

Pesticides and You

News from Beyond Pesticides: Protecting Health and the Environment with Science, Policy & Action

Volume 30, Number 3

Fall 2010

Reproductive Problems Peak with Pesticide Exposure

Seasonal water contamination studied

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Sowing Seeds for an Organic Future

The Organic Foods Production Act at Twenty Years Old

ChemWatch Factsheet: Oil of Lemon Eucalyptus

Save the Date!

**Beyond Pesticides'
29th National
Pesticide Forum**

**Denver, Colorado
April 8-9, 2011**



Letter from Washington

Bed Bug Frenzy

As humans, we are always fighting the next pest. Whether it is around our home or community, in the garden, or on the farm, we move from one pest crisis to the next. Then a chemical-intensive response often leads to the next pesticide crisis—poisoning and contamination follows. Sometimes the identified problem is managed with low level chemical use that doesn't attract much public attention. But other times, the problem escalates and headlines follow.

Bed bugs need a strategic response. No question.

But the toxic chemical response, which is too often the response, is not the answer. In October, it was reported by a news outlet that a New York City pest control company hired by the City's Department of Education for almost \$100,000 applied pesticides that, according to teachers, left the classrooms "soaked with a liquid bed bug killing chemical." At the time of this writing the chemical had not been identified.



A Teachable Moment

So, we have a teachable moment: a pest that most experts believe is not effectively controlled by chemicals; and, a recognition that the insect is resistant to the widely available chemicals allowed for use. Does this mean we should bring out a stronger and otherwise banned chemical, one that in 2007 was cancelled for all indoor uses that may result in exposure for children? The chemical in question, propoxur, is neurotoxic and carcinogenic. According to EPA, "The Agency's health review for its use on bed bugs suggests that children entering and using rooms that have been treated may be at risk of experiencing nervous system effects. The specific exposure scenarios that are of most concern involved inhalation risk and also hand-to-mouth behaviors on the part of children." In EPA-speak, that's a very strong statement.

For the moment, EPA has dismissed the idea of bringing back propoxur. A coalition of environmental groups, led by Beyond Pesticides, wrote EPA at the end of 2009, urging the agency to reject a request from the Ohio Department of Agriculture to allow the unregistered use of propoxur under an emergency provision in the nation's pesticide law, the *Federal Insecticide, Fungicide and Rodenticide Act* (Section 18). The agency then in June of this year told Ohio's Governor, in response to his April letter, "Although EPA recognizes the severe and urgent challenges that Ohio is facing from bed bugs, the results of the risk assessment do not support the necessary safety findings as required. . ." In the letter, EPA says it "is supportive of stakeholders involved in bed bug issues who are studying non-chemical practices to control bed bugs." The letter continues, "Some of these practices appear to have utility in homes and commercial settings (e.g. hotels and apartments), including the use of heat or cold to kill all life-stages of bed bugs and physical exclusion techniques to prevent bed bugs from entering areas where people reside and sleep (e.g. mattress encasements)." However, at the same time, EPA tells the Governor,

"We are collaborating with experts and stakeholders nationwide to determine what other pesticides may be effective for bed bug control."

Toxic Chemicals Are Not the Answer

At Beyond Pesticides, we saw the crisis coming and urged non-chemical preventive measures, an approach that always works best in pest management. In 2007, we published a factsheet on bed bugs, entitled *Bed Bugs - Back with a Vengeance: Detection, prevention and least-toxic control of bed bugs*. An updated version can be found on our website at www.beyondpesticides.org/bedbugs. Our approach involves a combination of methods that will (i) prevent most unwanted structural insects looking to get inside structures, and (ii) manage existing bed bug problems. We suggest the following: caulk and seal crevices, eliminate clutter, vacuum, launder fabrics and clothing, encase mattresses and box springs, steam treatment, and heat treatment. (See factsheet for more details.)

We can use the bed bug challenge and opportunity to reorient our nation's approach to pest management with questions and practices that prevent unwanted insects and rodents with techniques that eliminate points of entry, habitat, and sources of food and water that are attractive. If we embrace these non-chemical approaches, recognizing the failure and hazards of the chemical-intensive approach, we will not only improve the efficacy of our practices, but will better protect people from the public health diseases that are increasingly linked to pesticide exposure. Please feel free to contact Beyond Pesticides for non-toxic pest management strategies.

Please Consider a Donation to Beyond Pesticides

We ask you again this year to consider an end-of-year contribution to Beyond Pesticides to enable us to continue our important work. I believe that we are making headway in our program to hold back toxic pesticide use in our homes and communities. We play a critical role in keeping the pressure on decision makers and providing the support to local people and organizations at the same time that we work on policy to advance alternative strategies, like organic practices, that eliminate the use of toxic chemicals. We are honored to work with amazing scientists, policy makers, practitioners, and activists who share our vision for a toxic-free future that is healthy for people and the environment. And, we are grateful to have the support of Beyond Pesticides' members and supporters like you. We deeply appreciate your support in 2010. Please look for our appeal letter in the mail or donate on our website site at www.beyondpesticides.org/donate2010. Thank you for your support in 2010!



Jay Feldman is executive director of Beyond Pesticides.

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National Headquarters:

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

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BEYOND PESTICIDES STAFF

Jay Feldman, *Executive Director*
John Kepner, *Project Director*
Kagan Owens, *Senior Project Associate*
Nichelle Harriott, *Research Associate*
Stephanie Davio, *Public Education Associate*
Sharon Fried, *IPM and Health Care Facility Project Director*
Terry Shistar, Ph.D., *Science Consultant*
Adelia Bles, *Intern*

PESTICIDES AND YOU

Jay Feldman, *Publisher, Editor*
Jay Feldman, John Kepner, Stephanie Davio, Nichelle Harriott, Kagan Owens, Adelia Bles, *Contributors*
John Kepner, *Layout*

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Fruit Fly Frenzy

I am in a race against the fruit flies versus my fruit and veggies. I have been canning, freezing, pie-making and trying to eat up all my fruit as soon as possible. It's exhausting and it's driving me mad. What can I do?

*Thanks!
Carmen*

Dear Carmen,
Okay, so it's not going to be easy, but the first step is to figure out exactly where they are breeding and feeding, and then either eliminate those spots or make them completely inaccessible to these tiny pests. A single rotting potato or onion forgotten at the back of a closet, fruit juice spillage under a refrigerator, or dirty sink or floor drains can breed thousands of fruit flies, since they can lay about 500 eggs at a time. They usually lay their eggs near the surface of fermenting foods or other moist organic materials. Upon emerging, the tiny larvae continue to feed near the surface of the fermenting mass.

Fruit flies are especially attracted to ripened fruits and vegetables in the kitchen. But they also will breed in drains (in this case they are really drain flies), garbage disposals, empty bottles and cans, trash containers, mops and cleaning rags. **All that is needed for development is a moist film of fermenting material.** Infestations can originate from over-ripened fruits or



vegetables that were previously infested and brought into the home.

Here are some tips to eliminate these breeding/feeding spots:

- Eat, discard or refrigerate ripened food.
- Cracked or damaged portions of fruits and vegetables should be cut away and discarded in the event that eggs or larvae are present in the wounded area. Since fruit flies only feed and breed on the surfaces, this will eliminate any eggs that are currently present.
- Empty and clean recycling areas and garbage areas regularly. Be sure to empty daily and do one seriously thorough cleaning to eliminate any potential spillage and then as needed.
- Ensure that the containers are well-sealed; otherwise, fruit flies will lay their eggs under the lid and the tiny larvae will enter the container upon hatching. Note: well-sealed means REALLY well-sealed. Adults are about 1/8 inch long and they can enter in even the tiniest spaces.

■ The adults can also fly in from outside through inadequately screened windows and doors. Size 16 mesh screens will keep them out, which is a smaller mesh than average screens.

■ They can breed in garbage disposals in the sink, too! What to do? To find out if

this is a potential spot, seal the drain over night with plastic wrap or by taping a clear plastic food storage bag over the opening. If flies are breeding in these areas, the adults will emerge and be caught in the bag.

Hang in there! I

Get Printed!

Beyond Pesticides always welcomes your questions, comments or concerns! Have something you'd like to share or ask us? We'd like to hear about it! If we think something might be particularly useful for others, we will print your comments in this section. Comments will be edited for length and clarity, and unless you specify otherwise, your information will remain anonymous.

There are many ways you can contact us. Join other members and activists in discussions on our facebook page www.facebook.com/beyondpesticides or follow us on twitter www.twitter.com/bpncamp! And as always, you can send questions and comments to:

Beyond Pesticides, 701 E Street SE,
#200, Washington, DC 20003, or
info@beyondpesticides.org

know it's driving you mad now, but just remember that the lifecycle of a fruit fly is about one week. If all breeding sites are removed, it shouldn't take much longer to remedy the infestation. Hope this helps!

"Nit" Picky Advice

Thanks for all your information. As an advocate for healthy schools, I was wondering what the latest advice is regarding head lice and nits.

*Thanks,
Claire*

Successful treatment of lice depends on an integrated approach that relies on using a few different methods, including monitor-

ing, using preventive measures such as establishing “no share” policies for hair accessories, physical removal and heat.

One effective method for eliminating these pests is the use of hot air, which dries out both the adult head lice and the nits (eggs), and kills them. In a study, researchers tested six methods of applying hot air to the head and found that a common hand held blow dryer used to apply heat directly on sections of the head for a total of 30 minutes results in 98% mortality of eggs and 55% mortality of adult lice. A specially developed hot air applicator named the “lousebuster” results in equal egg mortality and higher (80%) adult lice

mortality and is actually applied at a lower heat. Most pesticidal shampoos, on the other hand, do not kill the eggs and must be applied twice in order to kill eggs that have subsequently hatched after the first shampoo. When considering both the dangers of applying these pesticidal soaps directly to your child’s head and the fact that lice often develop resistance to these products, hot air outperforms insecticidal shampoos in killing adult lice and nits.

Additionally, you can use nit combs to physically pick them out. This is absolutely necessary along with any other treatment method to eradicate the lice and nits. When combing, you might try heating up

some virgin coconut oil and applying it to the hair in order to loosen nits and make it easier to comb. It might seem like a lot of work, but it doesn’t have to feel like a chore if you make this into a fun evening activity: put on a movie and let your child enjoy being the center of your attention while you “play” with his/her hair. More details on this method can be found in our factsheet, *Getting Nit Picky about Head Lice*, on our Alternatives page: www.beyondpesticides.org/alternatives/factsheets.

Heat, a good nit comb and some patience is all it takes to control these critters. Hope this helps!

Beyond Pesticides Daily News Blog

Beyond Pesticides’ Daily News Blog features a post each day on the health and environmental hazards of pesticides, pesticide regulation and policy, pesticide alternatives, and cutting-edge science, www.beyondpesticides.org/dailynewsblog.

Excerpt from Beyond Pesticides original blog post (8/10/10):

Bill Would Strip Clean Water Act Protections from Pesticides

Senator Blanche Lincoln (D-AR), Chair of the Senate Committee on Agriculture, Nutrition, and Forestry, and Ranking Member Saxby Chambliss (R-GA) introduced legislation on August 6, 2010 that would strip the public of the protection provided by the *Clean Water Act* (CWA), which seeks to better restrict pesticides applied to or near U.S. waterways. If successful, the bill, S. 3735, would nullify regulations that require pesticide applicators to apply for National Pollutant Discharge Elimination System (NPDES) permits under CWA before applying pesticides on or near surface waters **Beyond Pesticides encourages its members to contact their Senators and let them know how they feel about S. 3735.**

Susan says:

Senators Lincoln and Chambliss - please do not do this. Even with the *Clean Water Act* as it is, there are agencies such as Carroll Electric Cooperative Corporation in northwest Arkansas that have blatantly disregarded the statute in their “Best Vegetation Management Practices” by not even mentioning protection of fresh water sources in any form. At present, there is a grassroots group that has had to hire attorneys to help us protect our private property and fresh water from their cocktails of mixed herbicides. Your bill will only make it easier for them to poison our drinking and recreational water, making both unusable for consumption and bathing.

