IR-4’s Senior Research Entomologist Retires

For over 25 years, Keith Dorschner had been the lead Entomologist with IR-4. As Senior Research Scientist, Keith attended numerous domestic and international meetings, contributed to hundreds of reports and publications and acted as mentor to Junior Scientists. His expertise and knowledge of entomology science is vast and IR-4 will miss his know-how. Keith retired on April 1, 2019.

According to IR-4’s Senior Associate Director, Dan Kunkel, “Keith made so many major contributions in filling the grower toolbox with insect control tools. I am sure his work has resulted in at least a couple of thousand insecticide registrations. He will be missed for his strategic thinking and resourceful approaches to getting new technologies to growers. His work with bait stations, super crop group strategies, data extrapolations for spinosad, chlorantraniliprole, and many others have all added to his contributions. He was one of the most well informed regulatory entomologists I know. He could always tell you what the growers needed, and what may be a good new tool to fill the voids. His peers always respected Keith and the information that he gained from other entomologists was quickly assimilated and applied to filling the toolbox. Keith’s work has contributed greatly to providing the latest and safest technologies. He always focused on IPM compatible products that had risk reduction characteristics. While we are happy for Keith, he will be greatly missed!”

IR-4’s Commodity Liaison Committee chair, Mike Bledsoe had these words to share about Keith. “Since the first day I began to participate in the IR-4 program, Keith Dorschner was there encouraging me forward. I have made several friends over the years, but I consider Keith as one of my close friends. I have told him over the years that when he attends a meeting, the attendance goes up and the meeting benefits, just from his presence. I have referred to him as one of the US’s National Treasures. He is respected in both the US and Canada. Keith’s retirement is certainly well deserved, but it will leave both the US and Canadian programs with one less champion for the minor use industries. I personally want to wish him the best, and to let him know he will be missed.”

Keith worked on some of the most “specialty” of the specialty crops. One such crop was ginseng. There is a group of ginseng growers in Wisconsin that grow some of the finest ginseng in the world. They are very committed to IR-4 and particularly to IR-4 research conducted by Michigan State University’s Mary Hausbeck, who had this to share about Keith, “Keith has a vast body of knowledge and experience that will be difficult to replace. He

continued on pg 19
Executive Director Notes

Dear Friends,

Earlier this year, the US government experienced its longest shut down in history. During the shutdown, our friends and federal partners at EPA and USDA (NIFA and ARS) were not allowed to work for five weeks and yes, the shutdown did affect IR-4 directly and indirectly. Fortunately, the impact on field trials was minimal. The ARS facilities were mostly delayed in submitting Field Data Books from the 2018 season and delayed the initial stages of 2019 research. The ARS laboratory research, sample analysis and data reporting were completely stopped. Our friends at EPA were also affected; they could not receive petitions for new tolerances or pesticide/biopesticide registrations. They could not work on existing data packages in their queue nor publish new rules. USDA-NIFA was not able to release the fiscal year 2019 Request for Applications (RFA) for the IR-4 grant.

Turning those lemons into lemonade; NIFA has since issued the RFA and is expediting the review/award process to get the funds to researchers as soon as possible. EPA has restarted processing IR-4 submissions and has published approvals of several new tolerances. ARS is back in business and is busy trying to catch up and get back to schedule.

This spring was full of activities with visits with new leaders at USDA. Rob Hedberg and I visited with the new NIFA Director Scott Angle in early February. Scott was already familiar with IR-4 from his days at the University of Maryland and University of Georgia. I also had an opportunity to meet the Administrator of Foreign Agriculture Service, Ken Isley, and several of the Deputy Administrators. Besides sharing info on IR-4 and our efforts to remove pesticide residues as a barrier to exports of US grown specialty crops, we discussed the Technical Assistance for Specialty Crops grant program. IR-4 was encouraged to submit new grant applications to assist specialty crop growers with their harmonized Maximum Residue Level issues. We also had the opportunity to meet with USDA Undersecretary designee, Scott Hutchins (more later).

Additionally, IR-4 was invited to speak at the European Minor Use Coordination Facilities Advisory Council meeting. The European regulatory authorities are taking a much different approach than EPA in reevaluating older products. Some of these changes will significantly impact US growers who intend to export fruits and vegetables to Europe. I believe that there could be great opportunity for IR-4’s new Integrated Solutions research initiative to develop approaches that may meet the conservative European standards.

In March, IR-4 held its joint Project Management Committee and Commodity Liaison Committee (CLC) meetings in Washington, DC. It was an extremely busy and successful week. The CLC held an informational briefing on March 12 for legislative aids associated with agriculture and agriculture appropriations. Not only did the CLC share information about IR-4 to the participants but they provided fresh fruits and vegetables. After the briefing we were joined by Dr, Douglas Steel of American Public and Land Grant University Associations, Dr, Scott Hutchings, Undersecretary Designee of USDA, and Mr. Rick Keigwin, Director of EPA’s Office of Pesticide Programs.

Steel shared with the PMC and the CLC APLU’s preliminary plan for Strategic Realignment of the 47 programs funded under NIFA. APLU and the Land Grant System has been keeping IR-4 informed of progress to convince Congress to consolidate the budgetary lines associated with these programs. Keigwin discussed the rebuilding of the Minor Use Team at EPA as well as the impact of the government shutdown on EPA activities.

The highlight of the meeting was Hutchings joining the group for a brief discussion of his vision of USDA-Research, Education and Extension mission area as well as the importance of pest management. Hutchings had familiarity of IR-4 from his career with the crop protection industry. He worked closely with IR-4 on the broad approval of several Reduced Risk insecticides.

During the business section of the PMC meeting, IR-4 requested that USDA convert our existing Special Research Grant to a Specific Cooperative Agreement. The purpose of this move is to allow our host institutions to recoup up to 10% of the grant funds to cover cost of operations. IR-4’s current authorization and under the provisions of a Special Research Grant
IR-4’s Integrated Solutions (IS) has come a long way since the 2018 workshop. Six projects have protocols developed: cucumber beetle on watermelon, soil insects on sweet potato, verticillium wilt in eggplant, orobanche weeds in processing tomato, damping off of hemp and bacterial diseases in onion.

