

Hands-on Pest ID Workshop At The Florida Ag Expo

— by Michelle Samuel-Foo, IR-4 Southern Region Field Coordinator

The University of Florida's Gulf Coast Research and Education Center (GCREC) in Balm, FL was the site of the recently concluded FL Ag Expo which is now in its 10th year of existence. This annual gathering of Florida fruit and vegetable growers has become a premier showcase of the industry's trends and issues. This year, as in the past, attendees had opportunities to liaise with GCREC experts in areas ranging from plant breeding to pest, weed and disease management. Several educational sessions were held throughout the day that covered a plethora of topics and these were complemented by an afternoon of well attended, rotating field tours. Ag chemical companies, commodity groups and other stakeholder partners and exhibitors were set up in easily accessible booths, where anyone could stop by to get



previews of the latest industry products and services.

New this year at the FL Ag expo was a hands-on Pest Identification (ID) Workshop that saw attendees having the opportunity to gather firsthand knowledge and gain practical experience with several key pests of specialty crops including whiteflies, spider mites, aphids and thrips. Participants also had the chance to become familiar with natural enemies (predators and parasitoids) that help control these pests. The training sessions were designed for growers, scouts, crop protection professionals, extension agents, and master gardeners, although anyone with an interest in the subject matter would have benefited.

The two 40-minute sessions were led by the vegetable entomology lab at GCREC, under the guidance of Dr. Hugh Smith, an entomologist who has worked extensively in strawberries and

Michelle Samuel-Foo, IR-4 Regional Field Coordinator helping a participant figure out the life cycle of thrips.

Photo by: Tyler Jones, UF/IFAS

tomatoes. Dr. Michelle Samuel-Foo, the IR-4 Southern Region field coordinator also assisted with the sessions, as did UF bioscientist Curtis Nagle and lab assistant Laurie Chambers. Jeff Cluever, an MS student who specialized in thrips ID as part of his Master's research was prominent in developing handouts and posters that were used in the teaching sessions.

During each session, attendees were introduced to the basic principles of pest management. The concepts of life cycle, metamorphosis, and feeding damage were all touched upon. After the introduction, participants divided into small groups to test their knowledge. Each group was given a

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Dear Friends,

Is it just me or did it seem like just last week we were ringing in the 2015 New Year and getting ready to put out the 2015 field trials? Well 2015 has come and gone and the ball has dropped to start 2016.

IR-4 prides itself on its efforts to help growers of fruits, vegetables, herbs, ornamentals and other specialty crops/minor uses. We have a lot to be proud of; some of our 2015 accomplishments include:

- 1179 food crop registrations on specialty crops/minor uses
- Two new fungicides and two amended herbicide registrations that added additional ornamental crops/pests to labels
- Support and facilitation of EPA approval Hop Beta Acid to manage Varroa mites in honey bee hives
- IR-4 hosted the first Global Minor Use Priority Setting Workshop
- Established the Global Minor Use Fund with USDA “seed resources”
- IR-4 supported pre-registration activities, including efficacy testing and Experimental Use Permits, for new insecticide-treated fabrics, mosquito traps, and molecular biocontrol agents

Please take a close look at Bob Simerly’s article in this Newsletter. Bob is an IR-4 Commodity Liaison Committee member, he writes about the strategic importance of the IR-4 Project. Along those same lines, USDA recently held grower “Listening Sessions” in Michigan and Georgia. IR-4 North Central Region Director, John Wise, and Southern Region Field Research Director/Product Performance Coordinator, Roger Batts, attended the sessions, respectively, and provided first-hand knowledge of farm industry testimony supporting IR-4.

The US Congress and President have agreed on funding levels for federal fiscal year 2016. Allocation for IR-4 remains at the same level that was provided in 2012. Level funding has caused IR-4 to reduce the amount of new research to offset increased operational costs. Some of IR-4’s long term partners are feeling the same pressure. Cornell University decided they could no longer afford to accept the USDA grant for IR-4’s Northeast Region activities because, by law, the grant does not allow for overhead costs. This decision raises the stakes on the entire issue of indirect costs (IDC). IR-4 is actively looking at this issue and developing a proactive approach to address the IDC issue while maintaining adequate funds for research.

I am sad to report that Dr. Robin Bellinder passed away last November. Robin was an international expert in weed control in vegetable crops at Cornell and was the Director of the IR-4 Field Research Center in Ithaca. Robin was a friend and mentor to many of us; she will be missed! Cornell has established the Robin Bellinder Graduate Student Fund “to provide financial support for graduate students working on vegetable crops, with a preference given to projects with a weed science emphasis.” See bit.ly/Bellinderfund for more details or contact Dan Kunkel.