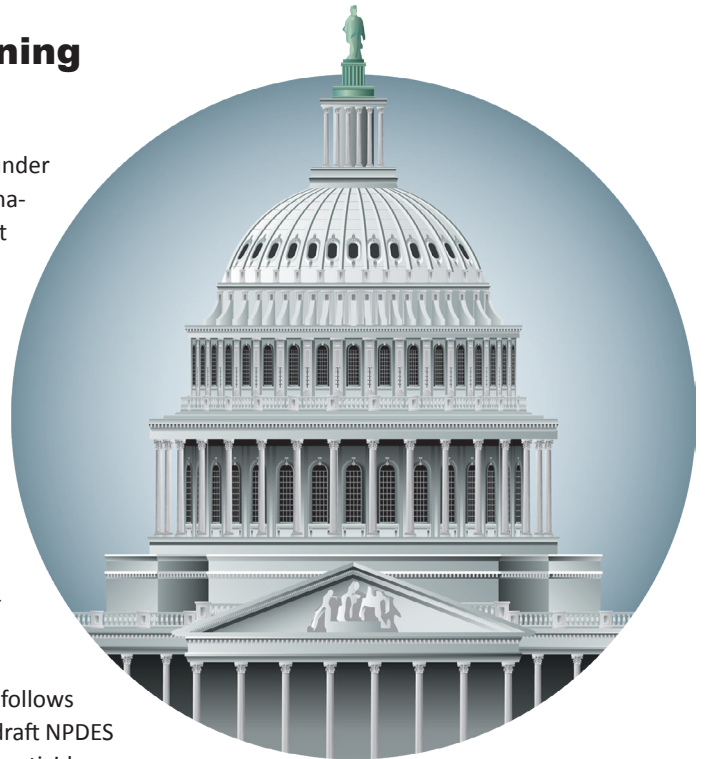


Groups Tell Senators to Stop Undermining Clean Water Act

Beyond Pesticides, along with dozens of environmental and public health groups, sent a letter to the U.S. Senate Committee on Agriculture, Nutrition, and Forestry, urging the withdrawal of S. 3735, a bill that would weaken the *Clean Water Act* provisions intended to protect the public from pesticides. The bill, introduced by Senators Blanche Lincoln (D-AR) and Saxby Chambliss (R-GA), the committee's Chair and Ranking Member, seeks to nullify regulations that require pesticide applicators apply for National Pollutant Discharge Elimination System (NPDES) permits before applying pesticides on or near surface waters. The groups say Congress should be supporting the Environmental Protection Agency (EPA) in fulfilling its mission, rather than undermining laws that protect public health and the environment. Senators Lincoln and Chambliss argue that because pesticides are registered under the *Federal Insecticide, Fungicide and Rodenticide Act* (FIFRA) additional regulation is unnecessary and burdensome. In their August 30th letter, the groups respond by saying, "CWA complements and does not duplicate the pesticide registration

reviews conducted by EPA under FIFRA, which sets a general national standard that does not take into account conditions and specific vulnerabilities evaluated through the NPDES process. Given extensive, documented water contamination by pesticides nationwide, it is critical that we allow the NPDES review process to move ahead. S. 3735 will prevent this from happening."

The introduction of S. 3735 follows EPA's June 2010 posting of a draft NPDES General Permit for certain pesticide use patterns, also known as the Pesticides General Permit (PGP). The development of the permit stems from a 2009 court decision in the case of the *National Cotton Council et al. v. EPA*, in which the 6th Circuit Court of Appeals ruled that pesticide discharges into water are pollutants and require permitting under CWA. In July 2010, Beyond Pesticides and others sent comments to



EPA requesting improvements to the proposed PGP and CWA regulations.

Take Action: *Beyond Pesticides encourages its members to contact their Senators and let them know how they feel about S. 3735. For more information on S. 3724 or the PGP, contact Beyond Pesticides.*

Federal Funding Awarded to Group Pushing Pesticide Agenda

The California Department of Food and Agriculture (CDFA) has awarded \$180,000 in federal funds to a chemical-intensive agriculture lobby group that says it will "correct the misconception that some fresh produce items contain excessive amounts of pesticide residues." The group, Alliance for Food and Farming, says it will use the grant to counter "claims by activist groups about unsafe levels of pesticides... and change public perception about the safety of produce when it comes to pesticide residues." The Alliance, which represents food producers, commodity groups and agricultural associations, specifically criticizes the Environmental Working Group's (EWG) "Dirty Dozen" project, contending that there is "no scientific evidence" that a small amount of pesticide residue on food represents any health risk. Last July, the Alliance set up a web site and press webinar claiming that the "Dirty Dozen" list is dangerous to the public health. Food residues are only a small part of the problem with chemical-intensive farming, however, and the Alliance completely misses the mark when it comes to pesticide residues and health effects, failing to address the extensive scientific evidence on the dangers of pesticides; not only in the form of residues on food, but from drift, water contamination and other routes of exposure.

For more information on the health and environmental benefits of organic food, visit www.beyondpesticides.org/organicfood. To learn more about the hazards of pesticides used on commonly consumed fruits and vegetables, visit www.EatingWithAConscience.org.

USDA Announces \$6M for Organic Certification Reimbursements

In September 2010, the U.S. Department of Agriculture (USDA) announced that it will make available \$6.37 million in federal funds for organic certification cost-share reimbursements for the fiscal year 2010. Recipients must receive initial certification or continuation of certification from a USDA-accredited certifying agent and may be reimbursed for up to 75 percent of their organic certification costs, not to exceed \$750 per year. According to a press release from the USDA Agricultural Marketing Service (AMS), these funds will be available through two cost-share programs that AMS manages, the Agricultural Management Assistance Program and the National Organic Certification Cost-Share Program. Each program provides cost-share rebates to eligible organic producers and/or handlers receiving or renewing organic certification by a USDA-accredited certifying agent through funds allocated to their respective state agriculture agencies. The states review applications submitted by eligible producers and/or handlers and distribute funds. The annual inspection/certification fee for organic farms was initially estimated to be about \$750 per farm by the National Organic Program (NOP) when the program began. However, the fees vary depending on the certifying agent and farm size.

The costs of certification and inspections are often cited by small farms as one roadblock to participating in organic certification. This program helps to alleviate some of those costs, giving more farmers the option to become organic. Additionally, small farms (making less than \$5,000/year on organic products) are exempt from the certification requirement. Farmers are encouraged to shop around for a certifying agent that will be the most cost-effective for their operation. **Take Action:** *Encourage the farmers at your local farmers market to go organic. For more information on organic certification and regulation, see www.beyondpesticides.org/organicfood. Additional information on the cost-share programs, as well as a list of participating states, is available on the National Organic Program home page at www.ams.usda.gov/NOPCostSharing.*

FDA Considers Approval of Genetically Engineered Salmon

The biotechnology firm AquaBounty Technologies Inc. is seeking U.S. Food and Drug Administration (FDA) approval for a genetically engineered salmon, hoping to do for aquaculture what biotech giants such as Monsanto have done for agronomy. Currently, the vast majority of U.S. soybeans, corn and cotton are genetically engineered, but this would be the first commercially available genetically engineered food animal. According to the company, AquAdvantage Salmon (AAS) grow year around (instead of only six months a year) reaching market weight in 18 months instead of 36, while consuming 25% less food over its lifetime. The variety was developed by inserting part of a gene from an ocean pout, an eel-like fish, into the growth gene of a chinook salmon. The blended genetic material is then injected into the fertilized egg of a North Atlantic salmon. AquaBounty is also developing genetically altered trout and tilapia. While AquaBounty argues its fish will help feed the world, many are leery of what critics call “frankenfish” be-

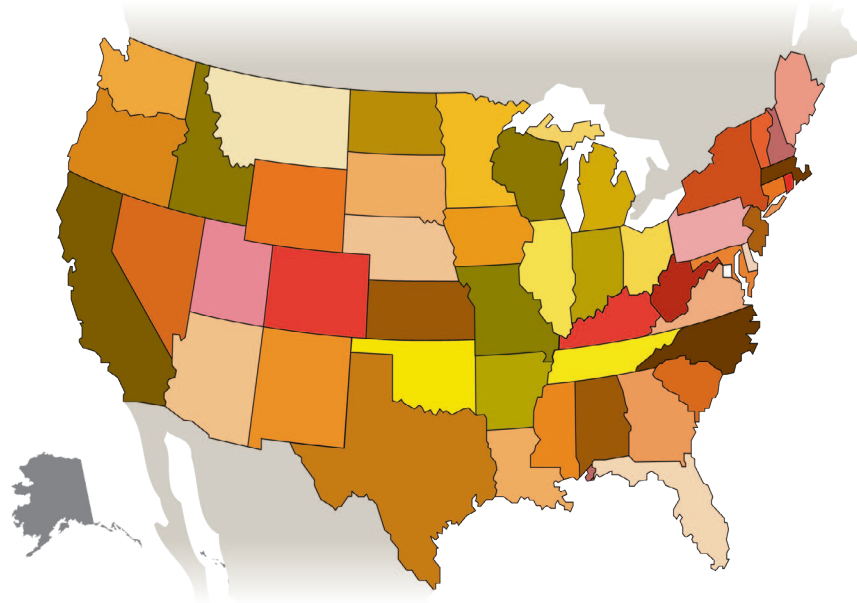
ing introduced into the food supply. If the proliferation of genetically engineered crops in the U.S. is any indication, the introduction of genetically engineered animals into the food supply will fail to produce an increase in yield.

Many are concerned about the potential for genetically engineered animals to cross breed with wild animals, resulting in genes escaping into the wild. The use of genetically engineered crops has led to several engineered genes escaping into the wild, creating so-called superweeds. To prevent genes from escaping into wild populations, AquaBounty would create sterile fish and require producers to raise salmon in inland tanks, as opposed to ocean pens where most farmed salmon are raised. However, sterilization

can occasionally fail and AquaBounty may sell to producers overseas who are not bound by U.S. regulations. FDA is expected to make a decision this Fall.

Take Action: *Write to FDA's Veterinary Medicine Advisory Committee and tell the agency to stop genetically engineered salmon: Aleta Sindelar, Center for Veterinary Medicine, Food and Drug Administration, 7519 Standish Place, Rockville, MD 20855 or email Aleta.Sindelar@fda.hhs.gov.*





Study Links Low-Dose Exposure to Persistent Chemicals and Type 2 Diabetes

A study published in the September 2010 issue of the journal *Environmental Health Perspectives* links low-dose exposure to some persistent organic pollutants (POPs), including the organochlorine insecticides trans-nonachlor, oxychlordane and mirex, with type 2 diabetes. However, POPs did not show a traditional dose–response relationship with diabetes. Instead, POPs showed strong associations at relatively low exposures. The authors conclude that exposure to relatively low concentrations of certain POPs may play a role in the increased incidence of diabetes in the U.S. The study, “Low Dose of Some Persistent Organic Pollutants Predicts Type 2 Diabetes: A Nested Case–Control Study,” examines participants who were diabetes-free in 1987–1988. By 2005–2006, the 90 controls remained free of diabetes, whereas the 90 cases developed diabetes. Using serum collected in 1987–1988, the authors measured eight organochlorine pesticides, 22 polychlorinated biphenyl congeners (PCBs), and one polybrominated biphenyl (PBB).

