

# Pesticides and You

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

Volume 27, Number 3

Fall 2007



## **Replacing Poisons with Precaution in Pest Management**

**The vision driving the precautionary principle**

**A Personal Story and the Change that Followed: Turning a poisoning incident into a precautionary policy ■ Pesticides and Pets: What you should know to keep your pets safe ■ Compost is the Key to Successful Plant Management ■ Compost Tea: Brewing success in the garden**

# Letter from Washington

## Leading with a Caring Vision and Foresight

**C**oncern about the environment has "exploded as a political and moral issue all over the world." That, according to the director of the Norwegian Nobel Institute, Geir Lundestad, in reference to the level of interest in Al Gore's Nobel Prize for his work on global warming.

On morality, we have a responsibility to define what is right and protective of health and the environment, future generations and the earth –to have a vision. Clearly, what is right may not always be easy. It may challenge our conventional wisdom, cultural practices and status quo. But, the challenge of doing right can be exhilarating and it will certainly be rewarding. Maybe a sense of morality will help us to ask and do what is necessary, and not be constrained by what we believe is acceptable.

I recently asked an integrated pest management (IPM) professional why we should allow certain exceptions to restrictions on chemical use we know to be hazardous or untested, chemicals for which we have alternative approaches and less toxic products. The answer: the pest control industry is not ready to give up these chemicals.

### The foresight principle

"I believe that IPM offers a solution, but it's not necessarily a vision," says Debbie Raphael, toxics reduction and green building manager for the City of San Francisco, whose talk is featured in this issue of PAY from the Beyond Pesticides 25<sup>th</sup> National Pesticides, *Changing Course in a Changing Climate: Solutions for health and the environment*, June 2007, Chicago. Ms. Raphael says that IPM was born of a fight between industry, pesticide users and the public and it offered a solution, but not a vision. The vision, says Ms. Raphael, is embraced in the notion of foresight and caring (from the German phrase *Vorsorgeprinzip, vorsorge*) and then translated in the U.S. as the precautionary principle.

I am constantly reminded by how little foresight we actually bring to environmental protection in the U.S., despite, as Ms. Raphael points out, our 1969 *National Environmental Policy Act*, which states:

"The nation, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment, particularly the profound influence of population growth, high density urbanization, industrial expansion, resource exploitation and new and expanding technological advances, and recognizing further the critical importance of restoring and maintaining environmental quality to the overall welfare and development of humankind, declares that it is the continuing policy of this nation to use all practical means and measures to create and maintain conditions under which people and nature can exist in productive harmony for present and future generations. In order to carry out this policy, it is the continuing responsibility of this nation to use all practical means to the end that the nation may fulfill the responsibilities of each generation as trustee of the environment for succeeding generations."

A reporter called me recently and recited the complex pesticide issues that EPA says it is facing in the coming year. Two are not new to the agency's pesticide program. Endocrine disruptors and endangered species. More than 10 years after being mandated by Congress, the EPA announced in 2007 that it will test 73 pesticides for their potential to damage the endocrine system and disrupt the normal functioning of hormones in the body. "This initial list of 73 chemicals is only a small fraction of the universe of 1,700 chemicals that the agency has identified for screening under the FQPA [Food Quality Protection Act] mandate. . .EPA apparently has no internal deadline for identifying subsequent sets of chemicals for testing, and no plan whatsoever for ensuring that all chemicals of potential concern will be tested," according to a letter from members of the House Committee on Oversight and Government Reform. EPA told the reporter it has a hard job with endocrine disruptors and that it faces serious hurdles in complying with a court decision requiring EPA to consult with the Fish and Wildlife Service on its pesticide registration decision impacts on endangered species. . .not a new issue.

Any student of pesticides and pesticide policy does not take long to come to the conclusion that the system of regulatory review and public disclosure is broken. Yes, endocrine disruption and endangered species are complex issues, but not half as complicated as some other issues that EPA does not even have on the table, such as synergistic effects of pesticide mixtures and pesticide, pharmaceutical and other toxic mixtures. And yet, EPA's mantra to the public is "read the pesticide product label first," as if to suggest that strict compliance with the label would be protective of health and the environment. Instead, if EPA had foresight and a sense of caring, it would WARN and ALERT people to the fact that it has never been able to grapple with the difficult issues that could begin to define pesticide safety. With that information, people could be informed to act to stay away from pesticides to the extent possible. And, when the City of San Francisco and other communities were faced with the political will of its elected officials, they chose foresight (precaution) and found that with some few exceptions toxic pesticides were not necessary.

### Compost

One of the alternatives that brings focus to these issues is compost, featured in this issue of PAY. It embodies for lawn and landscape management an appreciation for biological systems that eliminates the need for pesticides by ensuring the proper mixture of decayed organic matter and microbial colonies, in a well-balanced ratio of carbon and nitrogen. Healthy soil results in healthy plants, thus avoiding the need for pesticides. It's simple.



Best wishes for a healthy and happy holiday season and new year!

- Jay Feldman is executive director of Beyond Pesticides

# Contents



## Compost is the Key to Successful Plant Management

page 20

### 2 Mail

Ways To Use Our Safe-Lawns Doorhangers; Beyond Pesticides' Daily News Blog entries

### 4 Washington, DC

Industry Spends Millions on 2,4-D, EPA Decides Against Special Review for Cancer; Ten Years After Mandate, EPA To Begin Screening Endocrine Disrupting Pesticides; Lawsuit Challenges EPA on Continued Use of Chlorpyrifos in Agriculture; Bald Eagle Removed from Endangered Species List

### 6 Around the Country

Exposure to Organochlorine Pesticides Linked to Autism; WHO Report Focuses on Children and Toxic Chemicals; Children Exposed to DDT More Likely To Develop Breast Cancer; Researchers Find Key Link in Malaria Transmission; Organic Farming Shown To Keep Pace with Conventional Methods; Long-Living Arctic Sharks Show Buildup of Toxic Chemicals

### 9 Pesticides and Pets

What you should know to keep your pets safe

### 13 Replacing Poisons with Precaution in Pest Management

The vision driving the precautionary principle

### 18 A Personal Story and the Change that Followed

Turning a poisoning incident into a precautionary policy

### 20 Compost Is the Key to Successful Plant Management

### 24 Resources

CDC School Health Policies and Programs Study; Household Exposure to Pesticides and Risk of Childhood Hematopoietic Malignancies: The ESCALE Study



Page 9



Page 13

**Pesticides and You** © 2007 (ISSN 0896-7253) is published 4 times a year by Beyond Pesticides. Beyond Pesticides, founded in 1981 as the National Coalition Against the Misuse of Pesticides (NCAMP), is a voice for health and the environment, promoting protection from pesticides and safe alternatives; donations are tax-deductible.

#### National Headquarters:

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

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

#### BEYOND PESTICIDES STAFF

**Jay Feldman**, *Executive Director*  
**John Kepner**, *Project Director*  
**Jane Philbrick**, *Public Education Associate*  
**Ray Koytcheff**, *Research Fellow*  
**Nichelle Harriott**, *Research Associate*  
**Kagan Owens**, *Senior Project Associate*  
**Terry Shistar**, Ph.D., *Science Consultant*

#### PESTICIDES AND YOU

**Jay Feldman**, *Publisher, Editor*  
**Jay Feldman, John Kepner, Jane Philbrick, Ray Koytcheff, Nichelle Harriott, Ian Santino** *Contributors*  
**John Kepner**, *Layout*

#### BOARD OF DIRECTORS

**Robina Suwol**, *president*, California Safe Schools, Van Nuys, CA  
**Routt Riegart, M.D.**, *vice-president*, Medical University of South Carolina, Charleston, SC  
**Terry Shistar, Ph.D.**, *secretary*, Kaw Valley Greens, Lawrence, KS  
**Lani Malmberg**, *treasurer*, Ecological Services, Lander, WY  
**Caroline Cox**, *at-large*, Center for Environmental Health, Oakland, CA  
**Ruth Berlin, LCSW-C**, Maryland Pesticide Network, Annapolis, MD  
**Alan Cohen**, Bio-Logical Pest Management, Washington, DC  
**Shelley Davis**, Farmworker Justice Fund, Washington, DC  
**Lorna Donaldson**, Donaldson Family Farm, Tiptonville, TN  
**Jay Feldman**, Beyond Pesticides, Washington, DC  
**Tessa Hill**, Kids for Saving Earth Worldwide, Plymouth, MN  
**Warren Porter, Ph.D.**, University of Wisconsin, Madison, WI  
**Jim Riddle**, University of Minnesota Organic Ecology Program, Winona, MN  
**Floribella Redondo**, Campesinos Sin Fronteras, Yuma, AZ  
**Allen Spalt**, PEST EDucation Project, Agricultural Resources Center, Carrboro, NC  
**Andrea Kidd Taylor, DrPH**, Morgan State University, Baltimore, MD

Affiliations shown for informational purposes only.

## Beyond Pesticides Daily News Blog

On January 16, 2007, Beyond Pesticides converted its Daily News feature into a Blog, enabling readers to post additional relevant information that will further inform or give perspective to the daily issues of concern. Daily News is a service of Beyond Pesticides that is intended to keep activists, researchers, policy makers, the health care community, and pest managers informed on key issues and actions that are ongoing and important to the protection of public health and the environment. Daily News is intended to provide a tool for action as we seek to effect a shift in policies, practices and products to safeguard the health of people and the environment.

Excerpt from Beyond Pesticides original blog post (4/3/07):

### FL Restricts Phosphate Fertilizers To Improve Water Quality

Responding to concerns about the state's polluted waterways, Florida will become the first in the nation to enact a statewide restriction on the content of fertilizers. If passed, fertilizers sold in Florida must be no- or low-phosphate. Phosphorus, along with nitrogen, is a pollutant that contributes to algae blooms, fish kills, and dead zones, all of which alter already fragile ecosystems...

#### Steph Says:

Another way to get homeowners to care about and act on reducing pollution in addition to using less herbicide, pesticide, and fertilizer, and while they're at it, conserving water by not needing as much, is to focus on plant and insect and wildlife diversity. A diverse landscape is preferable to a solid green lawn in many ways. I saw a long-tailed skipper butterfly lay eggs on Desmodium (<http://butterflies.heuristron.net/plants/desmodium.html>), one of my most hated weeds, and it became one of my favorite plants. That got me to thinking about the diversity in my yard. Instead of wasting a lot of time, effort, oil, and gas taking out a tree stump the hurricanes left me, I planted *Passiflora suberosa* by it and let it cover it up. The stump acts like a trellis for the vine, the vine hides the stump, and three butterflies use that vine as a host plant so I have lots more butterflies now. As I've added native plants (you don't have to water native plants as much; they're used to their home climate), preserved little hidden corners for the weeds that I've noticed that the butterflies use, and quit worrying about the weeds in my lawn, I've seen my dragonfly populations go up (dragonflies eat mosquitoes!), and oddly enough I have fewer fire ant hills. I'm still trying to figure out which bug is eating those. I toss on a gentle application of fertilizer a couple of times a year, less than half of the recommended spread rate, and I don't spray for weeds or bugs. It's great! I have more butterflies (the butterflies and other insects need a variety of plants, not just grass), more mockingbirds (they eat butterflies), and more time to spend outside enjoying my creatures instead of spending so much of it trying to completely replace their habitat with a grass only lawn. I also have more money, because I'm not spending it on the pesticides and herbicides I've discovered I'm happier not using.

## Ways To Use Our Safe-Lawns Doorhangers

Hi there,

Thanks for getting the Safe-Lawn doorhangers order out to us so quickly. We distribute them to all potential customers and current customers. I'm an organic land care professional and am developing an educational program to bring to schools in conjunction with pesticide-free transition strategies. I'd like to send them home with children to share with parents and distribute them throughout their neighborhoods to create pesticide free zones. I would love to do some collaborating with you on public education and look forward to hearing from you about possible opportunities.