All the best,
Jerry



IR-4 Data Utilized in Securing New Bird

Repellent — by Michael Braverman, IR-4 Biopesticides & Organic Support Manager

The US Environmental Protection Agency recently approved the use of anthraquinone (also known as AV-1011) as a bird repellent under Section 3 registration to protect rice seedlings. The IR-4 Project received requests to assist with this project from Florida, California and Louisiana. IR-4's Biopesticide Grant Program funded field efficacy studies in Missouri. Following these studies, IR-4 met with EPA to develop a strategy to conduct the field trials needed for the residue study. Field trials began in 2012 in cooperation with the Louisiana State University (LSU), University of Arkansas, Texas A&M University and the University of California. IR-4's research supported a Section

18 temporary use permit starting in 2011 until the full registration was granted. After analysis was completed by IR-4's Michigan State University lab, IR-4 provided the data to Arkion Life Sciences (who now holds the registration) to prepare the reports and make the submission.

Anthraquinone is a natural product found in some plants such as rhubarb and is a strong bird repellent. It is unique in that it absorbs UV light, which can be perceived by birds. Birds develop a negative association between the material, light shift, and the crop, thereby repelling the birds (Michael Avery, National Wildlife Research

Center, Gainesville, FL). IR-4's Michael Braverman has managed the IR-4 Biopesticide and Organic Support Program for over 10 years and is a former faculty member of LSU. He has been aware of this potential product since the mid 1990's. Through his familiarity with the need he was able to develop a more efficient study design regarding the field research, which provided more data for EPA while also saving IR-4 resources. While most IR-4 research is focused on specialty crops like fruits and vegetables, minor uses on major crops (such as this) are also an important part of the program. IR-4 has conducted similar research on corn which has been supporting a Section 18 registration and growers are hoping for completion of the registration of that use in the near future. The current registration is valid for 2 years pending additional studies requested by EPA. 🌱

USDA Listening Sessions Yield Positive Results for IR-4

—by John Wise, IR-4 North Central Region Director and Roger Batts, IR-4 Southern Region Field Research Director and Product Performance Coordinator

USDA listening sessions at the Great Lakes Fruit and Vegetable Expo and SE Regional Fruit and Vegetable Conference have yielded positive results for IR-4. Michele Esch, executive director of the NAREEE (National Agriculture Research, Extension, Education, and Economics) advisory board and the USDA Specialty Crop Committee have organized several USDA Specialty Crop Listening sessions for 2015-2016. These sessions are an opportunity for specialty crop growers and citizens to share their ideas on the specialty

crop industry with members of USDA's Specialty Crop Committee. This committee is charged by USDA with the responsibility of studying and reporting on the scope and effectiveness of research, extension and economic programs affecting the specialty crop industry. The committee has members from across the country representing universities, grower associations and industry. At these listening sessions, growers and others will have the opportunity to comment on how to improve the efficiency, productivity, and

profitability of specialty crop production and to identify ways to improve competitiveness through research, extension, and economic programs affecting the specialty crop industry. The committee is interested in hearing about all aspects of the industry – enhancing quality and shelf-life, development of new crop protection tools, preventing foreign invasive pests and diseases, marketing strategies, and food safety. These thoughts and ideas will help formulate recommend-

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The Strategic Importance of The IR-4 Project

— by Robert Simerly, Agronomist McCain Foods USA, Inc. and IR-4 CLC member. Written on Behalf of the National Onion Association

Agricultural research is not a special interest for agribusiness; everyone who eats has an interest in agricultural research whether they know it or not. Maintaining the national agricultural research infrastructure to ensure our ability to defend the food supply against enemies, both natural and human, is vital. In fact, it should be considered a national strategic imperative. The IR-4 Project is one of these vital national agricultural research programs.

The IR-4 Project, as well as other agricultural research organizations, is heavily weighted toward fixed costs. In the case of IR-4 it is estimated that approximately 80% of the budget supports maintaining the infrastructure to run the Project; these are costs that exist regardless of the volume of work performed. I believe it is an appropriate role for the federal government to maintain, and strengthen this critically needed infrastructure.

Should the federal government be involved in financially supporting agricultural research? The short answer is yes. The Founders stated in the Preamble that one of the purposes for the establishment of the Constitution was to "... promote the general welfare..." (also in Article I § 8). The Supreme Court determined in *Unites States vs. Butler* (1936), and other cases, that Congress has discretion to determine what constitutes "general welfare" and the power to tax in order to

promote it. The Court also held that, in so doing, Congress must remain mindful of States' Rights. US cooperative research spending, that which is done in cooperation with State Land Grant Universities, is an excellent example of this process working amicably. If ensuring food security does not constitute promoting the general welfare I don't know what does.

