



# Newsletter

DEPARTMENT OF ENTOMOLOGY • COLLEGE PARK, MD 20742 • (301) 405-3810

## PESTICIDE NOTES

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**Nanotechnology and pesticides** – In 2004, EPA’s Science Policy Council created a cross-Agency workgroup to develop a white paper on nanotechnology. The workgroup is co-chaired by staff from EPA’s Office of Research & Development (ORD) and Office of Pollution, Prevention, and Toxics (OPPT). Currently under preparation for publication, the paper describes the potential

environmental benefits of nanotechnology, identifies risk assessment issues and research needs, and provides recommendations.

To be considered nanotechnology by EPA, there must be three components: size must equal approximately 1 - 100 nm in any dimension, the substance must possess unique phenomena enabling novel

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applications, and it must be deliberately engineered (i.e., not a naturally-occurring substance of the correct dimensions). The tiny size of such molecules facilitates exposure and could increase toxicity. Since the tiny size can also affect what happens on the cellular level, toxicity could be manifested differently than a similar (but not nan-size) compound not produced through nanotechnology. Human health concerns include both local and systemic effects. Exposure through inhalation could lead to inflammatory and fibrogenic response to specific nanomolecules. Dermal exposure could produce a toxic response including oxidative stress, loss of cell viability, and potential immune system effects.

Current applications of nanotechnology include sports equipment (golf clubs, skis, tennis rackets), clothing (antibacterial socks, water- and stain-resistant fabrics), cosmetics, sunscreens, toothpaste, non-stick coatings for pots and pans, canola oil, and others. Future applications are expected to include biological sensors, target drug delivery systems, energy-generating coatings and films, novel robotic devices, food packaging, and pesticides. A nanotechnology workgroup has been formed within the Office of Pesticide Programs. The group is charged with developing a regulatory framework for pesticides. [Presentation at Pesticide Program Dialogue Committee (PPDC) Workshop, 11/09/2006]

EPA rules out wood preservative ACC for residential use – EPA is taking legal action to deny the registration for acid copper chromate, commonly known as ACC, for residential use. EPA's scientific review process concluded that the risks associated

with residential uses of ACC outweigh the minimal benefits. The proposed residential uses of ACC would pose a cancer risk to treatment and manufacturing workers, as well as non-cancer risks to homeowners, children and contractors.

In addition, disposal of the ACC-treated wood could require that it be handled and disposed of as a hazardous waste since the wood may contain high levels of chromium. ACC contains hexavalent chromium, a known human carcinogen when inhaled and a dermal irritant and sensitizer.

Under the federal pesticide law, EPA is following the administrative process to finalize this decision. More information is available at:

[http://www.epa.gov/pesticides/factsheets/chemicals/acid\\_copper\\_chromate.htm](http://www.epa.gov/pesticides/factsheets/chemicals/acid_copper_chromate.htm)  
[EPA OPP Updates 01/09/2007]

EWG ranks pesticides in produce – The Environmental Working Group (EWG) has just released a revised version of their Shopper's Guide to Pesticides in Produce. Excerpts from EWG's website (<http://www.foodnews.org/>) are reproduced here.

The Shopper's Guide to Pesticides in Produce ranks pesticide contamination for 43 popular fruits and vegetables based on an analysis of nearly 43,000 tests for pesticides on these foods, conducted from 2000 and 2004 by the U.S. Department of Agriculture and the Food and Drug Administration. Contamination was measured in six different ways and crops were ranked based on a composite score from all categories.

