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

Newsletter

Vol. 44 No. 1 Winter 2013

Celebrating 50 years of service to Specialty Crop Growers

In a time of financial austerity the IR-4 Project is a government program that provides real results for stakeholders with a proven track record that spans 50 years.

In 1963, the IR-4 Project was established by the Directors of the State Agricultural Experiment Stations to create a program to assist growers of fruits, vegetables, herbs and other specialty crops with their critical pest management needs.

What began as a two-person operation at Rutgers University has grown into a multi-million dollar research organization with over 120 employees and a presence in nearly every state.

Since its humble beginnings, the research performed by the men and women of the IR-4 Project has facilitated 26,000 registrations of conventional pesticides and biopesticides for food and ornamental crops in conventional and organic production systems. The majority of these registrations have been approved in the last 10 years. Many of these recent approvals were with lower risk technology.

Today, many of the IR-4 facilitated specialty crop plant protection product registrations are fundamental to pest management strategies that include using techniques that are sustainable and environmentally friendly. According to Ray Ratto of Ratto Bros. Farms in Modesto, CA,"Without IR-4, California specialty crop growers would be left with very few tools to protect their crops and their livelihoods. The general public reaps enormous benefits from IR-4's activities by having a year-round, broad availability of healthy fruits and vegetables that can be purchased at reasonable prices."

IR-4 also focuses its research efforts on ornamental horticulture, which provides plants that enrich our communities and the environment. Craig Regelbrugge from the American Nursery and Landscape Association stated, "Over the years, IR-4 has played an instrumental role in facilitating the registration of over half of the crop protection tools available to nursery and greenhouse crop farmers. Having access to tools and technologies that would not otherwise be available for use in our industry helps our growers produce healthy crops while protecting both consumers and the environment from the threat of invasive plant pests and diseases."

And more recently, IR-4 initiated

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Workshop Announcement

IR-4 Southern Region to hold Priority Setting Workshop

— By Michelle Samuel-Foo, Southern RFC

The IR-4 Southern Region (SR) will be holding a priority setting workshop August 20-21, 2013 at the Radisson Hotel in Orlando FL. At this meeting we expect to have participation from a diverse group of SR stakeholders as we work to identify pest priorities that are of regional significance as a precursor to the annual IR-4 Food Use Workshop that will be held in Albuquerque, NM in September. In 2010, the region migrated to a rotating schedule for meetings in an attempt to be fiscally conservative and to try to provide multiple opportunities for stakeholder involvement. For the past 3 years, a combination of webinars and telephone conference calls were held to decide on regional priorities. This will be the first time since the new process was initiated that the region will be holding a meeting in person, and we expect strong participation from stakeholders.

This workshop will be a valuable opportunity to connect with growers, entomologists, pathologists, weed scientists and other extension and university personnel who all have an interest in chemical control measures for specialty crops. At the workshop, participants will have an opportunity to nominate eligible project clearance requests (PCRs) according to the following criteria:

- SR A: Urgent request.
- SR B: Strong need (but can wait another year).
- SR C: Documented need, but don't have all the information necessary to move forward at this time.

It should also be noted that in order for a project to receive either an A or B rating, efficacy and/ crop safety data generally needs to be available. Anyone wishing to submit a new PCR for consideration will also have an opportunity to do so at the meeting. We will have laptop computers available for this purpose. This meeting is open to the public and anyone with an interest in specialty crop agriculture, especially specialty crop growers and grower groups in the Southern U.S., are welcome to attend. Please SAVE THE DATE! To be added to our mailing list please contact mfoo@ufl.edu.

50 Years

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a Public Health Pesticide program that focuses on providing pest management solutions for arthropods that vector disease. Roger S. Nasci, Chief of the Arborviral Diseases Branch at the Centers for Disease Control and Prevention, stated, "Reducing mosquito population abundance is often the only intervention available to reduce the risk of disease due to West Nile, dengue and Chikungunya viruses. IR-4's efforts assure that we have a variety of effective public health pesticides registered and available to meet the growing needs of the U.S. and international health communities."

