

Maintaining Relevance in IR-4 Food Crop Registration Activities

— by Jerry Baron, IR-4 Executive Director and
Marty Marshall, Chair, IR-4 Project Management Committee

In the late 1990's IR-4 established timelines for the development of data to support registration of new pesticide uses on specialty crops. The goal was to submit a pesticide petition to EPA for a use within 30 months of when the protocol for the study was signed. IR-4 has had varying degrees of success with this timeline. Some critically important data packages/petitions have been completed and submitted in less than 12 months. Others, for a variety of reasons, have been submitted well past the 30 month performance standard. Obviously, delayed submissions delay approvals. If IR-4 misses submission timelines it can result in more work and expense for both the EPA and companies.

The regulated community is facing unprecedented challenges in establishment and maintenance of pesticide registrations. These challenges are the result of recent Federal Court decisions involving the Endangered Species Act and National Pollution Discharge permits, full implementation of 1996

amendments of FIFRA involving registration review and new study requirements for pesticides. In response to these challenges, companies of all sizes have informed IR-4 that they are intending to limit the number of submissions for a specific active ingredient. Registrants are asking IR-4 to further coordinate the specialty crop and minor use submissions with theirs. It is quite possible that IR-4 may only have one to two opportunities to submit data to support new uses. More importantly, if IR-4 data is not ready to be submitted near the time of the industry submission, the IR-4 submission may be delayed until the next industry submission. Worse case, IR-4 may never be able to submit the data.

In order to ensure the IR-4 developed data is fully used for its intended purposes, which is to facilitate the registration of a pesticide for needed specialty crop pest management use, IR-4 make change the linear approach of a 30-month timeline into a strate-

gic approach where all units of IR-4 are working in a coordinated manner on a specific project timeline. In many cases this means cutting the 30-month timeline almost in half.

Working strategically to reduce the time it takes for IR-4 to develop field and lab data and submit final reports to EPA will require IR-4 to look at areas where pinch-points, which obstruct data development, are formed. Some identified pinch-points include:

- Delays in finalizing study protocols, due to uncertainty about proposed use pattern, analytical method, or residues of concern

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Congress Spurs Immediate Steps to Limit Asian Stink Bug Damage to American Farmers

This release was posted on Rep. Bartlett's website at: bartlett.house.gov on September 24, 2010.

Congressmen Roscoe Bartlett (R-6-MD) recently coordinated meetings with officials from the US Department of Agriculture (USDA) and the Environmental Protection Agency (EPA) as well as collaborated with Congressman Todd Platts (R-19-PA) to send a bipartisan letter from Members of Congress to USDA Secretary Tom Vilsack and EPA Administrator Lisa Jackson to spur immediate steps to limit damage to America's farmlands from the Brown Marmorated Stink Bug (BMSB), *Halyomorpha halys*. The 15 bipartisan House members wrote that "both farmers and our local economies face profound harm if we fail to take action; damage from this insect could prove to be a national crisis." Congressman Bartlett said, "My immediate goal has been met to reach agreement on a series of steps that will allow coordinated federal government assistance to combat the BMSB during this year's fall harvest and next year's growing season. Swift action is needed to avert the potential of this invasive stink bug to cause a plague for American agriculture of biblical proportions."

Key members who signed the letter include the Chairman and Ranking Members of the House Agriculture Committee, Rep. Collin Peterson (D-MN-7) and Frank Lucas (R-OK-3), Dennis

Cardoza (D-CA-18), chairman of its Subcommittee on Horticulture and Organic Agriculture, and fellow Maryland delegation members: Frank Kratovil (D-MD-2), C.A. Dutch Ruppersberger (D-MD-2), and Steny Hoyer (D-MD-5). The Subcommittee on



The Brown Marmorated Stink Bug on hibiscus. Photo by Suzanne Wainwright-Evans

Horticulture and Organic Agriculture has jurisdiction of USDA-APHIS (Animal and Plant Health Inspection Service). In addition to Roscoe G. Bartlett (R-MD-6) and Todd Russell Platts (R-PA-19), the complete list of 15 members who signed the letter include: Shelley Capito (R-WV-2), Bill Shuster (R-PA-9), Frank Kratovil (D-MD-2), C.A. Dutch Ruppersberger (D-MD-2), Steny Hoyer (D-MD-5), Dennis Cardoza (D-CA-18), Charlie Dent (R-PA-15), Frank Lucas (R-OK-3), Leonard Lance (R-NJ-7), Collin Peterson (D-MN-7), Frank Wolf (R-VA-10), Peter Welch (D-VT-at large), Tim Holden (D-PA-17).

Congressman Bartlett organized a meeting in September with officials from USDA-APHIS and

the EPA to discuss strategies to combat the BMSB. Congressman Platts as well as staff from other interested members attended that meeting. As a result of this meeting, USDA-APHIS agreed to the urgent request by members in their letter "to fast track the reclassification of *Halyomorpha halys* from a non-regulated pest to one that is regulated."

Introduced to the U.S. from its native habitats in Asia in the mid-1990's, *Halyomorpha halys* damages all types of crops (apples, corn, soybeans, peaches, pears, watermelons, cantaloupe, tomatoes, peppers, blueberries, raspberries, blackberries, wine grapes, and more.) It is affecting silage, field corn including the stalk grown to feed dairy cows, and may damage dairy operations. Young trees such as sugar maples and other ornamentals are also damaged. While its greatest damage is currently occurring to crops in the mid-Atlantic region, *Halyomorpha halys* is fast moving. There are established populations in 15 states, with climates and agriculture as diverse as New Hampshire, Florida, Illinois and southern California. Specimens have been identified in 29 states.

