

# Look What's Out There

in

## Integrated Pest Management

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<http://www.wvu.edu/~agexten>

### **Wasp May Be Useful Biocontrol of Blueberry Gall Midge**

Tiny wasps discovered by Agricultural Research Service (ARS) scientists in Poplarville, Miss., may help blueberry growers control their crop's top insect pest: the gall midge. As larvae, gall midges feed on the blueberry plant's buds, deforming them; which results in reduced fruit production. But blueberry growers take heart: The pests themselves are fed on—from the inside out. Entomologist Blair Sampson and a research assistant made the discovery while working at the ARS Southern Horticultural Laboratory in Poplarville that the gall midge larva are fed upon by four different species of parasitic wasps. In blueberry fields, a female wasp seeks out midge larvae hiding inside buds and stings them. She then injects her eggs into her prey's stomach and brain. There, the eggs develop into immature wasps that fight for the chance to feast on their midge host resulting in one wasp consuming each gall midge larvae. Sampson has determined that a natural population of the wasps in blueberry fields can kill 40 percent of all midges, controlling them for about 200 days. Sampson is exploring the possibility of rearing the wasps for release into areas where years of insecticide use have diminished the insect's natural populations.

*(By Jan Suszkiw, USDA ARS January 2008)*

### **Molecular Pesticides for Controlling Mosquitoes**

Most pesticides are toxic to insects and humans alike, but a molecular pesticide developed by Agricultural Research Service (ARS) scientists may provide a new way to deal with mosquito pests without causing a risk to human health. The molecular pesticide technology would also overcome the mosquito's ability to develop resistance to particular pesticides. A molecular pesticide has nucleic acid, such as DNA or RNA, as its active ingredient. The technology also has potential to be used against other insect pests. The technology was developed by ARS entomologists Julia W. Pridgeon and James J. Becnel, in the ARS Mosquito and Fly Research Unit, Center for Medical, Agricultural and Veterinary Entomology, Gainesville, Fla. Their technology prevents mosquitoes from producing essential proteins necessary for their survival. Although other approaches to nonchemical pest control are being pursued, this ARS invention has certain advantages. The molecular pesticide concept allows scientists to design each pesticide specifically for the targeted individual pest species. It interrupts genes essential for insect survival, causing the insect to die. This recently discovered technology maximizes safety and minimizes environmental impact on beneficial insects. In addition, molecular pesticides should

be effective against pest species that are resistant to conventional chemical pesticides. Chemical pesticides often have an impact on the physiological systems shared by humans, but this new method only targets specific genes of the pest species. Molecular pesticides can also be easily administered—by contacting the insect externally. This technology would also reduce the time and costs associated with obtaining regulatory approval of new products and would also serve as a model system for developing novel insecticides. Successful development and transfer of molecular pesticides could represent a quantum leap in developing new toxicants for pest control. A patent application for this technology has been submitted and ARS is seeking a cooperative research and development partner to develop appropriate formulations that can be marketed and sold commercially.

*(By Sharon Durham, USDA ARS December 2007)*

### **New and Improved Pesticide Inert Ingredient Web Page**

EPA has reorganized and updated its pesticide inert ingredient listings to make it easier for stakeholders to access and make use of the information. Stakeholders can now easily find listings for inert ingredients permitted in 1) non-food pesticides, 2) minimum risk pesticides exempted under Section 25(b) of the Federal Insecticide, Fungicide, and Rodenticide Act, and 3) pesticide products that qualify for the U.S. Department of Agriculture's National Organic Program. You can find links to the updated inert ingredient listings on the Web site:

<http://www.epa.gov/opprd001/inerts/lists.html>.

On the same page, you will also see instructions for accessing the electronic Code of Federal Regulations for inert ingredients that may be used in pesticide products applied to food commodities.