Food matters to everyone and it is the duty of government to ensure that private industry has a healthy business environment conducive to producing an abundant supply of it. That environment includes fiscal (e.g. banking), logistical (e.g. roads), and biological (e.g. research). The American food supply is under constant threat; new diseases and/or newly resistant insect, weed and microbiological pests are continually emerging throughout the country on every crop. We must be vigilant and be prepared to fight these threats whenever and wherever they occur.

Iris Yellow Spot Virus (IYSV) in the dry bulb onion crop is an example of the IR-4 Project helping to resolve a biological threat. Dry bulb onions are the nation's third largest fresh vegetable crop. A decade ago IYSV had already been ravaging onion bulb production in the Pacific Northwest (PNW) for several years. The virus kills the leaves of the plant before it can reach full maturity resulting in small bulbs and consequently lower yields. Researchers knew that the virus was vectored (transmitted) by a small

insect called thrips. At the time the industry had few effective tools to control thrips as pesticide resistance was growing in the population.

IYSV has not been cured but today the industry has an IPM strategy that has brought the disease under control. The IPM program involves utilizing tolerant onion cultivars, managing the overwintering disease inoculum and a vastly improved thrips control program, thanks in large part to the IR-4 Project.

The IR-4 Project is currently being called upon to help register a badly needed herbicide for a noxious weed in onions called Yellow Nutsedge (*Cyperus esculentus*). This weed is physiologically similar to onion and is therefore difficult to control. It is spreading throughout the onion growing regions of the country with little to stop it.

A new disease is emerging in the PNW that may pose a significant threat to the storability of the nation's onion crop. *Fusarium bulb rot*, caused by the fungus *Fusarium proliferatum*, has been increasing in the northwest over the past few years. Serious research is needed to understand how to prevent and/or control this disease. Currently there are no registered fungicides with efficacy on *F. proliferatum*. Once again, the IR-4 Project may be called upon to help register a chemical as part of an IPM strategy to protect this important vegetable crop from another disease.

Dry bulb onion is just one of over 200 commodities that fall under the definition of "specialty crops". Each crop has similar stories. Specialty crops represent approximately one half of the agricultural revenue generated in the United States and growers of these crops depend

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ations from the Specialty Crop Committee to USDA.

The first session was held on December 14, 2015 at the Great Lakes Fruit and Vegetable Expo in Grand Rapids, Michigan. The panel was composed of three committee members Phil Korson, Michael Aerts and Chalmers Carr (chair). Two IR-4 Commodity Liaison Committee members, Bruce Buurma and Alan DeYoung, gave excellent testimonies to the panel on the importance of IR-4 to US specialty crop production. Buurma shared, "As an Ohio land owner, vegetable farmer and beekeeper, I am confronted with invasive species such as the Brown Marmorated Stink Bug in my vegetable crops and the Emerald Ash Borer in my wood lots. Besides providing the standard services of registering pesticides for specialty crops, IR-4 is playing a key role in combating invasive species and protecting pollinators." Alan DeYoung of Vandrunen Farms in Illinois said, "Increasingly, the success of specialty crop farming depends on accessing global markets. A major barrier to exporting specialty crops is the disparity in Maximum Residue Limits (MRLs) between US and target export countries. IR-4 is helping to address this problem by developing pesticide tolerances for domestic uses and harmonizing international MRLs." Many of the other growers giving comments also spoke of the importance of IR-4.

A second session was held on January 7, 2016 during the SE Regional Fruit and Vegetable Conference in Savannah, Georgia. Attendance was high. After panel introductions and opening remarks, the positive impact of IR-4 was immediately brought up. The first person to approach the

microphone was Bill Brim, from Tift County, GA. He spoke highly of the impact that IR-4 has had on specialty crop production, and in particular, he stated that at least 30 herbicides that he uses in his large and diverse operation, were registered through the IR-4 Project research data. He also noted that thousands of tolerances, across many crop groups, can be attributed to IR-4 efforts. He specifically asked the panel to, 'please let us, the growers, know how we can stimulate increased funding for this program.'

