

Pesticides and You

News from Beyond Pesticides / National Coalition Against the Misuse of Pesticides (NCAMP)



Healthy Hospitals

Controlling pests without harmful pesticides

-
- Synergy: The Big Unknowns of Pesticide Exposure • Getting the Dirt on Good Soil: Building healthy soil is the foundation for pest prevention •

From Sacred Cows to Mad Cows

It was inevitable that mad cow disease would hit conventional U.S. beef stock. What continues to amaze me is how little we know about big problems. Mad cow exemplifies this. In fact, as a matter of policy and practice, we allow and reward management approaches that put investment return before health protection. We do not answer basic safety threshold questions before allowing practices to proliferate. These practices become the norm or the convention, then widely institutionalized. Vested economic interests evolve, policies are promulgated, bureaucracies are established, interest groups are formed and sacred cows are born.

Corporate greed and systemic bias

On the one hand we could say that corporate greed has propelled the mad cow problem forward, that sloppy practices have given way to bad results that threaten public health. Issue a slap on the wrist to the corporations or farmers responsible and impose a few new guidelines. However, the simplicity of this analysis belies the complexities of the situation. Do organophosphate pesticides, as farmer Mark Purdy (see *PAY, Summer 2003*) suggests, also play a role in bringing on or increasing vulnerability to the disease. Could several interactions that come into play? Why don't we know more about practices that are so widespread? And, if we don't know more, given our poor track record in these situations, why don't we just stop!

The term sacred cow has come to mean any stubborn loyalty to a long-standing institution that impedes progress.

The agrichemical industry (CropLife America, aka the American Crop Protection Association, aka the National Agricultural Chemicals Association, *in lieu of* Responsible Industry for a Sound Environment/RISE) is one such sacred cow in the halls of Congress, the White House, the U.S. Department of Agriculture and the Environmental Protection Agency. The industry's views drive the process and are given elevated respect, despite the harm that they have had and continue to cause the nation. The industry's products, programs and policies, and its promotion of the widespread use of synthetic chemicals in our food, homes, land, air, water, workplace, schools and parks are literally killing us. They are impeding progress. Industry views and products are increasingly out of step with science, self-serving, and focused on downplaying risk factors by arguing for unrealistically low exposure assumptions, or by advocating no restrictive action, claiming there is not enough data.

Scientific red flags for change

This issue of *Pesticides and You* identifies, as do most issues, new scientific studies that serve as another warning shot, again affirming that much of what we did not know is hurting us. In this issue, you'll read about scientific peer-reviewed studies, including: (i) a study that finds pesticides cause asthma with childhood asthma rates nearly five times higher in household

that use herbicides; (ii) two studies that independently find elevated rates of Lou Gehrig's Disease in 1991 Gulf War veterans exposed to nerve agents in the organophosphate pesticide family; and (iii) a new study that finds a toxic soup in our homes, 26 different chemicals in the dust and 19 in the air of tested homes, confirming other previous studies. Some of the chemicals that are found in homes are not actually used there, raising the question of our ability to control where these chemicals end up when they are used. These findings reinforce the notion that pesticide use, with its identifiable hazards and unknown effects, is a violation of human rights – the right to pursue life without our very existence being involuntarily threatened by poisons.

The sacred agrichemical industry cow is now the mad cow, creating more urgency for change. *Precautionary Principle* policy, adopted at all levels of government, is needed. Chemicals should not be used unless they are proven safe. We should not have unanswered health and safety questions, such as those raised in this issue's article, *Synergy: The Big Unknowns of Pesticide Exposure*. This approach makes sense in a period when our food supply is threatened because of mad cow disease and policies that allow big unknowns to threaten our health. As a matter of policy, we can deem the unknowns unacceptable, especially in light of the availability of alternative approaches and products.

Embrace alternatives, stop the poisons

We need to embrace the alternatives and give voice and support to those who are implementing alternatives. This issue features a piece by Hendrikus Schaven, founder of Hendrikus Organics, *Getting the Dirt on Good Soil*, in which he describes the importance of soil health as the foundation for pest prevention.

Finally, since this is all about protecting health and the environment, *Beyond Pesticides* in December, 2003 helped give voice to a mother and nurse from Florida, who, along with her children, was poisoned from lawn care chemicals and used the holiday season and new year to issue a public wish for an end to the poisoning and the use of lawn pesticides. We join her with this wish for the new year, which appears on the *Beyond Pesticides* website, www.beyondpesticides.org, and is available in hard copy.

We press on and thank all those who so generously contributed financial support to the *Beyond Pesticides* program in 2003!

—Jay Feldman is executive director of *Beyond Pesticides*.



Contents



page 3



page 9



page 17

Printed on 100% post consumer waste with soy inks. Cover on Quest™, 100% non-deinked, non-rebleached post consumer waste.

2 Mail

Pesticide University; Natural Doesn't Mean "Non-Toxic"; Home and Creosote Don't Mix

4 Washington, DC

EPA Plays Politics More Than Ever, Say Staff; Consumer Product Safety Commission Rejects CCA-Wood Playground Ban Just Days Before EPA Admits Increased Risk; Department of Transportation Begins to Study Alternatives to Pesticides on Airplanes; Bill Requires Industry to Pay for Pesticide Registration; Wood Preservers Take a New Deadly Turn, Said To Want Chrome VI Product

6 Around the Country

NYC Mosquito Spraying Lawsuit Gets a Second Chance; Dow Must Pay Largest Pesticide Enforcement Penalty in U.S. History; Infant Pesticide Exposure Linked to Elevated Asthma Rates; Mother and Children Hurt by Pesticides Issue New Year's Wish to Stop the Poisoning; Genetically Engineered Crops Increase Pesticide Use in the United States

9 Healthy Hospitals

Controlling pests without harmful pesticides
By Kagan Owens

17 Synergy: The Big Unknowns of Pesticide Exposure

Daily combinations of pesticides and pharmaceuticals untested
By John Kepner

21 Getting The Dirt On Good Soil

Building healthy soils is the foundation for pest prevention
by Hendrikus Schraven

24 Resources

Our Toxic World – A Wake Up Call: Chemicals Damage Your Body, Brain Behavior, and Sex; My Insect Friends: An earth-friendly read, learn and color book for children and grown-ups

Pesticides and You © 2003 (ISSN 0896-7253) is published 4 times a year by Beyond Pesticides. Beyond Pesticides, founded in 1981 as the National Coalition Against the Misuse of Pesticides (NCAMP), is a voice for pesticide safety and alternatives and is a non-profit, tax-exempt membership organization; donations are tax-deductible.

National Headquarters:

701 E Street, SE,
Washington DC 20003
ph: 202-543-5450 fx: 202-543-4791
email: info@beyondpesticides.org
website: www.beyondpesticides.org

Articles in this newsletter may be reproduced without Beyond Pesticides' permission unless otherwise noted. Please credit Beyond Pesticides for reproduced material.

BEYOND PESTICIDES STAFF

Jay Feldman, *Executive Director*
Kagan Owens, *Program Director*
John Kepner, *Project Director*
Shawnee Hoover, *Special Projects Director*
Meghan Taylor, *Public Education Associate*
Jake Lubarsky, *Intern*
Asheesh Siddique, *Intern*
Terry Shistar, Ph.D., *Science Consultant*

PESTICIDES AND YOU

Jay Feldman, *Publisher, Editor*
John Kepner, *Editor*
Meghan Taylor, *Illustrator*
Free Hand Press, *Typesetting*
Jay Feldman, John Kepner, Kagan Owens, Shawnee Hoover, Meghan Taylor, *Contributors*

BEYOND PESTICIDES BOARD OF DIRECTORS

Ruth Berlin, LCSW-C, Maryland Pesticide Network, Annapolis, MD
Cissy Bowman, Indiana Certified Organic, Clayton, IN
Laura Caballero, Lideres Campesinas en California, Greenfield, CA
Alan Cohen, Bio-Logical Pest Management, Washington, DC
Shelley Davis, Farmworker Justice Fund, Washington, DC
Lorna McMahon, McMahon Family Farm, Tiptonville, TN
Jay Feldman, Beyond Pesticides, Washington, DC
Tessa Hill, Kids for Saving Earth Worldwide, Plymouth, MN
Gene Kahn, Small Planet Foods, Sedro Wooley, WA
Lani Malmberg, Ecological Services, Lander, WY
Paul Repetto, Boulder, CO
Robina Suwol, California Safe Schools, Van Nuys, CA
Terry Shistar, Ph.D., Kansas Chapter, Sierra Club, Lawrence, KS
Gregg Small, Washington Toxics Coalition, Seattle, WA
Allen Spalt, Carrboro, NC
Audrey Thier, Williamsburg, MA

Affiliations shown for informational purposes only

Pesticide University

Dear Beyond Pesticides,

My son just started his freshmen year at college. He has chemical sensitivities and must stay away from pesticides or he becomes very sick. It has come to my attention that parts of the school are sprayed monthly. Is there any way I can get them to stop spraying? Do you know of any large colleges that use a strict integrated pest management (IPM) program? I would like to put them in contact with those colleges so they can see that IPM works. My son's high school went from spraying monthly to an IPM program, and now only use baits. Not only did it save the school money, but it worked very well.

Mary Shoff
Arizona

Dear Ms. Shoff:

Congratulations on your success in stopping pesticide spraying at your son's high school. Please write us with the details of your experience so that it may serve as a model for others. The next battleground for our children's protection is colleges and universities. Now it is your son's challenge to lead the charge for change.

The first step is locating where pesticide use is occurring on the campus, and which of these areas are of greatest concern to you. Among the areas you should look at are structural pest control; turf and landscape maintenance; pesticide drift; pressure-treated wooden picnic tables, benches and other structures; antimicrobial cleaning products; mold remediation; pesticide product storage; and fresh and processed foods.

After identifying areas of prevalent pesticide use and the specific products used, research the dangers of pesticide use, such as acute and chronic health effects, and environmental concerns. It is also very important that you learn viable alternatives for pest management that can be incorporated into an IPM program. A good program should include monitoring, record keeping, prevention, thresholds, evaluation and notification. Beyond Pesticides has a multitude of resources available for these

informational needs. Contact us for information about both pesticide hazards and alternative pest management.

Step three involves organizing fellow students and community members to join in your effort. A student should start by familiarizing him or herself with the structure of the school's student-run organization system. Issues such as outreach, membership and fundraising should be addressed to help start organizing like-minded individuals in an effort to reduce unnecessary exposure to toxic chemicals on college campus. If this sounds like a mountain, don't worry. Raising awareness about pesticide issues on campus is a noble goal, and Beyond Pesticides can help. Contact us for more extensive information on organizing in your community or school.

As you mentioned, it is very helpful to point to other successful university IPM pro-

grams. Fortunately, there are major universities that have such programs in place, including the University of California at Berkeley, University of Colorado at Boulder, and James Madison University. In addition, Harvard University has a progressive program in place. Contact Gary Alpert at 617-492-8621 for more information on Harvard's IPM.

Natural Doesn't Mean "Non-Toxic"

Dear Beyond Pesticides,

I am researching the health risks of natural pyrethrin. Most research seems to deal with synthetic pyrethroids, a chemically engineered derivative of pyrethrin. Obviously, the synthetic version is more toxic to humans than the natural. I have found little information on any health risk of natural pyrethrin to humans. It is commercially grown, harvested and processed in large quantities in my area, and it appears that some people involved in the industry or living close by are suffering allergies such as respiratory effects or skin rashes.

Peter Granfield
Tasmania

Dear Mr. Granfield:

Pesticide products containing pyrethrin and synthetic pyrethroids are often described by pest control operators and community mosquito management bureaus as "safe as chrysanthemum flowers." While pyrethrin is a natural extract from the chrysanthemum plant, it is important to remember that this does not mean that it is safe for humans and other mammals, or that it cannot kill a wide variety of other life. It is true that pyrethroids are chemically engineered to be more toxic with longer breakdown times than pyrethrins. While pyrethrins, extremely sensitive to light, heat and moisture, break down in a few hours, the synthetic pyrethroids are stable and persist in the environment much longer. So why all the concern over this natural derivative of the chrysanthemum?

Both chrysanthemum flowers and pyrethrin extracts contain varying amounts of floral impurities, some of which are allergens.





The scientific journal *Environmental Health Perspectives* reported in 1995 that “though pyrethrum extracts are relatively low in terms of acute toxicity, there is concern that pyrethrins and their synthetic counterparts, pyrethroids, can trigger allergic reactions, particularly among the nation’s estimated 15 million persons with asthma.”

A 1994 *Clinical Toxicology* report by Paul Wax, a physician at the Strong Memorial Hospital in Rochester, New York, reported the death of a 37-year-old woman, with a history of mild asthma, after inhaling a pyrethrin pet shampoo: “Minutes after applying the shampoo, the woman developed fatal lung symptoms, went into cardiopulmonary arrest, and died. However, the 0.06% pyrethrins in the pet flea shampoo were not proven to be the cause, as there were neither immunological studies of the event nor subsequent animal studies trying to reproduce the result. The report was strictly observational, as is often the case in pesticide exposure incidents. Still, after the shampoo ingredients and emulsifiers listed on the label were excluded as allergens, pyrethrins were the only known allergen the woman could have been exposed to. However, 54% of the flea shampoo was labeled inert ingredients, which are considered trade secrets not divulged even to the medical profession.”

This leads us to another important aspect of the hazards of pyrethrin pesticide products: so-called inert ingredients. Both pyrethroids and pyrethrins are often formulated with oils or petroleum distillates and packaged in combination with synergists, such as piperonyl butoxide (PBO). A heavy exposure to an insecticidal synergist like PBO may

make a person temporarily vulnerable to a variety of toxic insults that would normally be easily tolerated. Symptoms of PBO poisoning include vomiting, diarrhea, intestinal inflammation, pulmonary hemorrhage and mild central nervous system depression. Repeated contact may cause slight skin irritation. Research has shown increased incidence of liver tumors in mice and rats exposed to PBO, which EPA classifies as a possible human carcinogen.

Home and Creosote Don't Mix

Dear Beyond Pesticides,

We found a piece of lumber that had broken from a pier, a beautiful piece of wood after weathering for possibly many years in the salt waters of the Atlantic. The chemical smell of the wood preservative creosote is obvious at close contact (right against the board). Is it possible to treat this piece of wood with a sealant so that we may use it as a mantle on our fireplace? I definitely do not want to endanger my family, but it would make a beautiful mantle.

