Look What's Out There

in

Integrated Pest Management

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New Fungal Finding Could Mean Better Bio-Insecticide

A method of culturing the beneficial fungus *Metarhizium anisopliae* so that it churns out billions of tightly bundled cells, called "microsclerotia," could mean even more moldy mayhem for soft-bodied ticks, termites and crop pests including sugar beet root maggots. Until 2004, *Metarhizium* wasn't known to produce the microsclerotia--among the toughest forms this fungus can take to tolerate adverse conditions. Indeed, only plant-disease fungi were thought to produce these sturdy cells. But now that the "secret" is out, Agricultural Research Service (ARS) scientists aim to exploit the information to develop new, improved bio-insecticide formulations containing the fungus. For more than a decade, bio-insecticide makers have formulated *Metarhizium* using conidia or other spore forms. But mass-producing them has been time-consuming and labor-intensive. Conidia-based formulations have also suffered from poor shelf life and field survival once applied, according to microbiologist Mark Jackson. He works at the ARS National Center for Agricultural Utilization Research in Peoria, Ill. Jackson's studies with ARS entomologist Stefan Jaronksi show that using microsclerotia instead of conidia can cut the costs and time involved in formulating the fungus and can significantly improve its shelf life and pest-fighting performance. For example, in studies led by Jaronski at the ARS Pest Management Research Unit in Sidney, Mont., conidia-only granules of *Metarhizium* germinated seven to 10 days after being applied, versus four days with microsclerotia-based formulations. The scientists were also able to produce the microsclerotia in four days, compared to two weeks for conidia. And during 2007 field trials, sugar beet root maggots inflicted far less feeding damage to microsclerotia-treated beets than to ones treated only with conidia. Another advantage, according to Jaronski, is that the microsclerotia can be formulated into granules and sized more easily than other spore forms. This should make the microsclerotia more compatible with farmers' seed planters and pesticide granulate applicators. The fungus infects and kills only certain insect hosts, and is never harmful to people, pets or livestock. Read more about this research in the September 2008 issue of Agricultural Research magazine.

(*By Jan Suszkiw, Agricultural Research Service September 4, 2008*)

Senate Seeks to Reinstate Pesticide Use Reports After USDA Cut

(*Beyond Pesticides*, October 8, 2008) In May, the U.S. Department of Agriculture (USDA) abruptly halted its program that tracks pesticide usage in fruits, vegetables and field crops, only to have the U.S. Senate in July put the program

back in the 2009 Senate budget bill. USDA cited the $8 million program expense as the reaon for the reports' demise, however the move left scientists, public advocates and even industry groups surprised and concerned about carrying out their work without this information. The Agricultural Chemical Usage Reports, launched in 1990 and administered by the National Agricultural Statistics Service (NASS), issues pesticide usage data on crops, having been initiated in response to public concerns over the contamination of apples by the pesticide Alar.The information was also widely used by universities and food industry researchers to help farmers monitor and reduce the amount of pesticides they use. "We looked at the budget and said, "We can't do everything we have been doing, and what are we going to get rid of?" said Mark Miller of NASS. However, a coalition of public interest groups which included Beyond Pesticides, NRDC, the Center for Food Safety, and the Union of Concerned Scientists argued that the Agricultural Chemical Usage data are the only reliable, publicly available source of data on pesticide and fertilizer use outside of California. Elimination of the program would have severely hampered efforts to make informed policy decisions on pesticide use, and also made it difficult to track progress in meeting policy commitments to reduce the use of hazardous pesticides through adoption of Integrated Pest Management (IPM) practices and to support IPM research. "Elimination of this program will severely hamper the efforts of the USDA, the Environmental Protection Agency (EPA), land grant scientists, and state officials to perform pesticide risk assessments and make informed policy decisions on pesticide use," wrote the coalition of environmental and health groups, in a letter to Agriculture Secretary Ed Schafer. On July 21, in a surprising turn of events, the Senate Appropriations Committee adopted language that reinstates USDA's chemical usage reports in the 2009 budget and directed the department not to disrupt ongoing market analysis reporting and to notify the committee in advance of any termination of other programs. It remains unclear however, whether the Senate and the House of Representatives will agree to keep this language in the bill before it is passed into law. The program has included tests on about 120 different kinds of fruits, vegetables and field crops, such as almonds, olives, spinach, wheat, corn and apples. However, due to annual funding cuts, USDA had been scaling back the program over the last several years, alternating which fruits and vegetables are tested. In 2007, USDA tested only cotton and apples, according to Mr. Miller. The decision to pull the program also came as a shock to researchers at EPA and elsewhere who have come to rely on the data. Termination of these tests would have had implications impacting pesticide regulation. Using this data, EPA regulates pesticide residues in food by setting tolerance levels assigned for certain pesticides, as part of its responsibility mandated under the 1996 *Food Quality Protection Act* (FQPA). Although pesticide residues are deemed "allowable," they still pose potential health risks. Without pesticide data, USDA and EPA would have to buy expensive privately collected data and relying on older information, which can be unreliable. Purchased data packages can cost about $500,000 to $700,000 a year and without reliable data tolerance limits set by the EPA would fall further into disrepute.

