other weeds that cycled into the mix were chickweed, eclipta, various grasses, Virginia buttonweed, moss, thistle, and conyza.

Since 2005 (Figure 1), IR-4 has sponsored research primarily on crop safety of herbicides with over the top applications to expand the list of labeled crop species. The efficacy projects included those that focused on nutsedge and sedge, early post-emergent efficacy for bittercress, oxalis, and spurge, and liverwort management. In both the crop safety and efficacy projects, the herbicides chosen shifted over the years depending on the focus. For example, the In Season Herbicide Crop Safety project, has included numerous herbicides

shifting as product labels become fully developed and weeds in nurseries shift. The liverwort crop safety project shifted from testing a single conventional tool in 2005 and 2006 to examining a number of post-emergent biorational tools arising from the liverwort efficacy project.

Over the last decade, IR-4 data have contributed to initial crop lists on new labels and expansion of existing herbicide labels. IR-4 crop safety data have supported crops on the following products: Barricade (prodiamine), Basagran (basamid), Biathlon (oxyfluorfen + prodiamine), Broadstar (flumioxazin), Dimension (dithiopyr), Freehand (pendimethalin + dimethenamid-p), Gallery (isoxaben), Marengo (indaziflam), Pendulum (pendimethalin),

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Table 1. Ranks of the weeds from the annual and biennial grower and extension surveys from 2005 through 2013.

#	2005	2006	2007	2008/2009	2010/2011	2012/2013
1	Nutsedge	Nutsedge	Nutsedge	Nutsedge	Liverwort	Grasses
2	Bittercress	Spurge	Bittercress	Liverwort	Nutsedge	Nutsedge
3	Spurge	Bittercress	Spurge	Oxalis	Bittercress	Conyza
4	Grasses	Oxalis	Oxalis	Spurge	Moss	Liverwort
5	Oxalis	Eclipta	Grasses	Eclipta	Spurge	Oxalis
6	Chickweed	Crabgrass	Liverwort	Bittercress	Oxalis	Bittercress
7	Liverwort	Liverwort	Groundsel	Virginia Buttonweed	Thistle	Groundsel

NCR Recognizes Satoru

The North Central Region recently recognized Satoru Miyazaki's 35 years serving as the NCR Regional Field Coordinator (RFC). In this role and as Michigan's IR-4 State Liaison Representative, Satoru is the second longest serving employee after Paul Schwartz, USDA-ARS.

Satoru received a B.S. in Agriculture, with a specialty in entomology from the University of Tokyo. From there, he received an M.S. in Entomology from the University of Hawaii and Ph.D. in Entomology from the University of Wisconsin. Satoru's major concentrated in the insecticide toxicology area.

Prior to joining MSU, Satoru's experience included working as a senior analytical chemist performing pesticide analysis at CIBA-GEIGY in North Carolina. When he began his career at the Pesticide Research Center at MSU, the primary objectives of the IR-4 Project were to "clear" pesticides for use on minor crops and minor uses on major crops. Satoru's first task was

to implement the PR366 Paraquat/Rhubarb/Weed control project for Bernie Zandstra, a new Horticulturist at MSU just beginning his career as an assistant professor.

An interesting memory from the past was when Alaska belonged to the NCR because of climate similarities. One day in 1978, Dick Leavitt (then Lab Director) and Satoru were flabbergasted when they received, without prior notice, two large heavy wooden crates from Fairbanks. The crates were air-freighted with dry ice and contained residue rapeseed samples treated with Treflan (trifluralin) herbicide. Luckily the shipping had been paid. Before "canola" became popular, Alaska grew rapeseed as a minor crop. Later when Satoru made a field trip to Alaska, he met Charles Knight, University of Alaska, who did the trifluralin/rapeseed project and talked about the surprise delivery.

Satoru has been deeply involved with the Ginseng Board of Wisconsin and its members in

helping to find solutions for American ginseng pest control problems.

Wisconsin produces 90% of the cultivated American ginseng grown in the US. From 2002 to date, and as a result of the IR-4 funded research of Mary Hausbeck, IR-4 has facilitated research data for 13 fungicides, which are labeled for ginseng. Since almost all of ginseng grown in Wisconsin is exported, the role of IR-4 in international activities is vital.

This is just a brief example Satoru's IR-4 experience. In the NCR other examples include: pest control issues of oregano in Iowa, blueberry and cherry in Michigan, sunflower in North Dakota and wild rice in Minnesota.