Be well,  
Bernadette  
Northampton, MA

Hello,

Thank you for sending the doorhangers. I wanted to let you know right away what my plans were. I have created Green Holiday goody bags for Christmas and that is going in the gift with the request that the recipient pass on the door hanger. Kind of like a door hanger chain public service announcement.

I will also work with my County to see that this information and the training link will go to the County executive, and the parks and recreation folks. I have your link on two of the websites that I manage. Having recovered from asthma as a child, I am a health and environmental activist and a new mommy. Educating the public is very important to me. I can't do everything, but I do what I can.

Thank you for your work,  
Cassandra  
Anne Arundel County

Bernadette and Cassandra,

Thank you for your feedback on our doorhanger campaign; I'm glad you are finding them as useful as we hoped they would be. We still have many left, so we encourage members and activists to use them to create dialogue between neighbors, encourage safe lawn care practices, and educate others about the dangers of toxic pesticides and fertilizers. Whether you prefer to distribute them in your neighborhood or through your business, we hope others will also find them helpful in raising awareness of alternative lawn care options.

If you would like to request doorhangers, please give us a call or visit our website at <http://www.shopbeyondpesticides.org>. We can offer up to 25 free of charge. Pricing is as follows: 50 for \$15, 75 for \$22, 100 for \$300, and 500 for \$130.

As always, please visit our website for more information on lawn care and alternatives to pesticides. Good luck!

## **Speak Your Mind!**

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

**Beyond Pesticides**  
701 E Street SE #200  
Washington, DC 20003  
[info@beyondpesticides.org](mailto:info@beyondpesticides.org)  
fax: 202-543-4791



## **Beyond Pesticides Daily News Blog**

*Excerpt from Beyond Pesticides original blog post (8/8/07):*

### **New WHO Report Focuses on Children's Susceptibility to Chemicals**

For the first time, the World Health Organization (WHO) released a report in July on children's heightened vulnerability to chemical exposures at different periods of their growth and development. The organization cites over 30% of the global burden of disease in children can be attributed to environmental factors, including pesticides...

#### **Ahmad Says:**

Pesticide residues More threat to children:

According to my calculation many years ago during my MS research working on pesticide residue analysis in apples, a particular amount of insecticide residue in apples that may be tolerated by an adult is harmful for a child and this depends on the body weight. This fact could be generalized for all food products and particularly for vegetables and fruits. These calculations were based on Acceptable Daily Intake and Maximum Residue Limits determined by food codex Committee In Rome. The body tolerance of a 20 kg child is quiet different than a 80 kg adult. The other reason for lower tolerance threshold for children as compared to adults is using less diverse food by children. According to my findings during Ph.D. research in Canada at the University of Guelph and also findings by others that consuming more diverse food and particularly more diverse vegetables and fruits induces a higher level of more diverse metabolizing and detoxifying enzymes in body. These metabolizing enzymes are developed more and more in the liver as age increases.

Best regards,  
Ahmad Mahdavi  
Insect and environmental toxicologist, Guelph Ontario Canada

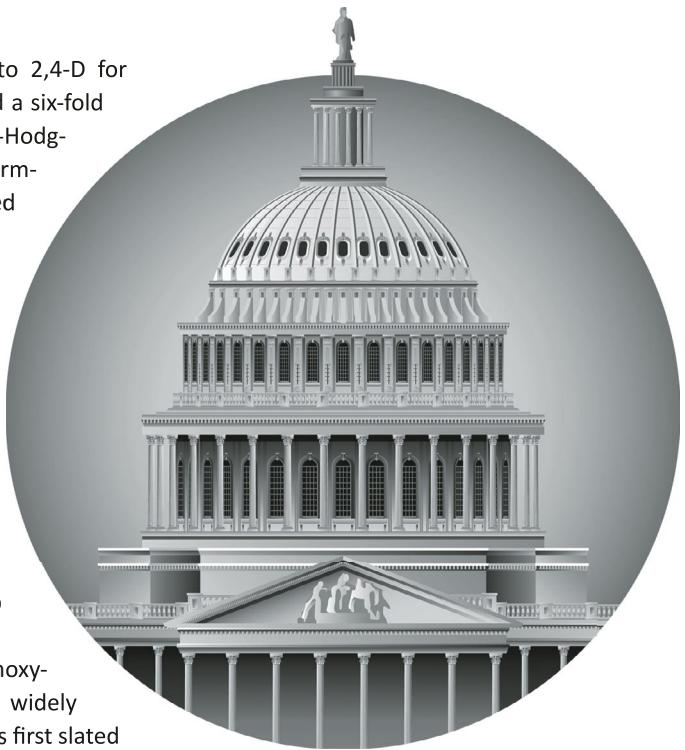
# Washington, DC

## Industry Spends Millions on 2,4-D, EPA Decides Against Special Review for Cancer

In a move that left environmentalists shaking their heads, the Environmental Protection Agency (EPA) announced its decision to not initiate a Special Review for the carcinogenic herbicide 2,4-D, as well as the related herbicides 2,4-DB and 2,4-DP (dichlorprop), following years of investment in research and public relations by the pesticide industry. The Federal Register Notice (72 FR 44510-44511) states, "Based on extensive scientific review of many epidemiology and animal studies, EPA finds that the weight of the evidence does not support a conclusion that 2,4-D, 2,4-DB and 2,4-DP are likely human carcinogens." Although a mounting body of evidence links 2,4-D to various cancers, particularly non-Hodgkin's lymphoma, EPA has been reluctant to classify it as a carcinogen in the face of industry pressure. However, the link between 2,4-D and non-Hodgkin's lymphoma has been demonstrated in the United States, Italy, Canada, Denmark, and Sweden. For example, a 1986 National Cancer Institute (NCI) study found that

farmers in Kansas exposed to 2,4-D for 20 or more days per year had a six-fold higher risk of developing non-Hodgkin's lymphoma than non-farmers. A 1990 study published in the journal *Epidemiology* (Vol. 1, No. 5) found a 50% increase in non-Hodgkin's lymphoma in farmers who handle 2,4-D. In addition to these epidemiological studies, a laboratory study conducted by the Food and Drug Administration (FDA) found a 4% incidence of lymphoma in rats exposed to 2,4-D and no lymphoma in unexposed rats.

2,4-D (2,4-Dichlorophenoxyacetic acid), the third most widely used herbicide in the U.S., was first slated by EPA for Special Review in 1986. In a unique move, several large pesticide companies with a common interest in keeping 2,4-D on the market formed the "Industry Task Force II on 2,4-D Research Data" to fund research and a public relations campaign for the purpose of clearing the toxic chemical's name. In 1988, EPA decided to defer its Special Review decision until the completion of the herbicide's Reregistration Eligibility Document (RED). During this time, the Task Force, comprised of



Dow AgroSciences, Nufarm Ltd. and Agro-Gor Corp., reports it funded nearly \$30 million in new research on the chemical. Environmental and public health advocates criticize industry-funded research as biased and influential in the regulatory process. EPA uses the pesticide Special Review process when it has reason to believe that the use of a pesticide may result in unreasonable adverse effects on people or the environment.

## Ten Years After Mandate, EPA To Begin Screening Endocrine Disrupting Pesticides

Better late than never. On June 11, 2007, more than 10 years after being directed to do so by Congress, the Environmental Protection Agency (EPA) announced that it will test 73 pesticides, including the common home and garden pesticides 2,4-D, glyphosate and resmethrin, for their potential to damage the endocrine system and disrupt the normal functioning of hormones in the body. The 1996 *Food Quality Protection Act* (FQPA) set a 1999 deadline for EPA to develop a battery of assays with which pesticide manufacturers would be required to screen their products as possible endocrine disruptors, similar to tests required to determine whether chemicals cause cancer, birth defects, genetic mutations, or other problems. EPA has repeatedly pushed back the deadline. The draft list of pesticide ingredients, including both active and inert ingredients, was chosen based on the chemicals' relatively high potential for human exposure. According to EPA, priority was given "to pesticide active ingredients where there is the potential for human exposure through food and water, residential exposure to pesticide products, and high levels of occupational exposure following an application of agricultural pesticides. For pesticide inert ingredients, the priority was on those with high production volumes found in human or ecological tissues, water, and indoor air."

## Lawsuit Challenges EPA on Continued Use of Chlorpyrifos in Agriculture

While the Environmental Protection Agency (EPA) phased out most residential uses of the neurotoxic insecticide chlorpyrifos in 2001, it did not afford the same protections to farmworkers. To protect farmworkers and their families living near agricultural fields, advocate groups, including Earthjustice, United Farm Workers, Farmworker Justice, Beyond Pesticides and others, filed a lawsuit on July 31, 2007 against EPA to stop the continued use of chlorpyrifos. Exposure can cause dizziness, vomiting, convulsions, numbness in the limbs, loss of intellectual functioning and death. Also known as Lorsban, it is responsible for a substantial number of worker poisonings each year and has been found to drift into rural schoolyards and homes. EPA acknowledges that chlorpyrifos poses risks to the health of workers and to the environment. "Recognizing the risks to children, EPA banned most home and garden uses of chlorpyrifos. But by allowing continued use in agriculture, EPA failed to protect farmworker children or children living in rural areas," said Shelley Davis, attorney for Farmworker Justice. "With safer alternatives already in widespread use, the EPA has betrayed the trust of the men, women, and children whose health it is supposed to protect," Ms. Davis continued. From 1987 to 1998, between 21 and 24 million pounds of chlorpyrifos were applied to more than eight million acres of crops in the U.S. It remains one of the most heavily used insecticides in agriculture. *For more information, contact Beyond Pesticides.*

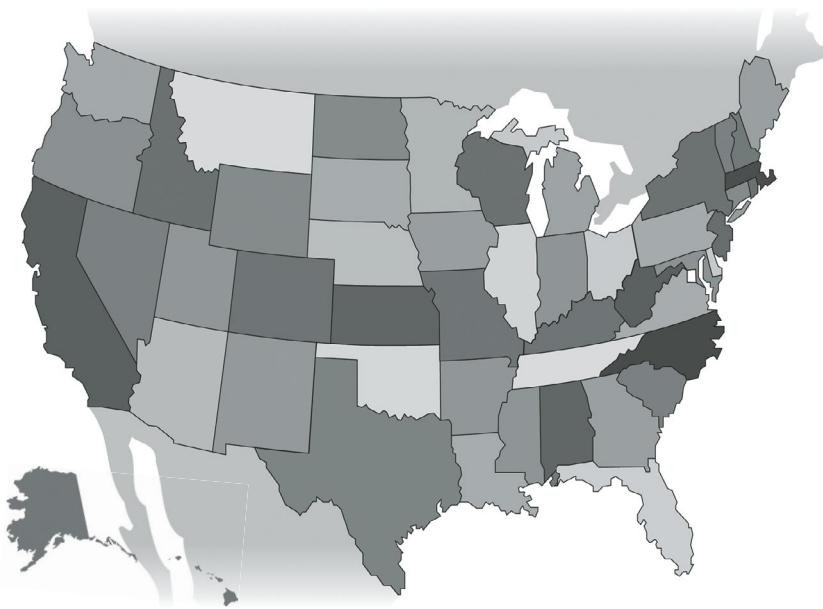


## Bald Eagle Removed from Endangered Species List

On June 28, 2007, 40 years after it received protection under the *Endangered Species Act* (ESA) and 35 years after the banning of DDT in the U.S., the bald eagle was removed from ESA's "threatened" list. Bald eagle populations declined dramatically in the last century, attributed mostly to the accumulation of the pesticide DDT in fish, a staple of the eagle's diet. The pesticide gradually poisoned females, causing them to produce thinly-shelled eggs. Years of hunting, accidental poisoning and habitat loss took an additional toll. The U.S. Fish and Wildlife Service (FWS) in 1967 listed the bald eagle as endangered, a designation that gave the bird legal protection from harmful human activities, and in 1972 the U.S. Environmental Protection Agency (EPA) banned most uses of DDT (although it remains a contaminant of the pesticide dicofol, which is still used today). Listing the bald eagle afforded greater protection for important habitat, and saw the beginning of intensive monitoring and management of bald eagle populations in the wild. By the mid-90's, the eagle was on the road to recovery and the FWS, under ESA, "downlisted" the bald eagle from endangered to threatened in most states. After delisting, the bald eagle will remain under federal protection largely through the *Bald and Golden Eagle Protection Act of 1940*, as well as a patchwork of state laws. However, environmentalists worry that without habitat protection, developers will move into critical bald eagle areas, push the birds out and reduce their numbers.

