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

Newsletter

Vol. 43 No. 1 Winter 2012

Hope for Managing Fly Nuisance in Mushrooms

—by Northeast Regional Field Coordinator, Edith Lurvey

Flies are a particular nuisance to mushroom growers. Many registrants overlook the pest control needs of mushroom growers, because of the relatively small mushroom production market. Phil Coles, of Giorgi Mushrooms appreciates the mission of IR-4 to help minor crop growers by facilitating registration of pest control products and stated, "IR-4 has been a great partner to the mushroom industry. Without IR-4's assistance, there would be little chance of having materials labeled for use on mushrooms. With IR-4's assistance we not only have been able to navigate the scientific and regulatory aspects of pesticide registration, but IR-4 has also guided us through the preliminary processes, such as deciding on the best materials to screen."

One way to help mushroom growers was finding a solution for sciarid (Lycoriella mali)and phorid (Megaselia halterata) flies, which are both pests that infest mushrooms. Both flies lay their eggs in mushroom compost substrate where larval feeding causes some loss in production and fruiting body quality. Their vectoring of green mold, however, is of far greater economic importance, especially in the young crop.

Adulticides for use as an insecticidal barrier against these two species are essential to the mushroom industry. Permethrin has been used as a fogging application for years, but a product or two from different IRAC (Insecticide Resistance Action Committee) insecticide mode of action groups are needed for resistance management.

The current IR-4 project to help manage these pests began as an efficacy study to support the 2011 Canadian "A" priority for acetamiprid in mushrooms. It soon became clear that there was little supporting efficacy data and there was no use pattern for this product, which resulted in IR-4 designating this as a PPWS project (Pest Problem Without Solutions).

The first step in this PPWS project was to identify what products could be effective. IR-4 funded some basic bioassay work in 2011. IR-4 Entomology Program Manager, Keith Dorschner, worked with mushroom specialists and industry representatives to identify several insecticidal products with potential. Michelle Meck, Lehigh Agricultural & Biological

continued on page 3

Inside this issue...

Western Region Webinar Residue Study Training

— by Western Region Assistant Field Coordinator, Stephen Flanagan

The Western Region IR-4 Program has opted to conduct a series of webinar training sessions in 2012. In an era of strained budgets and the need to judiciously allocate resources, the webinar format is a cost effective method of reaching researchers spread throughout the Western United States. There are very tangible benefits of meeting face to face where questions and side bar discussions add insight and engage everyone's attention. Although the webinar format is not face to face, the fiscal advantages over a hosted training (roughly $25K) verses twelve seventy-five minute webinars (roughly $100/session x 12 sessions = $1,200) is a compelling incentive to virtualize training.

The twelve webinars are scheduled on the second Friday of the month and run for approximately one hour and fifteen minutes. Participants call in on a group conference call and also log into a website which broadcasts the actual live training session. Through phone communication as well as chat capabilities within the web conferencing tools, participants can query presenters, make comments, and actively participate in the training. Various webinar topics will have relevance to either all IR-4 personnel, to field researchers or the laboratory folks. Presenters will include Western Region QA, lab, field and management personnel along with IR-4 Study Directors. For more information on topics and the webinar schedule, visit wrir4.ucdavis.edu and follow the events link.

Past Topics:

Changes in 2012 protocol and notebook, Ken Samoil

Multiple Trial Requirements, Ken Samoil

Test and Reference Substances Receipt and Identification, Jim McFarland
What doesn't match?
What ya gonna check?
Who ya gonna call?

Future Topics

Martin's Top Ten List, Martin Beran

QC reviews and QA findings Reactions, Responses, Relationships, Stephen Flanagan and Jim McFarland

The Timeline Thing, Debbie Carpenter

Lifecycle of an Expedited Project, Matt Hengel

What makes a good FRD? Becky Sisco

Equipment Maintenance, Martin Beran

Sample Receipt and Prep, Bronson Hung & Chava Torres

Writing those pesky deviations Becky Sisco

Procedure for terminating/replacing a trial

Trials with Challenging applications (e.g. chemigation) Stephen Flanagan

Tricks of the Trade/Lessons Learned, FRDs

Drying Commodities: Procedures and Documentation, Stephen Flanagan and Sherita Normington

Specific commodity experiences (prunes, grapes, hops, hay, herbs),FRDs

Lab Topics, Matt Hengel

Measuring Devices, Martin Beran and Sherita Normington

IR-4 Websites: National and Western Region What's available at your fingertips?

