The IR-4 Project

Pest Management Solutions for Specialty Crops and Minor Uses

Newsletter

Vol. 46 No. 3 Summer 2015

Chestnut Blight Management Utilizing Two Biopesticide Approaches — by Michael Braverman

The disease known as chestnut blight was first found in the US at the Bronx Zoo in NYC around 1904 and is believed to have come from Asia. Over the last century, chestnut blight has been one of the great unsolved problems in plant pathology, and there are no conventional pesticides available to manage this disease. Michigan State Univ. scientist, Dr, Dennis Fulbright stated, "These trees were often called the food and shelter trees of the Appalachian Mountains because they were decay-resistant and each tree supplied a crop of chestnuts. In about 50 years, this fungus basically eliminated the American chestnut from the Appalachian forest." The chestnuts produced by these trees were an important food source for a variety of wildlife species, and they also served as food and a source of income for inhabitants of the Appalachian region. Beyond the nuts, chestnut trees themselves were also economically important, because they were an important source of tannins and straight-grained, rot-resistant lumber. The American Chestnut was once an important ornamental tree, and, in 1908, the blight was reported to have reduced the trees in Prospect Park, Brooklyn from 1,400 to only 6. There are some hybrids that are resistant to the disease, but the nut yields are not as good.

There are currently two approaches to solving this problem, and both have been selected by the IR-4 Project to receive funding for efficacy studies to see how to make these approaches work.

Canker exhibiting callus tissue as a result of biological control treatment.
Photo by Mark Double. - See more at: http://bit.ly/mdouble

The Michigan Approach: Making the fungus sick

Chestnut blight is caused by an Asian bark fungus (Cryphonectria parasitica). Dr Dennis Fulbright thinks he has a cure by causing the fungi that causes the disease to itself get sick. Like elsewhere, losses of chestnut trees in Michigan was significant; however some trees were affected but survived naturally. There is a naturally occurring virus in Michigan that weakens the fungus that causes the disease. These weakened (or hypovirulent) strains can then transfer the virus to other

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Inside this issue...

Executive Director Notes

Dear Friends

The lazy days of summer…not for IR-4. While some of our friends and family are relaxing on holiday, visiting the ocean beaches, lakes or mountains, and enjoying the beautiful weather, many of us at IR-4 are in the busiest part of our year. Summer is the time where the investment of effort leads to future success. Most of IR-4's field trials utilizing conventional chemical pesticides and biopesticides on food and ornamental horticulture crops are in full swing. Product applications are being made, residue samples and data are being collected. Summer often means long work days for IR-4's Field Research Directors, their research teams and other cooperating scientists. They are at the mercy of Mother Nature, working in heat, humidity, rain, drought, hail, thunderstorms and whatever else is the challenge of the day. They persevere and often go above and beyond to fulfill the research protocol requirements. In discussions with many of these field women and men, it is evident that they are dedicated to the mission of IR-4 and motivated in how IR-4 helps specialty crop growers and farmers. Kudos to the IR-4 field research teams!

They are not the only group working overtime. Many in the regional field offices and IR-4 Headquarters are on call to promptly assist the field research teams when issues arise. Additionally, members of the IR-4 Quality Assurance Unit are making their visits to the Good Laboratory Practice facilities for audits. Summer is also the time for outreach via field tours and outdoor demonstration meetings. IR-4's efforts are highlighted at many of these outreach events and it gives IR-4 a great opportunity to inform stakeholders of how IR-4 can help them gain legal access to safe and effective pest management products.

Summer is also the time when many at IR-4 regional offices and headquarters prepare for the priority setting workshops, which involves meetings, with industry, EPA and commodity associations. IR-4 invests a significant amount of time to make sure we have the best available information to allow the workshop participants to choose the most relevant priorities. Attending these meetings require significant travel and time away from home. Anyone who has recently "enjoyed" air travel knows that totally full airplanes and airport delays are the norm.

Above and beyond the normal priority setting workshops, this year IR-4 is hosting the first Global Minor Use Workshop, September 20-22 in Chicago, Illinois. This workshop is a follow-up action item from the Second Global Minor Use Summit. We have already developed a global database of pest management voids on specialty crops. The objective of the Global Workshop is to bring together many of the leaders of the world's minor use stakeholders to identify what are the most critical pest management needs. It is hoped that the world can come together and select a few pilot projects where everyone can cooperate on data development to support a solution for the problem.

