

Look What's Out There

in

Integrated Pest Management

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Scientists Aim to Spike Pest's Biochemical Punch Bowl

Tiny, wormlike organisms called nematodes can be friend or foe to farmers. One such foe, the soybean cyst nematode *Heterodera glycines*, costs soybean farmers \$1 billion annually in crop losses and chemical controls. But now, the crop pests could become their own worst enemies, thanks to biochemical sabotage. Agricultural Research Service (ARS) physiologist Edward Masler is developing this strategy at the agency's Nematology Laboratory in Beltsville, Md. He's investigating molecules produced by the nematodes that could be used to subvert their feeding, mating or other behaviors. Masler's research with biogenic amines and other biochemicals is part of a long-term effort to devise environmentally friendly alternatives to conventional pesticides, particularly the fumigant methyl bromide, which is restricted for all but critical uses because of its toxicity. Masler also is targeting the root-knot nematode *Meloidogyne incognita*, which infests peanut, potato, cotton and other crops. The knot-like feeding site each nematode forms on host-crop roots restricts the plant's access to nutrients, causing stunted growth, diminished yields and other harm. Since the mid-1990s, Masler has scrutinized the biochemistry of these and other nematode crop pests for clues to disrupting such destructive behavior. Biogenic amines, a recent focus, occur in other living organisms. So, Masler must ensure their biological activity is restricted solely

to *Heterodera* and *Meloidogyne* nematodes. In laboratory experiments, he exposed juvenile nematodes and unhatched eggs to an "overdose" of one of three amines--dopamine, octopamine and serotonin--and monitored the effects. Interestingly, 90 percent of *Heterodera* eggs failed to hatch after exposure to serotonin, versus 40 percent for *Meloidogyne*. In juveniles of both species, serotonin exposure decreased head-swinging--a foraging behavior--while dopamine increased it. Ultimately, such observations could predict the amines' usefulness as natural agents for controlling the pests under field conditions. Proteolytic enzymes offer another potential target. Normally, they act as cellular brakes that stop the signaling of neuropeptides called FLPs. Masler is exploring whether removing those "enzymatic brake pads" could cause FLPs to build to levels that will incapacitate the nematodes, offering yet another alternative to chemically controlling them. ARS is a scientific research agency of the U.S. Department of Agriculture.

(By Jan Suszkiw, Agricultural Research Service
January 7, 2009)

USDA Seeks Public Comment on Deregulation of Genetically Engineered Corn

(Washington, December 11, 2008) The U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) seeks public comment on a petition to deregulate corn

genetically engineered (GE) for tolerance to glyphosate herbicides and acetolactate synthase-inhibiting herbicides. APHIS has regulated the corn, designated as line 98140, through its biotechnology notification and permitting process since 2005. The petition for deregulation, submitted by Pioneer Hi-Bred International, Inc., is in accordance with APHIS' regulations concerning the introduction of GE organisms and products and is available for the public's review and comment. As part of the decision-making process, APHIS also has prepared a draft environmental assessment (EA) for review and comment. Following the comment period, APHIS will make a determination of nonregulated status if it can conclude that the organism does not pose a plant pest risk. If APHIS grants the Pioneer Hi-Bred International, Inc., petition for deregulation, the corn and its progeny would no longer be regulated articles. The product could then be freely moved and planted without the requirement of permits or other regulatory oversight by APHIS. The scientific evidence indicates that there are unlikely to be any environmental, human health or food safety concerns associated with the GE corn. APHIS is responsible for protecting U.S. agriculture and the environment from animal and plant pests and has overseen the deregulation of more than 70 GE products. APHIS regulates GE products in cooperation with the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Health and Human Services' Food and Drug Administration (FDA). In addition to APHIS review, Pioneer Hi-Bred International, Inc. has submitted the appropriate documents to both EPA and FDA to address the requirements specific to each agency. EPA requires that all pesticides, including herbicides, be registered prior to distribution or sale, unless exempt from EPA regulation. Residue tolerances for pesticides also are established by EPA and FDA enforces those tolerances. FDA provides a consultation process to ensure that any human and animal feed safety issues are resolved prior to commercial distribution of a GE food. This notice was published in the Dec. 8, 2008, *Federal Register*. APHIS is seeking comment on the petition and on the environmental

assessment. Consideration will be given to comments received on or before Feb. 6, 2009.