Year in Review – A game (Mika, Matt, Martin, Stephen)

Fly Nuisance

continued from page 1

Services, Inc. (LABServices) conducted direct contact and residual contact bioassay studies. The idea was to keep the flies from laying their eggs, and the flies were not directly contacted by the application.

The products of greatest promise were those with the quickest residual knockdown. For the residual contact study, petri dishes were sprayed with each product. Once dry, < 3-day-old phorid flies were introduced and the number of moribund and dead flies were counted at 1, 3, 8 and 24 hours. At 3 hours, 93% of the phorid flies in the etofenprox (Zenprox) + PBO treatment and 95% in the zeta-cyper-methrin (Mustang Max) treatment were dead or moribund. After 8 hours 100% of the flies were dead or dying with the previous two products, Mustang Max + PBO gave 95% knockdown and Entrust 89%. For the sciarids, after three hours the etofenprox + PBO was only 21% effective, reaching 59% at 8 hours, but tolfenpyrad resulted in 76% knockdown at 3 hours and 84% at 8 hours. Only half of the sciarid fly bioassays have been completed, leaving Mustang Max and Entrust to be evaluated. Hopefully, the sciarid efficacy results will be comparable to the phorid.

Etofenprox was identified as one of the mushroom industry's "A" priorities and residue trials will begin in 2012. Additionally, 'mushroom house' evaluations will be conducted for some of the promising products with a mix of mushroom industry participation and some IR-4 funds that were budgeted in 2011. IR-4 and the mushroom industry are anxiously awaiting the results of these studies.

Pest Problems Without Solutions (PPWS) projects - In recent years, IR-4 has become more involved in efficacy and crop safety research, including screening studies to identify potential tools to manage pest problems for which there are currently limited or no available solutions. PPWS projects are actually a part of the IR-4 Strategic Plan 2009-2014, in which IR-4 suggested additional funding was needed to support comparative product performance testing aimed at quickly identifying promising pest management products for high priority pest management voids. Over the past couple years IR-4 stakeholders have given high priority to the funding of PPWS screening studies, including: thrips in onions; weeds in garden beets; and timber rot in tomatoes. A PPWS project is initiated with a request (the IR-4 Project Clearance Request, or PCR) submitted by an IR-4 stakeholder, identifying the pest management void, along with some potential solutions to be tested. The request is entered into the database for review and prioritization at the IR-4 Food Use Workshop. If workshop attendees choose an "A" priority for a PPWS project, it replaces an "A" residue study and can be funded at about $35,000, the cost of field trials in an average residue study (typically 6-7 trials). A Regional Upgrade can also be used for a PPWS project, again replacing a residue study.

Village Farms GAT
First of its Kind i

— article and photo provided

Village Farms is in the process of finishing construction on a state-of-the-art, greenhouse located in Monahans, Texas. This project broke ground in early June, it will be the fifth greenhouse built by the Company in the State of Texas, and will be based on the Village Farms' innovative proprietary technology termed GATES™, and is expected to begin production in early 2012. The first of its kind, Village Farms' GATES™ greenhouse has successfully operated over the past four years in nearby Marfa, Texas. Phase one of the Monahans greenhouse will incorporate a 30-acre production greenhouse in addition to various other service buildings including an advanced technology packing, sorting, and distribution facility. The long term plan is to build a total of 120 acres, on the 320 acre site. The Monahans greenhouse will initially employ 80 to 100 people and bear a capital cost of approximately US$42.0 million, which includes certain infrastructure improvements for future phases. Each consecutive phase would contribute approximately 30 acres of production area. The first 30 acres of the greenhouse has been planted and harvesting of 15 of those acres will begin at the end of February.