Currently online, a Request Database has been established with links to previous studies in both Food Use and Biopesticide programs. This database holds all requests submitted to Integrated Solutions. This page will also be the source of nominations for the 2019 IS Workshop. New this year will be the ability to discuss and prioritize organic pest management needs within Integrated Solutions. The ability to submit a request for review at the workshop is now available at:

www.ir4app.rutgers.edu/ir4FoodPub/IS/Is_reqForm.aspx.

Additionally, the Funded Database displays protocol information and final reports from 2019 onward. We look forward to stakeholders’ use of these pages leading up to the 2019 Week of Workshops.

What’s New with Integrated Solutions?

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Tolerance Successes

The trade names listed here 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: November 13, 2018
Cyantraniliprole
Trade Name: Exirel
Crops: Coffee, Low growing berry except strawberry subgroup 13-07H except lowbush blueberry and lingonberry, Caneberry subgroup 13-07A, Leafy greens subgroup 4-16A, Leaf petiole vegetable subgroup 22B, Celtuce, Florence fennel, Kohlrabi, Brassica head and stem vegetable group 5-16, Brassica leafy greens subgroup 4-16B
PR#: 10199, 10874, 11046, 12391, 12392, 12393, 12394, 12395, 12396, 12397, 12398

Federal Register: December 6, 2018
Clomazone
Trade Name: Command
Crops: Dry bean (asparagus, broad, kidney, lima, mung, navy, pinto, grain lupin, sweet lupin, white lupin, white sweet lupin), Succulent bean (broad, lima, wax), Dry chickpea, Cilantro, Dill, Brassica vegetable head and stem vegetable group 5-16, Chinese broccoli, Kohlrabi, Stalk and stem vegetable subgroup 22A except kohlrabi, Cotonseed subgroup 20C, Cucumber, Pumpkin, Squash (winter and summer), Rapseseed subgroup 20A
PR#: 08935, 10839, 11063, 11091, 11092, 11665, 12224, 12225, 12226, 12227, 12228

Federal Register: December 13, 2018
6-Benzyladenine
Trade Name: MaxCel
Crops: Avocado
PR#: 10922

Federal Register: December 21, 2018
Mefenoxam
Trade Name: Ridomil Gold
Crops: Cacao, Wasabi, Small vine climbing fruit except grape subgroup 13-07E
PR#: 10375, 11884, 12295

Federal Register: December 21, 2018
Tolfenpyrad
Trade Name: Tolfenpyrad
PR#: 09551, 09657, 10380, 10427, 10634, 10869, 11263, 11972, 11973, 11975, 11978, 12097, 12221, 12222

Federal Register: February 15, 2019
Trifluralin
Trade Name: Treflan
Crop: Rosemary
PR#: 10820

Federal Register: March 11, 2019
S-Metolachlor
Trade Name: Dual Magnum, S-Metolachlor
Crop: Stevia, Swiss chard, Kohlrabi, Leaves of root and tuber vegetables except sugar beet group 2, Brassica leafy greens subgroup 4-16B, Head and stem Brassica vegetable group 5-16, Cotton seed subgroup 20C, Stalk and stem vegetable subgroup 22A except kohlrabi, Leaf petiole vegetable subgroup 22B
PR#: 09872, 10480, 10673, 11697, 11896, 11897, 11899, 11901, 11902, 12134

Federal Register: March 22, 2019
Mandipropamid
Trade Name: Revus
Crop: Edible podded bean and cowpea, Citrus fruit group 10-10, Head and stem Brassica vegetable group 5-16, Leafy vegetable group 4-16, Leaf petiole vegetable subgroup 22B, Celtuce, Florence fennel, Kohlrabi
PR#: 11138, 11139, 11140, 12380, 12381, 12382, 12383, 12384, 12385, 12386, 12387

Federal Register: April 8, 2019
Flonicamid
Trade Name: Beleaf
Crop: Sunflower subgroup 20B
PR#: 11274, 11383
The 10th International IPM Symposium will be held March 15-18, 2021 at the Sheraton Denver Downtown Hotel, 1550 Court Place, Denver, Colorado 80202 USA. The International IPM Symposium is a premier global event for presenting and learning about the latest research and strategies for effectively managing pests in agriculture communities, and natural areas. The symposium is an outstanding networking and professional development event. In 2021, they will organize around an important theme, Implementing IPM across Borders and Disciplines.

Highlights include:
Mini-symposia featuring experts addressing hot topics in the IPM field
More than 40 concurrent sessions designed for practitioners, growers, educators, consultants, researchers, industry professionals, students, and employees of non-governmental organizations
CCA credits available
Presentation of the 2021 IPM Achievement Awards
Poster presentations of research and best practices
Field trips to see IPM in action in the Denver area
Exhibits from leading IPM suppliers
Past participants at IPM Symposium events have included research, Extension, and teaching academics, IPM-oriented students, private and government scientists, industry representatives, independent consultants, NGO professionals, policy makers and agency administrators, and IPM practitioners from the U.S. and more than 30 countries.

"Integrated Pest Management (IPM) is a sustainable, science-based, decision-making process that combines biological, cultural, physical and chemical tools to identify, manage and reduce risk from pests and pest management tools and strategies in a way that minimizes overall economic, health and environmental risks. Pests are defined as any organism (microbes, plants or animals) that poses economic, health, aesthetic or environmental risk. Pests are context-specific, so an organism that is a pest in one environment may be benign or beneficial in others." (National Road Map for Integrated Pest Management, Revised October 24, 2018)

Tentative Key Dates
Deadline for concurrent session proposals April 24, 2020
Deadline for IPM Achievement Award nominations June 30, 2020
Symposium registration opens November 29, 2020
Deadline for poster submissions January 8, 2021
Deadline for discounted exhibitor registration February 1, 2021
Hotel room block release date February 19, 2021
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The spotted lanternfly is an invasive pest that was introduced to Berks County, PA sometime around 2014. Since then, it has spread further within Pennsylvania and into surrounding states. Given the damage it can cause to fruit trees and grape vines, as well as its potential as a nuisance pest for homeowners, substantial efforts have been made to stop the spread of this insect. On May 6th-7th, the Spotted Lanternfly Regional Summit convened in Harrisburg, PA to discuss ongoing efforts to control the spotted lanternfly. Over 100 members of various organizations such as state Departments of Agriculture, Cooperative Extension, and Bureaus of Forestry, as well as the USDA and National Parks Service, gathered to discuss their efforts to contain and control this insect.

