The IR-4 Project
Pest Management Solutions for Specialty Crops and Minor Uses

Newsletter
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IR-4 International Activities

— by Dan Kunkel, IR-4 Associate Director

Increased globalization has resulted in seemingly easier movement of agricultural products from one part of the world to another. However, the diversity in pesticide standards, especially with regard to internationally acceptable maximum residue levels (MRLs) of pesticides on trade commodities across the different nations has acted as a trade barrier.

Several years ago, IR-4 realized it needed to support international harmonization of MRLs and began using its data not only for domestic registrations but also to support international harmonization of pesticide standards.

Today, IR-4 concentrates its global activities in four main areas identified at the 2007 Global Minor Use Summit (GMUS; see IR-4 newsletter ir4.rutgers.edu/Newsletter/vol39-1.pdf). These areas include: 1) information dissemination and communication, 2) capacity building to harmonize existing and developing regulatory systems, 3) supporting a minor use working group within Codex to increase MRLs for specialty crops, and 4) continued support of international collaborations such as joint reviews and pilot projects to share data.

Information Dissemination, Communication and Capacity Building

Shortly after the GMUS, IR-4 created the Global Minor Use Information Portal (ir4.rutgers.edu/GMUS/GMUSportal2.htm). This website provides a wealth of information, not only with regard to the summit and capacity building workshops, but also information about other minor use programs, regulatory agencies, and guidance information. This site is updated frequently as additional information becomes available.

The United States Department of Agriculture (USDA) and Environmental Protection Agency (EPA) continue to take leadership roles in providing training and support for developing countries seeking to build their own pesticide regulatory bodies. The USDA Foreign Agriculture Service (FAS) has provided many training workshops throughout Africa, Asia, and Central and South America. These workshops focus on the progress of Codex activities with regard to pesticide regulation and crop grouping, as well as identifying minor use priorities within each country. Other workshops have been held as "mini summits" to provide updates on the GMUS activities to international stakeholders and minor use interest groups. At a recent symposia held in April, prior to

continued on page 2

Inside this issue...

International

continued from page 1

the Codex Committee on Pesticide Residues (CCPR) meeting (Xi'an China), IR-4 provided presentations that gave attendees an overview of the IR-4 program, noted the importance of the crop grouping scheme for solving minor use issues, and provided an update on the Global Residue Study.

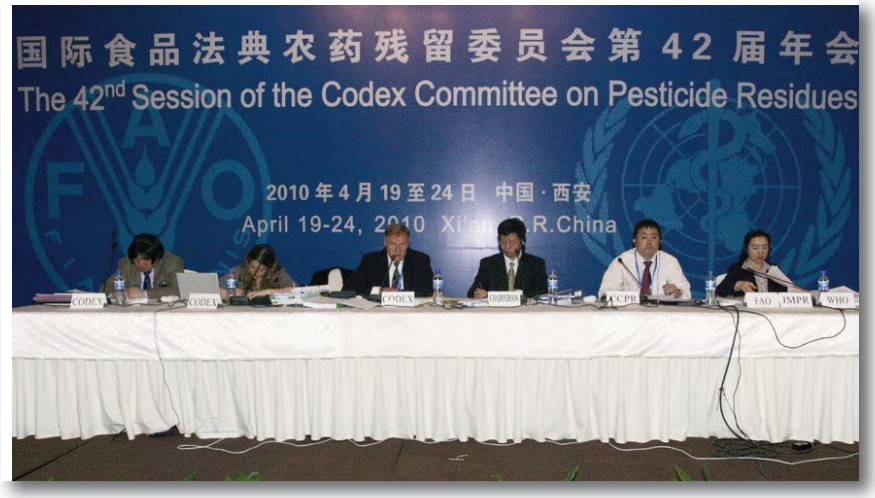
Expanding and Harmonizing MRLs, Global Collaborations

Canada

IR-4 continues to expand participation in global organizations with respect to pesticide issues causing commodity trade barriers. In North America, IR-4's strong partnership with the Canadian Agriculture and Agri-Food Canada's minor use program, the Pest Management Center (PMC), has been a model of what IR-4 hopes will develop with other countries. In 2010 (marking our 16th year of cooperation), 18 new cooperative projects, consisting of numerous field trials, were initiated between IR-4 and PMC. These trials will result in harmonized MRLs for new products, and new reduced risk tools for growers. IR-4 not only shares residue work but also efficacy and crop safety data with our Canadian partners for ornamental horticulture crops. Additionally, PMC personnel are active participants in IR-4 prioritization workshops, meetings with registrants, other meetings and vice versa. The minor use joint review process between EPA and Canada's Pest Management Regulatory Agency (PMRA) continues to save federal resources by fostering each agency's acceptance of the other's residue data review. But more importantly, both agencies establish MRLs at the same level and at the same time, thus preventing trade irritants.

Increasing Codex Alimentarius MRLs for Minor Use

The Codex Alimentarius provides a global standard regarding pesticide MRLs that protects the health of consumers and ensures fair trade practices for commodities utilizing FAO and WHO Food technical review of data and risk assessment at their Joint Meeting on Pesticide Residues (JMPR) and the CCPR meetings. In 2006, IR-4 provided data for six chemicals to sup-



Seated at the head table at CCPR are (l to r) Dr. Hidetaka Kobayashi, FAO Food Standards Officer; Ms Gracia Brisco, FAO Food Standards Officer; FAO Codex Seretariat, Dr. Jeronimas Maskeliunas; Chairperson CCPR, Dr. Xiongwu Qiao; Dr Weili Shan, CCPR Secretariat; and Ms Yongzhen Yang, FAO JMPR Secretary.