POPs are organic compounds that are resistant to environmental degradation through chemical, biological, and photolytic processes. The *Stockholm Convention on Persistent Organic Pollutants* is an international environmental treaty that aims to eliminate or restrict the production and use of POPs worldwide. While the persistent pesticides implicated in this study are no longer used in the U.S., the study illustrates how the health impacts of pesticides are often subtle and delayed, and how pesticides once considered posing “acceptable” risks are continuing to affect public health years after being pulled from the market. In response, Beyond Pesticides launched the *Pesticide-Induced Diseases Database* to capture the range of diseases linked to pesticides through epidemiologic studies. *The database is available at www.beyondpesticides.org/heath. For more information, see the Summer 2010 issue of *Pesticides and You* (Vol. 30, No. 2).*

Expanded! Eating with a Conscience: For You, Workers and the Environment

Consumer food buying decisions have a direct effect on the health of the environment and those who grow and harvest food. In September, Beyond Pesticides released its expanded *Organic Food: Eating with a Conscience* guide, now updated to include 43 of the most commonly eaten fruits and vegetables. Recent media attention has focused consumers on purchasing foods that are often referred to as “clean,” but grown with toxic chemicals that show up as residues on their food in small or nondetectable amounts. While this approach alerts consumers to hazardous residues on food, those very same “clean” food commodities can be grown with hazardous pesticides that wash off into waterways and groundwater, contaminate nearby communities, poison farmworkers, and kill wildlife.

For example, while conventional onions grown with toxic chemicals show low pesticide residues on the finished commodity, there are 63 pesticides with established tolerances for onions: 26 are acutely toxic creating a hazardous environment for farmworkers, 59 are linked to chronic health problems (such as cancer), 8 contaminate streams or groundwater, and 55 are poisonous to wildlife. While not all listed pesticides are applied to every onion, they may be used in onion production, making it impossible at the point of sale to identify which specific chemicals are used.



*For more information, see the Summer 2010 issue of *Pesticides and You* (Vol. 30, No. 2). To view the database, go to www.EatingWithAConscience.org.*

Organic Strawberry Farming Leads to Healthier Berries and Soils

A new study, "Fruit and Soil Quality of Organic and Conventional Strawberry Agroecosystems," published in the September 2010 issue of *PLoS One*, finds that organic strawberry farming results in higher quality fruit and healthier soils, providing further evidence that organic farming is healthier and better for the environment. To compare conventional and organic strawberry production, researchers selected 13 pairs of conventional and organic strawberry fields in Watsonville, CA, the nation's dominant strawberry growing region. While concentrations of potassium and phosphorus are higher in the conventionally produced strawberries,



organically produced strawberries have higher levels of antioxidants, Vitamin C, and phenolics. Organic strawberries also have a longer shelf life and greater resistance to post harvest fungal rot. Consumer sensory panels show a preference for the taste of organic strawberries. Soils on the organic farms are also found to be healthier with higher organic matter concentration, and greater microbial biodiversity.

California strawberries make up 25% of total production worldwide and 87% of U.S. production. Conventional strawberry production is notoriously dangerous for farmworker health and the

environment. After phasing out the ozone depleting fumigant methyl bromide, the California government began considering approval of methyl iodide, a chemical so carcinogenic it is actually used in the lab to induce cancer. Strawberries are generally considered one of the most toxic crops to grow conventionally, despite great successes in organic strawberry production.

For more information on the health and environmental benefits of organic food, visit www.beyondpesticides.org/organic-food. To learn more about the hazards of pesticides used on commonly consumed fruits and vegetables, visit www.Eating-WithAConscience.org.

Triclosan Persists at Low Levels in the Environment

A study by the U.S. Department of Agriculture (USDA) provides new details about how fertilizing soils with biosolids introduces triclosan, an antibacterial agent in soaps, toothpastes and cleaning supplies, into the environment. The study, published in the February 2010 issue of *Chemosphere*, finds that triclosan in biosolids is slowly degraded and persists at low levels in the environment for long periods of time. The authors determined that triclosan in Class B biosolids from a Mid-Atlantic wastewater treatment plant average 15.5 milligrams per kilogram. They collected soil samples from 26 local farms, some of which had never been amended with biosolids and others that received one to four applications within 9 months to 13 years. The farms that had not received biosolids had background triclosan levels that peaked at 4.5 micrograms per kilogram of dried soil. Farms that had received single and multiple biosolid applications varied from 3.1 to 66.6 micrograms per kilogram. Seventy-eight percent of the triclosan was degraded after 7 to 9 months, leaving significant triclosan levels in the fields during a typical growing season. Biosolids are prohibited in organic production.

Triclosan is one of the most detected chemicals in U.S. waterways; about 96 percent of triclosan from consumer products is disposed of in residential drains. This leads to large loads of the chemical in water entering wastewater treatment plants, which are unable to completely remove it during treatment. When treated wastewater is released to the environment, sunlight converts some of the triclosan (and related compounds) into various forms of dioxins. Triclosan is an endocrine disruptor and has been shown to affect male and female reproductive hormones and alter thyroid function. Due to its extensive use in consumer goods, triclosan and its metabolites are present in fish, umbilical cord blood, and human milk. A study, published July 21, 2010 online in the journal *Environmental Science and Technology*, finds that triclosan from sewage sludge can be taken up by soybean plants and translocated into the beans themselves, then consumed by people and animals. The Centers for Disease Control in its updated *National Report on Human Exposure to Environmental Chemicals* notes that triclosan levels in people increased by over 41% between the years 2004 and 2006.

Take Action: Sign the pledge to stop using triclosan today and encourage your local schools, government agencies and businesses to use their buying power to go triclosan-free. Urge your municipality to adopt the model resolution eliminating triclosan. See www.beyondpesticides.org/antibacterial/triclosan.htm.



Study Highlights High Levels of Endocrine Disruptors in Indoor Air

A new study confirms that indoor uses of consumer products, including pesticides, are the primary sources of indoor exposure to endocrine disruptors—chemicals that disrupt hormones and cause adverse developmental, disease, and reproductive problems—and shows that indoor levels are higher than those outdoors. Researchers measured airborne concentrations of endocrine disruptors in two California communities: Bolinas, a rural, affluent coastal town, and Richmond, a working-class city ringed by oil refineries. The study analyzed 104 chemicals in 50 homes, including both chemicals that penetrate indoors from outdoor industrial and transportation sources and those from indoor use of consumer products and building materials. Similar levels of contamination are found inside homes in both communities, but outdoor levels are higher in Richmond. Among the chemicals found are pesticides, phthalates, parabens, PBDE flame retardants, and PCBs. Of 38 pesticides evaluated, 13 are detected outdoors and 16 pesticides are detected in indoor air. The study is published online in the September 1, 2010 issue of *Environmental Science and Technology*.

The endocrine system consists of a set of glands (thyroid, gonads, adrenal and pituitary) and the hormones they produce (thyroxine, estrogen, testosterone and adrenaline), which help guide the development, growth, reproduction, and behavior of animals, including humans. Endocrine disruptors function by: (i) Mimicking the action of a naturally-produced hormone, such as estrogen or testosterone, thereby setting off similar chemical reactions in the body; (ii) Blocking hormone receptors in cells, thereby preventing the action of normal hormones; or, (iii) Affecting the synthesis, transport, metabolism and excretion of hormones, thus altering the concentrations of natural hormones. Endocrine disruptors have been linked to attention deficit hyperactivity disorder (ADHD), Parkinson's and Alzheimer's diseases, diabetes, cardiovascular disease, obesity, early puberty, infertility and other reproductive disorders, and childhood and adult cancers.

For more information on pesticides and endocrine disruption, see *Beyond Pesticides' Endocrine Disruptors brochure* and learn more about the links between pesticide exposure and a wide range of health effects at www.beyondpesticides.org/health/endocrine.htm.

Atrazine Causes Prostate Inflammation and Delays Puberty

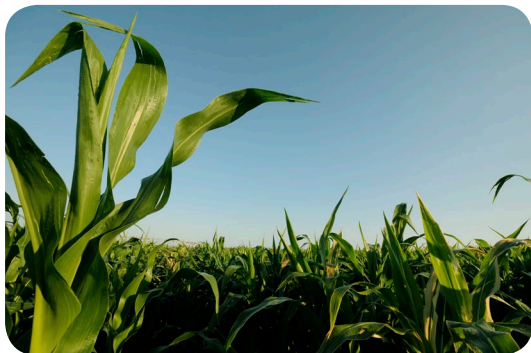
As the Environmental Protection Agency (EPA) continues its review of the top-selling herbicide atrazine, a new study shows that male rats prenatally exposed to low doses of the chemical are more likely to develop prostate inflammation and to go through puberty later than non-exposed animals. The research adds to a growing body of literature on atrazine, an herbicide used in agriculture, especially in corn and sugar cane production, on golf courses

and residential lawns. Atrazine and its byproducts are known to be persistent in the environment and frequently contaminate water supplies. It has been linked to a myriad of health problems in humans, including disruption of hormone activity, birth defects, and cancer.

The research, "Effects of prenatal exposure to a low dose atrazine metabolite mixture on pubertal timing and prostate development of male Long-Evans rats," published in *Reproductive Toxicology* (Vol. 30, No. 4), finds that the incidence of prostate inflammation went from 48 percent in the control group to 81 percent in the male offspring who were exposed to a mixture of atrazine and its breakdown products prenatally. The severity of the inflammation increased with the strength of the doses. Puberty was also delayed in the animals who received atrazine.

The doses of the atrazine mixture given to the rats during the last five days of their pregnancy are close to the regulated levels in drinking water sources. The current maximum contamination level of atrazine allowed in drinking water is 3 parts per billion. The doses given to the animals were 0.09 (or 2.5 parts per million), 0.87 or 8.73 milligrams per kilogram body weight.

In October 2009, EPA announced that it was launching a new evaluation of atrazine to determine its effects on humans. At the end of this process, it will decide whether to revise its current risk assessment of the pesticide and whether new restrictions are necessary to better protect public health. The announcement followed recent scrutiny and findings that current EPA regulation of atrazine in water is inadequate. For more atrazine information, see the *Pesticide Gateway*, www.beyondpesticides.org/gateway.



Sowing Seeds for an Organic Future

The *Organic Foods Production Act* at Twenty Years Old

By Michael Sligh

The following is testimony of Michael Sligh, on behalf of the National Organic Coalition, before the Senate Agriculture Committee, September 15, 2010.

Mr. Sligh is an organic farmer, author, first chair of the U.S. Department of Agriculture's National Organics Standards Board. He currently directs the Just Foods program at the Rural Advancement Fund International-USA (RAFI-USA). Working with a variety of farm, community, university and government groups, RAFI - USA promotes sustainability, equity and diversity in agriculture through policy changes, practical assistance, market opportunities, and access to financial and technical resources. The Just Foods program promotes a systems-based approach to a more sustainable food and fiber system. He began farming organically in the 1970's.

Chairman Lincoln, Ranking Member Chambliss, Distinguished Members of the Committee, I am here today on behalf of the National Organic Coalition, of which I am a founding member. The National Organic Coalition is a national alliance of organizations working to provide a "Washington voice" for farmers, ranchers, environmentalists, consumers and progressive industry members involved in organic agriculture. Our goal is to protect and enhance the integrity of the organic label, which is at the heart of continued consumer confidence.

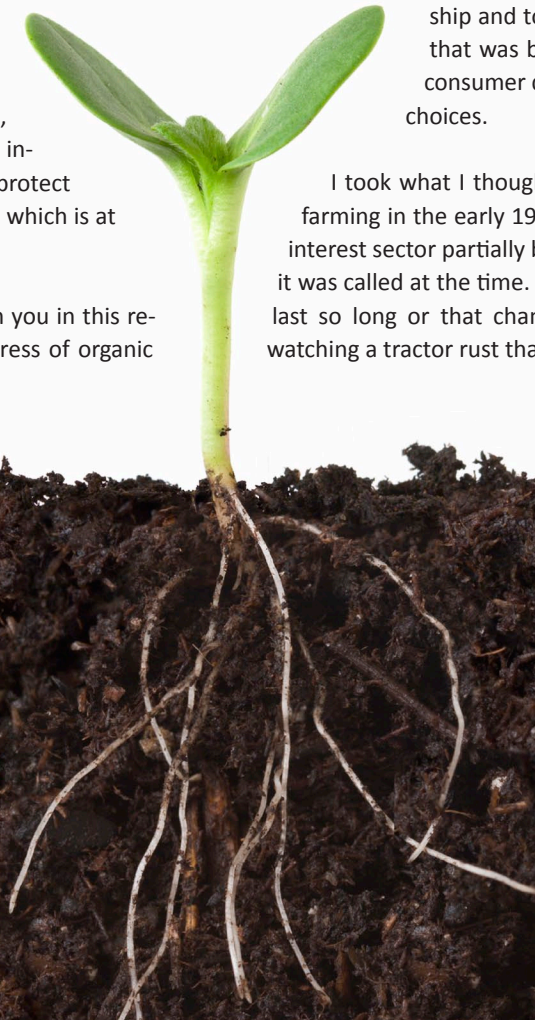
Thank you for this opportunity to engage with you in this reflection and celebration about the great progress of organic

agriculture since the 1990 passage of *Organic Foods Production Act* (OFPA). Even more important than commemorating the past, this hearing is about looking forward and setting a clear course for the next 20 years of organic agriculture and beyond.