USDA Prohibits Cut Flowers from New Zealand to Protect Against the Light Brown Apple Moth

(Washington, Sept. 24, 2008) The U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) suspended the importation of cut flowers and greenery from New Zealand due to recent interceptions of light brown apple moth (LBAM) in shipments at U.S. ports of entry. "Invasive pests like light brown apple moth pose a constant threat to U.S. agriculture and the environment--costing the United States millions to control and eradicate each year," said Bruce Knight, under secretary for USDA's marketing and regulatory programs. "Shutting down this pathway is a significant step towards protecting our natural resources from this devastating pest." Effective Sept. 12, cut flowers and greenery from New Zealand grown outside of certified greenhouses

or screen houses will not be allowed into the United States until an APHIS-approved protocol is in place to ensure the flowers are free of LBAM. This protocol would also require a phytosanitary certificate stating that the flowers were grown in certified greenhouses and inspected and found free of LBAM. "We are working aggressively to stop the introduction and spread of the light brown apple moth in the United States," said Knight. "USDA constantly evaluates potential pathways and takes swift action should invasive pests be detected." LBAM is a native pest of Australia and is now widely distributed throughout New Zealand, the United Kingdom, Ireland and New Caledonia. It targets nearly 2000 kinds of plants and trees, including oak trees, roses and strawberries. LBAM could easily spread throughout the United States if it becomes established here because it has relatively few natural enemies and reproduces quickly. This pest threatens agricultural and nursery production in America, as well as native plant species and the ecosystems they support. The first LBAM detection on the United States mainland occurred in March 2007 in Alameda County, Calif. Since then, it has been identified in 11 additional counties within California. USDA and the California Department of Food and Agriculture are working together to eradicate this pest from California and stop its spread to other parts of the United States.

(*By Melissa O'Dell and Wayne Bagett, USDA-APHIS Newsroom*)