Brim's comments were quickly echoed by Mike Buorton, Director of Agricultural Operations, Superior Berry Company of Fargo, GA. Buorton noted that 63 pesticides for blueberries have come through IR-4 and that, "there would be no blueberry industry in south Georgia without IR-4." He added that the large number of different products that IR-4 has helped provide for blueberries has helped stave off pest resistance, an increasing concern in all specialty crops. He also noted how grateful the blueberry growers are to IR-4 for helping discover tools for managing Spotted Wing Drosophila.

The third person to come forward for comment also praised the IR-4 program. Dave Trinka of MBG Marketing, stated that their growers participate in many USDA sponsored programs, including IR-4 and that IR-4 is seen as the model program for government/industry/grower cooperation. Trinka also commented that there is concern among IR-4 stakeholders on the level of indirect costs that have and may be taken from IR-4 funds by universities that participate in the IR-4 program.

Several more people came forward to speak, including growers from Georgia, Mississippi and representatives from academic institutions. Their statements focused on a wide range of USDA programs and included comments on the need for a less cumbersome process for specialty crop block grants, incentives for more and better student training and university infrastructure to ensure quality agricultural research for future generations of both specialty crop producers and consumers. Though IR-4 wasn't specifically mentioned, another topic that was repeatedly mentioned by speakers was the need for the US agricultural leaders to work with other countries to harmonize international MRLs; a focus where IR-4 has already emerged as a global leader.

These sessions were good venues for the committee to hear about the importance of IR-4 and the grower comments will be captured as a part of the Congressional Record, and ultimately help the Specialty Crop Committee formulate recommendations to USDA. There will be one to two more sessions held in California in 2016. 🌱

eQA Update

The IR-4 eQA reporting system is receiving an upgrade in its appearance and functionality. Prior to the mid-March launch, training sessions (via webinar) to introduce the system changes will take place during the months of February and March. If you are an eQA user and you haven't yet attended a training session, please contact Tammy Barkalow (ext. 4607), Jane Forder (ext. 4608) or your Regional QA coordinator to find out which webinar dates are still available. 🌱

Addressing Insecticide Resistance in Mosquitoes

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

The World Health Organization (WHO) recently reported one of the great public health success stories of all time – from 2000 to 2015, global incidence of malaria, the greatest infectious killer, had dropped 37%, while death rates overall had dropped 60% and death rates in children under 5 had dropped 65%.¹ The drop has been so dramatic, in fact, that serious efforts are now under way to completely eradicate the disease, and the United Nations (UN) has adopted a follow-up goal of an additional 90% drop in the next 15 years. This is truly great news, as millions of children are now alive that would have died if disease rates from the 1980's and 90's had continued. However, there is a deep sense of unease among malariologists with an awareness of history, and a fear that all our progress could come undone rapidly if we are not very careful to quickly and effectively address insecticide resistance.

In the face of clear successes, and an abundance of effective and inexpensive tools to combat malaria, why is this fear so pronounced? To be blunt, it's because we've been here before, we failed then to adequately address resistance to widely-used insecticides, and many people died as a result. And it's because it is not clear that we have been able to adequately address the weaknesses of the first global campaign to eradicate malaria, although major efforts are being made to get it

right this time.

In the aftermath of World War II, the new Center for Disease Control (CDC) and the new WHO both focused much of their efforts on reducing malaria – it was a major killer that looked vulnerable to new chemical tools, in particular, DDT. This chemical was first tested as an insecticide in 1939 and by the end of the war had saved many from typhus and other insect-borne diseases. By 1955, malaria had been pushed out of Europe and North America, and WHO adopted a goal of eradicating malaria in all countries with low to moderate transmission rates worldwide, relying largely on DDT for mosquito control. The campaign was highly successful at first, eliminating the disease in many regions (most of South America and the Caribbean; Australia, Taiwan, and most of the South Pacific; the Balkans; and much of northern Africa) and dramatically reducing mortality in India and Sri Lanka. While global eradication of malaria seemed possible, a variety of challenges, including funding gaps, environmental concerns, and insecticide and drug resistance, doomed the effort, and by 1969 WHO abandoned the goal of malarial eradication in favor of a strategy of disease control and treatment. Unfortunately, the disease rebounded with a vengeance and millions died in the years following this change in goal. It's beyond the scope of this article to tease out the contributing factors, but there is no doubt that

increasing insect resistance to DDT, and the lack of viable alternatives at the time, was largely to blame for the resurgence of malaria.²

What are the lessons to be learned for our current anti-malaria campaigns? Avoiding overreliance on a single chemical mode of action seems a good place to start, but it's easier to state than to implement. About 70% of the reduction in malaria since 2000 is attributed to the distribution and use of a billion insecticide-treated bed nets,³ and every one of these nets was treated with one of three closely related pyrethroids – permethrin, deltamethrin, and alpha-cypermethrin.⁴ In addition, much of the rest of the drop in malaria is due to indoor residual spraying (IRS) of pesticides to combat mosquitoes, and while the range of pesticide classes is wider in IRS than in treated nets, more than half of the recommended IRS pesticides are pyrethroids or DDT⁵, which shares a common mode of action and which show common cross-resistance.