Send two copies of postal mail or commercial delivery comments to Docket No. APHIS-2008-0094, Regulatory Analysis and Development, PPD, APHIS, Station 3A-03.8, 4700 River Road, Unit 118, Riverdale, MD 20737-1238.

Comments can be submitted on the Federal eRulemaking portal at <http://www.regulations.gov/fdmspublic/component/main?main=DocketDetail&d=APHIS-2008-0094>. Click on "Add Comments" to view public comments and related materials available electronically. Comments are posted on the Regulations.gov Web site and also can be reviewed at USDA, Room 1141, South Building, 14th St. and Independence Ave., S.W., Washington, D.C., between 8 a.m. and 4:30 p.m., Monday through Friday, excluding holidays. To facilitate entry into the comment reading room, please call (202) 690-2817.

(APHIS December 2008)

USDA Adopts Final Rule Restricting Ash Plant Imports to Protect Against the Emerald Ash Borer

The U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) is adopting as a final rule, without change, an interim rule that amended the regulations governing the importation of nursery stock to prohibit or restrict the importation of ash (*Fraxinus* spp.) plants for planting, except seed, from all foreign countries except for certain areas in Canada that are not regulated areas for emerald ash borer. The interim rule was necessary to prevent further introductions of emerald ash borer into the United States and to prevent the artificial spread of this destructive plant pest. This final rule was effective Sept. 23 and is scheduled to be published in the Dec. 18 *Federal Register*.

(APHIS December 2008)

Experimental Soybeans Sabotage Roundworm Pest with Its Own Gene

Using biotechnology, Agricultural Research Service (ARS) scientists have fortified the defenses of soybean plants against tiny but destructive pests called soybean cyst nematodes (SCN). The wormlike pests live in the soil, where they can wriggle into soybean roots to feed, mate and lay eggs. The damage they cause to root cells obstructs the flow of nutrients and water to the rest of the plant, weakening it. Such attacks cost U.S. soybean farmers up to \$1 billion in losses annually. Although SCN-resistant soy varieties are available, the nematodes can eventually overcome the resistance by evolving into virulent new races. Fumigating soils before planting can diminish the pest's numbers, but such chemical control is costly. As an alternative, ARS plant physiologist Ben Matthews and colleagues in Beltsville, Md., are exploring the use of genetic engineering to bolster SCN resistance in soybeans using novel or existing genes. Earlier this year, for example, Matthews' team completed greenhouse trials of soybean plants whose roots had been engineered with a DNA copy of one of the nematode's own protein-making genes. When nematodes ingest the DNA copy, the DNA "deactivates" the expression of the pest's corresponding gene, so it stops making the protein. In greenhouse trials at the ARS Soybean Genomics and Improvement Laboratory in Beltsville, 80 to 90 percent of juvenile female nematodes that fed on the engineered soybean roots died or failed to mature by 30 days. Matthews' team, together with a Towson University bioinformatics expert, used comparative genomics and genome sequence information from another nematode species, *Caenorhabditis elegans*, to identify the SCN protein gene they targeted. According to Matthews, a second round of greenhouse studies is planned to confirm the initial results. Similar studies with other resistance-conferring genes are under way. Commercial soybeans derived from the team's research are at least eight years away. That's contingent upon successful field tests, further refinement, regulatory approval,

propagation and other requirements, notes Matthews.