The NCR is proud to say thank you, Satoru, for your many years of serving the IR-4 Project. 🌿

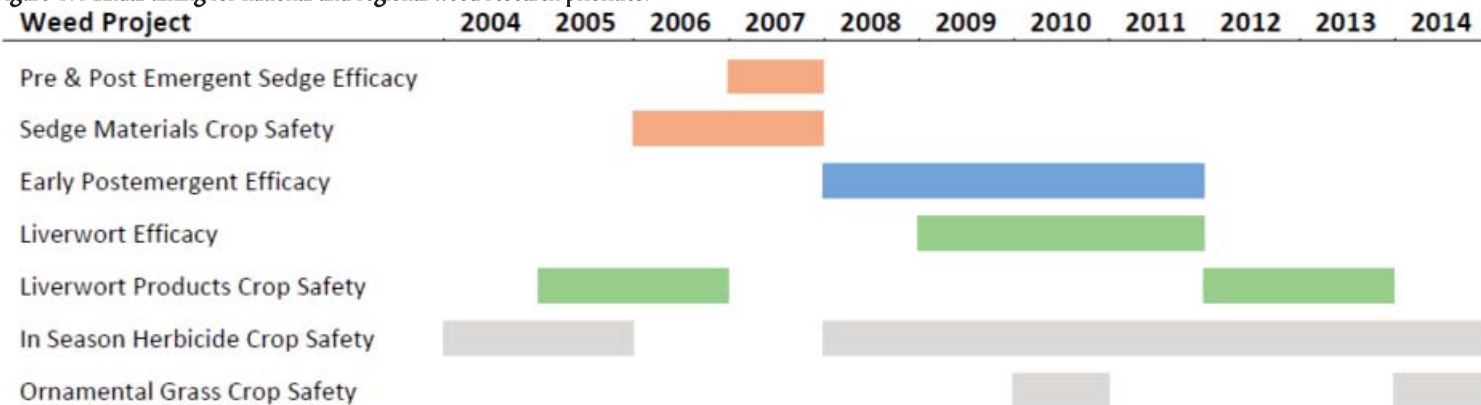


Pennant Magnum (s-metolachlor), Sedgehammer (halosulfuron), SureGuard (flumioxazin), and Tower (dimethenamid-p).

To maintain our success in addressing herbicide and other ornamental horticulture issues, we need input on research priorities. What should we be studying? What

pests cannot be managed with the current tools? Only you can tell us. Please take about 10 minutes and participate in the survey today at ir4.rutgers.edu/Ornamental/Survey/index.cfm. 🌿

Figure 1. Annual timing for national and regional weed research priorities.



IR-4 Hosted a Special Workshop for Pollinator Risk in Ornamental Horticulture Crops

—by Cristi Palmer, IR-4 Ornamental Horticulture Manager

Protecting pollinators is a unique challenge for the ornamental horticulture industry. Recent scientific and public awareness concerning pollinator safety in North America has led to consumers intentionally planting flowering plants suitable for commercial and native pollinators, but recent concerns about potential toxicity to pollinators from those plants, due to the possibility that residues of systemic insecticides occurring in pollen and nectar, have put the ornamental horticulture industry in a quandary. Growers can produce the diverse plant resources needed for a steady supply of nutritious nectar and pollen within residential and commercial landscapes. However, plant production and landscape maintenance often require the use of insecticides to manage insect pests, to maintain plant quantity and quality, and to satisfy regulatory requirements for shipment across state and national borders. Systemic insecticides,

particularly the nitroguanidine neonicotinoids, are of concern because their systemic nature could lead to unintended exposure to pollinators through ingestion of nectar and pollen from treated plants. However, there are many unanswered questions regarding the actual level of exposure in real-world situations and associated risk.

To refine the scientific questions and outline the needed research for the ornamental horticulture industry, IR-4 hosted a special workshop in December 2014 in Baltimore, MD with representatives of the ornamental horticulture industry and scientists who work with pests, pollinator biology, risk assessment, product submission to EPA, chemical residue analysis and agricultural economics. Presentations and discussions ranged from grower perspectives to risk assessments to bee biology and behavior to designing studies which address data gaps for assessing risk to pollinators in production of ornamental horticulture crops.

Speakers and discussion facilitators included: Dan Gilrein, Gary Mangum, Richard Allen, Rich Cowles, Kim Stoner, Lance Osborne, Dave Fischer, Jay Overmyer, Dan Potter, Joe Chamberlin, Hayk Khachatryan, Pete Nowak, Joe Bischoff, Lin Schmale, and Cristi Palmer.

This workshop addressed and clarified necessary research activities to examine risk assessment data gaps. First, it is critical to develop and implement common pollen and residue decline analysis protocols for foliar and drench applications. Second, pollinator attractiveness indices should be developed for ornamental horticulture plants and compared to the likelihood of pest and/or pathogen mitigation actions. Third, to educate consumers about green industry production practices and give them guidance on developing backyard pollinator habitats. It will be important to determine consumer buying preferences related to pollinator safety and grower practices before developing point of purchase educational materials. Outreach materials should be developed from research results being cognizant of different learning strategies and scientific literacy among the different potential audiences. Once these research avenues are addressed, a more thorough pollinator risk assessment for this agriculture sector can be undertaken with the result that label improvements will be made and more informed outreach activities will occur.


For more details, please download workshop presentations and summary notes at ir4.rutgers.edu/pollinatorworkshop.cfm. 



Photo by
Cristi
Palmer

Global Biocontrol

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Governmental Organization (IGOs) and NGOs.

- Harmonized organic certification program and harmonized data requirements for regulatory submissions.

Lynn LeBeck, executive director of the Association of Natural Biocontrol Producers (ANBP), said its board and membership were also pleased to be represented in the Federation. "There are a number of subjects that we agree on," she said. "It's nice that we can stand with a united voice on many of these vital issues." Melnick and the BPIA board believe that interaction with other organizations can only promote understanding of biocontrols.