Jason Sandahl, (USDA FAS) chairs the pre-CCPR symposium to discuss International capacity building.

Kathy Monk (EPA) and Dan Kunkel (IR-4) prepare discussions for crop classification (grouping) at the CCPR.

The General Assembly of the Codex Committee on Pesticide Residues

port new Codex MRLs on cranberry. Since that time IR-4 has provided data or submitted reports directly to Codex to support MRLs for numerous products covering many specialty crops. In 2009, these submissions included buprofezin, indoxacarb, and methoxyfenozide and in 2010, IR-4 submitted data to Codex JMPR for etoxazole, fenpyroximate, and novaluron. Additionally other submissions of IR-4 data were made by cooperating registrants. IR-4 has also assisted with data for submissions to Japan and the EU when requested by various commodity groups.

Along with establishing Codex MRLs on pesticides, the Codex Classification of Foods and Animal Feeds is extremely important to many countries: as a classification mechanism, as a cross-reference on commodity terminology, and as a basis for crop group MRLs and extrapolations within commodities. The US (IR-4), along with the co-chair (The Netherlands), have been working to update the codex crop classification. This revision, once implemented, will be useful to help promote MRL harmonization and uniform nomenclature of commodities, and this tool will help to remove trade irritants.

Organization for Economic Cooperation and Development (OECD)

At the request of US EPA, IR-4 personnel have been part of the US delegation to both the CCPR and OECD Working Group on Pesticides (WGP). IR-4 plays a key role on the OECD Expert Group on Minor Uses (EGMU) which works to assist countries, registrants, and growers in solving their minor use problems (i.e. needs, gaps) through activities associated with baseline information, collaborative data generation, data sharing, and joint reviews. The group has published an OECD guidance document on Defining Minor Uses of pesticides (www.olis.oecd.org). There is ongoing work to develop guidance documents on "Regulatory Incentives for Minor Uses" and "How to Address and Solve Minor Use Issues" that should be published sometime in the future.

IR-4 continues to work with other specialty crop programs throughout the world to reduce the data development burden on individual countries. In addition to Canada, other countries have begun establishing minor use programs or are considering expanding existing programs. The knowledge and expertise of IR-4 has been solicited as these new programs evolve and develop; at the same time IR-4 expects this will open doors to US exports by encouraging these countries to develop a similar regulatory structure that recognizes US MRLs.

USDA-FAS Support for IR-4 International Activities

The USDA FAS was a major supporter of the Global Minor Use Summit (GMUS) and now continues its support for many of the follow-up activities. IR-4 has received two grants from USDA FAS. The first grant was awarded to conduct a Global Residue Study examining the influence of geographic location on residues. This study should provide data that allows scientists to determine if the geographic zone truly affects the ultimate residue levels found in the test crop. Special care has been taken in this study to remove or control many of the other variables that may affect pesticide residues.

continued on page 11

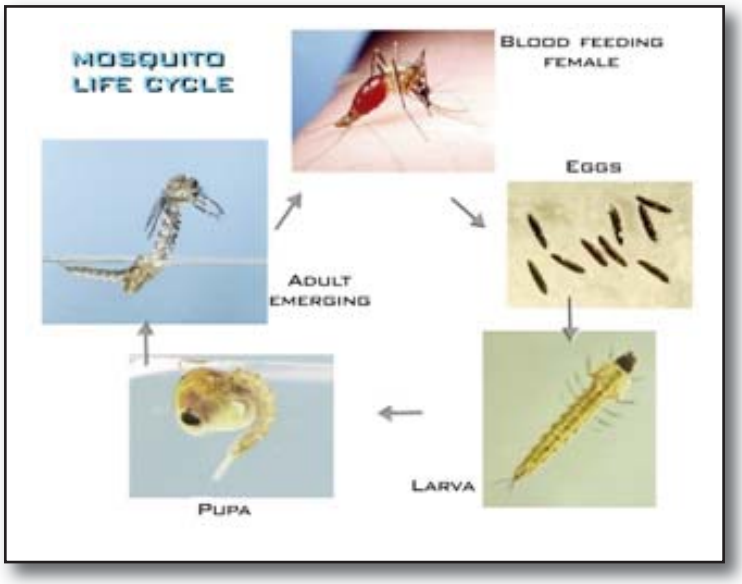
Controlling Adult Mosquitoes with Pesticides (Part I)

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

Mosquitoes are universally recognized as a substantial threat to human health, each year killing almost a million people and sickening hundreds of millions more. However, the best response to these noxious pests is controversial. No "silver bullet" has ever been found that solely counters mosquitoes, and every intervention that has been developed – from drainage to pesticides to bednets – has faced questions about cost, effectiveness, and side effects. In particular, the use of pesticides to combat adult mosquitoes has prompted vigorous debate. This article is the first of a series that describe mosquito adulticides and the methods used to assess their benefits, costs, and risks; specifically, Part I is focused on how and why pesticides are used against adult mosquitoes.