Halyomorpha halys has no known natural predators in the United States. Its rapid spread, damage to so many different crops throughout the growing season, adaptation to diverse climates,

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Relevance

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- Missing the appropriate time for applications/harvesting of the test crop
- Need to repeat a field trial because of crop failure, critical error in test substance application, residue sampling errors or freezer failure
- Delay completing Field Data Book, including delay in responding to Quality Control review and/or Quality Assurance audits
- Delay in laboratory receiving the residue samples
- Delays in laboratory starting method validation/storage stability aspects
- Problems with method validation/sample analysis in analytical laboratory
- Delay in completing Analytical Summary Report, including delay responding to Quality Assurance audits

- Working on too many different chemicals
- Field Data Books and/or Analytical Summary Reports submitted late
- Quality Assurance Unit rechecking previous audits
- Researchers needing to address Quality Assurance comments that are non-GLP
- Continuing to develop data/reports for chemicals with significant regulatory concerns
- Delay in companies providing supporting documentation (e.g. Letter of Authorization, Notice of Filings, EPA forms, data archival location)
- Bundling issues; one lab has completed chemical, waiting on others to submit reports for same chemical
- Loss of staff and other personnel issues

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Stink Bugs

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and wintering in homes and other buildings has made control and eradication difficult. Existing plant protection products, pesticides and practices are only minimally effective because of the way the insect feeds.

To limit damage to American farmers and agriculture as a result of the dangerous characteristics of the BMSB, the Members of Congress asked "that EPA evaluate existing plant protection tools and facilitate collaboration amongst the various federal research agencies, universities and private companies to ultimately facilitate the registration and/or emergency use of effective pesticides."

In response to this request by

Members of Congress and in response to the meeting, after the re-classification of the BMSB as a regulated pest, USDA-APHIS will request EPA approval under Section 18 of the Federal Fungicide Insecticide and Rodenticide Act for permission for farmers to apply pesticides found to be effective at limiting damage to crops attacked by the stink bug during the 2011 growing season. Section 18 authorizes EPA to allow an unregistered use of a pesticide for a limited time if EPA determines that an emergency condition exists. EPA officials agreed to take preliminary actions in anticipation of receipt of this Section 18 request from USDA-APHIS to facilitate its swift implementation. 

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Editor: Sherrilynn Novack

IR-4 Public Relations and Communication Manager, 732.932.9575 x 4632, novack@aesop.rutgers.edu

Newsletter Committee:

Northeast Regional Field Coordinator, **Edith Lurvey**, 315.787.2308.

North Central Regional Director, **Bob Hollingworth**, 517.432.7718. Western Regional Assistant Field Coordinator, **Stephen Flanagan**, 541.688.3155.

Southern Regional Field Coordinator, **Michelle Samuel-Foo**,

352-392-1978 ext 406 Southern Region Program Assistant/Quality Assurance Support **Robin Adkins** 352.392.1978 x 424. USDA/ARS, Laboratory Research Director, **Emy Pfeil** 301-504-8903 ext 234.

Commodity Liaison Committee member, **Dave Trinka** of MBG Marketing, 269.434.6791.

Alabama State Liaison Representative, **Charles Gilliam**, 334-844-3045 IR-4 HQ, 732.932.9575.

Assistant Director,

Van Starnes x 4621

Ornamental Horticulture Manager,

Cristi Palmer x 4629

Technical Coordinator/Entomology,

Ken Samoil x 4614

Assistant Coordinator,

Interdisciplinary Working Group

Kathryn Homa x 4604

IR-4, ARS, the Deployed War-fighter Protection Research Program: Partners in the Search for Public Health Pesticides

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

The IR-4 Project has recently joined the U.S. military and the USDA in an effort to develop new pesticides for protecting public health. This is the latest in a series of public and private actions which highlight both the critical need for an adequate supply of public health pesticides (PHP's), and the need for public support to ensure the availability of these products.

Public Health Pests and Public Health Pesticides

People have long been threatened by a wide range of public health pests, which can make them sick, either by vectoring pathogens, causing allergic reactions and secondary infections following bites, or simply through their nuisance value. Mosquitoes, ticks, sand flies, bed bugs, and their kin collectively sicken and kill millions of people annually and cause untold discomfort and lost productivity around the globe. Unfortunately, there are very few safe, effective, and affordable products available to combat these threats to human health and comfort.

Over the last few decades, the PHP market has encountered similar challenges facing other minor-use pesticide markets — essentially, increased regulatory requirements, insufficient financial incentive for private industry to

invest heavily in research and development for the smaller markets, and ever-present concerns about liability and litigation. While ensuring pesticide safety and public confidence is essential, high regulatory costs can stifle innovation or drive products from the market even when there is little or no evidence that they pose significant risks.

For PHP's, resistance is a problem in many areas. In addition, vector-borne disease cases have been relatively rare in the developed world for a number of years, and many members of the public in these countries are increasingly risk adverse regarding chemicals in general and pesticides in particular. These factors have contributed to low public investment in PHP's in recent years.

Both the Federal Insecticide, Fungicide, and Rodenticide Act and the Food Quality Protection Act (FQPA) recognized that PHP's deserve special regulatory attention because of the key role they can play in disease prevention, but public dollars to match these statements of Congressional intent and public commitment have been scarce. In particular, the FQPA authorized federal spending of up to \$12.5 million/year for data collection in support of regulatory requirements for PHP's, but these

funds have not yet been appropriated.

The Search for New PHP's

The last decade has seen a renewed interest in PHP's and their availability, largely because of the continuing high morbidity and mortality associated with malaria. A renewed commitment to combating malaria and the insects that transmit it has been reflected in the global Millennium Development Goals, the President's Malaria Initiative, the formation of numerous aid and advocacy groups, and the funding priorities of the Gates Foundation and other philanthropists. While most of these efforts have focused on distribution of insecticide-treated nets and other interventions, important PHP research and development has also occurred, much of it sponsored by the IVCC (Innovative Vector Control Consortium) in Liverpool, or the National Institutes of Health, and some of it addresses diseases beyond malaria.