"Each of our groups has become a resource to assist other organizations who need access to biopesticide technologies and services including new technologies, research and supply capacity, and the international regulatory and commercialization processes," he said. "Combine that collective knowledge it adds to our overall potential."

After the meeting, Cary told reporters, "Now we have set down key issues facing the global biocontrol industry and the discussions will continue at our October meeting in Basel (Switzerland). Our goal is action by that time."

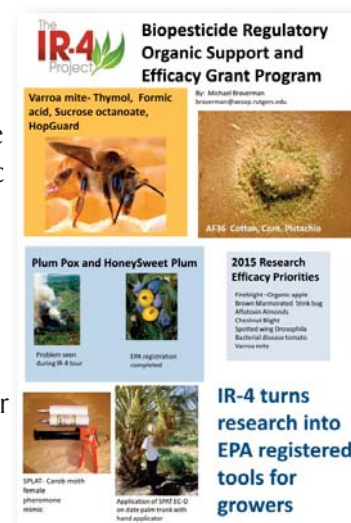
BPIA is the non-profit US-based alliance of biopesticide manufacturers and allied industry committed to raising awareness on the benefits associated with use of biopesticides in agriculture, public health, forestry, and specialty markets. The organization includes basic manufacturers, distributors, and technology and service providers operating in biopesticide markets. To learn more about BPIA, visit biopesticideindustryalliance.org.

IBMA is the European focused association of biocontrol manufacturers, producing solutions: microorganisms, macroorganisms, semiochemicals and natural and biochemical products for plant protection. Based on long years of intensive research and development, the "Biocontrol industry" is now growing fast and can offer safe and cost-effective solutions to growers. IBMA was created in 1995 to represent the views of the developing biological control manufacturers. The association has a diverse membership from large multi-national companies to many small and medium sized enterprise producers who often have limited resources. It also represents research organizations, extension services, consultants and distributors who contribute to the development of biocontrols and participates in IBMA activities. To learn more about IBMA, visit ibma-global.org.

ir4.rutgers.edu

ANBP is the Association of Natural Biocontrol Producers, a professional, non-profit association representing the biological pest management industry. Augmentative biological control utilizes beneficial insects, mites and nematodes to manage plant and animal pests in agriculture. ANBP membership includes producers, distributors, and users of natural enemies, as well as allied industry supporters, university and government researchers, extension agents and regulators. To learn more visit anbp.org.

Michael Braverman, IR-4's Biopesticide and Organic Support Program Manager also participated in the poster session giving an overview of



some of the significant EPA registrations by IR-4 in the field of biopesticides. These include aflatoxin management, varroa mite control in honeybees, pheromones and biotechnology products.

The IR-4 priority research areas for 2015 were also presented along with information about the upcoming IR-4 Biopesticide Workshop on September 24th in Chicago, Illinois. 🌱

The research reported in this report was originally published in the journal *Insect in November 2014*, and was primarily funded by an IR-4 Biopesticide Demonstration Grant. Partial support was also provided by the New Jersey Agricultural Experiment Station and by the USDA-NIFA. This article was edited from the original article by Karl Malamud-Roam, IR-4 Public Health Pesticide Manager.

Bed bugs are among the most difficult urban pests to manage, and the resurgence of bed bugs in recent years triggered the development of many insecticide products for bed bug control in the US. EPA-registered active ingredients for bed bug control include pyrethrins and pyrethroids, neonicotinoids, inorganic compounds (such as silicate-based diatomaceous earth), chlorfenapyr, the organophosphate DDVP (dichlorvos), the carbamate propoxur, the growth regulator S-hydroprene, alcohol, and neem oil. The majority of bed bug products are based on pyrethroids, but these have limited field efficacy due to widespread resistance in bed bug populations. Besides EPA registered products, dozens of "minimal risk" pesticide products that fall under FIFRA Section 25(b) have become commercially available. These products contain one or more listed natural materials such as citronella oil, clove oil, or the soap salt lauryl sulfate. These products are not subject to efficacy data requirements by EPA.

Pest management firms can use a variety of materials to control bed bugs, but homeowners or renters find a limited number of bed bug control products registered for non-professional use. All of the synthetic consumer products sold in the US are pyrethrins, pyrethroids, or silicate insecticides. Unfortunately, the efficacy of synthetic consumer products labeled for bed

Efficacy of an Essential Oil-Based Bug Infestations in

bugs is questionable because most field bed bug populations currently exhibit moderate to high levels of resistance to pyrethroids. Although silicate based products have demonstrated excellent efficacy in published laboratory trials, their field efficacy is unknown. The poor efficacy of the available bed bug control products can lead to chronic infestations, frequent treatments, use of off-label products by consumers, or the spread of the infestation into adjoining premises in multiple occupancy dwellings.

Bed bugs commonly hide on beds and upholstered furniture where applying insecticides creates opportunities for human-insecticide exposure. Therefore, there is strong interest in insecticides that have low health risks to humans and pets. Dozens of 25(b) products have become available in response to the need for safe treatment of bed bug infested furniture, and these are commonly used by consumers suffering bed bug infestations. Despite their popularity, there is only one previous scientific report documenting the efficacy of 25(b) bed bug sprays. In that study, among 11 products tested in direct spray laboratory assays, only EcoRaider and Bed Bug Patrol (clove oil + peppermint oil + sodium lauryl sulfate) caused >90% mortality; the other nine products caused 0%–61% mortality. No field efficacy data on 25(b) products has previously been published.