The first day of the summit saw attendees giving presentations on what their respective organization was doing to help the control effort. These talks were divided into four broad disciplines: operation, communication, research and regulation. The operation talks concerned efforts to track and monitor the spread of spotted lanternfly. This is done through a combination of surveying and reports of individual sightings to create a comprehensive map of the spread of spotted lanternfly. Understanding the limits of how far the insect has spread can allow for more carefully targeted control measures to limit further expansion. The communication talks were all about outreach. The conspicuous nature of this pest, as well as its ability to be a problem in residential areas, means that the general public has a vested interest in helping to control spotted lanternfly and is more able to positively contribute to the control effort in ways that would be impossible for other invasive pests. By canvassing social media with a combination of educational materials and humor (and threats regarding the fate of the local beer and wine industries), these groups have managed to make the public aware of the effort to control spotted lanternfly and have given them the tools and motivation to contribute in whatever manner they can. Research, as the name implies, concerned the ongoing efforts to develop effective means of control for the spotted lanternfly. These ran the gamut from conventional pesticides to egg parasitoids that lay their eggs inside spotted lanternfly eggs and even entomopathogenic fungi that readily infect and kill insects. Finally, the regulation talks were devoted to the quarantines that several states have created to deal with spotted lanternfly. While not established federally, Pennsylvania and New Jersey have established state level quarantines to stymie the spread of spotted lanternfly. One of the components of this quarantine is the establishment of a permit system in Pennsylvania for any business moving materials into or out of the state. By educating these businesses about how to spot the pest, the hope is that they will be less likely to inadvertently move spotted lanternfly to an area in which it has yet to establish itself.

After all of these presentations, the second day of the summit saw attendees separate into one of four breakout sessions, each devoted to one of the disciplines from the first day. After several hours of productive discussion where people could follow up on the presentations from the day before or strategize about future avenues to pursue, the group reconvened and summarized what their respective groups had discussed. After a short discussion about possible improvements to make to the summit for 2020, the meeting concluded.

This meeting was a fantastic opportunity for disparate organizations to coordinate their efforts to control this pest in the most efficient way possible. This sharing of ideas and strategies will allow for those who are working towards managing spotted lanternfly to avoid duplicating their efforts and pursue avenues that wouldn’t have been apparent without this collaboration. Moving forward, I expect the ideas developed at this summit will help make great strides in the fight against spotted lanternfly, and I avidly await the next meeting in 2020.
Western Region IR-4 group had a lively strategy and planning meeting in Mt Vernon Washington with old hands present along with new state representatives from Nevada, Colorado and Montana. Tim Miller, weed scientist, based at the Mt. Vernon WSU station acted as host for our group and reminded us on several occasions of his imminent retirement.

With new state liaisons in attendance, we discussed the general responsibilities of SLRs, the development of needed outreach materials, and how to successfully advocate for IR-4. With Commodity Liaison members Alan Schreiber and Lori Berger the group discussed funding and long range advocacy for the IR-4 project. Van Starner from headquarters led a discussion on the upcoming "week of workshops" and the group engaged in a discussion about the new integrated solutions projects and how they will be handled at the workshops in Maryland.

The last session of our first day focused on reviewing potential projects for the 2020 season and specifically which projects would likely be nominated by various stakeholders. Maninder Walia from the University of Nevada was attending her first IR-4 meeting and asked several questions about her role as a new state liaison and how to advocate for the IR-4 Project in her state. Jane Stewart and Zack Miller (Colorado State and Montana State, respectively) asked numerous registration and project questions relevant to the inner-mountain states. Alex (Jiahuai) Hu, University of Arizona, was also a first time participant from the University of Arizona. Having newcomers present gave us the opportunity to spend a bit more time unpacking the IR-4 Project processes which to others are remarkably routine and old rote. What's an SLN? 24C? IR-4? What happened to IR-1, IR-2 and IR-3?

We didn't really discuss those long lost Inter-Regional Research precursor projects, but the group and sidebar discussions covered a wide range of pest management and registration topics. Our final day in Mt Vernon was spent touring the WSU research station and several specialty farms including tulips, organic market farming, an oyster and clam "field" and a visit to Sakata Seeds a premier vegetable seed company based in the Skagit Valley.

Two whirlwind days, some dodging of spring rains, and interactions with researchers and growers, comprised a solid meeting preparing for the year ahead. We extend our congratulations to Dr. Tim Miller on his retirement and a friendly welcome to our new State Liaison Representatives in the Western States. 🌷
Modern petunia varieties we know and love are derived from two petunia species discovered in South America during the mid-1700’s through early 1800’s. The Latin name Petunia originated from one of the native Tupi-Guarani words ‘petun’ meaning ‘worthless tobacco’. Petunia is a member of the solanaceous plant family like tobacco and has similar floral and foliar characteristics.

There are 20 species of petunia, which originated in South America. The modern petunia arose from hybridization between Petunia axillaris and Petunia violacea. In the 1800’s plant breeders searched for double flowered cultivars or fringed petals and those with other traits such as upright growth habit versus trailing. During the 1950’s the first of the modern cultivar types was developed – Grandiflora. Grandiflora’s are known for blooms measuring as large as 5” across, but they can become spindly by midsummer. Multiflora petunias have smaller flowers and more compact plants and hold up better in windy areas and rainy weather. Milliflora petunias have 1 to 1.5” blooms on very compact plants. Spreading, or Wave, petunias were developed during the 1990’s and grow 2 to 4 feet wide with blooms about 2 inches across.

Petunias thrive in full sun and are typically pollinated by lepidopterans (moths such as hummingbird hawk moth).

According to the USDA NASS Census of Horticulture 2014, petunias in the US have a wholesale value of $201M and are the third highest in terms of units (containers & flats) sold with more than 51 million produced annually.