An additional major motivation for PHP's innovation in recent years has been the deployment of U.S. and allied military personnel in combat areas where they have been exposed to a wide range of relatively unfamiliar vector-borne diseases. A particular problem has

been cutaneous leishmaniasis, transmitted primarily by the sand fly *Phlebotomus papatasi*, which has sickened thousands of deployed warriors. Additionally, many common mosquito adulticides have not worked adequately in some environments (especially hot deserts). Finally, humanitarian missions by the military, such as providing assistance after the 2009 earthquakes in Haiti, have pointed out limitations in the existing PHP products.



In response to this need for new PHP's, the military's Armed Forces Pest Management Board (AFPMB) and the USDA Agricultural Research Service (ARS) rekindled the PHP development partnership that years ago brought DEET, the aerosol pesticide can, ultra low volume (ULV) application technology, and many other innovations to market. Started in 2004, the Deployed War-Fighter Protection Research Program (DWFP) has been a highly productive research consortium, funding both ARS and outside researchers, and generating copious papers, patents, and

incipient products for development (see www.afpmb.org/dwfpresearch.htm). By 2008, the DWFP research and product discovery pipeline was flowing fast, and the DWFP began moving into its next phase – product development and registration.

IR-4 and the PHP Program

Once a new pesticide compound or product has been discovered and its efficacy demonstrated, the next steps in converting a concept into a usable product are the same for PHP's and other pest control products. Prompt pesticide registration is always important, but for military-use PHP's it is critical for two reasons – satisfying this legal requirement is necessary for military use in state-side facilities, and for developing the market required by commercial partners. EPA registration also serves as an independent review of human and environmental safety, which reassures the troops and foreign governments when these products are used overseas.

Registration support for new pest control technologies for small markets has been the mission of the IR-4 Project since it was created, so it was a clear choice when DWFP needed a new partner to help bring underutilized or novel PHP's through registration to the field. In 2008, agreements between DWFP, ARS, and IR-4 led to the formation of the IR-4 Public Health Pesticide Program. As with small market agriculture, IR-4 provides advice and regulatory assistance and conducts research as budgets allow.

Additionally, the IR-4 PHP Program collaborates with EPA and user groups on improved integration of chemical products

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AFPMB,
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these threats.”

into Integrated Vector Management (IVM) strategies, support for the regulatory needs of existing PHP's, development of standardized data dossiers and other methods to streamline the PHP regulatory process, research, and outreach. The IR-4 PHP Program works to identify and register PHP's for use globally, through collaboration with IVCC and other global partners. Finally, The IR-4 PHP Program maintains the only public access database specifically dedicated to public health pesticides. Available through ir4.rutgers.edu/public_health/publichealthDB.cfm, the PHP Database provides information on the efficacy of chemical products against specific public health pests, PHP use patterns, and regulatory status inside and outside the U.S.

While there may always be the threats of disease vectors and vector-borne diseases, AFPMB, USDA-ARS, and IR-4 are at the forefront of the effort to ensure the availability of PHP's to combat these threats. 🌱

NCR Welcomes New SLR

The North Central Region (NCR) has a new State Liaison Representative (SLR), Dan Egel. Dan is the vegetable plant pathologist for Indiana. In addition to directing the vegetable disease extension program for Indiana, Dan is the lead author for the annual Midwest Vegetable Production Guide for Commercial Growers and is the editor for the Vegetable Crops Hotline newsletter. (see article on next page "Ugly Pumpkin Update").

Recent research efforts have concentrated on management methods of Fusarium wilt of watermelon and fungicide resist-



ance in strains of *Didymella bryoniae* causing gummy stem blight of cucurbits. Dan has been involved in efficacy testing of numerous fungicides in various cucurbits as well as tomatoes. Dan is a member of the Botany and Plant Pathology Department of Purdue University and is located in Vincennes at the center of Indiana cucurbit production. 🌱

The NCR Welcomes New RQAP

— by Michael Chen, NC Regional Quality Assurance Coordinator

The North Central Region welcomed Mr. Brian R. Bowman, RQAP (Registered Quality Assurance Professional), on board on July 1, 2010. Brian will be a new Quality Assurance Officer at the IR-4 Laboratory at Michigan State University (MSU).

Brian brings over 35 years of QA/GLP experience to IR-4. He previously served roles as a Residue Chemist, Study Director, Manager of Quality Assurance, GLP Compliance Specialist, and Compliance Senior Manager at ABC laboratories, Elf AtoChem,



Amgen Inc., and Illinois Institute of Technology.

Brian has a keen knowledge of analytical residue chemistry and is eager to serve as the new Quality Assurance Officer monitoring the GLP compliance of the MSU laboratory and auditing draft final reports and field raw data books.

His direct phone number is 517.336.4607 and email address is bowmanb@msu.edu. We are very pleased that Brian has joined IR-4 at MSU and please join us in welcoming him! 🌱

Photo Gallery

Can you guess where these were taken?



1. Taping the IR-4 global study video near Homestead, FL
2. Ornamental Horticulture Workshop Tour to Pettit's Garden Center Avon, OH
3. IR-4 GLP Training in North Carolina
4. John Wise's lab at the Trevor Nichols Research Complex, Fennville, MI.

Ugly Pumpkin Update

— by Dan Egel, Indiana IR-4 State Liaison Representative, Liz Maynard and Rick Foster, Purdue University

Most pumpkins are sold for their ornamental value as either Jack-o-Lanterns or fall decorations. Therefore, the appearance of pumpkin fruit is critical to the wholesale or retail buyer. The photos accompanying this article are of pumpkins with three different disorders. The purpose of this information is to help pumpkin growers tell the difference between insect damage, edema and bacterial spot.