Clear advances result from the public and private sector investment in IR-4, which stands at over $38 million of direct and in-kind support. The Center for Economic Analysis at Michigan State University recently studied IR-4's impact on U.S. Gross Domestic Product and concluded that IR-4 contributes more than $7.2 billion to U.S. GDP and is anticipated to support research and industry sales sufficient to support 104,650 U.S. jobs.

IR-4 Executive Director, Jerry Baron, stated, "Our economy and quality of life has been improved by the efforts of IR-4, but the story doesn't end at fifty years. As pests become resistant and new pests emerge from other countries, newer technologies will need research. IR-4 is looking forward to the next fifty years of helping specialty crop growers continue to fight pests to protect their valuable commodities."

In Memoriam

— by Robert M. Carver, LSU AgCenter Office Supervisor, Plant Pathology & Crop Physiology

Dr. Donald M. Ferrin, 61, passed away on December 25, 2012 in Baton Rouge, Louisiana. Don was the IR-4 SLR from Louisiana. He obtained his BS (1974) and MS (1976) degrees in Botany and Plant Pathology at Michigan State University. From 1976-1980, he worked as a plant pathologist for Yoder Brothers, Inc., in Alva, Florida. He then obtained his PhD (1985) from the University of Florida. Don's doctoral studies focused on the epidemiology of soilborne pathogens with emphasis on Phytophthora species. After a one-year post-doc at UF, he served as an Assistant Professor of Plant Pathology (1986-1994) with the University of California-Riverside. From 1994 to 2005, Don served as a diagnostician and researcher for a private laboratory and as a research staff associate for UC-Riverside.

While at UC-Riverside, Don's primary duties included conducting research on the etiology, ecology, epidemiology and management of fungal diseases of ornamental crops, and the epidemiology of plant diseases. He was also involved in graduate student education and taught two courses, Introduction to Plant Pathology and Epidemiology of Plant Diseases. Don's research activities covered a broad range of diseases and host plants, including Phytophthora root rots on an array of host plants, rust on carnations and Botryosphaeria branch dieback on native plant species. His most significant research contributions were the identification and characterization of the relative fitness of metalaxyl-resistant isolates of *P. parasitica* and *P. citricola* from ornamental hosts in southern California, and the assessment of population dynamics of *P. parasitica* in relation to fungicide use patterns. Later, working with Dr. Mike Stanghellini, he characterized the ecology, epidemiology and control of root rot and vine decline of melons caused by *Monosporascus cannonballus*, as well as the factors that trigger ascospore germination.

In 2005, he joined the Department of Plant Pathology & Crop Physiology (PPCP), LSU AgCenter, as a 100% Extension Plant Pathologist with commodity responsibilities for all horticultural crops in Louisiana.

While with the LSU AgCenter, Don was a major contributor to extension programming that assisted thousands of agricultural industry personnel and homeowners in the state. He was well regarded for consistently delivering outstanding extension and research materials to this diverse clientele. Don's program accomplishments included hundreds of presentations at conferences, trade shows, society functions, and Master Gardner and Home Garden training events. He was also prolific in his development of written materials to assist in the diagnosis and management of plant disease. Within this body of work, Don produced the first-ever series of Louisiana plant pathology disease identification and management fact sheets. This series was applauded by faculty members working in the field for their excellent photos on symptoms and signs of plant diseases. This series was supplemented by numerous additional print and webpage articles, mass media materials, and a blog on disease management.

Don was not just an intellectual; he was also always interested in the well-being of others. He was one of the great 'nice guys' who worked hard, supported his co-workers, and contributed greatly to the science of plant pathology. His depth of knowledge and clear thoughts about how things worked will be truly missed. Since Don came from a family of teachers, he, too, truly enjoyed all aspects of teaching. As a reflection of his interests and commitments to teaching and research, Don's wife, Pam, has helped to create the Don Ferrin Teaching Student Fund in the LSU PPCP Department.