Village Farms' existing GATES™ greenhouse in Marfa, Texas has proven to be a highly efficient, year round, precision agriculture, production facility allowing the Company to produce 365 days per year, with demonstrated yields exceeding 100 kilos per square meter per year. In 2007, in its first year of operation the Marfa GATES™ greenhouse broke the world record for production of tomatoes. The new Monahans greenhouse will provide year round supply and enhance the Village Farms' product offerings for its existing local and existing customer base. The additional capacity will also enable the Company to diversify and expand its product offerings at its existing 122 acre facilities in Marfa and Fort Davis, Texas.

The Monahans greenhouse will be based on a highly resource efficient hydroponic growing system. In keeping with Village Farms' "good for the earth" sustainability philosophy, the project is focused on water conservation, land preservation, food safety, integrated pest management, and reducing the overall carbon footprint. The greenhouse will recycle its water up to five times and utilize 86% less water compared to field tomato farming. Higher yields per acre equate to less land for producing greater quantities of food, up to 30 times more food per acre compared to field farming. In addition, the Monahans greenhouse will receive a portion of its electricity needs from renewable wind power. This state of the art facility will operate within a fully enclosed system mitigating outside

TES™ Greenhouse n North America

l by Village Farms

contaminants and unwanted crop pressures in order to ensure the highest food safety standards and crop vitality available today.

In addition to its other next generation technologies the Monahans' greenhouse will use supplemental lighting and be among the first greenhouses in North America to use diffused roof glass capable of increasing yields over conventional clear glass. The Company (in conjunction with its technology partners Verbakel Bomkas BV and Hortimax BV, both headquartered in The Netherlands) has developed advances in highly efficient growing systems enhancing our "from seed to fork" integrated business model, built with proprietary intellectual property strengthening our position as a leader in the industry.

The Monahans greenhouse will be the twelfth greenhouse that the Company has developed, built, acquired or operated over the past 22 years, including projects in Pennsylvania, New York, Virginia and Texas. In addition, the Company owns and operates the largest greenhouse in Canada located outside of Vancouver, British Columbia.

Role of Biopesticides in Greenhouse Tomato Production

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

Biopesticides such as microbial and natural products play an important role in greenhouse tomato production. Today's greenhouses depend on the use of biological control such as beneficial predatory mites that feed on other mites. Biopesticides generally have little to no impact on beneficial mites and insects so that other pests can be managed without impacting the beneficials. Bumblebees are another important component of greenhouse production. Bumblebees are excellent pollinators, but may be sensitive to conventional pesticides. Finally, greenhouse tomatoes are harvested at least once every day. Some conventional pesticides may require growers to wait several days between application and harvest, so several harvests could be sacrificed to the required waiting period. Most biopesticides can be applied on the same day as the tomato is harvested and workers may not have to wear hot protective clothing as long to re-enter the treated areas.
One of the newest biopesticides recently approved by EPA is the Bacteriophage of *Clavibacter michiganensis* susp. *michiganensis* sold as AgriPhage CMM. Clavibacter, also known as bacterial canker is a bacterial plant disease that infects the leaves and stems of the tomato plants. The completion of the registration for Bacteriophage of *Clavibacter michiganensis* susp. *michiganensis* is especially important due to the lack of effective conventional alternatives. IR-4 first became aware of this problem during a tour of a commercial tomato greenhouse facility in Virginia. On that tour, participants learned the grower had to prune plants to remove diseased tissue and in many cases destroy all the plants in a section of a greenhouse. The IR-4 Biopesticide Program funded greenhouse efficacy trials and submitted the registration package to the Biopesticides and Pollution Prevention Division of EPA.