Of thousands of species of mosquitoes in the world, hundreds bite humans in virtually all inhabited parts of the globe. For all species, the mosquito life cycle includes four distinct stages (egg, larva, pupa, adult), with the juvenile, larval, and pupal stages occuring in water. Adult mosquitoes disperse and are generally distributed more widely in an area than juveniles. Only adult females bite people or animals, searching for blood to nourish their eggs. This means that only adult female mosquitoes can transmit pathogens or cause nuisance. Therefore, the basic goal of mosquito control programs is to minimize contact between people and adult female mosquitoes, and thus o minimize the frequency of mosquito bites and their associated hazards.

All mosquito bites carry some risk of disease or discomfort, but the risk varies significantly, and this is important in deciding how to respond. The primary risk is the mosquito's potential for serving as a vector of pathogenic (disease-causing) organisms from one infected host to another. This requires that an adult mosquito lives long enough to bite an infected animal, digest the blood meal, lay eggs, and bite again – the second or later bites being the dangerous ones in terms of disease transmission. Thus, the vector risk of individual adult mosquitoes depends on their age as well as their sex. The risk also depends on the species, as some bite more often per full blood meal, target humans preferentially, and/or are more compatible with specific pathogens (which must enter the mosquito's gut, develop, migrate to a salivary gland, and exit through a bite). Other disease risks associated with mosquito bites – allergic reactions to proteins injected during bites, for example, or secondary infections following scratching of bites – can be serious and only require adult mosquitoes to live long enough to bite once. Mosquitoes can cause significant nuisance even without clinical disease; the degree of nuisance depends on



their abundance, aggressiveness, period of activity, and other factors which depend on the species but not on the mosquito's age.

There are many ways to reduce mosquito bites. They can basically be divided into those actions which directly or indirectly reduce the abundance of adult mosquitoes, and those which prevent contact between adult mosquitoes and people.

Drainage of wet areas and other habitat manipulations typically reduce juvenile mosquito populations, and thus indirectly prevent or minimize production of adults.

Digging a drainage ditch to reduce mosquitoes

Biological control of immature mosquitoes is often effective in limiting adult mosquito production from permanent water bodies, but predators and parasites are rarely successful

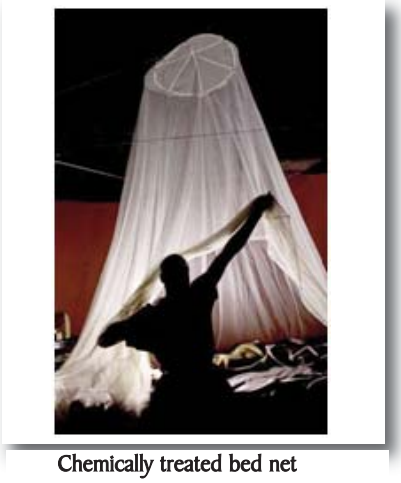
Mosquitofish and larval mosquito

tools for controlling mosquitoes from temporary habitats. Bats and birds eat some adult mosquitoes, but biological control of adults has not been an effective control intervention. Baited traps can be used effectively to reduce adult populations in some circumstances.

Chemical toxicants can be used to directly reduce mosquito populations as larvae, pupae, or adults. Generally, larvicides are more selective than adulticides and are applied over more limited areas.

Contact with adult mosquitoes can be lessened through physical barriers (bed nets, window screens, bite-resistant clothing), behaviors (staying inside during periods of mosquito activity), and/or chemical repellents.

Physical barriers, behavior changes, and chemical repellents can all be used at the individual or family level to reduce mosquito biting, but if



Chemically treated bed net

the disease risk and/or nuisance level is high enough to justify mosquito population reduction, this usually requires community-wide programs. Organized mosquito control programs typically apply multiple techniques to reduce mosquito populations, with specific actions based on abundance surveys, disease risk, and historic observations, in a general strategy known as Integrated Vector Management (IVM) or Integrated Mosquito Management (IMM). IVM/IMM tools exist to reduce mosquito populations at all life stages, and the key operational questions to ask are what are the appropriate control targets and the best techniques to address them?

Many mosquito control programs preferentially target juvenile mosquitoes. However, this indirect control of adult mosquitos through the management of the juvenile populations is not always effective at managing the adult population. For example, some habitats are not amenable to larval control techniques because of their configuration or distribution – e.g. tire piles, artificial containers in urban areas, and tree holes. In addition, in many warm, wet areas the extent of larval habitat within mosquito flight range of inhabited areas can be simply overwhelming. Finally, direct targeting of adult mosquitoes with interventions is critical when they are present in levels which pose significant risk of disease or substantial nuisance. If mosquito adults are present in an area, and especially if a significant portion of them

continued on page 6

Mosquito

continued from page 5

are infected with pathogenic organisms, then larval control tools cannot solve the immediate problem – the use of pesticides (including repellents) which specifically target adults can be the only effective, short-term, area-wide means of protecting people from mosquitoes and mosquito-borne diseases. Even if adult abundance rebounds after a pesticide application, if the average age of the flying females is reduced, disease risk can be substantially lowered.