The scars on the face of the pumpkin in Figure 1 are raised, white to off white lesions. These symptoms will likely make the pumpkin unsalable. The lesions are known as edema. Edema is caused by soil that has been too wet for pumpkin production throughout much of the season. Under such conditions the pumpkin fruit may retain too much water that results in lesions such as shown here. High humidity can also be a factor in the production of edema in pumpkin fruit. The wet, humid weather experienced over much of Indiana this summer may be responsible for edema in several pumpkin fields. Edema is not the result of any microorganism or insect feeding. There are few management options for this problem. Any practice that helps drainage, like raised beds, may help to reduce the portion of pumpkins with edema. Some varieties may show more edema than others, however, the timing of rains and fruit maturity also influence edema. It is important to recognize the symptoms of edema and realize that additional pesticide applications will not help the situation. The



Figure 1: The raised bumps on this pumpkin are edema, a swelling caused by the retention of too much water. This problem is not the result of a microorganism or insect.

good news is that edema does not progress to cause internal or external decay of the fruit.

Figure 2 has two types of symptoms on the same pumpkin fruit. The dashed arrow shows a light colored irregular scab that is likely caused by cucumber or rootworm beetle feeding. Although this feeding damage cannot be fixed by any amount of insecticide, if beetles are still found eating on pumpkin rinds, insecticide applications are necessary to prevent further feeding. The identification of such damage also indicates that an earlier insecticide application may have prevented or reduced

the amount of beetle damage. Increased scouting may be warranted in the future.

In addition to the beetle damage in Figure 2, round blister-like lesions can be observed (solid arrows). These lesions are the result of bacterial spot infection. This disease was discussed in Hotline issue no. 528

www.btny.purdue.edu/pubs/vegcrop/VCH2010/VCH528.pdf.

Briefly, this disease may be managed by crop rotation, sanitation and fixed copper applications applied early in fruit development. Although it may be too late to correct some of the pumpkin problems one sees in the field, knowing what caused the damage may lead to prettier pumpkins next year. 🌱

This article originally appeared in Vegetable Crops Hotline Newsletter September 3, 2010.

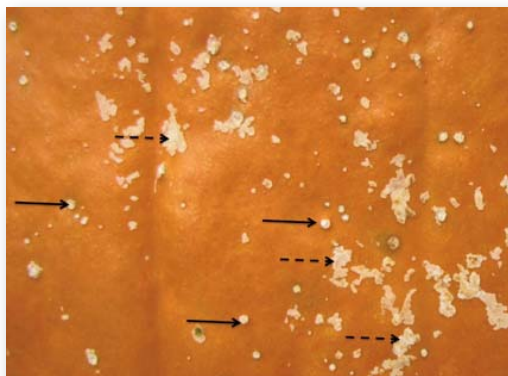


Figure 2: There are two types of lesion on this pumpkin: the irregular, raised scabs are caused by insect feeding (dashed arrow); the round blister-like lesions are caused by bacterial spot (solid arrow).

Pan Pacific Problem: Spotted

The biological apple cart for soft fruit has definitively been upset on the western coast of the U.S. and Canada. How? Enter the Spotted Wing *Drosophila* (*Drosophila suzukii*) which was first identified on the west coast in 2008. In three growing seasons this new pest, known as SWD, has emerged as a serious threat to specialty crop growers in California, the Pacific Northwest and British Columbia. Subsequent finds of SWD in Florida, North and South Carolina, Louisiana, and Utah along with finds in Spain, Italy and France, presage a growing infestation throughout the continental U.S. and Europe.

The SWD was originally described in the 1930's in Japan, and although resident in Hawaii since 1980, it is a recent arrival on the mainland. Ironically Japan is also the recipient of many US exported fruits which are directly affected by SWD. Blueberries, strawberries, caneberries, cherries and stone fruit, along with grapes are being adversely affected by the nascent SWD infestation.

IR-4, along with its cooperative land grant universities, is addressing the needs of specialty crop growers with specific research into the biology and control of SWD. The research efforts of the University of California (UC), Oregon State University (OSU) and Washington State University (WSU) have now generated pest control guidelines for SWD control and also elucidated specific new product registrations to pursue within the IR-4 program. Before discussing the specific role of IR-4 projects, let's examine this pest's biology and its direct affects on western specialty crops.

What is so particular about SWD compared to other *Drosophilids*, or vinegar flies? Vinegar flies infest and reproduce only on fallen or already broken fruit. If you happen to compost your kitchen waste you are no doubt familiar with the small, swarming flies which abound around your compost bucket. The SWD stands out in the *Drosophila* genus in its possession of an unusually large and strong, serrated ovipositor.

A what? Yes, a serrated ovipositor which functions like a serrated saw and allows the female SWD to lay its eggs into the flesh of intact fruit. This biological trait is why SWD is an agricultural pest. Unlike the codling moth of apples and pears, which is not a pest in its native orchards of Kazakhstan, the SWD is a significant pest in Japan. There have been some observations of biological control of SWD in Oregon by parasitic wasps, but biological control is not complete for this pest in Japan.

Along with a powerful egg laying ability, SWD can achieve up to ten generations a year and thrives in the moderate temperatures of the Pacific Northwest. Reports in California have noted greater SWD pressure in the coastal valleys, whereas the inland (hotter and drier) valleys have lesser infestations. Spot infestations in the San Joaquin Valley have occurred in cherry orchards located near riparian zones where higher moisture levels allow the pest to flourish. This environmental preference of SWD, combined with a smorgasbord of sequentially ripening fruit harvests in the Pacific Northwest provides an all too fitting new home for SWD.

The combination of environment, pest biology and agriculture created a serious production problem. One individual at the forefront of the SWD invasion is Tom Peerbolt of Peerbolt Crop Management in Portland, Oregon. Tom is a UC Davis trained horticulturist who works directly with Oregon and Washington berry growers. In addition to private consulting, Tom has coordinated regional SWD trap counts and disseminates the information through his electronic newsletter "Small Fruit Update."