The pyrethroids are impressive insecticides - effective, safe for mammals, inexpensive, and fast-acting (killing infected mosquitoes before they bite is important in disease prevention). Unfortunately, but inevitably, they are starting to fail, and we are starting to see the consequences of



Anopheles mosquito biting a person despite net use

their failure. Pyrethroid resistance has been observed in the lab for years, but it is now clearly and increasingly associated with control failures⁶, to the point that mosquitoes are observed flying unscathed inside bednets with tiny tears.

Management of insecticide resistance has traditionally relied on rotating the use of chemical classes, mixing materials with different modes of action to defeat or at least delay the spread of resistance genes, and/or developing new classes of insecticides.⁷ While all of these approaches are theoretically possible in mosquito control, there are major challenges facing each.

Rotation of pesticide chemical classes is common in agriculture but uniquely challenging in vector control. The typical bed net lasts three years, and with a billion having been distributed, it is hard to envision a mechanism to dramatically reduce pyrethroid selection pressure for years to come, even if other uses could be substantially curtailed. In addition, people might lean against nets for hours every night and children can chew on them, which means that very high mammalian safety is critical, and this is uncommon in other fast-acting insecticides.

Mixing chemical classes is possible in vector control and is beginning to happen, with combination nets coming on the market. WHO now recommends one net with PBO (piperonyl butoxide, a synergist) in addition to a pyrethroid, and nets combining pyrethroids with chlorfenapyr or pyriproxyfen are under evaluation in multiple sites. The safety of these nets is high, and the additional chemicals should help delay resistance, but in every case the primary protection is still offered



Permanet 3.0 - First WHO-recommended net with PBO

by a pyrethroid, and there is no good evidence on how long these will delay control failures due to resistance genes.

The great hope for many relies on a combination of goals: 1) developing and registering two or three wholly new classes of insecticides, with acceptable cost and safety, before pyrethroid control failures are overwhelming; 2) reserving the uses of these new classes solely for public health, to delay the onset of resistance that would probably be inevitable if they become widely used in agriculture and other applications; and 3) eradicating the disease while these new classes are still effective. Even if malaria eradication proves impossible or long delayed, it is hoped that the first two accomplishments would be sufficient to keep malaria under control without a rebound like the one following 1969. These are the main goals of the 10-year old Innovative Vector Control Consortium (IVCC), which has invested some \$100,000,000 of Gates Foundation funds in screening and evaluating compounds with new modes of action.⁸

The IVCC hopes to introduce chemicals with three novel modes of action into the global regulatory system within the next two years, to help streamline regulatory

pathways so they can be in the field quickly. They would like to limit their use to mosquito control in hopes of delaying resistance. If successful, this could go far to avoiding the tragic follow-up to the first global malaria eradication campaign, and the IR-4 Public Health Program has been working with IVCC since its inception. Unfortunately, these hopes face substantial obstacles, including the high cost of proving the safety of new insecticides (\$80-200 million each through global registration) and the challenges posed by novel metabolic resistance mechanisms in insects, which can target multiple chemical classes at once.

In addition to supporting IVCC and WHO in efforts to speed the regulatory process, the IR-4 Public Health Pesticides Program has continued a parallel effort to identify underutilized insecticidal materials, in both existing and new chemical classes, and to support their development, evaluation, and registration. We hope that this will help provide an addition safety net to ensure that we can turn the recent successes against malaria into a long-term victory. 🌱

Citations

¹<http://bit.ly/whofact>

²Tren & Roberts, 2010: *The Excellent Powder: DDT's Political and Scientific History*. Dog Ear Publishing. 452pp.

³<http://bit.ly/intreatednets>

⁴<http://bit.ly/longlastnet>

⁵<http://bit.ly/inspray>

⁶<http://bit.ly/pyrethroid>

⁷<http://bit.ly/irac-online>

⁸ <http://www.ivcc.com/>

mixed up set of insect life cycle puzzle pieces and they had to fit them together using the information that they had just received. Interactive puzzle activities introduce an element of gaming and light competition into the learning process, focusing information discovery and learning in a way that passive observation does not lend itself to.