Chemical tools are critical components of almost all successful IVM/IMM programs. All chemicals, including botanical products and other biochemicals, that target mosquitoes are legal "pesticides", even if they do not directly kill the targets. In fact, while the term "adulticide" has traditionally been applied to materials that are toxic to adult mosquitoes at the application dose, pesticides that target adult mosquitoes can also repel them (repellents), attract them to traps, excite them so they are more vulnerable to toxicants, and reduce their ability to detoxify these toxicants.

Treating larval mosquitoes with granular Bti.

This is the first in a series of articles which will examine the use of pesticides against adult mosquitoes to protect public health. The second article will explore how the effectiveness of adult mosquito control tools is measured. Part III will review the risks associated with their use and the tools used to evaluate these risks.

Further Reading:

American Mosquito Control Association [mosquito.org/mosquito-information/control.aspx]

Donald Roberts & Richard Tren, The Excellent Powder: DDT's Political and Scientific History, 2010 (452pp).

Florida Coordinating Council on Mosquito Control. Florida Mosquito Control 2009 (260pp) [mosquito.ifas.ufl.edu/Documents/Florida_Mosquito_Control_White_Paper.pdf]

Joint Statement on Mosquito Control in the United States from the US Environmental Protection Agency (EPA) and the US Centers for Disease Control and Prevention (CDC) [www.epa.gov/pesticides/health/mosquitoes/mosquitojoint.htm]

WHO, 2009 [http://www.who.int/malaria/world_malaria_report_2009/en/index.html

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IR-4 Tour

On June 23, 2010, IR-4 hosted their eleventh agricultural field tour. This year, participants visited various farms on the DelMarVa peninsula. The tours are designed to provide up close education to those who are making registration decisions and these tours are a critical part of the IR-4/EPA partnership. Participants have the opportunity to see agriculture, as well as have the opportunity to learn from growers what pest management issues they face every day.

On this tour, participants learned about growing mushrooms at Phillips Mushroom Farms, the largest growers of specialty mushrooms in the United States. Here, participants learned the greatest threat to mushrooms are fungi including *Verticillium* and *Trichoderma*.

Other tour stops included Fifer Orchards, a large retail fruit and vegetable grower; Papen Farms, which grows cabbage, snap beans and sweet corn for the wholesale market; and Conard Pyle, a large nursery which holds the patent for KNOCK OUT® roses.

Jeff Herndon, EPA Registration Division Deputy Director, thanked IR-4 and stated, "Back home we are often accused of being arm-chair agronomists. Tours like this help us become more in tune with reality."

Jau Yoh Retires

— by Michelle Samuel-Foo, SOR Regional Field Coordinator

Jau Yoh is retiring as the Southern Region Lab Coordinator, a position she has held for the past 19 years. Jau began her career with IR-4 in February 1991 after working at the University of Florida as a senior chemist doing method development research on pesticides. Originally from northeast China, Jau and her family moved to Taiwan when she was just 5 years old. She migrated to the US for graduate school and completed her MS degree in analytical chemistry from the University of Akron, OH, in 1973. After completing her graduate work, she was hired as a chemist in the technical support division of the General Tire and Rubber Company where she remained for three years. When she and her husband started a family, Jau remained at home full time to care for their two children before joining UF.

The IR-4 Southern Regional office together with the department of Food Science and Human Nutrition at the University of Florida, hosted a retirement luncheon in Jau's honor on May 25, 2010.

Additionally, she was one of several honorees at a departmental ceremony in April for 25 years of work commitment to UF. Immediate post retirement plans include an extended family reunion trip to China and finally getting around to cleaning out her closets which "...have suffered from many years of neglect," according to Jau. When asked about her most significant accomplishment, she responded by saying that no one item comes to mind, although she is quite happy to have had her lab survive five EPA audits unscathed. Her dedication and commitment to the IR-4 program is well known throughout both the Southern Region and National Program. In fact, she is notorious for spending many hours, a weekend and a holiday or two in her office working.

Jau's sense of humor, her wit and her outstanding work ethic ensure that she will be greatly missed by the entire IR-4 program. Good luck, Jau!

Smiles all around as Jau is honored for her 19 years of service to IR-4. Pictured l-r: Dr. Neil Shay, Department head, UF Food Science and Human Nutrition, Jau Yoh and Dr. Marty Marshall, IR-4 SOR director.

IR-4 and USDA Register 'Honey

— by Michael Braverman, IR-4 Biope

In 2001 IR-4 and EPA toured the Lerew Brothers Orchards in York Springs, Pennsylvania, to learn about the disease known as Plum Pox Virus (PPV). The Lerew farm is where, in the fall of 1999, the disease was first discovered in North America.

Tour attendees viewed large orchards that had been bulldozed and burned in order to quarantine PPV.

Since there were no pest management tools to directly control PPV, the grower was converting the orchard into apple production.

Plum Pox Virus is a plant disease that infects stone fruit trees including peach, nectarine, plum, apricot and cherries.

The disease, is also called Sharka disease, and is considered the most serious virus disease of stone fruit trees. Currently, there are no viral control products for Plum Pox.