Public Health Pestici

— by Karl Malamud-Roam, IR-4 Publ

While mosquitoes are probably the most notorious disease-vector insects, other blood-sucking arthropods such as ticks, bed bugs, and fleas are major and growing threats to people and domestic animals, and have spurred the recent development of novel public health pesticides and veterinary medicines. Fleas, in particular, are a group of insects that cause major irritation to domestic animals and people, in addition to their infamous role in spreading the Black Death (plague) and other infectious diseases. After a long period of declining impact, fleas have

rebounded extraordinarily in recent years, possibly due to reductions in the chemical control toolbox or to development of resistance to the remaining pesticide treatments. Regardless of the cause, this resurgence has led to many new and generally effective products coming onto the market, as well as a rekindling of interest in a range of traditional remedies.

Fleas are small (1/16" – 1/8"), laterally flat, dark, wingless insects with tube-like mouthparts adapted for piercing the skin of animals. Flea larvae have a varied diet, including flakes of dead skin and the feces of mature fleas, so they can live for long periods in animal bedding or burrows, but adult fleas, both male and female, are obligate ectoparasites, obtaining all their nourishment from blood taken from host animals. Fleas inject saliva when they bite, which causes irritation; if they also inject parasites, the bites can cause infection. In addition to plague, infectious disease spread by fleas include murine (endemic) typhus and other bacterial diseases, myxomatosis and other viral diseases, and infection by some tapeworms and trypanosome protozoans. Even without direct infection, flea bite saliva can cause strong allergic reactions, and scratching can open the skin to secondary infections.

There are many types of fleas, and their common names refer to their typical hosts, but this can be quite misleading, as many fleas are quite willing and able to blood-feed on a range of hosts. Thus, oriental rat fleas (*Xenopsylla cheopis*), which generally live on rats and mice, spread bubonic plague during the Black Death when fleas infected with the bacteria *Yersinia pestis* sought out other prey after their rodent hosts died. Ongoing *Yersinia pestis* activity in California, in contrast, is associated primarily with other fleas that infest ground squirrels and other rodents, but also move to domestic cats that can then bring the fleas and pathogen into houses. The human flea, *Pulex irritans*, despite its common name, has a very wide host spectrum, and probably spread to people from guinea pigs or peccaries in South America. It is not a major disease vector, and has become an increasingly uncommon pest species with modern hygiene.

While the dog flea *Ctenocephalides canis* is, not surprisingly, most often found on dogs, it is a relatively uncommon species, and the major cause of flea problems today for humans, dogs, and cats throughout the world is the cat flea *Ctenocephalides felis*. While this species is most often found on domestic cats, it can also maintain its life cycle on dogs and several other mammals. It bites people, and can cause substantial discomfort, but cannot maintain a population without pets or other animals. Cat fleas mate and lay eggs on cats or dogs, but most eggs fall off into the pet's bedding, where

Table 1. U.S. Regulated Flea Treatments for Animal Appl

Active Ingredient	Applied	Vet Uses	Regulation
Toxicants = Flea Killers			
Amitraz	Topical	Dogs	Pesticide
Dinotefuran	Topical	Cats & Dogs	Pesticide
Fipronil	Topical	Cats & Dogs	Pesticide
Imidacloprid	Topical	Cats & Dogs	Pesticide
Metaflumizone	Topical	Cats & Dogs	Pesticide
Nitempyram	Oral	Cats & Dogs	OTC Drug
Permethrin	Topical	Dogs	Pesticide
Selamectin	Topical	Cats & Dogs	Prescriptio
Spinetoram	Topical	Cats	Pesticide
Spinosad	Oral	Dogs	Prescriptio
Insect Growth Regulators or Insect Development Inhibitors			
Lufenuron	Oral, Injectable	Cats & Dogs	OTC Drug; Prescriptio
Methoprene	Topical	Cats & Dogs	Pesticide
Pyriproxyfen	Topical	Cats & Dogs	Pesticide
Ingredients added to control other ectoparasites			
Milbemycin	Oral	Dogs	Prescriptio
Moxidectin	Topical	Cats & Dogs	Prescriptio

ides for Flea Control

ic Health Pesticides Program Manager

the larvae can feed on dead skin or flea feces before reinfesting the host. Therefore, effective control of cat fleas requires treatment both of the adult insects on the host animals, and control of the eggs and immatures in the bedding and elsewhere in the local environment.