Lisa Cleaveland
North Carolina

Dear Ms. Cleaveland:

It may be tempting to decorate your home with the natural look of wood, but using creosote-treated wood is the antithesis of natural. Creosote, a toxic mixture of 10,000 chemicals, is linked with cancer, birth defects, endocrine disruption, mutagenicity, and teratogenicity.

Long-term lower level exposure to creosote can also result in skin damage, such as reddening, blistering or peeling, as well as adverse effects to the lungs. Creosote can enter the body through the lungs as a contaminant of air, through the stomach, and through dermal contact. Chemicals in creosote appear to accumulate in the body, particularly in fat tissue.

Manufacture and sale of creosote-treated

wood is prohibited for residential use, even with a sealant. It is inadvisable to bring a piece of this wood to your residence, especially indoors. Similar to your situation, many people re-use creosote-treated wood such as railroad ties to enhance the look of their yards or gardens without realizing the toxic implications. Since it is possible for creosote to leach, contact with surrounding soil poses an additional risk, especially to children, who have demonstrated common hand-to-mouth behavior.

Despite concerns about residential exposure, the U.S. Environmental Protection Agency (EPA) asserts that since residential uses are not registered, the exposure risk does not need to be evaluated in its preliminary risk assessment. The assessment is available for public review and comment in EPA's docket No. OPP-2003-0248 (closes 2/03/04). Contact Beyond Pesticides or see www.beyondpesticides.org for our critique of EPA's assessment.



Write Us!

Whether you love us, disagree with us or just want to speak your mind, we want to hear from you. All mail must have a day time phone and verifiable address. Space is limited so some mail may not be printed. Mail that is printed will be edited for length and clarity. Please address your mail to:

Beyond Pesticides
701 E Street, SE
Washington, DC 20003
fax: 202-543-4791
email: info@beyondpesticides.org
www.beyondpesticides.org

EPA Plays Politics More Than Ever, Say Staff

When Environmental Protection Agency (EPA) employees were asked whether they were “hesitant to perform controversial aspects of [their] job[s] for fear of retaliation,” nearly one-third of those interviewed said yes. Forty-two percent of responding managers and supervisors said yes when they answered the same question. The question was part of a survey conducted by Public Employees for Environmental Responsibility (PEER) among employees of EPA’s Rocky Mountain Region (Region 8). PEER developed survey questions with EPA employees and mailed out questionnaires to all staff in the region. Of the 675 surveys sent, nearly one-quarter was returned. The strongest response by survey participants centered on concern about political interference with environmental decision-making. According to PEER, more than three in four say that politics are shaping agency actions “more than they did five years” ago; more than half think that promoting administration initiatives has become more important than environmental protection; and, strong majorities register a sense that the agency is moving in the wrong direction and is becoming less effective. As one employee said, “This administration has politicized EPA to an extreme extent.” Some employees suggest that suing the agency is the best way to promote environmental stewardship. Environmentalists are very concerned about the ability of EPA employees to perform their jobs with the integrity that the public expects. “In the trenches at EPA, both junior and senior staff see science becoming secondary to servicing industry, especially the energy industry,” said Chandra Rosenthal, Director of PEER’s Rocky Mountain chapter and supervisor of the survey.

“Politics now plays a preeminent role in day-to-day work at EPA.”

To see the complete results of the survey, visit the PEER website at www.peer.org/EPA/EPA_reg8_survey.html or contact Beyond Pesticides.

Consumer Product Safety Commission Rejects CCA-Wood Playground Ban Just Days Before EPA Admits increased Risk

On November 4, 2003, the U.S. Consumer Product Safety Commission (CPSC) voted unanimously to deny a petition to ban the use of chromated copper arsenate (CCA) pressure-treated wood in playground equipment, citing a voluntary industry action to phase out the production of CCA-treated wood for most consumer uses by the end of 2003. Equipment already produced with CCA-treated wood can continue to be sold as long as supplies last. CPSC Chairman Hal Stratton said, “The industry has already agreed to stop using this chemical as a treatment for wood for most residential consumer uses. The EPA action effectively addresses the petitioners’ request.” This CPSC decision came just days before EPA released its *Risk Assessment for Children Who Contact CCA-Treated Play sets and Decks* on November 10, 2003. According to the new EPA data, children exposed to wood products, such as play sets and decks, treated with CCA suffer an extremely high risk,



possibly as high as 5,000 times greater than the agency’s acceptable risk threshold. EPA generally accepts one excess cancer case per million people exposed as its acceptable threshold, whereas children exposed to CCA-treated wood suffer as much as five cancer cases per 10,000 exposed in a worst case scenario, according to the new analysis. Many environmentalists and public health advocates believe that the new data is still an underestimation of real-world risk, given other exposures that children experience to the components of CCA beyond play sets and decks, including environmental contamination of air, water, soil and food from other uses of the chemicals.

Department of Transportation Begins to Study Alternatives to Pesticides on Airplanes

Airplanes, especially those used for international flights, are routinely treated with pesticides. In fact, Australia, New Zealand, India, Uruguay, and other countries require that incoming aircraft are treated with specific pesticides that are not approved for use in the passenger cabin in the United States. Passengers on domestic flights may also have reason for concern. Pesticides may be sprayed on planes making domestic flights at the discretion of the airlines, and the same planes are occasionally used for both domestic and international flights. Judith Murawski, an Industrial Hygienist with the Association

of Flight Attendants (AFA), AFL-CIO, told Beyond Pesticides that her union began lobbying for alternatives to routine pesticide treatments after she received hundreds of reports that flight attendants had suffered pesticide poisoning. AFA's work recently paid off when the U.S. Department of Transportation announced that it would commission a study to test the efficacy and feasibility of using air curtains to repel insects as an alternative to the routine spraying of pesticides on aircraft after international flights. According to Ms. Murawski, if the laboratory testing goes well, then the second phase of this study will be on-aircraft testing to assess whether air curtains are effective



and feasible means to keep insects off aircraft as an alternative to spraying pesticides. She anticipates that trying to get air curtains approved as an alternative will be a long process with lots of hurdles to overcome, but calls the study "a real step in the right direction." For more information visit the Association of Flight Attendants' website at www.afanet.org/pesticides_what_you_need_2_know.asp.

Bill Requires Industry to Pay for Pesticide Registration

Did you know that as a taxpayer you are picking up part of the bill for the testing and registering pesticides, while the chemical industry is making millions? For six years, Congress has passed a rider to appropriations bills, at the urging of the chemical industry, that has prevented EPA from carrying out its authority to charge the industry for the full cost of

the government's hazard review programs. This year, Congress is considering shifting the financial burden from taxpayers to the industry with an amendment to appropriations legislation,

The Pesticide Registration Improvement Act of 2003 (S. 1664), which will allow EPA to collect registration, reregistration and tolerance fees from pesticide manufacturers. Had Congress not blocked the fees in the past, the pesticide industry would have paid an estimated \$294 million since fiscal year 2000. Unfortunately, the new legislation, which is expected at press time to be adopted with the 2004 appropriations bill, is not perfect. With the law, the industry will pay an estimated \$44.6 million in fiscal year 2004, compared to the \$62.5 million that it would have paid had Congress not passed a rider to block fees. The bill also has a loophole for growers of "minor use" crops and prevents the collection of fees for future costs that are not yet known. Environmental, labor, consumer groups and Congressional allies, unable to prevent the blocking of fees, negotiated this deal with industry so that EPA receives much-needed funds to carry out its pesticide reviews. The legislation ensures that 100% of the fee-generated funds specifically support EPA's pesticide program, and do not end up in the U.S. Treasury where they can be used to pay down the skyrocketing national deficit. Under the current system, less than 60% of the fees EPA collects goes to EPA's Office of Pesticide Programs (OPP). If passed, OPP will actually receive more direct funds than under the current system. The bill also establishes a fund, between \$750,000 and \$1 million, specifically to address worker protection, and up to \$500,000 to evaluate new inert, or secret non-disclosed, ingredients in pesticide products. S. 1664, introduced in the Senate by Senators Cochran (R-MS) and Harkin (D-IA), and in the House by Reps. Lucas (R-OK), Goodlatte (R-VA) and Stenholm (D-TX), is supported by a coalition of industry, environmental, consumer and labor groups.

Wood Preservers Take a New Deadly Turn, Said To Want Chrome VI Product

Now that the December 31, 2003 deadline to stop using chromated copper arsenate (CCA) for treating residential wood products has passed, the wood treatment industry is looking for new ways to protect its market share. An Environmental Protection Agency (EPA) official told Beyond Pesticides that Arch Wood Protection, Inc. and other companies are attempting to bring back another deadly chromium-based wood preservative, acid copper chromate (ACC). While ACC does not contain arsenic, it does contain hexavalent chromium (also known as chrome VI and brought to public attention by Erin Brochovich), which, like arsenic, is a known human carcinogen responsible for drinking water contamination, worker illness, and soil and air degradation. It is also linked to health problems such as kidney and liver damage, lung cancer and respiratory effects, birth defects, and skin ulcers. Ironically, Osmose Inc., a wood treater and supplier of wood preservatives to wood treating plants around the world, was the sole registrant for ACC but just recently cancelled its registration. This means that any company hoping to use ACC in pressure-treated wood will be subject to all the tests and data requirements of a brand new registration. The EPA source said that something strange is going on in the wood preservative industry because a number of additional companies were seeking ACC registration when Osmose cancelled. "I don't know what will happen higher up," the source said, "but scientifically the chrome issue in ACC is not resolved so we don't think it will be registered soon." grant a new ACC registration to Arch Wood Protection, and possibly others.

For the latest on this issue, contact Beyond Pesticides.



NYC Mosquito Spraying Lawsuit Gets a Second Chance

The Second Circuit Court of Appeals in New York City pleased environmentalists on December 9, 2003 when it reversed a lower court decision and upheld the right of environmental and public health organizations to sue under the *Clean Water Act* (CWA) for the indiscriminate spraying of pesticides to kill mosquitoes. Earlier this year, U.S. District Court Judge John S. Martin dismissed the lawsuit, brought by No Spray Coalition, Beyond Pesticides and others, saying that CWA was not meant to deal with pesticide spraying since it is regulated under other laws. However, the Appeals Court overturned the lower court's ruling, stating that CWA clearly "authorizes 'any citizen' to bring suit to enforce its requirements, regardless of whether the alleged violation of CWA also constitutes a substantial violation" of other laws. The plaintiffs argue that the city's mosquito-control pesticide-spray program puts the health of residents at serious risk and threatens critical environmental wildlife habitat and is in violation of the approved labels and law. The suit lists a series of viola-

tions associated with the 1999 spraying in which hazardous insecticides were sprayed from helicopters and trucks. The lawyers for the plaintiffs, Karl Coplan of the Pace Environmental Litigation Clinic, and Joel Kupferman of the New York Environmental Law and Justice Project, were pleased by the decision. "The Second Circuit re-asserted the right of the average person to sue in the Courts under the *Clean Water Act*,"



Mr. Coplan said. "This is a terribly important ruling; it stops a bad situation from being made even worse." The lawsuit is now remanded back to the lower court where it will most likely be heard in time for next year's round of spraying.

Dow Must Pay Largest Pesticide Enforcement Penalty in U.S. History

New York State Attorney General Eliot Spitzer is the kind of person that makes environmentalists and public health advocates want to move to New York. Aside from going to bat for public health on disclosure of secret "inert" ingredients in pesticides, pesticide use in schools and public housing and EPA's partial

chlorpyrifos (Dursban) phase-out, Mr. Spitzer is now responsible for levying the largest pesticide enforcement penalty in history. On December 15, 2003, the NY Attorney General's office announced that Dow AgroSciences would pay a \$2 million penalty for illegally advertising safety claims about its pesticide products in New York between 1995 and 2003. "Pesticides are toxic substances that should be used with great caution," said Mr. Spitzer. "By misleading consumers about the potential dangers associated with the use of their products, Dow's ads may have endangered human health and the environment by encouraging people to use their products without proper care." Mr. Spitzer sued Dow for repeatedly violating a 1994 agreement with New York State prohibiting advertising that touts the safety of its pesticide products. An investigation in the early 1990s by the state's Attorney General's office found that Dow engaged in false and misleading advertising that violated both state and federal laws. In exchange for not paying fines for its illegal advertising claims, Dow signed an agreement with the state in 1994 in which it pledged to reform its advertising and marketing practices, including ending claims that its products are "safe." However, an investigation by the Attorney General's office found that almost immediately after the company entered into the agreement it once again began to make misleading safety claims in its print, video and internet advertising.

In addition to the financial penalty, Dow is required to implement a compliance program to help prevent future crimes.

Infant Pesticide Exposure Linked to Elevated Asthma Rates

Finding that pesticides aggregate or promote asthma is not breaking news. However, showing that pesticides cause or initiate asthma, as researchers at the University of Southern California (USC) have recently done, is a different story.

According to preliminary findings published December 9, 2003 at *Environmental Health Perspectives Online*, children exposed to household pesticides in their first year of life develop asthma twice as often as those never exposed. "The first year of life seems uniquely important in terms of susceptibility to environmental triggers of asthma," said Frank Gilliland, PhD, professor of preventive medicine at USC's Keck School of Medicine and one of the study's authors. "Understanding the causes of asthma early in life is especially

important because persistent asthma early in childhood is associated with long-term health problems." The case-controlled study was conducted within a large subset of children participating in an ongoing USC-led children's health study. Researchers looked at 338 children who had been diagnosed with asthma before they turned five years old and matched them with 570 asthma-free children of the same age who lived in the same communities. They found that the risk of developing asthma before age five rose significantly

with various exposures. Children exposed to weed-killers before turning one year old, for example, have more than four-and-a-half times the risk of developing asthma before age five as non-exposed children. Children exposed to insecticides before age one have nearly two-and-a-half times the risk of developing asthma before age five as non-exposed children. According to the Centers for Disease Control and Prevention, about 20 million people in the U.S. suffer from asthma, including more than 3.5 million children under the age of 15. The rate of asthma in preschoolers and school-age children has nearly doubled between 1980 and 1999.

