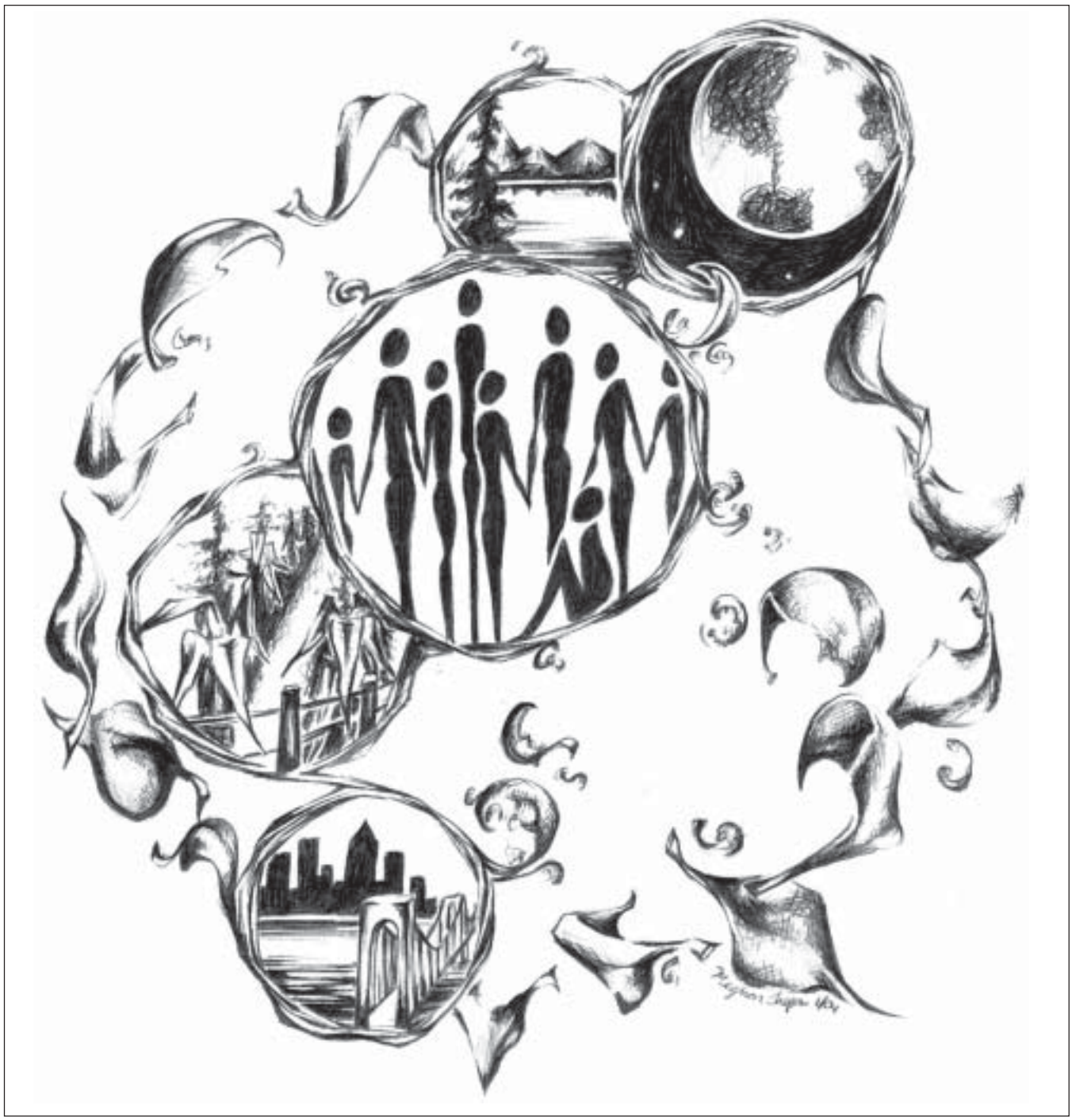
Volume 24, Number 1 Spring 2004

Pesticides and You

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



Contaminated Without Consent

Why our exposure to chemicals in air, food and water violates human rights

No Justice for Pesticide Victims • Do Pesticides Affect Learning and Behavior?
A Crack in the Wood Preservatives Case

Letter from Washington

What's the Chemical Lawn Care Industry Up To?

The poster reads "L*earn to Use Pesticides Safely*." If you walk into the EPA headquarters building in Washington, DC, go through the security checks and are escorted into the elevator up to the third floor, the first thing you see coming off the elevator in front of the office of the Assistant Administrator for Prevention, Pesticides and Toxic Substances is a poster with these words: "*Learn to Use Pesticides Safely*."

When I first saw that sign I was struck (again) by how EPA's pesticide program has misinterpreted its mission by not alerting the public to the real dangers of pesticides, and not providing the tools and guidance for alternatives. How can you use a pesticide safely (or as EPA says, in accordance with the label instructions), if the agency knows pesticides (i) have not been fully tested for health outcomes generally and for subpopulation groups specifically, (ii) could be synergistic with other chemicals, and (iii) are regulated by risk assessments that allow some rate of illness to occur, ignore exposure patterns outside an arbitrary norm, and have high uncertainty factors. That's just for starters.

Pesticides are poisons

A little further down the EPA hallway is another poster: "*Pesticides Are Meant to Poison These (insects), Not These (baby children)*." It was good to see EPA acknowledge that pesticides are poisons, if only subtlely. But the second part of the sign *should* read: and they poison babies every day too. The message is that pesticides only hit their target pest population, which EPA knows is untrue given pesticide drift and volatility. It also misleads the public into thinking that all insects are bad.

Toxic green lawns

Then the EPA notice arrived. EPA was announcing a conference in March at which it is hearing from the public and industry on draft *Lawn and Environment Guidelines* that have been in the works for over a year "to help develop a strategy for educating consumers about the proper use of pesticides and fertilizers, and how to conserve water and protect wildlife while maintaining a healthy and attractive home landscape."

EPA and the pesticide industry like to talk about the "proper use of pesticides." It is misleading. Terribly misleading. It is code for "safe" use of pesticides. But, neither EPA, nor the pesticide industry can describe their pesticides as safe under the *Federal Insecticide, Fungicide and Rodenticide Act* (FIFRA) because that would be a fradulent misrepresentation of the law's standard. The U.S. General Accounting Office has pointed this out and the Attorney General of New York and others have won cases on this. So, the implication of "proper use" is that if you follow the pesticide label, then you need not worry about adverse health or environmental effects. It means the consuming public and users of pesticides or services that use pesticides do not need to concern themselves with whether a pesticide is fully tested for impacts on their children, their pets, wildlife and the environment. It means that the public should not worry about whether there is a less toxic or better way to prevent, manage or live with the pest in question.

EPA's pesticide program views as one of its major responsibilities the quelling of public concern about pesticide hazards. Does the EPA say straightforwardly: Pesticides can kill you… cause cancer… damage your nervous system… destroy your immune system… harm your children's ability to concentrate and learn… cause respiratory illness… and toxic pesticides are unnecessary in managing pests in most situations and unwarrented, in light of their hazards, for cosmetic uses. No, EPA does not say this.

Greenwashing chemical lawn care guidelines

EPA and the pesticide industry imply that pesticides are both safe if properly handled and central tools for pest management. The pesticide industry has historically advocated for a weak statutory standard with high degrees of allowable risks and uncertainties, and then wants the public to believe that the resulting regulations will protect people and the environment fully. Guidance of this sort undermines efforts sweeping Canada and beginning in the U.S. to stop the unnecessary use of lawn and landscape chemicals, pesticides on school grounds, etc. The same pesticide industry that seeks to bathe itself in greenwash, by trying to link with environmentalists, has launched a major public relations effort organized by the Evergreen Foundation to combat "coordinated activist efforts to curtail or even eliminate pesticides and fertilizers…" At least two of the industry group participants in the lawn and environment guidelines, the Professional Lawn Care Association of America (PLCAA) and Scott's Company, are funding Evergreen.

While chemical industry groups lobby the outcome of legislation and regulations in an effort to protect their market share, they should not influence management guidelines such as these being developed, which should seek to eliminate use or dependency on toxic products.

Adding to the toolbox to phase out toxic and cosmetic pesticide use, this is an important issue of *Pesticides and You*, with articles by Sandra Steingraber and Warren Porter. These are extraordinary scientists doing work that should give anyone thinking of using lawn care chemicals the incentive to find another safer way, and soon.

And someday the EPA sign will read *Learn to stop using pesticides*.

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

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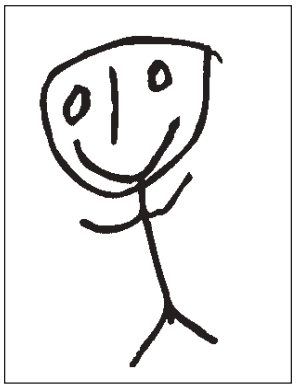

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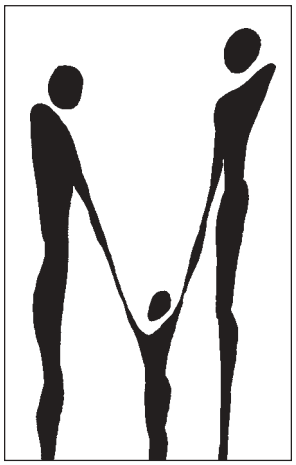

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Termite Trouble

Dear Beyond Pesticides,
I am about to buy a wood house that was built in the 1960's. The current owner told me about the huge amount of pressure that the termite inspectors will put on her to have the house tented and treated with the usual mix of poisons and chemicals for drywood termites. Are there any alternative methods that don't require the use of chemicals? Secondly, where can I find some literature about all pesticide-related issues and, most importantly, about all alternatives to toxic chemical use?

Daniele Luppi
Los Angeles, CA

Dear Daniele,
We are glad to hear of your effort to quell any insistence to use toxic chemicals. There are alternatives and we can help you show pest control companies what's out there, and point you to some companies that actually provide these non-toxic and least-toxic options.

It is important to use alternatives, since chemicals commonly used in drywood termite fumigation are extremely hazardous. Vikane, or sulfuryl fluoride, is a very common, and very hazardous, chemical used in termite fumigations. Residues of inorganic fluoride have been found on soft surface household items like rubber, feathers, rayon and wool as long as 40 days after fumigation. Exposure to sulfuryl fluoride is associated with depression, slowed gait, slurred speech, nausea, vomiting, stomach pain, itching, numbness, twitching, and seizures, as well as adverse effects to the nervous system, liver, and kidneys. Long-term exposure has been connected with weakness, weight loss, anemia, bone brittleness, stiff joints, and general ill health.

Drywood termite prevention entails filling in cracks or voids with expanding grout or high-grade caulk, and also caulking around sinks and bathtubs. In addition, install fan-powered kitchen and bathroom vents to control moisture. Eliminate dampness further by removing or fixing sources of water, such as leaky pipes and plumbing, leaky irrigation systems, and improper guttering and siding, and by repairing leaky roofs. Replace rotten or damaged wood using naturally insect resistant wood. Cover exposed wood with paint or sealant, such as one from AFM Safe Coat Paints, or Miller Paint. Screen windows, doors and vents with 20-grade mesh screen. Additionally, a desiccating dust such as diatomaceous earth can be used to prevent termite infestations. Desiccating dusts abrade the outer shell of the termites, causing them to dry out and die. They are also inorganic and not subject to decomposition, and should protect wood against termites for the life of the building. Avoid breathing in desiccating dusts, as they can cause lung irritation, and always wear a mask and goggles when applying.

If drywood termites have already been detected, removal of the infested wood or furniture is the quickest and easiest way to handle a localized infestation. Non-toxic options that some companies provide for controlling larger areas of infestation include the ElectroGun™, cold treatment, and microwaves. Least-toxic controls, including BoraCare® and Jecta®, are effective products for pre-and post-construction treatments to prevent and control termite infestations; Tim-bor® is an effect post-construction treatment.