Plum Pox is spread from tree to tree by aphids and through infected budwood used for grafting, which is the normal method of propagating stone fruit trees.*

First described on plums in Bulgaria in 1915, PPV has spread throughout Europe, the Mediterranean, the Middle East (Egypt and Syria), India, and Chile. In Europe, PPV has infected more than 100 million stone fruit trees.*

Plum pox is an economically devastating disease of stone fruit causing leaves and fruit to have yellow and brown ring spots or streaks. This leads to unmarketable fruit. It also weakens infected trees and decreases fruit yield (as much as 80-100% loss). The tree trunks may develop splits and drop fruit prematurely.

Unfortunately, once the symptoms are seen, it is too late. About 1,600 acres of fruit trees were destroyed in Pennsylvania under an APHIS Plum Pox quarantine and eradication program. This disease has caused annual worldwide losses of about $600 million. In addition to Pennsylvania, the disease was also found in Ontario, Canada in 2000, Michigan in 2007 and New York in 2008. While the eradication program has effectively helped save the stone fruit industry in PA, MI and NY, it has come as a severe sacrifice for growers who have had entire orchards bulldozed and burned. Luckily, the largest fresh and dried plum industry in the US, which is in CA, has not been infected. With about 40 countries (including Canada) having infected trees, the chance for re-infection in the US is a real threat.

Plum Pox infected leaves. Once these spots appear on infected leaves, the trees must be destroyed. The fruit of plum pox infected trees are no longer marketable.— *Photos by Dr. Ralph Scorza*

In the early 1990's Dr. Ralph Scorza of USDA-ARS, successfully transformed plum with the coat protein of PPV, enabling the plum to resist the virus through a process known as post-transcriptional gene silencing. The EPA considers plants that include a Viral Coat Protein to be biopesticides.

In 2006, USDA's Office of Technology Transfer contacted IR-4 about this project because they did not have the regulatory background needed to develop data packages to submit to EPA that would support the registration of this PPV resistant tree.

HoneySweet plums resistant trees— *P Ralph Scorza*

'Sweet' Plum Pox Resistant Plum

esticie and Organic Support Manager

After assurances USDA had vetted the technology through the California fruit industry, IR-4 agreed to assist. Dr. Scorza met with IR-4 and started formulating plans for registration. IR-4 and USDA met with EPA, and by June of 2007, IR-4 made a regulatory submission to the Biopesticides and Pollution Prevention Division of EPA. In May 2010, the EPA subsequently approved the registration. HoneySweet Plum is the first fruit tree that has gone through the full EPA regulatory framework and the first tree of any kind that has been registered solely through the efforts of governmental organizations. Because of the specificity of plant viruses, no animal testing was required to achieve this registration.

Having a stone fruit variety resistant to PPV has other environmental and long term economic benefits as well. Since there are no products that can be applied for the control of the virus, growers only have a few strategies to reduce the chance of getting this disease. One option includes buying disease-free stock and surveying trees and weeds for symptoms; but once a tree is infected, it and surrounding trees must be destroyed. In addition, Plum Pox is spread by 20 different aphid species in as little as 30 seconds of feeding contact, so growers must maintain a frequent spray schedule to manage aphids. Therefore, the use of HoneySweet trees will save the cost of surveys, avoid the destruction of entire orchards and reduce insecticide use.

from plum pox
hoto by Dr.

USDA is in the process of developing its distribution plans, and hopefully the trees will become available to growers shortly. For now, a major part of the process, EPA registration, has been achieved.

** Sections of this article were provided from USDA-ARS website defining Plum Pox Virus at www.aphis.usda.gov.*

Post Script: The Value of Tours

The process of IR-4's involvement with HoneySweet Plum began during an IR-4/EPA/USDA agricultural field tour. A similar tour was recently completed (see page 7) which also featured a number of biopesticide issues.

Joanne Whalen, Extension Specialist with the University of Delaware, mentioned on the most recent tour, that a number of states had requested a Section 18 for the biopesticide bird repellant, anthraquinone. Growers are currently losing about 20% of their corn crop due to bird damage and Delaware plans to submit a Section 18 for anthraquinone as well in 2011.

It often takes time and planning to find the right balance to incorporate beneficials into a management plan. Conard-Pyle Nursery (a tour stop on the most recent tour) utilizes the biopesticides for managing fungal diseases along with beneficial insects. They also use Predalure to attract beneficial insects and plant sunflowers as a pollen source for these insects. Additionally, flea beetles, a serious pest of nursery crops, can be managed with beneficial nematodes but it takes time and finesse for optimal control. Conard-Pyle have grown some crops with 100% biological control agents, but as stated by Suzanne Wainwright -Evans, a consultant who participated in the tour, "When it comes to beneficials, there is a tremendous learning curve. Having someone committed to make the program work is the most important thing."

The IR-4 Project has invited EPA and other partners on these tours to learn of grower problems and potential solutions. The HoneySweet Plum registration is one of many registrations that have been developed in response to learning about grower's needs while on an IR-4 tour.

Neal Thompson, Retired SOR Administrative Advisor, Passes

Neal P. Thompson PhD 73, a resident of Alachua County Florida, passed away on Monday March 8, 2010. He was born July 18,1936 in Brooklyn, New York.