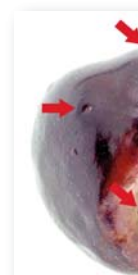
"Blueberries are uniquely suited to organic production practices and now IPM (Integrated Pest Management) on blueberries has been set back ten years by SWD", reported Tom. Organic growers are restricted to the use of compounds like organic pyrethrum and Entrust®, the organic formulation of spinosad. Late season fruit grown under organic practices can actually "run out" of labeled products such as Entrust® to control SWD, because the allowable number of applications is exceeded well before the crop is ready for harvest. Of particular concern to these growers with late maturing blueberries is the coincidental rise in SWD populations with harvest season. Many conventional and organic growers who previously only used one pre-harvest clean up spray are now facing repeated pesticide applications on a calendar basis to control SWD.

Amy Dreves and Vaughn Walton at OSU are conducting SWD biological studies in a number of key areas. Their research includes studying the attractiveness of trap baits and infestation levels in different fruits, identifying SWD natural

— by Stephen
IR-4 West
Assistant L
Coordinator



Adult SWD fly
up micrograph
ovipositor.



SWD ovipositor
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enemies and parasitoids, understanding how SWD overwinters in Oregon, and examining preventative tools such as mass trapping and sanitation practices. Mass trapping essentially lures flies into a trap where the pest is killed with a toxicant. This technique will potentially provide an environmentally-friendly control method for SWD. Mass trapping has the potential to suppress or eradicate low-density, isolated pest populations. In addition to other control techniques, field sanitation is a necessary and key tool to prevent the introduction or spread of SWD. Removing and properly disposing of unharvested fruit on plants, and on the ground, can prevent SWD population buildups. Bagging fruit with clear and black plastic bags, burying, crushing, and solarizing fruit are some of the sanitation treatments being explored. The extent to which SWD's behavior in the field is understood will contribute to enhanced pest control strategies.

In California, Mark Bolda is the UC berry farm advisor in Santa Cruz and Monterey Counties. Since Mark is located in the cool, coastal berry production areas of the central coast he has been working closely with growers to combat SWD. Mark was the first individual to notice SWD which was subsequently identified by the California Department of Food and Agriculture entomology laboratory. With proper field sanitation and cover sprays for control, "this is something we're living with", reports Mark. The options available for organic growers are one of many challenges facing berry growers. "Field sanitation is not enough" says Mark in regard to

organic growers' approach to SWD control. With half of the acreage in Santa Cruz and Monterey Counties planted to late maturing varieties, the increasing levels of SWD in the late season are problematic. For organic and conventional growers the high density and narrow rows common in berry fields make late season sprays nearly impossible, as tractors cannot travel down the field rows. Even with these serious constraints the efforts of UC continue with examining new active ingredients for SWD control and the use of drip system applied insecticides as a treatment option.

Similar to California, the berry industry in Washington State has encountered difficulties spraying in blueberry and raspberry fields. With conventional airblast sprayers used late in the season to control SWD, there is too much "fruit knocked off the plants" according to Lynell Tanigoshi with WSU in Mt. Vernon, Washington's Skagit Valley. "Fortunately this year the SWD population really didn't show up until early August, similar to our first find of SWD on August 10th of 2009." Lynell, and researchers from OSU and the USDA-ARS, have conducted bioassay trials with IR-4 for determining the best materials to control SWD. Along with insecticide tools, Lynell reports that work is needed modifying blueberry trellis systems to facilitate spraying, and exploring alternative spraying technologies with aerial equipment and the use of high top tractors. These techniques would allow growers to make the late season insecticide applications essential for controlling SWD before harvest. "We saw no real SWD problems in strawberries this year, but late season blueberries are now seeing the

highest population of SWD for 2010" reports Lynell. Although the 2010 season was manageable in the Skagit Valley, growers and university experts will continue efforts to understand and control SWD in Washington State.

Along the path to understanding SWD, the IR-4 program has supported efficacy studies in Oregon, Washington and California with targeted funding to determine both registered and unregistered compounds, which control SWD. These studies have refined growers' pest control practices by illustrating the effectiveness of registered products like malathion, spinosad, spinetoram and zeta-cypermethrin. The special funding for these studies was allocated from IR-4 HQ at Rutgers University to promptly address this significant, newly invasive pest. In addition to examining use patterns and efficacy for registered products, these studies also examined unregistered products. The 2010 Food Use Workshop in Summerlin, Nevada reviewed potential residue projects for SWD on blueberries, cherries, peaches, plums and pears and selected several residue projects to pursue during the 2011 field season.

The apple cart may have tipped, but the IR-4 project along with its research and industry partners have stepped up together in responding to the aftermath. Through a concerted effort across the west coast of the U.S., IR-4 and its partners are focused on this new pest. New pests bring new challenges and with these challenges come an excellent illustration of the key importance of IR-4's collaborative work supporting specialty crop growers. 🌿

Minnesota Wild Rice

— by Satoru Miyazaki, IR-4 NCR Field Coordinator
and Bob Hollingworth, IR-4 NCR Director

Portions of this article have been taken from the University of Minnesota Agricultural Experiment Station's publication, Food for Life, (www.extension.umn.edu/distribution/cropsystems/components/7658-11.html)

The North Central Region grows a unique specialty crop, wild rice (also called Indian rice, and water oats) that is not actually rice (*Oryza sativa*), but an aquatic annual grass seed belonging to the genus *Zizania*. Stems often reach 6 feet above the water surface. The plants are native to North America particularly Minnesota and Canada and have been a traditional part of the diet of some Native Americans. In the 1950's, University of Minnesota plant scientists began studying hundreds of alternative crops, including wild rice. At the same time, interested farmers in northern Minnesota began to form a cultivated wild rice industry to meet increased demand.

Today, there are two separate wild rice communities. One is Native Americans who hand-harvest "lake grown" natural wild rice by traditional methods from canoes and using flails to dislodge the grain. The other is cultivated "paddy grown" wild rice grown by commercial producers in paddies where mechanical harvesting is done by modified and specialized combines after draining the fields.