Where can you find a company that offers these options? Check out Beyond Pesticides' Safety Source for Pest Management, our national directory of companies that provide least-toxic and non-toxic pest management. See www.beyondpesticides.org, or call Beyond Pesticides for more information.

Compost Complications

Dear Beyond Pesticides,
If I am using non-organic vegetable components in my compost, such as banana peels and coffee grounds, will any of the pesticides transfer to my organic garden? Thank you so much for your information.

Cale Plasket
via email

Dear Cale,
Organic gardening is a wonderful way to raise healthy fruits and vegetables, and connect with your surrounding environment in an earth-friendly way. While compost is a worthy component in any garden, making sure it is organic is important to ensure that your plants remain organic as well.

Why put in the effort to make organic compost? Research shows that composting is an excellent technique for pest prevention. It helps suppress plant disease, and creates a healthy soil that supports root systems and plants to better deter pest activity. This is great for your garden because it avoids the need for pesticides! However, don't mistakenly put pesticides or other toxics in your garden through your compost. Your organic compost heap should not contain coal ash, glossy magazines, or foods with possible pesticide residues. Also avoid placing weeds or plant matter that have been treated with herbicides in the pile. Do not use pet waste, since it can lead to the presence of harmful bacteria and parasites. Manure from barnyard animals such as horses, cows or sheep is acceptable.

To make a compost pile, set up a heavy chicken wire frame (this works well for a passive pile), build wooden or concrete-block bins, or buy a commercially made bin to hold your pile. Some commercial bins have built in rotating turners that will make your job much easier. The ideal size for an active compost pile is 4 feet by 4 feet, though size can vary.

Choose a location that is shady and well drained for your pile. Clear away any surface

cover at the site, loosen the soil with a spading fork, and put down a layer of wood chips or brush as a base. You can toss in garden or kitchen wastes, grass clippings, newspaper, manure, and sawdust. Avoid adding kitchen waste that is heavy in oil and meat products. Shredded materials make better compost more quickly. Try to alternate layers of plant material (chopped leaves or straw) with nitrogen-rich materials (kitchen scraps with manure and blood meal). Keep your pile moist, at a similar level to a squeezed-out sponge, and keep open piles covered with a tarp or heavy canvas so that they won't become waterlogged in the rain. If your pile becomes too dry, add water with kelp extract to moisten it and stimulate biotic activity. Turn your active pile regularly, mixing and loosening the materials with a spading fork, to prevent overheating and keep microorganisms happy and active. Ideal active compost temperature should be within 140° to 150°.

Your organic compost pile will yield rich humus that will be an ideal fertilizer to yo garden. It will save you the money of buying commercial, synthetic fertilizers, many of which have shown to contain toxic waste. Healthy soil makes for hardy plants.

Cracking Down on Lawn Care Chemicals

Dear Beyond Pesticides,
I am a member of a group in Canada, the Coalition To Ban Pesticides in Greater Moncton, which is fighting to have cosmetic lawn/landscape pesticides banned. We are currently working with our municipal government on implementing a ban. We are particularly interested in any resources you may have as related to lawn care pesticides and herbicides, scientific studies, and other information that supports the movement to ban cosmetic pesticides.

Armand Melanson
Moncton, Canada

Dear Armand,
It is great to hear of community groups such as yours that are taking the opportunity to put an end to senseless toxic chemical use. The movement to stop unnecessary chemical lawn care is growing, and with good reason. Annually, 67 million pounds of lawn pesticides are used in and around homes and gardens, and in industrial, commercial and government settings. Alarmingly, suburban lawns and gardens receive far heavier pesticide applications per acre than most other land areas in the U.S., including agricultural areas.

Worse yet, these hazardous chemicals that are continually applied to our lawns and gar-

dens have been found tracked into our homes. One recent study found residues of the toxic herbicide 2,4-D contaminating indoor air and surfaces, exposing children at levels ten times higher than preapplication levels.

Such widespread use and exposure is alarming, considering that of the 36 most commonly used lawn pesticides, 14 are probable or possible carcinogens. Additionally, 15 are linked with birth defects, 21 with reproductive effects, 24 with neurotoxicity, 22 with liver or kidney damage, and 34 are sensitizers and/or irritants.

Beyond Pesticides is working to halt such senseless exposure, and encourages use of least toxic and non-toxic lawn care practices. Activists play an extremely important role in lawn pesticide reform, and Beyond Pesticides continually provides resources to educate the public on the hazards of these chemicals and on existing alternatives to them. To aid activists in their effort, we have made available resources including testimony, fact sheets on pesticides and alternatives, peer-reviewed studies, model policies, and reports from the U.S. General Accounting Office, all of which support the platform that lawn care chemicals present an unnecessary risk and/or that viable and safer alternatives are readily available. See the "Lawn And Landscapes" section of www.beyondpesticides.org, or call Beyond Pesticides for further information.

Welcome

We would like to welcome Shawnee Hoover, Beyond Pesticides' new special projects director. Prior to joining Beyond Pesticides in September 2003, she worked on campaigns such as labeling for genetically modified organisms, corporate accountability, international fair trade and environmental justice. From 1998-2000 she worked with the International Forum on Globalization in San Francisco where she organized and participated in activist strategy meetings, media events, debates and teach-ins. Prior to that, she lived and worked in Zimbabwe as a journalist, in Guatemala as a grassroots development consultant, and worked for the private sector as an executive manager. Shawnee holds a Bachelors degree in international relations (1993) and a Masters degree from Columbia University's School of International and Public Affairs (2003).

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:

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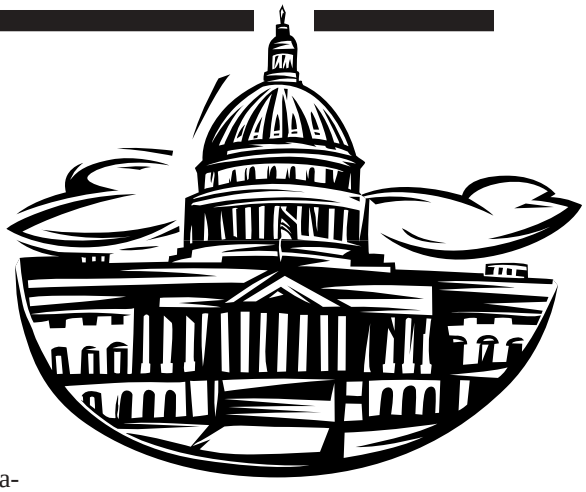


Farmworker Lawsuit Challenges Two Deadly Pesticides As Unnecessary

It is called a national disgrace. The farmworkers who grow the food that feeds our country have one of the most dangerous jobs in the U.S. The Environmental Protection Agency (EPA) estimates that farmworkers suffer between 10,000 and 20,000 incidents of pesticide-related illnesses every year, and acknowledges that this number is based on a severe underreporting of illnesses. To fight this trend, farmworker groups filed a lawsuit against EPA for approving the reregistration of two organophosphate pesticides, azinphos-methyl (AZM) and phosmet, that continue to poison workers, their children, communities and the environment. "It is outrageous that EPA authorized the use of these pesticides, putting thousands of workers at risk of serious illness every year," said Erik Nicholson of the United Farmworkers of America. "These two pesticides can poison so many farmworkers that EPA found the risks unacceptable, but the agency still allowed them to be used." The lawsuit was filed on January 14, 2004 in federal district court in Seattle by attorneys with Earthjustice, Farmworker Justice Fund, California Rural Legal Assistance (CRLA), and the Natural Resources Defense Council on behalf of Sea Mar Community Health Centers, United Farm Workers of America (UFW), Pineros y Campesinos Unidos del Noroeste (PCUN), Beyond Pesticides, and Frente Indígena Oaxaqueña Binacional. The plaintiffs claim that there are severe deficiencies in the re-registration of the two pesticides, and that EPA's cost-benefit analysis is skewed toward the estimated economic value of using the two pesticides. They further claim that EPA discounts the use of safe and proven alternatives and uses industry-generated data without subjecting it to the light of public scrutiny.

Stand-Alone Branch Office For Inerts Coming to EPA

You may have noticed that pesticide labels list both "active" and "inert" ingredients in pesticide products. While the active ingredients are the poisons specifically added to the product to kill the pest, inert ingredients often make up the largest percentage of the product, forming the solution, dust, or granule in which the active ingredient is mixed. In some cases, the inert ingredients are just as toxic as or more toxic than the active ingredient, yet the law allows these materials to remain undisclosed to the public because they are considered "trade secrets." Inert ingredients do require EPA approval to be used, however, the data required by EPA is much less stringent than it is for active ingredient chemicals. EPA allows products to be registered even though inert data may be lacking or inconclusive. In fact, of the over 2300 substances EPA believes are used as "inerts," over 1700 are classified as "of unknown toxicity," 209 are considered hazardous air and water pollutants (and/or hazardous waste), 14 have been assessed as extremely hazardous, 21 are known or suspected carcinogens, and 127 are regarded as occupational hazards, according to the 1998 report *Worst Kept Secrets: Toxic Inert Ingredients in Pesticides*, by Northwest Coalition for Alternatives to Pesticides (NCAP). Hundreds of inerts are considered active ingredients in other pesticide products. According to the electronic journal Pesticide.net, EPA's Office of Pesticide Programs is planning to open a separate regulatory branch within the next year to deal specifically with decade-long backlog of inert ingredients. Aside from receiving mounting pressure from industry to move the approvals along so new inert ingredients can hit the market, the recent implementation of the *Food Quality Protection Act* requires the agency to finally reassess tolerances for hundreds of food-use inerts, particularly for their toxicities to children, by August 2006. "Our goal is to put in place a dedicated infrastructure to review inerts," Betty Shackleford, deputy director of the Registration Division, told Pesticide.net. She added that it could take up to eight months to create the new department. In 1996, NCAP and Beyond Pesticides won a lawsuit against EPA to allow people to systematically know what ingredients are in specific pesticide product formulations, through the *Freedom of Information Act*.

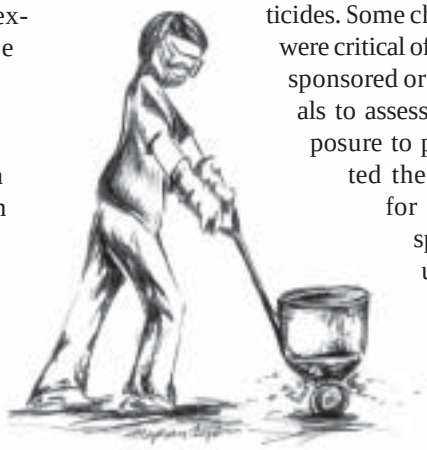
EPA Announces Industry-Environmental Guidelines on Lawn Care

After years of pushing chemical-based lawn care with little regard to the concerns of environmentalists, representatives from the lawn care and pesticide industries recently sat down with government agencies and environmental groups to develop voluntary guidelines for lawn care and the environment. While there were national environmental groups at the table, grassroots

activists question the timing of the guidelines, as they are emerging at a time when local ordinances or bylaws across Canada are outlawing the use of lawn chemicals for cosmetic uses due to their public health and environmental hazards. Activists believe the new agreement could undermine the push for cosmetic lawn care pesticide bans. Some industry groups involved with the guidelines have already formed a coalition to combat grassroots efforts to stop hazardous lawn care chemical use and restrict pesticide use under the *Endangered Species Act*. The guidelines will be released and discussed at a public conference in San Antonio, TX, March 14-17, 2004. Beyond Pesticides' executive director, Jay Feldman, urged environmental organizations and the public to carefully critique the guidelines to ensure that they support the tremendous momentum being made in the private sector marketplace to manage lawns and landscapes without dependence on pesticides. According to Mr. Feldman, "The focus of guidelines should be on educating consumers about the viability and availability of practices and services that do not utilize pesticides, not on 'proper use of pesticides,' which can still cause harm to human health and the environment." Beyond Pesticides points out that because chemical industry groups lobby the outcome of legislation and regulations in an effort to protect their market share, they should not influence management guidelines such as these which may seek to eliminate use or dependency on their toxic products. *For more information on lawns, landscapes and pesticides, see the Lawns and Landscapes issue page on the Beyond Pesticides' website at www.beyondpesticides.org, use the "Issues" pull-down menu.*