Petunias have several main disease problems including Botrytis blight, Phytophthora crown rot, Fusarium wilt, Rhizoctonia root rot, and Impatiens nectoric spot virus. Petunias have a wide variety of pests such as snails/slugs, tobacco hornworms, budworms, aphids, spider mites, thrips and whiteflies cause issues.

Most of the research IR-4 has sponsored has been related to crop safety (170 trials with 47 products), but we have screened new actives and products with petunia for effective management of Pythium aphanidermatum, Rhizoctonia solani and western flower thrips.

Sources:
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https://en.wikipedia.org/wiki/Petunia
https://www.gardeningknowhow.com/ornamental/flowers/petunia/different-petunia-flowers.htm

Pollinator Research Project Website

Pollinator Research under IR-4’s Environmental Horticulture Program — by Carolina Simao Roe-Raymond

Our pollinator website (https://protectingbees.njaes.rutgers.edu/) was first launched around this time last year. It was a great starting point to present the justifications for each research area, and placed the new research areas prominently on the home page. While we haven’t changed the research goals, we are presenting them in more approachable language to better reflect the general directions instead of the specific research objectives. We also created new research update posts that bring readers along on our research journey. While writing our new content, we made efforts to use less jargon. In places where we still needed to use scientific jargon, we included a text-hover feature on our website, which allows users to hover over a word and see its definition.

After our first website launch, we felt the main purpose of the website could be made clearer. Was the website a static description of a research project? A source for pollinator news? A place to create plant lists for bees? When viewing new posts, it was hard to track which updates were from our research, versus which updates were sourced from other research groups or news outlets. We therefore re-worked the content to make our purpose clear—that this website is primarily to share our research on the interactions between bees, environmental horticulture plants, and pesticides—and to be clear about which content represented our research updates versus outside pollinator news.

The website continues to provide additional resources on protecting bees, from a database allowing users to create customized plant lists for bees, to research articles, news updates, and best management practices documents. We have also added a section that provides background on bees and their natural history. Check it out and let us know what you think through the Contact Us link, found at the bottom of the website.

Pollinator Website

Research Goals Before

- Pollinator Attractiveness: Study ornamental horticulture plants for their pollinator attractiveness
- Insecticide Residues: Analyze level of systemic insecticide residues in pollen and nectar
- Pest Management Strategies: Compare efficacy, toxicity, economics of multiple pest management solutions
- Market Dynamics: Study consumer preferences for ornamental horticulture plants and whether how they are produced and protecting bees are factors

Research Goals After

- Bees & Plants: Identify which environmental horticulture plants attract the most bees.
- Bees & Plant Pests: Help growers manage plant pest outbreaks while minimizing the risk to bees.
- Bees & Public Perception: Measure consumers’ perceptions and level of interest in pollinator-friendly plants.
There’s no doubt that IR-4 Field Research Directors (FRDs) work long, hard days to conduct difficult trials. Every year, there is that one (or two, or three or four) special study that tests the Field Research Directors and their personnel. Some years, the difficulty involves trial space planning. During a given year, IR-4 may conduct a large number of greenhouse or tropical fruit studies. These studies are difficult to conduct since there are only select locations where the trials can be placed. In other cases, the main issue revolves around the development of specialized equipment or plot design to conduct the trial. In other cases, the FRDs may be working with a new specialty crop for the first time. This is especially challenging since little may be known about the plant’s growth habit, preferred growing conditions or the crop’s natural enemies such as insects, diseases or birds.

However, as they say “what doesn’t kill you makes you stronger”. The challenges such as those above allow the FRDs to gain additional knowledge from doing these complicated studies. For many of the complicated studies, a number of IR-4 personnel become more deeply involved including Regional Coordinators, Study Directors, Project Clearance Requesters and other FRDs not directly involved in the study. Often, the researchers involved enjoy the challenge of coming up with novel study conduct strategies. This is one of the many examples that makes the IR-4 Project unique. By working together, FRDs are able to come up with the best plan forward and conduct the study successfully. The following are just a few examples of residue studies that have been successfully conducted by the IR-4 Project using a little creativity and a lot of hard work.

**Greenhouse Studies**

The 2018 Food Use Workshop resulted in 15 greenhouse residue studies for the 2019 season. This is difficult for some of the FRDs since not every research site contains greenhouses or enough space to conduct more than one or two greenhouse trials. To combat this issue, the FRDs are planning carefully and well in advance so that they are able to conduct the trials throughout the year without running out of space. Greenhouse trials are also tricky since at some sites, the trial can only be conducted during times of the year when there is not extreme heat, cold or light issues. For this reason, many IR-4 FRDs make test substance applications on weekends and major holidays including Christmas Day in order to complete the studies on time. Also, this year, there is an incredibly tight scheduling of trials. For example, at the Maryland field site, FRD Marylee Ross stated that once one trial is completed, the plants from that trial are quickly removed from the greenhouse, the greenhouse is cleaned, and new trials are started all within a couple of days. If a crop takes a bit longer to mature or there is a delay for any reason, it throws the whole schedule off for the rest of the year. To aid in correct timing of trials, FRDs are in the process of starting transplants to be ready when the previous trial(s) are concluded.

**Strawberry Nursery Plant Study**

In 2019, IR-4 will be conducting a fluazinam residue study (PR 11920) on strawberry nursery plants for control of diseases including anthracnose crown rot and fruit rot caused by *Colletotrichum acutatum* and Botrytis gray mold caused by *Botrytis cinerea*. The goal of the study is to obtain uses that can be exclusively used in strawberry plant nurseries in an effort to help mitigate fungicide resistance that is escalating due to use of the same products in strawberry fruit production fields and nursery production fields. The FRDs and Regional Coordinators have been working diligently with strawberry extension specialists to learn how to develop a “mock” strawberry plant nursery to conduct the trial. As can be imagined, this trial involves a lot of planning time. FRDs must determine when to plant the “mock” strawberry plant nursery, the correct commercial density of mother plants for the field trial location so that a sufficient number of daughter plants will be produced and a proper dormancy period that must be achieved before daughter plants are planted into the “mock” strawberry production field the following season. FRDs also have to research the proper chilling temperatures and chilling period needed for the specific variety of strawberry chosen for the field trial. Depending on the field trial location, this period may be achieved in the field. However, at other locations, the dormancy...
period may not be able to be properly achieved unless the plants are dug up and placed in cold storage for an extended period of time before they are planted into the “mock” grower production field in the spring. In addition to trial planning, IR-4 FRDs and personnel also have to constantly maintain the plots by removing flowers and berries from the mother plants to promote runner and daughter plant production, remove dead foliage from dormant daughter plants, and dig up enough daughter plants to achieve the correct commercial density for a “mock” strawberry production field the following season.