Registration for all the 2015 workshops — Global, Food Use, Biopesticide and Ornamental Horticulture — is available on the IR-4 website at ir4.rutgers.edu. Hope to see you there.

All the best — Jerry

2015 NER Regional Meeting — by Edith Lurvey, NE Regional Field Coordinator

I conducted my last Northeast Regional (NER) Prioritization meeting June 16 and 17 in Albany, NY. Approximately 40 people attended the meeting, including several people who have not participated in the past. The main purpose of the meeting was to identify regional priorities for Biopesticides, Food Crops and Ornamental Horticulture Programs, as well as provide information on the transition of the NER office from Cornell to Rutgers.

The meeting began in the afternoon of June 16 with a discussion of the ornamental horticulture needs for the region. A number of researchers were in attendance and provided information on past research and potential projects for the future. A common theme was the need for more biopesticides listed with OMRI (Organic Materials Review Institute). Products may also become more difficult to list as organic because of the restrictions on inerts. Another topic of discussion was the lack of new chemical classes being developed and the resulting growth in resistance for conventional products, such as the strobilurins for fungal disease management and the pyrethroids for insects. We also discussed the potential loss or restriction of uses for the neonicotinoids. With the current negative press, neonics are no longer acceptable to the large box stores and other retailers, so some nurseries and greenhouses can no longer sell plants treated with that family of products. There is concern that their loss will, along with other products thought to be harmful to pollinators, result in the reemergence of insect problems, or some pests may become more difficult to manage. Let's start identifying alternatives now and not wait until our current tools are gone before finding replacement and rotational chemistries.

Apple scab was identified as a real problem in ornamental apples, with cross over into apple production for food uses. The use of pesticides on perennial ornamentals with edible fruit, such as blueberries, was discussed. At the moment, nurseries are required to have special sections to segregate edibles from the ornamental plants, to ensure that they are not being treated with products that do not have a food use label.

Wednesday morning Bill Barney presented updates on the Biopesticides and Crop Group Programs. Jerry Baron, Dan Rossi and David Soderlund discussed various aspects of the regional office transition from Cornell to Rutgers. Things seem to be going smoothly, but there has definitely been a learning curve. Field research for 2015 is being funded through Rutgers. Subcontracts will be set up once the NIFA grant comes through, possibly in July. Dan Rossi, Marylee Ross and Jane Forder will become the official Regional Director, Field Coordinator and QA officer, respectively, once the new grant is funded. David Soderlund, Edith Lurvey, Michele Humiston and Roxanne Fish will continue in advisory capacities for varying amounts of time. Sherrilynn Novack will be picking up communications responsibilities.

Food Crop needs were discussed Wednesday afternoon. Many of the issues are similar to those already heard in the ornamental horticulture session. Here again the lack of new or biopesticides products pesticides leaves us with problems for which there are currently minimal or no solutions, such as controlling Cercospora leaf spot and/or weeds in table beets.

Biopesticides were discussed for each crop group as we identified priorities. Given the high percentage of agricultural dollars earned from and the increasing interest in organic production of fruits and vegetables in the Northeast, many of our priorities are for effective organic-compatible (including OMRI listed) materials. In some cases, there are organic materials labeled, but they are not being used because the growers are unfamiliar with the products or there is not a well-defined use pattern. Should we support a high priority for a crop/pest demonstration study? One A priority for the northeast will be to continue the biopesticides study in apples for fireblight control. Another priority might be requests to shorten pre-harvest intervals (PHI) in asparagus as the production practices are changing to a longer season for harvests.

We presented Meritorious Service Awards to two ornamental horticulture researchers from New York. Both have made invaluable contributions to the IR-4 Ornamental Horticulture Program at the regional and national levels, as well as providing expertise in food crops.

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Happy Flowers?

— by Cristi Palmer, IR-4 Ornamental Horticulture Manager

Perhaps, but there will definitely be some happy gladiolus growers. Earlier this year the US Animal and Plant Health Inspection Service (APHIS) changed the national response guidelines for the exotic pathogen Uromyces transversalis which causes gladiolus rust. APHIS concluded that this pathogen has reached its potential geographic range in the US. What this means for gladiolus growers in California and Florida is that they are now able to manage this rust disease without resorting to crop destruction to eradicate the pathogen.