Environmentalists Sue EPA for Its Illegal Ties to Chemical Industry Group

In the category of news that should be shocking but has become commonplace in the Bush Administration, documents obtained under the *Freedom of Information Act* and other sources reveal that a corporate insider group has met regularly with EPA officials in secret and has urged the agency to weaken endangered species protections from pesticides. Conservation and pesticide-watchdog groups filed a lawsuit in federal district court in Seattle, WA on January 15, 2004 (Civ. No. CV04-0113C) to stop EPA from giving illegal special access to this group of chemical corporations, known as the FIFRA Endangered Species Task Force. The Task Force is pushing EPA to weaken pesticide safeguards by excluding expert biologists in the U.S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration (NOAA) Fisheries from consultations to determine the effects of pesticides on wildlife. At the companies' urging, EPA has started a rulemaking to reserve authority over such evaluations to itself. The *Federal Advisory Committee Act* prohibits the federal government from obtaining advice from committees comprised of only the regulated industry. That act also requires that the meetings of advisory groups are open to the public. "EPA has an open door policy to the biggest chemical companies in America while excluding the rest of us," said Mike Senatore of Defenders of Wildlife. "That's not right. In America all voices are supposed to be heard, not just wealthy interests that make campaign contributions." Natural Resources Defense Council (NRDC), the Center for Biological Diversity, Defenders of Wildlife, Washington Toxics Coalition, and NCAP, represented by Earthjustice, filed the lawsuit. On a related note, in February 2003, EPA revealed that it had been in discussions with the wood treating industry for over a year before releasing its risk assessment for the toxic wood preservative creosote.



Science Panel Says Pesticide Testing on Humans is Ethical

With a finding that has sent shockwaves around the world, the National Academy of Sciences (NAS) released a report stating that pesticide research using human test subjects is ethical. The issue of human testing has been hotly debated in recent years. In 1996, Congress passed the *Food Quality and Protection Act*, which tightened some safety standards on pesticides. Some chemical manufacturers were critical of the new standards and sponsored or conducted clinical trials to assess human risk from exposure to pesticides and submitted the results to the agency for consideration. In response, a public outcry urged EPA to reject the results. In 1998, EPA announced that it would not use the human test studies to inform its policy making until "many ethical and scientific issues had been resolved." In 2001, the Bush Administration asked NAS to study the issue. The NAS released its findings, "Intentional Human Dosing Studies for EPA Regulatory Purposes" on February 19, 2004. "The Academy report calls for the highest ethical and scientific standards, but undermines its own recommendations by making the appalling suggestion that it is okay to experiment with toxins on kids," said Erik Olson, a senior attorney at NRDC. "The report also shockingly says that federal agencies should accept the results of old, ethically questionable experiments with toxic chemicals on people unless there is 'clear and convincing evidence' that they were intended to hurt people or were otherwise absurdly unethical. We thought that these issues were resolved 50 years ago after the Nuremberg trials, but the chemical industry continues its campaign to make it acceptable to use human guinea pigs to maximize their profits. Shame on them."

Mad Cow Disease Hits U.S.

Unless you've been living in a bubble, you've probably heard that Mad Cow disease was discovered in the U.S. this past December. While the government is telling us that everything is okay, some experts disagree that USDA has taken the necessary precautions to protect consumers. So if you're not ready to give up burgers on the grill for this summer's cookouts, you might want to consider organic beef. While data seems to indicate it's the safer way to go, organic certifiers are worried that the organic livestock standards regarding replacement animals, breeder stock, the definition of slaughter by-products, and feed additives need tightening.

According to the Organic Trade Association (OTA), certified organic beef has seen a steady increase in the weeks following the discovery of Mad Cow Disease in Washington State. "The 'USDA Organic' seal may be little, but it carries a big message: the organic product being purchased is fully traceable, has passed rigorous inspections, and, in the case of organic beef, has never been fed any animal by-products in any form," says Katherine DiMatteo, executive director of OTA, the business association representing organic industry. According to the U.S. Food and Drug Administration (FDA), Mad Cow disease, also known as Bovine Spongiform Encephalopathy (BSE), is a transmissible, slowly progressive, degenerative, and fatal disease found only in cattle. However, a similar disease called variant Creutzfeldt-Jakob Disease (vCJD), which has been linked to BSE by FDA, is found in humans. The exact cause of BSE is not known, but the most widely accepted theory is that infectious proteins, or prions, cause BSE. While the initial source of the abnormal prions is unknown, the disease is thought to spread through the cannibalistic feeding practices that regularly occur in conventional meat production. Another theory, featured in "The Pesticide Link to Mad Cow Disease," an article published in the Summer 2003 issue of *Pesticides and You* (Vol. 23, No. 2), links the disease to a combination of exposures including organophosphate pesticides and manganese, a mineral found in animal feeds and salt licks. Whichever theory you support, organic production could provide some peace of mind.

Study Shows Need to Restrict Farm Raised Salmon Consumption

Continuing with the food-you-shouldn't-eat theme, a new study published in the January 9, 2004 issue of the journal *Science* (Vol. 303, No. 5655) finds significantly higher levels of carcinogens and other health-related contaminants, including PCBs, dioxins, dieldrin and toxaphene, in farm raised salmon than in their wild counterparts. The study, "Global Assessment of Organic Contamination in Farmed Salmon," concludes that concentrations of several cancer-causing substances in particular are high enough to suggest that consumers should consider severely restricting their consumption of farmed salmon, which represents the majority of salmon found on store shelves. The authors analyzed about 700 farmed and wild salmon fillets produced in eight major farmed salmon producing regions around the world and purchased in 16 large cities in North America and Europe. In most cases consumption of more than one meal of farmed salmon per month (8 ounces) could pose unacceptable cancer risks, according to Environmental Protection Agency (EPA) methods for calculating fish consumption advisories. The authors, scientists at the Institute for Health and the Environment at the State University of New York (SUNY) Albany, cite diet as the reason for this difference between wild and farmed salmon. While wild salmon eat a diverse diet from small aquatic organisms like krill to larger fish, farmed salmon are fed a concentrated and high fat mixture of ground up fish and fish oil. Since the chemical contaminants a fish is exposed to during its life are stored in its fat, the higher fat "salmon chow" passes along more of these contaminants to the farmed salmon. Consumers interested in knowing

whether salmon is wild or farmed should be aware that the word "Fresh" on the label does not mean the salmon is wild-caught from the ocean. Any salmon labeled "Atlantic" in the U.S. and in other countries is most likely farmed. Alaskan salmon is always wild.

Pesticide Industry Lashes Out at Scientists that Question Its Products

Two University of California, Berkeley scientists learned the depths to which the pesticide industry will sink to protect its profits if threatened by academic science. According to a January 11, 2004, article by the San Francisco Chronicle, professors Tyrone Hayes and Ignacio Chapela experienced a backlash after their research produced results that could harm the pesticide industry. According to the article, when Tyrone Hayes, PhD, a University of California, Berkeley endocrinologist specializing in amphibian development, exposed young frogs in his lab to very small doses of the herbicide atrazine, they first failed to develop normal larynxes and later displayed serious reproductive problems (males became hermaphrodites). At the time, EPA was close to completing the Reregistration Eligibility Document (RED) on atrazine. According to the article, when Syngenta, manufacturer of atrazine, saw the data, attempts were made to stall his research. Syngenta then offered Dr. Hayes $2 million to continue his research "in a private setting." Wanting the results to be part of the public record, he declined and proceeded using his own funding. When his work appeared in the prestigious *Proceedings of the National Academy of Sciences*, Syngenta attacked the study and claimed that three other labs it contracted had been unable to duplicate Hayes' results. Dr. Hayes has tenure and continues to teach.

Ignacio Chapela, PhD, a microbial ecologist in the plant sciences department at UC Berkeley, also attacked by the agrichemical industry, does not have tenure. In 2000, Dr. Chapela discovered that pollen had drifted several miles from a field of genetically engineered (GE) corn in Chiapas, Mexico into the remote mountains of Oaxaca, landing in the last reserve of biodiverse maize in the world. Environmentalists and ecologists worry that if genes from the GE pollen actually penetrated the DNA of traditional crops, they could potentially eliminate maize biodiversity forever. Dr. Chapela cautiously stated that this might have happened in his peer-reviewed study published by *Nature* in November 2001. The *San Francisco Chronicle* reports that the Bivings Group, a PR firm hired by Monsanto, launched an aggressive public relations campaign beginning with a vicious e-mail attack mounted by two "scientists" who turned out to be fictitious. In response, *Nature* editors published a partial retraction of Dr. Chapela's report. The article reports that largely on the strength of that retraction, Dr. Chapela was recently denied tenure at UC Berkeley. *The full story, which also includes the accounts of Scottish scientist Arpad Pusztai and Cornell University professor John Losey, is available on the San Francisco Chronicle website, www.sfgate.com/search. Enter the author's name, Mark Dowie, and a publish date of January 11, 2004.*

Orchard Thinners and Their Children Face Higher Risk of Pesticide Exposure

According to findings from Fred Hutchinson Cancer Research Center in Seattle, WA, orchard thinners, the farmworkers who remove young buds from orchard trees to increase the size of the remaining fruit, are more likely to have detectable levels of pesticides in their house and vehicle dust than other agricultural workers. The study also found that children of thinners were more likely to have detectable levels of pesticide metabolites in their urine than children of non-thinners. These findings support other studies that show pesticides are tracked home on workers' clothing and shoes. "Most previous pesticide-exposure research on farmworkers has focused on pesticide handlers, such as pesticide mixers, loaders and sprayers, but this study suggests that more research is needed regarding exposure patterns among other types of farm workers as well," said lead author Gloria Coronado, PhD. Orchard thinners are thought to be at higher risk for pesticide exposure because thinning usually takes place in the spring, when crops are being sprayed to prevent pests. Unlike pesticide handlers, thinners are not required by EPA to use protective equipment or undergo the already deficient safety training.

Mix of Stress and Chemical Exposure Causes Brain Damage

Stress is a well-known culprit when it comes to disease. It has been linked to everything from heart attacks to the common cold. New research published in the February 27, 2004 issue of the *Journal of Toxicology and Environmental Health* has shown that stress can also intensify the effects of certain chemicals, making them very harmful to the brain and liver, at levels otherwise thought to be safe. Duke pharmacologist Mohamed Abou Donia, PhD, designed the study to reproduce the symptoms of Gulf War Syndrome, a disorder marked by chronic fatigue, muscle

and joint pain, tremors, headaches, difficulties concentrating and learning, loss of memory, irritability and reproductive problems. Previous research has revealed widespread damage to the brain, nervous system, liver and testes of rats exposed to a 60-day combination of the insect repellant DEET, the insecticide permethrin, and the anti-nerve gas agent pyridostigmine bromide – the same chemicals that the soldiers were exposed to during the 1991 Persian Gulf War. Dr. Abou Donia's rats were exposed to the chemicals at the same levels, in weight-adjusted doses. To induce stress, rats were placed in plastic holders to restrict their movements for 5-minutes at a time every day. The research demonstrated that this combination of stress and chemical exposure can promote cellular death in specific brain regions and injury to the liver in as little as 28 days. Moreover, it caused damage to portions of the brain where its protective blood-brain barrier was still intact, suggesting that chemicals permeated the protective barrier in one region, then traveled into other regions of the brain causing even more damage. Dr. Abou Donia's team found a significant number of dead or dying brain cells in several parts of the brain that control motor and sensory function, learning and memory, and gait and coordination of movements, as well as major alterations to brain chemicals that are necessary for learning and memory, muscle strength and body movement. Stress alone caused little or no brain injury in the rats, nor did the three chemicals given together for 28 days.