Mother and Children Hurt by Pesticides Issue New Year's Wish to Stop the Poisoning

In an effort to alert the public to pesticide poisoning and to prevent future harm, Brenda Jones, a registered nurse living in Florida, is sharing her story of exposure to hazardous pesticides. Ms. Jones, who describes herself as a trusting consumer, explains that she hired the lawn care company TruGreen-ChemLawn not knowing that the pesticides they were using could harm her family. The application, which included the weedkiller atrazine and the synthetic pyrethroid insecticide bifenthrin, resulted in the acute poisoning of Ms. Jones and her two children, ages eight and four. "My New Year's wish is that our county and state regulators wake up to the devastating effect that these toxic chemicals can have on people's lives," says Ms. Jones. "If the public were not led to believe that these pesticides were safe, as I was, then perhaps more people would push for laws to protect us from the unnecessary use of these chemicals." Ms. Jones says she feels misled by the company about the hazards of common lawn chemicals and the failure of regulators to protect her family and the public. She de-

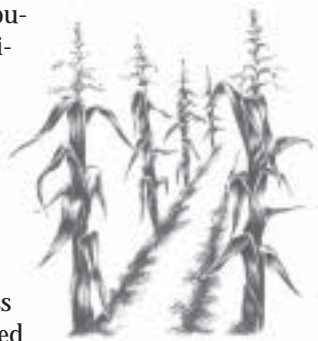


scribes the incident as typical of lawn care applications in her area and recalls the applicator telling her that the chemicals are so safe that he does not need to wear a mask. Yet as soon as the spraying began, some 15 feet from where she stood, she immediately felt a burning in her chest and throat and developed an incessant cough. That evening her children began complaining of dizziness and stomach-aches, and her dog was wheezing and vomiting. Ms. Jones was diagnosed by her doctor with pesticide poisoning, had to quit her job as a nurse and has spent much of the last year in doctor's offices. Her eight-year old son has been permanently removed from his school due to reactions he gets to pesticide treatments nearby or on the school premises. When Ms. Jones asked the applicator near the school not to spray during school hours, he replied that the pesticides are registered with the EPA, are safe to use, and will not hurt children. "We are loving parents and would never consent to have our children exposed to any chemical which would harm them," Ms. Jones says. "If only I had known."

Genetically Engineered Crops Increase Pesticide Use in the United States

Although the biotech industry sells the image of genetic engineering as an environmentally friendly technology that reduces pesticide use, a recent study by the Northwest Science and Environmental Policy Center shows that in the U.S. exactly the opposite is true. According to the report, *Impacts of Genetically Engineered Crops on Pesticide Use in the United States: The First Eight Years*, released November 25, 2003, the planting of 550 million acres of genetically engineered (GE) corn, soybeans and cotton in the U.S. since 1996 has increased pesticide use by about 50 million pounds. The report draws on official U.S. Department of Agriculture (USDA) data on pesticide use by crop and state. In their first three years of commercial sales (1996-1998), GE crops reduced pesticide use by about 25.4 million pounds, but in the last three years (2001-2003), over 73 million more pounds of pesticides were applied on GE acres. Substantial increases in herbicide use on "Herbicide Tolerant" (HT) crops, especially soybeans, account for the increase in pesticide use on GE acres. Many farmers have sprayed incrementally more

herbicides on GE acres to manage a new tougher-to-control weed species, coupled with the emergence of genetic resistance in certain weed populations. "For years weed scientists have warned that heavy reliance on herbicide tolerant crops would trigger ecological changes in farm fields that would incrementally erode the technology's effectiveness. It now appears that this process began in 2001 in the United States in the case of herbicide-tolerant crops," said lead researcher Charles Benbrook, PhD, of the Northwest Science and Environmental Policy Center. On the other hand, the report considers the substitution of conventional pesticides with the natural insecticide Bt, incorporated through genetic engineering a source of pesticide reduction. However, it did not address increased insect resistance to Bt.



cautionary Principle policy restricts chemical use unless it is proven safe. The ACC memo, according to advocates, demonstrates the lengths to which the chemical industry may go to win its economic battle against chemical regulation. ACC tactics in the memo include "selective intelligence gathering about the plans, motivations and allies of opposition activists" and "recruiting and arming new highly credible third party allies in from appropriate communities (e.g., the minority community, consumer activists, regulatory watchdogs, think tanks) to deliver messages critical of the [Precautionary Principle] concept." *The ACC memo can be viewed at www.ewg.org/briefings/acc/ or by contacting *Beyond Pesticides*.*

Leaked Industry Memo Proposes Clandestine Tactics

Infiltration, spying, and fake front groups are all proposed in the chemical industry's fight against health and environmental public interest groups, according to a leaked internal memo of the American Chemistry Council (ACC). The Environmental Working Group (EWG), an environmental organization, which identified Tim Shestek, ACC's California lobbyist, as the author, obtained the July 2003 memo in November. The strategic document includes a proposal for the ACC to hire Nichols-Dezenhall, a Washington-based corporate PR firm, and spend more than \$120,000 annually on the campaign. According to EWG, Nichols-Dezenhall is known to hire former FBI, CIA and DEA agents and use borderline tactics such as spying and digging through trash to gain intelligence. The hard line ACC campaign in a response to growing interest in the Precautionary Principle policy, especially in Europe and California, used to tighten safety restrictions on chemical use. Pre-

Gulf War Linked to Lou Gehrig's Disease

Two unrelated studies have concluded that an abnormally high number of veterans from the 1991 Gulf War have developed the neurodegenerative disorder amyotrophic lateral sclerosis (ALS), also known as Lou Gehrig's Disease. According to both studies, ALS, which affects roughly 30,000 people in the U.S. primarily between the ages of 50 and 70, is impacting this subsection of veterans at more than twice the rate in the general population. "This disease occurred in a very abnormal age group – in people in their 20s and 30s instead of 60s and 70s," said Dr. Robert Haley, chief of epidemiology at the University of Texas Southwestern Medical Center at Dallas. "It raises the question of whether the condition might have been caused – or triggered prematurely – by unusual environmental exposures in the war." One of the main exposures to toxic chemicals during the Gulf War, identified by the Department of Defense, involved the nerve agents sarin and cyclosarin. Like many widely used pesticides, both sarin

and cyclosarin are in the organophosphate chemical family. Dr. Haley's study, published in the September 23, 2003 issue of *Neurology* (Vol. 61, No. 6), used national vital statistics data from 1979 to 1998 to project that under normal circumstances 1.38 cases per year of Lou Gehrig's disease would be found in the Gulf War veteran population, compared to the five cases he actually observed for that year. Another study, published in the same journal and conducted by the Department of Veterans Affairs, reached the same overall finding, despite using a completely different methodology.

Study Finds Toxic Soup in Household Air and Dust

While most people look at their homes as a safe place, a study published in the September 2003 issue of *Environmental Science and Technology* finds that the average U.S. home is contaminated with a cocktail of hazardous pesticides and other chemicals, some of which have been banned for more than ten years. On average, the study led by Ruthann Rudel, a senior scientist in environmental toxicology at the Silent Spring Institute, based in Newton, MA, found 26 different chemicals in the dust and 19 in the air of sampled homes. In a majority of homes, at least one chemical was found to exceed EPA risk-based exposure guidelines. The pesticides found in high dust concentrations in more than 50% of the sampled homes include pentachlorophenol (penta) (86%), DDT (65%), permethrin (45-53%), 2,4-D (63%) and piperonyl butoxide (66%). Penta was also found in high air concentrations in 58% of the samples along with chlordane (51-53%), and o-phenylphenol (67-73%). The article theorizes that the high levels of chlorpyrifos found in homes (38% air, 18% dust) may explain the Center for Disease Control's findings that children aged 6-11 have higher exposure levels to the pesticide than the rest of the population. The study was funded by the Massachusetts Department of Public Health.

Healthy Hospitals

Controlling Pests Without Harmful Pesticides

Written by Kagan Owens, Beyond Pesticides

A REPORT BY



Healthy Hospitals

Controlling pests without harmful pesticides

by Kagan Owens

The following are excerpts from the report *Healthy Hospitals: Controlling Pests Without Harmful Pesticides* (November 2003), released by *Beyond Pesticides* and *Health Care Without Harm*, which finds that many major hospitals are regularly spraying toxic pesticides, unnecessarily risking the health of patients, staff and visitors. It is incredibly counterproductive that people go to receive treatment for illnesses such as cancer and neurological disease at hospitals that unnecessarily use carcinogenic and neurotoxic pesticides. This report also signals the necessity of protecting the elderly and other sensitive populations. According to EPA, "The elderly may be more susceptible to the health effects of certain pollutants than other age groups. If the elderly are more vulnerable, and the numbers of older people increase, then it follows that many more people could be affected by environmental contaminants."¹ Aging individuals are at risk of chronic diseases and disabling conditions that may be caused or exacerbated by pesticides.²

There is an urgent need for more hospitals to protect people's health by using safer pest management practices, in keeping with the medical profession's commitment to "First, do no harm." *Healthy Hospitals* includes a first-of-its-kind survey of top U.S. hospitals and offers tips and resources for how hospitals can manage pests while also protecting the health of people and the environment.

It is important to note that although the report does not address sterilants and disinfectants (antimicrobials), their use is a concern. EPA's website states that antimicrobial use does "involve risks of potential efficacy failure and exposure hazards." And a study published in the October 2003 issue of *Environmental Health Perspectives* finds that youth face a four-fold increased risk from occupational exposure to disinfectants than adults.

The report is available at www.beyondpesticides.org or from *Beyond Pesticides*. —KO and JF

Introduction

Hospitals are intended to be places for health and healing. Yet the findings of a new survey of top U.S. hospitals indicate that many major hospitals in the U.S. are regularly using toxic pesticides. This puts the health of patients and staff at risk and raises questions about the safety of hospitals.

In order to better understand the current state of hospital pest management, Health Care Without Harm (HCWH) surveyed top U.S. hospital facilities. Survey results show that while some hospitals report using least hazardous approaches and/or provide notification of pesticide use, there is still considerable pesticide use at hospital facilities, even at hospitals that report using the safer method of pest management called Integrated Pest Management (IPM).

While it is essential that hospitals maintain a clean environment free of pests that threaten health, it is also important that patients, staff and visitors be protected from exposure to pesticides. Hospital patients who have compromised immune and nervous systems, the elderly, infants and children and those who have an allergy or sensitivity to pesticides are particularly vulnerable to their toxic effects. Patients taking certain medications may also have heightened reactions to pesticides.

"Pest management in health care facilities differs from control practices in other types of institutions," states the Department of Veteran Affairs. "The effect on patients in various stages of debilitation and convalescence, and in varied physical and attitudinal environments, requires that a cautious, conservation policy be adopted concerning all uses of pesticides. The use of any pesticide establishes a risk of uncertain magnitude."³

The American Medical Association's Council on Scientific Affairs states, "Particular uncertainty exists regarding the long-term health effects of low dose pesticide exposure.

Current surveillance systems are inadequate to characterize potential exposure problems related either to pesticide usage or pesticide-related illnesses. Considering these data gaps, it is

prudent for homeowners, farmers and workers to limit pesticides exposures to themselves and others, and to use the least toxic chemical pesticide or non chemical alternative."⁴

Pesticides are hazardous chemicals designed to kill or repel insects, plants and animals that are undesirable or that threaten human health. Many of them contain volatile compounds that contribute to poor indoor air quality. In addition to killing pests and beneficial organisms, pesticides can exacerbate asthma and cause acute adverse effects in humans, such as nausea, headaches, rashes and dizziness. Many pesticides are also linked to chronic effects, such as cancer, birth defects, neurological and reproductive disorders, and development of chemical sensitivities. Pesticide poisonings are frequently misdiagnosed or unrecognized, largely because most health care providers receive minimal training in environmental illnesses and few people know when they have been exposed to a pesticide.

Why Focus on Hospitals?

There are 5,810 registered hospitals in the U.S.⁵ that see about 32 million inpatients, 83 million outpatients and 108 million emergency room patients per year.⁶ Thus a large number of individuals may be exposed to toxic pesticides in health care settings. Some hospital patients are especially vulnerable to the toxic effects of pesticides.⁷ Hospitals have a special obligation to demon-

strate leadership in instituting effective and safer pest management in keeping with the medical profession's basic tenet of "first, do no harm."

Fortunately, a method of pest control called Integrated Pest Management (IPM) eliminates or greatly reduces the need to respond to pests with hazardous pesticide products and helps ensure a healthier environment for hospital patients, staff and visitors. The focus of IPM is to prevent pest problems by reducing or eliminating sources of pest food, water and shelter in hospitals and on their grounds and by maintaining healthy lawns and landscapes. The first approach to controlling a pest outbreak is improving sanitation, making structural repairs (such as fixing leaky pipes and caulking cracks) and using physical or mechanical controls (such as screens, traps and weeders). A least hazardous chemical is used only when other strategies have failed. If a pesticide is used, the hospital community must be notified prior to the application in order to take necessary precautions.

Hospital pesticide use survey findings

HCWH distributed a *Hospital Pesticide Use Survey* to the top 171 hospitals listed by the *U.S. News and World Report* in 2001. Twenty-two hospitals (13%) responded to the survey. Although this was a relatively low response rate, the results were

While it is essential that hospitals maintain a clean environment free of pests that threaten health, it is also important that patients, staff and visitors be protected from exposure to pesticides.

Examples of Hospital IPM Programs Featured in Healthy Hospitals

Veterans Hospitals
Oregon Health and Science University
San Francisco General Hospital
Massachusetts General Hospital
Brigham and Women's Hospital
Hackensack University Medical Center

consistent with reported pesticide use in New York hospitals,⁸ schools and other public buildings and grounds. It also highlights the fact that it is often very difficult to obtain information about pesticide usage in any location.