*(EPA December 2007)*

### **2008 Methyl Bromide Critical Use Exemptions**

In accordance with the Clean Air Act and Montreal Protocol, EPA has issued final methyl bromide production and import critical use exemptions for 2008. EPA also authorized uses that qualify for the 2008 critical use exemption. The exemptions for continued production and import of methyl bromide will honor the U.S. commitment to obtain methyl bromide for American farmers, in a manner consistent with the Montreal Protocol, while protecting the ozone layer. This action is authorizing 4,813,452 kilograms (4,813.5 metric tonnes) of methyl bromide for approved critical uses in 2008, with 3,083,769 kilograms supplied from new production or import. Approved critical uses include strawberry and tomato production, as well as commodity fumigation. In 2008, production or import of methyl bromide in the United States will be almost 88 percent less than 1991 levels. After an October 2006 meeting of the Montreal Protocol parties, which authorized the use of 5,355,946 kilograms, EPA adjusted the authorized amount to account for the increased use of alternatives among methyl bromide users, and unused methyl bromide from previous years, effectively reducing more than 500,000 kilograms of potential methyl bromide releases. Critical use exemptions are permitted under the Montreal Protocol for circumstances where there are no technically and economically feasible alternatives to methyl bromide. Further, the Clean Air Act Amendments of 1990 direct the EPA to issue regulations to implement the provisions of the Montreal Protocol within the United States. Allowance decisions for 2009 were made at 19th Meeting of the Parties to the Montreal Protocol in Montreal, Canada in September. The agency is beginning the notice-and-comment rulemaking process for the 2009 calendar year. For more information on the final rule, go to: <http://www.epa.gov/ozone/mbr/>

*(EPA December 2007)*

### Researchers Reveal How Soybean Parasite Operates

Cyst nematodes are menacing, microscopic roundworms that infect and feed on the root cells of many important agricultural crops. One species of cyst nematode, *Heterodera glycines*, feeds on soybean crops, resulting in up to \$1 billion in crop loss in the United States each year. Recent research, funded by USDA's Cooperative State Research, Education, and Extension Service (CSREES), is uncovering the mechanisms used by this nematode to weaken the plant's defense system. The results from recent work by scientists at the University of Missouri (UM) and Iowa State University (ISU) may lead to more effective management tools to combat the agricultural pest and protect this vital U.S. crop. Nematodes have developed a highly evolved relationship with the host plant. During the juvenile stage, cyst nematodes penetrate the roots of the soybean plant and travel to the vascular tissue. Here the juvenile nematode stops to feed. During the feeding process, the nematode injects secretions that modify the root cells, creating specialized feeding cells, called syncytia, which provide nutrients to the nematode necessary for growth and development, as well as maintain the host-parasite relationship. In essence, the plant cell is reprogrammed by these secretions to support the feeding nematode rather than support and benefit the plant. Without a functioning syncytium, the nematode will die. Lead scientist Melissa Mitchum and colleagues at the UM and ISU examined the molecular mechanisms that lead to the development of the syncytia cells. The scientists examined 35,611 soybean genes and obtained the first comprehensive gene expression profile of the developing syncytium during very early stages of the plant-nematode interaction. Their work shows that within two days after syncytium formation over 1,765 soybean genes changed expression. This team found that genes for proteins involved in plant cell wall formation

are compromised by interplay between plant hormones, called phytohormones. In addition, a decrease in the production of jasmonic acid may suppress the plant defense response, which allows the nematode to survive and thrive. The results from this study provide the most comprehensive picture of gene expression changes within developing syncytia to date. These findings may provide scientists the key to decipher which genes play essential roles in the induction, formation, and function of the syncytium for the survival and growth of cyst nematodes. Future work in this area may lead to new management techniques through the use of biotechnology to better control these important agricultural pests.