Following this activity, attendees rotated from station to station that had been set up around the entomology lab to examine both live and curated specimens. Working individually or in pairs, students examined specimens using a stereo-microscope or hand-held lens. Posters and photo ID guides produced by the GCREC Vegetable lab and UF Doctor of Plant Medicine student Nicole Casuso were set up around the room to aid in the activities, and the GCREC entomology lab members were all available to help answer questions as they came up as well. Each specimen had a letter next to it that, when correctly identified and recorded in the answer sheet, 'GCREC 10 YEARS' was spelled out.

To close the session, video feed by means of a camera attached to a microscope and monitor display,



University of Florida GCREC entomology lab member Laurie Chambers helping with pest identification under the microscope. Photo by: Tyler Jones, UF/IFAS

showed live insects on screen. The attendees seemed to really enjoy this aspect of the pest ID workshop. Using video allowed Dr. Smith to point out characteristics that can sometimes be difficult to see in the field, such as the shape of spider mite eggs, or the appearance of a parasitized whitefly nymph. Additionally, live video readily captured the way different arthropods move and search, characteristics that can be useful for identification. The FL Ag Expo offered growers, producers and those with an interest in Florida agriculture a chance to discover ideas for increasing their productivity and efficiency in their operations. The hands-on pest ID workshop provided an excellent overview of the entomology side of Florida fruit and vegetable operations.



Dr. Hugh Smith, using live video to point out thrips characteristics during the pest ID workshop at the FL Ag Expo. Photo by: Tyler Jones, UF/IFAS

An Up and Coming Landscape Plant:

Enkianthus

— by Cristi Palmer, IR-4 Ornamental Horticulture Manager

Enkianthus species naturally occur in Asia and were introduced into England by botanist Charles Maries in the late 1800's on a plant collection trip to Japan, China and Taiwan where he discovered 500 new plants. During this trip, Maries collected seeds and shipped them back to England where Veitch Nurseries evaluated plants for introduction into the plant trade.

Enkianthus species range from deciduous low shrubs to small trees. At the smaller end, *E. perulatus* 'Compacta' grows to 2 feet, while *E. campanulatus* (redvein enkianthus) is a small tree topping out at 15 feet under warm temperate growing conditions. Enkianthus bloom in spring to early summer with white or red pendulous flowers on branches formed previous years. While most species have somewhat inconspicuous blooms at less than 1/2", *E. serrulatus* bears ivory blooms from 1/2 - to 3/4" across and dangle from the bare branches like so many celestial bells. Fall color is variable from yellow to orange to bright red depending

on species and cultivar.

Related to rhododendrons, azaleas, and other members of the ericaceae plant family, enkianthus prefer moist acidic soils rich in organic matter and are hardy in USDA Hardiness Zones 4 - 7. Redvein enkianthus is fairly cold tolerant and can grow in zone 4. Other species typically grow best in zones 5 - 7. Generally, enkianthus are untroubled by pests and diseases, but there are reports of cottony cushion scale, mulberry borer, lacebug, and *Phytophthora cinnamomi*. Growing outside the optimal acidic soil range can cause chlorotic leaves.

Although enkianthus species and cultivars have been planted in the United States for decades, these plants have not been commonly available through garden centers. Due to their attractive landscape qualities, more enkianthus will be produced over time, but growers have little information on use of herbicides. During 2016, IR-4 will start screening over-the-top applications of pre-emergent herbicides to determine whether early applications as plants are breaking dormancy and will cause unacceptable injury.

Enkianthus perulatus with white pendulous flowers in the spring.
Bugwood Images



Enkianthus campanulatus with showy red fall foliage. Bugwood Images.

IR-4 Support

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upon the IR-4 Project to provide the data that EPA requires to register a new crop protectant or a new use for an existing one (including organics). The vast majority of the data that EPA uses to register crop protectants on specialty crops comes from the IR-4 Project. The importance of the IR-4 Project should not be understated but unfortunately it often is.

Even in the agriculture industry the IR-4 Project is often unappreciated; how much more so among our city cousins, many of whom are woefully ignorant of the demands of food production. It is incumbent on all of us in the industry, you who are reading this article, to speak out about the importance of federal government support for the IR-4 Project as well as other vital agricultural research efforts. Make it a priority in your commodity groups to get the word to Congress that you want them to support agricultural research and especially the IR-4 Project.



New Product Corner

This is for informational purposes only as IR-4 does not endorse a particular product or registrant.