The major findings of the survey show that of the 22 responding hospitals:

- 100% use chemical pesticide products either on their grounds, inside the buildings or both;
- 91% use chemical pesticide indoors and 77% use chemical pesticides outdoors;
- 36% use pesticide products that are no longer registered for use by the U.S. Environmental Protection Agency (EPA);
- 18% use a pesticide product in which the active ingredient is being phased-out by EPA due to the unacceptable risk associated with its use; and,
- 73% hire a pest control company to manage the majority of the hospital's structural pest management program and 41% hire a pest control company to manage the majority of the hospital's grounds;

The survey findings also indicate that at least some of the responding hospitals are making an effort to reduce their pesticide use and/or notify staff and patients when pesticides are used, thus reducing patients' toxic exposure. Of the responding hospitals:

- 73% report using an IPM approach to pest management;
- 45% use one or more pesticide products containing boric acid, a least hazardous pesticide;
- 14% post notification signs for both indoor and outdoor pesticide applications; and,
- 27% have provided pesticide-poisoning training for their staff.

Hospital IPM Programs. While the returned surveys indicate that the majority (73%) of responding hospitals have IPM programs, many hospital IPM practices are severely undermined by a continued reliance on hazardous pesticides. For example, five of the 16 responding hospitals (31%) state that their IPM program uses between 18 and 38 pesticide products. This highlights the fact that there are many different definitions of IPM. While true least hazardous IPM programs use few or no synthetic pesticides, the term IPM is increasingly being used by the pest control industry to describe programs that include synthetic pesticides or are, in fact, just traditional spray programs.

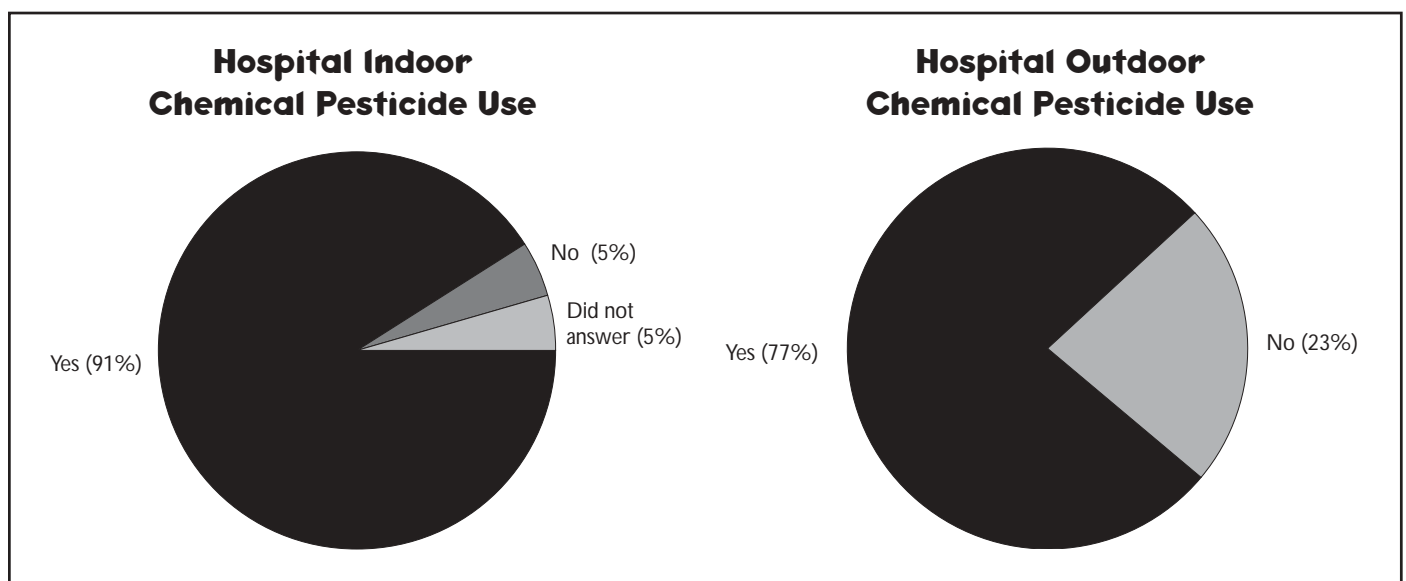
Hospital Pesticide Use. Although one responding hospital (5%) does not use chemical pesticide indoors and two other hospitals (9%) do not use chemical pesticides outdoors, all of the responding hospitals use chemical pesticide products either on their grounds, inside their buildings or both. Not one of the surveyed hospital's pest management programs is 100% free of chemical pesticides. One hospital (5%) states that they do not spray pesticides around patients.

Seventeen hospitals (77%) provided a list of pesticides used at their facility. Of the 216 pesticide products reported, 159 are different pesticide products containing 80 different active ingredients. The number of products used by a single facility ranges from one to 38, averaging nearly 13 pesticide products per hospital.

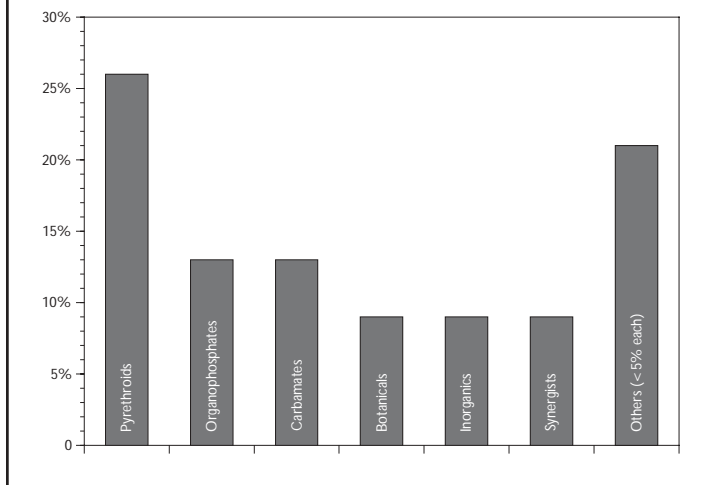
Of the 37 most commonly used pesticides (active ingredients) identified from the hospital survey responses:

- 62% are insecticides, including synergists;
- 27% are herbicides;
- 8% are rodenticides; and,
- 3% are fungicides.

Of the insecticides identified as part of the 37 most commonly used pesticide active ingredients by surveyed hospitals: six (26%) are pyrethroids; three (13%) are organophosphates; three (13%) are carbamates; two (9%) are botani-



Surveyed Hospitals Most Commonly Used Insecticides, By Chemical Family



cals; two (9%) are inorganics; two (9%) are synergists; and the remaining five (21%) represent other chemical families that only occur once.

Phenoxy herbicides (e.g. 2,4-D, dicamba and mecoprop) are the most commonly used herbicides identified as part of the 37 most commonly used pesticide active ingredients by surveyed hospitals.

Of the 37 most commonly used pesticides by surveyed hospitals:

- 16 are likely, probable or possible carcinogens;
- 13 are linked to birth defects;
- 15 are linked to reproductive problems;
- 22 are neurotoxins;
- 18 cause kidney or liver damage;
- 28 are irritants that can cause skin rashes, eye irritation and other problems;
- 9 are known groundwater contaminants;
- 12 can leach through soil and are potential groundwater contaminants;
- 14 are toxic to birds;
- 30 are toxic to fish and other aquatic life; and,
- 16 are toxic to bees. (Bees play a critical role in plant reproduction.)

Least Hazardous Pesticide Use. Survey results reveal that many facilities have adopted the use of some pesticides that are less hazardous to human health and the environment. These include boric acid, bacillus thuringiensis (B.t.) and potassium salts of fatty acids (soaps). In fact, products containing boric acid as the active ingredient were the most commonly used pesticide products reported by the responding hospitals. Ten of the responding hospitals (45%) reported us-

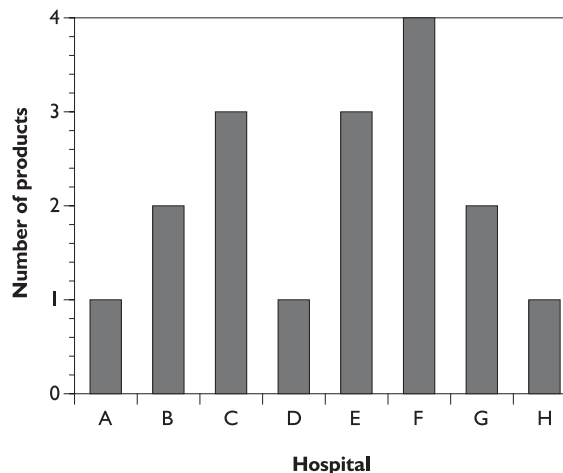
ing one or more pesticide product containing boric acid. Boric acid, an inorganic chemical, is a non-volatile mineral with insecticidal, fungicidal and herbicidal properties. Because of its extremely low volatility, it has long been embraced as a safer alternative to highly volatile synthetic chemical pesticides, as long as it is not mixed with solvents or other toxic inert ingredients.

Hospitals also reported the use of “natural” pesticides that are derived from plants or other non-synthetic sources. They are often characterized as having low toxicity, yet can still be quite hazardous. For example, seven hospitals (32%) reported the use of products containing pyrethrin, a nerve toxin derived from a member of the chrysanthemum plant family. Although this chemical is naturally derived and breaks down faster than pyrethroids and other synthetic pesticides, its use is still a cause of concern because of its high acute toxicity, allergenic potential, volatility and possible ability to cause cancer in humans.⁹ Also, pyrethrins are often formulated with toxic “synergistic” chemicals, including piperonyl butoxide, that pose their own risks.

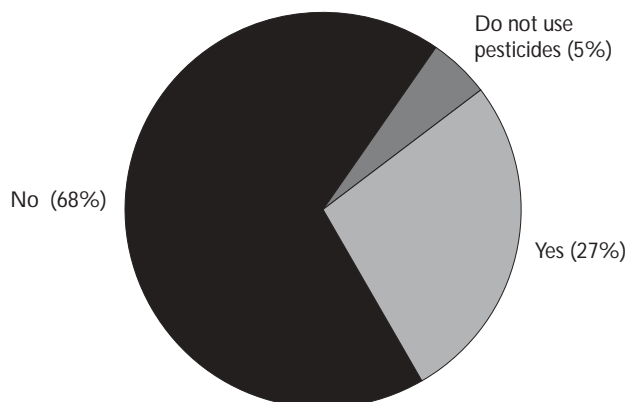
Hospital Use of Cancelled Pesticide Products and Active Ingredients. From time to time, the registration of a pesticide or certain uses of the product are “cancelled” by EPA or withdrawn from use by the manufacturer. Cancelled products are often phased-out over time, allowing individuals to use the products they have already purchased until existing stocks are depleted. According to EPA, these cancellations occur for various reasons, such as:

- Voluntary cancellation by the registrant;
- Cancellation by EPA because required fees were not paid; or
- Cancellation by EPA because unacceptable risk existed that could not be reduced by other actions such as voluntary cancellation of selected uses or changes in the way the pesticide is used.¹⁰

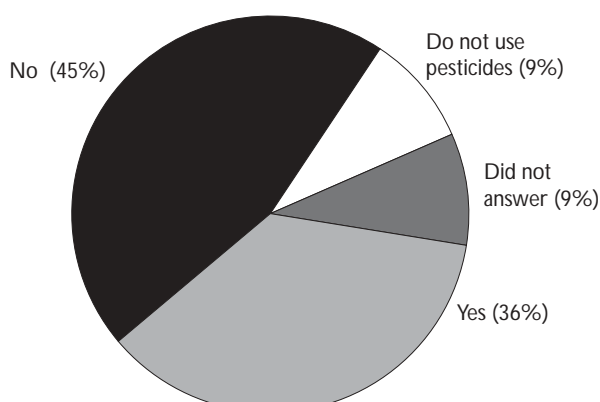
Hospitals Use of Cancelled Pesticide Products



Hospitals Posting Indoor Pesticide Notification Signs



Hospitals Posting Outdoor Pesticide Notification Signs



Although EPA does not maintain a list of cancelled pesticide products, a search through the California Department of Pesticide Regulation's Pesticide Product Database on the 159 pesticide products surveyed hospitals reported using shows that some hospitals use products that have been cancelled. Eight hospitals (36%) reported using at least one cancelled pesticide product. A total of sixteen cancelled pesticide products were reported as being used by the eight hospitals. The dates these products were cancelled range from May 1987 to November 2001.

While these cancellations are for the pesticide product and not for the product's active ingredient, the active ingredients bendiocarb, chlorpyrifos and diazinon are also being cancelled. In these cases, EPA and the pesticide registrants have agreed to phase-out and cancel the use of these active ingredients in pesticide products for many non-agricultural uses due to the fact that they pose unacceptable health risks.¹¹ While the use of products containing these active ingredients are legal while the phase-outs take place, the risk associated with these pesticides should raise concerns for hospitals that reported their use. Four (18%) of the surveyed hospitals reported using eight products that contain bendiocarb, chlorpyrifos or diazinon.

Hospitals may be using cancelled products because: 1) the hospital or contractor is unaware of EPA's cancellation of the pesticide product, 2) there is inadequate record keeping of pesticide use, 3) the hospital or contractor have stockpiles of the product that they are using until existing stocks are depleted, and/or 4) the pesticide applicator is knowingly using a cancelled product because it is a "favorite tool." What is clear, however, is that federal and state agencies that regulate pesticides need to improve communication with hospitals regarding pesticide cancellations or restrictions. On the other hand, the individual that oversees the hospital pest management program, whether performed in-house or contracted out, is responsible for gathering appropriate information on the proposed pesticide before it is used and staying up-to-date on the regulatory status of pesticides already in use.

Hospital Pesticide Use Notification. Patients, staff and the public have a right to be informed about the use of pesticides at health care facilities and their adverse effects. Providing individuals notice prior to a pesticide application allows them to take precautions to avoid exposure to hazardous pesticides. Notification before, during and after a pesticide application, is especially important for people who are most vulnerable to the harmful effects of pesticides, such as children, the elderly, those who already ill and people who are chemically sensitive.

Six responding hospitals (27%) reported that they post notification signs when pesticides are used inside the hospital and eight hospitals (36%) post notification signs for outdoor pesticides. Only three hospitals (14%) post notification signs for both indoor and outdoor pesticide applications.

Some of the responding hospitals do provide other forms of pesticide notification to those in the hospital, although they usually only inform the hospital staff and not the patients or visitors. Eight hospitals (37%) provide other forms of notice for indoor pesticide applications and six hospitals (27%) provide other forms of notice for outdoor applications. Other types of notice include informing the contact person or supervisor in the treatment area, posting a notice on a bulletin board, providing verbal notice, or providing written notice through email or other form of distribution.