In that context, my testimony will not only focus on my experiences in the early years of organic agriculture and the progress that I have witnessed in the last 20 years, but I would also like to talk to you about the efforts that our Coalition has made to engage the organic community in a multi-year dialogue about the future of organic agriculture through the establishment of a *National Organic Action Plan* (NOAP).

But first, to step back for a moment, I would like to talk about my background and the history of my work on organic agricultural policy issues. I got into this line of work, honestly enough – having come from a long line of family farmers and converting my own operations to organic in the 1970's. Mostly because of having watched the struggles of my elders, I was interested in finding a way to better reward farmers for their stewardship and to provide farmers with a way to farm that was both profitable as well as serving the consumer demand for greater marketplace food choices.

I took what I thought was to be a short sabbatical from farming in the early 1980s to work for the non-profit public interest sector partially because of the looming farm crisis, as it was called at the time. Little did I know that the crisis would last so long or that changing agriculture policy is more like watching a tractor rust than just making hay. (No offense.)



Farming organically had been relatively easy, but we also understood that organic could not grow without a clear federal program, complete with clear, consistent standards and regulatory oversight. We supported both Congressman Jim Weaver's fine attempt at national organic legislation in 1984 and then Senator Wyche Fowler's later attempt, and finally, the successful leadership package by Senator Leahy and Congressman DeFazio for the passage of OFPA. I believe this legislation stands as a model in both defining and implementing a successful public/private partnership in a very vigorous, hyper-participatory and transparent manner.

One of the key aspects of the public/private partnership of OFPA was the creation of the National Organic Standards Board (NOSB), to give members of the organic community a formal role in advising the U.S. Department of Agriculture (USDA) about key aspects of the National Organic Program (NOP) and the organic standards.

I was recruited to be a member of the first National Organic Standards Board in 1992, and was elected as its founding chair. As volunteer Board members, we took our call to serve our country seriously and held meetings and hearings across the country for over five years to present USDA with a sound, comprehensive and a well-vetted community consensus, which now serves as basis for the NOP.

Through the early years of the NOP, there have been many twists and turns, some serious failures to communicate, major lapses of fair play, and many "hiccups." However, through it all not only has organic survived, but it has actually thrived –against all of the odds. The combination of strong farmer innovation, common sense and entrepreneurship along with a strong and very loyal consumer demand, coupled with sound federal policy, has served us all quite well.

We do indeed have much to be proud of. Organic agriculture is emerging from the margins to the mainstream, and is now start-



ing to hit its stride. A few noteworthy milestones to date for organic agriculture include:

- The first marketplace label for sustainable agriculture with verifiable "third party" certification and accreditation systems;
- Continued brisk growth for over two decades, even during this most current period of economic downturn;
- Over 86 million acres worldwide under organic production; and over 4.1 million acres in the U.S.;
- Strong consumer confidence with over \$50 billion dollars in sales worldwide. The U.S. is the world's largest organic market with over \$26 billion dollars in annual sales;
- A truly global response, with organic farmers and organic farming associations in almost every country, and nearly 60 countries in the process of developing national organic regulations;

- Significant contributions to ongoing reduction in the use of potentially toxic chemicals and technologies, reducing farmer and farmworker health exposures;

- A demonstrated increase in yields for some of the poorest farmers in world by converting to organic, as noted in a United Nations study;¹ and,

- Improved consumer choice and local food security for sustainable, nutritious, and healthy food.

So, to sum up, organic agriculture produces high yielding crops while reducing the adverse impacts of agriculture and directly contributes to increasing the viability of family farms by adding new green jobs for rural communities.

Organic has been a success story with concrete benefits. These benefits are inspiring farmers and consumers to strengthen organic integrity, grow for fair organic markets and increase the uni-

¹UNEP-UNCTAD Capacity-building Task Force on Trade, Environment and Development, 2008. *Organic Agriculture and Food Security in Africa*.

versal access to healthy organic foods worldwide.

The role of Congress and USDA in fostering these successful milestones has been critical. The 2008 Farm Bill, under the leadership of this Committee, included landmark provisions to address many of the needs of the organic sector. A few highlights of that bill include:

- Additional funding for the organic certification cost-share program, which ensures that limited resource and smaller farms are not priced out of the growing organic market opportunities by high certification costs;
- Increased funding for organic research;
- Greater access for organic farmers to crop insurance programs; and,
- Recognition of the need to foster the conservation benefits of organic agriculture within the Environmental Quality Incentives Program (EQIP) and Conservation Stewardship Program (CSP).

We are also very pleased by the commitment of USDA to organic agriculture, not only in terms of bringing greater transparency and enforcement to the NOP, but also the ongoing effort to have each of the USDA sub-agencies recognize their role in supporting organic agriculture in a well-coordinated manner.

Looking Forward

While the successes of organic agriculture are exciting, there is much unfinished business and many significant challenges to be addressed.

Organic agriculture has much to offer with regard to many of the environmental, natural resource, and public health challenges facing us today. Yet that potential has been largely untapped. Organic can and should be part of the solution to the problems of environmental degradation, climate change, food safety, and toxic chemical exposures in the environment and residues on

food.

However, to fully tap into the full benefits of organic agriculture, we must shift our thinking both in and outside of government to recognize organic not just as another marketing program, but as a food system with multiple health, environmental, rural and social benefits to society. We must find our collective public voice to better articulate and reward all of these multiple benefits from the organic approach.

To that end, the National Organic Coalition and other partner organizations sponsored a five-year process of dialogue and consensus-building within the organic community to develop a roadmap for organic into the future. Each member of the Committee has received a copy of the final report of the process, called the National Organic Action Plan. Our long-term goals are to establish organic as a strong and stable choice for food and agricultural production systems across the U.S., and the report lays out very specific goals and benchmarks in a number of key areas.

Here are a few broad policy goals that arose from the NOAP process.

- Doubling the amount of organic products, number of farms, animals, acreage, and public land use under organic management, without undermining fair prices to farmers and workers;
- Expanding the research scope from simply an agronomic focus to a more interdisciplinary systems evaluation of multiple benefits of organic and the documentation of the full societal costs of the currently externalized impacts of the industrial food production models. This includes creating a more “open source” and participatory organic research and extension model that increases the direct involvement organic farmers;
- Expanding local organic seed production capacities;
- Increasing local organic production and processing infrastructure and regional food systems;





vention of GMO contamination back to the manufacturer/patent-holder. I would add to that the requirement for the labeling of GMO foods. It is clear that this novel technology cannot and will not stay put and is creating contamination, new and novel plant pests, and undue economic harm to the farmers and businesses that are serving both the non-GMO and GMO markets.

To be clear, this issue is hurting and affecting all farmers. This must not be misunderstood as a fight between farmers, or between environmentalists versus farmers, but as an urgent need for overall market clarity and policy fairness. It is one of corporate responsibility and the need for real governmental oversight.

- Increasing the commercial availability and U.S. production of all organic agricultural ingredients; and,
- Implementing fair and appropriate crop insurance and other safety nets for organic farms.

We are very pleased that USDA and Congress in their wisdom have already taken action on several key recommendations of this National Organic Action Plan, since its publication in January of this year, through the:

- Appropriation of additional resources for a more fully functional and fully staffed NOP;
- Publication of the much-overdue regulatory clarification on pasture requirements for organic livestock;
- Public commitment by USDA to ongoing third-party oversight of the entire NOP program;
- Appointment of a USDA Organic Coordinator; and,
- Publication of a NOP program manual, to help ensure greater consistency of enforcement of organic standards.

In talking to stakeholders across all parts of the organic sector – farmers, processors, handlers, and consumers– a few key overarching themes arise consistently as significant barriers for organic agriculture, and each of these are areas where the role of the federal government is critical:

GMO Contamination. We have heard loud and clear from our NOAP stakeholder process and more recently from USDA itself in a recent article for *Choices* magazine that we must address the issue of shifting more of the liability and responsibility for pre-

Food Safety. There is a growing body of research that organically managed soils, and the rich beneficial microbial action in those soils, are more able to break down pathogens than conventionally managed soils. Yet many past food safety actions by federal and state agencies, as well as private buyers, have imposed regulations that have the effect of steering farmers toward chemically intensive farming practices, inadvertently discouraging and penalizing organic farming systems. The Food and Drug Administration (FDA) and Congress need to be cognizant of this problem, and recognize the latest research about pathways of pathogen contamination. In addition, food safety must be viewed from a holistic perspective, taking into consideration the public health concerns of pesticide residues as well as pathogens. Organic agriculture can be part of the solution to the growing food safety problems we are witnessing in the country.

Concentration in the Seeds Markets. In an economy as vibrant and technologically advanced as ours, we should be seeing an increase in the diversity and availability of seeds and germplasm to meet the expanding needs of farmers and consumers. Yet, the opposite is occurring. A few large market players are controlling an alarming percentage of the germplasm of this nation and, as a result, seed costs to farmers are skyrocketing, and the diversity of seed options is dwindling, particularly for publicly held varieties.

There is an urgent need to reinvigorate our public plant and animal breeding capacity to develop public cultivars and breeds that can meet the changing and growing consumer demands for more healthy, local and nutritious foods. This will position us well for dealing with the implications of climate change by encouraging a much more diverse and less genetically uniform agriculture. In the

2008 Farm Bill, Congress mandated this as priority for competitive grants within the Agriculture and Food Research Initiative (AFRI) program, but that mandate has yet to be fully implemented. We strongly urge a fully distinct institute within USDA to meet this need. This will not only further organic agriculture but serve as a major benefit to all who farm.

Lack of Funding for Organic Research. Despite important gains in funding for organic research in the 2008 Farm Bill, organic research funding still pales in comparison to that devoted to conventional agriculture. Given the multiple benefits of organic agriculture to society, organic research should receive at least a fair share of funding. Organic represents 3.5% of the U.S. retail market share, but according to estimates from the Organic Farming Research Foundation, explicit organic research represents only 1.8% of the USDA-Research Education and Economics (REE) mission area budget.

Areas where greater research is necessary include addressing the role of organic agriculture in:

- Sequestering carbon and mitigating the effects of climate change;
- Reducing pesticide residues in food;

- Addressing food safety concerns; and,
- Meeting nutritional needs.

Lack of Access to Organic Food for Vulnerable Populations. There is a growing body of evidence about the nutrition and public health benefits of organic agriculture, particularly for children. Yet, many barriers remain within federal nutrition programs, such as the Women Infants and Children (WIC) program, limiting access of vulnerable populations to organic food. These barriers must be removed to maximize the public health benefits of these important programs.

With the strong public-private partnership fostered by the *Organic Foods Production Act*, we have seen many gains for organic agriculture. But the opportunities and challenges of the future are greater still.

History will not only judge us by how well we managed our resources today but how well we defended opportunities of future generations. Now is the time for us to set the course ahead.

For more information on the National Organic Coalition or National Organic Action plan, visit www.nationalorganiccoalition.org. For more information on RAFI-USA, visit www.rafiusa.org.