IR-4 coordinated a research project to study gladiolus rust and how best to manage this disease. Research in Mexico, where U. transversalis is endemic, led to the identification of several effective fungicides registered in the US for other rust diseases: azoxystrobin, boscalid + pyraclostrobin, chlorothalonil, difenconazole + azoxystrobin, fluoxastrobin, myclobutanil, propiconazole, tebuconazole, and trifloxystrobin. Please note that additional products with these active ingredients may be available in the US.(Table 1).

When actives were rotated in a programmatic approach, very little disease developed.

It had been suspected that there was a correlation between flower color and tolerance to this disease, but several experiments examining various cultivars did not demonstrate this. There were red cultivars highly susceptible to infection and some that were less susceptible.

For more details on these experiments and results from studies on spore longevity, impact of temperature on infection, and the development of serological and genetic diagnostic assays, please see the final project report at http://bit.ly/ornhortsum.

Active Ingredient	Product Trade Name	US Label Rate for Rust Diseases
Azoxystrobin	Heritage 50WDG	1 – 4 oz per 100 gal
Boscalid + pyraclostrobin	Pageant Intrinsic Brand Fungicide	6 – 12 oz per 100 gal
Chlorothalonil	Daconil	1.375 pints per 100 gal
Difenconazole + azoxystrobin	Alibi Flora	8 – 14 fl oz per 100 gal
Fluoxastrobin	DisArm 480SC	1 – 4 fl oz per 100 gal
Myclobutanil	Eagle 20EW	6 – 12 fl oz per 100 gal
	Eagle 40WP	3 – 6 oz per 100 gal
Propiconazole	Banner Maxx	5 – 8 fl oz per 100 gal
Tebuconazole	Torque 3.65SC	4 – 10 fl oz per 100 gal
Trifloxystrobin	Compass O 50WDG	2 – 4 oz per 100 gal

Gladiolus varieties planted in commercial fields in Mexico.
Photo by Dr. Valencia-Botin.

Call for Nominations

Please nominate someone for the IR-4 SOAR award. The selected awardee(s) will demonstrate excellence in 3 of the 4 elements:

Service: Such as participation in standing committees and ad hoc committees, participation in advisory panels, or participation in similar activities which enhance the direction and mission of IR-4.
Outreach: Such as being a consistent vocal supporter of IR-4 with growers and/or lawmakers, and/or routinely including recognition of IR-4 in print and visual media thus elevating IR-4's profile in the grower community.
Altruism: Such as donations of time, extra research, or plant materials.
Research: Such as participation in IR-4 Program for a minimum of 3 years, and consistently producing stellar and timely research where research results contributed to new or enhanced product labels
Deadline for nominations is **August 31 2015**. For more information visit ir4.rutgers.edu/awardcriteria.html.

NER Award Winners

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Daniel O. Gilrein, Extension Entomologist at the Long Island Horticulture Research and Education Center (LIHREC), has been contributing his time and expertise to the IR-4 program for a number of years. He has been one of my principle sources for information on insect management, insecticides and regional needs. It took me a few years to convince him to participate in the ornamentals research program, but since 2005 he has provided considerable data, especially for product efficacy for whiteflies, thrips, mites and grubs. His research supports important registrations and his work has expanded the output from LIHREC making it a major Field Research Center for the IR-4 Ornamental Horticulture Program.

Elizabeth M. Lamb came to Cornell as Ornamentals IPM Coordinator in 2006. She had the misfortune of having been my office mate at the University of Minnesota in the late '80s and early 90s, so when I heard she was coming to Cornell I drafted her into the IR-4 Program. She has been an admirable recruit; far surpassing any expectations I may have imposed on her. She has taken ownership of the Ornamentals survey, distributing them to the growers and ensuring responses, resulting in good representation of grower needs for the Northeast. She actively participates in the prioritization process for ornamentals research at the regional and national level. She was also an active IR-4 participant for vegetables in the Southern Region before coming to Cornell.

Orn. Hort. Workshop

The 2015 Ornamental Horticulture Workshop is being held outside Chicago, IL at the Hyatt Regency in Schaumberg, Chicago during October 6 - 8, 2015. This following is a preliminary agenda.