USDA and CDC Sign North American Rabies Management Plan with Canada and Mexico

(Washington, Oct. 3, 2008) The U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) and the U.S. Department of Health and Human Services' Centers for Disease Control and Prevention (CDC) today signed the *North American Rabies Management Plan* with Canada and Mexico. The plan's aim is to strengthen cooperation and communication among the three countries in addressing wildlife rabies management and control. "This plan is a crucial step to controlling rabies not only in the United States, but throughout North America," said Cindy Smith, APHIS administrator. "It solidifies our strong relationships with Canada and Mexico, as well as our federal and state partners, in addressing this potentially deadly virus in wildlife populations through information sharing and strategic planning." The *North American Rabies Management Plan*, which is the culmination of more than three years of work by APHIS' wildlife services program, CDC and the governments of Canada and Mexico, establishes a framework and forum for constructive interaction among the countries to build long-term wildlife rabies management goals. The plan, signed at the 2008 Rabies in the Americas Conference, calls for annual meetings between the three countries to share information about oral rabies vaccine research, wildlife management, population control and surveillance techniques. Collaboration between the three countries already is successful in controlling rabies in wildlife. Representatives from the United States and Canada in the fields of health, agriculture and wildlife management work together each year to provide expert information and guidance to develop complimentary rabies management plans to ensure the virus' containment in wildlife. In recent years, APHIS and Mexican officials also have worked to successfully contain and eliminate canine rabies in coyotes in south Texas. "We've made tremendous strides in our efforts to combat rabies, particularly canine rabies. However, people are at risk from this terrible disease because it is still present in other types of wildlife," said CDC Director Dr. Julie Gerberding. "We must remain vigilant and this unprecedented agreement will enable us to continue to protect people from rabies." Because human cases of rabies in North America are often the result of exposure to wildlife with the virus, each country works to eliminate the virus in its wildlife populations. In the United States, APHIS' wildlife services program staff established the *National Rabies Management Program* in 1997. That program was developed to prevent further spread of rabies in gray fox,

coyotes and raccoons by using oral rabies vaccines in wildlife, as well as increasing public education.

(*By Brienne German and Angela Harless, USDA-APHIS Newsroom*)

Orchards Work Together to Reduce Pesticides

(University Park, PA., September 21, 2008) In Pennsylvania, over 400,000 tons of tree fruit such as apples, peaches, cherries and pears are produced each year, with over 50,000 orchards and vineyards spanning the state. Internal fruit worms such as Oriental fruit moth and codling moth pose a serious economic threat to this valuable industry. According to Jeff Mizer, Penn State extension education in Snyder county, fruit-damaging worms not only reduce marketability of the fruits they infest, but can cause the rejection of entire truckloads of apples at processing plants, which has occurred in Pennsylvania and other states. "In Snyder County, eleven orchards are working together under a Penn State apple worm monitoring project. The project was previously funded by Penn State and the PA Horticulture Association of Pennsylvania, but starting in 2006 the project was funded by the growers themselves," says Miser. The goals of the project are to develop the grower's insect monitoring skills in order to reduce costs of pesticides and to prevent the rejection of loads of Central Pennsylvania fruit by apple processors. Insect monitoring skills and other tactics aimed at reducing pesticide use are a part of an integrated pest management, or IPM program. IPM aims to manage pests -- such as insects, diseases, weeds and animals -- by combining physical, biological and chemical tactics that are safe, profitable and environmentally compatible. "We're educating growers about IPM programs that reduce the use of older, more toxic insecticides and replace them less-toxic versions. We also use pheromones in traps, which disrupt mating in several types of moth pests," Miser explains. Pheromones are chemicals produced by insects to communicate with other individuals of their species. Typically, female insects use pheromones to attract males over long distances. According to Mizer, growers are using trap count information to make decisions for slightly more than 225 acres. "Collectively, they were able to save more than $4,250 on insecticide costs and over $550, approximately $17 per acre in just one growing season. Four growers estimate that the knowledge gleaned enabled them to change pesticide application practices strategically enough to avert financial losses due to apple worm damage. The estimated monetary savings for these four growers alone amounted to over $6,750." Technical and administrative support is provided by Dr. Greg Krawczyk, senior research associate at Penn State Fruit Research and Extension Center in Biglerville, Pa. "The Lycoming County Extension Association pays the wages of project assistant to monitor the traps in the Lycoming County Orchard, while six of the orchards pay their own staff to monitor the traps and record data. The total time required per farm per season is at least 25 hours. We estimate that each farm then invests several hundred dollars just in staff time required for monitoring," Mizer explains. Additionally, cooperators report the weekly monitoring data to Dr. Krawczyk, which is published in the "Fruit Times" monthly newsletter and distributed to the growers in the Central Susquehanna Valley. Through this insect monitoring program, fruit growers have become aware that different orchard blocks have different levels of pest pressure, and, armed with the trap data, they can watch the problem blocks more carefully. The project is also being supported by the Degenstein Foundation, Cadbury Schweppes Americas Beverages, Knouse Foods Cooperative, the Central Pennsylvania Fruit Growers Association, and the Pennsylvania Higher Education Assistance Agency. Growers involved in the project are more than pleased with the results. "Too much information is gleaned from the traps to drop the practice," said one grower, while another stated they feel the project is almost essential to grow quality fruit. For more information about the project, contact Mizer at (570)837 4254 or e-mail jwm5@psu.edu. The Pennsylvania IPM program is a collaboration between the Pennsylvania State