Avocado Injection/Infusion Studies
A number of avocado studies have been conducted throughout the years at IR-4 field sites in California, Puerto Rico and Florida. However, there are few avocado studies that “warm the hearts” of the FRDs as the injection/infusion studies on propiconazole and tebuconazole (PR 11053 and 11160) that were conducted over the past several years. These studies were conducted for the control of Laurel Wilt caused by Raffaelea lauricola that is introduced into host trees by a non-native insect, the redbay ambrosia beetle (Xyleborus glabratus). These residue studies are important, as all avocado cultivars are vulnerable to the pathogen. Because the most effective method to deliver the test substance is via direct delivery to the xylem, researcher and IR-4 Project Clearance Requester, Dr. Jonathan Crane, conducted several studies to determine a workable use pattern and method for delivering the test substance into the tree. For these studies, FRDs had to plan and purchase the supplies needed for the trial in order to develop the unique test substance delivery system. In addition, Dr. Crane visited field sites to aid in conducting the trials.

Quinoa
Quinoa has gained popularity in the U.S. over the past several years. Because of this, many growers are producing quinoa throughout the Western Region of the US. However, as many know, establishing a new specialty crop isn’t always easy because there are little or no chemical tools available for control of diseases, insects and weeds. For this reason, IR-4 conducted some residue studies to support quinoa production. However, these studies were met with some challenges. For example, in one study, FRDs learned the hard way that quinoa plants do not produce seed in some trial locations because of hot summer temperatures. However, it was discovered that if quinoa is planted as early as possible, a crop can be successfully produced. In another example, FRDs in eastern Washington learned that Lygus bugs can serve as a real challenge to growing quinoa, as substantial feeding injury can result. The FRDs found out that alfalfa is the preferred host for Lygus and when alfalfa fields are cut, large numbers of adult Lygus fly out of these fields and invade the adjacent quinoa plots. None of the three registered insecticides on quinoa had any activity on Lygus. Therefore, it was a major challenge to obtain proper samples from the residue plots to complete the study. A 2019 sulfoxaflor, quinoa residue study (PR 12526) is being conducted to target Lygus bugs in quinoa. Weeds and birds also continue to be a challenge to producing a quinoa seed crop.

Stevia
Stevia, a fairly new specialty crop in the US, has been encountering similar pest issues in the U.S., including stem and root rot of continued on pg 12
FRDs Are Here

continued from pg 11

Stevia caused by Sclerotium rolfsii, Septoria leaf spot caused by Septoria stelae and many species
of weeds including yellow and purple nutsedge.

Similar to quinoa, as IR-4 FRDs began conducting residue studies on stevia, they learned the hard way
that growing this crop can result in many challenges in the field. For example, FRDs Marylee Ross of
Maryland and Roger Batts of North
Carolina discovered after
conducting one year of a two-year
s-metolachlor herbicide study (PR
09872) that stevia does not
overwinter well in locations that
may experience extremely harsh
winters. Although it appeared that
the roots showed signs of life in the
early spring, several late freezes
and snowfall eventually killed the
crop. Since there was limited
information on growing stevia in
cooler climates, the FRDs and IR-4
Project Clearance Requester talked
with each other to come up with possible solutions for re-conducting
the trials such as the options of
planting the crowns deeper into the
soil when transplanting the initial
crop or covering the rows for
winter. The average temperatures
for the Northeast that year were 42 / 25°F in January, 37 / 18°F in
February, 51 / 31°F in March and
66 / 45°F in April, with some
evenings near freezing.

Another issue that was encountered with stevia trials involved the
growth habits of the stevia plants. The herbicide protocol
instructed the FRD to make drop nozzle
applications. Since plants were extremely
bushy, they fell across the row middles. To
correct this issue, plants in the plots
were staked before making the
applications.

In 2019, IR-4 will continue to conduct
stevia residue studies, including
PR 12532 azoxystrobin +
benzovindiflupyr,
PR 12538 benzovindiflupyr +
difenonazole, and PR 12535
fluproxad + pyraclostrobin for
control of stevia leaf spot.

Wasabi

Wasabi is a specialty crop that is mainly grown in Japan in stream beds in cool, shady climates.
Therefore, when the IR-4 Project received a request to conduct a residue study for control of
Pythium, the IR-4 Western Region knew they had to brush up on
their wasabi knowledge. They
learned that since wasabi does not
grow well in a number of climates
or in soil production, a special
production system had to be
developed to be able grow the
wasabi to conduct the trials. Over
the course of several months of visiting wasabi growers in
Washington, the IR-4 Western
Region FRDs and Regional
Coordinators developed a
specialized system in the
greenhouse on gravel with
frequent misting to simulate the
stream bed conditions. The
application of the test substance
was made through the mist
system, since this was the way a
grower would apply the chemical.
This use was recently granted a
tolerance and will be labelled
soon (PR 10375).

While residue studies continue to
become more complex, it is great
to know that the IR-4 Project has
a team of Field Research
Directors, Regional Field
Coordinators and other personnel
that remain dedicated to learning
new ways to fulfill the needs of
specialty crop growers. Thank you
for your service!
One plane ticket to Southwest Florida International Airport: $200…one pair of sunglasses: $10…one tube of sunscreen: $7…being able to spend the entire week “behind the scenes” viewing multiple facets of Southwest Florida agriculture…priceless.

During the week of March 25, individuals from multiple organizations including: the Florida Fruit and Vegetable Association (which sponsored the event), Florida Department of Agriculture and Consumer Services / Division of Agricultural Environmental Services and Office of Agricultural Water Policy, Florida Fertilizer and Agrichemical Association, Florida Department of Environmental Protection, South Florida Water Management District, Florida Farm Bureau Federation, the Environmental Protection Agency and the IR-4 Project came together to learn about a wide array of regulatory challenges facing Florida’s agricultural industry.