The six measures of contamination used [by EWG] were:

- Percent of the samples tested with detectable pesticides
- Percent of the samples with two or more pesticides
- Average number of pesticides found on a sample
- Average amount (level in parts per million) of all pesticides found
- Maximum number of pesticides found on a single sample
- Number of pesticides found on the commodity in total

Consistent with two previous EWG investigations, fruits topped the list of the consistently most contaminated fruits and vegetables, with seven of the 12 most contaminated foods. Among the top six were four fruits, with peaches leading the list, then apples, nectarines and strawberries. Cherries, pears, and imported grapes were the other three fruits in the top 12. Among these seven fruits:

- Nectarines had the highest percentage of samples test positive for pesticides (97.3%), followed by peaches (96.6% ) and apples (92.1% ).
- Peaches had the highest likelihood of multiple pesticides on a single sample — 86.6% had two or more pesticide residues — followed by nectarines (85.3% ) and apples (78.9% ).
- Sweet bell peppers had the most pesticides detected on a single sample with eleven pesticides on a single sample, followed by peaches and apples, where nine pesticides were found on a single sample.
- Peaches had the most pesticides overall with some combination of up to 42

pesticides found on the samples tested, followed by apples with 37 pesticides strawberries with 35.

Sweet bell peppers, celery, spinach, lettuce, and potatoes are the vegetables most likely to expose consumers to pesticides. Among these five vegetables:

- Celery had the highest of percentage of samples test positive for pesticides (94.1%), followed by sweet bell peppers (81.5% ) and potatoes (81.0% ).
- Celery also had the highest likelihood of multiple pesticides on a single vegetable (79.8% of samples), followed by sweet bell peppers (62.2% ) and lettuce (33% ).
- Sweet bell peppers was the vegetable with the most pesticides detected on a single sample (11 found on one sample), followed by celery and lettuce (both with nine).
- Sweet bell peppers were the vegetable with the most pesticides overall with 64, followed by lettuce at 49 and celery with 30.

The vegetables least likely to have pesticides on them are onions, sweet corn, asparagus, sweet peas, cabbage and broccoli.

- Nearly three-quarters of the broccoli (71.9% ), sweet pea (77.1% ), and cabbage (82.1% ) samples had no detectable pesticides. Among the other three vegetables on the least-contaminated list, there were no detectable residues on 90% or more of the samples.
- Multiple pesticide residues are extremely rare on any of these least contaminated vegetables. Cabbage had the highest likelihood, with a 4.8% chance of more than one pesticide when ready to eat.

Onions and corn both had the lowest chance with zero samples containing more than one pesticide when eaten.

- The greatest number of pesticides detected on a single sample of any of these low-pesticide vegetables was three as compared to 11 found on sweet bell peppers, the most contaminated crop with the most residues.
- Broccoli and asparagus both had the most pesticides found on a single vegetable crop at up to 19 pesticides but far fewer than the most contaminated vegetable, sweet bell peppers, on which 64 were found.

The six fruits least likely to have pesticide residues on them are avocados, pineapples, mangoes, kiwi, bananas, and papaya.

- Fewer than 10% of pineapple, mango, and avocado samples had detectable pesticides on them and fewer than 1% of samples had more than one pesticide residue.
- Though 59% of bananas had detectable pesticides, multiple residues are rare with only 2% of samples containing more than one residue. Kiwi and papaya had residues on 15.3% and 23.5% of samples, respectively, and just 3.4% and 5.0% of samples, respectively, had multiple pesticide residues.  
[\[http://www.foodnews.org/\]](http://www.foodnews.org/)

*Editor's Note:* When trying to interpret the lists, consumers should be aware of some additional considerations, as follows.

The U.S. Environmental Protection Agency (EPA) sets a tolerance, or legally allowable limit on the amount of residue that may exist at harvest, for each food or feed crop on which a pesticide is allowed to be

used in the U.S. Tolerances range in the order of parts per million or parts per billion, and most are well below the level at which EPA considers the pesticide to pose a potential threat to health. There may be various reasons why no tolerance exists on a certain U.S. crop. It may be that the EPA has, in fact, determined there could be an unacceptable threat to health or the environment if a particular pesticide were to be allowed for use on a particular crop. In such a case, EPA would not register the pesticide on that crop and no tolerance would be set. Another reason, however, for lack of a tolerance is that the pesticide company has not requested that the product be allowed for use on that particular crop. In that case, use of the pesticide on the crop would be an illegal use, but would not necessarily be a health concern.