University and the Pennsylvania Department of Agriculture aimed at promoting integrated pest management in both agricultural and urban settings. For more information, contact the program at (814) 865-2839, or Web site http://www.paipm.org. To view our archived news releases, see Web site http://paipm.cas.psu.edu/10.htm.

(*By Kristie Auman-Bauer, Pennsylvania IPM Program*)

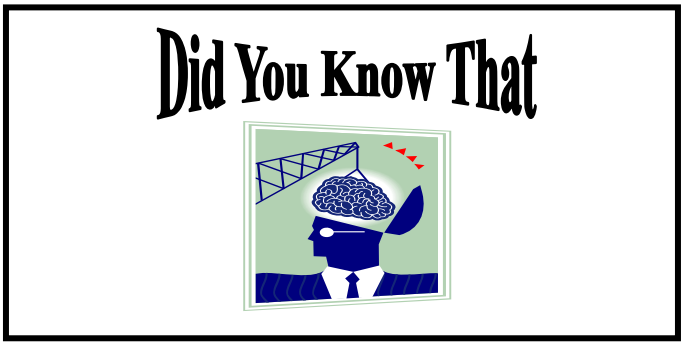
Don't Forget to take Advantage of Online First Detector Training

The National Plant Diagnostic Network (NPDN) is pleased to announce that the Online First Detector Training modules are up and running and can be found at: http://cbc.at.ufl.edu/. The site allows anyone to participate in the First Detector Program. The course is composed of several modules, and includes topics such as:

- The NPDN Mission
- Agricultural Biosecurity
- Purpose of a First Detector
- Monitoring for Exotic Pests
- How to Submit a Suspicious Sample
- The Art and Science of Plant Pest Diagnostics
- And more….

Each module takes anywhere from 40 to 60 minutes and the course can be completed at your own pace. To get started, first register for the First Detector Training Workshops to get your user name and password.

The general goal of the program is to get the public involved in protecting our plant related industries and our natural plant resources from being impacted by exotic and potentially damaging plant pests be they insects, weeds or pathogens. Upon completion of the training, First Detectors receive a certificate of training completion. Trained First Detectors are also provided with the opportunity to receive the national NPDN First Detector newsletter as well as pest alerts via e-mail through the National First Detector registry. For more information, go to http://cbc.at.ufl.edu/ or contact Dr. John Baniecki at: John.Baniecki@mail.wvu.edu.



Diagnoses are not Always Easy

Diagnosis of plant diseases and pathogens is not always quick and easy. Insects may often be quickly recognized with the naked eye low magnification, especially after previous identification. However, the microscopic nature of fungi and bacteria often requires more detailed investigation. Symptoms of many pathogens and other causal agents can be similar and easily confused. Sometimes diagnostic features of microscopic pathogens are present on plant parts, but more often an organism needs to be isolated on a growth medium using sterile technique and diagnostic features searched for after a period of growth. The time and effort taken to positively identify a pathogen is well worth it when considering the impact some pathogens can have when left untreated.

Questions?

If you have any comments or questions regarding any of the material presented, please let us know by sending an e-mail to:

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