Neal's diverse accomplishments while a professor at the University of Florida (UFL) spanned over 3 decades and included teaching, administration and a position in the Dean's office. He was hired as a Pesticide Chemist in the Food Science Department at UFL in the early 60's and became the first Southern Region IR-4 Director around 1976. In the early 80's Neal became an Assistant Dean for Research in UFL's Institute of Food and Agricultural Science (IFAS) and served in that capacity until he returned to the faculty. At the same time, he became the Administrative Advisor for the Southern Region IR-4 Program and held this position until he retired.

Southern Region IR-4 Director, Marty Marshall, offered these comments about Neal. "My impression of Dr. Thompson was how much time he would spend discussing questions and management of the IR-4 program. When he was Interim Dean for Research I was awarded a Leadership Award to work in the Dean's office. Neal was always willing to take the time to sit and explain the decisions he was making for IFAS. He continued this as the Administrative Advisor always willing to discuss issues. He was an excellent mentor for managing the regional IR-4 Program."

Northeast Regional Field Coordinator, Edith Lurvey, recalled the many Sven and Ole jokes Neal told at meetings. The following is one example.

The Boat

Sven and Ole go fishing. It's such a great day, they rent a boat so they can fish from the middle of the lake. They row out, drop their lines, and before you know it, they're catching fish, one after another after another. They can't believe what a great fishing spot they found.

Sven says, "This is the best fishing spot in the county. It's just too bad we didn't bring some paint."

Ole asks, "Paint? Why should you want paint, to go fishing?"

"Well Ole, don't you see, so we can paint an "X" in the bottom of the boat, so we can find this spot next time." Ole laughs at him. "Sven, don't be such a dummy! Next time, what if they give us a different boat?"

Neal's Christian faith was very important to him and his family as he served on numerous

Neal Thompson with wife, Beverly at his retirement party at University of Florida.

Christian Boards such as the Southeastern District Board of the Evangelical Free Church, the Child Evangelism Fellowship Board of Alachua County, and served as a church officer, Elder, and founding member of Creekside Community Church in Gainesville, Florida.

He is survived by his wife of 51 years, Beverly: his children, Erick and wife Denise, Victor and wife Ann, Clifford and wife Sherry, Stuart and wife Teresa Thompson and Karen and husband Steve Pritchett; his grandchildren, Ericka, Elizabeth, Heather, Jeremy, Clifford II. Christabel, Joy, Grace, Faith, Taylor, Ander, and Trae Thompson; his brother Thomas M. Thompson, and sister Muriel Thompson Johnston.
Neal will be missed!

Excerpts of this article were taken from Neal's funeral pamphlet.

International

continued from page 3

YouTube Video helps maintain trial uniformity by exampling a study from start to finish. IR-4's own Bill Barney (HQ) and Michelle Samuel-Foo (SOR) are the video actors.

For example, premeasured vials of test chemicals were applied with identical application equipment (purchased and delivered by IR-4 to each location) to tomatoes growing at 27 locations throughout the world.

IR-4 also created and produced a YouTube video that showed the field researchers how to conduct the trials from start to finish. IR-4 research cooperators are expected to finish much of the field and laboratory research for this study in 2010. If these data show that geographic region does not play a major role in residue levels, then increased data sharing can occur and global data sets can become a reality. Ultimately global residue programs will provide a more robust data set and global review, thereby providing growers with new technologies earlier with less impact on trade.

The USDA-FAS has also awarded a grant to IR-4 to continue assisting US specialty crop growers by submitting existing IR-4 data, to foreign regulatory authorities to establish MRLs. In some cases this may mean generating additional residue data because of requirements for additional test sites.

Continued Commitment

The increased sophistication and regulation of pesticides make it very apparent that the potential trade issues could be enormous when growers use products (new reduced risk) that are not recognized by other countries. As global markets for US produced specialty crops continues to grow, IR-4's involvement with global harmonization of MRLs and other global pesticide registration issues will also continue to grow.

MRL Workshop

The California Specialty Crops Council (a coalition of specialty crop commodity groups that have joined forces to proactively approach issues concerning pest management and stewardship) held their Fifth MRL Workshop (June 2 & 3) in San Francisco. The MRL Workshop addressed several critically important issues for stakeholders with interests in exporting agricultural products. Topics included international trade, global registrations, pesticide residue monitoring, residue decline curves, MRL strategies for growers, evolving requirements for international residue standards (US, NAFTA, Asia, EU, Codex, etc.), phytosanitary issues (SPS) and an update on uses of methyl bromide related to provisions of the Montreal Protocol. For further information contact Lori Berger, the Executive Director at: lori@specialtycrops.org.

USDA-FAS Plant Health Division Director, Peter Tabor (far right) discusses US Trade trends and targets for Ag Commodities with Wally Ewart (session moderator) and Kathy Monk, (EPA).

Are Beneficial Organisms Impacted by the Newer Thrips Control Products?

— by Cristi Palmer, IR-4 Ornamental Horticulture Manager

IPM is Integrated Pest Management. It is obvious what that is, isn't it? Not always. IPM really means to think about the crop, the disease or insect attacking your crop, the environmental conditions, and choosing the most appropriate tools available to prevent significant crop loss. The available tools could be cultural, such as better screening on a greenhouse or better watering regimes, or biological or chemical products registered to control the problem. Just as important as discovering whether tank mixing two chemical products can lead to negatives, it is important to test whether biological and chemical tools are compatible.