In this study, our objectives were to determine the effectiveness of EcoRaider spray in naturally infested apartments, and to determine whether EcoRaider alone or in

combination with a synthetic insecticide will provide a similar level of control compared with synthetic insecticide alone. Temprid SC, a synthetic insecticide commonly used for bed bugs by pest management professionals, previously shown to be highly effective against this pest, was selected for comparison in this study. The study was conducted in two high-rise apartment buildings located in Irvington, NJ. Most of the apartments were occupied by senior citizens and did not have air conditioners. Bed bugs collected from apartments prior to the study showed low to medium level resistance to pyrethroids.

Bed bug infested apartments were identified using records from the housing staff and verified with insect interceptors under the legs of beds and upholstered furniture. Twenty four apartments with 9–318 bed bugs were selected. Among the 24 selected units, 14 residents used



insecticide sprays before our study (13 used pyrethrins/pyrethroids and one used essential oils), seven residents used electronic pest repellents, and seven residents did not use any pest control products. 80% of mattresses and box springs were encased in plastic or fabric. The 24 apartments were divided into groups based on bed bug

— by Changlu
Narinderpal S
Richard Coop
of Entomology
University

Bed Pesticide for Controlling Bed Apartment Buildings

Wang,
Singh and
er, Department
y, Rutgers

counts. Apartments in each group were randomly assigned to one of three treatments: EcoRaider alone, Temprid SC alone, or a combination of the two. We asked all residents to stop using insecticides. We did not include an un-treated control because residents would be reluctant to participate in the study if their apartments were left un-treated for an extended period of time. A comprehensive spray treatment was performed in each of the test apartments at 8–10 days after the pre-count was obtained. For all treatment groups, follow-up visits were conducted biweekly during which a visual inspection of beds and upholstered furniture was conducted to guide additional treatments, which were applied only where live bed bugs were found. The amount of pesticide used was not significantly different between treatments.

In all groups, residents were taught how to recognize, prevent, and control bed bugs. Residents were encouraged to reduce clutter and launder bed sheets and clothing frequently. Insect interceptors installed under bed and sofa legs were inspected after the initial

treatment. If bed bugs were not found in interceptors, a thorough visual inspection was conducted to confirm bed bug elimination.

The apartments were thoroughly inspected at 12 weeks. There were no significant

differences in the initial bed bug counts among treatment groups. The bed bug counts declined in all groups significantly over 4 to 12 weeks. At 12 weeks, the mean bed bug counts were 9.1 (Treatment I = EcoRaider), 5.9 (II = Temprid), and 14.1 (III = Combination). The mean bed bug count reduction in the three treatments was 92.5, 92.9, and 91.7%, respectively.

At 12 weeks, bed bugs could not be found in 5 apartments, evenly divided between treatments. Eighteen (78%) apartments still had bed bugs based on interceptor counts (mean: 11; range: 1–70), although visual inspections only found bed bugs in 50% of the infested apartments. Interviews with residents whose apartments still had bed bugs show that 76% of them did not feel bites or see bed bugs.

We interviewed residents regarding their pesticide use prior to our treatments, and 89% used at least one type of product for bed bug control, most often pyrethroid sprays. Other self-control products included silicon dioxide dust, essential oils, rubbing alcohol, household cleaning sprays, electronic “pest repellers”, and pesticides labeled for other pests. Homeowners commonly use insecticides themselves when they find pests at home, but many of these treatments are ineffective and over-application is common. Especially when applications are made to beds and sofas, or other furniture where residents rest and bed bugs hide, there are major risks of high pesticide exposure to

people. Identifying low-risk and effective alternative insecticides will have immediate benefit to consumers.

The active ingredients in EcoRaider are not unique, but the efficacy of other 25(b) products against bed bugs was substantially lower than EcoRaider in our laboratory tests. This may be due to formulation differences, differences in the cedar oil source, or interactions among the active ingredients which might enable the active ingredients to more effectively penetrate the insect cuticles. Further research on the relative toxicity of essential oils and their interactions will be instrumental in developing more effective products.

Ecoraider has a noticeable smell that can last for more than two weeks after application and is much more expensive than the commonly used synthetic insecticide sprays. Users should learn where bed bugs hide and target the treatment to bed bug harborages to maximize the effectiveness of the treatment and minimize misuse and cost.