ESA plays an important role in the regulation of pesticides. The *Federal Insecticide, Fungicide and Rodenticide Act* (FIFRA) alone does not adequately protect endangered species. EPA interprets FIFRA to require balancing the profits from using a pesticide against the dollar value of harm caused by that pesticide, without adequately considering alternative products and techniques. ESA, on the other hand, recognizes what almost all Americans believe – that no dollar amount can be placed on the extinction of our nation's wildlife. While happy about the success of the bald eagle, pesticide activists are cautious because as species are removed from the endangered species list it opens the door for greater pesticide use under weak federal standards near habitat of once-listed species.

# Around the Country



## Exposure to Organochlorine Pesticides Linked to Autism

With the rate of autism tripling in the past five years, researchers have stepped up efforts to understand the factors contributing to this disease. One possibility, according to scientists from the California Department of Public Health, is maternal exposure to pesticides. Their study, "Maternal Residence Near Agricultural Pesticide Applications and Autism Spectrum Disorders (ASD) Among Children in the California Central Valley," published July 30, 2007 in the online edition of *Environmental Health and Perspectives*, finds mothers who were within 500 meters of fields sprayed with organochlorine pesticides during their first trimester of pregnancy are six times more likely to have children with autism compared to mothers who did not live near the fields.

The study analyzes information collected for the years 1996 through 1998, for nearly 300,000 children born in 19



counties of the Sacramento and San Joaquin river valleys. State records of the addresses of the pregnant women were compared against those fields sprayed with pesticides. Areas sprayed with organochlorines, especially endosulfan and dicofol, exhibited extraordinary patterns. A previous report citing air monitoring in Fresno, Monterey and Tulare counties in July by the California Department of Pesticide Regulation (DPR) demonstrates that endosulfan drifts from fields and exposes the public. The agency is likely to soon designate endosulfan as a toxic air contaminant, which should lead to steps that minimize chemicals drifting off fields into nearby homes.

ASDs include a range of developmental disabilities that are characterized by substantial impairments in social interaction and communication and the presence of unusual behaviors and interests. The symptoms range from mild to very severe, appearing before the age of three and lasting throughout a person's life. ASD prevalence shot up in 1990s, reaching levels of 2.0-7.0 per 1,000 children.

## WHO Report Focuses on Children and Toxic Chemicals

On July 27, 2007, the World Health Organization (WHO) released a report recognizing for the first time children's heightened vulnerability to chemical exposures at different periods of their growth and development. The organization cites over 30% of the global burden of disease in children can be attributed to environmental factors, including pesticides. The report, *Principles for Evaluating Health Risks in Children Associated with Exposure to Chemicals*, is a new volume of the WHO's Environmental Health Criteria series. It highlights the fact that for children the stage of their development when chemical exposure occurs may be just as important as the magnitude of the exposure.

With respect to pesticides, the report cites several studies that tie pesticide exposure during key periods of development to neurobehavioral problems, Parkinson's disease, and immunotoxicity, including respiratory diseases. Furthermore, the vulnerability of children is increased in degraded and poor environments. Neglected and malnourished children suffer the most. These children often live in unhealthy housing, lack clean water and sanitation services, and have limited access to health care and education. For example, lead is known to be more toxic to children whose diets are deficient in calories, iron and calcium. One in five children in the poorest parts of the world will not live longer than their fifth birthday, mainly because of environment-related diseases. The report (*Environmental Health Criteria 237*) is available at [www.who.int/ipcs/publications/ehc/ehc237.pdf](http://www.who.int/ipcs/publications/ehc/ehc237.pdf).

## Children Exposed to DDT More Likely To Develop Breast Cancer

Proponents of DDT use for mosquito control often characterize their opposition as environmentalists who care more about protecting birds than human health. In

reality, there are much safer and effective ways to combat mosquito borne diseases, and research continues to link the outdated insecticide to a variety of health issues. The latest such study, "DDT and breast cancer in young women: New data on the significance of age at exposure," published July 24, 2007 in the online edition of *Environmental Health Perspectives*, shows women who were exposed to DDT before the age of 14 are five times more likely to develop breast cancer later in life. The researchers analyzed blood that had been collected from women between 1959 and 1967, years during which the use of DDT was at its highest. The researchers identified

women in the California Cancer Registry and the California Vital Status Records who were diagnosed with breast cancer before age 50, or those who had died because of breast cancer before age 50. Of the women whose blood was stored, 129 cases were used to measure DDT. The samples were divided into groups based on what their age would have been in 1945, the year DDT was first used in the U.S. After analysis, DDT was found to be present in all subjects, but in much higher levels for those who developed breast cancer. Those younger than 14 in 1945 with the highest levels of exposure were 5.4 times more likely to have breast cancer. In contrast, there was no relationship between exposure level and breast cancer for women who were 14 years and older in 1945. The researchers also found that those exposed at the youngest age were at the greatest risk.



## Researchers Find Key Link in Malaria Transmission

With malaria responsible for over a million deaths each year and likely to worsen due to global warming, public health advocates are desperate for an inexpensive strategy that does not rely on toxic pesticides. A new study, "Mosquito Heparan Sulfate and Its Potential Role in Malaria Infection and Transmission," published in the August 31, 2007 issue of the *Journal of Biological Chemistry*, identifies the biochemical pathway that facilitates the spread of malaria from mosquitoes to humans. The research team from the Rensselaer Polytechnic Institute in Troy, NY believes that if this link in the chain can be broken at its source - the mosquito - then a new tool would be available to stop the spread of malaria. The researchers found that humans and the mosquitoes that carry the malaria parasite Plasmodium share the same complex carbohydrate, heparan sulfate. In both humans and mosquitoes, heparan sulfate is a receptor for the Plasmodium, binding to the parasite and giving it quick and easy transport through the body. Robert J. Linhardt, Ph.D., professor of Biocatalysis and Metabolic Engineering at Rensselaer, led the team. "The discovery allows us to think differently about preventing the disease. If we can stop heparan sulfate from binding to the parasite in mosquitoes, we will not just be treating the disease, we will be stopping its spread completely."

Beyond Pesticides believes that advocating a reliance on pesticides, especially DDT, as a silver bullet solution for malaria protection is extremely dangerous. When the underlying causes of pest problems are not adequately addressed, then a sustained dependence on toxic pesticides like DDT causes greater long-term problems than those that are being addressed in the short-term. It is possible to effectively fight malaria without poisoning future generations of children in malaria hot spots. "We should be advocating for a just world where we no longer treat poverty and development with poisonous band-aids, but join together to address the root causes of insect-borne disease, because the chemical-dependent alternatives are ultimately deadly for everyone," says Jay Feldman, executive director of Beyond Pesticides.



## Organic Farming Shown To Keep Pace with Conventional Methods

Conventional agribusiness has long argued that organic farming is a nice idea, but it could never feed the world. However, a new study, "Organic agriculture and the global food supply," published in the journal *Renewable Agriculture and Food Sys-*

tems

 (Vol. 22, No. 2), disputes this myth, showing that organic farming can match and sometimes exceed the crop and animal yields of conventional farming. Researchers from the University of Michigan derived their findings from a database of information on farms in both developed and developing nations. Among the findings are that: (1) in developed countries, organic and conventional farms record similar yields, (2) yields can be doubled or tripled in developing countries using organic methods, and (3) organic fertilizers can be used to attain such yields, even without putting more farmland

into production. Their research shows that for organic corn yields range from 84 percent to 130 percent of chemical-intensive corn production. "It even surprised us," Dr. Badgley said. "We expected we might find that it might be, oh, 80 percent or something simply because that's the number that has been cited in the past." This study is not the only analysis that shows organic farming is competitive with conventional methods.

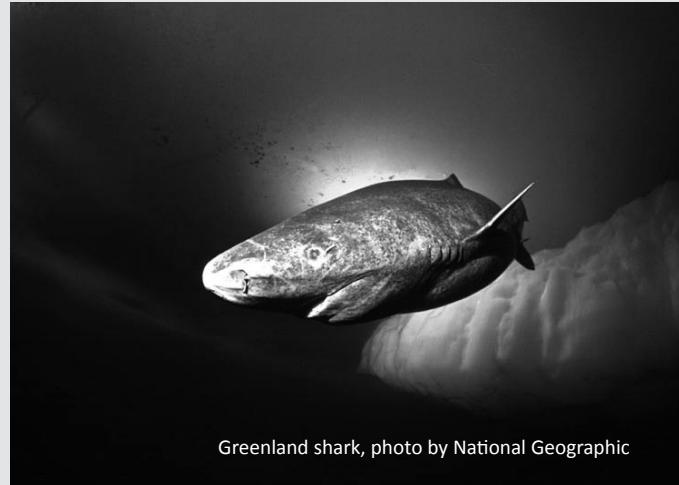
Paul Hepperly, Ph.D., a Rodale Institute researcher presented data at Beyond Pesticides 25th National Pesticide Forum, June 2, 2007 in Chicago, showing that organic methods are not only competitive, but outperform conventional farming in drought years, while at the same time sequester four times as much atmospheric carbon and reduce greenhouse gases that contribute to global warming. *For more information, contact Beyond Pesticides.*



## Long-Living Arctic Sharks Show Buildup of Toxic Chemicals

A Swedish study reports that Greenland sharks, which inhabit remote Arctic waters, contain high amounts of human-manufactured industrial waste in their bodies, including toxic pesticide byproducts. The study, "Dioxins and PCBs [Polychlorinated Biphenyls] in Greenland shark (*Somniosus microcephalus*) from the North-East Atlantic," was published June 13, 2007 in the online edition of the journal *Marine Pollution Bulletin*. According to the team of researchers at Stockholm University, the highest measured concentration found is for the world's most toxic dioxin, 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD), a compound found in the herbicide Agent Orange, which was used as a defoliant in the Vietnam War and for other applications from 1961 to 1971. The study also names another set of discontinued chemicals, polychlorinated biphenyls, or PCBs, as the main source of the contaminants found in the Greenland sharks. PCBs were banned in the 1970s, which illustrates how persistent such compounds are in the environment and how long-living, top predator species carry them for decades.

Compared to other areas, the concentrations of contaminants are often low in the fish species consumed by the Greenland sharks in the remote marine environments that they inhabit. However, project leader Åke Bergman, Ph.D., an environmental chemist at Stockholm University, thinks that pollutant levels are especially high in the sharks due to their slow metabolism rates as a result of their cold-water habitats. Studies show that other apex predators, like polar bears, large marine mammals and birds high on the food chain, tend to have more contaminants because of "biomagnification through the food web," meaning that as one animal eats another, the substances in their bodies become more concentrated with each step up in the chain. Dr. Bergman said, "Sharks provide evidence for what is happening in marine ecosystems, and since we found Greenland sharks carry quite a load of environmental contaminants, there is cause for concern."