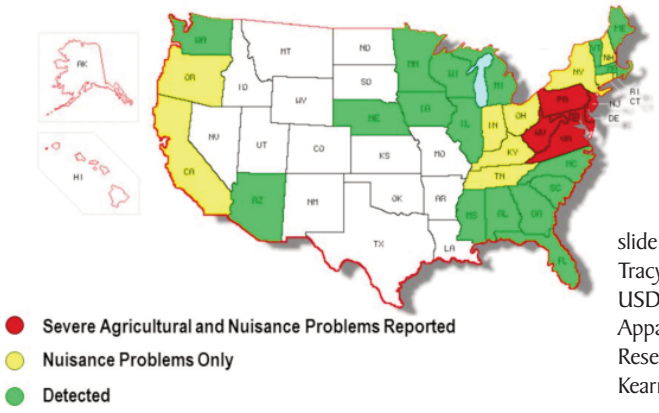
Update: IR-4's Work on BMSB

—by Northeast Regional Field Coordinator, Edith Lurvey

Brown Marmorated Stink Bug (BMSB) burst onto the scene as a major pest in crops in the mid-Atlantic states in 2010. Because of the huge economic losses in crops, especially apples and peaches, as well as its visibility to the general public as an incredible nuisance pest, there was a push for additional, effective control measures. In the fall of 2010, a study to screen for products to control BMSB was selected as an IR-4 PPWS (Pest Problem Without Solution) project. A number of researchers already had plans to conduct BMSB field trials in conjunction with the BMSB IPM Working Group. In this case, the idea was to provide a small amount of funding to include a few IR-4 treatments in larger studies.

IR-4 funded six field trials in specialty crops that seem to suffer the most BMSB feeding damage. The crops and researchers were as follows: apples and peaches, George Hamilton (Rutgers); peppers, Thomas Kuhar (VA Tech.) and Galen Dively (Univ. MD); sweet corn, Joanne Whalen (Univ. DE); and raspberries, Doug Pfeiffer (VA Tech.). Keith Dorschner, IR-4 Entomology Program Manager, put together a protocol that included 4 treatments, dinotefuran (Venom, Scorpion) and etofenprox (Trebon) with and without PBO (Piperonyl butoxide, Exponent Insecticide Synergist). The rates were the same across all six crops, but the number of applications was dependent on the crop. For example, only one application was made on raspberries, but six applications were made on peaches.

Current Distribution of BMSB in the United States



slide courtesy of
Tracy C. Leskey
USDA-ARS
Appalachian Fruit
Research Station
Kearneysville, WV

Dinotefuran was chosen for its three day pre-harvest interval and the BMSB IPM Working Group requested a Section 18 emergency exemption in pome and stone fruit. In addition, IR-4 was already submitting a data package to the EPA for the use of dinotefuran in peaches, so BMSB could be added to the label fairly quickly. Etofenprox was included in the Section 18 because it has a good track record for insect control elsewhere in the world, and has a separate risk cup from the other pyrethroids, because of its unique chemical structure.

The results are hard to interpret as the BMSB populations were so low later in the season that treatment differences were not always statistically significant. There is some evidence that dinotefuran (Venom) and/or etofenprox (Trebon) significantly controlled BMSB. The addition of PBO as a synergist may improve efficacy of one or both products, but additional research is needed.
IR-4 also provided some funding to help support the inclusion of reduced risk chemistries in an ongoing bioassay and basic BMSB research being conducted by Greg Krawcyzk at Penn State's Fruit Research and Extension Center, Biglerville, PA.

IR-4 will not be providing additional funding for 2011. With one year's positive results, researchers are being encouraged to include the Trebon, Venom and PBO in their future field research.

IR-4 Successes Oct. 2011 to Dec. 2011

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:
Oct 26 2011
Lytic bacteriophage of Clavibacter michiganensis subspecies michiganensis (exemption from tolerance)
Trade Name:
Agriphage-CMM
Crop: Tomato
PR#: 0430B

Federal Register:
Nov 09 2011
Abamectin
Trade Name: Agri-Mek, Epi-Mek
Crop: Bulb onion subgroup 3-07A, Chive, Dry bean
PR#: 07237, 07102, 05001, 06594

Many Thanks Rocky

— by IR-4 Executive Director, Jerry Baron

Rocky Lundy has been a member of the IR-4 Commodity Liaison Committee (CLC) for 19 of its 20 years of existence. Over the past 19 years, Rocky has taken true "ownership" of this CLC, first as an active participant at meetings and for the last 14 years as an extremely productive and influential Chair. Rocky put his heart and soul in keeping IR-4 on the appropriate path to help mint and other specialty crop growers find solutions for their pest management problems. His efforts helped facilitate unprecedented expansion within the IR-4 Project.

Equally important, Rocky often led fierce battles to protect IR-4 from funding cuts and government bureaucratic changes that threatened the Project.