Data from the same sources used by EWG to calculate their rankings consistently indicate that most fruits and vegetables with pesticide residues had levels that were well below health concern. For example, the latest report from shows that pesticides were detected in 73% of fresh fruits and vegetables sampled, and that 36% contained more than one pesticide. However, residues exceeding the tolerance were detected in only 0.2% of the samples tested in 2005. Another 4.2% of fresh fruit and vegetable samples in the 2005 PDP showed residues of pesticides for which there is no tolerance existing for that crop in the U.S.

Phosmet reentry intervals: Final decision  
EPA has issued its final decision on the restricted-entry intervals for nine uses of the organophosphate pesticide phosmet (Imidan). Consistent with EPA's June 2006 proposal, most restricted entry intervals will be lengthened and additional mitigation will be

implemented to protect workers and bystanders. This risk mitigation will be included on labels of phosmet products sold or distributed by the registrant after June 2008. The nine uses include: apples (including crabapples), apricots, highbush blueberries, grapes, nectarines, peaches, pears, plums, and prunes.

Additional mitigation includes lower seasonal maximum application rates, prohibition of phosmet application until after certain high-exposure activities have occurred, a 25-foot buffer zone around occupied dwellings for ground applications, a 50-foot buffer zone around occupied dwellings for aerial applications, and health protective entry restrictions for pick-your-own operations. Additional biomonitoring or other data is also required to address remaining uncertainties in the existing database.

After evaluating the risks and benefits of phosmet use, EPA found in its 2001 Phosmet Interim Reregistration Eligibility Decision (IRED) that 36 uses were eligible for reregistration, three uses would be canceled, and nine uses would be available on a time-limited basis for a period of five years, contingent on the submission of biomonitoring and other data by Gowan Company, the sole technical registrant. EPA announced in the IRED that it would reevaluate these uses in 2006 and today's decision completes that process.

Phosmet is an alternative to the organophosphate pesticide azinphos-methyl on several major crops including apples, blueberries, and pears. Azinphos methyl is being phased out over a six-year period due to occupational and ecological concerns.

EPA's phosmet decision document and other information about this pesticide are available on the Agency's website at <http://www.epa.gov/oppsrrd1/op/phosmet.htm>. Additional information may be found in phosmet docket number EPA-HQ-OPP-2002-0354 at:

<http://www.regulations.gov>  
[EPA OPP Updates 01/19/2007]

**Remaining lindane registrations canceled**  
EPA has issued final orders cancelling the registrations of all remaining pesticide products containing lindane. In July 2006, EPA received formal requests to voluntarily cancel their lindane pesticide product registrations from all registrants, first Chemtura USA Corporation, followed by AGSCO Inc., Drexel Chemical Company, and JLM International, Inc. The Agency received no substantive comments in response to an August 23, 2006, Federal Register notice announcing its receipt of these requests and inviting public comment. Therefore, as announced in the Federal Register on December 13, 2006 (<http://www.epa.gov/fedrgstr/EPA-PEST/2006/December/Day-13/p21101.htm>), EPA has granted the voluntary cancellation requests, and sent cancellation orders to the registrants. Technical (manufacturing use) products were cancelled effective October 4, 2006, and the last date for use of these products will be July 1, 2007. Cancellation of end-use product registrations will be effective on July 1, 2007, and the last use date for these products will be October 1, 2009. The Agency expects that all existing stocks of lindane will be depleted by that time. This action results in the cancellation of all remaining lindane pesticide products registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) for use in the United States.

The six seed treatment use cancellations are the last of many lindane voluntary cancellations that have taken place since the Food Quality Protection Act of 1996 (FQPA) was enacted. Lindane is a toxic, persistent, and bio-accumulative pesticide that has been of international as well as domestic concern. Lindane is a broad spectrum, organochlorine insecticide used to treat the seeds of barley, corn, oats, rye, sorghum, and wheat. EPA announced in early August 2006 that it has determined that the risks of continued lindane registration outweigh the benefits, and therefore the remaining uses of lindane are not eligible for reregistration. EPA expects the cancellation of these uses to result in no significant loss to U.S. agriculture due to the successful development and registration of safer alternative pesticides in recent years. Once the cancellation process is complete, EPA will propose to revoke the existing tolerances (allowable residues of lindane) for animal fat.