At the 2009 IR-4 Ornamental Horticulture Workshop, we established a research project to examine the impact of the newest thrips control materials on beneficial insects and mites used to manage thrips populations. To outline the scope of the needed information, two websites that document these interactions were searched: Biobest and Koppert (www.biobest.be/bedrijfsprofiel/0/3/ and www.koppert.com/). Avid (abamectin) and Conserve (spinosad) interactions have been well documented. These two products are often incorporated into grower management plans for thrips. While the table below highlights the impact of spraying directly onto these predators, once sprays have dried Avid and Conserve have little impact on beneficial organism populations, particularly if spot applications were made to thrips hot spots. It was quite surprising that little information about direct sprays of Kontos (spirotetramat) and Overture (pyridalyl) was posted on these two sites. Since both are now registered and are recommended tools for thrips, growers need to know whether they will impact the beneficial organisms commonly used within integrated thrips management programs. IR-4 will be including both of these products along with NNI-0101 and Tolfenpyrad in our research.

Table 1. The direct impact of spraying newer insecticides on beneficial organisms for thrips management on a scale of 1 to 4.

Beneficial Organism	Avid (abamectin)	Conserve (spinosad)	Kontos (spirotetramat)	Overture (pyridalyl)	NNI-0101 (pyrifluquinazon)	Tolfenpyrad
Amblyseius cucumeris	adult: 2 [z] persistence: 5 [y]	adult: 1 persistence: 1-2	?	?	?	?
Amblyseius swirskii	adult: 4 persistence: ?	adult: 2 persistence: ?	?	?	?	?
Hypoaspis spp (*aculeifer* and *miles*)	nymph: 2 adult: 2 persistence: 5	adult: 1 Persistence: ?	?	?	?	?
Orius spp. (*insidiosus* and *laevigatus*)	nymph: 3 adult: 3 persistence: 7	nymph: 3 adult: 2 persistence: 3	?	?	?	?

[z] 1 = Harmless; 2 = 25 – 50% reduction; 3 = 50 – 75% reduction; 4 = Harmful; these ratings are based on testing spray applications under field testing conditions. While there were some discrepancies between the numbers published on the Koppert and Biobest websites, Biobest relies solely on results garnered from experiments and Koppert includes observations made under commercial growing conditions without untreated experimental standards. When there were discrepancies, the Biobest rating was included.

[y] Persistence is the length of time in days residual impact was observed after sprays had dried.

Growing Collaborations

— by Frank Lowenstein, Director of Forest Health, North America, The Nature Conservancy

Since its discovery in 2002, the emerald ash borer has cost nursery growers in Ohio, Michigan and Indiana tens of millions of dollars. Even these losses will soon be dwarfed, according to a recently published paper (Kovacs et al 2010), which projects ten-year costs to homeowners from this forest pest at over $10 billion. Meanwhile, the Asian longhorned beetle chews up the urban trees of central

Before and after shot from Worcester MA in the wake of ALB infestation and tree removal. — *Photos by Tom Zetterstrom, The Nature Conservancy*

Massachusetts, light brown apple moth threatens crops and landscapes in central California, Sudden Oak Death continues to disrupt wild forests on the West Coast and the nursery trade nationwide, and yet few people are thinking about the potential impacts of gold-spotted oak borer, Mediterranean pine engraver beetle, thousand cankers disease, or the winter moth. A wave of non-native forest insects threatens wild forests, beloved backyard trees, and growers, nationwide.

For The Nature Conservancy (TNC), which has protected more than 119 million acres of land around the world to fulfill our mission to protect the world's plants and animals, the threat of invasive forest insects and diseases is critical. TNC began its conservation work in the early 1950's by working with willing landowners to protect their lands from development—whether through donation of the land or an easement on it, or by simply buying the land. These collaborative, market-based roots continue to drive our work today. We work with indigenous communities, private landowners, and corporations around the world to find solutions to land use that work for all parties involved. For example, in Maine, New Hampshire, Michigan, Montana and many other locations around the world we've worked with timber investors to put in place conservation solutions that will allow sustainable forest harvesting on much of the land, while protecting against more damaging land uses or poor forestry practices. These efforts ensure continued forest cover, improved forest habitat protection and improved water quality in streams—all at a very efficient cost.

But as we have protected larger landscapes and moved into international conservation we have increasingly recognized the need to also address threats that can't be mitigated simply by controlling what human uses occur on a given piece of land—no matter how large. Invasive forest insects and diseases, which are notoriously hard to control once established and have removed entire species or even genera from North American forests, are a prime example. Unlike many conservation issues, there are no winners when pests arrive. Municipalities, nurseries, urban and suburban homeowners, tree crop producers, and forest products companies have all suffered losses from pests like the plum pox virus, emerald ash borer, citrus canker or the hemlock woolly adelgid.

So working with diverse partners, TNC founded a new organization in 2006 to stem the tide of introductions, and to also stop the flow of non-native pests around the country. Called the Continental Dialogue on Non-Native Forest

continued on page 14

TNC

continued from page13

Insects and Diseases, the group aims to cultivate collaborations to stop pest introduction and spread. In its brief four year history, for example, the group has launched a campaign to stop domestic movement of pests via firewood that has reached 6 million Americans (www.dontmovefirewood.org), produced a documentary now showing on many PBS stations on the impacts of forest pests on a New England town (www.lurkinginthetrees.org), and helped to develop consensus positions across nursery, forest products and conservation groups on the first phase of USDA's revised plants-for-planting rules. A draft rule reflecting many elements of the consensus was published last year by APHIS.

