

Look What's Out There in Integrated Pest Management

John F. Baniecki, Ph.D., Coordinator, Pesticide Safety Education Program
David P. McCann, Graduate Assistant, West Virginia University
Rakesh S. Chandran, Ph.D. Coordinator, Integrated Pest Management Program
West Virginia University Extension Service.

Issue 6 June-July 2008
<http://www.wvu.edu/~agexten>

New Study Investigates Symptoms of Pesticide Poisoning

(*Beyond Pesticides*, July 16, 2008) People exposed to pesticides are more likely to suffer changes in nerve responses and severe weakness in their neck and limb muscles in the days before they succumb to their symptoms. This is according to a new study, which found that the major cause of death was as a result of respiratory failure following acute organophosphate poisoning. The study entitled, "The Spectrum of Intermediate Syndrome Following Acute Organophosphate Poisoning: A Prospective Cohort Study from Sri Lanka" published in the open-access journal *Public Library of Science (PLOS) Medicine* was a collaboration between researchers from Sri Lanka, Australia, and the UK. These researchers examined and assessed 78 consenting symptomatic patients with organophosphate poisoning and found that 10 suffered severe weakness in their neck and limb muscles and five of these eventually developed respiratory failure. Respiratory failure is the major cause of death after poisoning by organophosphates. Lead author Pradeepa Jayawardane, clinical pharmacology lecturer at the University of Sri Jayawardenepura in Sri Lanka, and colleagues realized that there are changes in nerve transmission that are presented before individuals with organophosphate poisoning develop muscle weakness, also known as intermediate syndrome (IMS). IMS results in muscle weakness in the

limbs, neck, and throat, and develops in some patients 24–96 hours after poisoning. Long-term nerve damage sometimes develops 2–3 weeks after poisoning. The functional changes that are associated with IMS (its pathophysiology) are poorly understood however. Electric shocks were applied to certain muscles of the patients, using a technique called repetitive nerve stimulation (RNS). This technique allows researchers to trace changes in nerve transmissions during the course of poisoning. About 12.8% of patients (10 of 78) were diagnosed with IMS and the researchers saw specific changes in their neuromuscular transmission patterns - often before a physician could make in IMS diagnosis from clinical signs. "In all 10 patients we demonstrated that the neuromuscular junction progressively fails, leading to muscle weakness," said Pradeepa Jayawardane. About 38% of patients (30 of 78) presented muscle weakness that was not severe enough for an IMS diagnosis. In these patients, the researchers also found defined changes in their neuromuscular transmission patterns. The findings reveal that IMS is a "spectrum" disorder in which the weakness and neuromuscular problems, caused by organophosphate poisoning, gradually progress over time through a series of electrophysiological changes that can sometimes resolve quickly and, only in the most severe cases, result in respiratory failure. Changes in nerve transmission that evolve during the development of IMS can be objectively monitored using RNS. Since the clinical signs of

IMS come after changes in nerve transmission, the researchers suggest using these changes as an indicator of future outcome. RNS tests might also be useful in the clinical management of patients with organophosphate poisoning, particularly since such tests could provide an early warning of impending respiratory failure. However, the researchers note that these findings need to be validated in further studies, particularly since most of the patients in this study had been exposed to a single organophosphate (chlorpyrifos). This would improve diagnostic and prognostic tools for clinical use in organophosphate-poisoned patients. Organophosphates, derived from World War II nerve agents, are a common class of chemicals used in pesticides and are considered to be the most likely pesticides to cause an acute poisoning. Many are already banned in England, Sweden and Denmark. Organophosphates are cholinesterase inhibitors and bind irreversibly to the active site of an enzyme essential for normal nerve impulse transmission- acetylcholine esterase (AChE), inactivating the enzyme. Symptoms include tingling sensations, headaches, tremors, nausea, abdominal cramps, fever, severe forgetfulness, convulsions and movement disorders. Repeated or prolonged exposure to organophosphates may result in the same effects as acute exposure, including delayed symptoms. Most pesticide poisonings in developing countries result from deliberate ingestion of pesticides. About half the people in developing countries in Asia who kill themselves do it using pesticides, and aid agencies have been lobbying to ban their use.

(Source: *Medical News Today*)