Florida is a unique environment that grows a broad range of crops including many types of vegetables, citrus, sugarcane, tropical fruit, berries, other tree crops, environmental horticulture crops and turf. For this reason, it is known as a “specialty crop state”. They also have lots of mosquitoes to boot. These factors make it the perfect location to host a regulatory tour since professionals who have regulatory careers are able to witness firsthand many examples where agricultural public policy directly effects growers’ day-to-day activities. It also provides them with knowledge of industry issues and a network of individuals that can help them become advocates for specialty crop agriculture.

On Monday March 25, the day began with a presentation by the South Florida Water Management District regarding water regulation in the Lake Okeechobee region and south. The talk focused on how important water management has been throughout Florida’s history and how it continues to be a focus that directly affects agricultural operations. Florida continues to implement restoration and best management practices (BMPs) plans to improve the quality, quantity, timing, flow of water to maintain a sustainable water supply to meet environmental, urban, agricultural and flood protection needs. In addition, many tour stops throughout the week highlighted specific rules and regulations that they adhere to in order to maintain water quality. This is especially challenging as tropical storms and hurricanes affect the state yearly. The rest of the day focused on golf course pest and water management. The tour was located at Old Collier Golf Course, which is located on approximately 267 acres of mixed upland and wetland habitat that is bounded to the north by the Cocohatchee River and to the east, south and west by various forms of development. This was a unique location to visit since it is the first Audubon International Certified Gold Signature Cooperative Sanctuary golf course. This certification means that wildlife conservation, habitat enhancement, resource conservation, environmental improvement and sustainable development were planned as part of the design and implementation of the course. Since there is approximately 109 acres of connected native habitat, golfers and bird-watchers alike can view bald eagles, osprey, native reptiles and other flora and fauna. Tour participants learned about common golf course pests and pathogens including but not limited to dollar spot and mole crickets and new water management technology that is being used to maintain the course more efficiently, such as runoff from adjacent areas (warehouse parking lots). Golf course management is also using a combination of biopesticides and conventional materials to treat the turf. Too bad we did not bring our clubs for a round on the beautiful course on a beautiful day.

On Tuesday, the day began with a...
tour of Syngenta Flowers, Incorporated in Alva, Florida, which is the major north American horticultural supplier of mums including 125 varieties of pot mums, 118 varieties of garden mums and 19 varieties of asters. Here, tour goers were able to learn about the many aspects of chrysanthemum cutting production including the development of starter material for cutting production, soil and bed preparation, direct sticking of cuttings into the field, pinching, verification of varieties, harvesting of cuttings and postharvest storage. Many tour participants were excited to learn how to stick and harvest cuttings. At this stop, it was stressed that quality was of their utmost priority. Practices at this site included the use of quality water, clean starter material via tissue culture in elite greenhouses (to keep pest out), a preventative spray program and scouting, fertility and water analysis, fumigation and strict sanitation protocols to prevent the spread of pathogens and insects.

In the afternoon, tour goers were exposed to sandland vegetable production, with a visit to Lipman Family Farms. This operation began when Max Lipman began buying and selling fresh produce on the streets of New York City in the mid-1930s. Later, the business became involved in production, packing and sales of produce. Today, the operation is the largest field tomato grower in North America, with operations from the Eastern Shore of Virginia to Florida and California. These strategic locations ensure year-round production and sales. Tour participants were able to view crops at various stages of growth including tomatoes, bell peppers, eggplant and squash. Many participants asked the grower excellent questions about production, rotation practices and common pests encountered in the field. The grower was also able to express his concerns about the need for more effective pest management options.

To fit all of the tour stops in on Wednesday, the bus departed early for a visit to Southern Gardens Citrus processing plant and production operation, under US Sugar Corporation. This stop was especially important since Florida has been devastated by Citrus Greening Disease caused by the bacterium Xanthomonas axonopodis, which was spread throughout the state by hurricanes in 2004. As part of the mandatory Canker Eradication Program, all trees on 4,500 acres were destroyed. Then in October 2005, Citrus Greening Disease (also known as Huanglongbing or HLB) was found in the groves. Southern Gardens responded to this by initiating an aggressive management program by inspecting groves for infected trees four times per year, removing infected trees, spraying to control the vector of the disease, (Asian Citrus Psyllid) and replanting with healthy trees. During this process, more than 750,000 trees were removed. Today, the disease is managed by maintaining tree health using fertility, nutrition and pest management. This ends up costing the grower three times more to produce one half to one third less fruit (future production is estimated to be reduced to 2.0 to 2.5 million boxes). As one of the speakers said, “we are learning to live with HLB”. To combat this devastating disease, tour participants learned that Southern Gardens Citrus is working to develop resistant varieties including the use of transgenic viral vector (Citrus Tristeza Virus) to promote resistance in healthy trees.
To get another perspective of vegetable production in a different region of the state, that afternoon we travelled to Duda Farm Fresh Foods. Duda Farm Fresh Foods, which has been operating for more than 90 years, is a family-owned and operated grower, packer, shipper, marketer, importer and exporter of fresh fruits, vegetables and fresh-cut vegetables. Here, we learned about muck vegetable production—particularly celery harvesting. As one of the world’s largest celery producers, it was breathtaking to observe both the large celery acreage and the harvesting and packing of celery in the field.

To end the day, we travelled to the University of Florida Everglades Research and Education Center to learn about an important non-chemical form of pest control—the barn-owl. Plant Pathologist, Dr. Richard Raid and his assistant Ann Hartman work with the UF Barn Owl Program, which utilizes barn owls for sustainable rodent control in the Everglades Agricultural Area (EAA). By establishing owl nesting boxes in agricultural areas, owls that nest in the boxes consume a variety of pests including cotton rats and marsh rats that can cause up to $30 million in damage each year to sugar cane, rice and vegetable crops.

