Greenlist Bulletin

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This is the weekly bulletin of the TURI Library at the University of Massachusetts Lowell. Greenlist Bulletin provides previews of recent publications and websites relevant to reducing the use of toxic chemicals by industries, businesses, communities, individuals and government. You arewelcome to send a message to jan@turi.org if you would like more information on any of the articles listed here, or if this email is not displaying properly.

Global trends in the use of insecticides for vector-borne disease control

Source: Environmental Health Perspectives [Ahead of Print], January 2012
Authors: Henk van den Berg, Morteza Zaim, Rajpal Singh Yadav, et al.

BACKGROUND: Data on insecticide use for vector control are essential for guiding pesticide management systems on judicious and appropriate use, resistance management, and reduction of risks to human health and the environment. OBJECTIVE: To study global use and trends in the use of insecticides for control of vector-borne diseases for the period 2000-2009.

METHODS: A survey was distributed to countries with vector control programs to request national data on vector control insecticide use, excluding the use of long-lasting insecticidal nets (LNs). Data were received from 125 countries representing 97% of the human populations of 143 targeted countries.

RESULTS: The main disease targeted with insecticides was malaria, followed by dengue, leishmaniasis and Chagas disease. The use of vector control insecticides was dominated by organochlorines (e.g. DDT) in terms of quantity applied (71% of total), and by pyrethroids in terms of the surface or area covered (81% of total). Global use of DDT for vector control, the majority of which was in India alone, was fairly constant during 2000-2009. In Africa, pyrethroid use increased in countries that also achieved high coverage for LNs, and DDT increased sharply until 2008 but dropped in 2009.

CONCLUSIONS: The global use of DDT has not changed substantially since the Stockholm Convention entered into force. The dominance of pyrethroid use has major implications due to the spread of insecticide resistance with potential to reduce the efficacy of LNs. Insecticide resistance management should be coordinated between disease-specific programs and

sectors within the context of an integrated vector management approach.

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A revival for biocides

Source: Chemical & Engineering News, January 30, 2012
Author: Marc S. Reisch

Biocides protect products and their users from microbial attack, but changes in how products are made have reduced biocides' effectiveness. Because manufacturers have shifted from solvent-thinned to plant-based, waterborne paints and other goods, they are encountering new challenges in controlling organisms that can destroy products or cause irritation and disease.

"The move to more sustainable products has led to the emergence of difficult-to-control wild strains of microorganisms" in a host of products including cosmetics, paints, and dishwashing liquids, says Rick Strittmatter, global R&D director for Down Chemical's microbial control business. "We could solve the problem by adding more of the currently available biocides," he points out, but environmental, regulatory, and toxicity concerns get in the way.

The increasing influence of sustainability standards organizations such as Ecocert, Blue Angel, and Nordic Ecolabel has also limited the number of acceptable biocides, Strittmatter says. Although they are approved by government regulators, biocides such as parabens and formaldehyde donors, both of which pose human toxicity concerns, are frowned upon by standards agencies. Manufacturers and consumers look for certification labels from the standards agencies, and when they don't see them they might look elsewhere, Strittmatter suggests.

To cope with these conditions, specialty chemical makers have adopted a number of strategies to provide cost-effective biocides. Their approaches include the development of new molecules, blending existing biocides, and encapsulation systems that dispense the preservatives as needed.

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Researchers discover 'green' pesticide effective against citrus pests

Source: University of Florida, January 17, 2012

University of Florida researchers have discovered a key amino acid essential for human nutrition is also an effective insecticide against caterpillars that threaten the citrus industry.

The Lime Swallowtail, or Citrus Swallowtail, is a well-known agricultural pest from southern Asia discovered in the Caribbean in 2006, and researchers say its potential impact on the U.S. citrus industry is cause for serious concern.

"Everything that's in the Caribbean eventually gets to Florida - Florida is an invasive magnet," said UF lepidopterist Delano Lewis, lead author of the study published in the current issue of the Journal of Economic Entomology. "That's why we're trying to make the first strike to see how to stop it."

Experiments conducted on the UF campus at the Florida Museum of Natural History's McGuire Center for Lepidoptera and Biodiversity and the College of Medicine show when methionine is sprayed on leaves it is 100 percent effective in killing larvae related to the Lime Swallowtail caterpillars within two to three days. If not controlled, the caterpillars can completely defoliate young wild lime plants.