Beneficial Bacteria Help Control Produce Pathogen

A new food safety treatment developed by the Agricultural Research Service (ARS) could increase the effectiveness of conventional produce sanitization methods. ARS microbiologist Ching-Hsing Liao developed and tested the method, which pits beneficial bacteria against potentially harmful ones. The beneficial

bacteria inhibit the growth of pathogens that survive initial physical or chemical attempts to remove them from fresh produce. Produce pathogens are a prominent source of food-borne illness in the United States. At the ARS Eastern Regional Research Center (ERRC) in Wyndmoor, Pa., Liao identified three beneficial bacterial antagonists for use in food safety intervention. He dipped bell peppers in solutions of water containing the beneficial antagonists and examined the effect on surface pathogens such as *Salmonella* and *E. coli* O157:H7. One bacterium, known as *Pseudomonas fluorescens* 2-79, was particularly effective. Dipping peppers in a Pf 2-79 solution for about two minutes halted pathogen multiplication almost entirely. On untreated peppers, pathogen populations multiplied about 100,000 times when stored at 68 degrees Fahrenheit for two days. But treating peppers with Pf 2-79 suppressed pathogen growth. This treatment could potentially prevent pathogens from proliferating to numbers capable of causing human illness. The dip also stopped the growth of two common spoilage bacteria and reduced the development of soft rot. Pf 2-79 is easy to grow and can colonize several types of produce. Because it can grow at refrigeration temperatures, it could be an effective control agent for cold-tolerant pathogens such as *Listeria monocytogenes* and *Yersinia enterocolitica*. Liao and his colleagues plan to validate the research on a larger scale. Their research will also aim to identify additional bacterial strains that could be used with Pf 2-79 to further improve produce safety and quality. Consumers can help remove pathogens from produce at home by taking simple food safety precautions, such as peeling, washing or cooking the produce.

(By *Laura McGinnis, Agricultural Research Service June 2008*)

USDA Proposes to Implement Risk-Based Process for Certain Fruits and Vegetables from Hawaii and U.S. Territories

(*Washington, June 16 2008*) The U.S. Department of Agriculture's Animal and Plant

Health Inspection Service (APHIS) today announced a proposal to establish a risk-based process for approving the interstate movement of certain fruits and vegetables from Hawaii and the territories in the United States. APHIS also proposes to acknowledge pest-free areas in Hawaii and the territories using a notice-based process. The proposed process for approving certain fruits and vegetables only would apply to those commodities that can be moved safely by interstate, subject to one or more of six designated phytosanitary measures. These measures would include inspection in the first state of arrival; approved treatment; origination from a pest-free area; inspection and certification in the state or territory of origin showing that the commodity is pest-free; limiting the distribution of the commodity to certain states; or, determining that the risk associated with the commodity can be mitigated through commercial practices. The interstate movement of fruits and vegetables that require additional phytosanitary measures would continue to undergo the full rulemaking process. The proposed changes would not alter which fruits and vegetables are currently eligible for interstate movement or how the risks associated with those commodities would be evaluated or mitigated. The proposed changes would only make more timely the approval of fruits and vegetables that are safe for interstate movement in the United States. APHIS also is proposing to make other changes, which include:

- Establishing a “notice-based” process for acknowledging changes in the status of pest-free areas;
- Reorganizing the regulations to consolidate and eliminate redundant requirements; and
- Making various non-substantive changes to the regulations to make them easier to use.

If approved, these changes would make APHIS’ domestic interstate movement regulations more consistent with its fruit and vegetable import regulations, also known as Quarantine 56. This action is scheduled for publication in the June 17 *Federal Register*. Consideration will be given to comments received on or before Aug.

18. Send an original and two copies of postal mail or commercial delivery comments to Docket No. APHIS-2007-0052, 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-2007-0052>. 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.

Note to Reporters: USDA news releases, program announcements and media advisories are available on the Internet. Go to the APHIS news release page at <http://www.aphis.usda.gov/newsroom>. Also, anyone with an e-mail address can sign up to receive APHIS press releases automatically. Send an e-mail message to lyris@mdrdlyriss10.aphis.usda.gov and leave the subject blank. In the message, type `subscribe press_releases`.

(Melissa O’Dell and Angela Harless, USDA-APHIS June 2008)

Soil Fumigant Pesticides Subject to New Safety Measures

(Washington, D.C. - July 10, 2008) New safety measures for soil fumigant pesticides will increase protections for agricultural workers and bystanders - people who live, work, or otherwise spend time near fields that are fumigated. For the soil fumigants methyl bromide, chloropicrin, dazomet, metam sodium, and metam potassium, EPA will require a suite of new mitigation measures that will work together to protect human health. "The new restrictions protect

workers and bystanders against inadvertent exposure to soil fumigants and are practical to implement," said Jim Gulliford, EPA's Assistant Administrator for the Office of Pesticides, Prevention, and Toxic Substances. When fumigants dissipate from the soil, workers or bystanders who are exposed to these pesticides may experience eye or respiratory irritation, or more severe and irreversible effects, depending on the fumigant and level of exposure. The following mitigation measures are designed to work together to protect bystanders and workers:

- To help ensure safe fumigation practices, users must complete written, site-specific fumigant management plans before fumigations begin.
- Buffer zones around treated fields will reduce the chances of immediate harmful effects to bystanders from fumigant concentrations in air. Buffers can be adjusted based on the use of other good management practices that also reduce risks to bystanders.
- Posting requirements will inform bystanders and field workers about the location and timing of fumigations and associated buffer zones so people do not enter these areas.
- To ensure emergency preparedness, registrants must provide first responders with fumigant-specific safety information and training. Fumigant applicators must monitor buffer zone perimeters or provide emergency response information directly to neighbors.
- Fumigant registrants must conduct outreach programs to educate community members about fumigants, buffer zones, how to recognize early signs of fumigant exposure, and how to respond appropriately in case of an incident.
- Fumigant registrants must adopt more stringent worker protection measures, and develop training for fumigation handlers and workers to enhance their knowledge and skills and to promote product stewardship.
- All soil fumigant products will be classified as restricted-use pesticides, to ensure that only specially trained individuals can apply and oversee fumigant operations.