FENPYRAZAMINE (Fungicide – Valent USA Corporation)

Introduction: Unconditional registration for the new active ingredient (AI) fenpyrazamine was granted by the EPA in March 2013. The first commercial label in the U.S. was released by Valent in early 2015. This registration provides growers with a new pest management tool for use against various diseases. Belonging to the amino-pyrazolinone class of chemistry, fenpyrazamine is an SBI Class III fungicide, and targets 3-keto reductase, C4- de- methylation (erg27). This new AI may be especially useful against target diseases that have developed resistance to other fungicides. Fenpyrazamine has been classified by the Fungicide Resistance Action Committee (FRAC) as a Group 17 fungicide.

Other global registrations: first global registration was in Korea; the European Commission approved the AI and placed it on Annex I in July 2012; Prolectus® was launched in Italy in 2012; Pixio®DF was launched in Japan in 2014.

US trade name/formulation: Protexio™ SC fungicide (a 3.34 lb ai/gal suspension concentrate)

Protexio™ SC labeled crops (see label for specific use patterns and other general directions for use): raspberry, blueberry, grape and strawberry.

Labeled pest spectrum: gray mold/bunch rot (*Botrytis cinerea*), mummy berry (*Monilinia* spp)

Completed IR-4 residue projects (PR#): blueberry (09445), caneberry (09444), ginseng (09453)

IR-4 database requests for which a tolerance is established (PR#): ginseng (09453); lettuce, head and leaf (09443); pistachio (09452)

Other IR-4 database requests (PR#): apple, postharvest (PH) (09457); stone fruit, PH (09448, covering cherry PH [09456], peach PH [09454], plum PH [09455]); stone fruit, foliar/ pre-harvest (11704) – all are on manufacturer hold until further notice 🌿

New Faces at IR-4 HQ

IR-4 HQ welcomes **Julieane Lacsina** who has been hired as an intern focusing on helping with international projects.



For the last several years IR-4 has been conducting international capacity-building programs in Asia, Latin America and Africa. Julieane has begun learning how to prepare residue project field data summaries on the data from projects in Southeast Asia, including her native country of the Philippines. Julieane is funded through US-AID and will be at IR-4 a few hours per week while she is pursuing her Masters in International Agriculture at Rutgers.

We would also like to introduce **Yu-Han Lan**. Yu-Han is working as a Research Assistant supporting the Public Health Pesticides (PHP) Program.



Specifically, she is updating and expanding the PHP Database to include current information on all pesticide products registered for use against mosquitoes, ticks, and other invertebrate vectors of disease; when she's finished, this will provide a one-stop shop on the labels and regulatory status for about 3000 products. When she is not at HQ, she is a graduate student in the Rutgers Department of Entomology and the Center for Vector Biology, studying nematodes as biological control agents vs. mosquitoes. 🌿

The 2016 Biopesticide (1st day) & Food Use Workshops will be held September 21-23 at the Rosen Center in Orlando, FL

Robin Bellinder, Leader in Weed Management, Passes

Article from Cornell University website at news.cornell.edu

Robin Bellinder, professor of plant science and a national and international leader in weed management, died Nov. 13 in Ithaca, New York, at age 70. She joined the Cornell University Horticulture Department in 1984 as assistant professor, with a program focused on weed management for vegetable crops. She was appointed professor in 1997.

Bellinder led the effort at Cornell to provide fresh vegetables from plots at the Homer C. Thompson Vegetable Research Farm to the Food Bank of the Southern Tier. Since 2004, Cornell has donated more than 1 million pounds of produce from the Thompson farm.

Bellinder was a "tireless fighter" for New York vegetable growers, always looking for new tools to manage weeds, according to Steve Reiners, chair of the Horticulture Section of Cornell's School of Integrative Plant Science. She was past president of the Northeastern Weed Science Society and in 2005 was named the recipient of Cornell's College of Agriculture and Life Sciences award for Outstanding Accomplishments in Applied Research.

Her research included all aspects of weed management, from traditional herbicides to cultural and chemical alternatives. She pioneered research in the weed suppressive ability of

cover crops. A sabbatical leave to Sweden in 1991 introduced Bellinder to new and innovative European cultivation equipment that she brought back to New York.

She mentored and advised many graduate and undergraduate students, and also co-taught the course *Commercial Vegetable Production*. Bellinder traveled throughout Central America and Asia, and after a visit to India pioneered the use of backpack sprayers for small growers. "Anyone who thinks farmers in India should control weeds without herbicides should spend an afternoon in a field there with a hoe," she once said. She was elected a fellow of the Indian Weed Science Society for her contributions to Indian agriculture.