Greenland shark, photo by National Geographic

# Pesticides and Pets

## What you should know to keep your pets safe

By Ian Santino

**S**ome of our closest companions are pets. According to the American Pet Products Manufacturers Association, approximately 142.6 million cats and dogs are cared for in the United States. Despite the level of care Americans have given their furry friends, pets are at high risk of being poisoned due to our everyday home and garden and pet hygiene practices. The culprit? Pesticides. The smaller bodies of companion animals make them more susceptible to chemicals, and their behavior patterns make them more likely to be exposed to toxic pesticides. In fact, in the summer of 2001 half of all cases at the American Society for the Prevention of Cruelty to Animals (ASPCA) Animal Poison Control Center involved pesticide poisoning. Chemicals that may seem harmless can be a real life and death matter for cats, dogs, birds, horses, rabbits, and other pets. The good news is that by being conscious about your pet's environment and behavioral patterns, and reducing potential pesticide exposures, you can help to protect your pets.

### Is Your Pet at Risk?

Companion animals are more vulnerable to pesticides for several reasons. They walk through chemically-treated areas unknowingly, absorb pesticides through their mouth, nose, and eyes, and can absorb through their skin any powder that sticks to their fur. For example:

- Cats will wander half a mile or more to hunt, thereby becoming exposed to any pesticide-treated area within that radius.
- Dogs and cats use their noses to poke around and explore. The nose is a mucous membrane and an easy place for pesticides to enter their bodies.
- Dogs, in particular, absorb pesticide residues by chewing or eating plant material that was treated with pesticides.
- Cats absorb more chemicals than dogs due to their grooming habits.
- Cats are especially sensitive to organophosphates and permethrin, both of which are used in lawn and garden products.
- Because cats are specialist carnivores, they lack certain enzymes in their liver that decontaminate chemicals, making them especially vulnerable to the effects of toxic chemicals.

### Secondary Poisoning

Although it is quite common for dogs and cats to walk through toxic lawns or sniff pesticide-treated weeds, a perhaps quicker way to consume large doses of pesticides is by catching and eating poisoned prey. Dogs and cats both eat rodents, mollusks, and insects, all of which are considered undesirable species and are



frequently controlled through the use of pesticides. If a cat eats a mouse that has just been poisoned by a rodenticide, the cat will absorb the poison also. This is called secondary poisoning. Consider these facts:

- Cats and dogs hunt, and it is natural for hunters to pick the weakened animals as prey. Animals that have been poisoned are easy targets for predators because they are easier to catch.
- Symptoms of secondary poisoning may not occur for weeks after a dog or cat eats a poisoned animal, and may not be recognized as such.
- As companion animals eat more and more toxic prey, the poison becomes more and more concentrated in their body. This process is known as bioaccumulation.

Especially at risk of secondary poisoning are cats that hunt birds. Birds can travel longer distances after eating a pesticide and often eat grains from fields that have been sprayed. In fact, every year an estimated 672 million birds in the U.S. are exposed to pesticides from agriculture alone. Only ten percent die, meaning 90% of those poisoned birds are still alive long after consuming pesticides, and are potential prey for cats. Some common pesticides used on grain eaten by birds are:

- Captan, which is carcinogenic.
- Diazinon, which attacks the nervous system.
- Lindane, which is carcinogenic and is a neurotoxin. (EPA requested voluntary cancellation of agricultural Lindane use in 2006.)
- Malathion, which is a nerve poison.

This shows how pesticides can bioaccumulate up the food chain, in this case from grain to birds to cats. Perhaps this is a reason cancer is a leading cause of death for pets.

### **What Do Pesticides Do to Pets?**

It's surprising how many pesticide products can have adverse effects on animals. A product meant for a dog, for instance, can be highly toxic to a cat, and something with mild effects in humans can have disastrous effects on companion animals. Here are some risks of pesticides to domestic animals:

- In 1993 a study by Colorado State University researchers found significantly higher levels of 2,4-D among dogs who live near treated lawns. A study published in 1995 in the academic journal *Environmental Research* shows a "statistically significant" increase in the risk of canine malignant lymphoma in dogs when exposed to herbicides, particularly 2,4-D, commonly used on lawns and in "weed and feed" products.
- In one case study by the Association of Aviary Veterinarians, indoor use of chlorpyrifos caused pet birds to lose weight and die.
- One product of particular concern is snail bait. A common active ingredient, metaldehyde, is tasty and attractive to mammals. Unfortunately, it is also highly toxic to all mammals, and causes blindness, excessive salivation, seizures, and sudden death.
- A case report published from the Harvard Medical School linked cholinesterase inhibitors with excessively aggressive behavior in both cats and humans. Organophosphate (e.g. dichlorvos, malathion) and carbamate (e.g. aldicarb, carbaryl) insecticides are both known to inhibit cholinesterase.
- A study by Purdue University found that Scottish Terriers exposed to pesticide-treated lawns and gardens are more likely to develop transitional cell carcinoma of the bladder, a type of cancer.

Specific pesticides that are toxic to dogs include:

- Avermectin B1: An insecticide used for fire ants, causes lethargy and tremors in dogs.
- Allethrin: Used on flies and mosquitoes, linked with liver cancer in dogs.
- Bendiocarb: This insecticide and cholinesterase inhibitor causes muscle tremors, chest discomfort, and excessive salivation. It is



used to control cockroaches, ants, fleas, and crickets. It is currently being phased out of use.

- DCPA: An herbicide used in lawns and gardens, it is suspected to cause adverse effects in the liver of dogs.
- Diazinon: An organophosphate insecticide that is a cholinesterase inhibitor, used in agriculture.
- Malathion: This insecticide is an organophosphate and a cholinesterase inhibitor, and is used in agriculture and for public health uses to control a wide range of insects, such as mosquitoes.
- Rotenone: An insecticide used in agriculture and in gardens that has been linked to vomiting and weight loss in dogs when exposed continuously.

Remember that pesticides that are toxic to dogs will have adverse effects in cats also, due to their more delicate digestive system. Some other pesticides to look out for if you have cats or other pets are:

- Warfarin: A rodenticide that causes internal bleeding, it is acutely toxic and is also a reproductive toxin.
- Difenacoum and Brodifacoum: These rodenticides are anticoagulants and are both acutely toxic.
- Benomyl: This fungicide is a possible carcinogen and a reproductive toxin.
- Methiocarb: An insecticide that is both acutely toxic and a cholinesterase inhibitor.

### **Flea Control Products**

Another known area of risk for pets is from flea and tick control products. These products are designed to kill, so it follows that they could be harmful to put on pets. In fact, Hartz flea products were blamed for at least 200 pet deaths in 1988 and thousands more in 2002. These incidents illustrate the dangers of using poisons near pets.

A number of studies have also shown the adverse health effects caused by flea products. Significant studies include:

- A 2003 study by University of Massachusetts researchers found that cats that wear flea collars have five times the risk of oral squa-

mous cell carcinoma (a form of skin cancer) than those that do not wear flea collars.

- A study by researchers at the University of Pennsylvania found that risk of bladder cancer in household dogs is "significantly increased by topical [applied externally to an animal's body] insecticide use." Cancer is a leading cause of death for pets.
- A case report published from the Harvard Medical School tells of a cat becoming intensely aggressive after being exposed to a tick powder used on a dog.

Many flea control products include organophosphate insecticides. Organophosphates work by interfering with nerve signals in the body, therefore harming the nervous system. This kills insects, and in larger doses can kill humans and pets as well. They are known to be neurotoxic. However, even with the doses applied in flea control products, pets may be in danger. The two common organophosphates that still remain on the market are dichlorvos and tetrachlorvinphos, which are in a variety of tick and flea control products. Be sure to avoid these chemicals! Be forewarned that checking a product's label for ingredients can be misleading because "inert" ingredients, which are routinely not disclosed, are often also toxic. Using non-chemical methods to control undesirable species is the safest way to protect yourself and your pet.

### **Keeping Your Pets Safe: Alternatives for treating fleas and managing your home and garden**

Despite the prevalence of toxic pesticides, many safe and effective alternatives do exist. Ranging from increased prevention to least-toxic alternatives, there is a healthy, non-poisonous way to treat your pets' problem.

#### **Fleas**

**Prevention:** First and foremost, it is important to treat the root of the problem—that is, keep fleas from getting to your pets in the first place! Here are some easy ways to prevent fleas:

- Vacuum daily during flea season with a strong vacuum cleaner. Change the collection bag often.
- Groom pets with a flea comb daily. After each stroke, dunk any fleas in soapy water.
- Bathe pets frequently with soap and water.
- Restrict pets to a single bed and wash bedding frequently to kill larvae.

**Control:** If you already have a flea infestation, there are many non-toxic and least-toxic ways to get rid of them without using toxic pesticides.

- Give pets vitamin B1, which is shown to reduce flea bite frequency.
- Heat treatment:

Cat flea larvae die after exposure to 103°F for one hour. Certain pest control companies use a common heating unit modified to include special blowers and flexible ducts to heat areas of the house that are infested.

- Either dry, or saturate with water, infested areas of the house or yard.
- Nematodes can be applied to the lawn as a spray. Nematodes are a biological control that enters the fleas bodies, feed on tissues and release harmful bacteria. Nematodes occur naturally in soil, and do not affect people, pets, or plants. Treat areas where you have seen pets often, be sure to water the area before and after the application.
- Diatomaceous earth or silica aerogel: Choose a garden/food grade pyrethrin-free variety. Apply this powder in dry areas suspected of harboring fleas, wait a couple days, and vacuum it up. Wear a mask while applying.
- Boric acid can be rubbed into carpets and applied to other places where fleas reside. Make sure not to put it in a place where pets will come in direct contact with the chemical.
- D-limonene and linalool are citrus extracts that kill adult and larval fleas. Remember to read the label carefully, as some are too strong for cats or young animals. Also, be careful about breathing in the fumes, as they will cause irritation. People with sensitivities should consider using another alternative.

### **Lawns, Landscapes and Gardens**

**Prevention:** Again, the most effective way to treat unwanted plants is to stop them from establishing themselves on your property at all.

#### **Do this by creating a thick, healthy turf:**

- Mow at 3-3.5 inches to shade out weed germination and foster deep roots.
- Leave the grass clipping on the lawn after mowing. Grass clippings are a free natural fertilizer and will improve soil conditions!
- Aerate your lawn in order to help air, water, and fertilizer to enter.
- After aerating, fertilize lightly in the Fall with a natural, slow-release fertilizer. Request organic fertilizers at your local nursery or order online.
- Overseed with a grass species that is naturally resistant to fungal diseases and/or insects. Use native species.
- Use corn gluten meal on weed prone areas in the early spring and early fall. Corn gluten keeps selected weed seeds from germinating, yet is high in nitrogen so it fertilizes your lawn at the same time. Do not seed at the same time.





#### **And by promoting healthy landscapes and gardens:**

- Consider alternative ground covers such as clover, wildflowers, herbs, and shrubs.
- In gardens, use high quality mulches to suppress weeds. Good mulches include mowed leaves, bark, or plastic mulches free of PVC.
- Use native species. Native plants are adapted to your climate, and therefore require little maintenance, and they compete well against weeds.
- You can also use netting or plastic barriers to keep weeds from growing, and these can be put under mulch, stone, pebbles, and other landscaping materials.

**Control:** In addition to prevention, there are easy and direct ways to control unwanted plants without the use of toxic herbicides.

- Hand pull weeds from the roots.
- Flame weeding machines use a targeted flame to kill weeds. This option is not advisable for drier climates.
- High-pressure steam and boiling water can both be used to kill weeds.
- Goats and geese can both be used to remove weeds.
- Horticultural vinegar is a powerful acid that will non-selectively kill weeds. You can buy horticultural vinegar at a plant nursery or even make your own. Avoid contact with skin, as it is an acid.
- Herbicidal soaps are refined soaps that dry out plants and kill them.

