



# Newsletter

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## 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 applications, and it must be deliberately engineered (i.e., not a naturally-occurring

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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, targeted 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]

**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/>]

*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.

**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:**

- *Pesticide exposure factors for children*  
EPA is announcing a 60-day public

comment period for the external review draft document titled, "Child-Specific Exposure Factors Handbook" (EPA/600/R-06/096A). The draft document was prepared by the National Center for Environmental Assessment (NCEA) within EPA's Office of Research and Development. In 1997, NCEA published the Exposure Factors Handbook (EPA/600/P-95/002Fa-c), which includes exposure factors and related data on both adults and children, but the EPA Program Offices identified the need to consolidate all child exposure data into one document.

The goal of the Child-Specific Exposure Factors Handbook is to fulfill this need. The updated version released for comment provides analysis of exposure factors data using the age groups for children recommended in the EPA document entitled, "Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants"

The document provides a summary of the available and up-to-date statistical data on various factors assessing child exposures. These factors include drinking water consumption, soil ingestion, inhalation rates, dermal factors including skin area and soil adherence factors, consumption of fruits and vegetables, fish, meats, dairy products, homegrown foods, breast milk, activity patterns, body weight, consumer products and life expectancy. Concluding the Fall 2006 external peer review, the final version will be published on the NCEA Website in 2007.

Technical comments should be in writing and must be received by EPA by

December 5, 2006. The draft document is available at <http://cfpub2.epa.gov/ncea/cfm/recordisplay.cfm?deid=56747> [J. Kasai, EPA, via AAPSE Listserv, 11/01/2006]

- *Aldicarb (Temik)* – As part of an ongoing effort to reassess older pesticides and make decisions about their future use, EPA is releasing for public comment revised human health and ecological risk assessments for the N-methyl carbamate pesticide, aldicarb. Aldicarb poses certain drinking water and ecological risks, but also provides substantial benefits to agriculture. The Agency is encouraging the public to submit information and suggestions for managing the risks of aldicarb, and to comment on initial impacts or benefits assessments for a number of aldicarb uses. After completing this risk management decision for aldicarb, EPA will complete a cumulative risk assessment for the N-methyl carbamate pesticides, including aldicarb. Additional risk mitigation for dietary concerns may be necessary at that time.

A systemic insecticide, acaricide and nematicide, aldicarb is registered for use on agricultural crops including citrus, cotton, dry beans, peanuts, pecans, potatoes, sorghum, soybeans, sugar beets, sugarcane, and sweet potatoes, and on seed alfalfa in California. Aldicarb also may be applied to tobacco, field grown ornamentals in California, and coffee grown in Puerto Rico. Aldicarb is classified as a Restricted Use Pesticide. No aldicarb products are intended for use in residential settings.

While aldicarb provides significant benefits to crop growers, it also presents certain risks of concern. Aggregate food and water dietary risks to infants less than one year of age are associated with aldicarb residues leaching to rural drinking water wells in peanut and cotton growing regions of the southern coastal plain (Alabama, Georgia, and South Carolina). Ecological risks are posed to birds, mammals, fish, and aquatic invertebrates. The Agency is requesting information on effective and practical measures to mitigate these risks. For additional information, see the Note to Reader, Request for Additional Information and Risk Management Suggestions for the Reregistration of Aldicarb Phase 5 Public Comment Period in the aldicarb docket.

EPA's November 15, 2006, Federal Register notice is available on the Agency's website at <http://www.epa.gov/fedrgstr/EPA-PEST/2006/November/Day-15/p19360.htm> and on the aldicarb reregistration web page:

<http://www.epa.gov/oppsrrd1/reregistration/aldicarb/>

Comments must be received by the Agency by January 16, 2007. EPA's aldicarb risk assessments and related information are available at <http://www.regulations.gov> in Docket Number EPA-HQ-OPP-2005-0163. Information on the Agency's N-methyl carbamate cumulative risk assessment is available at <http://www.epa.gov/pesticides/cumulative/index.htm>. [EPA OPP Updates 11/17/2006]

## 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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