Effective control of adult fleas inevitably requires treatment of the host animals with chemical insect toxicants known as ectoparasiticides (see Table 1), although these are sometimes sold as insecticides (regulated by EPA), and sometimes as veterinary drugs (regulated by FDA). Some botanical products, including garlic and pennyroyal, are promoted as alternative "natural" flea killers, but their safety and effectiveness have not been shown (pennyroyal, in particular, can be highly toxic to mammals). Most of flea control products have been formulated for topical ("spot-on") application, generally for monthly use, but others are orally administered and a few are injected. Some require prescriptions, and others do not, but some flea treatments have been associated with serious side-effects, and precisely following product labels is mandatory in all cases. As well, it may be wise to consult a veterinarian before starting a new product.

Treated animals will become rapidly reinfested by fleas in the bedding or elsewhere in the house unless effective measures are taken to control immature fleas and eggs as well as adults. In addition to ectoparasiticides, most modern flea control products also include insect growth regulators (IGR's) or insect development inhibitors (IDI's), which prevent the hatching of eggs or the development of adults from juvenile fleas. While IGR's and IDI's work well, they can take several months to fully eradicate a flea infestation. During this time, the cat or dog treated with an ectoparasiticide will act as a "roving flea trap", mopping up and killing newly hatched fleas. Some veterinary flea treatments also include materials active against other ectoparasites.

In addition to IGR's and IDI's in veterinary flea treatments, there are a wide range of alternative methods for killing juvenile fleas in the home, including both chemical and non-chemical approaches. Over 2500 insecticide products are registered in the U.S. vs. fleas, including many household insecticide foggers and sprays; as with spot-on treatments, strict adherence to the label instructions is critical for safe and effective control. Diatomaceous earth and many household chemicals, including baking soda, salt, and borax, as well as "25(b)" exempt botanical pesticides, have been recommended for flea control, but there is little evidence of their effectiveness and some risks associated with their use.[2] Non-chemical treatment of juvenile fleas, including frequent vacuuming and high-temperature laundry of bedding, can be quite helpful and pose essentially no risk, although diligent care is required for complete control. Temperature and humidity affect flea survival, but the extraordinarily cool and dry conditions required for effective environmental control mean that it is generally not a practicable option.

For More Information:
FDA (2009): "Safe Use of Flea and Tick Products in Pets" (www.fda.gov/ForConsumers/ConsumerUpdates/ucm169831.htm)
National Pesticide Information Center (2012): "Flea Control" (npic.orst.edu/pest/flea.html)

ication

	Typical Products & Application (Alphabetical)
	Certifect, Promeris for Dogs
	FirstShield, SimpleGuard, Vectra
	EasySpot, Fiproguard, Frontline, Parastar, PetArmor
	Advantage, Advocate, K9Advantix II
	Promeris[1]
	Capstar
	FirstShield Trio, K9Advantix II, SimpleGuard 3, Vectra 3D
n Drug	Revolution
	Assurity
n Drug	Acuguard, Comfortis, Trifexis
n Drug	Program, Sentinel
	Fiproguard Plus, Frontline Plus, PetArmor Plus
	Advantage II, FirstShield, K9Advantix II, SimpleGuard, Vectra
n Drug	Trifexis, Sentinel
n Drug	Advantage Multi = Advocate

1(from Table 1)Sales of Promeris for Dogs were voluntarily discontinued by Pfizer in 2011, but products may still available.