Safer pest management practices

Many hospital occupants are especially vulnerable to pesticides and pests are unacceptable in such an environment. Therefore, it is vital that the hospital employ a pest management program that effectively prevents and controls pest problems using the least hazardous approach.

Like other public buildings, hospitals experience their share of pest problems ranging from mice, ants, flies and spiders inside facilities to weeds and other insects on hospital grounds. Although many pests are only nuisances, some pests like flies, cockroaches, yellowjackets, rodents and termites have the po-

Health Care Community Supports IPM

American Hospital Association Certification Center has developed a certification program for Certified Healthcare Environmental Services Professionals. The examination includes sanitation issues and requires the candidate "... to possess an understanding of pest control, develop and administer an integrated pest management program, ... [and] develop a process for monitoring and evaluating contracted services for ... pest control ..."¹²

American Society for Healthcare Environmental Services published *Integrated Pest Management* for their Professional Development Series, which addresses issues regarding IPM versus traditional pest control, client expectations, IPM implementation and pesticide use and storage, while emphasizing "a hierarchical approach, with actual pesticide application[s] being the last accommodation."¹³

American Society for Healthcare Engineering (ASHE) has developed a Sustainable Design Award recognition program, which includes the recommendation to use IPM practices.¹⁴

Hospitals for a Healthy Environment (H2E) is a joint project of the American Hospital Association, EPA, Health Care Without Harm and the American Nurses Association. The goal of H2E is to educate health care professionals about pollution prevention opportunities in hospitals and healthcare systems, including the adoption of IPM.¹⁵

tential to cause harm by spreading disease, triggering allergies or asthma attacks, causing painful stings which can be life-threatening to those with allergies, contaminating food or causing structural damage.

Pest problems usually signal larger problems with a health care facility's sanitation, maintenance and soil health. Pests are attracted by improperly stored food, waste scraps, food gifts and water sources. Frequent sites of pest infestations include hospital cafeterias, loading docks, storage areas, bathrooms, waste disposal areas and patient rooms, especially in long-term care facilities. Pests most frequently enter a hospital through open or leaky doors (exacerbated by typically heavy foot traffic in and out of hospital facilities), windows, wall, ceiling and floor cracks and gaps around plumbing and other pipes that enter the building. They can also enter a hospital by hitchhiking a ride in cardboard boxes, suitcases and flowers, among other things. On hospital grounds, unhealthy lawns and landscape and/or poor soil conditions foster weed growth and insect infestations.

The solution to a pest problem must not be more harmful than the pest problem it is meant to solve. In typical pesticide spray programs it is not unusual to overestimate the risk of the pest and underestimate the risk of the pesticide. For ex-

ample, many pests like common house spiders may be a nuisance but are not harmful. Most pesticides however, are associated with a variety of health risks.

Integrated Pest Management (IPM): A Safer Solution. IPM is a program of prevention, monitoring and control that eliminates or drastically reduces the use of pesticides, and to minimize the toxicity of and exposure to any products that are used. This approach focuses on long-term prevention or suppression of pest problems through a combination of techniques such as regular pest population monitoring, site or pest inspections and structural, mechanical, cultural and biological controls. Techniques can include such methods as improving sanitation, making structural repairs, pest-proofing waste disposal, establishing good soil health and other non-chemical tactics.

Where preventive approaches fail, the adoption of additional tactics, including mechanical traps, vacuuming, biological controls and habitat modification, can significantly improve the safety and effectiveness of a pest management program. The least hazardous pesticide is used only as a last resort. Public notification is provided if any pesticide is used. The IPM approach uses knowledge of a pest's biology and habitat needs to time specific least hazardous interventions to prevent and control pests.

Hospitals deciding to use an IPM program should adopt a written IPM policy that clearly specifies the program's goals and establishes a process for decision-making. This will help ensure the program's implementation success and longevity. An IPM policy gives facility managers and commercial pest control contractors guidance on how to prevent and manage pest problems in the least hazardous manner possible.

It is important to involve staff from various hospital departments in the creation and implementation of the IPM program. An IPM coordinator should be designated to manage or oversee the IPM program. The most appropriate person to be the IPM coordinator is usually the current staff person in charge of the hospital's pest control (often the environmental services manager) and/or grounds and maintenance. In any case, decisions about a hospital's pest management are best done by a knowledgeable person who does not have a financial interest in selling a pesticide product or service. The IPM coordinator should also determine the needs of the various areas of the hospital and set "action thresholds," or pest population levels that require remedial action for human health or economic reasons.

Recommendations

While some hospitals use an integrated pest management (IPM) approach to managing pests, it appears that the majority of U.S. hospitals have an urgent need to adopt safer pest management practices. Implementation of cost-effective IPM programs can eliminate the unnecessary use of hazardous pesticides that threaten the health of patients and staff. Hospitals, government entities, the public and pest management industry can all take action to increase the number of hospitals adopting least hazardous IPM programs.

A Closer Look at San Francisco General Hospital's IPM Program

Interview with Deanna Simon, Toxics Reduction Specialist,
San Francisco Department of the Environment

What are the main pest problems you needed to solve?

The main problems at San Francisco General Hospital (SFGH) are ants, rodents and pigeons.

What have you done in landscape/building design to prevent pest problems?

Because the buildings are very old and were built before "designing for pest control" was a paradigm, we continually try to modify the existing structure. This includes installing window screens, caulking to exclude ants and installing wires and spikes to prevent birds from landing on windowsills and ledges. We have also centralized our garbage to minimize pest aggregation areas and facilitate monitoring and control.

To keep outdoor pests such as rodents from entering, our landscaping design requires a 12" to 18" vegetation-free zone next to all building structures. We also choose landscape plant varieties with few known pest problems, less allergenic and pollen-producing plants, and species producing reduced amounts of fruit. Several areas have weed fabric and mulch to reduce or eliminate weed growth. We have also installed door sweeps to prevent rodents from entering the building especially in loading dock and trash collection areas.

What are some of the techniques you use to prevent and manage weeds?

We avoid spraying pesticides or herbicides more than 99% of the time. This is out of concern for our immune-compromised patients and because of the unknown combined effects of pharmaceuticals and pesticides on patients' health. In the past we have used propane flamers to control weeds in hardscaped areas, and we receive annual training in the use of this technology. Other landscaped areas are hand-weeded, weed-whacked, or have weed fabric and mulch as a long-term weed control strategy. We have invested considerable energy into changing our paradigm of what a tolerable plant is, and we now have a greater diversity of vegetation in our lawns. We also fertilize the lawns regularly promoting vigorous grass growth which crowds out broadleaf weeds, and top dress areas where weeds are hand-pulled. Aeration and leaving grass clip-

pings in place further enriches the soil and promotes a healthy, vigorous lawn.

What are some of the techniques you use to prevent and manage pests?

Sanitation – hospital staff have been trained to wash out trash containers, rinse drink cans to prevent fruit flies, and not keep food in their lockers or desks. Regularly cleaning floor and sink drains and removing accumulated food particles under kitchen equipment are also very important in our plan. Exclusion – includes installing pigeon wires, bird spikes and screening, door sweeps and an air blower in the kitchen; and caulking areas where ants enter buildings. All ivy is cut back from buildings at least 12 inches to remove easy building access for rodents. Vacuums are used to remove pests, especially flying insects such as bees and wasps inside buildings. Aphids are removed from landscape plants by spraying them off with water; insecticidal soaps are used rarely and only for extreme problems.

Monitoring and trapping helps with early detection of pest problems and also helps track the size of a population in order to evaluate whether our methods are working. We have trained nursing and custodial staff to look for and report the first signs of pest problems to our Pest Control Contractor (PCC). To accomplish this we use lots of sticky traps, and have centralized all the pest information from the entire facility into one office where a pest-sighting logbook is continually updated for quick reference by our PCC.

How do you decide when and if to use pesticides?

Pesticides are reserved for last resort or emergency use only. Although certain, reduced risk, pesticides are "allowed" for use under the Citywide IPM program, other methods are tried first, and they almost always succeed. Our staff has received extensive training to ensure that everyone is on board with prevention measures and alternative controls.

What is the key to your success?

There are three factors that stand out as critical to our success.

continued on the following page



continued from the previous page

The first is to have a PCC who is committed to finding and using least toxic control measures. However, he could not do his job without the cooperation of our hospital staff. A top-down commitment to toxics reduction and continual trainings have generated buy-in and cooperation from our staff, who play a key role by helping with sanitation, prevention, monitoring and communicating pest problems as they develop to our PCC. Also, our staff have access to a network of advisors for support and advice, including the Department of the Environment, members of the Citywide IPM Technical Advisory Committee and a team of professional pest management consultants.

What have been your biggest challenges?

Our aging buildings with few screens and ample gaps for pest entrance, combined with a limited budget for non-emergency pest control, often make it difficult to be proactive. Also, it is difficult to enlist the participation of our entire custodial staff to check traps and clean for pest prevention. Hospital custodians are often stretched thin and we can run into resistance when we appear to be adding extra work to already busy schedules.

In the calendar years 2001 and 2002, what were your expenses for pesticides and pesticide application?

SFGH pays \$1700 per year for contracted structural pest control services. This includes all site visits and materials used (almost exclusively traps and baits). Each month every building is fully inspected, with some areas (i.e.: the cafeteria) receiving more frequent attention. This does not include labor or materials for large-scale pest exclusion jobs. In addition, the Department of Public Health (of which San Fran-

cisco General Hospital is one facility) contributes \$17,000 annually to the Citywide IPM program to help fund staffing, training and pest management consultant services.

What would have made your transition easier? What types of assistance would be useful to you now in implementing IPM?

Persistent leadership and thorough staff trainings facilitated our transition. At this point two things would make IPM easier to implement: extensive building renovations and replacement of temporary labor with permanent labor. Continually training new temporary workers is inefficient and prevents us from planning ahead.

What suggestions do you have for a health care facility that is just starting to make the transition?

The first and most important step is to designate a committed person who can effectively communicate the importance of IPM and provide leadership and oversight during the transition. To ensure your pest control contractor is committed to IPM, re-write your contract and carefully evaluate each service proposal. In-house, a plan must be developed to promote a top-down philosophy and bottom-up buy-in through trainings and incentives. Understand that changing behavior can be a long and frustrating process, and don't give up.

It is also critical to provide new tools and technologies, not just take away old ones. A great way to do this is talking to and visiting other programs. Don't try to re-invent the wheel!

Deanna Simon is the Toxics Reduction Specialist at the San Francisco Department of the Environment, 11 Grove Street, San Francisco CA 94102, 415-355-3707, deanna.simon@sfgov.org.

Endnotes

- 1 U.S. EPA. 2003. Tackling a Suspected Hazard of Aging. <<http://www.epa.gov/ord/archives/2003/september/htm/article1.htm>>.
- 2 U.S. EPA. 2002. "EPA Announces New Aging Initiative to Protect Older Persons From Environmental Health Threats." EPA Pesticide Program Update 10/31/02. Office of Pesticide Programs.
- 3 Department of Veterans Affairs. 1986. Pest Management Operations, Chapter 2. Environmental Management Service. February 3. p.5.
- 4 American Medical Association, Council on Scientific Affairs. 1997. "Educational and Informational Strategies to Reduce Pesticide Risks." Prevention Magazine 26:191-200. < <http://www.ama-assn.org/ama/pub/article/2036-2492.html>>.
- 5 American Hospital Association. 2001. Fast Facts on U.S. Hospitals from Hospital Statistics™. Chicago, IL.
- 6 CDC. 2002. "Hospital Utilization." National Center for Health Statistics. Center for Disease Control and Prevention. U.S. Department of Health and Human Services. Hyattsville, MD.
- 7 Vacco, D. 1995. Pest Management in New York State Hospitals: Risk Reduction and Health Promotion. Attorney General of New York State. New York State Department of Law. December 5; Duerhing, C. 1996. The Healthy Hospital Part Two: Pesticide Risks and Alternatives. Medical and Legal Briefs 2(1) July/August.

- 8 Vacco, D. 1995.
- 9 U.S. EPA. 2002. Chemicals Evaluated for Carcinogenic Potential.
- 10 U.S. EPA. 2003. Restricted and Cancelled Uses. Office of Pesticide Programs. <<http://www.epa.gov/pesticides/regulating/restricted.htm#canceled>>.
- 11 U.S. EPA. 2001. Diazinon Revised Risk Assessment and Agreement with Registrants. Office of Prevention, Pesticides and Toxic Substances. Washington DC. <<http://www.epa.gov/oppsrrd1/op/diazinon/agreement/pdf>>; U.S. EPA. 1999. Reregistration Eligibility Document Facts: Bendiocarb. Office of Prevention, Pesticides and Toxic Substances. Washington DC. <<http://www.epa.gov/oppsrrd1/REDS/factsheets/0409fact.pdf>>; U.S. EPA. 2000. Chlorpyrifos Revised Risk Assessment and Agreement with Registrants. Office of Prevention, Pesticides and Toxic Substances. Washington DC. <<http://www.epa.gov/oppsrrd1/op/chlorpyrifos/agreement.pdf>>.
- 12 American Hospital Association. 2000. Certified Healthcare Environmental Services Professional: Candidate Handbook. American Hospital Association Certification Center. Chicago, IL.
- 13 American Society for Healthcare Environmental Services. 2000. Integrated Pest Management (IPM). Professional Development Series. American Hospital Association. Catalogue No. 197107. June.
- 14 American Society for Healthcare Engineering. <<http://www.hospitalconnect.com/ashe/recognition/sustainable.html>>.
- 15 Hospitals for a Healthy Environment. 2002. <<http://www.h2e-online.org/tols/chem-ipm.htm>>.

Synergy: The Big Unknowns of Pesticide Exposure

Daily combinations of pesticides and pharmaceuticals untested

By John Kepner

Pesticide exposures in the real world are not isolated incidents. Rather, they are a string of incidents marked by combinations of exposures. As a result, scientists have argued for years that toxic exposures to pesticides should be measured as they would normally occur, in combination with one another. Yet, current federal law does not require this type of testing for pesticides on the market, except in very limited instances. This issue has been fueled during the recent West Nile virus spray programs by researchers at Duke University's School of Medicine, who found that exposure to a popular insect repellent when combined with exposure to a popular insecticide caused a synergistic, or magnified, effect greater than the individual chemical effects added together. The debate has also heated up around the question of potential interactions between pesticides and pharmaceuticals. A law requiring the testing of drug-pesticide combinations was adopted by Congress and then dropped by the Food and Drug Administration (FDA) in the 1960's.