In March, Rocky's tenure as Chair of the IR-4 Commodity Liaison Committee will come to the end. We will miss Rocky's energy and ideas but we are certain that Rocky's commitment to IR-4 will always remain and when the going gets tough, he will be there to lend a hand. Thanks Rocky, for your service to IR-4.

The IR-4 Newsletter Vol 43 No. 1 Winter 2012

The IR-4 Newsletter is published quarterly for distribution to cooperators in our partner State/Federal/Industry research units, State and Federal officials, commodity groups, and private citizens. Material from the IR-4 Newsletter may be reproduced with credit to the publication. Major funding for IR-4 is provided by USDA-NIFA and USDA-ARS in cooperation with the State Agricultural Experiment Stations. New Jersey Agricultural Experiment Station Publication No.P-27200-12-01, supported by state, US Hatch Act, and other USDA funds.

Editor: Sherrilynn Novack
IR-4 Public Relations and Communication Manager, 732.932.9575 x 4632, novack@aesop.rutgers.edu
Newsletter Committee:
Northeast Regional Field Coordinator, **Edith Lurvey**, 315.787.2308.
North Central Regional Director, **Bob Hollingworth,** 517.432.7718.
Western Regional Assistant Field Coordinator, **Stephen Flanagan,** 541.688.3155.
Southern Regional Field Coordinator, **Michelle Samuel-Foo,** 352-392-1978 ext 406
Southern Region Program Assistant/Quality Assurance Support **Robin Adkins** 352.392.1978 x 424.
Commodity Liaison Committee member, **Mike Bledsoe,** 407.936.1190 and **Liz Johnson** 604-940-6012 Ext. 308 of Village Farms.
Alabama State Liaison Representative, **Charles Gilliam,** 334-844-3045
IR-4 HQ, 732.932.9575.
Assistant Director, **Van Starner** x 4621
Ornamental Horticulture Manager, **Cristi Palmer** x 4629
Technical Coordinator/Entomology, **Ken Samoil** x 4614
Assistant Coordinator, Interdisciplinary Working Group **Kathryn Homa** x 4604

Spotlight on Ornamentals

A Growing Need

—by Kathleen Hester

Labor cuts in ornamental production have become a reality with the new economy. Previously, weed seedlings that escaped control from preemergent herbicides were typically hand weeded prior to marketing. With fewer hands to weed containers these menacing seedlings are quick to take the advantage leaving ornamental crops overgrown with weeds which reduce yields and render crops unsalable. The IR-4 Ornamental Horticulture Program responded to this need for early postemergence weed control in greenhouse and field grown ornamental container production by making it a research priority at the 2007 workshop. Since that time fourteen herbicides were tested for efficacy on several of the most troublesome weed seedlings including bittercress, spurge, and yellow wood sorrel. Positive results show a number of treatments that successfully impact escaped weed seedling control in ornamental production. Dr. Charles Gilliam of Auburn University said "No doubt this has been a major success in addressing this shortage. Now growers are able to apply Gallery as a preemergent application and reliably manage emerged bittercress seedlings as well." Data shows that Pendulum and Tower are effective as postemergence treatments on spurge seedlings while Certainty managed a number of emerged species. New generations of chemistry offer potential use such as indaziflam for oxalis control.

Interestingly, Gilliam has observed "a greater tolerance among growers regarding crop injury from herbicides today than in the late 90's." Striking a balance between the levels of injury growers will tolerate on crops and innovative herbicide treatments may be the key to a sustainable weed management program for the future. IR-4 plans continued study on the effect of herbicide crop safety in ornamentals in 2012. For complete protocols and reports please click the Ornamental tab at ir4.rutgers.edu.

The IR-4 Project

IR-4 Headquarters,
Rutgers, The State University of New Jersey
500 College Road East
Suite 201 W
Princeton, NJ 08540

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

Major funding for IR-4 is provided by Special Research Grants and Hatch Act Funds from USDA-NIFA , in cooperation with the State Agricultural Experiment Stations, and USDA-ARS.

Rutgers, The State University of New Jersey • University of California • Cornell University • University of Florida • Michigan State University