EPA's decision will also halt the use of methyl bromide on sites where alternatives are available. The newly registered fumigant iodomethane will be reexamined later this year to determine what new mitigation or restrictions are necessary. The soil fumigant 1,3-dichloropropene, which was evaluated previously, may be subject to similar provisions when the soil fumigants are evaluated together again in 2013. Soil fumigants are pesticides that, when injected or incorporated into soil, form a gas that permeates the soil and kills a wide array of soil-borne pests, providing an important tool for American agriculture. Fumigants are used on a wide range of crops, primarily potatoes, tomatoes, strawberries, carrots, and peppers. EPA is providing 60 days for public comments on implementation of these measures and will refine the measures as needed. More information is available at: epa.gov/oppsrrd1/reregistration/soil_fumigants/

(EPA 2008: Contact Information: Dale Kemery, (202) 564-4355 / kemery.dale@epa.gov)

Pesticide News Story: EPA Acts to Protect Bees

EPA has received a number of inquiries about recent bee deaths in Germany associated with the use of the pesticide clothianidin and whether this incident might be related to Colony Collapse Disorder (CCD). Based on discussions with German authorities, EPA believes this incident is not related to CCD. Although pesticide exposure is one of four theoretical factors associated with CCD that the United States Department of Agriculture is researching, the facts in this case are not consistent with what is known about CCD. CCD is characterized by a relatively rapid decline in the adult bee population of a hive; typically only the queen, a few nurse bees and brood remain in the CCD-affected hive. Reported incidents of CCD have detected few if any dead adult bees. The recent incident in Germany, however, was associated with large numbers of dead adult bees in and around the hives. Additionally, clothianidin residues were detected in the dead bees and their hives. According to German authorities, the

May 2008 incident resulted from inadvertent exposure of the bees to clothianidin, an insecticide used for corn seed treatment, resulting from a combination of factors. These factors include the specific formulation of the pesticide used, weather conditions and type of application equipment:

- The formulation of the pesticide clothianidin used to protect seed corn from corn root worm did not include a polymer seed coating known as a "sticker." This coating makes the pesticide product stick to the seed. Although the formulation used in the US also does not require a "sticker" on corn seed, it is typical practice to use "stickers" on corn seed in the US.
- Normally, corn is planted before canola blooms and attracts bees. Because early, heavy rains delayed the corn planting in Germany, the seeds were sown later than usual when nearby canola crops were in bloom and bees were present.
- A particular type of air-driven equipment used to sow the seeds apparently blew clothianidin-laden dust off the seeds and into the air as the seeds were ejected from the machine and into the ground.
- Finally, dry and windy conditions at the time of planting blew the dust into the neighboring canola fields that were in bloom and where honey bees were foraging.

Together, these factors helped create the circumstances under which this incident occurred. While this incident is not related to CCD, EPA is examining its practices with respect to label requirements for seed treatment pesticides and will revise them as necessary to prevent the types of exposure that led to the bee deaths. Our initial focus will be on seed treatment pesticides that we know are toxic to bees and whether the use of stickers or coatings should be required. In many situations, the use of pesticide-treated seeds results in less human and environmental exposure than would the use of the pesticide later, after the crop is growing. We want to make sure that seed treatment is

done according to best practices that minimize human and environmental exposure.

(EPA 2008)

DON'T FORGET! 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.

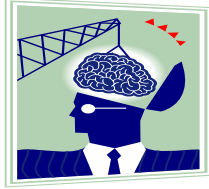
The general goal of the program is to get the public involved in protecting our plant related industries and our natural plant resources from being impacted by exotic and potentially damaging plant pests be they insects, weeds or pathogens. Upon completion of the training, First Detectors receive a certificate 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.

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.

Did You Know That



The cheapest, simplest and often most effective way to minimize the spread of fungal pathogens, particularly those of ornamentals, is good sanitation. Pruning diseased limbs should be done at the proper time of year for a given species and equipment effectively sanitized after use. Leaf and twig debris around trees and shrubs should be removed regularly. All potentially infected material should be disposed of or destroyed promptly.

Events



August 14, 2008 (Tentative)

Plant Diagnostics Clinic

Moundsville, WV (Marshall Co.)

Contact: Edgar Hooper 304-843-1170

August 22, 2008

Plant Diagnostics Clinic

New Martinsville, WV (Wetzel Co.)

Contact: Stephanie Moore 304-847-2727