October 6

- Ornamental Horticulture Tour

October 7

- Welcome & Introductions
- State of IR-4
- Ornamental Horticulture Program Updates
- Informational Materials & Prioritization Process
- Grower & Extension Survey Results
- New Products & New Uses for Current Products
- Grower & Trade Association Comments Project Overviews & Status: Pathology, Entomology, Weed Science
- Regional Priority Discussions (Breakout Sessions)
- Sticker Caucus

October 8

- Recap, Sticker Caucus Results
- Discussion to Refine Priorities
- Pollinator Protection in Ornamental Horticulture Discussion
- Biopesticide & Organic Support
- Program Priorities for Orn. Hort.
- Other IR-4 Topics TBD

Personalities in the News

The IR-4 Newsletter Vol 46 No.3 Summer 2015

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IR-4 /EPA/USDA Ag Tour
Shenandoah Va

On Wednesday, June 24, 2015, IR-4 hosted its 17th IR-4/EPA/USDA tour. This year's tour was titled "A Look at VA's Northern Shenandoah Valley Agriculture". Forty-five people from EPA's Registration, Pesticide Re-Evaluation, Environmental Fate & Effects, Health Effects, Biopesticide & Pollution Prevention, Biological & Economic Analysis, and Field & External Affairs Divisions participated in the tour. IR-4 researchers Allen Straw, Marylee Ross and Barbara Abbott;Liza Fleeson from the Virginia Department of Agriculture and Consumer Services; and Craig Hunter from the Ontario Fruit & Vegetable Growers Association were also welcome participants.

The first stop included a look at Virginia Cooperative Extension's Shenandoah County Sustainable Farm Demonstration. There, participants learned about sustainable farming practices that include being environmentally sound and profitable to both the farmer and landowner. Demonstrations at the county farm include multi-year lease agreements, managed grazing of cattle, renovating overgrown pasture area, excluding livestock from surface water, rejuvenating forest, multiple grassed waterways, continuous no-till practices, and landowner financial well-being.

The second stop gave tour participants a unique look at hops, which are grown at the North Mountain Vineyard. The hops industry is growing in Virginia thanks to increased demand for locally-produced goods. The North Mountain Vineyard is also one of the older vineyards in Virginia , and varieties grown include Chardonnay, Cabernet, Sauvignon, Cabernet Franc, Petit-Verdot, Veltliner, Zweigelt, Riesling, Vidal Blanc, Chambourcin and Traminette grapes.

The third stop on the tour was at the Virginia Tech Alson H. Smith Jr. Agricultural Research and Extension Center. At this stop participants were escorted to the research fields on farm wagons and learned about the various pest pressures encountered in these fields. Participants received an "up close" look at the center's research on efficacy and phytotoxicity of biopesticides for the control of fire blight on Gala apples and research on the monitoring and management of brown marmorated stink bug.

The last stop on the tour was the Marker-Miller Orchards, which has been in the Marker-Miller family for many generations. There they grow a variety of apples along with peaches, green beans, plums, sweet corn and other fruits and vegetables. Their farm market is open from June to December and in addition to farm grown produce, the market sells local wines and baked goods.

While the day was long, participants who answered the survey gave IR-4 many accolades, stating the tour was well organized and the tour stops provided valuable information. Many of those on the tour stated they had not been out in the field and the tour provided good information regarding agricultural practices.

History of IR-4 Tours

— by Ken Samoil

When Bob Holm became the IR-4 Executive Director in late 1998, one of his first acts was to

: A Look at VA's Northern lley Agriculture

negotiate a series of meetings with EPA to be held quarterly (the Technical Working Group meetings), with the location of the meetings to alternate between EPA HQ and IR-4 HQ. The first TWG meeting to be held at IR-4 HQ was scheduled for June 7, 1999, and someone suggested that it would be useful to include an agricultural tour of New Jersey for the visiting EPA personnel.

Bob asked George Markle to organize the tour, and George asked me to help, knowing my background in Rutgers Cooperative Extension. I had worked at the Rutgers University Blueberry & Cranberry Research Station 1988-1993, and during the last three of those years had spent a significant amount of time at the Rutgers University Fruit Research and Extension Center at Cream Ridge.

The first tour, named Beyond the Turnpike, was held on June 8, 1999, to provide regulatory officials and policymakers with information on the diversity, complexity, and special needs of minor crop agriculture in New Jersey. (A previous agricultural tour organized in upstate New York had been called Beyond the Big Apple. I shamelessly ripped off the theme.)