A key to the domestication and commercial production of wild rice was the development of shatter-resistant varieties that allowed efficient harvesting. According to

the Minnesota Cultivated Wild Rice Council According to the Minnesota Cultivated Wild Rice Council (www.mnwildrice.org/), since the 1960's Minnesota has grown cultivated wild rice in ~20,000 acres of paddies in the northern third of the state and harvests between 4 and 6.5 million pounds annually. Much of it goes to food processors that market it in blends with white rice. Minnesota ranks 2nd nationally in the production of wild rice averaging 44% of the total U.S. production. California accounts for most of the remaining national production.

The NCR IPM center (www.ipmcenters.org/cropprofiles/docs/mnwildrice.html), reports the wild rice worm (*Apamea apamiformis*) is the most important insect pest of Minnesota's cultivated wild rice fields. Adult moths emerge in late June and are active until early August. They oviposit for most of this adult period and feed mostly on milkweed. Eggs are laid inside florets of young panicles of wild rice. Larvae pass through the sixth instar feeding in the panicle, mining out developing kernels. The larger instars can be found under leaf sheaths and occasionally in stalks. Most larvae are fifth, sixth, or seventh instars at harvest. Larvae damage wild rice by feeding on kernels, mining them out and leaving silk and starchy frass behind. Studies show that one larva causes an average yield loss of 11% of the ear. Estimates indicate that the typical loss is 5-15% (with control), and can reach 75% without control. The wild rice worm is a

pest every year, and infests an estimated 70-100% of acreage. Malathion provides only fair to good control of wild rice worm, and was the only registered insecticide until recently. There are no cultural or biological controls.

Recently, IR-4 received a request for clearance of lambda-cyhalothrin on wild rice to control wild rice worms from the Minnesota Cultivated Wild Rice Council. In 2007, EPA granted a Sec. 3 registration for Warrior II with a 21 day PHI. However growers wanted a 7 day PHI and the wild rice trials were approved for 2010.

Dan Kunkel, IR-4 Associate Director and Satoru Miyazaki, IR-4 Regional Field Coordinator, attended the 2010 conference of the Minnesota Cultivated Wild Rice Council held February 17-18, 2010, in Grand Rapids, MN. The conference helped to familiarize them with wild rice production and to seek the cooperation of the growers for field trials. Under the requirements of GLP, Mark Ciernia, North Dakota State University (NDSU), conducted two field trials at grower's plots using an aerial application and one at a University of Minnesota field using a ground application. Aerial application is typically needed because of the aquatic environment of the crop. This type of application is relatively novel in the experience of NCR field trials and provided some challenges in terms of sprayer calibration.

On August 11, Michael Chen and Satoru Miyazaki inspected and

continued on page 11



Aerial application of treatment. Photo by Satoru Miyazaki



Radar gun is calibrated to 55 mph. using a tuning fork. Photo by Satoru Miyazaki

observed the first application by a commercial air applicator. Mark and Vern Hofman, an agricultural engineer at NDSU and an aerial pesticide application authority, recorded the required parameters to verify the treatment rate of 0.025 lbs a.i./acre. Since it takes only a few seconds to spray a test plot, plane speed (130 miles/hr) was checked using a radar gun. It was calibrated by using a tuning fork to fulfill GLP requirement.

Although residue samples are collected in the same manner as other IR-4 field crop trials, growers harvest wild rice by specially modified caterpillar combines to

get into paddies after draining. Peter Imle, cooperating grower, says he needed six combines to harvest 1500 acres of wild rice and since 2007-2008 was a record crop year, the farm gate

value dropped significantly.

The analytical residue studies will be conducted by the Southern Region. 🌱



Specially modified combine to harvest wild rice. It's huge! Photo by Satoru Miyazaki

Relevance continued from page 3

The best places to find solutions to loosen these pinch-points can be found through an examination of how IR-4 works in the areas of study management, residue analysis, and quality assurance.

The IR-4 Project Management Committee (PMC) has undertaken a comprehensive examination of all aspects of the IR-4 data development processes to identify those areas that can be modified or improved to lower the project

completion timeline. As the first step, all personnel have been asked to participate in the analysis of difficulties and the development of solutions. Recognizing that many aspects of data development within IR-4 are interrelated, the functions of one group directly impact the ability of other groups to complete their assigned tasks. A team with representatives from IR-4 Field Research Directors, Regional Field Coordinators, Laboratory Research Directors,

Study Directors, Quality Assurance Unit, Registrants and IR-4 Management will consider the analysis and potential solutions. This team is charged to make some concrete recommendations to their peers and the IR-4 Project Management Committee by February 2011.

It is hoped that with broad participation in the process to reduce timelines, there will be complete "buy-in" that will allow IR-4 to be more responsive to the needs of specialty crop growers. 🌱

IR-4 2011 Priorities

IR-4 has recently established priority projects for 2011 in the Food Use and Ornamental Horticulture Programs. The food priorities were established at the 2010 Food Use Workshop, while the ornamental horticulture priorities are a continuation in the biennial research cycle with minor updates made at the North Carolina State University Ornamental Workshop.

Food Use Priorities for 2011

Over 150 people attended the 2010 IR-4 Food Use Workshop held in Las Vegas. Participants appreciated both the venue and the weather. Todd Scholz, USA Pea & Lentil Council, Director of Information & Research and IR-4 Commodity Liaison Committee Member, commented, "These workshops are invaluable to me. Where else would I have the opportunity to discuss my pest management issues and have in one room regulators, producers, chemical industry representatives and fellow researchers? It's intangibles like this that make the IR-4 Food Use Workshop great."