Because the Lime Swallowtail, Princeps (Papilio) demoleus, is invasive and cannot be legally brought into the U.S., researchers experimented using a genetically related surrogate with a similar life history and appetite for citrus, the Giant Swallowtail, Heraclides (Papilio) cresphontes. Because these pest caterpillars have the same body structure and biology, researchers are confident methionine will also control the Lime Swallowtail, Lewis said.

"Its effectiveness is based on the biochemistry of the insect gut, so although this work was done on a surrogate, the methionine will block the ion channel in the same way," Lewis said.

Methionine is needed in the human diet for many reasons, including protein-building and metabolism. It is environmentally safe and harmless to citrus plants, mammals and birds.

"It's a very curious phenomenon to have this nutrient amino acid that humans can't live without, yet at the concentrations we put on the leaves, it is toxic to crop-destructive caterpillars," said study co-author Bruce Stevens, professor of physiology and functional genomics in the UF College of Medicine. "It's a completely different class of pesticides that has not been seen before - most are toxic to not only the pest, but to people and animals, too."

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First link between potentially toxic PFCs in office air and in office workers' blood

Source: American Chemical Society, January 18, 2012

In a first-of-its-kind study, scientists are reporting that the indoor air in offices is an important source of worker exposure to potentially toxic substances released by carpeting, furniture, paint and other items. Their report, which documents a link between levels of these so-called polyfluorinated compounds (PFCs) in office air and in the blood of workers, appears in ACS' journal *Environmental Science & Technology*.

Michael McClean and colleagues explain that PFCs, used in water-repellent coatings on carpet and furniture, may have adverse effects on human health. The substances are widespread in the environment and in humans around the world. Scientists know that potential sources of exposure include food, water, indoor air, indoor dust and direct contact with PFC-containing objects. But the link between levels in air and blood had not been explored previously, so McClean's group set out to fill that gap with a study of 31 office workers in Boston.

They found concentrations of a PFC called fluorotelomer alcohol (FTOH) in office air that were 3-5 times higher than those reported in previous studies of household air, "suggesting that offices may represent a unique and important exposure environment." In addition, the study found a strong link between concentrations of FTOH in office air and perfluorooctanoic acid (a metabolite of FTOH) in the blood of office workers. The results also suggested that workers in newly renovated office buildings may receive considerably higher doses of PFCs than workers in older buildings.

Soy-based adhesives provide formaldehyde-free alternative for interior wood products

Source: Biobased Solutions, January 2012

While soy-based adhesives have been used in the manufacturing of wood products such as plywood for more than 70 years, environmental concerns and rising costs for petrochemical-based resins have renewed interest in these less toxic and more sustainable options. Consequently, Ashland Hercules Water Technologies' development of a completely formulated soy adhesive for use in wood composites, including particleboard and medium density fiberboard, presents furniture manufacturers and consumers with a safer alternative for adhesives used in producing interior furniture.

Ashland's line of Soyad adhesives contains no formaldehyde and low volatile organic compounds (VOCs). Typical interior wood products include urea formaldehyde (UF) in their adhesives. Over time, UF releases free formaldehyde into the air as a carcinogenic gaseous form, which can be inhaled by humans.

Following recent legislation enacted to reduce formaldehyde emissions, the California Air Resources Board (CARB) adopted the United States' strictest emissions standards. Soyad adhesives meet both CARB Phase 2 standards and Leadership in Energy and Environmental Design (LEED) criteria, at a lower cost than other low-emitting alternatives. In recognition of utilizing renewable, natural soy flour with the principles of green chemistry, Ashland was jointly awarded the U.S. Environmental Protection Agency's Presidential Green Chemistry Challenge Award along with Columbia Forest Products and Kaichang Li, Ph.D., of Oregon State University.

"By the end of 2007, we had converted all seven of our hardwood plywood plants from urea formaldehyde based adhesive systems to a soy-based formulation, and since then, we have produced over 60 million 'PureBond®' hardwood plywood panels on a cost-neutral basis," says

Steve Pung, vice president of technology at Columbia Forest Products.

"Our employees enjoy a healthier work environment and our customers have a product that produces no negative impact on indoor air quality, at no additional cost. In fact, they market that fact to their health-conscious customer base - both residential and commercial. Our soy-driven PureBond has been a win-win for all involved," added Pung.

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