The bus tour began at IR-4 HQ in North Brunswick, and included stops at the Rutgers University Fruit Research and Extension Center at Cream Ridge, the Joseph J. White, Inc. cranberry farm in Whitesbog, Pakim Pond in Lebanon State Forest (for lunch), Bellview Farms in Landisville (they specialized in Southeast Asian vegetable production), and the Rutgers Agricultural Research and Extension Center in Upper Deerfield (Bridgeton). After the Bridgeton stop, the bus drove to the Wilmington train station to drop off the EPA participants, and then traveled back to North Brunswick.

By 2000, the TWG meetings were being held exclusively at EPA HQ. They were still interested in a tour (and said that they could get a lot more people by starting from the DC area), so George and Johannes Corley and I planned another tour—Beyond the Beltway. Held on June 7, 2000, it began at College Park and the Greenbelt Metro station. Tour stops were made at the USDA chemistry lab in Beltsville, the Saulsbury Bros. packing plant in Ridgely, MD, Phillips Mushroom Farms, Inc., in Kennett Square, PA, and then dinner at Il Giardino's, also in Kennett Square, before returning to Beltsville.

On January 31, 2001, a single-stop tour was made to the Village Farms greenhouse operation in Fredericksburg, Virginia. (This site is no longer affiliated with Village Farms.)

Van Starner helped George and I organize the next tour, held June 12, 2002, and called Beyond the Chesapeake. The tour began in Crystal City, VA, and included stops at the Laurel Airport in Laurel, DE, for a discussion and demonstration of crop spraying; the University of Maryland Lower Eastern Shore Research and Education Center in Salisbury, MD, the Wye Research and Education Center in Queenstown, MD, for a honey bee discussion/demo, and then to the Harris Crab House in Grasonville, MD, for dinner.

The next year was the last year that I was involved in planning. George Markle had retired, and Van had taken the lead in organizing. Held on June 19, 2003, the IR-4/EPA/USDA Ornamentals Tour began at Crystal City and had stops on the Eastern Shore at Wye Nursery, Inc., in Hillsboro, MD, the John S. Ayton State Tree Nursery in Preston, MD, Chesapeake Nurseries, Inc. sites in Green Hill and Salisbury, MD, and Stadler Greenhouses (also in Salisbury), before concluding with dinner at the Harris Crab House.

Van Starner, along with help from Sherrilynn Novack, has organized all of the ag tours since then.

No Minor Crop Is Ever too Small for IR-4 Part 1

—by Kathryn Homa, IR-4 Fungicide Coordinator and Bill Barney, IR-4 Senior Coordinator

This is a two-part series focusing on some unique minor crops.

Throughout the years, the IR-4 Project has been involved in thousands of food use requests and magnitude of residue projects. Sometimes the projects involve conducting a large number of trials, such as a joint fluensulfone residue study with Canada with 22 trials on potato for the control of nematodes. Other times, the project is not nearly as large, e.g. a metaldehyde residue study consisting of four trials on ginseng for the control of slugs. However, all of these IR-4 projects have something in common: they are used to facilitate the registration of sustainable pest management tools for specialty crops and minor uses in an effort to aid growers.

Recently, the IR-4 Project has been working to facilitate the development and registration for a number of pesticides across a vast array of newly popular minor/specialty crops for food use including stevia and African marigold. Part II of this series will focus on quinoa and wasabi.

Stevia

Stevia rebaudiana is an herb in the Chrysanthemum family that is native to South America. In the US, it is mainly grown as a small shrub in North Carolina, Georgia and California for the glycosides in its leaves that are manufactured into a zero calorie sweetener; it is 200-400 times sweeter than sugar. Stevia is consumed throughout the world including Japan, South Korea, China, the Pacific Rim, Europe, Australia, North America and South America. Major production areas include Paraguay, Brazil, Japan and China. Other growing areas include the Pacific Rim, Southern Ontario, Mexico, California and the South of England. Besides being used as a pre-packaged replacement for sugar and other artificial sweeteners, stevia is incorporated into many food products including gum, yogurts, soda and desserts.