Thursday began with an overview of sugar cane production by US Sugar, which was founded in 1931 and produces approximately 10 percent of all sugar in the U.S. Here tour attendees learned about new technologies in sugar cane farming including precision agricultural tools that are being used for weed management and fertility. Lucky tour goers were able to ride in a large tractor with a self-propelled spray rig to get a first-hand experience of a spray application. During that time, tour participants also learned about how the crop is grown and the growers are implementing Best Management Practices in the sugar cane fields. This was followed by a tour stop at a sugar cane field being harvested and a sugar mill “drive-thru” tour.

In the afternoon, the important topic of pollinators was discussed at Cracker Jack Farms, Inc. in North Ft. Myers. David Mendes hosted the tour and answered many of the burning questions that tour goers had about queen production and honey bee health issues that have emerged in recent years including Varroa mite control. Tour participants were able to have an up close view of the hives as well as learning about the importance of maintaining honey bee nutrition, with supplemental protein feeds and by planting forage to attract and feed pollinators.

Although it was only a half-day tour on Friday, the day was not lacking in excitement or learning opportunities. In fact, most tour attendees were especially excited because a helicopter tour was provided to view an aerial mosquito control application on Beautiful Island (which, in fact, was not beautiful at all, but was riddled with millions of salt marsh mosquitoes).

After high tides or rain, mosquitoes from these small island habitats can fly as much as 50 miles to seek humans and/or animals for their blood meal needed to produce eggs. Tour participants also learned about some of the other mosquito species in the area that can transmit mosquito-borne diseases including West Nile Virus. Lee County Mosquito District representatives spoke about and demonstrated the need for the registration of granular mosquito control products since they penetrate wooded canopies effectively. They also explained that the basis of the mosquito control operation consists of daily surveillance to check mosquito breeding habitats and respond to service requests from citizens. They also demonstrated drone scouting and an airboat application to control noxious aquatic plants that are choking Florida waterways.

This tour provided the ultimate agricultural experience. Many aspects of Florida agriculture were covered thoroughly and tour goers were able to have all of their questions answered. Although tour participants viewed more in one week than many individuals are able to see in a lifetime, Mike Aerts mentioned at the end of the tour “I wish we had more time to show you more…because there is a lot more to see.” So if you ever get invited to a future Florida Spring Regulatory Tour (hosted by the Florida Fruit and Vegetable Association), get ready for a truly memorable experience!
A GLP Audit in Salinas

A Good Laboratory Practice (GLP) Standards inspection and data quality audit was conducted on December 11, 2018 at the USDA-ARS, Crop Improvement and Protection Research facility in Salinas, CA. The audit concerned research in support of the IR-4 Project through the ARS in-house project on Minor Use Pesticide Testing on Vegetables and Sugar Crops. The audit was led by EPA Chemist Mark Lehr from the EPA’s GLP Program. Also present were Sharon Benzen (Field Research Director), Martin Beran (IR-4 Western Region Quality Assurance), Alvin Simmons (Interim Coordinator for USDA-ARS Minor Use Pesticide Registration Program), and James McCreight (Location Coordinator and Research Leader). Mark Lehr presented his official credentials, and presented the FIFRA Notice of Inspection which was then signed by James McCreight. James McCreight gave an overview of the location six in-house research projects on agriculture. Sharon Benzen had prepared in advance by arranging associated documents for the inspection and audit on tables in the conference room.

The GLP standards compliance inspection included an interview of Sharon, tours of the laboratory, archives, test substance and storage areas, and field site. Personnel CV and training records, SOPs, and equipment and calibration/maintenance logs were inspected. In addition, the ongoing trial PR# 12251 / NMG787: Magnitude of the Residue on Strawberry was inspected. Audits were conducted on three studies (PR# 02660 / Nitrapyrin: Magnitude of the Residue on Mustard Greens; PR# 11503 / Cyromazine: Magnitude of the Residue on Pea-Edible Podded and Succulent; and PR# 11029 / Fenpyroximate: Magnitude of the Residue on Bean – Succulent Shelled). The exit discussion was quite positive.

This inspection case closed on March 1, 2019 with a conclusion that compliance problems were not identified by EPA. Sharon had gone through previous audits at this site. In addition to a positive reflection of the quality of Sharon’s work, the support by Tammy Barkalow at IR-4 HQ and Martin Beran in the Western Region facilitated the smooth process of this inspection and audit.

Left to right are Martin Beran, Sharon Benzen, Mark Lehr (EPA Auditor) James McCreight (ARS Location Coordinator/Research Leader), and Alvin Simmons. — Photo by Amy Liu.
This is the 50th year the IR-4 Project has produced a newsletter and sadly, this will be the last, but we hope you will enjoy this reminiscence through a few past issues (since 1999). You can view them all at www.ir4project.org/ir-4-outreach/
Northeast region liaisons and researchers gathered at the Adele H. Stamp Student Union on the main campus of the University of Maryland (UMD) in College Park. The objective of this meeting was to discuss our challenges and successes throughout the year as well as identify our priorities for the upcoming year.

We were pleased to welcome a few people new to IR-4: Lily Calderwood (State Liaison Representative for Maine), Shelby Fleischer (vegetable Entomologist with Penn State) and Mengjun Hu (small fruit Pathologist with UMD). Our hope was that they were able to learn more about IR-4 and become familiar with the faces of the Northeast.

After breakfast, we started off with an overview of activities in the Northeast throughout 2018. Dan Rossi, Northeast Region Director, walked us through the many accomplishments over the past year and an impressive lineup of trials scheduled for 2019. Jerry Baron, IR-4 Executive Director, provided a presentation explaining the state of IR-4 including the challenges faced due to the flat funding we have experienced for the past decade. It is really quite remarkable how much we can accomplish in spite of that.

We then shifted our focus from a more broad view of IR-4 to the individual programs. Cristi Palmer gave an overview of the Environmental Horticulture Program and details about the workshop scheduled for September 2019. We then engaged the group in discussion about the major pests of ornamentals, potential solutions, and identifying which ones are most important to address at the workshop. Participants were encouraged to take part in and distribute the Environmental Horticulture Grower and Extension Survey. Next we heard from Van Starner who explained the Food Use process and details about the upcoming workshop. Finally, Jerry introduced and explained IR-4’s newest program: Integrated Solutions.