*(By Jan Suszkiw, Agricultural Research Service
December 18, 2008)*

Plum Pox Eradication Program on the Road to Success

If eradication efforts continue as planned, Michigan and Pennsylvania should be declared plum pox free at the end of 2009. Both States are well on their way to eradication of the viral disease, which significantly affects the production of stone fruit including peaches, apricots, plums, nectarines, almonds and cherries. Scientific protocols require three consecutive years of negative survey for a regulated area to be eligible for deregulation. Both Michigan and Pennsylvania have two years free and only one more to go before they are considered completely free of the virus. We're looking forward to another negative year in both States," said Don Albright, the National Plum Pox Virus Operations Director. Pennsylvania has been dealing with plum pox since 1999, but the disease was only detected in Michigan in 2006. While the infestation in Pennsylvania was significant, only a single infected tree was ever identified in Michigan. To eradicate the disease, APHIS' Plant Protection and Quarantine program removed all infected trees and established a 500-meter buffer zone around the infected areas. During fiscal year (FY) 2008, survey crews collected and processed more than 230,000 samples in Pennsylvania with no positive results. Only 49-square miles in Pennsylvania remain regulated. This is down from a peak of 350-square miles in 2003. "Pennsylvania is the big star on the wall right now because we had a high number of trees infected and we knocked it down to nothing," Albright said. The only other State in the nation with plum pox is New York. Eradication efforts are underway there as well, and more than 110,000 samples were processed during FY 2008. The number of confirmed positive plants is down 50 percent from FY 2007, but the new finds are located 60 miles east of the closest

known infected areas. This indicates that the infestation in New York may be larger than delimiting surveys have previously indicated. The infected area in New York starts at the Canadian border where Canada has a serious outbreak of plum pox. APHIS is continuing to work with producers in New York and Canadian officials to harmonize eradication efforts. Eradication is still the goal in New York, but due to the possibility of re-infection from Canada, the buffer zone around infected trees is only 50 meters. While this is good for producers, it may take longer to eradicate the disease. For more information on plum pox, visit: http://www.aphis.usda.gov/plant_health/plant_pest_info/plum_pox/index.shtml

(APHIS January 2009)

Court Reverses Bush EPA Exemption of Pesticides Under Clean Water Act

(*Beyond Pesticides*, January 13, 2009) In another stinging defeat for the Bush Environmental Protection Agency (EPA), on January 7, 2009, the 6th Circuit Court of Appeals issued a clear rebuke of the administration's 2006 rule which exempted certain commercial pesticide applications from the oversight provided by Congress under the *Clean Water Act*. [The National Cotton Council et al. v. EPA (Nos. 06-4630; 07-3180/3181/3182/3183/3184/3185/3186/3187/3191/3236). See also *Headwaters, Inc. v. Talent Irrigation Dist.*, 243 F.3d 526, 532-33 (9th Cir. 2001).] The Court held that pesticide residuals and biological pesticides constitute pollutants under federal law and therefore must be regulated under the *Clean Water Act* (CWA) in order to minimize the impact to human health and the environment. According to *Beyond Pesticides*, the EPA rule had allowed the weaker and more generalized standards under the *Federal Insecticide, Fungicide and Rodenticide Act* (FIFRA) to trump the more stringent CWA standards. CWA uses a kind of health-based standard known as maximum contamination levels to protect waterways and requires permits when chemicals are directly deposited into rivers,

lakes and streams, while FIFRA uses a highly subjective risk assessment with no attention to the safest alternative. Read *Beyond Pesticides'* press release on EPA's 2006 decision. Several manufacturers and industry associations had joined the case to try to broaden the EPA's 2006 exemption. The Court told them in no uncertain terms that their products are harmful to human health and the environment, and therefore EPA must regulate aquatic pesticide applications under the *Clean Water Act*. "The decision today is a victory for clean water, and for fish and wildlife" declared Charlie Tebbutt, Western Environmental Law Center attorney and lead counsel for the environmental organizations and organic farms that challenged the rule. "Furthermore, this decision is another in a long line of rebukes to the Bush administration policies that overstepped their statutory authority and to the chemical manufacturers who peddle their poisons without concern to the effect on human health and the environment. We look forward to working with the new EPA to protect the environment rather than the chemical industry." With this decision, virtually all commercial pesticide application to, over and around waterways will now require National Pollutant Discharge Elimination System (NPDES) permits. The NPDES permits will allow for local citizen input, and provide for accountability and oversight. The permits will also require the regulatory agencies to evaluate effects on fish and wildlife from individual applications, to monitor exactly how much of a pesticide application goes into in our nation's waters, and to evaluate the cumulative impact this residual effect has on aquatic organisms. "Time and again during these past eight years EPA has walked into federal courts and tried to defend absolutely indefensible rules like the one vacated today," said Waterkeeper Alliance Legal Director Scott Edwards. "And time and again they've been sent back to the drawing board to rewrite these unlawful rules. Hopefully, EPA's days of pandering to industry and other polluters and wasting taxpayers dollars in illegal rulemaking are drawing to a welcome close." The organizations bringing the case include Baykeeper, National Center for Conservation