Stevia Plot at KARE / David Ennes – 2014, Treated Plot on 8/18/14

Because stevia is a fairly new crop in the US, there were no herbicide products labeled for in season use on this crop. As a result, the state of Georgia proposed a third-party 24(c) Special Local Need registration for the use of the product, Select Max® (clethodim) herbicide on stevia to control annual and perennial grasses. IR-4 also received a product clearance request (PCR [PR 11205]) from Georgia and California for the use of clethodim on stevia for weed control. Stevia is currently proposed for inclusion in the revised Fresh and Dried Herb subgroups, with basil and mint as the proposed representative commodities. Since there were existing tolerances for spearmint and peppermint tops at 5.0 ppm, a stevia tolerance proposed at 12.0 ppm provided a conservative extrapolation. ChemSAC decided that the use of clethodim on stevia is a food use and that a tolerance on stevia could be extrapolated from the existing clethodim Herb subgroup 19A tolerance at 12.0 ppm to stevia. While stevia has not yet been included in the revised Herb and Spice Group 19, the proposal to include this commodity in the group has been submitted by IR-4 and is currently being reviewed by EPA HED.

African Marigold

African marigold (*Tagetes erecta*) native to Mexico, Central America, Ecuador and Peru, is one of the most popular bedding plants grown in the US. These tall plants have large, 5-inch globe-shaped yellow or orange flowers that bloom from summer to frost. In addition to their ornamental value, African marigolds contain many important phytochemical constituents that are used for industrial purposes including cosmetics and medicines. Compounds in the leaves are used against piles, kidney troubles, muscular pain, ulcers and wounds. Flowers are used against fevers, epileptic fits, liver issues and other

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African Marigold-Photo courtesy of http://www.edenbrothers.com

Chestnut Blight

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strains thereby weakening the infection so that the tree can recover. The hypovirulent strains used for management of chestnut blight were taken "as is" from American chestnut trees naturally surviving blight in Michigan. There has been no genetic manipulation of these strains. In Michigan, growers can plant low-yielding blight-resistant trees or high-yielding blight-susceptible trees. Growers can make more money growing the blight susceptible trees, but they will need the hypovirulent treatment to keep their trees alive. That is a big difference.

The trees on commercial farms are not American chestnut, but hybrids of European & Japanese chestnut cultivars grafted for high yielding, high quality nuts. These trees are blight susceptible and the hypovirulent biopesticide works well in managing the blight on these trees.

Chestnut trees go into production 3-5 years after planting. They can begin to get chestnut blight cankers about 10 years after planting or longer depending on the closest blighted trees.

The American chestnut trees with the native hypovirulence are doing well. MSU owns a 5 acre plot with about 800 surviving trees. This approach might be a viable option for spot treating trees on a commercial farm or home landscape. In targeting the trees only when the disease starts, this avoids having to treat unless the problem occurs.

The New York Approach: Developing resistant trees

At the State University of New York in Syracuse, Dr William Powell is leading a research team taking a different approach to solving the chestnut blight problem. Chestnut trees were once a significant part of the North American forest and ecosystem and restoration of that environment is an important goal. In large swaths of forest, it is not practical to treat individual trees with a hypovirulent fungi strain. The disease-causing fungus dissolves some of a trees' tissue and utilizes it as a food source, resulting in cankers on the bark. More specifically, this pathogen produces oxalic acid which dissolves chestnut tissue.

Wheat has a naturally occurring oxalate oxidase (OxO) gene which codes for production of an oxidase enzyme which breaks down the oxalic acid. This enzyme stops the pathogen from dissolving the bark, thereby protecting the tree from the damaging effects of the fungus. The enzyme does not kill the fungus, but instead detoxifies the acid produced by the fungus. The research team has transferred this gene into American chestnut, making it resistant to the blight. As shown in the photo below, young transgenic trees survive after they were inoculated with C. parasitica, the blight fungus while non-transgenic control trees have wilted. The long term plan is to plant these trees back into North American forests so they can spread and again be part of the eastern North American ecosystem. For more information see an article recently published in the Smithsonian at http://bit.ly/NYaproach.

These two approaches can help solve the same problem in two very different production systems, each filling an important unmet need. However, efficacy data itself is not enough to make the technologies available. In addition to the IR-4 Biopesticide grant program providing some funding for efficacy studies, IR-4 is also consulting with the researchers on how to bring these 2 technologies to market, both via deregulation with Agency.

eNewsletter

We have launced our eNewsletter. We will continue to publish print and digital newsletters for a few more issues.

Please let us know which version you would like to receive or if you want both.

Contact Sherri Novack at novack@aesop.rutgers.edu or by phone at 732.932.9575 x 4632.