#### **In The Home**

There are many alternatives to using insecticides and rodenticides in the house. Beyond the basic pest control services most pets naturally provide, basic sanitation techniques can prevent most problems.

- Look for entry points where ants, rodents, or other creatures could be getting in the house. Seal or block these places.
- Keep clean! By sweeping up bits of food from the floors and by decluttering nooks and crannies, insects and rodents won't be lured into the house.
- Don't leave crumbs on the floor—most dogs will ensure this doesn't happen, but anything edible that can be reached by insects and other species is an open invitation.
- Vacuum regularly—this can remove pest habitat and many insects lay eggs in carpeting.

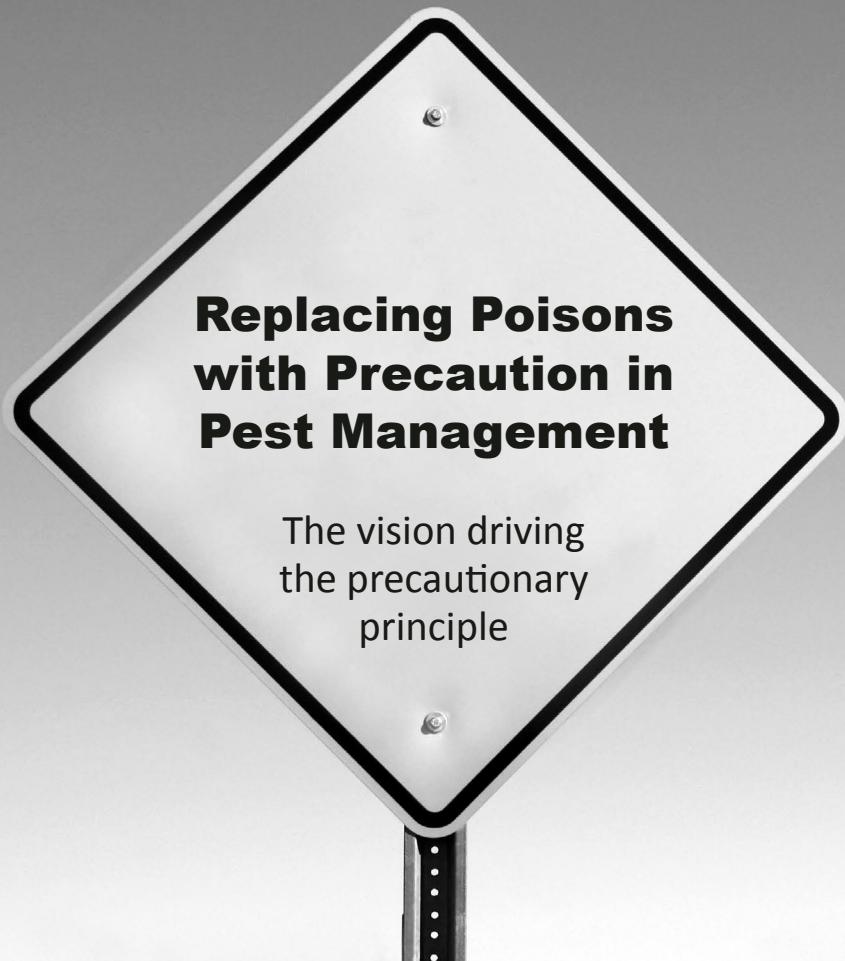
If the problem becomes severe, there are least-toxic solutions, such as boric acid and diatomaceous earth (both work for indoor and outdoor control), that can be used safely and effectively.

*Ian Santino, a student at Oberlin University, was an intern with Beyond Pesticides.*

---

#### **Selected References. For a fully cited version, see [www.beyondpesticides.org/pets](http://www.beyondpesticides.org/pets).**

- Allen AL. 2003. The diagnosis of acetaminophen toxicosis in a cat. *Canadian Veterinary Journal* 44(6): 509–510.
- ASPCA. 2002. ASPCA Animal Poison Control Center warns pet owners about the dangers of summer pesticides. Accessed at <http://www.aspca.org/>
- Bear D., J. Rosenbaum, R. Norman. 1986. Aggression in cat and human precipitated by a cholinesterase inhibitor. *Psychosomatics* 27(7): 535–536.
- Bertone ER., LA. Snyder, AS. Moore. 2003. Environmental and lifestyle risk factors for oral squamous cell carcinoma in domestic cats. *Journal of Veterinary Internal Medicine* 17(4): 557–562.
- Glickman LT, M. Raghavan, DW. Knapp, PL. Bonney, MH. Dawson. 2004. Herbicide exposure and the risk of transitional cell carcinoma of the urinary bladder in Scottish Terriers. *Journal of the American Veterinary Medical Association* 224(8): 1290–1297.
- Glickman LT, FS. Shofer, LJ. McKee, JS. Reif, and MH. Goldschmidt. 1989. Epidemiologic study of insecticide exposures, obesity, and risk of bladder cancer in household dogs. *Journal of Toxicology and Environmental Health* 28(4): 407–414.
- Hayes HM., RE. Tarone, KP. Cantor. 1995. On the association between canine malignant lymphoma and opportunity for exposure to 2,4-dichlorophenoxyacetic acid. *Environmental Research* 70: 119–125.
- Reynolds PM., JS. Reif, HS. Ramsdell, JD. Tessari. 1994. Canine exposure to herbicide-treated lawns and urinary excretion of 2,4-dichlorophenoxyacetic acid. *Cancer Epidemiology, Biomarkers & Prevention* 3: 233–237.
- Richardson, J. 2000. Permethrin spot-on toxicosis in cats. *Journal of Veterinary Emergency and Critical Care* 10:102–106.
- Rusk, Anthony. 2005. Cancer: Cases likely will rise in aging animals. *DVM Newsmagazine*, Mar 1.



## Replacing Poisons with Precaution in Pest Management

The vision driving  
the precautionary  
principle

by Debbie Raphael

*Editor's Note: The following two talks were given to the 25th National Pesticide Forum, Changing Course in a Changing Climate: Solutions for health and the environment, June 1-3, 2007 in Chicago, Illinois. The first presentation focuses on the experience in San Francisco, California implementing the precautionary principle, and the second portrays the evolution of parent activism to protect children in the Los Angeles Unified School District..*

### Acknowledging an activist and leader

The first thing I want to do is acknowledge someone in the audience. Because here I am, talking about the *precautionary principle*, and the first time I heard those two words together was when I was working for the city of Santa Monica. There, I met this incredible woman with energy like nobody's business: Robina Suwol, founder and executive director of California Safe Schools and president of the Beyond Pesticides board of directors. She got me to join a group of angry but constructive parents who wanted to change the Los Angeles Unified School District. Now, that is a big measure. I was sitting around the table with her and some other people and we were trying to figure out how to deal with this pesticide issue in this incredibly massive school district, and she brought to our attention this thing called the *precautionary principle*. I had never heard of it, and as I read it I thought, "If these guys in the administration of the school district read it carefully, there's no way they're going to include this in their principle."

So they didn't read it; they just said, "Alright, whatever Robina and her friends want, at this point we just have to say 'yes' because they've got us painted into a corner." So the board of education voted to include the *precautionary principle* in their integrated pest management (IPM) policy. That was in 1998.

That was my very first introduction to the *precautionary principle*. I didn't know a lot about what it meant at that point, but I could tell that it was a fundamental shift. I credit Robina with introducing me to a concept that has turned into a real vision for me, and a real paradigm that helps me understand the work that I'm doing. So what I want to do today is introduce you to how we define the *precautionary principle* and why I believe it's such a robust concept, and then tell you how it fits incredibly well with the work you do in integrated pest management of looking for alternatives to pesticides.

### A vision or a fight

The fit is so phenomenal that I find it really helps us move even farther than we think we can. I look for inspiration and, as a government official, I have to look for inspiration in unusual places. I was at a conference in Minnesota where a logger from Libby, Montana, Bruce Vincent, gave the most amazing talk I've heard. He said a couple of things that I want to share with you today. The first thing he said is: people will follow those who lead. If you don't have a vision all you have is the fight. When I think about integrated pest management, I really believe that IPM was born of a fight --a fight between the industries that make the pesticides and people on the ground who have to use them, and the citizen groups who oppose their use. So IPM really came out of a fight,

and I believe that IPM offers a solution, but it's not necessarily a vision.

## Uncertainty and paralysis

When I think about the vision that my children have now, about their future, and we're around the breakfast table talking and using words like "climate refugee" and peak oil" and "body burden" and "asthma" and "breast cancer," that's a pretty gloomy vision. What we really need is a vision that's going to carry us forward, not just a solution. We could sink into that place of being overwhelmed, but hopefully I'm going to offer you something today what I believe is a vision for moving us forward.

The challenge is that science really helps us understand all of those problems, but we know that proof of cause and effect can be incredibly elusive and can take way too much time. We cannot afford for this uncertainty to be an excuse for decision makers to put off making decisions: a paralysis of leadership. That's where we are now, right? This uncertainty means we don't make decisions. We wait for more information. So I want to read you a couple of really inspirational pieces of things that governments say.

## Examples of precautionary policies

"It is legitimate that decisions be guided by society's chosen level of protection against risk." That's the Canadian government, recently, in its chemicals policy. So they're acknowledging that we can understand risk, but the people have a right to decide how much risk is acceptable.

Here's another one: "A scientifically based suspicion that a chemical may cause damage is enough for taking regulatory actions." (You

can tell that's not the U.S.) "The uncertainty that might arise from the hazard of using such a chemical shall not be carried by the general public, but shall fall upon those who want to market the product." It's Sweden, my heroes. There are days when I wake up and just wish I was in Sweden. It is amazing to me that they can say that.

I'm going to read you a little longer one now –this blows me away, too:

"The nation, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment, particularly the profound influence of population growth, high density urbanization, industrial expansion, resource exploitation and new and expanding technological advances, and recognizing further the critical importance of restoring and maintaining environmental quality to the overall welfare and development of humankind, declares that it is the continuing policy of this nation to use all practical means and measures to create and maintain conditions under which people and nature can exist in productive harmony for present and future generations. In order to carry out this policy, it is the continuing responsibility of this nation to use all practical means to the end that the nation may fulfill the responsibilities of each generation as trustee of the environment for succeeding generations."

Do you know who said that? That was the 1969 *National Environmental Policy Act* (NEPA) that the U.S. Congress passed.

When I read NEPA, I just went, "Holy cow, where have we gone? We got it in 1969. What are we doing now?" So basically, governments are really looking – governments like San Francisco and state governments across this country –for a better decision making process. We need a process that is not stymied by uncertainty. We need a process that allows society to weigh in on the appropriate level of protection. We need a way to make decisions that will counteract the current vision of hopelessness.

In the 1970s, the German government was faced with a dilemma. They saw that in the Black Forest the trees were dying. They couldn't quite prove it, but they had a really good inkling that it was coal-fired power plants that were causing acid rain, which was killing the trees. But, they couldn't prove cause and effect. So of course the power industry was saying, "More study, more study." Instead, the German government did something: "*Vorsorgeprinzip, vorsorge*." *Vorsorge*, if you really translate it, means "for caring." Like all translations, sometimes it's hard to go between one language and the other. But it means "for caring." Foresight is the word we use: the *foresight principle*. Unfortunately, in my mind, what happened at Wingspread, Wisconsin, when a lot of visionaries came together to look at this, they called it the *precautionary principle*. So they translated "*vesorga*" to precaution. I, frankly, am not sure that it is the best word, but it's the word we have now. I like "for caring," I like "foresight," I think that is more meaningful.



Debbie Raphael addresses the 25th National Pesticide Forum in Chicago.