The APHIS rulemaking illustrates how the Continental Dialogue works. The steering committee had authorized a workgroup on preventing new introductions. This group works from recommendations developed by one participating group to put forward a draft position on the first phase of the plants-for-planting rules. These recommendations were refined by the steering committee and the workgroup with help from the facilitation team. A new consensus position was then developed that many participating groups—including nursery industry representatives and The Nature Conservancy—made central to their advocacy on the issue. Sitting down with political leaders at USDA and having nursery, forest products, academic and conservation groups all speaking the same language and the same agenda proved both successful and powerful.

Nature Conservancy staffer Hannah Chamberlain spreads the Don't Move Firewood message at a street fair.

The Continental Dialogue is led by a very diverse steering committee (www.continentalforestdialogue.org /committee.aspx), with professional facilitation of both the steering committee and the full dialogue provided by non-profit RESOLVE, Inc. "The steering committee operates by full consensus, and initiatives are developed based on interests of participants, with light guidance from the steering committee," explains Paul De Morgan, leader of the team from RESOLVE that works with the Continental Dialogue. This ground-up structure allows the Dialogue to respond nimbly to new opportunities, and also helps ensure a focus on areas where there is room for productive action. Areas where there is too little energy or too much conflict tend not to attract participants, with the energy of the facilitation team and Continental Dialogue participants focusing instead on areas where there is a sense of shared opportunity.

Initiatives now under development include an effort to address elements of the *Phytophthora ramorum* problem not otherwise being fully addressed, a look at the options for compensating nursery growers for stock lost to pest problems as a means of encouraging early reporting of new problems, and the development of a mini-series of documentaries addressing pest problems of trees and possibly crops in diverse parts of the country.

With respect to *P. ramorum* some possible activities include outreach to try to encourage voluntary efforts to limit the movement of soil from recreational sites in hiking boots, bike tires or vehicle tires, as well as outreach to the public at large to highlight ways that the nursery industry is working to prevent the spread of the disease. Over 30 people from diverse groups have signed up to work on this initiative, making it one of the most popular in the Dialogue's brief history.

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To date, funding for the Dialogue's efforts has come primarily from private funds raised by The Nature Conservancy, particularly via the generosity of the Grantham Foundation for the Protection of the Environment.

Additionally, in the last 18 months funding from both APHIS and the USDA Forest Service has enabled many of the Dialogue's public outreach efforts. Another limiting factor, besides funding, is getting attention from busy leaders in diverse industries as The Continental Dialogue thrives on consensus across diverse constituencies. But the Dialogue's annual meeting and the phone meetings of the various initiatives are not part of the common agenda of any one profession.

Who needs another meeting? Well, perhaps you do. The next meeting of the Continental Dialogue will be October 5-6, 2010 at Brandeis University in Waltham, MA. The meeting will include field trip options, including the possibility of seeing the Asian longhorned beetle eradication effort in Worcester first hand. More importantly, the 75 or more people who attend will help shape the future direction of this collaborative effort. For more information, log onto www.continentalforestdialogue.org, or email me at flowenstein@tnc.org.

IR-4 Successes Apr.'10 - May '10

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: April 14, 2010
Thifensulfuron-methyl
Trade Name: Harmony
Crop: Safflower
PR#: 03454

Federal Register: April 28, 2010
Cyromazine
Trade Name: Trigard
Crop: Succulent bean
PR#: 03909

Federal Register: May 12, 2010
Clethodim
Trade Name: Select
Crops: Globe artichoke, Bushberry subgroup 13-07B (except lowbush blueberry), Caneberry subgroup 13-07A, Peach
PR#: 09013, 05234, 05233, 06060, 06875

Federal Register: May 12, 2010
Fluazinam
Trade Name: Omega
Crops: Bushberry subgroup 13-07B (to include new commodities in the expanded subgroup), Bulb onion subgroup 3-07A, Lettuce (head and leaf)
PR#: 07092, 06892

IR-4 has a new logo. We will be incorporating the new logo into all our communication pieces, however we still have quite a bit of stationary and tri-fold brochures with the old logo and will be using these until we need to reorder these pieces.

If you would like to purchase polo shirts with the new logo, contact Sherrilynn Novack at novack@aesop.rutgers.edu.

The WSR Welcomes New Field Program Assistant

— by Stephen Flanagan, Western Region Assistant Field Coordinator

The Western Region would like to welcome Mika Pringle Tolson as the new Field Program Assistant, working in the Field Office to support the project management of the Ornamental Horticulture, Food Use and Biopesticide Programs.

Mika has worked at the University of California, Davis for the past 16 years in support of the Toxics Substances Research and Teaching Program. She comes to the IR-4 program with a keen knowledge of botany and plants, as well as extensive experience in database and website management, program organization and technical writing. We are very pleased that Mika has joined the IR-4 Field Team and look forward to her participation in the program.

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.

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USDA United States Department of Agriculture
National Institute of Food and Agriculture
ARS Agricultural Research Service

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