Information about lindane is available at <http://www.regulations.gov> in docket number EPA-HQ-OPP-2002-0202, and on the Agency's lindane reregistration Web page, <http://www.epa.gov/oppsrrd1/reregistration/lindane> [EPA OPP Updates 12/15/2006]

**Phase-out of azinphos-methyl** – EPA has issued its decision to phase-out the remaining uses of the organophosphate (OP) insecticide azinphos-methyl (AZM, Guthion) over the next several years. This action will increase protections for agricultural workers and the environment. This phase-out will encourage and facilitate transition to safer alternatives and reduce risks to farm workers, pesticide applicators, and aquatic ecosystems. The Agency expects growers to successfully adapt and make the transition to available safer alternative pesticides, including acetamiprid,

lambda-cyhalothrin, methoxyfenozide, novaluron, tebufenozide, thiacloprid, and thiamethoxam. AZM is a member of the organophosphate class of pesticides that has undergone EPA reevaluation through the pesticide reregistration and tolerance reassessment programs.

Under the agreement, AZM registrations on the following commodities will be affected:

- Brussels sprouts and nursery stock will be phased out by September 30, 2007
- Almonds, pistachios and walnuts by October 30, 2009
- Apples, blueberries, cherries, parsley, and pears by September 30, 2012

All other uses of AZM have been voluntarily cancelled by the registrants. During the phase-out, additional use restrictions will help minimize risks. For example, reduced annual application rates will be phased in, buffers for water bodies will be increased, and buffers for occupied dwellings will be added.

The registrants will develop training materials in both English and Spanish that are designed to educate workers regarding (1) work practices that can reduce exposure to AZM; (2) the recognition of symptoms associated with cholinesterase inhibition; and (3) how to seek medical attention in the event that workers experience such symptoms. These materials will include a description of how, and by whom, the training will be conducted.

To facilitate the transition to safer alternatives, growers, registrants, and other stakeholders will meet with EPA periodically during the phase-out to discuss alternatives

to AZM, as well as newer pesticides in the pipeline to replace AZM. This workgroup will be headed by EPA and USDA, and will be discussed at a future Pesticide Program Dialogue Committee (PPDC) meeting.

For additional information about the AZM phase-out:

[http://www.epa.gov/oppsrrd1/op/azm/phaseout\\_fs.htm](http://www.epa.gov/oppsrrd1/op/azm/phaseout_fs.htm)

<http://www.epa.gov/oppsrrd1/op/azm.htm>

<http://www.regulations.gov>

-- AZM docket number EPA-HQ-OPP-2005-0061. [*EPA OPP Updates* 11/17/2006]

Opportunities for comment to public agencies:

- *Allethrins* – EPA has made available the risk assessments and related documents for the allethrin series of pesticides (bioallethrin, esbiol, esbiothrin, and pynamin forte), and opens a public comment period on these documents. The public is encouraged to suggest risk management ideas or proposals to address the risks identified. Submit your comments, identified by docket identification (ID) number EPA-HQ-OPP-2006-0986, by one of the following methods: Federal eRulemaking Portal: <http://www.regulations.gov>, or mail. Comments must be received on or before February 26, 2007. Contact: Molly Clayton, Special Review and Reregistration Division (7508P), Office of Pesticide Programs, telephone number: (703) 603-0522; e-mail address: [clayton.molly@epa.gov](mailto:clayton.molly@epa.gov). [*EPA OPP Updates* 01/03/2007]

- *Rodenticides* – EPA is proposing measures to reduce risks associated with nine household-use rodenticides. As part of the Agency's program to ensure that all pesticides meet current health and safety standards, EPA is evaluating the following nine rodenticides concurrently to ensure that human health and ecological risk assessment and risk management approaches are consistent: brodifacoum, bromadiolone, bromethalin, chlorophacinone, cholecalciferol, difethialone, diphacinone, warfarin, and zinc phosphide.