2. For example, diatomaceous earth can cause severe problems for lungs, eyes, and mucus membranes if not used carefully.

Another Invasive Pest Discovered in Pennsylvania

— by Pennsylvania IPM Program
Winter 2013 Newsletter

Penn State researchers recently discovered the African Fig Fly in Pennsylvania for the first time, giving fruit growers across the state another invasive pest to be on the look out for.

Zaprionus indianus Gupta, commonly known in Brazil as the African Fig Fly (AFF), was discovered last month by the Pennsylvania Department of Agriculture (PDA) in grape and pest survey traps.

Spotted Wing Drosophila (SWD) male in comparison with the African Fig Fly (AFF). Photo by David Biddinger.

Dr. David Biddinger, biocontrol specialist at the Penn State Fruit Research and Extension Center in Biglerville, also positively identified the invasive fly in apple cider vinegar traps used for the seasonal monitoring of Spotted Wing Drosophila (SWD). SWD is another recently introduced invasive pest of small-fruit crops Dr. Biddinger first detected in PA and MD in July of 2012.

After reviewing samples from 2011, Dr. Biddinger discovered AFF has been in Adams County for the previous two growing seasons. "This is important because AFF is considered a tropical pest. Not only did it survive the extremely mild winter of 2011-12, but also the more typical previous winter," says Dr. Biddinger. He points out that while SWD traps have greatly increased in the last two weeks despite heavy frosts, the same vinegar traps are no longer catching AFF. AFF is now recorded from Adams, York, Dauphin, and Clearfield counties according to the PDA.

According to Dr. Biddinger, AFF is easily distinguished from all other fruit flies in our region due to a pair of silvery-white strips from antennae to thorax tip that are outlined along both sides by black stripes. "The PDA has humorously nicknamed AFF the 'Speed Racer Fly' since it has prominent 'racing stripes'," he says. Adults of this species are slightly larger in size than the Spotted Wing Drosophila and the background color of the body is lighter than most other drosophilid flies commonly found in vinegar monitoring traps.

Native to Africa, the Middle East, and Eurasia, it is now found in much of South and Central America where it is mainly a pest of figs. It was first found in FL in 2005, where it quickly spread and out-competed other fruit flies. New records were found for MI, NC, and CT in September of this year and it appears to be spreading throughout the South as far west as TX.

Since it does not have a large, sharp ovipositor like SWD females, AFF appears to only attack damaged and over-ripe fruit and the harsher winters of Pennsylvania may prevent it from establishing as aggressively here as it did in Florida. "So far, numbers of adults collected in vinegar traps have been only a fraction the number of SWD collected," Dr. Biddinger explains. "An exception is from net collected samples in a grape vineyard where numbers of AFF greatly outnumbered SWD. While it appears from our samples that grape is not a preferred host of SWD, it may be that grape is preferred by this new fruit fly. AFF also has the potential to damage small fruits such as cherries, blueberries, blackberries, strawberries, and raspberries."

AFF's presence and damage potential in grapes and other crops is under investigation by Dr. Biddinger's lab and Kathy Demchak, Penn State small fruit specialist. Monitoring efforts throughout the state will continue next season by PDA and Penn State and records for new hosts and county records can be forwarded to either institution. For more information about AFF and other fruit pests, visit Penn State's Fruit Research & Extension Center website at http://agsci.psu.edu/frec. For more information, go to www.paipm.org.

IR-4 Presents Dan Botts with its SOAR Award

— by Cindy Baker Smith, Senior Vice President and Director of Global Regulatory, Amvac Chemical

On February 5, 2013, IR-4 Executive Director, Jerry Baron, presented the IR-4 SOAR Award to Daniel Botts at the winter meeting of the Minor Crop Farmer's Alliance (MCFA). "Dan has been a strong and consistent voice in solving minor use problems through his leadership of Minor Crop Farmers Alliance and support of the IR-4 Project,"said Jerry

"It has been my privilege to work with IR-4 for over thirty years, and seeing the program spread its wings to become an integral and critical program working for specialty crop producers," stated Dan. "The specialty crop industry and my membership owe a debt of gratitude to the quality research and successful advocacy that is a corner stone of this program. I look forward to another 50 years of success."