Science and Policy, Oregon Wild, Saint John's Organic Farm, Californians for Alternatives to Toxics, California Sportfishing Protection Alliance, Waterkeeper Alliance, Environment Maine, Toxics Action Center, Peconic Baykeeper and Soundkeeper. The organizations are represented by the Western Environmental Law Center, the National Environmental Law Center, the Pace Environmental Litigation Clinic, the Columbia Environmental Law Clinic and Waterkeeper Alliance. "This is a significant victory for our nation's waters. More than 8 million pounds of pesticides are applied each year in the Bay Area alone," said Sejal Choksi, Program Director for San Francisco Baykeeper. "These toxic chemicals enter our creeks harming numerous species of fish, frog and other aquatic life and will now be regulated under the Clean Water Act."

Rodale Reports Organic Farming May Ensure World Food Security

(*Beyond Pesticides*, January 7, 2009) To best feed the world, a growing number of researchers, development experts, farming groups and environmentalists are calling for new emphasis on sustainable agricultural practices that make a sharp break from current policies. A recently released Rodale Institute research paper, titled "The Organic Green Revolution" and reviewing replicated research, shows that the latest scientific approaches in organic agriculture offer affordable, immediately usable, and universally accessible ways to improve yields and access to nutritional food in developing countries. A recent report cited in the paper from the UN Environmental Programme (UNEP) notes that not only can organic agriculture feed the world but it may be the only way we can solve the growing problem of hunger in developing countries. UNEP states that its extensive study "challenges the popular myth that organic agriculture cannot increase agricultural productivity." In an analysis of 114 farming projects in 24 African countries, UNEP reports that organic or near-organic practices result in a yield increase of more than 100 percent. An Organic Green Revolution, using integrated

farming practices such as cover crops, organic no-till and composting, not only substantially improves yields but it also protects and restores soil and environmental health. "Yield data just by itself makes the case for a focused and persistent move to organic farming systems," explains Tim LaSalle, Ph.D., co-author of the report and CEO of the Rodale Institute, a 60-year-old research and education nonprofit. "When we also consider that organic systems are building the health of the soil, sequestering CO₂, cleaning up the waterways, and returning more economic yield to the farmer, the argument for an Organic Green Revolution becomes overwhelming. Since these methods build the soil they also increase drought and flood resistance as well as adaptability to climate change," Dr. LaSalle added. The term "Green Revolution" took hold in the 1960s to describe the combination of fertilizer, hybrid varieties and pesticides applied to single-crop fields to achieve maximum yield. Yet "the so-called Green Revolution was anything but green," says Dr. LaSalle. "Initial production benefits have declined and societal costs increased. A paradigm shift, rather than incremental change, is therefore needed in the way we grow, buy and eat our food. The Organic Green Revolution provides that needed shift." A number of independent research studies shows that the commodity-oriented Green Revolution has not, and cannot, feed the world sustainably, the paper reports. Some 923 million people are seriously undernourished, 25,000 people die each day from starvation. The Rodale Institute paper cites a major 2006 study which assessed results from 286 farms in 57 countries, finding that small farmers increased their crop yields by an average of 79 percent by using environmentally sustainable techniques, including organic farming and crop rotation. Organically managed soils have more physical soil structure, preventing erosion; more permeability, for healthier microorganism growth; and more availability of nutrients, which are vital for crop productivity. Furthermore, these soils sequester carbon in soil from carbon dioxide in the atmosphere, making organic farming the most available strategy to fight global warming. The