Santa Barbara City Going Toxic Pesticide-Free

Thanks to the hard work of the non-profit public interest law firm Environmental Defense Center (EDC), Santa Barbara, CA could be on its way to becoming a pesticide-free city. On January 27, 2004, the Santa Barbara City Council unanimously approved a least-toxic Integrated Pest Management (IPM) program that will immediately result in pesticide reduction on all city property, with the goal of becoming a pesticide-free city. As adopted, it mandates reduction and elimination of the most toxic pesticides from all city-owned properties and departments. This policy also provides for bilingual public notification for any applications in public areas, the development of an "Approved List" of acceptable pest management materials, and the creation of a city-run IPM committee that will include members of the public. Under the policy, 15 of the City's 55 parks will immediately become pesticide-free. Those parks not on the list of 15 will implement "pesticide-free spray zones" if they contain playgrounds, picnic benches and/or creeks. Finally, this IPM policy commits Santa Barbara to an ultimate goal of becoming entirely pesticide-free. "We thank the City for their work and commitment, and we look forward to ensuring a successful program," said Eric Cárdenas, Director of EDC's Central Coast Environmental Health Project (CCEHP). "As with any new program, there will be obstacles to overcome. I think everyone realizes this but is committed to making the program work."

POPs Treaty Ratified by 50 Countries, Soon to Become International Law

The United Nations announced on February 20, 2004 that the international treaty banning the world's most dangerous pesticides, industrial chemicals and hazardous by-products of combustion will take effect on May 17, 2004, now that 50 countries have ratified the pact. The Stockholm Convention on persistent organic pollutants (POPs) represents one of the most important efforts by the global community, to date, to rein in and ultimately halt the proliferation of toxic chemicals. The 90-day countdown to the convention's entry into force was triggered with France's ratification. The 12 POPs are aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex, toxaphene, polychlorinated biphenols (PCBs), hexachlorobenzene, dioxins and furans. Most will be banned at once, but use of DDT for disease vector control under UN World Health Organization guidelines will continue in many countries to control malaria. The Convention sets out control measures covering production, import, export, disposal, and use. It requires governments to promote the best available technologies and practices for replacing existing POPs while preventing development of new ones. According to the World Wildlife Fund, POPs pose a particular hazard because of four characteristics: they are toxic; they are persistent; they accumulate in the body fat of people, marine mammals, and other animals and are passed from mother to fetus; and they can travel great distances on wind and water currents. Although the U.S. has expressed support, it has not officially signed onto the treaty. *The Toxic Substances Control Act* (TSCA) and the *Federal Insecticide, Fungicide, and Rodenticide Act* (FIFRA), must first be amended for the U.S. to be in compliance and bills to do that currently before Congress are unacceptable to environmental advocates.

No Justice For Pesticide Victims

People harmed by pesticides speak out for change

By Shawnee Hoover

This article is the second part of a periodic series that highlights the stories of people whose lives have been adversely impacted by pesticides. Part one, published in the Fall 2003 issue of Pesticides and You, *provided an introduction to the subject of pesticide poisoning, which includes such issues as toxic body burdens and pesticide incident monitoring. It also profiled the cases of Loretta Haines, a victim of poisoning from a termite extermination and Lou Ann Pack, a department of transportation employee made sick by spraying herbicides. This issue of Voices will highlight the stories of Brenda Jones and her family whose life changed forever after a lawn care treatment, and the Hannans who lost their health and home to ant control pesticides. Many people think that because pesticides use is so common, then it must not be harmful, or because a pesticide is registered with the U.S. Environmental Protection Agency (EPA), then it must be safe. But as you will see, no pesticide is safe and no one is immune to the impacts of exposure to a dangerous mix of chemicals.*

Brenda Jones and her family.

Typical lawn care treatment sickens family

Like most people, Brenda Jones believed the lawn care applicator of Tru-Green Chem-Lawn when he told her that the chemicals he was going to use on her lawn were so safe that he didn't even need to wear a mask. According to Brenda, she was still hesitant and asked him to wait until she was safely inside the house before he started to spray. While Brenda waited for her dog, the applicator began spraying some 15 feet behind her. Suddenly, her eyes began to burn and a cough welled up in her throat. She turned to see a cloud of silver mist coming from the nozzle held by the applicator. Instantly, she grabbed the dog and dashed into the house to escape. She washed herself and the dog off, but it was too late; the damage was already done.

As a registered nurse (RN), Brenda knew immediately she was sick. Her eyes, throat and chest burned. Her head pounded. Her stomach was nauseous, and she couldn't stop coughing. But it wasn't until later that evening when her two children, Jeffrey (7) and Kara (3), and husband Wayne began complaining of headaches, dizziness, loose stools and other symptoms, that she really began to worry. The next day they called the lawn care company and found that they had been exposed to the commonly used weedkiller, atrazine, and synthetic pyrethroid bug-killer, bifenthrin. "We closed the windows," she says, "but the chemicals were still getting in."

The next day, the most Brenda and her family could do was lay as still as possible in their beds. Brenda was the worst off, with a burning chest, incessant cough and shortness of breath. Even the dog, who was vomiting the night before, lay very still and would not eat – classic behavior of pesticide poisoning for dogs. Being a Saturday, she left a message for her doctor and, like many people who are acutely poisoned, hoped the illness would pass on its own.

Two days after the incident, Brenda went to the doctor and was diagnosed with chemical poisoning and given some antibiotics and steroids. Her children were similarly treated. She called Florida's Poison Control Center to report the incident and was incorrectly told that they do not handle pesticides. Eventually, Brenda was told by a lung specialist that her airway had become reactive – a condition with no real treatment except the absence of chemicals in her environment.

After working fifteen years as an RN with an impressive resume that includes Johns Hopkins Medical Center, University of California Los Angeles, Stanford University, and the John Wayne Cancer Group in California, Brenda has now lost her livelihood to this incident. The few times she has tried to go back to the operating room she has become symptomatic with dizziness, weakness and tremors and unable to complete her shift. But, she says, this is the least of her worries.

Jeffrey, Brenda's son, has had to be permanently removed

from his school due to reactions he now gets to chemical treatments either on or near the school premises. When Brenda witnessed pesticides being applied on a field adjacent to the school she asked the applicator not to spray during school hours. She received a commonly heard response: "Weed killers and pesticides are registered with the EPA and are safe to use," the applicator told her. "They won't hurt the children."

Since Florida is known for its manicured lawns, Brenda was worried about others suffering a similar fate and felt compelled to report the poisoning. Roughly two weeks after the January 2003 incident, she contacted Florida's Department of Environmental Protection. In April, Brenda received a letter from a division of Florida's Agriculture Department telling her that the lawn care company had been questioned, but that too much time had elapsed to do an on-site inspection to determine if there was a violation of the pesticide's label.

Atrazine is linked with endocrine disruption, neuropathy and cancer, and despite the EPA's own findings that atrazine has widely contaminated groundwater across the country and specifically in Southern Florida, as much as 82 million pounds of the chemical are still used on lawns, fields and golf courses throughout the country. At least six countries in Europe have already banned or severely restricted its use.

"My cousin Amanda was diagnosed with a type of cancer caused by poison exposure at nine years old and died at thirteen," says Brenda. "I will remember Amanda and every child that I have seen over the past 15 years who have died from cancers linked to pesticide exposures, and I will try to prevent this from happening to other children," vows Brenda. "If the public were not led to believe that these pesticides were safe," she argues, "then perhaps more people would push for laws to protect us from the unnecessary use of these chemicals."

Tools for Activists

Toxic pesticide use is unsafe and unnecessary. See *Info Services* and *Lawns and Landscape*s webpages at www.beyondpesticides.org for:

- pest management fact sheets
- organizing materials
- scientific studies
- model local policies
- U.S. GAO reports
- and more.

Two days after the incident, Brenda went to the doctor and was diagnosed with chemical poisoning and given some antibiotics and steroids.

Toxic ant control leads to great losses

Several hours after a professional treatment for ants, Mary Jane and Lawrence Hannan and their daughter Kaitlyn reentered their home. Upon doing so however, all three of them instantly began experiencing severe flu-like symptoms and extreme fatigue. All signs indicate that the Hannans had been acutely exposed to two toxic organophosphate insecticides, chlorpyrifos (Dursban™) and diazinon (Knoxout™).

The Hannas quickly realized that their symptoms mainly persisted while they were in the house but not outside in fresh air. With little option, they were forced to vacate their home and most of their belongings and live in a motel. Upon entering the home on several occasions, even months after the application, exposure to the remaining residues put Mary Jane in the emergency room and made others sick.

The Hannans sued Pesco, the Illinois company responsible for applying the pesticides. Despite a deposition from the applicator admitting that he applied Knoxout™ at fifteen times the legal rate and medical records showing decreased levels of the enzyme cholinesterase (a key indicator of organophosphate poisoning), the Hannans lost in court because the judge said they could not prove the symptoms were not caused by an "unknown infectious agent." To this day, almost 11 years after the tragic incident, the Hannans are unable to sell their home due to the contamination and unable to return to it due to persistent residue levels.

Organophosphates are extremely hazardous to human health. Studies in animals indicate that early childhood exposure can lead to lasting effects on learning, attention, and behavior, just like the environmental neurotoxin lead. They are also considered by the EPA to be the most likely pesticides to cause an acute poisoning. 63,000 reports, almost 25,000 involving children under 6, were made to U.S. poison control centers about unintentional residential exposures to organophosphates between 1993 and 1996.

In 2000, EPA finally pursued a phase-out agreement with the industry to stop many common uses of chlorpyrifos and diazinon. But because the phase-out deals are so weak and riddled with loopholes, countless people will continue to be poisoned by the neurotoxins. Most victims of these pesticides, such as the Hannans, still have not received justice for the damage to their health and property. Meanwhile, environmentalists, health advocates, and many individual activists continue to push for an all-out ban that will force the agency to stop allowing industry profits to take precedence over human health and safety.

These pesticide-poisoning victims and many others will be featured in a future report from Beyond Pesticides chronicling the effects of commonly used pesticides on society. For an initial summary of the report or if you would like to share your story, please contact Beyond Pesticides.

Do Pesticides Affect Learning and Behavior?

The neuro-endocrine-immune connection

By Warren Porter, Ph.D.

Children are our future and the people we have to protect. I have serious concerns about children exposed to low level pesticide mixtures from lawns and in the food, water, and air that passes through their bodies. Children do not have defensive enzymes at levels present in sexually mature adults. In this presentation, I will explore the neurological, endocrine, immune and developmental effects of such exposures.

Herbicides inaccurately touted as safe

In 1945, a National Geographic photographer took a picture of a child walking through DDT that was being sprayed from a truck at New York's Jones Beach State Park. The side of the truck said, "DDT. Powerful Insecticide. Harmless To Humans."

Since that time, herbicides like RoundUp (glyphosate) have been touted for their safety. Yet, they are capable of modifying the most fundamental biological processes. For example, many people report experiencing severe digestive problems related to overexposure to RoundUp. In fact, Finnish researchers showed that RoundUp's active ingredient, glyphostate, decreases the defenses of enzymes of the liver and intestines.[1] RoundUp, as a mixture of all its ingredients, has been shown to shut down a powerful antioxidant in the liver that detoxifies harmful compounds so they can be excreted through bile. A paper published in August 2000 shows that RoundUp alters gene expression and inhibits necessary steroid production by disrupting a particular protein expression. In 2002, a paper shows that RoundUp can also affect early cell division processes in embryos.

RoundUp can also affect early cell division processes in embryos.