The remainder of the meeting was spent discussing the Food Use program requests. The requests were broken down by discipline (pathology, entomology and weed science). Each discipline based discussion began with open conversation about ongoing and emerging pest issues. We established a preliminary list of those projects most important to the Northeast. It was inspiring to see the interest in being proactive against emerging pest problems (i.e. Spotted Lanternfly) and encouraging to see how nicely it fits into the opportunities offered through the Integrated Solutions program. We will have a follow-up conference call in August to become fully prepared for the Week of Workshops.

We consider it a success to be able to get people together and focus discussion on identifying the most important challenges our farmers are dealing with. For those who could not join in person, we also hosted the meeting via WebEx and were able to include a few other affiliates in discussion using this medium. In the upcoming year we will be focusing our efforts on increasing participation in our future meetings and encouraging further involvement in 2020. We look forward to another year of serving our Northeast Region growers and send many thanks to our meeting participants!
embodies a genuine and earnest desire to help growers and provide a timely response to their needs. In situations where an industry did not have the benefit of a research entomologist working on their behalf, Keith graciously and humbly offered his insight and assistance. Keith’s ability to think creatively to fill needed pest management gaps has been very much appreciated. Cheers to Keith, for his many years of collegiality with researchers and his service to specialty crop growers.”

IR-4’s Executive Director, Jerry Baron, shared these words, “It has been a great honor to be a friend and work associate of Keith for the past 25 years. He has been the perfect example of the IR-4 spirit in helping provide growers of specialty crops with safe and effective insect management tools. His career accomplishments are many and they mean much to the specialty crop farmers. It is safe to say that almost every specialty crop farmer, organic, advanced IPM or conventional, have used an insect registration was handled by Keith.”

And finally Stephen Flanagan chimed in with his thoughts about Keith. “The life of a Study Director and Discipline lead extraordinaire is detail, detail, detail and a fair amount of whack-a-mole persistence to bring all those pieces together. Keith Dorschner’s long tenure and tenacity as the IR-4 entomology lead has been a fruitful career for his stakeholders and colleagues in the Western Region. Keith spent some time in the hop yards of Idaho in his early career and maybe that touch of the arid plains worked its way into Keith’s blood. As a colleague I always found Keith’s curiosity and attention to detail to be well fitted to our specialty crop work. If you’re a Treasure Valley hop grower in Idaho or a date palm grower in the Coachella Valley of California your livelihood has been touched by Keith’s work. Resistance? New Crop? New Chemistry? Invasive Pests? From quinoa and spotted wing drosophila to mushrooms and phorid flies there is hardly an aspect of western insect pest control that hasn’t encountered Dr. Dorschner. Keith’s detailed protocols, numerous EPA petitions and the attendant new registered pesticides will have a lasting legacy for western growers.

There’s a rumor afloat that Dr. Dorschner will head out west for a farewell tour to some of his old haunts. We will certainly carve out some time for our esteemed colleague and be left wondering who will follow in Keith’s remarkable path. Keith’s humorous quips and cooperative spirit will be missed. Congratulations Keith and all the best.”

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**Phorid Flies**

Phorid flies are a vector of green mold (Trichoderma aggressivum), a major disease problem in the production of mushrooms. Notably, most materials used to control flies in mushroom production that are effective in controlling sciarid flies are not effective in controlling phorid flies. For these reasons, the Biopesticide and Organic Support Program funded research on phorid fly management in mushroom growing operations in 2017 and 2018. The protocol included PFR-97, Grandevo, and JMS Stylet-Oil. In both 2017 California experiments, there was on average a 70% reduction in total fly population in the treated rooms versus the un-treated control rooms. No yield reduction was observed in the treated rooms versus the control rooms. However, 2017 Pennsylvania experiments indicated that applications of PFR-97 and Grandevo at label recommended rates did not significantly reduce the number of phorid flies. The results for 2018 are still incoming. Hopefully, IR-4’s contributions will provide a solution to this pesky problem.
New Product Corner

Pyrifluquinazon (Insecticide – Nichino America, Inc.)

Introduction: Unconditional registration of the first food crop uses for the active ingredient (AI) pyrifluquinazon was granted by the EPA on November 19, 2018. The AI was first registered in January 2013 for non-food uses on ornamental horticulture plants grown in greenhouses (GH). These new food crop registrations provide growers with a pest management tool for use against various sucking (sap-feeding) insects such as whiteflies, thrips, aphids, mealybugs and leafhoppers. This AI has demonstrated selectivity to beneficial insects and has a favorable environmental profile, making it an excellent fit in IPM programs. The Insecticide Resistance Action Committee (IRAC) has classified it as a Group 9B insecticide.

Other global registrations: Japan (for outdoor uses on over 20 food crops) and Korea; submission planned for Canada Feb. 2019 for GH uses on cucumbers, lettuce, eggplant, pepper, tomato and ornamental plants, as well as for import tolerances for U.S. approved outdoor food crop uses. U.S. trade names/formulations: PQZ™ Insecticide; Pyrifluquinazon 20% SC Insecticide; Pyrifluquinazon 20SC Insecticide; Rycar® Insecticide for environmental horticulture uses.

U.S. labeled crops (see labels for specific use patterns and other general directions for use): Brassica head and stem vegetables (crop group 5-16), Citrus fruits (crop group 10-10), Cotton, Cucurbit vegetables (crop group 9), GH cucumbers, Fruiting vegetables (crop group 8-10), GH peppers and tomatoes, Leaf petiole vegetables (crop subgroup 22B), Leafy vegetables (crop group 4-16), GH lettuce, Pome fruits (crop group 11-10), Small fruit vine climbing subgroup (crop subgroup 13-07F), Stone fruits (crop group 12-12), Tree nuts (crop group 14-12), Tuberous and corm vegetables (crop subgroup 1C)

IR-4 food use project requests (PR#): cantaloupe (10431), cucumber (10428), GH cucumber (10793), GH lettuce, head and leaf (11202), bell and non-bell pepper (10430), GH bell pepper (10555), squash (10429), field and GH tomato (10126), squash (10429), watermelon (10432) – all these uses are registered, with IR-4 data generated/submitted for GH pepper and tomato; dry bulb onion (09658) – MFG does not support