How much do we really know about the pesticides that are widely used in our communities, schools, homes, offices, hospitals, parks, on lawns and golf courses and in West Nile virus and other mosquito spray programs? Not as much as we should be able to make sound decisions that are protective of public health and the environment. Sometimes limitations in protection are a function of a regulatory failure to carry out the mandate of a federal statute. But, in this case, the underlying statutes that govern pesticide use, allowable residues (and exposure), and risk assessment are wholly deficient. The laws simply do not require testing that is ultimately essential in determining the safety of pesticide use, as typically used every day. No amount of improved enforcement of law or additional dollars for EPA will correct this situation until the mandates in law change.

This piece by John Kepner tracks the current situation and history on this critical issue of public health and safety. It leaves us with a greater sense of the importance of efforts to eliminate on a daily basis exposure to pesticides and opt for alternative pest management approaches that do not rely on pesticides. The burden must shift to those who want to use pesticides to show that basic questions of health protection have been answered. Pointing to a pesticide label or citing an EPA pesticide product registration is no assurance of safety. —JF

Introduction

In the summer of 2001, the mosquito-borne West Nile virus hit Maryland. As the media fueled a local panic, the Maryland Departments of Health and Agriculture worked together to monitor, treat, contain and eradicate the disease. Permanone, a synthetic pyrethroid-based insecticide containing the active ingredient permethrin, emerged as the pesticide of choice for combating the adult mosquitoes that could be carrying the virus. Aside from spraying Permanone from foggers mounted on the backs of trucks, the state also instructed its residents to empty standing water on their property to reduce mosquito breeding grounds, and encouraged residents to use mosquito repellants containing the active ingredient N, N-diethyl-m-toluamide (DEET).

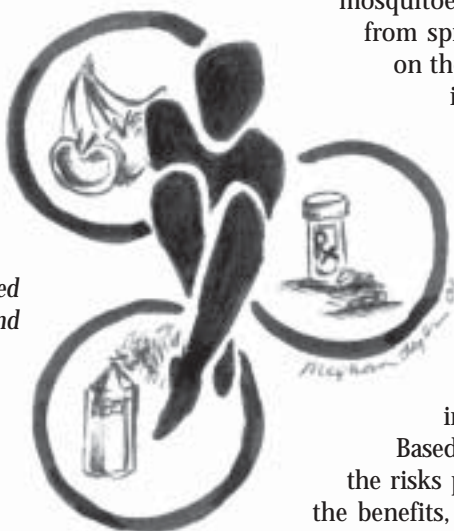
Both DEET and permethrin are registered as pesticides by the Environmental Protection Agency (EPA) and have been, or are in the process of being, individually tested for adverse health effects.

Based on these results, EPA has determined that the risks posed by these pesticides do not outweigh the benefits, namely killing and repelling mosquitoes.

However, many of the residents of Maryland will not be exposed to these pesticides individually. Real world pesticide exposures rarely occur as individual, isolated incidents. Many residents could have applied DEET to their bodies as recommended by the state when the mosquito trucks fog their neighborhoods. Or because permethrin has a half-life of 30 to 38 days, they could be exposed to the combination anytime they are wearing DEET for weeks to come. Although not all pesticide combinations show increased toxicity, recent studies out of Duke University's School of Medicine suggest that the residents of Maryland should be concerned about the potentially damaging synergistic effects of this particular pesticide combination. These studies will be discussed in greater detail below.

What is synergy?

The concept of interaction is fundamental to understanding the processes by which chemical mixtures act. If the effect is simply additive, the sum of the effects is the same as if we were exposed to each chemical individually. Synergy occurs when



the effect of a mixture of chemicals is greater than the sum of the individual effects.¹ (If the effect of a mixture is less than the sum of the individual effects, it is called antagonism).

For example, a population exposed to neither "Pesticide A" nor "Pesticide B" experiences a background level of a certain health effect at 5%. In a population exposed only to "Pesticide A," the effect is seen at 10% (5% + the 5% background). In a population exposed only to "Pesticide B," the effect is seen at 20% (15% + the 5% background). If the two pesticides are simply additive, and not synergistic, we would expect the effect to be observed at 25% (5% + 15% + the 5% background). If the observed effect is greater than 25%, the combination is synergistic.

Prior to 1957, the combined effects of exposure to a group of pesticides was assumed to be additive. However, a study² published that year documented for the first time a case of pesticide synergy. The authors postulated that the combined effects of exposure to the organophosphate insecticides ethylp-nitrophenyl benzenethiophosphate (EPN) and malathion would be additive. Instead, there was a 10-fold synergistic effect in rats and a 50-fold synergistic effect in dogs for the acute toxicity of EPN and malathion administered simultaneously.

Regulatory history

Faced with potential interactions between pesticides and pharmaceuticals, the *Food, Drug and Cosmetic Act* was amended with the following in 1962: "Pesticide chemicals that cause related pharmacological effects will be regarded, in the absence of evidence to the contrary, as having an additive deleterious action. For example, many pesticide chemicals within each of the following groups have related pharmacological effects: chlorinated organic pesticides, arsenic-containing chemicals, metallic dithiocarbamates, cholinesterase-inhibiting pesticides." While this language assumed only additive and not synergistic effects, it still considered, for the first time, the adverse impact of cumulative chemical exposures. However, in 1967, FDA abandoned the regulation on the grounds that the "requirement has failed to serve any useful purpose."

During its first 85 years, federal pesticide law did not require testing for adverse health effects of pesticide combinations. In 1996, EPA was required for the first time to consider cumulative pesticide exposures in limited circumstances under the *Food Quality Protection Act* (FQPA). FQPA, which amends the *Federal Insecticide, Fungicide and Rodenticide Act* (FIFRA), recognizes that real-world pesticide exposures do not occur as single discrete exposures to a specific pesticide, but rather in combination to several pesticides at once. Considering dietary exposure alone, U.S. Department of Agriculture (USDA) data shows that apples surveyed from across the U.S. contained 22 different pesticide residues, and peaches surveyed contained 40 different pesticide residues. Many of these residues remain even after thorough washing and preparation of food.



To address the issue of multiple pesticide exposures, FQPA directs EPA to consider combinations of pesticides that have a common mechanism of toxicity when setting tolerances. This means that only if EPA determines that two chemicals have the same toxic mechanism in the body will the agency aggregate the exposure value in its risk assessment calculation. The first result of this mandate was released in June 2002 when EPA published its *Revised Organophosphate Cumulative Risk Assessment*,¹⁴ in which the agency examined the combined hazard of exposure to all organophosphate pesticides. Although the report was seen as incomplete by the environmental community and criticized by FIFRA's Scientific Advisory Panel, the intent of the report is an important first step in evaluating the combined effects of several pesticides. Unfortunately, the current *Guidance on Cumulative Risk* requires that only chemicals sharing both a common toxic effect and a common mechanism of toxicity be considered in determining pesticide tolerances. In the real world, a liver cannot tell the difference between two cancer-causing chemicals because of the biochemical route each chemical takes to cause that cancer. In other words, if a number of pesticides and other substances cause liver cancer via a number of different pathways, the end result is the same,

a diseased liver. EPA should not use common mechanisms of toxicity as a filter to decrease the number of chemicals it considers. This leaves the majority of potential pesticide interactions untested and potentially dangerous.

Medical studies: proof of pesticide synergy

While the first study showing pesticide synergy was published in 1957, the topic has not been studied at the level necessary to adequately inform officials making decisions regarding human health. Despite the lack of depth, many studies demonstrating synergy between pesticides and other commonly used chemicals have been documented in medical literature. In the late 1960's and early 1970's, researchers Samuel Epstein, MD, at the time with the Children's Cancer Research Foundation in Boston, MA and Keiji Fujii, MD, of the National Institute of Hygienic Sciences in Tokyo, Japan published a series of papers^{3,4} on the synergistic effects of carcinogens and co-carcinogens found in a variety of common pesticide products. "Co-carcinogens" is a term used to describe non-carcinogenic chemicals that increase the rate of cancer when used in combination with carcinogens. These papers highlighted carcinogenicity between two chemicals used in combination, even when the individual dosages were applied at sub-carcinogenic levels. One study produced the effect even when the chemicals were applied as far as 200 days apart.

Much of the latest research on the synergistic effects of pesticides used in combination has come out of the Duke University Medical Center in Durham, NC. In 2001, researchers in the Department of Pharmacology and Cancer Biology published

a series of papers in the *Journal of Toxicology and Environmental Health* and *Experimental Neurology* looking closely at the synergistic health effects of DEET, the active ingredient in most insect repellents, and permethrin, a pesticide commonly used in community mosquito spray programs, as well as many household bug killers.

To determine the effect of subchronic dermal application of these chemicals on the brain, the researchers evaluated neurological indicators after daily dermal doses of DEET, permethrin or a combination of the two pesticides for varying periods of time, from 24 hours to 60 days. The neurological indicators included: sensorimotor performance and permeability of the blood-brain barrier,⁵ increased urinary excretion of 6B-hydroxycortisol (a marker chemical poisoning),⁶ release of brain mitochondrial cytochrome-c (a result of cell death)⁷, and diffuse neuronal cell (cells specialized to conduct nerve impulses) death and cytoskeletal (structural components of the cell) abnormalities.⁸ In the first study, DEET alone caused a decrease in the permeability of the blood-brain barrier and impairment of sensorimotor performance, and permethrin alone



showed no effect. In combination, the effect on the blood brain barrier and sensorimotor performance was amplified, a “0+1=2” example of pesticide synergy. This “0+1=2” pattern was also seen in the study examining increased urinary excretion of 6B-hydroxycortisol. When the researchers looked at the release of cytochrome c as an indicator of brain cell death, no effect was seen when the pesticides were used individually. However in combination, a significant increase in the release of cytochrome c was seen 24 hours after dosing, a “0+0=1” example of pesticide synergy. In the study examining neuronal cell death, damage was seen in all treatment groups, but was accelerated in rats treated with both DEET and permethrin.

The purpose of the Duke studies was to determine a possible link between pesticides and other chemicals used during the Persian Gulf War and “Gulf War Syndrome,” neurological disease characterized by headache, loss of memory, fatigue, muscle and joint pain, and ataxia, which causes an inability to coordinate muscular movements. The first work in this area by this team of researchers, published in 1996, studied the combination of DEET and permethrin with pyridostigmine bromide, a drug taken prophylactically to counteract toxic gas warfare agents.⁹ The study found that test animals exposed to the three chemicals in combination experienced neurological deficits similar to the symptoms of the Gulf War veterans. However, when the chemicals were administered alone, even at doses three times the level soldiers received, no effects were observed, a “0+0+0=1” effect. The researchers theorized that many of the symptoms might be seen without the pyridostigmine bromide and continued to study the interactions of DEET and permethrin.

Neurology experts give three possible reasons for the synergistic effects seen in the above experiments. First, the stress endured by animals when exposed to a combination of chemicals undermines the protective role of the blood brain barrier, allowing the level of toxics to cross into the brain to be 100 times higher. Second, tissue that has been exposed becomes more sensitive and receptive to other toxic substances. Third, certain chemicals bind to enzymes that detoxify the body, making the enzymes unavailable to protect the body from other intruding chemicals. Dr. Goran Jamal, a neurologist at the West London Regional Neuro-Science Center of the Imperial College of Medicine, makes the following comparison, “It’s like releasing 200 criminals in London and taking away the police officers that are usually on duty. There is bound to be some damage.”

Conclusion

Synergistic effects between multiple pesticides and/or other chemicals represent one of the greatest gaps in EPA’s ability to protect the public from the adverse health effects associated with pesticide use and exposure. The U.S. government recognizes that pesticide exposures occur in combinations and not as unique events, yet has rules and regulations to test only a

Pesticide-Drug Synergy

In the summer of 1985, 30 year-old Thomas Latimer was leading a good life in the suburbs of Dallas, TX. He was a vigorous, athletic man with a promising engineering career. On one particular Saturday afternoon, Mr. Latimer spent the day mowing the lawn, picking up the clippings and edging the walkways. After about an hour, he began to feel dizziness, nausea, tightness in his chest and a pounding headache. Ten days later, he felt even worse and went to see his doctor.

Over the next six years, Mr. Latimer found himself unable to exercise and suffering from brain seizures. He visited 20 different doctors and underwent numerous tests to determine the source of his medical problems. His symptoms were consistent with organophosphate poisoning, most likely from the insecticide diazinon that had been applied to his lawn. But because his symptoms were so severe and the amount of pesticide he was exposed to was so low, the doctors continued to look for a complicating factor. After further research, a toxicologist, three neurologists and two neuro-ophthalmologists all concluded independently that the popular ulcer drug Tagamet that Mr. Latimer was taking had suppressed his liver, making him more susceptible to pesticide poisoning.