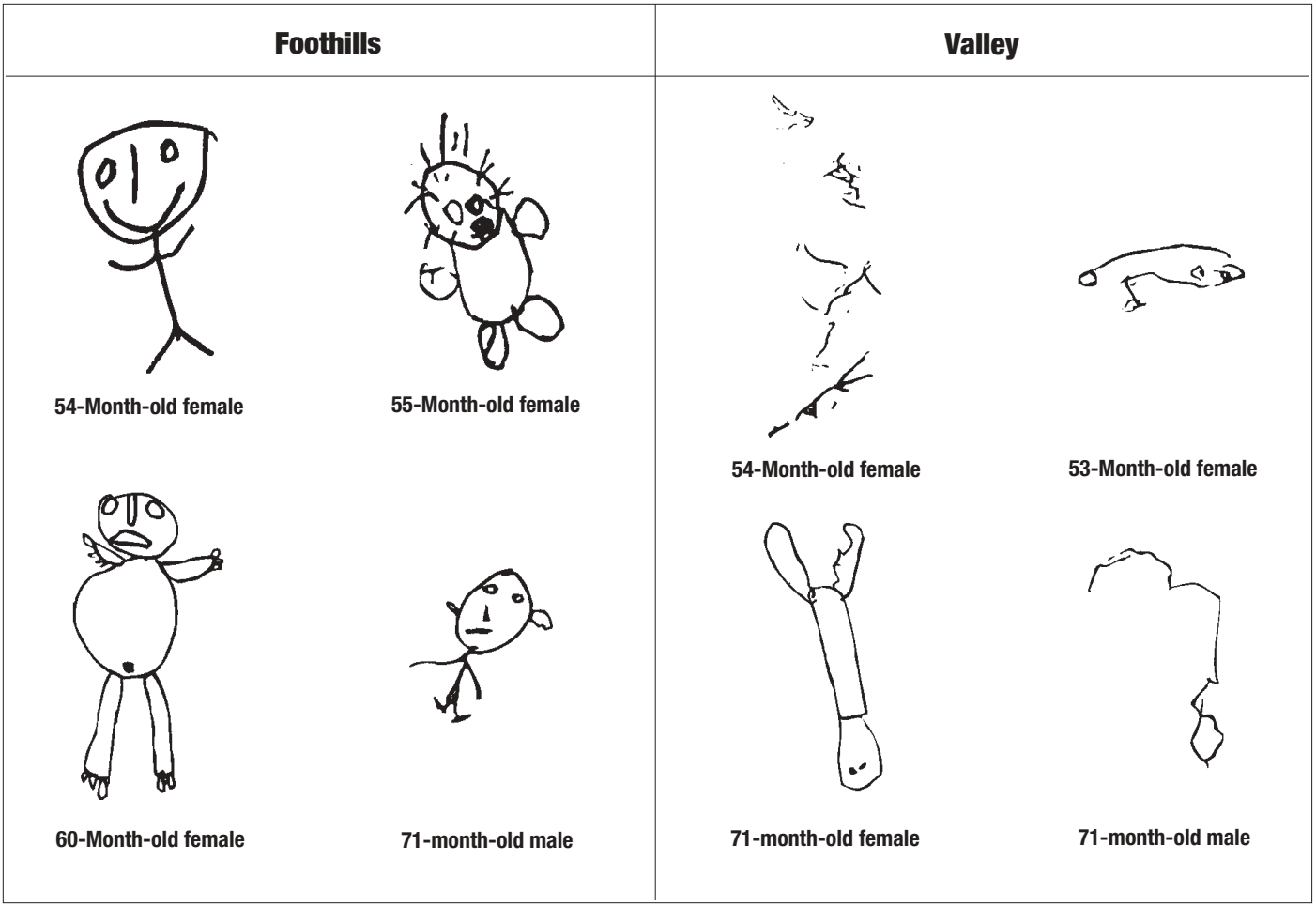
This article contains excerpts from a talk that Dr. Porter gave to the Nutrition for Optimal Health Association on February 4, 2004.

The increase in children with disabilities is alarming

I really got into the issue of children's pesticide exposure after reading an article in 1997 that looked at student disabilities in the Madison Metropolitan School District (WI), based on the U.S. Department of Education Federal Child Count Data from 1990-1995.[2] The data showed that the number of children in Madison that were emotionally disturbed increased 87%, children with learning disabilities increased 70%, and children with birth defects increased 83% in that five-year period. This is a serious epidemic and yet no one really knows exactly how or why this is happening. It's not unique; not to Madison, the state of Wisconsin, Chicago, New York, Philadelphia, Iran or Australia. It seems to be a global phenomenon and the question is why and how is this happening and what can we do about it.

Neurological processes and functions are tied to the hormone and immune systems and thus impact developmental processes.[3] When we think about learning we also have to think about how the immune system is working what the hormones in the body are doing, and how might all this be impacting the developmental processes. Organ system processes as well as the central nervous, endocrine, and immune systems talk to each other all the time by many different chemical mechanisms and support individual level functions of reproduction, growth and behaviors. Studies show that pesticides can function as nerve poisons and as pseudo hormones, modify hormone levels, and/or impact immune system function. Therefore, the hypothesis is that if one of these is impacted then because of the interconnection in the communications among them, it is likely that all other systems will be affected. Because organ system functions affect the intake of food, energy and mass, the fundamental foundation on which this whole super structure rests may be eroding in very subtle ways.

Perhaps the most telling experiment in effect is the work of Elizabeth Guillette, Ph.D. in her study on the children in the



Representative drawings of children exposed to pesticides (valley) and those that were not (foothills). (Adapted from Elizabeth Guillette, 1998, Environmental Health Perspectives.*)*

Yaqui Valley in Sonora, Mexico. Dr. Guillette compared preschool-aged children living in the foothills where pesticides use was avoided with children living in the valley where agricultural pesticides were frequently used. Although Dr. Guillette and her colleagues found no differences in growth patterns, the exposed children demonstrated decreases in stamina, gross and fine eye-hand coordination, 30-minute memory and in the ability to draw a person. It is those drawings that are the most telling of all and show the most striking differences between the exposed and unexposed children. The children from the foothills drew figures of humans with features that are characteristic of four and five year olds, whereas the children from the valley lacked the ability to draw humans with any such detail.[4]

EPA lacks sufficient data on safety

Surfactants, organic soaps and "re-worked" chemicals in herbicide mixtures together with active ingredients create the cocktails that are sold but unregulated. EPA registration is based on tests of the pure agent chemicals. Yet, it is the mixes with all the surfactants and all the other ingredients present in them that are sold. These are very different products from what is registered. When a pesticide is registered, the following six items are *not* included in the toxicology data submitted to EPA.

Dosing deficient. Pulse doses at low concentrations are not considered.

Routes restricted. Single exposure routes are used in registering a pesticide. However, oral, cutaneous and respiratory routes are very significant ways for these chemicals to get right at the brain.

Endpoints excessive. Cancer and mutations are used. Yet, even though the *Food Quality Protection Act* mandates testing for immune, endocrine and nervous system and developmental function defects from pesticide exposure, it has not been enforced.

Additives absent. Manufacturing contaminants, toxic waste contaminants deliberately added ("reworking") and inert ingredients are missing from the laboratory testing that is done for a pesticides' registration.

Mixtures missing. There is little or no testing for commonly occurring mixtures.

Stresses squelched. Nutrition, disease, and climate stress are not considered.

Weeding Out Hazardous Pesticides

As spring approaches and pesky weeds begin appearing on lawns and landscapes, be sure to implement a prevention-oriented weed management program. *For more information, contact Beyond Pesticides or see www.beyondpesticides.org.*

Prevention

The first step is to prevent weed infestations by maintaining a healthy lawn.

- **Develop healthy soil**. Using a soil probe, cut or dig a small hole about 10" deep and with one side that is straight and smooth. The lawn should have between 5"-6" of topsoil, which is the darkest soil layer. If needed, add topdressings of organic matter.
- **Plant well-adapted, pest-resistant grass varieties**. Find out which grass is most suitable to your climate from your local cooperative extension. A mix of two or more grass varieties is preferable. Over seeding can also reduce weed problems in some cases.
- **Aerate the lawn regularly**. Aerating loosens the soil, allowing air, water, and nutrients to reach the grass roots. Most lawns should be aerated twice a year.
- **De-thatch.** Thatch is a dense layer of grass stems and roots on the surface of the soil. When it becomes thick, roots will grow within the layer of thatch instead of establishing themselves deeply in the soil, which can lead to insect and disease problems, and increase susceptibility to cold, heat and drought. Thatch is reduced by aeration, topdressing with organic matter, or by vertical mowing.
- **Maintain proper pH.** Test the soil and adjust the pH if necessary. Low pH means high acid content – add lime to lower the acidity to 6.7-7 for most grass varieties. High pH means high alkaline – add sulfur to lower the pH, taking care not to add too much and burn the lawn.
- **Fertilize** the lawn at least once a year, preferably in the fall, using a slow-release, urea based product. Fertilizer should not be water-soluble.
- **Water properly**. Too much or too little water can induce pest outbreaks. Enough water should be used each time to wet the soil to the depth of the grass root zone. Soil should be allowed to become nearly dry between watering. Avoid frequent, shallow watering, which promote shallow root systems and reduce the ability of the lawn to resist stress.
- **Mow** correctly and frequently to ensure that weeds are unable to build energy reserves and become well established. Use sharp blades set as high as possible to minimize adverse effects. Never cut off more than 30-40% of the grass blades in a single mowing. Rotate mowing patterns to reduce lawn compaction. Leave a light layer of grass clippings on the grass, as they can provide up to half the lawn's nitrogen requirement.

Least-toxic control strategies

When weeds appear, you don't have to resort to toxic chemicals to get rid of them.

- If you feel that an herbicide is necessary, **corn gluten meal** is an excellent pre-emergent. Because of its high nitrogen content, it can be applied to turf grass as a fertilizer and top dressing, and it suppresses growth of annual weeds such as crabgrass.
- **Fatty acid soaps**, which rapidly biodegrade in soil, provide a least-toxic post-emergent weed control option. Over use of soaps, like chemical pesticides, can lead to pest resistance. Carefully read the label of fatty-acid soap pesticide products to identify the active ingredient and make sure that they do not also contain toxic pesticides or synergists. A fatty-acid soap product called Sharpshooter™ is an effective broad-spectrum herbicide.
- **Vinegar** in at least a 20% solution can be used to spot treat weeds.

Beware of genetically engineered (GE) turfgrass seed varieties, such as RoundUp Ready bentgrass that is currently being developed by Scotts and Monsanto. Many agree that GE turfgrass will lead to an increase in the use of toxic pesticides.

Pulse doses – small exposures, big problems

Enzymes in the liver detoxify the human body of fat-soluble molecules that are most dangerous. It takes anywhere between a half a day to five days to defend against a chemical exposure, which in many cases is not quick enough in protecting the body from defending itself. The trouble is, these liver enzymes, which we do not want too high or too low, not only help detoxify the body, but they also carefully regulate the level of reproductive hormones in the human body. There is now some evidence that is beginning to accumulate that suggests that very short-term pulses concerning key hormones related to thyroid hormones may in fact be behind a large number of pesticide poisoning symptoms.

For example, a pregnant woman standing by a window at springtime inhales pesticides or it lands on her skin, it will get in her blood. Because pesticides contain surfactants and organic soaps that allow them access to the brain, she will get a sudden pulse of a thyroid hormone response either up or down and that thyroid hormone crosses the placenta. All of a sudden the thyroid hormone level changes and the fetus' brain changes the way it is forming. A baby's brain forms in a two-day window. According to animal studies, if the mother's thyroid is either too high or too low when the brain is forming, it will cause the spinal cord to form inappropriately. A year or so later the child is having trouble learning. Yet, there is no trace of a pesticide.

Pesticides get into the human body and make their way to the brain easily because of the way they are formulated to get into plants and insects.