## **Is it legal?**

What the German government said in invoking this *foresight principle* is: we owe it to our citizens to take action even though we cannot prove cause and effect. And that's the crux of the thinking behind the *precautionary principle*. When I have tried to define this –and I've been up on wonderful panels with the oil industry and the American Chemistry Council, all my good friends, talking about the *precautionary principle* – I like to bring it down into this one sound bite. This is how I define the thinking of precaution in terms of decision making: *it's a matter of the questions you ask*. When you're thinking about whether you should do something, or buy something, or use something, *it's no longer sufficient to ask if it's legal*, because we know in the U.S. pretty much everything is legal. It's perfectly legal to put the weedkiller Roundup on a playground where children are going to play and it's perfectly legal to carry a handgun. We know that that's no longer a sufficient question that we should be asking.

## **Is it safe?**

It's no longer sufficient to ask "Is it safe?" either, because there's a real problem when you ask "is it safe?" When you ask "is it safe?" it depends who answers the question. Monsanto can come with their two feet thick of science saying Roundup is perfectly safe, and Caroline Cox [Center for Environmental Health, formerly of the Northwest Coalition for Alternatives to Pesticides] can come with her two feet thick of science saying there's no way this is safe. What does a decision maker like me do when trying to make a policy and people are coming with all this science? I don't want to ignore the science, but how do I make a decision? So the answer, traditionally, has been: more study. Don't make a decision, study the problem more.

## **Is it necessary?**

Instead, the *precautionary principle* says: *the question we need to ask is not, "Is it legal?" not, "Is it safe?" but, "Is it necessary?"* Do we have to use that product? Is there a safer alternative? Because that's actually a question that can be answered right then and there. That's a question that leads to action, whereas, "Is it safe?" doesn't lead to anything. So the *precautionary principle*, I believe, places the idea of IPM into a larger context, and this is where the vision comes in. It makes it into a context that is explicit about an obligation to minimize harm. That we're going to look at alternatives, and we have an obligation to choose the alternative that minimizes harm. It also becomes explicit on public involvement, and I'm going to talk about that as we go. So the big question is, then, how do you determine if something is necessary?

When I think about books and visionaries, the book I'd like to recommend is one by a woman named Mary O'Brien, Ph.D., who wrote the book *Making Better Environmental Decisions: An Alternative to Risk Assessment*. She proposes that what we need to do is not knock out risk assessment, but use it as an alternatives assessment. So what we need to do is look at risk, but in the context of an alternatives assessment. So that the question we're asking our risk assessors to answer now is not how much harm is allowable. That's what typical risk-assessment people do, they figure out how much harm is allowable: one death in a hundred thousand, one death in a million, and then they say, "Does this practice fall within that realm of allowable harm? And if so, go for it."

Instead of asking how much harm is allowable, we ask *how little harm is possible*. What are the alternatives? Look at the risks, the benefits, the costs of all of them. Look at the science of all the alternatives, and choose the alternative that minimizes harm.

Who gets to determine what's necessary? We know the how: that's the alternatives assessment. This is the scariest part to industry: they're not that uncomfortable with alternatives as a concept, but it's the question of *who gets to decide* that makes them very uncomfortable. In a precautionary approach, it's incredibly democratic. In a precautionary approach, you bring in the affected parties early on, at the beginning of the decision making process, to decide what alternatives will be decided. Traditionally, this is what happens in government: let's say, we need to build a new sewage-treatment plant. What we do is hire a consultant, and the consultant spends thousands of dollars putting a plan together, and then we give that plan out to the public, and you have thirty days to comment on it. Then we don't really want to hear your comments because we have so much invested in that plan. That's traditional public participation.

What precautionary participation means is that you recognize that there's a problem, you bring in affected parties, and you decide what the alternatives are going to be that the government is going to analyze, and then you look at those alternatives. And, you know what? The one that minimizes harm is 10% more expensive. But if the elected officials say, "This is how we want to spend our money, this is important to us," then that's the alternative that gets chosen. So the status quo, which is very comfortable to industry, really gets thrown out the door because all the alternatives are on the table early on. In order for governments to do this, though (and it's scary for them, too), they cannot fear the dissenters. In fact, they have to invite the dissenters in very early on to help look at the alternatives. I would suggest that we as government need not fear them –you guys– but to allow you in early so you can sharpen the debate.

## Applying precaution in San Francisco

I want to give some specific examples now about San Francisco and pesticides. Basically, it was the dissenters that brought IPM to San Francisco. Our gardeners were perfectly happy to be doing things the way they always have. But a guy named Gregg Small, who's now with the Washington Toxics Coalition, was a young person in Green Corps and was spending a summer in San Francisco, when he decided to look at the storage closets to determine what was being used in our parks. He discovered some pretty awful stuff and got his findings in the *San Francisco Chronicle*. The headline read: "Parks Are for People, Not Pesticides." In San Francisco, we have a pretty radical elected body, and they said, "We're using pesticides; we need to change this!" So they passed a law that said, "We're going to ban all pesticides by the year 2000." This was in 1996. And everybody cheered, except their cheers weren't very long-lasting, because then they realized that oops, did you know that disinfectants are pesticides and we run hospitals, and did you know that chlorine is a disinfectant and we have public swimming pools, and we have very happy rats in Fisherman's Wharf and Chinatown, and do we really not want to control rats? So they said, "Forget that old ordinance: we'll pass a new one that'll say we're going to ban all pesticides by the year 2000 except for this list of approved pesticides that the Department of the Environment is going to figure out, that will be consistent with IPM."

I joined the San Francisco city government in 1999, and in August of '99 and January of 2000 we had to come up with this list of approved pesticides. I spent a lot of time working on that list with Washington Toxics Coalition, and it was a really powerful process of looking at alternatives. But really, as you all know, IPM is more than a list of approved pesticides. It's all about a program of prevention, hiring a coordinator, and all the other pieces of a program. So I want to give you an example of how applying precautionary thinking to pesticide use ends up with phenomenal outcomes.

What we did was to ask our gardeners to ask the question, "Is

Roundup necessary?" not, "Is it safe?" because we could have talked for hours on that, but is it necessary? What we found over three years was that in 90% of the cases, Roundup was not necessary. We reduced our Roundup use by 90%. What did we replace it with? We replaced it with goats. Goats, it turns out, are amazingly useful when you have endangered species, because they don't step on the little frogs and snakes. They can eat around them. So it's cheaper than using people. We did hand weeding, we used green flamers, we looked at prevention in terms of mulch and sealing cracks, and we also did a little acceptance shifting. Now our gardeners who work in our major park, Golden Gate Park, don't say they grow lawns, they grow meadows. We like diversity. If it's green, fine.

But sometimes, when we ask the question "Is it necessary?" the answer is "yes." And we need to be big, enough people to see when that's true. In the case of Roundup, there were some times when Roundup was the alternative that minimized harm – our median strips on some really busy streets. And when we had gardeners out there trying to get those weeds with weed whips, little rocks were flying, and they were breaking windshields, and they were in danger of getting run over. So in those median strips and busy highways, Roundup minimized harm. At our airports, on the runways, the FAA has extremely tight height regulations – you know, for visibility – and so the gardeners there had a very small window of time when they could run out, get the weeds, and come back. So again, they're allowed to use Roundup. Interestingly our biggest champions of Roundup were not our gardeners, but they were the people from the native plants society. In their mind, the enemy is the invasive weed, not the chemical. And so in our natural areas, we actually use Roundup there as well, because that's what the Audubon Society and others want us to use it there. Of course, we use it extremely carefully.

So, what do we achieve when we've got precautionary pest management? We achieve this 90% reduction in Roundup and a 50-70% reduction overall. We've eliminated indoor sprays; we've eliminated the most toxic pesticides; we've eliminated pre-



emergent herbicides because they're not necessary. But the other thing it did was it really inspired innovation and creativity. Because we had a lot of people asking the question, "Is it necessary?" and there is a lot of creativity in what was possible as an answer. It improved morale and cooperation among agencies. We meet monthly as agencies (Recreation and Park, the airport, Public Health) to talk about what the alternatives are and what we can do. We have a training program and an awards program. So it has fostered this sense of cooperation.

Then it did something that was very unexpected and yet incredibly powerful and important for government. It increased the trust that the community had in us, so that we had the ability to use pesticides when they were necessary. That's because we had a transparent decision making process, clear criteria, an approved list, and accountability. Because all those things were in place, when we said, "Look, this pesticide is necessary for this reason," we didn't have a fight. So we had a vision, we had shared goals, a transparent decision making process, and no fight.

### **Showing up**

The other thing this logger said, that I think you guys live in your lives, is that *the world is run by those who show up*. I think that's really true. You guys are the ones who show up, and on the panel after me are some really specific examples of people who have shown up in their communities and made change. We know what IPM means here, we get it, we know. Who cares about definitions? We know in our hearts what it is. I believe that IPM is no longer an option; it's really mainstream at this point. It needs to be mainstream because it's the best way of doing things, and when we apply a precautionary decision making process we can push it even further.

### **Third-party certification**

So where do we need to show up? We need to start looking at third-party certification of pest-control contractors, making it easy



for the public. We need to look at the green building world, with the Leadership in Energy and Environmental Design (LEED) Green Building Rating System, because there are LEED-existing buildings that have a whole pesticide/pest-control [approach] – you get points for that. With LEED new construction, we need to look at how we design pests out of buildings and make that part of the green-building movement. We need to partner with the chemically sensitive: it's a question of accessibility to public structures, when chemically sensitive people can't use them because a pesticide's been sprayed. Everyone wants to be green. That's what we see in all the magazines, everyone wants to be considered green. Your job and my job is to make sure that that word "green" has meaning, that it's not some greenwashing principle that the Wal-Marts can attach themselves to by adopting minimal changes.

The other place I think we need to show up is –where's Carolyn Cox, my hero on this issue– related to public right to know and inerts (nondisclosed ingredients in pesticide products). There is an amazing moment right now where the federal government is looking at the inerts disclosure laws, and attorneys general from across the country are joining together to really fight this issue. We have a right to know what ingredients are in pesticide products. Carolyn is leading that charge. The City of San Francisco wrote a long letter explaining why we need inerts disclosure. I really recommend that you guys –you and your organizations– weigh in on this because they need to hear from a wide cross-section of people.

### **Working together**

So finally, IPM offers a powerful model for precautionary thinking. I invite all of you passionate activists and human beings to find some partners in unexpected places. Rolf Halden, Ph.D., said this yesterday that we need to be careful of silos. We can see those with us and those against us in pretty bright lines, when, in fact, change happens most when those lines get blurred, and when champions in government work with activists who work with elected officials. When that happens –along with industry that can give us the alternatives because they want to make a buck on the alternative– change is smooth. You can't stop it. What we need to find are those partners, so that we can work together toward a world with a common vision, this vision of "for caring." So that when we ask, "Is it legal?" we're confident that our laws are protective of all life. And, when we ask, "Is it safe?" there's sufficient data and testing so that we can really understand how the chemicals interact inside people, and inside ecosystems. And, when we ask, "Is it necessary?" affected communities are at the table. Our elected officials are empowered to examine all the alternatives, and to choose alternatives that minimize harm.

*Debbie Raphael is the Toxics Reduction Program Manager and green buildings manager for the City of San Francisco, California and has been instrumental in implementation of the precautionary principle. Ms. Raphael can be contacted at debbie\_raphael@ci.sf.ca.us.*

# A Personal Story and the Change that Followed

Turning a poisoning incident into a precautionary policy

by Robina Suwol

**Editor's Note:** This talk was delivered at *Changing Course in a Changing Climate: Solutions for health and the environment*, June 1-3, 2007 in Chicago, Illinois.

**F**irst of all, I want to thank Debbie for her lovely comments, but I think we all know –everyone working in this room– that all of these efforts are collaborative. So when we work together, miracles can happen. I don't want any of you to think you're ever alone, or that you don't have colleagues to help you.