Public Participation: Making organic better

You can help protect the integrity of the organic label and have your voice heard. While organic agriculture is far better than chemical-intensive conventional agriculture for people and the environment, there is always room for improvement. The organic regulatory process provides numerous opportunities for the public to weigh in on what is allowable in organic production.

USDA maintains a “National List” (NL), set by the NOSB, of the synthetic substances that may be used and the non-synthetic substances that may not be used in organic production and handling. The *Organic Foods Production Act* (OFPA) and NOP regulations provide for the sunset of NL substances every five years and relies on public comment in evaluating their continuing uses. The public may also petition to amend the National List. In both cases, sunset and petition, the NOSB is authorized by OFPA to determine a substance’s status. Currently Beyond Pesticides’ executive director serves on the NOSB.

To more fully participate and make your voice heard, see the current issues before the board on Beyond Pesticides website at www.beyondpesticides.org/organicfood/action. This webpage also provides information on how to file a petition. You may review the substances currently on the National List here: <http://bit.ly/national-list>. For more information or for assistance, contact Beyond Pesticides, 202-543-5450 or info@beyondpesticides.org.



Reproductive Effects Peak with Pesticide Exposure

Seasonal water contamination studied

By Paul Winchester, M.D.

Paul Winchester, M.D. is a professor of clinical pediatrics at Indiana University School of Medicine and a neonatologist at St. Francis Hospital in Indianapolis. The following is a transcript of Dr. Winchester's talk at Beyond Pesticides' 28th National Pesticide Forum in Cleveland, OH, April 9, 2010.

My name is Paul Winchester. I am a professor of neonatology at University of Indiana School of Medicine. When I was looking at the babies in our nursery one day in 2001, I became concerned about the frequency of birth defects and began looking for the reason. This research led me here to all these intelligent people [motioning to his fellow panelists: Warren Porter, PhD, Beyond Pesticides board member and professor of zoology and environmental toxicology at the University of Wisconsin-Madison, and Michael Skinner, PhD, professor of molecular biosciences at Washington State University] and to all of you. This is the summary of some of the findings we have made since we began our journey.

Basic truths

Basically, this is what we have learned, just so we do not have to argue whether pesticides are in your body or in your water. That is the "we hold these truths to be self-evident" part of this discussion.

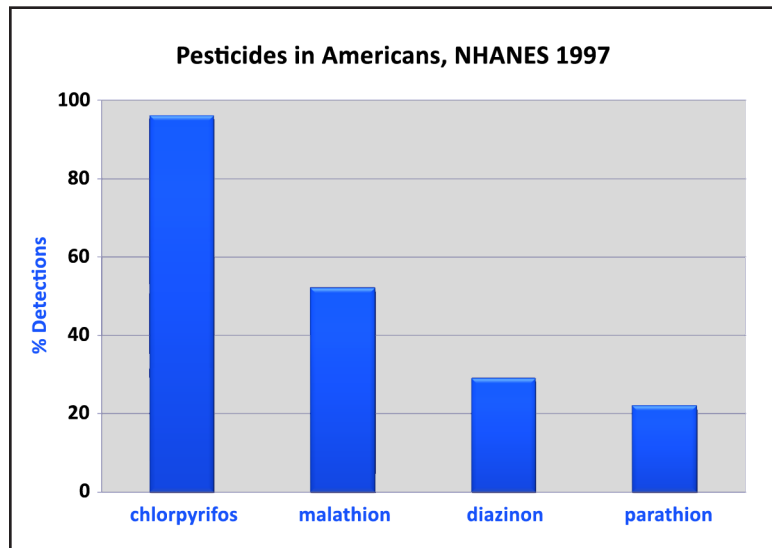
- We know from extensive research that pesticides and

contaminants are in all of us all the time;

- We also know that it is not just one pesticide that we are contaminated with, it is a mixture of chemicals. (As Dr. Porter has said, pesticides are one part of a burden that we all carry.);

- We also know that the contaminants that we are loaded with –and this includes the 247 molecules of contaminants found in every single newborn baby born in America– each one of them is known to cause biological effects at very low doses;

- And the final truth is that our regulatory agencies have told us that we are safe.



Slide 1. The National Health and Nutrition Examination Survey (NHANES) nearly all U.S. residents are contaminated with pesticides and other chemicals.

Contaminated without consent

The National Health and Nutrition Examination Survey (NHANES) findings show that multiple pesticides are found in virtually every single American. [Slide #1] When the Environmental Working Group conducted the study to see how many pesticides an average person has in their body, they found that all of the volunteers are contaminated with everything from Teflon to plasticizers to flame retardants to DDT. DDT, remember, was banned almost 30 years ago and is still now found in 87% of every American measured. This is just another piece of the puzzle for us, because we may not like these molecules, but once we release them into the environment, whether we were right or wrong about them, we get to find out over the next 50 years.

If you look at placentas, an area a little closer to my

heart, we find mixtures of pesticides. If you look at animals around the planet, you find contamination. The remarkable thing is that many of these molecules, perfluorooctane sulfonate (PFOs), for example, are man's greatest accomplishment. We have now created molecules that are immortal! Immortal means that they will rise up into the atmosphere, be carried by the jet stream, and now they can appear in virtually every living organism on the planet, whether you are a seal, a dolphin or a robin's egg.

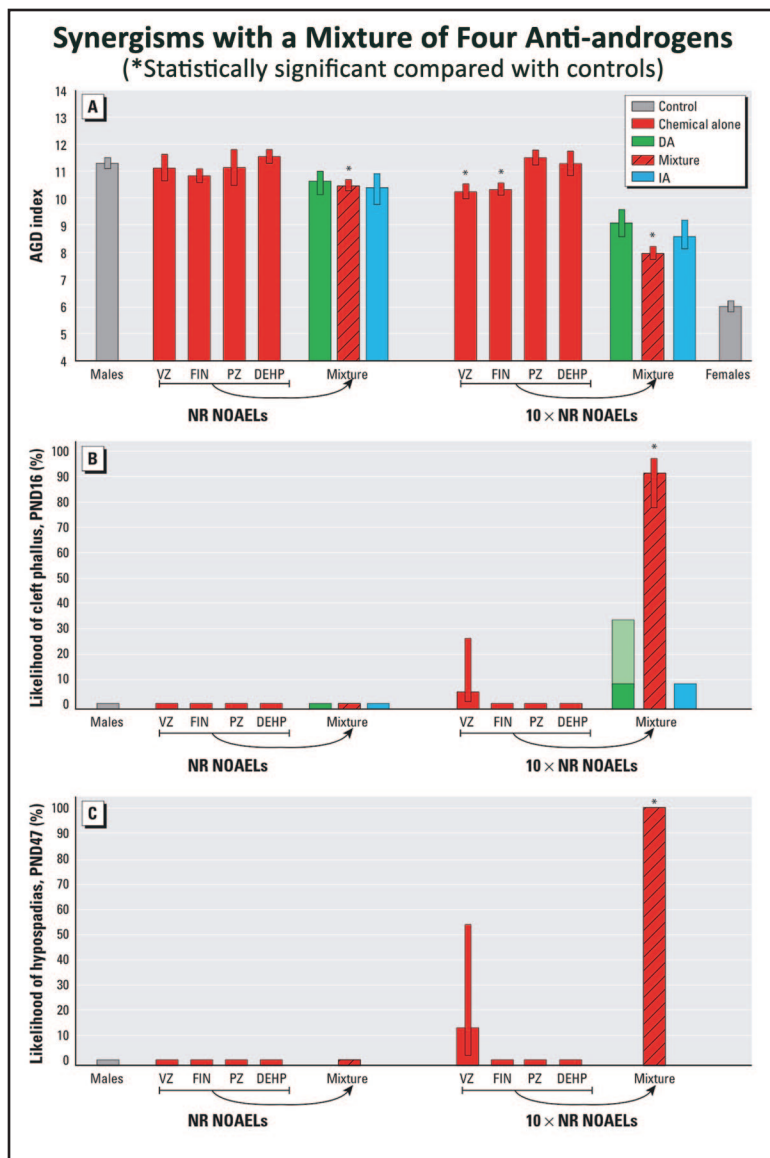
We have lots of evidence that shows mixtures are an important concept. The endocrine disrupting effects of vinclozolin mixed with three other molecules serves as a good example. Individually these molecules have very little effect, but mixed together they have elevated effect. [Slide #2] By the way, there are no Americans that have individual molecules, but when EPA requires testing of a product for safety, tests are performed on a single molecule, never the mixture combinations in your body.

The U.S. Geologic Survey (USGS) is showing us that the same is true for all rivers and streams in the U.S. They are all found to be contaminated. It is not a matter of whether they are contaminated, it is how many contaminants can be found. Slide #3 shows the 50th percentile; the average is 5 or 6 of these chemicals that are found in every single river or stream in the U.S.

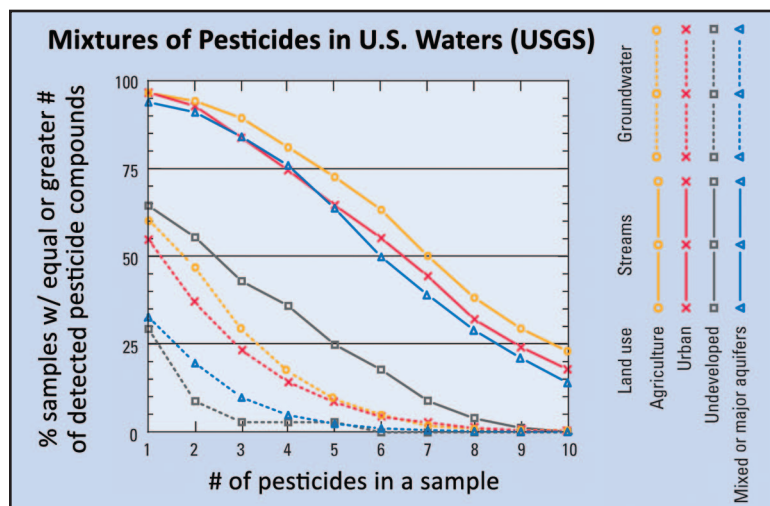
Paying the price later in life

Back to the question, "Are we safe?" One way to answer that is to ask, "Are we healthy?" When we talk about exposures to chemicals, we frequently forget that our mind has already been preset to imagine the type of harm that could befall us. I like to compare the concern about toxic harm to our understanding of fire: we know that it is harmful, but we also know you have to put your hand in it for a while before you actually get burned. So when we spray a fog of DDT on a group of playing children—and they run through the fog and come out the other side—we kind of think that is safe. It did not dawn on us that safety is a matter of measuring over years. It may be a matter of counting over generations before we can really have the sense of safety. Our cancer specialists have told us that carcinogenesis is important. And, we kind of learn that through the smoking story—if I smoke now, I will not get cancer until I am 50. So, yes, smoking causes lung cancer, but it is not going to kill me today.

The epigenetic story (inherited changes in gene expression without changes in DNA) is even more daunting. We have learned that the idea of toxicity that EPA uses is *entirely inappropriate* when it comes to our reproductive outcomes. When we are forming babies



Slide 2. Rodents exposed to phthalates (DEHP), finasteride (FIN), prochloraz (PRO) and vinclozolin (VZ) are less likely to cause birth defects when exposed to individually than in a mixture (Kortenkamp et al., 2009).



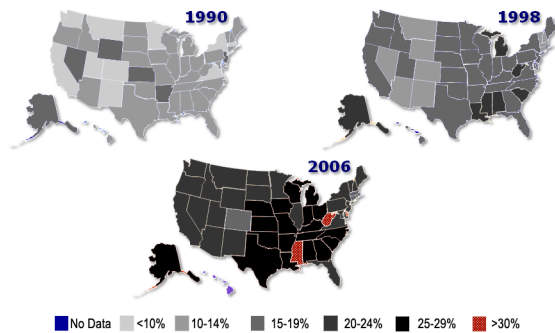
Slide 3. Data from the U.S. Geologic survey (USGS) shows that streams in the U.S. are contaminated with combinations of pesticides.