(By Stacy Kish, USDA CSREES January 2008)

### Funding Opportunity

- The United States Department of Agriculture Cooperative State Research, Education, and Extension Service is requesting proposals for the Methyl Bromide Transitions (MBT) program. The purpose of the MBT is to support the discovery and implementation of practical pest management alternatives to methyl bromide uses or minimize methyl bromide emissions for which the United States is requesting critical use exemptions. The program is focused on integrated commercial or field scale research that targets short- to medium-term solutions. There is a total of \$2.95 million in available funds with no maximum limit per project. The deadline for submittal is February 22, 2008. For further information go to <http://www.csrees.usda.gov/fo/methylbromideicgp.cfm> or contact William Hoffman at (202) 401 - 1112 or [whoffman@csrees.usda.gov](mailto:whoffman@csrees.usda.gov).
- The Cooperative State Research, Education and Extension Service (CSREES) is now accepting applications for two of its grant programs- Crops at Risk (CAR) and Risk

Avoidance and Mitigation (RAMP.) The CAR program helps create or enhance IPM practices for individual food or fiber crops grown for commercial purposes. The RAMP program helps develop and implement IPM strategies for multi-crop food and fiber production systems, or production systems on an area-wide or landscape scale. The application deadline for both programs is February 29, 2008. For more information on the CAR program, go to:

<http://www.csrees.usda.gov/fo/cropsatriskicgp.cfm>. For more information on the RAMP program, go to:

<http://www.csrees.usda.gov/fo/riskavoidancemitigationicgp.cfm>.

- **2008 John Z. Duling Grant Program: Tree Research and Education Endowment Fund.** The goal of the John Z. Duling Grant Program is to provide seed money or partial support for research and technology transfer projects that advance arboriculture knowledge & address topics that have the potential of benefiting the everyday work of arborists. Projects are expected to be completed within one to three years. For successful applicants, grant award amounts will vary depending on the adjudged value of the project relative to the needs of the arboricultural industry. Awards are limited to \$7,500, and no project will receive more than one award from this program. Please note that funds cannot be used to pay for overhead expenses or student tuition and fees. The TREE Fund priority areas are derived from the Revised National Research and Technology Transfer Agenda for Urban and Community Forestry. Deadline for proposals is March 31, 2008. Proposals in priority areas are more likely to be funded, but all proposals will be considered. Priority areas include:

- **Root and Soil Management:** Many urban tree problems originate below ground. Promoting root development, protecting roots from injury, and conflicts with infrastructure are issues that

arborists encounter regularly. Managing roots includes soil management.

- **Planting and Establishment:** Survival and vigorous growth of trees after planting is of concern to arborists and the entire green industry. Arborists are increasingly dealing with problems that originate in, or could be avoided by, the planting process.
- **Plant Health Care:** Healthy plants have more effective defense systems and are better able to resist pests. Complete understanding of plant health may lead to new pest control strategies.
- **Risk Assessment and Worker Safety:** Safety is a major concern. It can be a life-or-death issue to workers and the public. Detection of defects, and knowing how they develop, are important. Improved equipment and work practices are needed.

See web link for full details:

[http://www.treefund.org/pdfs/JDuling\\_Application2008.pdf](http://www.treefund.org/pdfs/JDuling_Application2008.pdf)

- **2008 The Hyland R. Johns Grant Program: Tree Research and Education Endowment Fund.** The goal of the Tree Research and Education Endowment Fund (TREE) Grant Programs is to provide support for research and technology transfer projects that are in keeping with the TREE Fund's mission and priorities as well as addressing topics that have the potential of benefiting the everyday work of arborists. Hyland R. Johns Grants support multiyear research projects (two to five years in duration). Grants may support expenses over multiple years, but no more than one grant can be awarded to any project. For successful applicants, grant award amounts will vary from the amount requested depending on the adjudged value of the project relative to the needs of the arboricultural industry. Grants range from \$7,500 to \$25,000. Funds cannot be used to pay for overhead expenses, student tuition or

student fees. Deadline for application is May 1, 2008. Research and Technology Transfer proposals in the following priority areas are more likely to be funded, but all proposals will be considered.