New Product Corner

Bicyclopyronel (Herbicide – Syngenta Crop Protection, LLC)

Introduction: Following a global review involving the US, Canada and Australia, US registration for the new active ingredient (AI) bicyclopyrone was granted by the EPA in April 2015 for use in corn (and an import tolerance in sugarcane). This new AI provides burndown plus residual that delivers improved efficacy for difficult-to-control large-seeded broadleaf weeds in corn, and allows reduced rates of certain other herbicides, while meeting stringent health and environmental safety standards. This new mode of action AI has been registered in a 4-way mix of AIs in Acuron™ Herbicide: bicyclopyrone is mixed with mesotrione, atrazine and s-Metolachlor. State registrations are in progress and supplies of product are limited in 2015. Bicyclopyrone is an HPPD herbicide.

Other global registrations: Canada (registered), Australia (pending 4Q2015)

US trade name/formulation: for food uses - Acuron™ Herbicide (contains 0.06 lb ai bicyclopyrone, 0.24 lb ai mesotrione, 2.14 lb ai s-Metolachlor and 1.0 lb ai atrazine/gallon of product)

US labeled crops (see label for specific use pattern and other general directions for use): food uses on Acuron™ Herbicide label - corn in Crop Groups 15/16, including field corn, seed corn, silage corn, sweet corn and yellow popcorn

Labeled pest spectrum: Acuron™ Herbicide has been shown to control 70+ weeds, including broadleaf and grass weeds like Palmer amaranth, marestail, giant ragweed, kochia, morningglory, waterhemp and foxtail

Ongoing IR-4 residue projects: none currently

IR-4 database requests (PR#) (all are considered "Researchable"): carrot (11621), horseradish (11667), dry bulb onion (11619)

IR4 cooperators are evaluating bicyclopyrone on other specialty crops, including carrot, papaya, pineapple, banana/plantain, timothy grown for seed, onion, horseradish and cuphea; other specialty crop uses are under investigation by the registrant.

Minor

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ailments. Lutein and zeaxanthin, major constituents of African marigold, are used in supplements to aid in the treatment of diseases of the eye and the promotion of eye health.

As a result of a company's interest in growing African marigold on a large scale in the US for the purpose of extraction of lutein and zeaxanthin, IR-4 received a PCR request for the use of the herbicides pendimethalin, a dinitroaniline selective herbicide that controls annual grasses and certain broadleaf weeds and topramezone, a pyrazolone herbicide for postemergence weed control of broadleaf weeds and grasses in order to produce a successful crop. A ChemSAC proposal is being written that will propose that while this is a food use, there are no expectations of residues due to the extensive processing that African marigolds undergo to extract lutein and zeaxanthin. There is also the understanding that the requestor will maintain complete control of the crop, the labeled use will be held as a private label only by the requestor, and that the label would include a feeding restriction.

Currently, marigold (*Calendula officinalis*) is included in herb and spices crop group 19. African marigold (*Tagetes erecta*) is proposed for inclusion in the revised Herb crop group.

All of the IR-4 PCRs above have one theme in common: they are all important requests for major issues (insects, diseases, weeds) on a minor/specialty crop. IR-4 looks forward to receiving these requests in hopes of helping to obtain sustainable pest management tools for minor/specialty crops and minor uses in an effort to aid growers.

Translating Innovation to Impact in Vector Control

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

Efforts to encourage innovation in vector control have been motivated for the last decade by the rapid expansion of vectors and vector-borne diseases around that world, spreading resistance to existing chemical control tools, and a belief that eradication of some of these diseases may be possible with an adequate toolbox. The Innovative Vector Control Consortium (IVCC), the Deployed War Fighter Protection (DWFP) Program, and the IR-4 Public Health Pesticides Program have all encouraged research and development, and the array of potential control measures for public health pests have never been greater. However, few of these new ideas assisted by these initiatives have yet entered the operational toolbox, and attention has recently shifted to translating innovation to impact.

Innovation in vector control has focused on three areas – reformulating existing Active Ingredients (AI's) into new products for public health uses, developing new product types (e.g. attract-and-kill products or area-wide repellents), and identifying new compounds with novel modes of action. In all three areas, there is a critical need for new high-impact products.