Alfredo A Sudan, a professor of neurology and ophthalmology at the University of Southern California, who conducted extensive tests evaluating an eye disorder that Mr. Latimer developed, estimates that taking a medication like Tagamet “can make a person 100 to 1,000 times more sensitive to organophosphate poisoning.”¹⁰

limited number of possible interactions. Given that there are over 875 active ingredients currently registered for use, it would be impossible to test all possible combinations, but we must start somewhere. One approach would be to prioritize pesticides most likely to act in combination. The following recommendations would serve as a basis for beginning to look at this very important aspect of pesticide safety:

- **Test for interactions between pesticides commonly used in combination in both agricultural and non-agricultural settings.** This would include testing of groups of pesticides that are commonly used on the same crops, like atrazine and chlorpyrifos, the most common herbicide and insecticide applied to corn.¹¹ Another example would be DEET, used as an insect repellent and permethrin, used as a mosquito fog.
- **Test for interactions between agricultural pesticides and the most persistent food contaminants.** FDA data shows chlordane, DDE (a breakdown product of DDT), DDT, dieldrin, dioxin, endrin, heptachlor, hexachlorobenzene, and toxaphene are frequent contaminants of the typical U.S. diet.¹²
- **Test for interactions between the pesticides that most commonly contaminate drinking water.** Like all pesticide use patterns, water contamination will vary greatly around the country, so it is imperative that these combinations are tested for synergistic effects. The Wisconsin State Laboratory of Hygiene has found 14 different pesticides contaminating state water supplies.¹³
- **Test pesticides that are most likely to drift and cause non-target exposure.** Based on formulations and methods of application, pesticides often drift far from their point of application. A July 2000 survey of air samples

in Fresno, CA, on four separate sampling dates, detected carbaryl, chlorpyrifos and trifluralin.¹⁴

- **Test interactions between the most common pharmaceuticals and the most common pesticides.** According to the National Defense Research Institute, DEET has been reported to accelerate the dermal absorption of pharmaceuticals and possibly other pesticides.¹⁵

Recognizing the unlikely reality of testing even the most common pesticide combinations, another approach would be to reduce pesticide risk by limiting exposure. When weighing the benefits of a pesticide against the risks to public health, we must err on the side of safety. In registering pesticides, EPA should assume interactions between chemicals will occur. Limiting exposure, and therefore limiting synergistic health effects, could be accomplished through decreased pesticide use and tighter restrictions to minimize pesticide drift and runoff. For example, ban drift-prone application technologies, like cropdusting and ultra-low volume foggers; establish buffer zones around populated areas; require notification to nearby residents before a pesticide application, so appropriate precautions may be taken; and encourage lower exposure formulations such as containerized baits. By taking the appropriate steps, we could minimize harmful synergistic health effects.

Overall, this deficiency in data and the difficulty associated with its collection calls for a national policy of pesticide use reduction and national adoption of the Precautionary Principle that seeks to avoid pesticide use in favor of alternatives.

John Kepner, project director at Beyond Pesticides, has been with the organization since 1999. He graduated with a B.S. in biology from Pennsylvania State University minor in Human Environmental Relations in 1998.

Endnotes

For a fully cited version of this article, see www.beyondpesticides.org.

- ¹ Working Group on Synergy in Complex Mixtures, Harvard School of Public Health. 1986. Synergy: positive interaction among chemicals in mixtures. *Journal of Pesticide Reform*, Summer.
- ² Frawley, J.P., et al. 1957. Marked potentiation in mammalian toxicity from simultaneous administration of two anticholinesterase compounds. *J. Pharmacol. Exper. Therap.* 121:96-106.
- ³ Epstien, Samuel S., et al. 1967. Synergistic toxicity and carcinogenicity of freons and piperonyl butoxide. *Nature*, 214:526-528.
- ⁴ Epstein, Smauel S. and Keiji Fujii. 1970. Synergism in Carcinogenesis with particular reference to synergistic effects of piperonyl butoxide and related insecticidal synergists. *Chemical Tumor Problems*. Ed. Nakahara, W. Tokyo: Japanese Society for the Promotion of Science, 1970.
- ⁵ Abou-Donia, M. B., et al. 2001. Effects of daily dermal application of DEET and permethrin, alone and in combination, on sensorimotor performance, blood-brain barrier, and blood-testis barrier in rats. *Journal of Toxicology and Environmental Health* 62:523-541.
- ⁶ Abu-Qare, Aqel W. and Mohamed B. Abou-Donia. 2001. DEET (N,N-Diethyl-m-Toluamide) alone and in combination with permethrin increased urinary excretion of 6B-hydroxycortisol in rats, a marker of hepatic cyp3a induction. *Journal of Toxicology and Environmental Health* 64:373-384.
- ⁷ Abu-Qare, Aqel W. and Mohamed B. Abou-Donia. 2001. Combined ex-

posure to DEET (N,N-Diethyl-m-Toluamide) and permethrin-induced release of rat brain mitochondrial cytochrome c. *Journal of Toxicology and Environmental Health* 63:243-252.

- ⁸ Abdel-Rahman, Ali, et al. 2001. Subchronic Dermal Application of N,N-Diethyl m-Toluamide (DEET) and Permethrin to Adult Rats, Alone or in Combination, Causes Diffuse Neuronal Cell Death and Cytoskeletal Abnormalities in the Cerebral Cortex and the Hippocampus, and Purkinje Neuron Loss in the Cerebellum. *Experimental Neurology* 172:153-171.
- ⁹ Abou-Donia, M.B., et. al. 1996. Neurotoxicity resulting from coexposure to pyridostigmine bromide, DEET, and permethrin: Implications of Gulf War chemical exposures. *J. Toxicol. Environ. Health* 48:35-56.
- ¹⁰ Allen, Frank Edward. 1991. One Man's Suffering Spurs Doctors to Probe Pesticide-Drug Link. *The Wall Street Journal*. October 14.
- ¹¹ U.S. Department of Agriculture. 2002. Agricultural Chemical Usage 2001 Field Crops Summary. <<http://usda.mannlib.cornell.edu/reports/nassr/other/pcu-bb/agcs0502.txt>>
- ¹² Schafer, K. S. and S. E. Kegley. 2002. Persistent toxic chemicals in the U.S. food supply. *J. Epidemiol. Community Health* 56:813-817.
- ¹³ Wisconsin State Laboratory of Hygiene. 2002. Pesticides in drinking water. <<http://www.slh.wisc.edu/ehd/pamphlets/pesticide.html>>
- ¹⁴ Environmental Working Group. 2001. Every breath you take: airborne pesticides in the San Joaquin Valley. <<http://www.ewg.org/reports/everybreathyoutake/everybreath.pdf>>
- ¹⁵ Cecchine, Gary, et. al. 2000. *Review of the Scientific Literature as it Pertains to Gulf War Illnesses, Volume 8: Pesticides*. RAND.

Getting The Dirt On Good Soil

Building healthy soils is the foundation for pest prevention

by Hendrikus Schraven

Over the past three decades, Hendrikus Schraven has mastered the way to nurture organic, living fertilizers and soils and their vital microorganisms. From those soils, he has created compost teas that can regenerate life on spent and poisoned landscapes and repair stripped hillsides whose landslides create immeasurable losses.

Hendrikus has come a long way. He grew up on an organic farm in Holland and carried with him an ingrained understanding about the necessity to maintain nature's balance. In 1972, he and his partners created a landscaping construction and design company and when he could not find organic soils on the market, he took to concocting them in his garage in Seattle, WA. Today he has three companies under The Hendrikus Group, that together offer solutions to one of society's most pressing environmental challenges – land management. His techniques have been employed in some 60 countries and in the U.S. by homeowners, farmers, states and municipalities. Hendrikus swears that if people would just pay attention and learn from the earth, "We can eliminate by 90% all the chemicals used on this planet tomorrow!" Below are excerpts from a talk Hendrikus gave about his approach and technologies at Beyond Pesticides' 21st National Pesticide Forum – *Toxics in the Age of Globalization* last April for a workshop titled, *Global Ecology and The New Age of Solutions*. —S.H.

If you have to wear gloves, glasses and a mask to make things grow, something is just simply wrong. We have been brainwashed. The majority of the population has become comfortably numb. They see these ads and they never question. And their kids are going to play right there?



Homeowner applies liquid compost, or compost tea, to backyard foliage.

“If you have a healthy system, you don’t get diseases. And if you don’t get diseases then you don’t need the pesticides and herbicides to control them. Start with the solution.”

The evolution of soil and invasive plants

Seattle has a lot of slopes. We've had a lot of landslides in the Northwest, all the way from Cancún to British Columbia. And it will keep happening as the weather patterns keep changing and we create more run off because we create more hard surfaces. When landslides happen, that soil goes all the way back to where it was when the ice age occurred.

This is how evolution works. The ice age came by, then retreated, and so you have soils that are so compacted it's unbelievable. Billions of tons of ice crushing and compacting the soils. The only thing that can grow in a little crack is a weed. Eventually it dies and that little area becomes slightly organic matter. And this happens again and again until that little area of organic matter becomes large enough for another specie to thrive because that plant has done its job. That's the evolutionary state of this planet. Finally you get trees like cottonweeds and alders, that grow fast, die fast and in that process create what's called nitrogen – a very needed form of food for most of the plants

on this planet. That's how nature repairs its own wounds.

Now what happens when the highway departments do their cuts for the roads or create what's called the ice age? Then you see a lot of hydro seeding. That's where they blow grass [on the slope] and the majority of it fails. What do you get next? Noxious weeds. That's nature's way of dealing. If you're getting noxious weeds, basically your soil is bad. So all these chemicals are developed to fight all the diseases that originate because we have a bad practice to begin with.

What happens on a slope when all of a sudden it's a straight drop, with no plant growth on it? Rains come and everything washes down – it's all sedimentation. Keep that in mind for a minute. Then if you try to hydro seed something like that, those seeds say, "You must be kidding me! I can't grow on this crap." Half of it slides down [the slope] and the other half is treated with chemicals because of all the noxious weeds. So what do you think happens in that sedimentation? Oxidants. Loads of them. Where do they go? Right down to the streams, lakes, and right into the oceans.

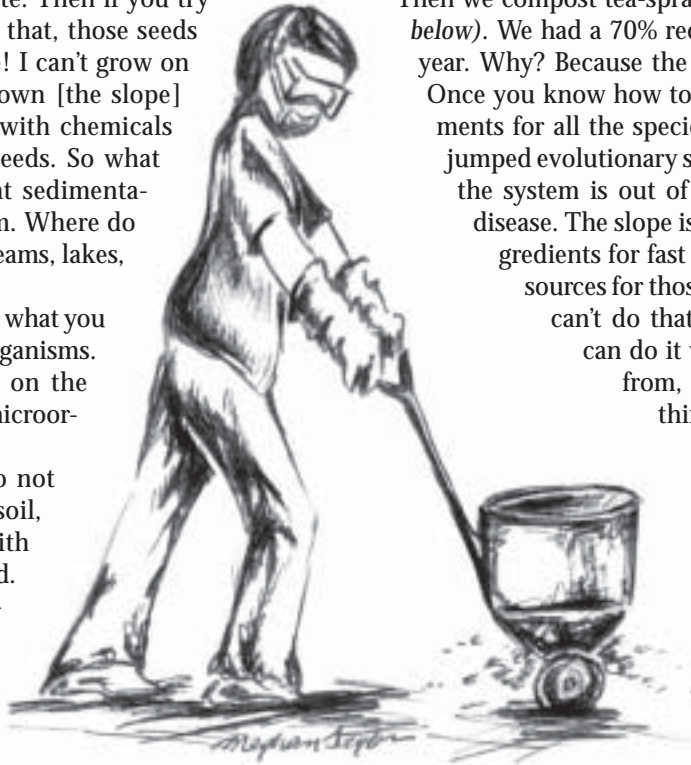
If you took a handful of soil, what you have is a few billion microorganisms. Now if you take all the soil on the planet, you know how many microorganisms you have? A lot!

This is your life. If you do not have microorganisms in your soil, they can't provide the plant with minerals you need in your food. Why do you think you're buying mineral supplements? Because they're not in your food. Because your food is grown chemically. And chemically is just like you and me drinking a cup of coffee. If you feed a plant chemicals, it just absorbs those chemicals. It doesn't know the difference, it just wants food. You and me, we're tired so we drink a cup of coffee. And then we're temporarily not tired anymore; we've fooled our system. But what happens if you kept that up, if that's all you lived on? Your immune system is going to break down. You get disease and sickness. See, we function exactly the same as this world.

New air replacement technology

So you have a huge landslide. I developed a way of blowing the soil back on the hill. We put the layer of soil back on those slopes, with 100% organic mineral, no chemicals, and it stays on the slopes. Rain can pour down and it won't slide or run. And you have an inoculator for life. We do in one day what it would take nature thousands and thousands of years to do. Obviously we never have to use chemicals because it's already a healthy system.

In Seattle, they were blasting herbicides for noxious weeds on both sides of a dam four times a year. And it goes right into the drinking water. They said, 'Oh god we really don't want to do that, what are we going to do?' They said they couldn't



afford this, couldn't afford that – because you know governments, they can't afford anything except bombs. We actually grew compost on the entire area, a layer about an inch thick.

Then we compost tea-sprayed it (*see compost tea discussion below*). We had a 70% reduction in noxious weeds in one year. Why? Because the weeds weren't needed anymore. Once you know how to provide nature with the supplements for all the species to take hold of, you have just jumped evolutionary stages by leaps and bounds. When the system is out of whack, out of balance, you get disease. The slope is now bio-stable. It has all the ingredients for fast root expansion and life and food sources for those microorganisms to survive. You can't do that everywhere. But hopefully you can do it where our drinking water comes from, and our lakes, rivers and everything else.

What do you do on these slopes in cities with development? You educate them about the right installation so that pesticides never have to be used. I've done this for 30 years, and proven that it functions well and is cheaper than anything else.

Compost tea

Let's move on to microbial inoculation. So we got into compost tea. A good compost means that the process has gone through a microbial process. That's the reason compost gets hot. If I told you all to get up and start running inside this room, for half an hour, the temperature is going to rise in this room. Same thing happens in the compost. All those microbes are working overtime, and it gets hot in there. You stick your hands in there, and you can almost burn yourself. It's anywhere between 132-165 degrees. Then you need to turn it because oxygen is needed. You turn your compost pile, and the process starts again. Do it four, five sometimes six times and all of a sudden your compost is done. You

have all these beneficial guys that are supposed to be in a healthy system living in there. Then you take that compost, put it in a brewer, and you brew tea.

It's safe and non-toxic to animals, you can spray it and you don't have to wear gloves or a mask. It's non-toxic to beneficial insects and soil and safe for our salmon lakes and streams. And it's safe for our food. We can spray it on our food

and farmlands. Lots of Washington farmers have gotten huge brewers and basically hooked it up to their irrigation system, just like they used to do with chemicals.

Albert Einstein said, "You can't solve a problem in the same state of thinking you were in when you created it."

Hendrikus Organics, my company, offers a whole program. We set it up and we do hundreds and hundreds of tests and guarantee that the system we sell works. That's our answer to the problem. You have all sorts of diseases depending on the soil and climate, but 80-90% of those diseases would never occur if the process was right. That other 10% can easily be dealt with in an environmentally safe way. We use 70% less water with this type of technology. There's less disease, no pesticides, and of course, the soil is more durable.