Herbicides and birth defects

The owner of a lawn company once said that the diluted pesticide sprays they use on yards is perfectly safe. Yet, Vincent Garry, M.D., one of the top epidemiologist in the country at the University of Minnesota Laboratory of Environmental Medicine and Pathology, did a long-term study, a retrospective study, which was based on the assumption that if pesticides are safe and applied according to label instructions, then we should be able to look at the children of the pesticide applicators and compare them to the children of general population and there should be no difference. Dr. Garry's study looked at 210,723 live births in Minnesota from 1989 to 1992, a very large sample size, and found three things:

1) Pesticide applicators' children had significantly higher birth defect rates;

2) Birth defect rates were significantly higher in the western agriculture region of the state; and,

3) A significant majority of children with birth defects were born nine months after spring, suggesting that whatever was causing the birth defects was happening at a very early stage in fetal development.[5]

Poisoning similarities of plants, insects and humans

Pesticides get into the human body and make their way to the brain easily because of the way they are formulated to get into plants and insects. Two routes of entry exist. One way is through the waxy skin, the cuticle of the plant or insect. Lipids and organic soaps, surfactants, dissolve wax and are therefore added to pesticides in order to get rapid penetration through the waxy surface of the insect or plant. Unfortunately, human skin is also a waxy surface and pesticides have the same affect on humans.

The other primary route of entry is through plants and insects' breathing pores, which have a hemispheric film of water that acts as a physical barrier. But surfactants are designed to weaken that watery film and make for rapid penetration. Unfortunately, there are tiny cavities on the surface of human lungs, which are also lined by a thin film of water with surface tension that acts as a barrier. Therefore, pesticides act in a similar way in getting into human lungs quickly.

Both of these routes of entry, absorption and inhalation, allow for immediate access to the blood stream. These fat-soluble substances cross the blood brain barrier, because the barrier does not protect against anything that is fat-soluble. So in effect, you are giving these very reactive chemicals access to the command and control center of the body.

Herbicide mixtures and the thyroid connection

The thyroid hormone that controls brain, sexual development, irritability, steroid hormone and immune interactions, is consistently modulated in adult and fetal exposures to all the herbicide mixtures we have tested.

Tests of carbamate insecticides and triazine herbicides mixtures show a: (i) reduction in spatial discrimination, (ii) decrease in speed of learning, (iii) reduction in exploratory behavior, (iv) change in aggression intensity and frequency, (v) change and reduction in memory and motor coordination in the brain, (vi) change in food absorption, (vii) change in thyroid hormone, (viii) change in growth hormone, (ix) reduction in antibodies formation capability, (x) reduction in the host defense mechanisms of the white blood cells in the immune system, (xi) reduction in the ability to gobble up foreign microorganisms and (xii) change in DNA synthesis of genetic materials and RNA synthesis in a cell culture.[6]

Low level exposure to herbicides

The mixture studies have consistently shown neurological, endocrine and immune effects at low doses, most of which were environmentally relevant. Some colleagues and I developed a study looking at an herbicide mixture of 2,4-D, mecoprop, dicamba and its effect on fetal exposures, starting with a concentration that EPA said would have an effect, diluted down to a level to be considered "safe," to then even lower concentrations. We specifically wanted to see what the effect was in the ability to bring young successfully to birth and wean; and how an herbicide induced abortion of fetuses. The results, published in November 2002, showed that this common lawn pesticide mixture is capable of inducing abortions and resorptions of fetuses at very low parts per billion concentrations. The greatest effect was at the lowest dose.[7]

...this common lawn pesticide mixture is capable of inducing abortions and resorptions of fetuses at very low parts per billion concentrations.

It is important to point out that these hormonal results are not unique. It is seen in the inverse dose response of the immune system that we published in 1987, where we looked at aldicarb.[8] And in 2000, a study found that chlorpyrifos' greatest impact was at the intermediate doses or really the lowest dose and that the female rats are much more affected, whereas the males tend to be relatively unaffected, thus showing a differential sexual dependent response in terms of learning abilities.[9]

Seasonal effects on immune function

There are seasonal effects on the immune system function due to herbicide exposure as well, which are also not considered in EPA's testing requirements for pesticide registration. For instance, we have found that herbicide exposure in the spring has an increased effect on males, exposure in the fall has an increased effect on males and females, and in the winter there is no effect at all. Not only season, but season plus sex is involved in terms of immune function. For example, we found that immune function changes occurred in males in the spring, and females were significantly different in the fall. In looking at blood level thyroid hormone levels, we found significant differences in the males in the fall and in the winter.

Dr. Porter received his Ph.D. in physiological ecology from the University of California, Los Angeles and has been a professor of zoology and environmental toxicology at the University of Wisconsin, Madison since 1986. Dr. Porter and his colleagues have found that even minute levels of pesticides can harm the immune, reproductive, endocrine and nervous systems of animals. For more information about Dr. Porter's work, see www.wisc.edu/zoology or contact him at Department of Zoology, University of Wisconsin, 250 N. Mills Street, Madison WI 53706, 608-262-1719 or wporter@mhub.zoology.wisc.edu.

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Contaminated Without Consent

Why our exposure to chemicals in air, food and water violates human rights

By Sandra Steingraber, Ph.D.

Rachel Carson is the guiding light for all of us who care about the health of the planet and the people who live on it. With the publication of *Silent Spring*, Carson provided us four decades ago with a comprehensive exhaustively researched biological argument in simple lyrical language that anyone with or without training in the sciences could read and understand.

The book takes a four-part argument. First, Carson says we are all being contaminated without our consent to inherently toxic chemicals in the form of pesticides. Secondly, that the risks to our health and the health of other species are really needless because there are many non-toxic alternatives, if we only looked about us and sought them out. And then third, these alternatives are more effective than toxic chemicals because besides all of the unintended consequences of pesticides, the truth is that these chemical poisons don't really work very well in controlling pests. And finally - and this is the message I would like to elaborate because it is in the book and in her last speeches before Congress, but it is not the part that people really remember – she said we have the right to know about the risks that we are being compelled to endure, and once knowing we have the obligation to act.

Carson died eighteen months after *Silent Spring* was published. At the mid point between Carson's death in 1964 and today, 3 December 2003, came Bhopal. It was a wretched enactment of Carson's idea. The pesticide plant in Bhopal released the raw ingredient for a pesticide, methyl isocyanate, into the air. Eight thousand people immediately died. Another twelve thousand would die in the years to follow. No one knew what had happened to them, not even the doctors treating the patients knew what had happened because there was no right to know. The chemistry of what that pesticide plant was using was a trade secret. And so people died without knowing what kind of poison gas hit them. Their doctors struggled to treat them not knowing what antidotes might be possible. That so horrified the world that two years later in 1986 in the United States passed a comprehensive Right to Know Act on the basis that toxic chemicals used within factory walls or released into the environment that we all share – either by a terrible accident or through routine emissions into air, food, soil or water – form a public gesture and the public therefore has the right to know about them. That is now enshrined in the US legislation because anyone, including my students at the university, has the ability to dial up a website, type in their zip code and within thirty seconds have a read out of all the toxic releases in their home community, from what industry, in what amounts. You can click on the names of those chemicals and find out the health effects of being exposed. It's a very powerful tool for social activism and it was the dead of Bhopal who gave us that.

This article contains excerpts from the Rachel Carson Memorial Lecture held by Pesticide Action Network, UK on December 3, 2003 in London, England.

The young, teenagers and the elderly

Here is the idea: the old belief was called the 'dose makes the poison,' a phrase originally used by a mediaeval physician named Paracelsus who noticed when treating syphilis with mercury, the treatment of choice, that too much would kill the patient. 'The dose makes the poison' is still the principle upon which chemotherapy drugs are given to cancer patients. The hope is to give a dose the patient can tolerate, but large enough to poison the cancer cells. This is a very powerful notion in medicine and in toxicology. When a chemical is discovered to be inherently toxic – perhaps because it causes miscarriage or infertility, perhaps because it is a neurological poison that effects the brain, perhaps because it is related to cancer – instead of moving immediately to divorce our economy from depen-

dence on such a chemical the regulatory system requires instead laboratory studies (mostly on animals, but also on possible human exposure) to decide on the maximum dose allowable in the environment. Exposure routes could be as a residue in food if it is a pesticide, levels allowable in drinking water or ground water, or how much air pollution can we allow. Regulators set these so-called safe threshold levels. The idea is that above these levels there might be human harm, but below that the harm is mostly negligible.

The new science is showing that the timing of exposure makes the poison as much or more than the dose. This draws on the realization that we are not all middle-aged adults; we all begin our lives as embryos and go through a life span; and we are not the same individual biologically or physiologically during that entire life span. We go through important changes during our life and enter windows of vulnerability when we are exquisitely sensitive to the effects of toxic exposures – far out of the proportion that the dose might predict. Embryonic and fetal life is one of those times, and so is infancy.

For example, all of us have something called the 'blood brain barrier' that works pretty well to keep out any pesticide. Insecticides operate on the principal of chemical electrocution. They are all neurological poisons. The blood brain barrier will work pretty well to ensure that insecticide residues consumed with your dinner will not leave your blood stream and enter the brain matter where they can do some more damage. However we do not get a blood brain barrier until we are six months old. Anyone younger than six months is missing the suit of armor that surrounds the brain and offers pretty good protection against the neurological damage of insecticides. So tiny, vanishingly small exposures of insecticides to someone younger than six months can create disproportionate risks to the brain, and can be a terrible saboteur of that brain compared to similar or even much larger exposures for older humans.

The human rights implications of this new science need to be fleshed out, and let me offer an overarching observation. We are not providing under the law equal protection against toxic chemicals to all citizens. The new science shows that we are discriminating by age against particular groups of people, not only the very young but also I hope to demonstrate to you that adolescence, affected by the hormonal effects of puberty, represents another window when tiny exposures can create disproportionate risks to health. And old age represents another period when we are exquisitely sensitive to toxic chemicals because we start losing defense mechanisms. The blood brain barrier becomes permeable again. It starts to fall apart. Liver enzymes are no longer as efficient. The kidneys are not detoxifying as effectively. The immune system becomes compromised. So the very old and the very young physiologically resemble each other to a large degree and then in the middle you have the experience of puberty and adolescence which for very different reasons also represents a vulnerable window of time. I argue that our current model of regulation does not sufficiently protect these three groups: the very young, teenagers and the elderly.

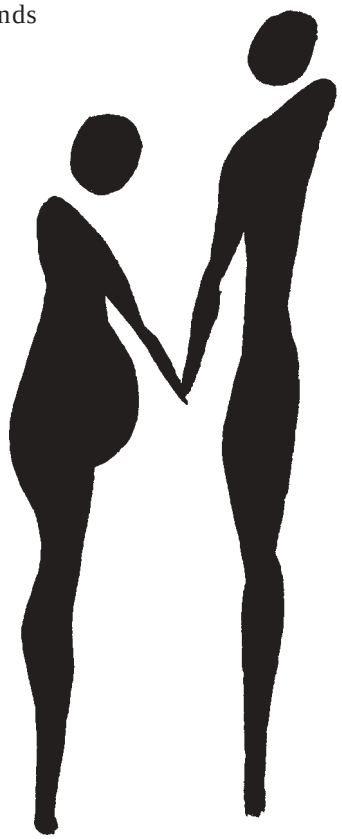
Danger at beginnings of human life

Let us look at the threats to human life right at the very start: the stage of egg and the sperm. Women who smoke go into menopause on average two to three years earlier than women who do not. Something about smoking shortens the fertile life span of a woman: we now know the agent behind this is a chemical in tobacco smoke called benzoapyrene that cycles around the blood, gets into the chromosomes of the eggs, flips certain genetic switches, and programs cell death. So we know that cells can commit programmed suicide. The threat is called apoptosis. Benzoapyrene in cigarette smoke has this effect on human eggs in the ovary and shortens the fertile life span of women smokers. Laboratory rats exposed to benzoapyrene in the ambient air of their cages at levels in some of our larger industrial cities, experience a shortening of fertile life.

Anyone younger than six months is missing the suit of armor that surrounds the brain and offers pretty good protection against the neurological damage of insecticides.