Children's Health Report Card 2007
(Environmental Working Group)

Autism	10X	increase early 80's - 1996
Male Birth Defects	2X	increase hypospadias, 1970-1993
Childhood Asthma	2X	increase 1982-1993
Acute Lymphocytic Leukemia	62%	increase in children, 1973-1999
Childhood Brain Cancer	40%	increase 1973-1994
Preterm Birth	23%	increase mid-80s-2002
Infertility	5-10%	of couples
Birth Defects	3-5%	of all babies
Sperm Counts	1%	decrease yearly 1934-1996

Slide 4. Data compiled by the Environmental Working Group in their 2007 Children's Health Report Card shows environmentally linked health effects are on the rise.

Obesity Trends Among U.S. Adults (BRFSS, 1990, 1998, 2006)
(BMI >30, or about 30 lbs. overweight for 5'4" person)



Slide 5. According to the Centers for Disease Control and Prevention's (CDC) Behavioral Risk Factor Surveillance System (BRFSS), the world's largest on-going telephone health survey system, obesity rates among U.S. adults has steadily increased from 1990 through 2006.

in the womb, we are actually forming an imprint of DNA that will set the stage for the rest of that person's life. When this imprint is altered by exposure to these products, then not only does your disease risk change for the rest of your life, but it may alter the lives of all of your descendants.

These environmental factors –weed killer, fungicide, insecticide, air pollution, nitrates, protein, calorie and/or vitamin deficiency, plasticizer, PCBs, BPA, flame retardant, lead, mercury– are the list of things we have to worry about during pregnancy or conception. All of these have now been shown to be capable of imprinting DNA, which means they are potentially capable of altering our adult life, the spectrum of disease, and our descendants' lives. I was thinking of 'inherit the wind' here, but it really should be 'inherit the weed killer.'

More cures, more disease

Are we healthier today? Well indeed, you know, cure rates are up, but diseases are up. [Slide #4] We are doing better at taking care of premature babies than ever –I love to brag about it. But premature rates are up, autism rates are up, male birth defects are up, asthma is up, cancer is up, and infertility is up. The only thing that is down are sperm counts.

Yes, we are getting better at saving people with cancer. I notice this University, like every other community in the U.S., is building a Taj Mahal to cancer. In a neighborhood near you, you will find a heart center with valet parking, a maternal-fetal medicine center for high risk pregnancies, and a reproductive endocrinology center to help women get pregnant who are no longer capable.

We can compare disease rates between people who live near crop lands with the general public. Rates of cancer, asthma, obesity, attention deficit hyperactivity disorder (ADHD), major depression and premature menarche may all be linked. Slide #5 identifies the obesity story in the U.S., where light shading is good and dark is bad.

Autism: This disease has not only increasing instances of diagnosis but the younger ages are making the diagnosis.

Major depression: Many pregnant women now come to me already on an antidepressant. When did that start? Psychotropic drug use is up. My wife works in a school system as a nurse, and you have to be a pharmacist now to take care of kids in an ordinary school.

Child neglect and abuse: One of the most frightening aspects of fetal exposure to hormonally active drugs is that it makes females less good mothers when they grow up. This has been shown now in animal models and

it would predict, if it were true in humans, that we are having more abuse and neglect.

The age of menarche (first menstrual cycle): The long-term trend for age of menarche is shown in Slide #6. Tracking back to 1860, the present-day American experience shows where girls less than 11 years old are menstruating. So actually, you can say hormones are raging at an incredibly early age.

Prostate cancer rates are epidemic. **Breast cancer** rates are epidemic worldwide. Even in countries with low rates of breast cancer, breast cancer rates are up.

Global increase in diabetes: It is the same story. The lowest rate of diabetes is in Africa, but it has the highest rate of increase. The diabetes rate is not just increasing, but the age of onset is decreasing. When I was practicing in New Hampshire, I was seeing two-year-olds starting on insulin. Diabetes has been linked to pesticide levels. Research shows an increased risk of having diabetes with exposure to DDT and many other current use pesticides.

Diabetes affects the adult, but it also affects pregnancy and the baby. I just admitted a baby that looks just like babies we call "Buddha babies." The mother had diabetes. With too much sugar on board, the baby becomes very obese, but the baby's risk of birth defects of any kind is increased two- to four-fold. There is an increased risk of immaturity, jaundice, poor feeding, temperature instability and low blood sugar.

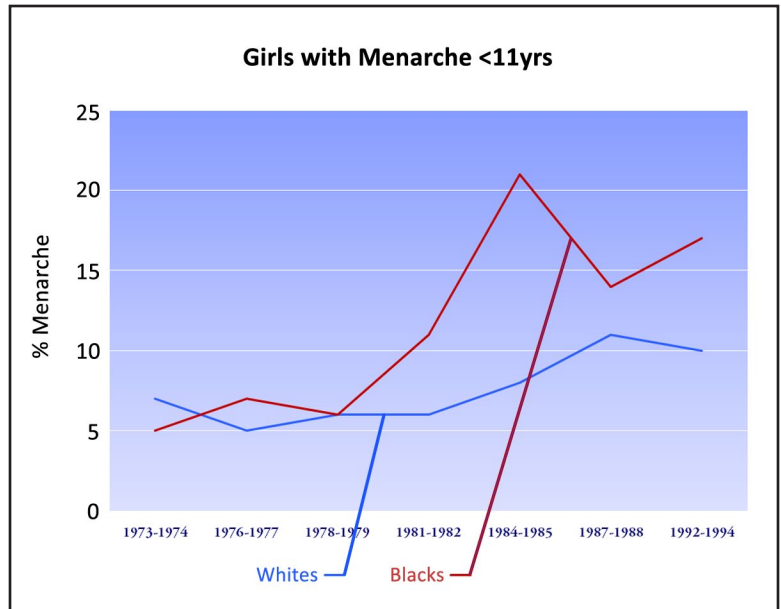
Many OBGYN diseases that are on the increase have now been linked to environmental contaminants, including, as Dr. Warren Porter mentioned, polycystic ovarian disease. There is not a woman here who does not have a friend who does not have that disease. When did that start?

Pregnancy-induced hypertension poses health risks. This is a disease that is now increasing in incidence. It causes premature babies and is linked to how closely exposed to pesticides you are.

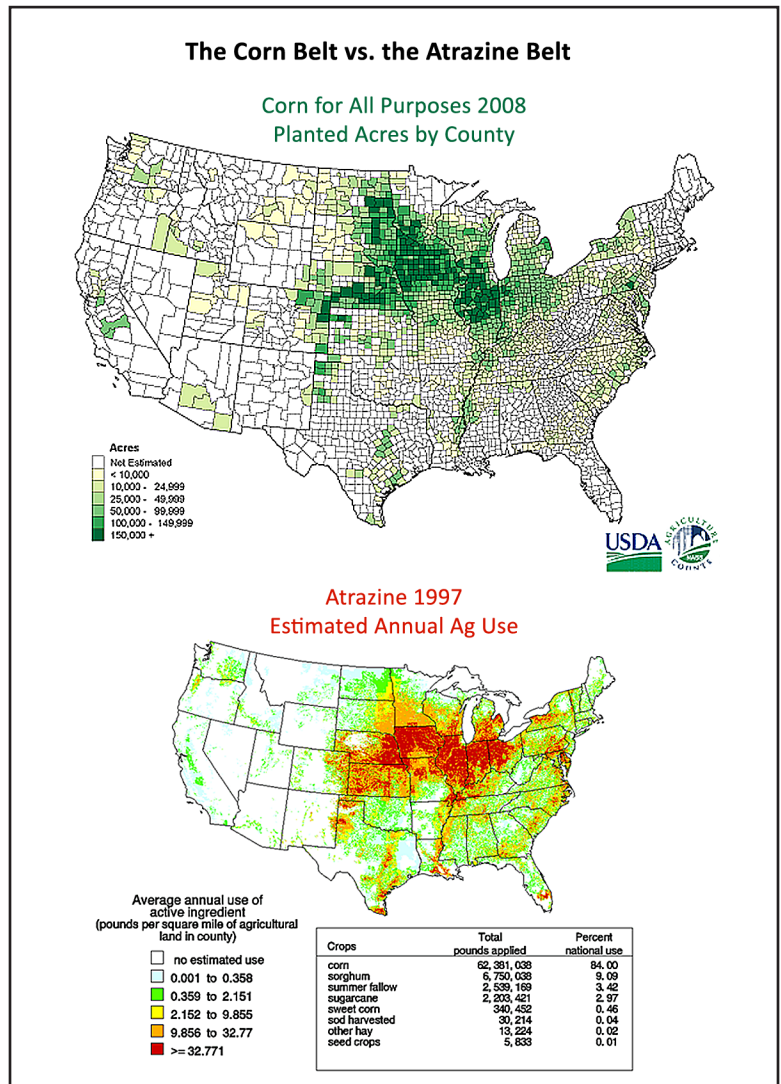
Can't find what you're not looking for

So my trouble in paradise really began when I looked at babies in the nursery at my hospital and asked about birth defects. What I found were two things.

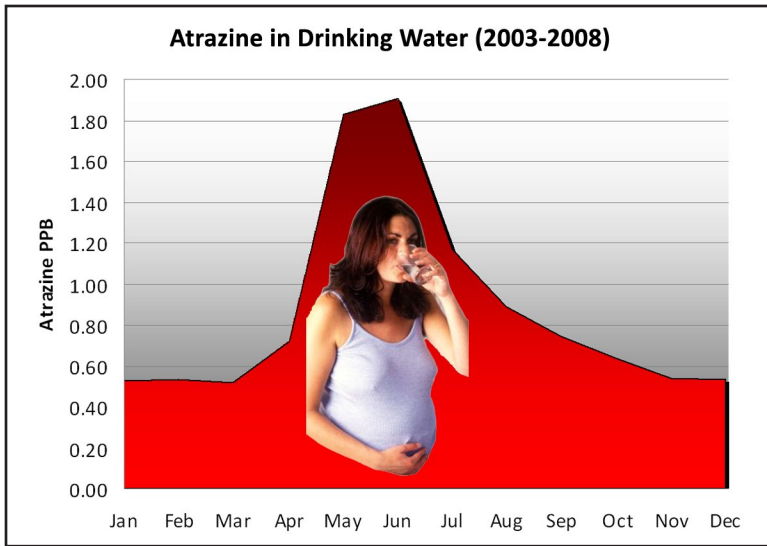
Indiana and 12 other states were not counting birth defects in 2001. I know birth defects and, according to the Centers for Disease Control (CDC), they are the leading cause of infant death in the U.S. The leading industrial country in the world was not counting the leading cause of infant death in a quarter of its states in 2001.



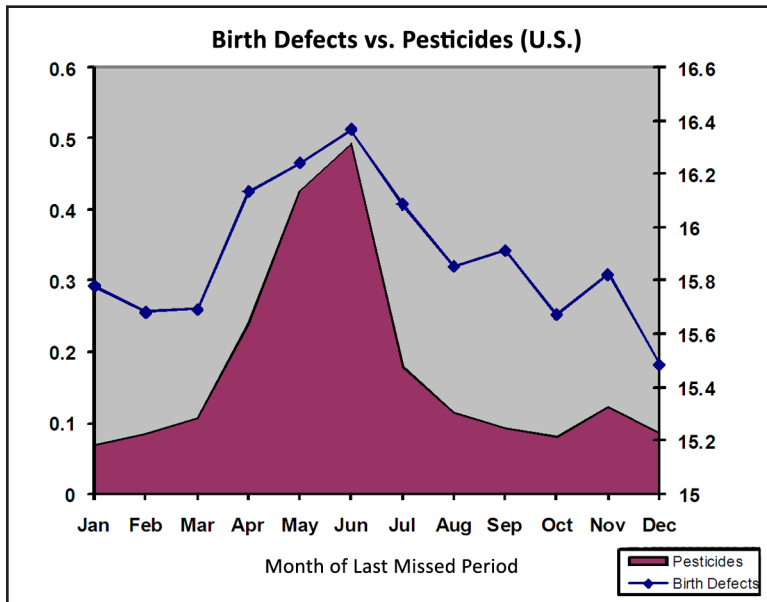
Slide 6. The percentage of U.S. girls whose age of menarche was under 11 has increased over the past two decades, especially in African American girls.