data and analyses compiled in the “Organic Green Revolution” report make a compelling case that organic agricultural practices are established, commercially successful and applicable at any scale of operation as shown by farmers across the United States - from family market farms to commercial operations of thousands of acres. Regenerative organic techniques can adapt to virtually any location, make best use of local inputs, and creatively transform carbon-based waste streams into valuable products. Updating government agricultural policy that currently perpetuates unsustainable practices to a strategy appropriate to these times by providing incentives for ecological restoration could include paying farmers and other land managers for the soil carbon they store rather than the volume of commodities that they produce. For more information on organic agriculture and food, visit the Organic program page at <http://www.beyondpesticides.org/organicfood/index.htm>

Funding Opportunity

- Program announcement: Agriculture and Food Research Initiative Competitive Grants This is a Program Announcement (PA) for the Agriculture and Food Research Initiative (AFRI). AFRI combines elements of the former National Research Initiative (NRI) and Initiative for Future Agriculture and Food Systems (IFAFS) programs and is the new core competitive grant program for research, education, and extension. It is anticipated that the complete Request for Applications, which will contain the application submission instructions and be accompanied by required application forms, will be made available in early 2009 on the CSREES Web site and the Grants.gov Web site. This AFRI PA contains opportunities for support of research, education, and extension priorities. This PA is being released prior to the passage of the Fiscal Year (FY) 2009 Agricultural Appropriations

Act. The release of this PA is to inform the applicant community of upcoming research, education, and extension opportunities through the AFRI program to fund issues critical to agriculture. The enactment of the FY 2009 Appropriations Act may impact the overall level of funding for the AFRI program. Hence, the Cooperative State Research, Education, and Extension Service (CSREES) reserves the right to amend, delete, or otherwise alter any programs. Depending on the FY 2009 Appropriations Act, CSREES may be issuing a supplemental RFA to address topics already identified in this PA. Updated information about the AFRI program will be made available on the CSREES Web site: <http://www.csrees.usda.gov/funding/afri/afri.html>. The full document is available at http://www.csrees.usda.gov/funding/afri/pdfs/program_announcement.pdf

- The Pest Management Foundation is pleased to announce the availability of \$35,000 for pest management industry related research. Funds may be used to fund a single or multiple projects; however, the Foundation reserves the right to decline to fund any of the proposed submissions. Research ideas may include, but are not limited to:
 - Effective pesticide runoff mitigation measures for exterior perimeter treatments
 - Effective management of small flies in commercial accounts
 - Early season migration habits/patterns of the paper wasp (*Polistes* sp)
 - Impact of outside/perimeter cobweb control in managing spiders in structural settings
 - Discovering new and emerging pest inspection methods
 - Highlighting the role pest management plays in protecting and enhancing children’s health;
 - Determining why or if termite swarming has decreased in recent years;
 - Determining the impact of insect and rodent pests on the elderly;
 - The pathogenic transfer via stored

product pests;

- Determining how many termites make up an infestation and if an infestation may be comprised of multiple colonies;
- Termite infestation as related to moisture level in hardwoods and softwoods;
- Establishing that certain pests have reemerged due to demise of pesticides resulting from the implementation of the Food Quality Protection Act;
- Humaneness of euthanasia methods for nuisance wildlife; and 2
- Identifying methyl bromide alternatives.

While the ideas listed above may certainly be worthy projects, it should be stressed that the purpose of this document is not to prescribe specific research projects as much as encourage the submission of potentially worthwhile, stimulating, and valuable proposals. Therefore, potential applicants are strongly encouraged to present projects that are not listed above in their submissions. As noted above, countless changes are occurring within the industry and the Foundation is eager to review as many proposals that may potentially benefit the industry as possible. Deadline: February 20, 2009; for more information visit: http://northeastipm.org/ipm_funding_popover.cfm?id=1329