Another comment from a participant was that the researchers in the room are not just researchers but they are the ones that use the products and deal with the results. These are the people who spray the crop protectants on the crops and see how the products work—they are not theoretical scientists but rather users of the product. This participant liked to hear from them because they could say that the proposed timing would not work because of damage or could actually discuss a better spray height or concen-

tration. Todd also exhorted IR-4 Executive Director, Jerry Baron, "While I can't make it every year, please continue these workshops that provide opportunities like this to all of the IR-4 stakeholders."

Participants selected 16 "A" priorities in Entomology, and Weed Science and 18 "A" priorities in Plant Pathology. The complete list of "A" priorities has been posted to the IR-4 website. In addition to prioritizing residue research, this year participants also had the opportunity to select efficacy and crop safety (E/CS) projects, a new process for IR-4.

Workshop participants prioritized these projects as "H" for high (top priority research that IR-4 should do if funding is available), "M" for medium (projects that are not as critical as "H" priorities), or "L" for low (projects that we should not consider doing at this time). Similar to food tolerance requests, if an E/CS project does not get nominated, its ranking will get progressively lower and it will be dropped if not nominated for 3 years in a row. Each discipline was allowed up to 10 "H" priorities (see the lists posted on the IR-4 website). Because there are numerous ongoing projects initiated in 2010, these "H" priorities may not be funded with the limited 2011 funding. However, these projects have been deemed by stakeholders as most important and will be started as soon as funding becomes available.

A new category of projects, "Pest Problem Without Solution" (PPWS), was also introduced. Any of these could be selected for

“
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Todd Scholz,
USA Pea & Lentil
Council, Director of
Information & Research
and IR-4 Commodity
Liaison Committee
Member

2011 research if a solution is urgently needed by IR-4's specialty crop stakeholders.

Ornamental Horticulture Program Priorities for 2011

During 2010 and early 2011 there were several venues where the ornamental horticulture research priorities were discussed.

The entomology and pathology disciplines were discussed at the

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NCSU Ornamentals Workshop held in North Carolina during Sept 20-23, 2010. The high priority projects for pathology and entomology will remain the same (Bacterial Disease Efficacy, Pythium Efficacy, Scale & Mealybug Efficacy, Mite Efficacy and Thrips), but several additional new regional priorities were proposed including the Thousand Cankers of Black Walnut, Grasshoppers, and Brown Marmorated Stink Bug. It was also suggested the Canker Diseases regional priority be modified to include stem & trunk diseases in general.

The Plant Growth Regulator research priorities were established by meeting at the Ohio Short Course in July followed by conference calls to narrow to two projects. These projects will be Herbaceous Plant Branching and Woody Plant Branching.

For Weed Science, the current priorities of Herbicide Crop Safety, Liverwort Efficacy, and Early Post Emergent Efficacy will remain with the products selected for these protocols modified at the North East Weed Science Society Meeting in January.

Save the Dates:

The 2011 Food Use Workshop will be held September 13 & 14, 2011 in Raleigh, NC. The 2011 Ornamental Horticulture Program Workshop will be held October 5 & 6, 2011, in Sacramento, CA. 🌱



Members of the Southern Region, the host of next year's FUW.

It's Mum Season

— by Cristi Palmer, IR-4 Ornamental Horticulture Manager

Blooming in September through November and with the prevalence of orange, red, gold and yellow cultivars, chrysanthemums are the epitome of fall. As the third largest single ornamental horticulture pot crop (behind orchids and poinsettias), mums possess an annual wholesale value of over \$135 million, with more than 51,500 million pots of hardy and indoor florists mums sold annually. This does not include the mums grown as cut flowers and placed in floral arrangements year-round.



Photo by Cristi Palmer,

Chrysanthemums are prone to a number of pests & diseases. Some of the common diseases include Pythium and Fusarium root rots, foliar nematodes, leaf spots, viruses, and bacterial blights. Chrysanthemum brown rust and white rust can cause severe issues during the late stages of production right before plants are harvested for shipping to retail outlets. Pest problems include aphids, thrips, whiteflies, scale, mealybugs, leafminers, mites and foliar feeding caterpillars.



Cornell University, Long Island Horticulture & Research Center. Photo by Margery Daughtrey,

Over the last 10 years, IR-4 has tested more than 140 disease, insect and weed management products to help growers produce healthy high quality mum crops. Much of the research has focused on crop safety, but there were many experiments for the control of bacterial diseases, thrips and whiteflies. Current research projects on mum pest issues include Pythium and Fusarium efficacy along with starting a project on Foliar Nematodes. Some of the researched products include newly registered fungicides, insecticides, and herbicides such as Adorn, Flagship, and Freehand. Other products tested are already EPA registered and IR-4 is expanding the available uses; examples of these include Conserve, ProStar, and Snapshot. 🌱

Mention of a specific product does not constitute a recommendation for use. As always, consult product labels prior to application and follow all label directions.

Disease Alert: Downy Mildew Threatens Popular Herb Crop Across U.S.

— by Kathryn Homa, IR-4 Associate Coordinator

Imagine you are the grower of a popular crop and have a large contract with a major retailer. You've grown the plants from seed and have invested a considerable amount of time and money to make this a high quality crop. Then, a couple days short of shipment, you notice the leaves are beginning to turn yellow in color, patches of dead tissue are forming, and as you turn the leaves over, you notice that a purplish brown "fuzz" has formed. In a panic, you call your extension agent to determine the cause, only to be told that there is little that can be done at this point. As a result, you lose your crop, time and money. Unfortunately, this story has become a reality for many sweet basil (*Ocimum basilicum*) growers across the U.S. over the past couple of years.

Sweet basil has become the most commercially important annual herb grown in the United States. It is produced for both fresh and dry culinary uses and as a source of essential oil for foods, flavors and fragrances. A member of the Lamiaceae family, the genus *Ocimum* consists of over fifty species of herbs and shrubs that are native to the tropical areas of Asia, Africa, and South America.