Rodenticides are an important tool for public health pest control, including controlling mice and rats around the home, but current marketing and use practices have been associated with accidental exposures to thousands of children each year. Children in low-income families are particularly at risk. Rodenticide products also pose significant risks to non-target wildlife. These factors highlight the need for effective rodent control using the safest methods that can be provided. The Agency's proposed decision would, through use of tamper-resistant bait stations, significantly reduce the likelihood of exposure to children, including those who may be disproportionately at risk for exposure. Other proposed restrictions would also minimize risks to birds and non-target mammals. With the proposed risk mitigation measures in place, the Agency believes rodenticide products would remain affordable for all consumers.

To minimize children's exposure to rodenticide products used in homes, EPA

would require that all rodenticide bait products available for sale to consumers be marketed only in tamper-resistant bait stations with solid bait blocks (as opposed to small pellets, for example). In addition to rodenticide baits, other affordable rodent control products such as spring traps and glue boards would remain available.

To mitigate ecological risks, EPA would classify all bait products containing the active ingredients brodifacoum, bromadiolone, and difethialone as restricted use pesticides, available for purchase and use only by trained, certified pesticide applicators or persons under their direct supervision. These three rodenticides pose particularly significant risks to wildlife.

To mitigate the risks associated with bait products containing any of these nine rodenticides, EPA would require that labels provide clearer directions to

consumers on how to use rodenticide products while minimizing potential exposure to children, wildlife, and pets.

EPA is seeking public comment on the proposed decision until March 19, 2007. The Agency's Federal Register notice announcing the proposed decision is available at <http://www.epa.gov/fedrgstr/EPA-PEST/2007/January/Day-17/p351.htm>. The Agency's January 17, 2007, Proposed Risk Mitigation Decision for Nine Rodenticides is available at <http://www.regulations.gov> in docket number EPA-HQ-OPP-2006-0955, and on the Rodenticides web page, <http://www.epa.gov/pesticides/reregistration/rodenticides/>. See also the fact sheet on EPA's proposed rodenticides decision at [http://www.epa.gov/pesticides/factsheets/chemicals/rodenticides\\_fs.htm](http://www.epa.gov/pesticides/factsheets/chemicals/rodenticides_fs.htm). [EPA OPP Updates 01/19/2007]

#### References cited in this volume of Pesticide Notes

- EPA OPP Update Update from Office of Pesticide Programs, EPA

#### Editor's Notes –

- *How to find documents for comment* – To access documents on-line, go to the web site <http://www.regulations.gov>. From the menu just under the banner at the top of the page, click on “Advanced Search” and then “Docket Search.” This will bring up a page on which you can enter the Docket ID (see above). Once you have entered the Docket ID, scroll to the bottom of the page and click on “Submit.” When the next page comes up on your screen, click on the appropriate Docket ID. This will take you to a list of all the documents within the public docket for that chemical.
- *Time-sensitive information* – Some of the actions described in this newsletter have comment periods designated. Because the turnaround time for comments is often relatively short,

***Pesticide Notes* is not always able to publish the opportunity for comment before the comment period closes. If you think you may be interested in commenting on pesticides in the future, please sign up for the free subscription to *Just-In-Time Pesticide Info*. Subscribers to the *Just-In-Time Pesticide Info* service are notified of upcoming pesticide policy-related meetings; requests for comment on proposed actions such as cancellations, restrictions, or changes in registrations; and other time-sensitive pesticide issues. Being on the Listserv maximizes the time subscribers have to plan for meetings, learn about possible actions, or prepare comments. *Just-In-Time Pesticide Info* subscribers will also receive more detailed information about how to access documents for comment. To subscribe to this free service, please visit the University of Maryland Pesticide Education and Assessment Program web site at <http://www.pesticide.umd.edu/management/JustInTime.html>.**

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