Sprays alone did not eliminate most bed bug infestations after four follow-up inspections and re-treatments, confirming the limitations of insecticide treatments alone in eliminating bed bug infestations. Resident cooperation and non-chemical methods such as de-cluttering, frequent laundering and drying, etc., will no doubt provide faster elimination of bed bugs and further reduce the need for insecticide applications. 🌱



Flupyradifurone (Sivanto™ 200 SL Insecticide – Bayer CropScience)

Introduction: On Jan. 15, 2015, registration was finalized by the EPA for the new active ingredient (AI) flupyradifurone (originally coded BYI-02960), and end-use product Sivanto™ 200 SL, on multiple commodities. Regulatory scientists from EPA and counterpart agencies in Canada and Australia conducted a global joint review of the dossier. The authorities in Brazil, China and Mexico were observers. This AI, discovered by Bayer CropScience, is the first member of the butenolides, a new chemical class of insecticides (classified in the newly created subgroup 4D by the Insecticide Resistance Action Committee [IRAC]). Due to its favorable human health and ecotoxicological profile compared with products already in the market, flupyradifurone has received Reduced Risk designation by EPA. Registration of Sivanto provides growers with a new resistance management and pest management tool for rapid knockdown of all mobile stages of sucking pests (such as aphids, whiteflies, thrips and psyllids), via foliar, soil drench and/or chemigation. Based on its selectivity to most beneficials in fruit and vegetable crops, Sivanto can be used in IPM programs together with biologicals and beneficials. The product has a favorable honey bee profile – studies showed it is practically non-toxic to adult honey bees when used as directed, with no adverse effect on overall honey bee colony

This section of the IR-4 Newsletter called 'New Product Corner' was suggested by grower stakeholders as a way for IR-4 to help inform specialty crop growers about pest management tools recently registered by EPA. This is for informational purposes only as IR-4 does not endorse a particular product or registrant.

performance or overwintering ability compared to untreated colonies. The EPA registration decision involved evaluation of the largest number of honey bee-related studies ever for the registration of a new chemical.

Other global registrations: registered in Dominican Republic, Honduras, Guatemala, Nicaragua; expected spring 2015 in Canada, Mexico; and from 2016 onwards in European countries, Australia, etc.

U.S. trade name/formulation: for food uses - Sivanto™ 200 SL (1.67 lb ai/gallon)

U.S. labeled crop uses (see label for specific use pattern and other general directions for use) on Sivanto™ label: root vegetables in Crop Subgroup 1B (except sugar beet); tuberous and corm vegetables in Crop Subgroup 1C; leafy vegetables in Crop Group 4; Brassica leafy vegetables in Crop Group 5; legume vegetables (succulent or dried) in Crop Group 6; fruiting vegetables in Crop Group 8-10; cucurbit vegetables in Crop Group 9; citrus fruit in Crop Group 10-10; pome fruit in Crop Group 11-10; bushberry crops in Crop Subgroup 13-07B (except cranberry); small fruit vine climbing crops (except fuzzy kiwifruit) in Crop Subgroup 13-07F; low growing berries in Crop Subgroup 13-07G (except cranberry); tree nut crops in Crop Group 14-12 (except almond); cereal grains in

Crop Group 15 (except rice); nongrass animal feeds (alfalfa and clover only [clover in only ID/OR/WA]); hops; peanut; cotton

Sivanto™ labeled pest spectrum: aphids, blueberry maggot, Colorado potato beetle, leafhoppers, certain mealybugs, psyllids, certain scales, squash bug, thrips, whiteflies

IR-4 projects submitted with the first dossier (PR#): blueberry (10637 – global residue study); prickly pear cactus (10722 – foliar use); clover, red, seed crop (10747)

Ongoing IR-4 residue projects (PR#): 2012 – caneberry (10860), GH cucumber (10785), pomegranate (10770), GH tomato (10784); 2013 – GH bell/non-bell pepper (11244), prickly pear cactus (11188 – soil use)

Other IR-4 database requests (PR#): asparagus (11318) 🌿

*See labels for specific use patterns and other general directions for use.

eNewsletter

We launched our first eNewsletter with our last edition. We will continue publishing print and digital versions throughout the year.

Please let us know which version you wish to receive or if you want both. Contact Sherri Novack at novack@aesop.rutgers.edu or 732.932.9575 x 4632.

The IR-4 Commodity Liaison Committee (CLC) met on March 4, 2015 at the Holiday Inn Capital, Washington, DC. The eighteen members in attendance voted to renew the memberships of Ray Prewett, Texas Vegetable Growers; Paul Schlegle, American Farm Bureau Federation; and Lin Schmale, Society of American Florists. New CLC members include, Steve Salisbury, Mint Industry Research Council; Bob Simerly, Onion Growers Association and McCain Foods; and Dennis Tristao, J. G. Boswell Co.

The major topics of discussion were the IR-4 funding, which included the ARS budget, where IR-4 is not considered to be a “core program”, and the need to provide overhead to universities. IR-4 dollars have been exempt from overhead dollars within the Land Grant system; however, some universities are asking for overhead (indirect costs). Any overhead paid would come directly from the IR-4 budget.

Other topics of importance included the fewer new compounds in the Industry pipeline, increased interest in Biotechnology, studies surrounding pollinator issues, and more decline studies required for food crops.

All of these issues result in a critical need for increased funding for IR-4. The CLC is also looking to into alternative funding methods within the Federal Budget, such as an IR-4 authorization within the Farm Bill.

The fewer number of new compounds is resulting in some companies choosing to do some of the minor crop work on their own. When companies are not working on new products for major crops they free up both lab space and

personnel to do the minor crop work on their own.