Unfortunately, many pests can affect this crop, including a pathogen new to North America called *Peronospora belbahrii*,

which causes downy mildew of basil. First reported in Florida in 2007, the disease has devastated both field and greenhouse-grown basil throughout the U.S. over the past couple of years. Although the recent outbreaks make it appear as if this is a new disease, downy mildew was first reported in Uganda in 1933. Other areas of the world affected by basil downy mildew include Canada, Europe (Switzerland, Italy, Belgium, France), Israel, Iran, New Zealand, Argentina, and several African countries. Currently, some scientists believe that an aggressive strain of downy mildew evolved in Uganda and spread throughout the world, causing this recent outbreak.

In 2010, downy mildew spread across the U.S. affecting many states including: Louisiana, Ohio, New York, Massachusetts, New Jersey, Maryland, Virginia, Kentucky, Delaware, Pennsylvania, Alaska, North Carolina, New Hampshire, Wisconsin, Illinois, North Dakota, Vermont and California.

What can be done to help control basil downy mildew? Learning more about the disease is the first step:



SYMPTOMS: Some symptoms of the disease can be mistaken for a nutrient

deficiency and include yellowing between the veins of the leaves and necrosis of the leaf tissue. The other major symptom is dark purple-brown sporangia on the underside of the leaves (see picture below).

SPREAD: Favorable conditions for development and spread of the disease include: high humidity, mild to warm temperatures, stagnant air conditions, cloudiness, and long periods of leaf wetness. Downy mildew can be spread by contaminated seed. Contaminated seed and distribution of the fresh product is thought ways in which the disease has spread across continents in recent years.

EPIDEMIOLOGY: Currently being researched.

TREATMENT/MANAGEMENT: Currently, the best way to ensure that the disease does not affect a grower's crop is to use good cultural practices. The key is to promote airflow, thereby reducing leaf wetness and humidity. This can be done in the field by planting in an area with good air flow, planting rows parallel to the prevailing winds, increasing plant spacing, and using drip irrigation. In the greenhouse, fans, lights, and increased temperature can reduce disease pressure. Daily monitoring aids in early detection. (A Basil Downy Mildew Monitoring Program can be found

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at: spreadsheets.google.com). Harvesting the crop early before spores reach the area may aid growers.

Few commercial fungicides are currently registered to control this disease. The phosphorous acid fungicides ProPhyt and K-Phite have been shown to provide control. A few organic fungicides are labeled and may help control the disease when discovered early. These include Actinovate AG and OxiDate (see IR-4 Biopesticide and Organic Database for Integrated Pest Management ir4.rutgers.edu/Biopesticides/LabelDatabase/index.cfm).

Although there are few treatment options available to control basil downy mildew, many management strategies are currently being tested including chemical control, seed treatments, genetic screening, plant morphology, and cultural practices. Some of these strategies will be more readily available soon. 🌱

Information provided by:

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IR-4

Successes

Jun. - Aug. 2010

The trade names listed below are provided as a means to identify the chemical for which a tolerance has been established. A trade name listed here may not be the name of the product on which the new food use(s) will be registered. Only labeled products may be used on a food crop. Be sure to obtain current information about usage regulations and examine a current product label before applying any chemical.

Federal Register: June 8, 2010

Thiacloprid

Trade Name: Calypso

Crop: Stone fruit group 12

PR#: 07811, 07812, 08038

Federal Register: June 23, 2010

Novaluron

Trade Name: Rimon

Crop: Sweet corn

PR#: 09838

Federal Register: July 14, 2010

Cyazofamid

Trade Name: Ranman

Crops: Head and stem brassica subgroup 5A, Brassica leafy greens subgroup 5B, Turnip greens, Spinach, Hop

PR#: 09082, 09083, 09084, 09265, 09717, 09823

Federal Register: August 4, 2010

Halosulfuron-methyl

Trade Name: Sandea

Crops: Tuberous and corm vegetable subgroup 1C, Succulent shelled pea and bean subgroup 6B, Dried shelled pea and bean subgroup 6C, Bushberry subgroup 13-07B, Apple, Okra, Rhubarb

PR#: 07281, 07286, 07769, 08838, 08937, 08976, 09114, 09243, 09407

Federal Register: August 18, 2010

Mancozeb

Trade Name: Dithane

Crops: Atemoya, Mango, Sugar apple, Canistel, Cherimoya, Custard apple, Mamey sapote, Sapodilla, Star apple, White sapote, Ginseng, Cucurbit vegetable group 9

PR#: 00992, 03028, 03130, 03131

New CI Executive Director

The Cranberry Institute (CI) Board of Directors is both pleased and excited to announce the hiring of Terry Humfeld to become the CI's new Executive Director.

Terry will officially begin working with the Institute on November 1 under Jere Downing's expert tutelage, formally stepping up to the role of Executive Director on January 1, 2011.

Terry will maintain his primary office at his residence in Delaware and work from the Institute's Massachusetts office several days each month. Full contact information will be made available after November 1.

Terry brings to the CI and to the



cranberry industry substantial professional experience with association management for horticultural and produce trade organizations. We are excited to begin working with Terry and believe that he will provide tremendous value to the cranberry industry through his leadership at the Institute. We are confident that you will share in our welcome of Terry to the cranberry industry as you get to meet and work with him over the coming months and years. 🌿

Join the IR-4 Listserv

IR-4 has developed a listserv to send monthly email communications of news and information. We report on deliverables and successes, work in progress and future research planning. In these monthly reports we also report on news from QA, crop grouping, international activities, outreach and communications and upcoming events.

To sign up for the IR-4 listserv, send an email to Sherrilynn Novack at novack@aesop.rutgers.edu and request your name and email be added to the list. 🌿



IR-4 Headquarters,
Rutgers, The State University
of New Jersey
500 College Road East
Suite 201 W
Princeton, NJ 08540



United States Department of Agriculture
National Institute of Food and Agriculture



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• University of Florida • Michigan State University

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