My journey began in 1998. It was March, a beautiful spring day. I was dropping off my two sons at school in the carpool lane – one was six, one was nine – and we went through our regular ritual of kiss-and-goodbye and running up the steps. My youngest son, who is asthmatic, yelled back at me, "Mommy, it tastes terrible!" And when I looked to my right, I saw simultaneously this gardener in a hazardous materials suit spraying something, and it was very clear that it wasn't water. I was extremely alarmed because of his asthma and wanted to know if I needed an antidote. I was heading off to work and I called the school office, but at that point in time, schools (or workers) were not required to notify the administrative office that they were doing work on the perimeter of the property or anywhere near it. So they didn't know and they referred me downtown to a district office. When I called there they were very reticent to tell me what the product was. Quite frankly, I was frantic to find out if an antidote was needed. I finally said, "Well, the grounds look beautiful, can you tell me what you're using?" And they said, well, it's a product that you can't buy off the shelf, ma'am; it's a product that requires very stringent guidelines to purchase, called Princep. That's a product I hadn't heard of, and I was like, "Well, you know, this Princep went all over kids as they were entering school, and I hope this was an isolated incident, and if it is and it won't ever happen again, you won't hear from me."

I looked up Princep on the Cornell website and also Beyond Pesticides website and was horrified to see what was there: it was a product that, clearly, I did not feel should be used around children, animals, adults, anyone at any time. The fact that they were using it in a school district, in itself, was rather alarming to me.

## My child's poisoning

When I picked up Nicholas at school, he had a full-blown asthma attack, and I was really alarmed by it, and he said to me, "Mom,



please, is this going to happen to me again?" And, you know, really without knowing where all this was going to lead, I said, as any parent would, "Of course not. This isn't ever going to ever happen to you again." And he said, "What about my friends?" and I said, "No, it's not going to happen." So I began a journey to try to educate myself about whether there were alternatives. I knew that, being just a mom, influencing the Los Angeles Unified School District –the second-largest school district in the nation that spans 704 square miles, 28 cities, and has more than a thousand school sites, not to mention administrative sites– was going to be very daunting unless I had some information to support me. So I began. I made some calls to a number of environmental groups. They helped. A small group was formed, and we created an organization called California Safe Schools.

## Organizing for change

We met with the school board member who was very open to this: Julie Kornstein, whose mother happened to be a physician and understood the kind of cumulative and synergistic effects of chemicals, especially on a young child. I came to learn that the threshold levels for children were based upon a 160-pound, healthy adult male. So I just really wanted to move forward. We met with the school board. We created an oversight team: this team, in the initial stages, consisted of anyone who wanted to come forward and participate. At some point, there were something like 60 to 70 people around tables in very large meetings.

At one of these meetings, something curious happened. This man, after hearing everyone speak (and there were physicians and scientists present, as well as environmentalists, parents, and community members at these initial meetings), said, "Excuse me, everything I've heard so far is hysterical, none of it is based on science." He's saying this to scientists and medical experts, and I thought, and I didn't say anything for a long time. Finally, I very politely said, "May I please ask your name and who you're representing today?" And he said, "My name is Mr. Orange, and I'm from Monsanto." And I thought, "Well, how interesting that Monsanto would show up." Clearly their products were being used at this school district, and they had a financial interest certainly in attending these meetings to see what the outcome was going to be. So we talked to the school board and then Monsanto representatives were prevented from attending any further meetings because of their financial conflict of interest.

## A policy is born

Shortly after that, we continued working on a school pest management policy, and one year from the date that Nicholas became ill, L.A. Unified created the most stringent pesticide policy in the country for schools. It was the first to embrace the precautionary principle and parents' right to know. It went down from 136 products to 36 products. Currently, L.A. Unified does not even use Roundup.

It wasn't enough to create a policy. We wanted to ensure its implementation. We created a highly visible 15-member oversight team that meets monthly, often with speakers, and includes among its members a physician and environmental health expert. I would urge you all in creating policies to create some sort of oversight team that includes parents and environmentalists and community members. We also wanted to locate who, at that time, would have the most experience working with a school district this large on integrated pest management (IPM), and was considered to be a national and international expert. We located William Curry, who had worked with the National Park Service. Bill came and immediately started training the staff. To date there have been thousands and thousands of staff trained, including nurses, school teachers, maintenance and operations directors, and plant managers, as well as students. This is a collaborative effort, ensuring that this policy goes forward. The training extends to crafts-persons as well, so individuals that come to do plumbing work at the schools are trained not to leave gaping holes. So it's a really interesting and extensive program that's very intense.

At one of our oversight committee meetings, a woman came and said, "Well, I'm here today because I'd like to use Los Angeles Unified school sites to test experimental products." And she offered, "They're stronger and we use less, so therefore they're safer." We said, "I don't think so, we have a policy that embraces the precautionary principle," and we really weren't interested. So as she departed her final comment was, "You know, that's okay if L.A. Unified doesn't want to use these kinds of products, we have tons of other school districts lined up, so thank you very much." Just like the initial experience with Nicholas, that comment haunted me. I thought, "Oh my gosh, what is going on with this?"

In an event not unlike this, I was talking about this story, and California Assembly member Cindy Montanez came forward and said, "I'd like to carry a bill that prevents K-12 public schools from being used as lab rats, as guinea pigs. This will not only be for experimental products, but for phased-out products." I also want to acknowledge Jay Feldman and Beyond Pesticides for their tremendous help in reviewing the draft legislation because it was a very complicated issue in determining what were conditional, experimental and phased-out products. The bill, AB 405, became law, banning experimental pesticide use in California schools and this is something that we are moving forward on at the federal level. I urge you to please help support this as we move this forward so that all our children throughout the United States are protected.

The policy of L.A. Unified led to California legislation, which doesn't mandate that schools create IPM, but it does mandate right to know at the beginning of the year and posting. That's called the *Healthy Schools Act*, which was adopted in 2000.

When I went to testify for the *Healthy Schools Act*, there was a gentleman in the audience, and he was talking (he was someone from one of the pesticide companies), and saying, "There's nothing to fear from pesticides, it's cockroach defecation that's really the most serious and problematic." My youngest son – he was six at the time – who heard this in a quiet hearing room said, "What's defecation, mommy?" I explained to him, and he said, "That's silly!" really loudly.



When it came time for me to testify, my son said "I want to come with you," and I thought, "What is he going to say?" You know, he goes, "I want to say something." And so I said way too much, and at the conclusion of my comments, he just said, "I just want to say, the kids go to school to learn, not to die, that's it. And I want a cookie." And so I'll leave it at that. Thank you; our children have no lobbyists, they have no vote, they depend upon adults to protect them. Thank you for all for doing all of your work. Thank you.

*Robina Suwol is the founder and executive director of California Safe Schools and president of the Beyond Pesticides board of directors. She can be reached at [robinasuwol@earthlink.net](mailto:robinasuwol@earthlink.net).*

# Compost Is the Key to Successful Plant Management

...and a personal contribution to saving the planet

by Miranda Smith, et. al.



**Editor's Note:** It has been said that compost can save the planet and maybe the human race. So we write this piece to not only distribute information on alternatives to pesticides, but do this in the broader context of reducing our "carbon footprint," by reducing synthetic chemical use, energy use, and practices that deplete soil, and pollute waterways. We recognize that this approach requires different cultural practices than the typical and hazardous "weed and feed" method in recognition of the fact that we just can't do things the way we may be used to doing them without thinking of their impact on health and the environment. Compost is the key to healthy soil, whether it is for your organic lawn or chemical-free garden. Decomposed plant material and organic fertilizers provide the basis for a humus-rich soil that nourishes plants and sequesters atmospheric carbon. Healthy plants can better ward off insects and disease, making chemical pesticides unnecessary. We thought that the best way to get information on composting to our readership is by reprinting the following article from Rodale's Chemical-Free Yard and Garden © 1995 by Rodale Press Inc. Permission granted by Rodale, Inc., Emmaus, PA 18098. Available wherever books are sold or directly from the publisher by calling (800) 848-4735.

## Compost: Nature's Black Magic

It may seem like magic – a pile of leaves, grass clippings, pulled weeds, and kitchen scraps turns into a wonderful, dark, uniform, organic soil amendment-compost. But making compost doesn't require a magician's tricks, just a little tinkering with the natural decay cycle.

In the soil, microorganisms, nematodes, and earthworms consume organic matter and break it down into simpler compounds. They require air, moisture, and heat to do so. The same process happens in a compost pile. It just happens faster (in an active pile) because the microorganisms have a diverse supply of raw materials to digest and optimal conditions for their work.

### The Magic Formula

You can make compost one of two ways-by the active method or the passive method. The active method, of course, requires more work. With either method, the first step is to make a compost pile. You can build wooden or concrete block bins or buy a commercially made plastic bin to hold your pile in place. Or you can just layer the materials in a heap. An easy way to keep a passive pile contained is to set up a heavy chicken wire cylinder as a frame.

Follow these simple guidelines for successful composting:

**Location:** Select a shady, well-drained spot for your pile.

**Season:** It's best to compost when temperatures are above 50°F. At lower temperatures your pile will not be active, or may freeze.

Of course, you can restart the compost pile in spring by turning it and adjusting the moisture content.

**Preparation:** Clear away sod or other surface cover at the site, loosen the soil with a spading fork, and put down a base layer of brush or wood chips.

**Materials:** Materials you can use include garden wastes, grass clippings, kitchen scraps, manure, newspaper, and sawdust. Never include meat scraps or fats, which attract dogs and rodents. It's also best not to add kitchen scraps that are heavy with oil, as oils take longer to break down and can slow the composting process.

**Layering:** Alternate layers of plant material such as chopped leaves or straw with nitrogen-rich layers of kitchen scraps mixed with manure or blood meal. If you don't have nitrogen-rich materials, don't worry. Your compost will just take longer to finish.

**Activating:** Add an activator that contains microorganisms and growth stimulants to boost your pile's activity. You can use topsoil, fresh manure, or a commercial compost activator such as BioActivator.

**Shredding:** Shred materials to make better compost more quickly.

**Moisture:** Keep compost moist, but not wet; it should feel as damp as a squeezed-out sponge. Cover loose piles or open bins with plastic or a heavy canvas so they won't become waterlogged

by rain. If your compost is too dry, use water with kelp extract added to moisten it; this will help stimulate biotic activity.

**Minerals:** Add the fertilizers your garden needs directly to the compost as you add layers of plant material to the pile. It saves a step in your garden work and makes richer humus. Try adding colloidal or rock phosphate and kelp or fish meal.

**Size:** Size can vary. A pile 3 feet square heaped 5 feet high can yield almost a ton of compost. The ideal size for an active compost pile is 4 feet by 4 feet by 4 feet.

**Aerating:** The microorganisms that drive the composting process need air. Fluff or turn the pile regularly to keep microorganisms active, and to prevent the pile from overheating.

### Active or Passive?

If you want your compost to stay active, you must turn it every week or so to add oxygen and keep the decomposition rate high. The inside temperature of an active pile can reach 170° F. If you are composting diseased plant material or plant seeds, you must keep the pile at or above 160° F to kill disease organisms and weed seeds. Otherwise a range of from 140° F to 150° F is ideal. You can use a compost thermometer to monitor the temperature of the pile. Plan to turn the pile whenever the center of pile exceeds 140° F.

Of course, you can't just flip a pile like a pancake. Turning a pile means mixing and loosening the materials that make up the pile. If you have more than one compost bin, you can turn a pile by forking the material from one bin into another. Moving the pile in this way will let in air and remix the materials, which will stimulate a new flush of microbial activity. If you just have a single loose compost pile, you can turn it by using a spading or manure fork to lift material, shake it, and try to redistribute it in the pile.