Both new products based on existing AI's and new product types have begun to enter the market, but their impact on public health has been limited so far. For example, products based on previously unused pyrethroids (etofenprox, deltamethrin) have been introduced in the U.S. for wide-area mosquito control, and these look promising, but other pyrethoids have lost registration in the same period, and the net impact is unclear. In addition, clothing treatment with pyrethroids other than permethrin is being evaluated, and new household and pet products enter the market frequently, so other reformulations seem likely in developed markets. For malaria control, long-lasting indoor residual sprays based on deltamethrin and the pirimiphos-methyl, and new bed nets with combinations of AI's have generated enthusiasm. These new formulations can represent real improvements for users, but all of these products use traditional chemical classes, and resistance will probably limit their life span. Promising new product types, including ovitraps, attractive toxic sugar baits, etc., have been discussed previously in this series of articles, and are starting to sell, but so far represent a very small part of the market.

New AI's used exclusively for vector control would be highly desirable for resistance management, but the need for at least two new modes of action to inhibit resistance, and the large cost of developing and registering each novel chemical class, have appeared to be insurmountable challenges. However, a Gates/IVCC effort to screen millions of chemicals in company libraries for mosquito control efficacy has apparently paid off, and it looks likely that new AI's could start the registration process in the next year. If funding is sufficient, the goal is to restrict these new chemicals to the vector control market, hopefully ensuring their utility for decades.

Support for vector control innovation has been fruitful, and the potential for many new chemicals, product types, and products is great, assuming the pipeline from innovation to impact flows smoothly and quickly. Thus, the current focus in public health pesticides is on addressing the critical paths needed to ensure product development, evaluation, registration, and procurement.

IR-4 has focused on this type of translational research in minor use pest management for decades, and we are now collaborating with an initiative known as I2I (Innovation "2" Impact) intended to promote a more efficient approval process for new vector control materials and products, and in particular for fast registration of the new IVCC AI's. A meeting in London in June highlighted key elements of the plan: A restructuring of the WHO Pesticide Evaluation Scheme to speed-up the evaluation and recommendation process; development of a network of GLP test facilities in malaria-endemic areas to support reliable efficacy testing by manufacturers; global joint review with a common data dossier for each material; revisions to procurement methods to ensure high quality products reach the market; a review of the technical basis for determining that products are equivalent in efficacy; development of a similar pathway to global approval for new product classes; and continued investment in early-stage innovation. IR-4 experience in translational research and regulatory support indicates that we will have a major role in vector control innovation for years to come.

Tolerance Successes

There were no tolerances were established in January and February

January - June 2015

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: March 4, 2015
Metaldehyde
Trade Name: Meta
Crop: Edible podded legume vegetable subgroup 6A, Succulent shelled pea and bean subgroup 6B, Foliage of legume (except soybean) subgroup 7A, Clover (Pacific Northwest registration only), Ginseng, Tomato subgroup 8-10A, Citrus fruit group 10-10
PR#: 10105, 10333, 10334, 10667, 10704, 11401, 11402

Federal Register: March 18, 2015
Boscalid
Trade Name: Pristine
Crop: Dill (seed), herb subgroup 19A, Stone fruit group 12-12, Tree nut group 14-12
PR#: 08691, 08792, 08793, 11384, 11385

Federal Register: April 10, 2015
Pyraclostrobin
Trade Name: Pristine
Crop: Dill (seed), herb subgroup 19A, Stone fruit group 12-12, Tree nut group 14-12 (except pistachio)
PR#: 08691, 08792, 08793, 11386, 11387

Federal Register: May 29, 2015
Metconazole
Trade Name: Metconazole
Crop: Dried shelled pea and bean (except soybean) subgroup 6C, Rapeseed subgroup 20A, Sunflower subgroup 20B, Stone fruit group 12-12, Tree nut group 14-12
PR#: 10388, 10389, 10390, 11373, 11374, 11375, 11403, 11404, 11405

Federal Register: June 15, 2015
Sethoxydim
Trade Name: Poast
Crop: Fescue, Bushberry subgroup 13-07B, Caneberry subgroup 13-07A, Low growing berry (except strawberry) subgroup 13-07H, Citrus fruit group 10-10, Pome fruit group 11-10, Small vine-climbing fruit (except fuzzy kiwifruit) subgroup 13-07F, Rapeseed subgroup 20A, Sunflower subgroup 20B, Cottonseed subgroup 20C, Bulb vegetable group 3-07, Fruiting vegetable group 8-10
PR#: 04873, 09933, 10933, 10935, 10936, 10937, 10938, 10939, 10940, 10941

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