People have to get out of the rut of looking at a particular thing the same way. We have to get into a different dimension. Nature tells us so many things. As kids we'd watch swallows – if they flew low we were going to get rain, if the swallows flew



Rich soil contributes to plant health and eliminates the need for pesticides.

high we knew we'd have sunny weather. How do the birds know that? Well it's all common sense. If you have high pressure or low pressure, the birds are either going to fly low to pick up the insects, or the insects are going to be higher up in the air and the birds then fly high. The birds and insects are never wrong. The weatherman is, but the birds are not. So once we start listening a little more to nature, it starts to tell us things.

Hendrikus Organics and The Hendrikus Group can be contacted at 1-888-828-9977 or by internet at <http://www.hendrikusorganics.com>. Hendrikus Organics sells organic fertilizers, soil amendments and compost teas as well as brewers, soil installations, landscaping, and other services.

What is compost?

Compost is a mixture of decaying, or decomposing, vegetation and manure, which is then used as fertilizer. The compost heap in your garden, made from grass clippings, leaves, egg shells, potato peels and other common vegetation, is an intensified version of nature's rebuilding process.

What is compost tea?

Compost tea is an aerobically brewed liquid extract made from compost. Compost tea contains beneficial microorganisms and nutrients essential for plant and soil health.

What is the difference between compost and compost tea?

Compost is a solid. Compost tea is a liquid and contains a higher concentration of microbes. Whereas compost will not cling to leaves, compost tea can be applied to leaves, twigs, bark and soil using a pump spray device or sprinkler. Both are very important tools.

What are the benefits?

Benefits include improved soil structure, retention of nutrients, cycling of nutrients into plant available forms, and reduced plant stress. Disease organisms may be displaced by the normal set of soil or foliar organisms in the tea leading to healthier plants, improved growth and soil. It is non-toxic and safe to family and pets. Compost tea breaks down compacted soils with repeated use, letting

roots grow into the soil more easily, find more nutrients, and aerate the soil so conditions do not attract diseases or allow toxic metabolites of anaerobic organisms to build up. It puts the micro-biology back into the soil that has been removed from over-development and chemical application practices.

Why are microbes important?

Bacteria and fungi retain nutrients in the soil. Protozoa and nematodes make nutrients available to plants and turf; both groups also aid in blocking plant surfaces so non-beneficial organisms cannot gain access, and in consuming potential disease-causing organisms. Given the proper foods, and habitats in the soil, beneficial microorganisms outcompete non-beneficial microorganisms. All four groups of organisms play critical roles in building soil structure, maintaining aeration, and increasing water retention. Colonies of beneficial microorganisms will continue to live in soil as long as they are provided good conditions and organic food sources. Contaminants such as pesticides, herbicides, and air pollutants impact microbe lifespan and kill the normal set of organisms on leaf surfaces.

Will compost tea solve all my gardening /plant problems?

Compost tea is not a "silver bullet" for the problems in your yard. Other practices, such as organic fertilizing, soil amending, mulching, and aeration are also important to build and sustain a healthy garden. The soil, environmental and prior chemical conditions of your yard all play a role in its overall health.

Our Toxic World – A Wake Up Call: Chemicals Damage Your Body, Brain Behavior, and Sex

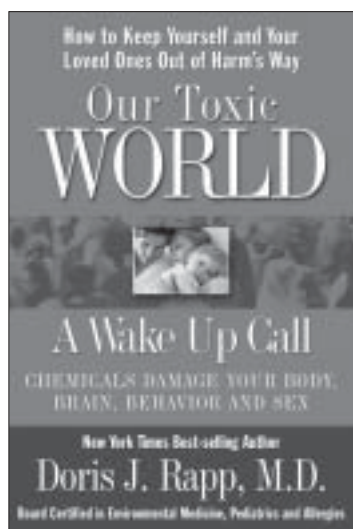
Doris J. Rapp, M.D.
(Personal Transformation Press, Penryn, CA.)
© 2003, 520 pages,
\$24.95.

There is no doubt that people's health is often compromised by exposure to chemicals and pesticides. But sometimes telling how, if, or when you are being hurt by toxins in your environment and what to do about it takes some special guidance. This book proposes to do just that. It is a remarkable source for all ranges of people with allergies or chemical sensitivities and their advocates as well as professionals who work with or treat such individuals. A blend of how-to and research, the book offers a pragmatic approach of how to identify and remove the cause of allergies and illnesses in one's environment, while also providing useful insights, methods, studies, statistics, and extrapolations into the world of environmental illness, pesticides and chemicals, scientific understanding, and government regulation.

Using various checklists, the author helps the reader ask practical questions to pinpoint the possible causes of illness and learn ways to avoid or remove these causes and their symptoms. A seeming motto for *Our Toxic World* could be: You don't have to "learn to live with it" but instead learn what it is and start living without it.

Dr. Rapp, a board-certified environmental medical specialist and pediatric allergist, has been identifying and treating the effects of allergens and environmental toxins on her patients for over

20 years. Her philosophy, revealed on her website and in her writing, is stemmed in the pursuit to help people and their loved ones find the source of their symptoms that other physicians often do not recognize or explore. Doris Rapp is the author of several books, including *Is This Your Child's World?*



The book is written in an easy-to-read style, using leading questions as headers, and reads like a personal conversation between doctor and patient rather than a dry medical text, which makes the information more accessible and engaging.

Besides the how-to sections, some of the more practical information addresses home indoor air suggestions, buying or remodeling a home, detection test-

ing and detoxifying methods, tables of common chemicals, chemical exposures, and more. The appendices also provide a plethora of resources ranging from health professionals and test centers to advocacy groups and products.

The author discusses a variety of allergy or chemical sensitivity testing methods, including the somewhat controversial Provocation/Neutralization Allergy Testing (P/N) method, which she prefers. P/N entails exposing a person to numerous allergens, documenting their response, then neutralizing any symptoms with a diluted version of the original exposure.

Perhaps most importantly, Dr. Rapp is not afraid to draw parallels and connections based on her own theories and medical experience and, when possible, supporting studies. By implicitly drawing correlations and asking pointed questions the author gets at the linkages between current trends in public health and our exposure to toxic chemicals. In doing so, she takes a leap that most scholars and physicians would never dare. Those who are already skeptical of pes-

ticides will appreciate the book's intuitive approach, criticism of government regulation, and advocacy for personal activism, proactivism, and reform.

This book is packed with information and is a well-cited resource useful for anyone interested in human health and exposure to chemicals. Dr. Rapp successfully combines over twenty years of professional medical experience and contacts with some of the latest research and statistics to shed greater light on our understanding of environmentally-caused allergies and illnesses.



My Insect Friends: An Earth-friendly Read, Learn and Color Book for Children and Grown-ups

Barbara Eaton, (Pigweed Press, Rootstown, Ohio) © 2003, 32 pages, \$7.95

This homespun children's coloring book provides an easy way for children to learn about the fun world of insects and develop an early appreciation. With excellent outlined illustrations of butterflies, caterpillars, ladybugs, ants, and many more, kids will enjoy the opportunity to use every crayon in their coloring box. The short story follows a young girl curious about insects and teaches the sounds or actions each one makes – like fireflies that rise and glow and crickets that chirp and lurk. Additional information for the whole family on touchable insects and pesticide hazards is provided in the appendix.

BEYOND PESTICIDES MEMBERSHIP & SUBSCRIPTIONS

- YES, make me a member of Beyond Pesticides (includes subscription to *Pesticides & You*).**
- \$25 Individual
 \$30 Family
 \$50 Public Interest Organizations
 \$15 Limited Income
- YES, I'd like to subscribe to *Pesticides & You*.**
- \$25 Individual
 \$50 Public Interest Organizations
 \$50 Government
 \$100 Corporate
- YES, I'd like to receive Beyond Pesticides' monthly *Technical Report*. \$20 with membership or subscription.**
- If outside the United States, please add \$10.00 each for memberships and subscriptions.

R E S O U R C E S

T-Shirts

- "Pollution Prevention Is the Cure." full color graphic on 100% natural organic cotton Patagonia™ T-shirt. Sizes S, L, XL, XXL. \$10 each; 2 for \$15.
- Beyond Pesticides' Praying Mantis T-shirt. Printed on slate blue, 100% organic cotton with soy ink. Sizes S-XL. \$15 each; 2 for \$25.

Books

- A Failure to Protect*. Landmark study of federal government pesticide use and pest management practices. \$23.00. *Summary and Overview* \$5.00.
- Unnecessary Risks: The Benefit Side of the Risk-Benefit Equation*. Explains how the EPA's Risk-Benefit Analyses falsely assume the need for high-risk pesticides, how "benefits" are inflated, how alternatives might be assessed, and the public's right to ask more from its regulators. \$10.00.
- Safety at Home: A Guide to the Hazards of Lawn and Garden Pesticides and Safer Ways to Manage Pests*. Learn more about: the toxicity of common pesticides; non-toxic lawn care and why current laws offer inadequate protection. \$11.00
- Voices for Pesticide Reform: The Case for Safe Practices and Sound Policy*. A study documenting stories of tragic pesticide poisoning and contamination, and successfully used alternatives that avoid toxic chemicals. \$20.00 *Summary: Voices for Pesticide Reform* \$5.00
- Poison Poles: Their Toxic Trail and the Safer Alternatives*. A study on the largest group of pesticides – wood preservatives, the contamination associated with treated wood utility poles and the available alternatives. \$20.00
- Pole Pollution*. Deals specifically with the wood preservative pentachlorophenol, and the EPA's shocking findings about its toxicity. \$7.00.

Back Issues

- Back issues of *Pesticides and You* \$2.00 each
- Back issues of *Technical Reports* \$1.00 each

Brochures (\$2.00 each; bulk discounts available)

- Least Toxic Control of Lawn Pests
- Agriculture: Soil Erosion, Pesticides, Sustainability
- Estrogenic Pesticides
- Pesticides and Your Fruits and Vegetables
- Pesticides – Warning: These Products May Be Hazardous to Your Health
- Pesticides in Our Homes and Schools

Testimony

- Lawn Care Chemicals, 3/28/90 or 5/9/91, \$4.00
- Federal Insecticide, Fungicide, Rodenticide Act (FIFRA), 4/23/91 or 6/8/93, \$4.00
- Food Safety, 10/19/89, 8/2/93, or 6/7/95, \$4.00
- School Environmental Protection Act (SEPA) 7/18/01, \$4.00
- School IPM, 6/20/91, 3/19/97, or 3/30/99, \$5.00
- New York City's Response to the Encephalitis Outbreak, 10/12/99 \$4.00
- Parents: Right-to-Know-Schools, 3/19/97 \$3.00

Publications

- Building Blocks for School IPM \$15.00
- Expelling Pesticides from Schools: Adopting School IPM \$15.00
- Beyond Pesticides' West Nile Virus Organizing Manual \$15.00
- Safer Schools \$5.00
- Healthy Hospitals \$5.00
- Least-Toxic Control of Pests \$6.00
- Community Organizing Toolkit \$12.00
- Model Pesticide Ordinance, Model School Pest Management Policy, Model State School Pesticide Law \$5.00 each
- Building of State Indoor Pesticide Policies* \$4.00
- The Right Way to Vegetation Management* \$4.00

Method of Payment: Check or money order VISA/Mastercard # _____ Expiration Date: _____

Name _____ Phone _____ Fax _____ Email _____

Title (if any) _____ Organization (if any) _____

Street _____ City _____ State _____ Zip _____

Quantity	Item Description (for T-shirts, please note size S,M,L,XL)	Unit Price	Total
1	MEMBERSHIP		

Mail to: Beyond Pesticides, 701 E Street SE, Washington, DC 20003

Tax-Deductible Donation: _____

Total Enclosed: _____

PLEASE JOIN US FOR
Unite for Change
New Approaches to Pesticides
and Environmental Health

The Twenty-second National Pesticide Forum

University of California, Berkeley • April 2-4, 2004

This national conference will feature sessions on: latest science, successful grassroots campaigns, corporate accountability, pesticides in schools, working with the labor movement, sustainable food systems, West Nile virus, social marketing, litigation for change, pesticide drift, body burden monitoring and home contamination. **For more information see www.beyondpesticides.org/forum.**



Featured Speakers



Sandra Steingraber, ecologist, author, and cancer survivor, is an internationally recognized expert on the environmental links to cancer and reproductive health. Her most recent work, *Having Faith: An Ecologist's Journey to Motherhood*, explores the intimate ecology of motherhood and serves as both a memoir of her pregnancy and an investigation of fetal toxicology. Dr. Steingraber's other books include *Living Downstream* and *Post-Diagnosis*.



Tyrone Hayes, professor of integrative biology at UC Berkeley, discovered that frogs exposed to very small doses of the herbicide Atrazine develop serious reproductive problems. Sygenta, Atrazine's manufacturer and funder of the research, offered him \$2 million to continue his research "in a private setting." Dr. Hayes declined and continued with his own funding.



Warren Porter is chair of the Department of Zoology at the University of Wisconsin – Madison. He found that mixtures of insecticides, herbicides



and fertilizers commonly used on lawns are capable of suppressing immune parameters, changing hormone levels, and altering aggression. Dr. Porter also discovered a link between miscarriages and low levels of lawn chemicals.



Robin Whyatt is a professor of clinical public health at the Mailman School of Public Health at Columbia University. Her research interest has been the effects of environmental exposures on women and children, including the developing fetus. Prior research evaluated the extent of pesticide exposure in the preschooler's diet.



Ignacio Chapela, a microbial ecologist at UC Berkeley, discovered that pollen had drifted several miles from a field of genetically modified corn in Chiapas to remote mountains of Oaxaca, landing in the world's last reserve of biodiverse maize. After reporting that the biodiversity could be lost, Monsanto attacked Dr. Chapela through a PR campaign to challenge his credibility.

Pesticides and You

Beyond Pesticides/
National Coalition Against the Misuse of Pesticides
701 E Street SE, Suite 200
Washington, DC 20003
202-543-5450

Non-Profit Org.
U.S. Postage
PAID
Washington, DC
Permit No. 345

Printed on 100% post consumer waste with soy inks. Cover on Quest™, 100% non-deinked, non-rebleached post consumer waste.