Dan fulfilled the requirements to win the award by his **S**ervice, **O**utreach, **A**ltruism and **R**esearch. Dan's service to IR-4 and specialty crop growers was recognized through his support of IR-4 through his company, Third Party Registrations Inc., a Florida Fruit & Vegetable Asso. (FFVA) subsidiary that manages the registration process under liability limitation for specific pest management tools that would not otherwise be available to FFVA producer members. Through his outreach to U.S. and international growers, he has established effective relationships that have helped improve the minor use process. Some of his efforts include involvement with the Global Minor Use Summits, involvement with CODEX, work with the U.S./Canadian databases and activities around methyl bromide.

Dan's altruism can be identified by his personal influence and relationships with commodity groups, regulators, legislators and other decision makers to benefit minor crops and IR-4.

Dan has been a tireless advocate supporting research and the necessary funding for research at the university level, through community group foundations and in Washington, D.C.

Speaking on behalf of the MCFA, Chairman Christian Schlect stated, "Dan Botts has been central to the success enjoyed by the MCFA over the past two decades. While he is employed as vice president for industry affairs at the Florida Fruit & Vegetable Association, Mr. Botts is really the nation's leader in the representation of all producers of specialty crops on the complicated policy issues that envelop the registration and availability of needed agricultural chemicals."

Congratulations Dan!

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Tolerances

IR-4 Successes Nov. 2012 to Jan. 2013

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: Nov. 7, 2012

Fluazinam

Trade Name: Omega

Crops: Melon subgroup 9A, Pepper/Eggplant subgroup 8-10B

PR#: 07097, 09556

Federal Register: Nov. 14, 2012

Flonicamid

Trade Name: Beleaf

Crops: Berry, low growing, subgroup 13-07G, Rapeseed subgroup 20A, Cucumber (increased tolerance)

PR#: 09604, 09783, 08551

Federal Register: Nov. 28, 2012

Fenpropathrin

Trade Name: Danitol

Crops: Acerola, Guava, Jaboticaba, Lychee, Passionfruit, Starfruit, Sugar apple, Wax jambu, Atemoya, Biriba, Cherimoya, Custard apple, Fiejoa, Ilama, Longan, Pulasan, Rambutan, Soursop, Spanish lime, Tea

PR#: 07872, 07866, 07867, 07865, 07871, 07869, 07864, 07868, 10318

Federal Register: Dec. 7, 2012

Zeta-cypermethrin

Trade Name: Fury, Mustang

Crops: Globe artichoke, Barley, Buckwheat, Oat, Rye, Avocado, Mango, Papaya, Canistel, Sapodilla, Black sapote, Mamey sapote, Star apple, Pistachio

PR#: 09365, 08812, 09396, 08538, 10579

Federal Register: Dec. 12, 2012

Fenpyroximate

Trade Name: Fujimite

Crops: Avocado, Mango, Papaya, Canistel, Sapodilla, Black sapote, Mamey sapote, Star apple, cucumber, Tea, Snap bean, Fruiting vegetable group 8-10, Citrus fruit group 10-10, Pome fruit group 11-10

PR#: 10007, 09032, 10647, 09942, 10783, 10781, 10782

Pyriproxyfen

Trade Name: Esteem, Distance, Knack

Crops: Herb subgroup 19A, Low growing berry except strawberry subgroup 13-07H, Bushberry subgroup 13-07B, Caneberry subgroup 13-07A, Pome fruit group 11-10, Citrus fruit group 10-10, Fruiting vegetable group 8-10, Bulb vegetable group 3-07

PR#: 08908, 08909, 08913, 10745, 10744, 10743, 10742, 10741, 10740, 10739, 10738

Federal Register: December 21, 2012

Quinclorac

Trade Name: Quinclorac

Crops: Low growing berry except strawberry subgroup 13-07H, Rhubarb

PR#: 08000, 10135

January, 2013—No new tolerances

The IR-4 Project

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