While this may seem to be a reduction in potential workload for IR-4, there is more interest in biopesticides, which has resulted in modified thinking regarding IR-4 biopesticide support. There is increased potential for IR-4 to fund more research on biopesticides and to “main stream” them into the current research prioritization process.

Increased EPA research requirements are commonplace within IR-4 research. Pollinator issues are requiring additional research on most studies to look at pesticide residues in both pollen and nectar. While this new data fills a critical need in understanding the connection between pesticides and pollinator health, it creates a financial burden on IR-4 and further intensifies the need for additional dollars.

EPA is also requiring more pesticide decline studies on food use products. This too justifies the need for increased funding.

During the week, some CLC members made Congressional visits to connect with members of Congress and their staff to discuss the future of IR-4 funding. The CLC had great discussion on these topics and more and looks forward to continued dialogue. 🌱

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2015 Canadian Biopesticides and Minor Use Pesticides Priority Setting

— by Shirley Archambault, and Leslie Cass Pest Management Centre, Agriculture and Agri-Food Canada

The 13th annual Canadian Biopesticides and Minor Use Pesticides Workshops were held from March 24-26, 2015 in Gatineau, Québec. Over 190 participants including growers from Canada, US and Mexico; registrants from Canada, US, Japan, and the Netherlands; provincial crop specialists; and Minor Use Coordinators, Health Canada's Pest Management Regulatory Agency (PMRA) officials, as well as representatives from the US IR-4 program, the Australian Government, Crop Protection Australia, and Agriculture and Agri-Food Canada researchers and Pest Management Centre (PMC) staff were in attendance. The purpose of these workshops was to select (through grower consensus) top insect pests, diseases and weeds and the pesticide solutions for their control, and up to nine biopesticide products as candidates for registration in Canada.

Forty-two crop-pest priorities were selected during the Minor Use Workshop including thirty-four "A" priorities and eight "A" Priorities without solution (APWS) within pathology, entomology and weed science disciplines. Issues such as spotted wing drosophila, mites, nematodes, powdery mildew and bacterial diseases in various crops remain high priorities. The Minor Use Pesticides Program will now address these issues and work in partnership and collaboration with growers, registrants, researchers


and the federal regulator (PMRA) to improve grower access to new and effective pest management tools. If similar priorities are selected by the US stakeholders at the IR-4 Food Use Workshop, in September, some of the priority issues may be addressed as joint (US-Canada) projects.

In addition, nine biopesticide products were identified as priorities for registration, and from these, PMC, in collaboration with key stakeholders, will select four products to receive regulatory support toward first time registration or major new use site registration through the Pesticide Risk Reduction Program (PPRP). This selection is made based on an analysis of potential impact for growers', needs within the industry as a whole, and other considerations. The PPRP facilitates improved grower access to reduced risk pest control products through its work with registrants, growers, and the PMRA on first time registration of new biopesticides and major new use site category expansions of those already registered, and in its support for IPM projects which incorporate priority biopesticides into production systems for growers.

A special session on bacterial diseases was held the afternoon before the Priority Setting Workshops at the request of industry, which is concerned about lack of sustainable control options for serious bacterial diseases.

Information on integrated approaches and gaps for management of key bacterial diseases including fireblight in apple, canker in cherry, and bacterial diseases affecting field vegetables and strawberries were presented by research and crop specialist experts in these areas. Potential solutions in the pipeline, including reports on PMC projects, ongoing AAFC research, and work underway at the US IR-4 (presented by Kathryn Homa, IR-4 Fungicide Coordinator) were shared with more than 100 participants in attendance.

With limited new options coming "down the pipe", and given the tendency for pathogens to develop resistance to products such as antibiotics, delegates agreed that integrated pest management approaches will be of critical importance for long term management of these diseases.

This will include incorporation of products and production practices with multiple modes of action, along with cultural and sanitation practices and use of available resistant varieties. If you wish to receive the lists of selected priorities please contact Shirley Archambault at: Shirley.archambault@agr.gc.ca. 

Reminder

Attend IR-4's Global Minor Use Priority Setting Workshop September 20-22 in Chicago, IL.

Register today at ir4.rutgers.edu
Also consider attending the Food Use and Biopesticide Workshops September 22(afternoon) -24, 2015

New Equipment for MSU and UFL Labs

— by Sue Erhardt, MSU and Wlodek Borejsza-Wysocki, U of FL

After long negotiations with Michigan State University (MSU) purchasing and instrument suppliers, the MSU IR-4 North Central laboratory was able to lease a new LC/MS/MS instrument from Thermo Scientific. Their existing Thermo Finnigan Quantum LC/MS/MS was 14 years old and was no longer running reliably. Given the longevity of the Thermo instrument as well as their familiarity with the equipment, MSU made the decision to proceed with Thermo Scientific Endura LC/MS/MS for a 5 year lease with a one dollar buyout at the end of the lease. The new equipment arrived in mid-February in several large crates. After weeks of anticipation and some delay, Thermo Scientific personnel installed the new equipment and gave the instrument a brief shakedown by mid-March.