- National Urban and Community Forestry Advisory Council Challenge Cost-Share Grant Program. This year the National Urban and Community Forestry Advisory Council has revised its grant categories and process to the Forest Service's National Urban and Community Forestry Challenge Cost Share Grant Program. We anticipate \$ 1 million in funding. The funds will be divided into two main categories: Innovation Grants are to focus on one of the Council's identified priority areas. One or more grants may be awarded from the \$500,000 available in this category. Best Practices Grants are smaller grants intended to improve existing or develop new best practices related to urban forestry. A maximum of \$50,000 per application can be

awarded from the \$500,000 available in this category. Deadline: February 17, 2009; for more information visit: <http://www.fs.fed.us/ucf/nucfac>

- Pest Management Association: Pest Management Foundation
Focus: management of structural pests and pests in urban and suburban environments
Deadline: February 20, 2009
Duration: 18 months
Amounts: \$35,000
While the solicitation lists specific project ideas, the Foundation is interested in any proposal that pertains to the management of pests in structures and urban and suburban environments. The Foundation recently funded research published by Cornell University, University of Kentucky, and Spokane Falls Community College researchers on the effectiveness of yellow jacket trapping, the efficacy of residential mosquito control, and various methods of controlling the black widow and hobo spiders. The Foundation also supported the World Health Organization's recently published research on the public health significance on public health pests, and is funding ongoing research on the efficacy of canines as bedbug detectors, the significance of an emerging invasive ant species in the Southeastern U.S., and the odorous house ant. For more information visit: <http://www.npmapestworld.org/PMFoundation/>

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

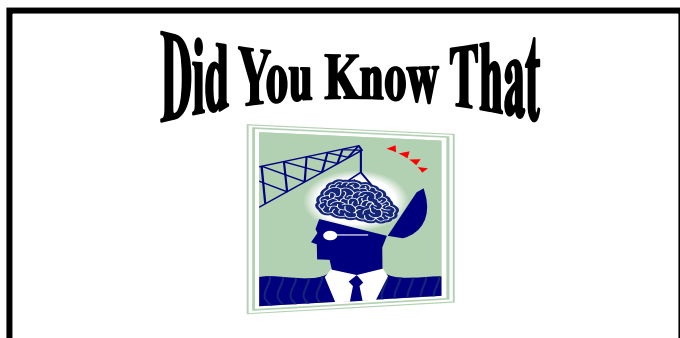
The National Plant Diagnostic Network (NPDN) is pleased to announce that the Online First Detector Training modules are up and running and can be found at: <http://cbc.at.ufl.edu/>. The site allows anyone to participate in the First Detector Program. The course is composed of several modules, and includes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



Decay is the Forest's Greatest Enemy

The greatest threat to wood production in forests and tree farms is an often unseen enemy. Decay fungi account for ~ 40-45% of timber volume losses. This exceeds losses to insects, nematodes, vascular and foliar fungi, or fire and other environmental catastrophe. However, decay fungi are more often than not invisible to the observer as they grow within trees. Symptoms are not always evident and by the time a fruiting body is seen colonization of the host and resulting damage is likely extensive. When decay fungi are present in a stand avoiding wounding to reduce available

infection courts and maintaining tree vigor to maximize host defenses are highly recommended.



Mid-Atlantic Fruit and Vegetable Convention, Feb 3-5

Hershey Lodge and Convention Center, Hershey, PA

For information on exhibiting at the Convention: Maureen Irvin, Convention Coordinator at 717-677-4184 or shap@embarqmail.com

Weed Science Society of America Annual Meeting, Feb 9-12, 2009

Orlando, FL

For information:

<http://www.wssa.net/Meetings/WSSAAnnual/Info.htm>

Tree Farm Area Meetings 2009

Locations:

Feb. 17: Ramada Inn, Morgantown, WV

Feb. 18: WV Forestry Association, Ripley, WV

Feb. 19: New River Community College, Summersville, WV

For information:

Sherry Barnett: 304-372-1955, or send an e-mail to wvtreefarm@wvadventures.net

9th Annual Pesticide Stewardship Conference February 22-24, 2009

Albuquerque, NM

For information:

info@tpsalliance.org

**Mid-Atlantic Specialty Crop Planning
Workshop, March 3-4**

Harrisburg, PA.

For information:

Dana Ollendyke, call (814) 863-5567 or e-mail
djm428@psu.edu.

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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