- **Root and Soil Management:** Many urban tree problems originate below ground. Promoting root development, protecting roots from injury, and conflicts with infrastructure are issues that arborists encounter regularly. Managing roots includes soil management.
- **Planting and Establishment:** Survival and vigorous growth of trees after planting is of concern to arborists and the entire green industry. Arborists are increasingly dealing with problems that originate in, or could be avoided by, the planting process.
- **Plant Health Care:** Healthy plants have more effective defense systems and are better able to resist pests. Complete understanding of plant health may lead to new pest control strategies.
- **Risk Assessment and Worker Safety:** Safety is a major concern. It can be a life-or-death issue to workers and the public. Detection of defects, and knowing how they develop, are important. Improved equipment and work practices are needed.

Please see web link for complete details:  
[http://www.treefund.org/pdfs/H.JohnsApplication\\_2008.pdf](http://www.treefund.org/pdfs/H.JohnsApplication_2008.pdf)

Dodder is a plant that is a parasite of other plants. It must have a host plant in order to survive. Dodder gets all its nutrition from the plants it parasitizes. The seeds produced by dodder can survive in the ground for up to five years and only germinate if a suitable host is present. The best management of this pest is to prevent it from establishing in an area. Remove all dodder vines before they have a chance to produce seeds. Removing hosts and planting non host plants may also help, but due to dodder's wide host range this may not be feasible. There are also some chemicals used in controlling this plant pest.

## Events



### Feb 7, 8, & 9 2008

Pennsylvania Association for Sustainable Agriculture's **17th Annual Farming for the Future Conference** will be held at the Penn Stater Conference Center Hotel, State College, PA. For more information go to:  
<http://www.pasafarming.org/conference2008/>

### February 10-13 2008

**International Plant Resistance to Insects Workshop**, Fort Collins, CO. For more information contact Frank Peairs by sending an email to [Frank.Peairs@colostate.edu](mailto:Frank.Peairs@colostate.edu) or by phone at 1-970-491-5945.

### February 11-15 2008

**4th Hemlock Woolly Adelgid Symposium** Harford, CT. For more information send an email to [DSouto@fs.fed.us](mailto:DSouto@fs.fed.us) or call 1-603-868-7717.

## Did You Know That



**February 24-27, 2008**

**Pesticide Stewardship Alliance Conference**  
Asheville, North Carolina. For more information go to: <http://tpsalliance.org/conference/Introduction.htm>

**February 24-29, 2008**

**North American Weed Management Association Conference**, Washington D.C. For more information go to: <http://www.nawma.org/>

**February 26-27, 2008**

**Northeast Plant Diagnostic Network Annual Meeting**, Chadds Ford, PA.

**7th Annual NOFA Course in Organic Land Care**, A five-day professional course offered in:

**February 27, 28, 29, March 3, 4, 2008**

Narragansett, RI

For more information go to:  
<http://www.organiclandcare.net/events/7thannualOLCcourse.php>

**March 14-16, 2008**

**The 26th National Pesticide Forum**, Reclaiming Our Healthy Future: Political change to protect the next generation, University of California, Berkeley. For more information go to: <http://www.beyondpesticides.org/forum/>.

**March 25-27, 2008**

**Sustainable Agriculture Research and Education (SARE) 20th Anniversary Conference: The New American Farm: Advancing the frontier of sustainable agriculture**, Kansas City, Missouri. For more information go to:  
<http://www.sare.org/2008conference/>

**March 25th – 27th, 2008**

**43rd Annual West Virginia Vegetation Management Association Meeting**. Stonewall Resort, Stonewall Jackson Lake State Park, Roanoke, WV. For more information please contact Jerry Lewis by calling (717) 285-7162 or by E-mail at [jerry.lewis@uap.com](mailto:jerry.lewis@uap.com).

**May 27-30, 2008**

**The 2008 Weeds Across Borders** conference will be held in Banff, Alberta, Canada. For more information go to:

<http://www.nawma.org/documents/2008%20WAB/WAB%20announcement-english.pdf>

**Comments or Questions?**

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

[John.Baniecki@mail.wvu.edu](mailto:John.Baniecki@mail.wvu.edu).

Thank you.