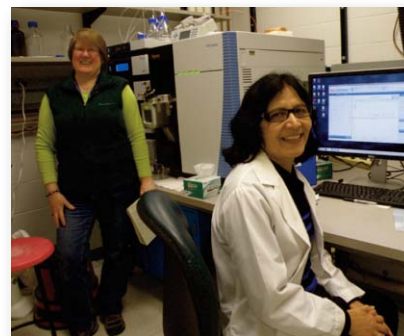
Sima Kumar is the analyst operating the new instrumentation and has already found that the sensitivity and reliability is much improved over the retired equipment. The first projects for the new instrument at MSU are two trifloxystrobin

ion studies conducted in cooperation with our colleagues in Canada.

But the life of the old equipment is not over yet. MSU agreed to send the old instrument to the University of Florida (U of FL), Gainesville, IR-4 Southern Regional (SOR) Laboratory. The North Central and Southern regional labs shared similar vintages of Thermo Finnigan LC/MS/MS instrumentation. These instruments no longer have available parts, so shipping the old MSU instrument to U of FL may allow their older instruments a few more years of useful life. Personnel from MSU Surplus helped pack up the instrumentation with the hope that it will extend the life of Florida's older and not yet replaceable instrumentation. Now the MSU instrument will be able to retire in comfort and help the Florida lab at the same time.

While MSU negotiations were on-going, so too were negotiations with multiple suppliers with the SOR Laboratory, which decided to purchase a new LC/MS/MS instrument from Thermo Scientific as well. Currently, the lab uses Triple Quadrupole LC-MS instruments, all of which were leased from Thermo Scientific. the SOR Lab has been pleased with the equipment and the service provided by the company.

Last November, the IR-4 SOR lab



Susan Erhardt (left) and Sima Kumar (right) in front of the new Thermo Endura LC/MS/MS at MSU.

was excited when boxes with a new Thermo Scientific TSQ Quantiva mass spectrometer, and a new nitrogen generator (PEAK Scientific) arrived in the lab. After the equipment was installed in the first week of December the chemists were trained, and the TSQ Quantiva was successfully used by chemist Victor Bauder in the first IR-4 project to analyze residue of flonicamid and its metabolites on pea.

For both laboratories, these new high tech, higher sensitivity instruments with breakthrough software are significant additions. We expect that TSQ Quantiva (Florida) and TSQ Endura (MSU) will make the analyses more efficient especially for complex and difficult to run samples. In addition, having functioning instruments versus those awaiting parts and/or service has the potential to improve productivity. 🌱



First short training provided by Gerald Koncar from Thermo Scientific at U of FL



Annie Young of MSU Surplus strapping down the old equipment for shipping to U of FL

Highlights from the IR-4 Southern Region GLP and Residue Field Training

— by Michelle Samuel-Foo SOR Regional Field Coordinator

According to IR-4 protocols, what is the minimum information that must be on plot markers when conducting an IR-4 Maximum Residue Level (MRL) field trial under Good Laboratory Practice (GLP) regulations? The answer to this question and many others were belted out during the recently concluded IR-4 Southern Region

of the IR-4 Quality Assurance Unit, who met later that week at the IR-4 SOR office for their annual planning meeting. Study directors from IR-4 HQ and representatives from the IR-4 Western Region (WSR) also participated.

Attendees were welcomed by Maurice Marshall, the IR-4 SOR Program Director. IR-4 SOR Field Coordinator, Michelle Samuel-Foo, moderated the sessions and opened the training by reminding attendees about the logic behind and importance of “Draft Protocols, Protocols and Amendments.” Kathleen Knight, SOR QA coordinator followed with a presentation on “Differentiating Multiple Trials in a Single Study.” Kathleen highlighted the criteria that field researchers are expected to utilize when completing two or more trials from the same GLP residue field study. In the south, it

is common for a Field Research Director (FRD) to have this situation in any given year, depending on the commodity of interest.

Sherita Normington, WSR QA Officer led a session on “Test Substance Receipt and Identification” which included the new IR-4 requirement that governs temperature monitoring, and the expiration of and storage for adjuvants that will be used during residue trials. This change became effective in March 2015. Sherita’s talk outlined the check-off points that researchers need to pay attention to during the course of a study and also touched on the use of secondary containers for test substances. Sherita also covered the retention of containers after a trial is completed at a field site. Robin Federline, SOR QA Coordinator joined Sherita’s talk, as they emphasized the importance of



IR-4 study director Ken Samoil, SOR field coordinator Michelle Samuel-Foo, and Field Research Director at TX Agril Life Weslaco, Cristina Marconi, capture the output from a boom during a calibration event as part of the field demonstration at the University of Florida horticulture science facility. *Photo by Jun Estorninos*

GLP field and residue training workshop that was held on March 10 -11th, 2015 in Gainesville, FL. Field personnel from the IR-4 Southern Region (SOR), and contract research organizations, participated in a two day intensive training that consisted of classroom sessions and field demonstrations.

Attendees also included members



It’s all smiles from the attendees following a successful GLP field and residue training workshop in Gainesville FL, hosted by the IR-4 Southern region. *Photo by Wlodeck Borejsza-Wysocki*
ir4.rutgers.edu

“Communication and Timely Follow- up” with respect to scheduling field in life and facility audits, as well as communicating changes to master schedules. Effective and timely communication was a strong focus of many of the sessions that were presented during the meeting and Martin Beran, WSR QA Coordinator continued the theme discussing the “Notes and Communication” section of the Field Data Book (FDB), where he highlighted the best practices for completion.