At the urging of her colleagues, Cornell is proud to announce the establishment of the Robin Bellinder Graduate Student Fund. The fund will be established "to provide financial support for graduate students working on vegetables crops, with a preference given to projects with a weed science emphasis. The fund will be distributed at the discretion of the chair of the horticulture section, and may be used to supplement travel or research expenses for the successful candidates".

Those interested in supporting the

fund should visit: bit.ly/Bellinderfund. We will be happy to share any notes or messages with Robin's family.

Dan Kunkel: Remembering Robin...

Robin was a mentor and friend of mine for nearly 30 years, starting with the honor of undertaking my Ph.D. program with her. She guided me through an excellent program of applied and basic vegetable weed control research. Her profound dedication to the profession set a good example for me and for her many other graduate students as we began our profession. Over the years she evolved into a world-renowned leader in the area. Intense is a word often used to describe Robin, and it is a reflection of her extreme dedication to the profession, with the highest level of integrity. She had a deep concern for so many, through her guidance and support she provided to us graduate students, to the growers in New York, to many around the world, and even to the hungry families in her community, and the state. She was truly selfless and she will be dearly missed by many. 🌱



Robin, left, in 2012 with other volunteers gleaning potatoes for the food bank to which she was devoted.

Oct. - Dec. 2015

Federal Register — October 2015

Pyrimethanil Trade Name: Penbotec, Scala
 Crop: Cucumber (greenhouse-grown), Tomato subgroup 8-10A, Citrus fruit group 10-10, Pome fruit group 11-10, Stone fruit group 12-12 PR#: 10284, 11424, 11425, 11426, 11427, 11497, 11498

Methoxyfenozide Trade Name: Intrepid Crop:
 Chive (fresh leaves), Green onion subgroup 3-07B (except chive), Herb subgroup 19A (except chive), Tree nut group 14-12, Stone fruit group 12-12 (except fresh plum) PR#: 07240, 11471, 11472

Rimsulfuron Trade Name: Resolve Crop: Grain sorghum PR#: 08604

Federal Register — November 2015

Nicosulfuron Trade Name: Accent Crop: Grain sorghum PR#: 08604

Acetamiprid Trade Name: Assail Crop: Clover (Pacific Northwest only) PR#: 09600

Saflufenacil Trade Name: Treevix powered by Kixor Crop: Pomegranate PR#: 10786

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 — December 2015

Azoxystrobin Trade Name: Abound Crop: Ti palm, Quinoa, Stone fruit group 12-12, Tree nut group 14-12 (except pistachio) PR#: 10994, 11430, 11431, 11634

NAA Trade Name: Tre-Hold Crop: Pomegranate PR#: 05389

Pendimethalin Trade Name: Prowl H2O
 Crop: Bushberry subgroup 13-07B, Caneberry subgroup 13-07A, Tree nut group 14-12 PR#: 09840, 10181, 11454

Propiconazole Trade Name: Inspire, Quilt, Tilt
 Crop: Brassica leafy greens subgroup 5B, Dill, Quinoa, Radish, Ti palm, Watercress, Stone fruit group 12-12 (except plum), Tree nut group 14-12 PR#: 06236, 06385, 06589, 09937, 10995, 11597, 11598, 11736

Spinetoram Trade Name: Delegate, Radiant
 Crop: Low growing berry subgroup 13-07G (except cranberry), Bushberry subgroup 13-07B, Caneberry subgroup 13-07A, Coffee,

Cottonseed subgroup 20C, Citrus fruit group 10-10, Pome fruit group 11-10, Small vine-climbing fruit (except fuzzy kiwifruit) subgroup 13-07F, Stone fruit group 12-12, Tree nut group 14-12, Bulb onion subgroup 3-07A, Green onion subgroup 3-07B, Fruiting vegetable group 8-10, Quinoa PR#: 07331, 11219, 11220, 11221, 11222, 11223, 11224, 11225, 11226, 11227, 11228, 11229, 11230, 11686

Spinosad Trade Name: Entrust Naturalyte
 Crop: Low growing berry subgroup 13-07G (except cranberry), Bushberry subgroup 13-07B, Caneberry subgroup 13-07A, Coffee, Cottonseed subgroup 20C, Citrus fruit group 10-10, Pome fruit group 11-10, Small vine-climbing fruit (except fuzzy kiwifruit) subgroup 13-07F, Stone fruit group 12-12, Tree nut group 14-12, Bulb onion subgroup 3-07A, Green onion subgroup 3-07B, Fruiting vegetable group 8-10, Quinoa PR#: 07731, 11207, 11208, 11209, 11210, 11211, 11212, 11213, 11214, 11215, 11216, 11217, 11218, 11642



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