Slide 7. "The Atrazine Belt"



Slide 8. Like other contaminants, levels of the endocrine disrupting herbicide atrazine peak in June in Indiana water.



Slide 9. The national peak of pesticide water contamination in June mirrors the seasonal increase in rate of birth defects.

Birth Defects Linked to Season of Conception

Birth Defect Type	BIRTH DEFECTS (per 100,000)*		p-value
	April-July	Other Months	
Spina Bifida/Meningocele	21.93 (0.50)	20.31 (0.34)	<0.01
Other Circulatory/Respiratory	134.99 (1.25)	131.09 (0.85)	<0.01
Cleft Lip/Palette	83.09 (0.98)	79.07 (0.66)	<0.01
Polydactyly/Syndactyly/Adactyly	85.65 (1.00)	81.88 (0.68)	<0.01
Other Musculoskeletal/Integumental	223.49 (1.61)	217.36 (1.11)	<0.01
Down's Syndrome	46.23 (0.74)	43.22 (0.49)	<0.01
Other Congenital Anomalies	455.89 (2.33)	443.89 (1.59)	<0.01
Tracheo - esophageal fistula/Esoophageal atresia	13.33 (0.39)	12.32 (0.26)	<0.05
Other Gastrointestinal	32.22 (0.61)	30.82 (0.42)	<0.05
Other Urogenital	105.37 (1.11)	102.54 (0.76)	<0.05
Club Foot	58.17 (0.82)	56.23 (0.56)	<0.05

Slide 10. Birth defects with a statistically significant link to time of conception.

The other issue deals with what we learned about the water contamination rate in our state, and eventually the entire U.S. Nearly every contaminant we studied seems to peak in June. When I asked EPA to send me the information on Indiana, I calculated the rate of sampling by the water companies. It almost made me sick, because I realized that EPA allows water companies to not measure in the most contaminated month. So we realized they are not counting birth defects and they are not measuring the water in June! So we went looking.

It is relevant that my research team had met Tyrone Hayes, PhD [professor of biology at the University of California, Berkeley] at this point, and we live in the Corn Belt. We could rename it the "Atrazine Belt," because this is the atrazine story. [Slide #7] Dr. Hayes' research has shown that you are more likely to have eggs in your sperm-containing organs if you are a frog being exposed to atrazine. This means that an estrogen effect could be affecting children. At least if we live in the Corn Belt or the Atrazine Belt, we should be counting our babies to see if they are abnormal. Sure enough, if we look at the water in Indiana, we find that atrazine peaks as regularly as the Matterhorn. [Slide #8] I call this the June effect.

The timing of birth defects

We collected all the birth certificates from Indiana that contain birth defect information, which our state health department was not using. What we found, to make this story a little shorter, is that birth defects like spina bifida peak in June [conceptions]. Abdominal wall birth defects peaked in June. We also found premature birth peaked in June, sudden infant death peaked in June, and malformed genitals peaked in June. And while we were not counting spina bifida, we exceeded the national average for the time period. So a state that was not having problems with birth defects, just was not counting them!

In our national study, we found that the national water looks the same. The birth defects for the whole U.S. increase in women who conceive in the month of highest pesticide concentrations. The astonishing part of Slide #9 is not the findings, it is that I was the first one who did it. We have an entire CDC that could have easily asked this question. In fact, I think you could have asked somebody in kindergarten this question. That was the part that upset me the most.

Out of the 22 different birth defects, these 11 are significantly increased in months of increased pesticide contamination. [Slide #10] The other 11 were not significantly different. Now some investigators prefer that we report these as negatives, which suggests there

is no risk of these other disorders. However, if you notice, every single one of these numbers except one is greater in months of elevated pesticide contamination. The reason our study was successful is that we had 50 million babies to study. If we had 100 million babies, these probably would all become significant too. Birth defects increase during the time of conception when pesticide contamination is the highest.

By the way, this study was refused by the *Environmental Health Perspectives* journal, but thanks to the Scandinavians who were willing to publish it. So these are photos of kids with birth defects who I take care of every day. [Slide #11] Certain birth defects can be addressed through surgery –although we cannot do much about others, such as trisomy 18. We do have very expensive clinics that they can attend. We can repair their tracheoesophageal fistula and their heart defects. Wouldn't it be better if it did not happen?

Geography of birth defects and preterm birth

What about location? Well, to estimate pesticide exposure, we used the U.S. Department of Agriculture (USDA) pesticide usage data and found that the counties with the highest pesticide rates have the highest birth defect rates. Since then, one of my colleagues at Purdue University found that if you just do a satellite view of where you conceived your child, the closer you are to a cornfield, the more likely you are to have a birth defect.

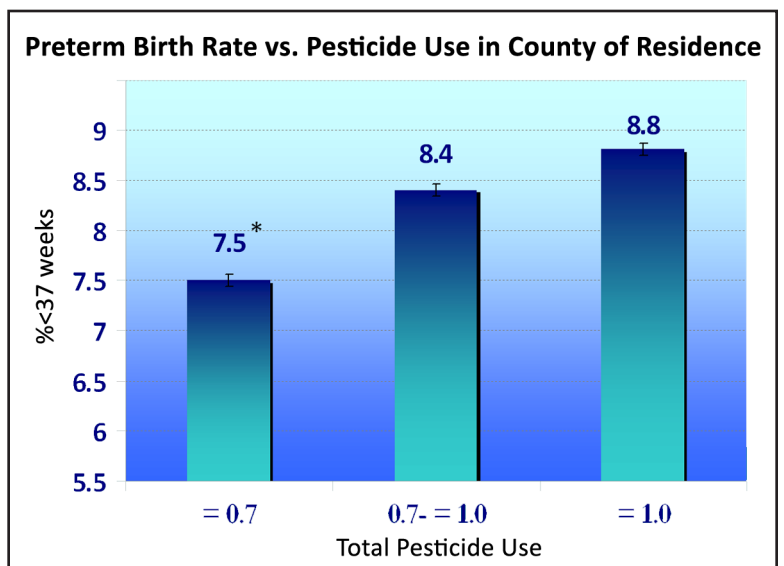
Preterm birth is next. If you take all the diseases linked to preterm birth, it is even more dangerous than birth defects. Because it is more common, it is increasing in an epidemic manner in the U.S.

Why don't we all know this? This is by far the most important fact of human health that I can think of. It determines the outcome of our human race; and it is epidemic. So, we took the California pesticide usage database, which is the best estimate of how much pesticide exposure you might have had (the California pesticide usage is gargantuan). We found that prematurity rates, if you control for other variables, goes up directly with the amount of pounds per person, or per acre, of pesticides that are used in a particular county. [Slide #12]

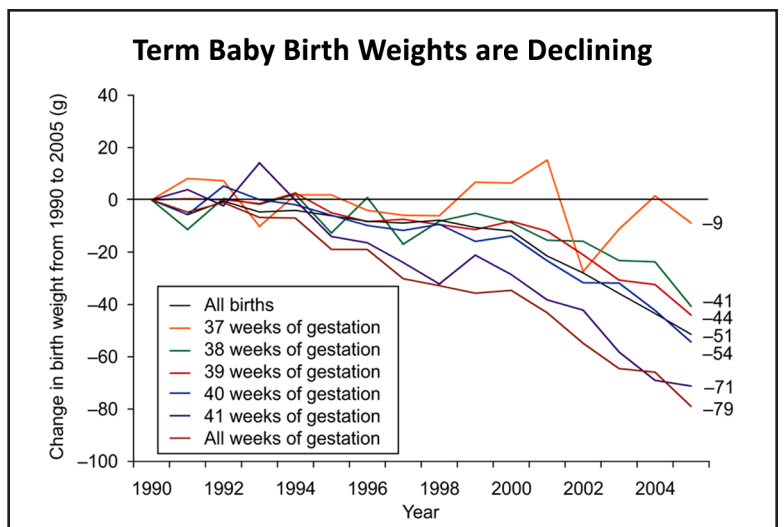
When we presented this last year, one of the participants in our audience asked, "Is this true?" And I said, well the U.S. government is actually funding a study in California that shows that when you measure pesticides in pregnant women, the ones with the highest levels have the shortest gestations. Fortunately, they also went further



Slide 11. Children with various birth defects, linked to environmental factors.

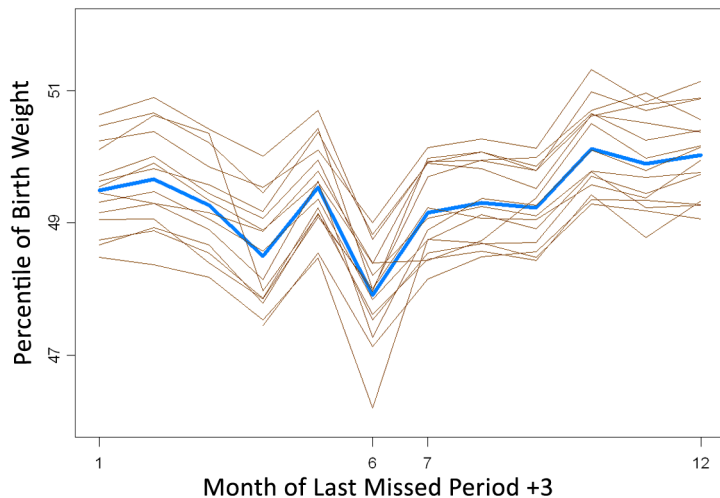


Slide 12. Rate of preterm birth highest in counties with high pesticide usage.



Slide 13. Since 1990, birth weights in the U.S. have been decreasing. Birth weight is a predictor of lifetime health and IQ.

Birth Weight Percentile vs. Month of 2nd Trimester



Slide 14. Birth weight is lowest when second trimester occurs in June-July.

to explain why some people that are exposed have problems and others do not. It turns out that what we really have is not just genes for prematurity, we have genes for detoxifying our womb, and some of us are better at it than others. The paraoxonase (PON) gene polymorphisms can determine which of those you are; as a pregnant mother, are you a good detoxifier, or are you a bad detoxifier? Those with the bad detoxifier versions of the genes are much more likely to have the premature babies.

Birth weight and more

Birth weight is our final item. We preface this by saying the newest development and recorded findings are that there is an epidemic not just of preterm birth, but of relatively smaller babies. It turns out over the last 15 years American babies are getting smaller. [Slide #13] Those of you who are dieting right now might think that

is a good thing, but those of us in the area of neonatal medicine know that the size of the baby is the best predictor of brain size and ultimately your lifetime risk of being on welfare, having a job, and having major disease of the heart, and so on. So it is not a good thing.

It is happening not just in term babies, but also in preterm babies. Babies are getting smaller. And so in California, once again as with the rest of the country, we find that pesticides are peaking in the middle of summer and the babies' birth weights, which reach the second trimester, have the lowest rates in those months. [Slide #14] This was found whether we measured their actual birth weight, relative birth weight or z-score [indicates how many standard deviations an observation is above or below the mean], and so we can say that if your baby was reaching the second trimester in May, June or July, you are much more likely to have a smaller baby.

Interestingly, in the same time period in California, that increases your risk of having an autistic child. In summary, we can say that growth restriction is another risk factor for having small babies.

And then finally, we did find that the Indiana University School of Medicine z-scores were lowest in the pesticide peak months in Indiana, and the same for having learning disabilities. Those babies are more likely to be conceived in those same months. So, perhaps we should be worried.

Dr. Winchester published the study, "Agrichemicals in surface water and birth defects in the United States," in the April 2009 issue of Acta Pædiatrica (Vol. 98, No. 4).