Sperm also are not immune to these effects. Studies of men exposed to pesticides through drinking water in some agricultural areas in the United States have lower sperm

quantity and lower sperm quality. These men are not farmers, but are simply living in farming areas and drinking the water in rural communities. We also know that males who have exposure to certain kinds of industrial chemicals, such as diesel and kerosene, father children who are at much higher risk for certain kind of pediatric cancers. In some cases, their children have ten-fold the risk, for example of neuroblastoma, a childhood cancer that tends to kill the very young. Children of men with these occupational exposures are ten times more likely to be diagnosed with neuroblastoma in the first two years of life than children of men of a similar socio-economic backgrounds and classes but who do not have such exposures.



Fertilization and Implantation. But let us continue our story. Let us assume that there is a viable egg and sperm. Fertilization occurs, grows into a morula and begins to implant itself in the lining of the uterus. The risk of exposure at this point in our story is not infertility but spontaneous abortion. Whatever your thoughts or opinions on abortion, we might agree that if you become pregnant willfully and with great joy, and then experience a spontaneous miscarriage because of a chemical that you were exposed to earlier on in your pregnancy, this is a violation of human rights, a violation of fetal protection and a violation of a woman's ability to choose to have a child. It is a form of chemical abortion. Evidence suggests that solvents and pesticides that enter into the story of pregnancy in the first few weeks raise the risk of interfering with the chemical cascade that has to occur: these are chemical messages that flow from one cell to another in the morula and as the morula turns into embryo with the extra embryonic membranes. All these require a choreography of messages being sent back and forth between the cells in the embryo and interference will cause this new life form to be flushed from the system because implantation does not take place properly.

Studies of men exposed to pesticides through drinking water in some agricultural areas in the United States have lower sperm quantity and lower sperm quality.

Week Five to Week Ten of Life. Let us go on with our story. Let us assume that a miscarriage does not occur, that implantation successfully happens. Now we are at about week five of a human pregnancy as midwives and obstetricians would date it. What happens next is a period called organogenesis. This takes place between weeks five and ten of a human pregnancy and during this time the entire human body is assembled, developing from the top down and from the center out. At the end of week ten of pregnancy you have a human being the size of a paper clip with all the body parts present. We have thirty more weeks to come. The danger at this point is a birth defect. Any toxic chemical that enters our story at this point and interferes with essentially the process of Japanese origami that causes these flat pieces of tissue to roll themselves up and fold themselves up into three dimensional human body structures will affect the human body form in some way.

We have pretty good evidence that exposure to pesticides during that week five to ten of a human pregnancy is linked to birth defects. Data [from birth registries] show that women exposed to pesticides, either because they work in farming, nurseries or greenhouses during the window of time in early pregnancy, have excess rates of particular kinds of birth defects. This is shown over again, no matter what the country: certain kinds of clefts, cardiac defects, limb reduction deficits, undescended testicles and hypospadias (when the opening of the penis does not happen at the tip but by the scrotum or under the shaft). Women who work in certain kinds of agricultural occupations have sons who are at higher risk for this kind of birth defect. The good registry data I could use in the U.S. (mostly from California and some from Texas and Minnesota) shows similar trends. In California, the closer a woman lives to an agricultural field where pesticides are sprayed, the higher her risk for stillbirth caused by birth defects. The highest risk of all is living within a mile of an agricultural field that is sprayed with pesticides. In Minnesota, interesting evidence shows that the further west you live in the State, the higher the risk of birth defects. The further west you go, the more intense the agriculture. Furthermore, there is an interesting seasonality to the data. Children born to farmers have high risks of birth defects, but even higher if their birthdays are in the winter: the period of organogenesis corresponds to the spring months of planting when pesticide use is the highest. So there is a spike of birth defects among babies born in the winter months of December and January. Now there is corroborating evidence from Iowa.

The Next Thirty Weeks of Life. So let us continue with our story. Let us presume the body develops in a perfectly

healthy way. There is no birth defect; the next thirty weeks of pregnancy are devoted to the growth and development of all those parts that were formed during organogenesis. One of the hallmarks of that development occurs in the fifth and sixth months of pregnancy when there is a huge spurt in brain growth development. During this month all those brain neurons that were formed during organogenesis start moving. They migrate. They spin out an axon and travel down it just like a spider that can propel down from a silken thread from the ceiling. And as these spider cells meet each other they spin the connections, which are a hallmark of being human. We do not have so many more brain cells than most other mammals but we have far more connections between those brain cells, and many of those are spun in the fifth and sixth months of pregnancy. The danger here is brain damage. So if pesticides, or a heavy metal like lead or mercury, enter our story at this point, those brain cells stop moving. They are paralyzed; they cannot find each other and the connections are not made. When the baby is born, its head looks perfectly normal. There is no malformation, there is no birth defect, but we cannot see the subtle change in the architecture in the brain underneath and we may not notice until maybe that child goes to school that there is a learning disability or behavioral problem like Attention Deficit Disorder or hyperactivity or autism. Now this is fascinating because it means we are changing the nature of the self through exposure to toxic chemicals. A child is born with a different mind than it otherwise would have.

Late Pregnancy. Let us go on. Let us go to the very end of pregnancy. We have emerging evidence to suggest that certain pesticides as well as certain industrial chemicals can alter the day of birth. We might think that our birthday has something to do with our astrological chart. I can tell you as a biologist, that the kind of chemicals that your mother was exposed to when she was pregnant, probably had as much to do with the day that you were born than the stars did. That is because certain chemicals such as PCBs and now we suspect DDT not only cross the placenta, but also can get into the fibers of the uterine muscle tissue itself and alter the way calcium flows through that muscle. The flow of calcium through any muscle determines whether it will contract or not. By opening the calcium channels of the muscle in late pregnancy, the uterine muscle will start contracting sooner than it otherwise would, and essentially shortens gestation. Babies are being born early. If this is more than three weeks before their due date they are officially classified as a preterm birth and we are beginning to realize that the stubbornly high incidence of pre-term birth in spite of good pre-natal care in the U.S. may be related to environmental exposures. Being born before you should is the leading cause of disability in the United States. It sometimes requires millions of health care dollars to save the lives of those babies and just bring them up to their birth dates. Very often, many of them require a lifetime of special medical needs and special educational needs.

The risks and benefits of breast milk

Let us talk about breastfeeding. There are two true things about breast milk, and they seem mutually contradictory, but they are not, and it is hard to hold two true things that seem like they contradict each other in your head at the same time. The first true thing about breast milk is that it is absolutely the best food for human infants. The data on the health benefits of breast milk are absolutely unanimous.

Here is the other true thing about breast milk. Breast milk, human milk, is the most chemically contaminated human food on the planet. Why is that? Well, you have to think like an ecologist. Breast milk occupies one rung higher on the human food chain, than the food that adults eat. What that means is that the milk making lobules in the back of a nursing mother's chest wall have one more chance to concentrate the poison found in things like toilet deodorizers, moth-proofing agents, flame retardants, pesticides, dioxins, PCBs. These are the most common contaminants of breast milk. They are commonly found in the food, but are ten to a hundred times higher in breast milk because they are persistent and concentrate as they move up the food chain. Nursing infants that feed on their mother's body eat one rung higher on the food chain than we who eat a combination of animal food and plant based food. For that reason, pound for pound, human infants are receiving many times more pesticide residues than we are. When safe levels are set for pesticide residues in food bought in the supermarket, no one thought "what are nursing in-

Breast milk, human milk, is the most chemically contaminated human food on the planet.

fants going to receive if we allow this much pesticide residues in wheat, that much in sweet potatoes, this much in eggs, and this much in fish." No one thought that a nursing infant will get at least ten times that amount in breast milk. No one regulates breast milk, it is not transported across state boundaries and it is not sold in supermarket shelves. If it were, U.S. data indicates that many women's breast milk would not be available for sale because the amount of deleterious substances found exceed the accepted levels; the accepted maximum contaminant levels that allow you to sell something from the supermarket shelf.

So on the one hand, breastfed children are healthier, die less often, go on to be smarter, have better eye sight, have fewer immune problems, and do suffer less from allergies. On the other hand, measures of the blood of children in school, or who have been nursed, even for a period as short as six weeks, show four to five times more contaminants than their formula fed counterparts. So our breastfed children are paying a terrible price for their right as children to drink their mother's milk. And the right of the mother to feed the child milk from her own body is being compromised. The goodness of that milk is being compromised by the presence of contaminants. I want to be careful and say that we have not yet contaminated mother's milk to the point where it is a worse food for babies than formula but do we want to let it get to that point? The U.S. has terrible breastfeeding rates, we have the worst in the world, I think, of developed countries, because we fail to give women paid maternity leave. Formula feeding is thought to kill at least four thousand infants a year in the United States. In other words, if we enabled all women to breastfeed there would be four thousand less deaths of infants under the age of one every year in the U.S.

Contaminated breast milk is not killing four thousand infants a year. A risk benefit analysis would argue that as long as it is killing fewer than four thousand, then we should do nothing. But a human rights analysis should say, that no child should be harmed by contaminants in mother's milk. If we can raise the goodness of mother's milk, then we should do it and we should get chemicals out of milk. The answer is not to use formula milk, but to say that any chemical that is (a) known to be inherently toxic, and (b) known to accumulate in mother's milk, has no place in the twenty-first century economy and we need to immediately phase out any dependency that our economy has, whether industrial or agricultural on the use of this chemical.

Puberty: a window of vulnerability

Some words about puberty. This amazing rite of passage between childhood and adulthood is made possible by parts per billion concentration of steroidal hormones. You might remember the profound effects that puberty had on your psyche, your body, your thoughts, and your emotional life. Just parts per billion concentration of hormones elicited this huge change. We do not know a lot about the biology of puberty yet. But we do know that the body is growing rapidly, the skeleton is being mineralized and cells are dividing fast, so a lot of DNA is replicating. Whenever DNA replicates, it is more vulnerable to injury than when in its quiet state. All kinds of parts of the body develop hormone receptors so that they can become targets of hormones such as estrogen, testosterone or some of the hormones that your adrenal gland is producing, your pituitary gland, your thyroid gland. We in the biological community are worried about the effect that endocrine disrupting chemicals in the environment might be playing on this body that is primed to respond to hormones, because we know that there are chemicals out there that have the ability to mimic hormones inside the human body.

Some preliminary evidence from laboratory animals shows that early life exposures to certain kinds of pesticides are associated with Parkinson's dementia.

Threats to the elderly

A word about old age. One of the things that interests me is dementia. My own dear adopted father was diagnosed quite a long time ago with Parkinson's disease. It developed, as in the case of 30 percent of Parkinson's patients, into full-blown dementia. Some preliminary evidence from laboratory animals shows that early life exposures to certain kinds of pesticides are associated with Parkinson's dementia. Laboratory animals exposed early in life, followed by an exposure in adult life, have two injuries to the brain, one very early and one later. The combination can elicit the cascade of neuro-degenerative changes leading to full blown Parkinson's. There is something about silent toxicities early in life, matched by exposures in adult life, which elicit changes and appear to be behind Parkinson's dementia.

All this, of course, is in controlled animal studies. However, we also know that certain kinds of farmers are more prone to dementia than other people and that certain kinds of veterans of wars where pesticides were used, such as the Vietnam War, are at higher risk for Parkinson's. Now we are looking closely at the Gulf War veterans. The first of the two military ventures in Iraq in 1991 has led to an entire generation of disabled veterans. Lou Gehrig's Disease, or what is called ALS, is one neuro-degenerative disease that these veterans appear to suffer from and perhaps Parkinson's is another one. So right now provocative evidence from both human and animal studies suggests environmental links to Parkinson's disease. I am now looking closely at the data, and I would like to expand that to include Alzheimer's disease. I have not yet cast my net there, but I would like to look at the entire human spectrum, the ways in which we enter and leave these vulnerable times, and the human rights problems connected to exposures during these periods of time.