Ken Samoil, IR-4 Study Director, and WSR Assistant RFC, Stephen Flanagan, gave a well-received presentation on “IR-4 Application Types, Advisories and Calculations.” They provided detailed explanations of the different types of foliar vs soil applications that typically appear in protocols. Stephen used examples from uncommon trials, to introduce workshop participants to different scenarios and protocol language. Stephen’s use of photographs to quiz the workshop attendees was very useful in driving home the different application types that FRDs are likely to encounter. Ken also led a session entitled “Protocols and Field Data Books” where he presented the changes to the 2015 protocols and improvements that researchers could expect to see in the 2015 version of the IR-4 FDB. Michelle, Ken and Stephen led the audience section by section through the FDB. Audience members had an opportunity to seek clarification on areas of the notebook that they might have had difficulty with in the past. The QA team were also on hand to field questions, and they

provided helpful explanations on the logic as it relates to data collection metrics.

Tammy Barkalow, IR-4 Assistant Director QA, took the audience through a session on “Updating Standard Operating Procedures (SOPs)” and also touched on the plethora of information that is available on the IR-4 website (including master schedule and EPA residue and Testing Guidelines) as well as the eQA system. Tammy shared the IR-4 SOP web interface where SOPs from all field sites across the program, will soon be posted or linked on the IR-4 webpage, beginning in 2015.

Quality Control (QC) of FDBs is a critical initial step that all FDBs must pass at the regional level before being audited by QA. The importance of this process was emphasized by Grace Lennon, IR-4 Study Director, who talked about the differences in QC vs QA review. Grace also went into detail about the best practices for presenting calculations in FDBs, highlighting the significance of not omitting steps and carrying forward units during calculations with regard to the role this information plays in future review of the generated data.

Jane Forder, HQ QA Officer moderated the closing panel discussion on Day One. Members of the program wide QA team fielded questions from index cards that were distributed to the workshop audience. This served as the perfect transition into an informal but lively segment. Topics ran the gamut from “what does the IR-4 acronym mean?” to “the

difference between deviations and amendments.”

In keeping with tradition, the SOR workshop integrated elements of fun and lightheartedness into the meeting. Martin Beran joined Michelle Samuel-Foo as host in a blended Jeopardy-style game that was entitled: “How Well Do You Know IR-4 and GLPs?” Workshop participants were awarded prizes for effort and for correct answers, of course. This “game show” served the dual purpose of breaking up the monotony of continuous classroom sessions and also gave folks an opportunity to show off their familiarity with all things GLP and IR-4.

Concurrent field demonstrations led by Roger Batts, NCSU FRD; Peter Dittmar, U of FL FRD and Stephen Flanagan were a major component of the second day’s afternoon training. The presenters each discussed the calculations that are involved in different types of applications. This was accompanied by simulated spray demonstrations and an airblast application demonstration.

As the classroom segments were drawing to an end, the IR-4 SOR program used the gathering to acknowledge the contributions of two long serving members of the SOR family. Reed Olszack, FRD at the U of FL TREC and Lori Gregg, former FRD at Texas Agrilife in Weslaco, TX were honored with plaques to commemorate their contributions to IR-4. 🌱

Baited Trap Technologies

Mosquitoes and other arthropod vectors of human disease are small, dispersed, mobile, and hard to target with pesticides. In addition, chemical control of vectors using area-wide pesticide applications is increasingly restricted because of risks to pollinators, endangered species, and other non-target species. Regulators generally consider that the human risk associated with vector control practices is minimal. Public concerns about pesticides are considerable therefore vector control programs strive to minimize pesticide drift into inhabited areas. Larval mosquitoes have a more limited distribution than adults, but are often in inaccessible sites. For all of these reasons, there has been a recent surge in interest in "attract-and-kill" technologies in vector control.

Attract-and-Kill

— by Karl Malamud-Roam, IR-4 Public Health Pesticide Program Manager

These approaches to vector control use the mobility of adult mosquitoes as part of a strategy which attracts pests from a wide area to a trap or other "kill zone." In recent years, attract-and-kill systems have become increasingly practical, and many people are familiar with the devices which trap and kill female mosquitoes while they seek blood meals. A previous IR-4 Newsletter article (Vol. 45 No 1 Winter 2014) described attractive toxic sugar baits that target male and female adult mosquitoes as they search for carbohydrate food sources.

Another approach to trap-and-kill targets females hunting for egg-laying (oviposition) sites, and then killing them or their young. Female mosquitoes lay eggs every

3-7 days, up to eight times. Oviposition requires female mosquitoes to search for areas in their habitat suitable for the survival of their young, and they find these sites largely through chemical cues. The hope is that effective oviposition attractants will lure mosquitoes to devices which trap the adults, poison the adults, trap or poison the juveniles after oviposition, or dose the adults with IGR's which they will carry to other oviposition sites. Future articles in this series will review each of these approaches and the research that IR-4 is conducting to evaluate them. 🌱



A "Mosquito Magnet" trap for host-seeking female mosquitoes.

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