ChemicalWatch Factsheet

OIL OF LEMON EUCALYPTUS (PMD)

What is Oil of Lemon Eucalyptus

Oil of lemon eucalyptus, specifically p-menthane-3,8-diol (PMD), its component that contains pesticidal properties, is an alternative to toxic mosquito repellents and most likely acts by masking the environmental cues that mosquitoes use to locate their target. Oil of lemon eucalyptus is the common name of one of the natural oils extracted from the leaves and twigs of the lemon-scented gum eucalyptus plant, *Eucalyptus citriodora* Hook, also called *Corymbia citriodora* Hook. Many other compounds have been identified and extracted from the eucalyptus, including citronellol, limonene and linalool. PMD is also chemically synthesized for commercial use, as is normally the case with insect repellents manufactured in the U.S. The term PMD is often used interchangeably with oil of lemon eucalyptus when it is used as an insecticidal repellent. However, PMD and the “pure” unrefined oil of lemon eucalyptus are chemically distinct.

The use of PMD has a long history, but only recently became important as a commercial repellent in the U.S. Oil of lemon eucalyptus has been used for many years in China as a product known as Quwenling (translated as “effective repellent of mosquitoes”). Researchers in the U.S. began investigating this product in the early 1990s and identified PMD as the active ingredient. In 2000, EPA registered oil of lemon eucalyptus/ PMD as a ‘biopesticide repellent’ –meaning that it is derived from natural materials. Its products can be applied to human skin and clothing for the purpose of repelling insects, such as mosquitoes, biting flies and gnats, and is formulated as a spray and a lotion.

Note: “Pure” oil of lemon eucalyptus (e.g. essential oil) has not received similar testing for safety and efficacy and is not registered with EPA as an insect repellent.

Mode of Action

The mechanism by which PMD and other repellents repel insects is

unknown. Specific sensory receptors provide mosquitoes with the information they need to detect a source blood meal. Host location is determined by many factors, including lactic acid, ammonia, carbon dioxide, octenol, phenols, temperature, and humidity. It is believed that these products do not repel insects, but that they simply mask or confuse the attractive signals that humans emit so that mosquitoes are unable to locate their target.

Efficacy

When compared to the “pure” oil of lemon eucalyptus, PMD showed far superior repellent activity under laboratory conditions. PMD has also shown remarkable ability to repel mosquitoes when compared to DEET –the most popular synthetic commercial insect repellent which has been linked to serious adverse effects, especially in children.

When used in the field on humans in Tanzania, PMD gave complete protection from biting for between 6 and 7.75 hours. In comparison to DEET, there was no significant difference regarding efficacy and

duration of protection when used against the *Anopheles* mosquito, Africa’s chief malaria vector. In fact, PMD has been found to be equally efficacious compared to lower concentrations of DEET. In tests against a 10% DEET repellent, PMD products, such as the Repel Brand (with 26% oil of lemon eucalyptus or 65% PMD), were shown to prevent bites for 4 to 7 hours after application for aggressive species of mosquito and for

greater than 12 hours for less aggressive mosquitoes –a period of prevention greater than the studied DEET repellent. Studies have found that concentrations of PMD at 20-50%, at various formulations, can provide between 2-12hr protection against different mosquito species.

Other studies have shown that PMD also gives protection against the biting midge, *Culicoides variipennis* Coquillett, the deer tick, *Ixodes ricinus* L., and the stable fly, *Stomoxys calcitrans* L. Recently,

ChemicalWatch Stats

CAS Registry Number: 42822-86-6

Chemical Class: Botanical

Use: Mosquitoes, ticks, biting flies, gnats, and no-see-ums

Toxicity rating: Least-toxic

Signal Words: Warning

Health Effects: Eye irritation

Environmental Effects: None known



it has also been shown that burning the leaves of the lemon-scented gum eucalyptus (*E. citriodora* Hook) could provide a cost-effective means of household protection (in addition to mosquito nets) in sub-Saharan Africa.

Toxicity

In EPA studies using laboratory animals, PMD showed

no adverse effects except for eye irritation. The technical material is categorized as an eye irritant, while the diluted end use products are expected to be milder. In rare cases, skin irritation can occur, but PMD is not classified as a skin sensitizer. As a result of eye irritation,

PMD is classified in Toxicity Category I for the technical product and Toxicity Category II for the end-use product, and must carry “Warning” on the product label. Acute toxicity studies have shown low toxicity. The oral and dermal LC50 (dose required for 50% mortality) are both more than 2000mg/kg in rats. At high doses (5000mg/kg) significant dermal irritation was noted at the site of test material application, which included erythema, edema, dermal lesions, necrosis, and desquamation, which dissipated after day 7.

There is little epidemiologic data on the effects of PMD. Developmental toxicity and mutagenicity studies submitted for PMD registration showed no treatment-related signs of toxicity.

Avoid Repellents Containing DEET

DEET (N,N-diethyl-meta-toluamide) is commonly used as an insect repellent but its use has become highly controversial. Scientists have raised concerns about the use of DEET and seizures among children, even though EPA claims that there is not enough information to implicate DEET with these incidents. DEET is quickly absorbed through the skin and has caused adverse effects including large blisters and burning sensations. Laboratory studies have found that DEET can cause neurological damage, including brain damage in children.

DEET labels are required to include the following directions: Do not apply over cuts, wounds, or irritated skin; Do not apply to hands or near eyes and mouth of young children; Do not allow young children to apply this product; Use just enough repellent to cover exposed skin and/or clothing; Do not use under clothing; After returning indoors, wash treated skin with soap and water; Wash treated clothing before wearing it again; and, Use of this product may cause skin reactions in rare cases.

Duke Medical University pharmacologist Mohamed Abou-Donia, Ph.D. conducted numerous studies in rats, which clearly demonstrate that frequent and prolonged applications of DEET cause neurons to die in regions of the brain that control muscle movement, learning, memory and concentration. Rats treated with an average human dose of DEET (40 mg/kg body weight) performed far worse than control rats when challenged with physical tasks requiring muscle control, strength and coordination. With heavy exposure to DEET and other insecticides, humans may experience memory loss, headache, weakness, fatigue, muscle and joint pain, tremors and shortness of breath.

Further research by Dr. Abou-Donia shows even greater impacts when DEET exposure occurs in combination with pharmaceuticals and other pesticides, including permethrin, an insecticide commonly used for public mosquito control. According to Dr. Abou-Donia, “Never use insect repellents on infants, and beware of using them on children in general. Never combine insecticides with each other or use them with other medications. Even an antihistamine could interact with DEET to cause toxic side effects... Until we have more data on potential interactions in humans, safe is better than sorry.”

For more information on alternatives to using DEET, see Beyond Pesticides mosquito and insect-borne diseases webpage: www.beyondpesticides.org/mosquito.



Environmental fate

Little to no data exists for the environmental fate of PMD. However, PMD is not expected to adversely impact the environment or wildlife.

Regulation

PMD was first registered with the EPA in 2000 with the issuance of its Biopesticide Registration Eligibility Document for the registrant-S.C. Johnson & Son, Inc. As part of its assessment, EPA stated in its document that since PMD is intended for direct application to the skin, including that of infants and children, FQPA considerations apply. It states, “The requirements for a biochemical pesticide registration include only one developmental study (in one species), and there are usually no data available which demonstrate whether young animals are differentially affected upon exposure to that pesticide. Therefore, the ten-fold FQPA safety factor could be retained for biochemical pesticides.” As such, product labels

specify that it is not to be used on children younger than three years of age.

According to EPA, PMD as an active ingredient is considered GRAS (generally recognized as safe), is used to flavor foods and medicines, and is found in many consumer products. As a result, EPA concluded that an assessment of aggregate exposure was not necessary. The Centers for Disease Control and Prevention (CDC), after an evaluation of information contained in peer-reviewed scientific literature and data available, recommends the use of PMD products to help people avoid the bites of disease carrying mosquitoes.



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The Polluters: The Making of Our Chemically Altered Environment

Benjamin Ross and Steven Amter, Oxford University Press (USA), 240 pages, hardcover.

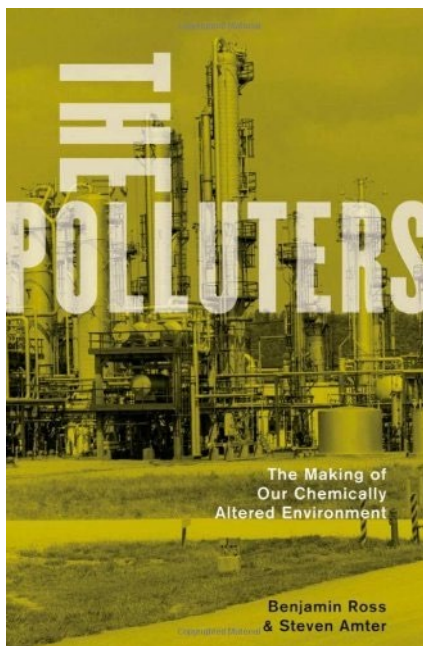
The Polluters is an eye-opening historical analysis of the origins and workings of the American chemical industry. From its early inception in the late 1800s, rise to power and prominence in the mid 1900s to its domination of American politics and regulation processes today, *The Polluters* details how industry has artfully woven itself into the fabric of every aspect of modern American society. With active roles in the construction of the Empire State Building, the success of General Motors and two World Wars, the chemical industry has planned for its longevity.

The book sets the scene that intertwines family bonds and business, with an early focus on DuPont and Monsanto. The authors put names and faces to many dealings that found industry insiders on many industry, science and regulatory oversight panels, as well as university, federal and state boards. This essentially ensured that industry endeavors went unchallenged by the government and the public until the publication of *Silent Spring* in 1962. As more communities and factory workers became affected by chemical pollution, industry backed scientists and regulatory groups used tactics to delay or suppress data and sway politicians.

The book opens with the tragedy of Donora, PA in 1948, where several people died over the course of a few days from smog belched from factories in the town. Politicians, facing an election year, were quick to demand investigations into the matter. Many committees were formed, which curiously made public statements minimizing the dangers of air pollution and recommending against federal regulation of emissions, arguing that air pollution was a 'local problem.' On these committees were influential scientists from DuPont, Monsanto and Mutual Chemical.

Authors Ross and Amter delve into the manufacture and promotion of pesticides. Initially manufactured for military use, 'economic poisons,' later called pesticides (and now crop protectants) were big business by the 1930s. By then the Food and Drug Administration (FDA) was formed and the authors describe

with detail how toothless government regulators were reluctant to protect the American food supply if it meant economic damage to farm and industry groups. The principle of 'evidence of harm' versus the 'precautionary principle,' put before regulators in the late 1930s, has been a contentious issue, and as the authors show, transparent discourse was blocked by industry interests. Their mantra: If there is uncertainty in actual hazard, then society should err on the side of utility and economic benefits. The underlying theme of the book is one that translates today- that chemicals are to be innocent until proven guilty, and if so, then industry would only act in its way and on their terms.



The Polluters also describes the attempt by industry to clean up its act. Early policy decisions were made by the late 1930s to address the storage and disposal of waste, and by the 1950s DuPont in particular was willing to spend money on environmental control. New staff, improved plant designs, steel tanks and radiation detectors were added and implemented. These new measures were put in place, the authors contend, while industry resisted government interference. Thus, these moves were really an attempt to stave

off federal intervention, falling short of real environmental protection.

Many well-researched examples are given in the book, detailing the manipulations of "independent" boards and committees, the firing of outspoken scientists, the influence and suppression of data involving pesticides and other harmful chemicals by farming and chemical interests, even in the face of disproportionate cancer trends and human fatalities. The book describes the origins of many organizations, such as FDA and the National Cancer Institute, and the inception of early environmental laws like the 1906 *Food and Drug Act* and the *Insecticide Act of 1910*, which were subsequently revamped in the 1970s into the laws we know today. The heroes and villains of this book are clear and *The Polluters* is a well-researched, fascinating read for anyone interested in the history of the American chemical industry, its strategies for circumventing government regulations in the name of profit, and an understanding of how American corporate interests really work.

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