Eliminating toxic chemicals

More importantly, I would like to look at ways in which we can re-cast our entire regulatory system, our entire way of delivering goods and services, and of growing foods so that we no longer need to use toxic chemicals. We can, as Rachel Carson encouraged, seek out alternatives and to stop taking counsel from those who tell us that the only way is to use poisons.

I always close my lectures with a short reading from one of the more lyrical and joyful passages of my books. I want to remind us that when all is said and done, this is really about human life and its joy. Behind every data point, is a human life and that is the reason for our interest. This is from chapter four of *Living Downstream*. This is the scene of my own amniocentesis with Faith. It is a procedure offered to what they call elderly prima gravida, meaning old mothers, like myself and in it about 30ccs or one short glassful of amniotic fluid is removed from the belly of a pregnant woman. In that fluid is contained the skin cells of the fetus, which can be cultured and grown to show the DNA, to see if there are any gross chromosomal abnormalities. The woman

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can make her decisions based on those results. So I underwent this procedure and here is what happened after that.

The needle is out. We're done. The mood is still upbeat. The obstetrician hands the pair of vials to the technician, who holds them up to the light like glasses of fine wine.

'Nice color,' she says. 'Do you want to hold them?' And she passes the vials, hot as blood, into my hands. The fluid inside is pale gold, it seems to glow. 'Well, it's like liquid amber!' I sputter, 'Like an amber jewel.' It occurs to me that amniotic fluid might be the loveliest substance I have ever seen.

The obstetrician touches my arm, 'That's baby pee,' she says, smiling. 'We like it yellow. It's a sign of good kidney functioning.' I look at the vials again, Oh right....

The obstetrician is finishing up, she reminds me to drink plenty of water today. Drink plenty of water. Before it is baby pee, amniotic fluid is water. I drink water and it becomes the blood plasma which suffuses through the amniotic sac and surrounds the baby – who also drinks it.

And what is it before that? Before it is drinking water, amniotic fluid is the creeks and rivers that fill reservoirs. It is the underground water that fills wells. And before it is creeks and rivers and ground water, amniotic fluid is rain. When I hold in my hands a tube of my own amniotic fluid, I am holding a tube full of rain drops. Amniotic fluid is also the juice of oranges that I had for breakfast, and the milk that I poured over my cereal, and the honey I stirred into my tea. It is inside the green cells of spinach leaves and the damp flesh of apples. It is in the yoke of an egg. When I look at amniotic fluid and I am looking at rain falling on orange groves, I am looking at melon fields, potatoes in wet earth, frost on pasture grasses. The blood of cows and chickens is in this tube. The nectar gathered by bees and humming birds is in this tube. Whatever is inside humming bird eggs is also inside my womb. Whatever is in the world's water is here in my hands.

Before it is drinking water, amniotic fluid is the creeks and rivers that fill reservoirs. It is the underground water that fills wells. And before it is creeks and rivers and ground water, amniotic fluid is rain.

Ecologist, author, and cancer survivor, Dr. Steingraber. is an internationally recognized expert on the environmental links to cancer and reproductive health. Dr. Steingraber's highly acclaimed book, Living Downstream: An Ecologist Looks at Cancer and the Environment *presents cancer as a human rights issue. It was the first to bring together data on toxic releases with newly released data from U.S. cancer registries.* Living Downstream *won praise from international media, including* The Washington Post, *the* Nation, The Chicago Tribune, Kirkus Reviews, Publishers Weekly, The Lancet, *and* The London Times. *Continuing the investigation begun in* Living Downstream, *Dr. Steingraber's new work,* Having Faith: An Ecologist's Journey to Motherhood, *explores the intimate ecology of motherhood. The Library Journal selected* Having Faith *as one of its best books of 2001. In 2002, it was featured on "Kids and Chemicals," a PBS documentary by Bill Moyers. Dr. Steingraber received her doctorate in biology from the University of Michigan and master's degree in English from Illinois State University. She is the author of* Post-Diagnosis, *a volume of poetry, and coauthor of a book on ecology and human rights in Africa,* The Spoils of Famine. *She has taught biology at Columbia College, Chicago, held visiting fellowships at the University of Illinois, Radcliffe/Harvard, and Northeastern University, and served on President Clinton's National Action Plan on Breast Cancer. For more information on Dr. Steingraber's work, see www.steingraber.com.*

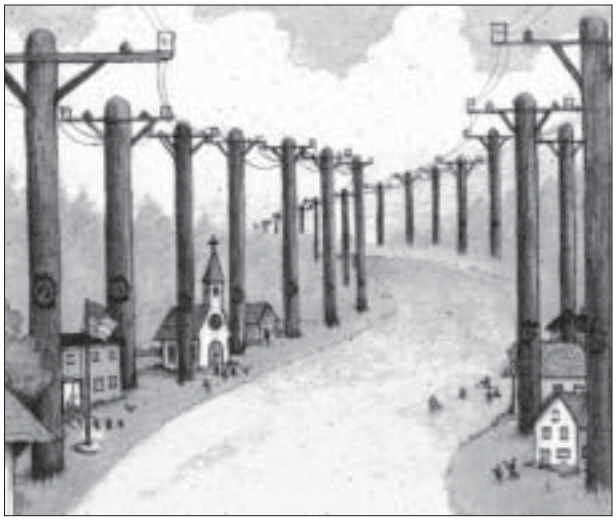
A Crack in The Wood Preservatives Case

Lawsuit to get EPA to act moves forward

By Jay Feldman

On February 21, the U.S. District Court (Washington, DC) approved a timetable for hearing Beyond Pesticides' claim that EPA has "unreasonably delayed" its review and action on wood preservatives. The decision keeps the slow wheels of justice in motion, setting a schedule running through October 13, 2004.

On January 29, 2004, District Court Judge Richard Leon threw out most of the case filed by Beyond Pesticides, the Communication Workers of America, Center for Environmental Health, and Joseph and Rosanne Prager (*Beyond Pesticides et al. v. EPA*, Case No. 02-2419, December 10, 2002), which asked the court to find EPA in violation of the *Federal Insecticide, Fungicide and Rodenticide Act* (FIFRA) because of its failure to cancel the highly toxic (heavy-duty) wood preservatives pentachlorophenol, chromated copper arsenate (CCA), and creosote. At that time, the Judge found in his opinion memorandum that plaintiffs did not have a right to sue under pesticide law, but allowed the "unreasonable delay" claim under the *Administrative Procedure Act* to go forward. EPA does not concur that it has delayed, but affirms the right of plaintiffs to sue on the matter.



Extraordinary Hazard. The widespread use of highly toxic wood preservatives is an environmental and public health outrage. These chemicals are among the most toxic chemicals in use, linked to cancer, birth defects, genetic damage, neurological effects and more. The chemicals in question contain arsenic, dioxins, hexachlorobenzene, furans and other deadly compounds, and as a group annually account for the largest volume of pesticide use. They have no place in a modern world with the availability of alternative technologies and approaches that are more respectful of human life and the environment.

EPA's Unreasonable Delay. Central to the original case is a request from the court for a declaratory judgment that EPA has unreasonably delayed in (i) completing its regulatory actions on the three heavy-duty wood preservatives which were initiated in 1978, and (ii) responding to Beyond Pesticides' petitions to cancel and suspend their registrations.

While we feel that the court is wrong on the matter of EPA's failure to protect the public by removing the wood preservatives from the market, at the very least, EPA should be held to a timetable for decision making. The agency has dragged out its review and re-review of the wood preservatives for almost three decades.

EPA continues to drag its feet. In a document that describes excessively high worker risks and potentially hazardous consumer exposure to the wood preservative creosote, on December 5, 2003 EPA announced its preliminary risk findings, and confirmed health effects that have been known to the agency, the wood preservative industry, and the scientific community for over 20 years. Prior to releasing the document, EPA engaged in nearly a year of closed-door meetings with industry, and locked the public out of the review process. The pentachlorophenol draft risk assessment, also subject to industry review, has been sitting at EPA since 1999 even though it discloses excessively high risks. EPA insiders told Beyond Pesticides that t;he final risk assessment was completed nearly a year ago and was in the hands of EPA's Assistant Administrator for Prevention, Pesticides and Toxic Substances.

Chromium VI Product. Now in another unbelievable twist, EPA is considering allowing the reemergence in the marketplace of a wood preservative, acid copper chromate (ACC), with highly elevated levels of hexavalent chromium (also known as chromium VI), the chemical Erin Brochovich worked to remove from the environment. While ACC does not contain arsenic, it does contain as much as 65% chromium VI, which is double the amount in CCA. Chromium is a known human carcinogen responsible for drinking water contamination, worker illness, and soil and air degradation and linked to kidney and liver damage, lung cancer and respiratory effects, birth defects, and skin ulcers.

The delays and decisions on wood preservatives can only leave one asking, "Who controls EPA?"

***Stopping Toxic Wood**. You can stop the continued use of toxic wood preservatives and protect children and the community from existing structures with information and tools for action from Beyond Pesticides. See the wood preservatives issue page at www.beyondpesticides.org.*

Blessed "Pests" of the Beloved West: An Affectionate Collection on Insects and Their Kin

Edited by Yvette A. Schnoeker-Shorb and Terril Shorb. Native West Press, Prescott, AZ. (c)2003, 144 pages, $9.95

Pesticide pollution and poisonings occur not just from use but also from overuse by consumers driven by an incessant and often irrational fear of insects. A fear that just may be calmed by reading this charming collection of essays about various insects that one may often or may never encounter. The stories are not fuzzy tales of cutesy caterpillars but rather unique, sometimes funny, sometimes adventurous encounters with some of our least favored insects like cockroaches, spiders, sow bugs, beetles and more. Through the eyes of the writer we see nit-picking head lice serve as a bonding ritual and the remarkable ability of a wasp force our minds into the present faster than a Buddhist monk. The stories of these entomologists, naturalists, psychologists, poets and others successfully combine their expertise with personal experience to reduce fears, encourage respect, and demonstrate non-toxic ways of living along side these uninvited pesky friends.

Join Our Pest Patrol: A Backyard Activity Book for Kids on Integrated Pest Management

U.S. EPA, Office of Pesticides Programs. (c)2003, 27 pages, Free.

This kids IPM book was recommended to us by Nancy of Sidell, LA who wrote, "I love the book Join Our Pest Patrol. The centerfold is on Mosquito Patrol and recommends building a bat house. I highly recommend it." We agree. The book, originally developed by the Minnesota Agriculture Department, is great for parents and educators of children in grades 3-6. It has all sorts of activities including coloring, fun facts, puzzles, and written games. Best of all, it promotes holistic, integrated ways of thinking about and managing weeds and insects without the use of pesticides. The EPA offers the book for free to anyone. *To order, call 703-308-8272 or email seikel.kathy@epa.gov. Bulk orders accepted.*

Environmental Health Sourcebook, 2nd Ed.

Edited by Dawn Matthews. Omnigraphics, Detroit, MI. (c)2003, 673 pages, $78

This reference text is kind of like the encyclopedias your parents or grandparents used to collect on a devoted bookshelf. It can be useful, particularly for those without access to the internet, or those seeking a resource that synthesizes the plethora of environmental hazards into their more manageable compartments, or those who simply prefer to thumb through pages rather than scroll through screens for brief insights into environmental health hazards, definitions, histories, and precautions. The text does not endeavor to make new discoveries or new parallels in the field of environmental illness or even draw any conclusions. The book briefly covers more than 65 distinct environmental hazards under the following 8 categories:

1. Understanding the Health Effects of Environmental Hazards;
2. Airborne Hazards;
3. Waterborne Hazards;
4. Chemical Hazards;
5. Radiation and Electromagnetic Field Hazards;
6. Biological Hazards;
7. Foodborne Hazards; and,
8. Environmental Hazards to Specific Populations.

The last chapter is reserved for useful websites, hotlines, environmental groups and other resources. The editor attempts to present a neutral approach to environmental illnesses but in so doing defers at times to EPA-language of protective standards and unreasonable risks without referencing the existing controversy over how well such assessments and standards actually protect us.

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.

RESOURCES

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

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