If you don't want to worry about turning your compost, build a passive pile. A passive compost pile is simply a pile of organic material that is left to sit until the material decomposes slowly over time-usually one to two years. Making leaf mold is an example of this. Most homeowners have passive piles tucked somewhere in the far reaches of their backyards. This approach may not produce as much compost for the garden, but it does work, and at least it's a good method for recycling yard wastes.

Many communities now collect yard waste and compost it en masse. If municipal yard waste is available in your area, it can be an excellent source of organic matter. However, not all municipal

programs actually compost the yard waste; some just stockpile it. Keep in mind that unless your municipal maintenance department is turning and monitoring the material to keep it active, it may not be truly composted. If you collect some for your home garden, put it in an active pile to kill off any disease organisms it may contain. Active composting will also help break down pesticide residues that could be in the material.

### Computing Compost Coverage

Recommendations for spreading compost or other soil amendments are often given in terms of spreading a layer of a given thickness. But how do you know how much material to spread to end up with such a layer? The ratio to remember is nine cubic yards of compost per 100 square feet of garden yields a one inch thick layer. Here's how to apply the ratio to your garden.

1. First measure the area you want to cover with compost and determine the total square footage.
2. Divide by 100.
3. Multiply by the thickness of the layer you want to spread (in inches).
4. Multiply that number by nine. This will tell you how many cubic feet of compost you need.

A handy "measuring cup" for compost is a 30-gallon garbage can. It holds about four cubic feet (or about 50 pounds) of finished compost. You can also measure the volume of your garden cart and use it as your measuring device.



Rich in organic matter and active microbes, high-quality compost is very dark - almost black in color.

# Compost Tea: Brewing success in the garden

**Editor's Note:** Some of following text is reprinted from the International Compost Tea Council's website, [www.intlctc.org](http://www.intlctc.org).

**C**ompost tea is an aerobically-brewed liquid extract made from good quality microbial foods. Compost tea properly made has only beneficial organisms and nutrients that are essential for plant and soil health.

## What Is the Difference Between Compost and Compost Tea?

Compost, in simple terms, is a mixture consisting of decayed organic matter and microbial colonies, in a well-balanced ratio of carbon and nitrogen. Compost tea, on the other hand, is a liquid extraction of beneficial microorganisms and soluble nutrients from the compost that is reproduced during the brewing process.

Compost adds the organisms which build soil structure necessary to develop percolation, and allow air passage ways to be opened up as well as the foods to feed these organisms. Compost can be over-applied which means that water and air cannot penetrate

the soil, whereas compost tea cannot be over-applied, unless to the point where the soil is water-logged.

Many organisms grow in compost tea, resulting in higher numbers of organisms in tea than in compost. This therefore increases microbial activity in less time than compost. Coverage of plant surfaces with compost tea is necessary to block pathogen access to leaves in order to ensure greater efficacy. Compost tea can be applied to leaves, twigs, bark and soil, whereas compost can only be applied to the soil.

Ideally, both are very important tools to use.

## What Are the Benefits of Compost Tea?

Benefits include improved soil structure, retention of nutrients, cycling of nutrients into plant available forms, and reduced plant stress. Disease organisms may be displaced by the normal set of soil or foliar organisms in the tea.

Compost tea also breaks down compacted soils with repeated use, letting roots grow into the soil more easily, allowing them

## Compost Bins

Compost bins are ideal for urban environments as they save space and keep material out of reach from foragers. Composters or tumblers can reduce the time and effort needed to compost by turning the pile for you.

To buy a commercially made compost bin or composter, you can first try your local garden center or home improvement store. Some municipal organizations also provide compost bins for sale. The following websites provide different options to hold your compost.

### Buy a Composter

**Green Culture Composters** ([www.composters.com](http://www.composters.com), 877-204-7336) compost bins, tumblers, electrically powered chipper shredders and wood chippers; **Gardener's Supply** ([www.gardeners.com](http://www.gardeners.com), 888-833-1412) many styles of bins, tumblers and more; **Urban Garden Center** ([www.urbangardencenter.com](http://urbangardencenter.com), 866-923-1992) manufactures the Urban

Composter Tumbler that is primarily made of recycled materials; **The Compost Bin** ([www.compost-bin.org/bins](http://www.compost-bin.org/bins)) manufacturer of the compost bin; **Compost Guide** (<http://store.compostguide.com>, 214-363-5170) compost bins, static composters, composting accessories; **Grow Organic** ([www.groworganic.com](http://groworganic.com), 888-784-1722) the Envirocycle Composter.

### ...Or Build Your Own!

Building your own bin is a great way to customize a system to fit your composting needs. There are a variety of composting methods. The method you choose depends on the material you're composting and how much effort you want to put into it. The Stop Waste Partnership provides useful instructions on selecting and building compost bins that best suit your needs. Choose from the E-Z Wire Bin, Plastic Worm Bin, Closed Air Composter, 3-Bin System, Urban All Wood Bin, 2 Person Wooden Worm Bin. View instructions at <http://www.stopwaste.org/home/index.asp?page=447>.



to find more nutrients, and letting air into the soil so conditions are not right for diseases to grow, or for toxic metabolites of anaerobic organisms to build up. All plants will gain health and vitality with continued use.

Compost tea puts the micro-biology back into the soil that we have removed because of our over-development and chemical application practices. This biology has co-evolved with plants for billions of years and is critical for plants to function within their environment.

When applied to the foliage of plants, compost tea covers the plant surfaces and prevents harmful material from reaching the plant, including disease organisms. Increased carbon dioxide from the respiration of the bacteria and fungi increases the time that stomates open and let foliar nutrients into the leaves. When tea is applied to the soil, it improves the soil structure, increases nutrient uptake, breaks down pollutants and reduces water use.

### **How Do I Use It?**

Compost tea can be sprayed on foliage, twigs, branches and trunks (the entirety of the plant), drenched into the soil, injected into the soil for established roots, and used as root dip for bare root, juvenile plants and cuttings, and can be applied through established irrigation systems.

When using tea as a foliar application to leaves, twigs, and branches, tea must cover at least 70% of leaf surfaces. Apply until coverage is thick enough before it drips off the leaf. Finer mists will attain better coverage and a better spray pattern. Wetting and adhesive agents are available to assist in leaf coverage. When using as a soil drench, tea needs to be applied so it moves down into the soil to aid roots.

When using as a soil application, high ratios of water can assist in carrying the compost tea further into the soil. Deep root injections will need specialized injection equipment. As a root dip, use full strength. Application through established irrigation systems requires specialized irrigation injection systems.

### **Compost Tea for Your Lawn or Garden**

Many landscaping companies are beginning to feed lawns and gardens with compost tea. If your local service providers are not using compost tea or if you prefer to do your own yard work, you will have to buy or build a compost tea "brewer."

Again, the best place to check is your local lawn and garden center. In addition, the following retailers also sell compost tea brewers.



Compost tea provides tremendous benefits to organic gardens like this organic lavender garden in Shasta County, CA.

**Back Yard Gardener** ([www.backyardgardener.com/compost/compost-tea](http://www.backyardgardener.com/compost/compost-tea)) provides instructions and sells various brewers; **Growing Solutions** ([www.growingsolutions.com](http://www.growingsolutions.com), 888-600-9558) manufacturers 10-500 gallon brewers; **Keep It Simple Inc.** ([www.simplici-tea.com](http://www.simplici-tea.com), 866-558-0990) sells 5-1000 gallon brewers; and **Clean Air Gardening** ([www.cleanairgardening.com](http://www.cleanairgardening.com), 214-819-9500) sells a 5 gallon brewer.

You can build your own compost tea brewer with a large bucket and aquarium supplies. Brewing compost tea at home is a 2-3 day process. Instructions on building your own brewer are available from Tauton Press ([www.taunton.com/finegardening/how-to/articles/brewing-compost-tea.aspx](http://www.taunton.com/finegardening/how-to/articles/brewing-compost-tea.aspx)) or the Pennsylvania Department of Environmental Protection ([www.dep.state.pa.us/dep/deputate/airwaste/wm/recycle/Tea/tea1.htm](http://www.dep.state.pa.us/dep/deputate/airwaste/wm/recycle/Tea/tea1.htm)).

To apply compost tea, use it as a foliar spray with a backpack sprayer on your garden plants or lawn. You can also apply with a watering can directly to the roots. Apply in the morning or under cool, dry conditions. It may be done in the rain when applied to the soil/lawn. because active microbes are present, compost tea is most effective within four hours after the brewing process is completed.

*For more information, contact Beyond Pesticides or visit [www.beyondpesticides.org/lawns/compost](http://www.beyondpesticides.org/lawns/compost).*



## Pesticide Impacts On Children Highlighted in New Research

### CDC School Health Policies and Programs Study (SHPPS).

In a report it releases every six years, the Centers for Disease Control and Prevention (CDC) issued its School Health Policies and Programs Study (SHPPS) and for the first time considered "the extent to which schools have health-promoting physical school environment policies and programs." The report's consideration of environmental health issues suggests a breakthrough in public policy at the federal level. In Part II of the report, in its section on pesticides, the authors cite the work of the American Academy of Pediatrics Committee on Environmental Health, the American Academy of Pediatrics Committee on School Health, the Journal of the American Medical Association, and Beyond Pesticides' report, *The Schooling of State Pesticide Laws*.

In its introduction, the report says: *The toll that environmental hazards take on children's health is not completely understood, nor has it been quantified. Nonetheless, environmental exposure to air pollution, lead in paint and drinking water, tobacco smoke, radon, asbestos, and many pesticides and other chemicals in and around school environments is known to be hazardous to children's health.*

The report acknowledges and cites the scientific literature on the special vulnerability of children to environmental hazards during developmental stages of life. The report cites the literature on the elevated exposure to chemicals in the environment relative to their body weight, metabolic rate, and relative consumption of food, as well as exposure patterns and an elevated breathing rate. "Damage to the lungs during development through exposure to indoor or outdoor air pollution may interfere with proper lung development and may lead to chronic lung disease later in life," the report says. The report continues, "Furthermore, the brain is not fully developed until adolescence, and thus, children's brains are more vulnerable than adults' brains to such toxins as metals, solvents, insecticides, and certain gases."

SHPPS found the following: *One third (35.4%) of districts and 51.4% of schools had an indoor air quality management program; most districts and schools had a policy or plan for how to use, label, store, dispose of, and reduce the use of hazardous materials; and, 24.5% of states required districts or schools to follow an integrated pest management program.*

The report makes important linkages and citations to the scientific literature and clearly states that environmental hazards "that sometimes are found in schools. . .can adversely affect the health, attendance, and academic success of students, as well as the

health of teachers and other staff." For those who advocate the precautionary principle of taking pesticides out of school (replacing chemical-reliant practices with prevention and non-chemical practices), this report clearly supports the notion that what we do know is suggestive of problems that impede the safety of students and their ability to learn and develop to their full potential. These same advocates maintain that what we do not have full information on undermines the very chemical industry and EPA risk assessments on which hazardous pesticide product registrations rely.

### Household Exposure to Pesticides and Risk of Childhood Hematopoietic Malignancies: The ESCALE Study (SFCE).

Rudant, et. al. *Environmental Health Perspectives*, Vol. 115, No. 12. This study led by researchers at the French National Institute for Health and Medical Research (INSERM) finds that children born to mothers living in households with pesticide use during pregnancy have over twice as much risk of getting cancer, specifically acute leukemia (AL) or non-Hodgkin lymphoma (NHL). The study investigates the role of household exposure to pesticides in the etiology of childhood hematopoietic malignancies, using the national registry-based case-control study ESCALE (Etude sur les cancers de l'enfant) that was carried out in France over the period 2003–2004.

The researchers evaluated maternal household use of pesticides during pregnancy and paternal use during pregnancy or childhood which was reported by the mothers in a structured telephone questionnaire. Insecticides (used at home, on pets or for garden crops), herbicides and fungicides were distinguished. The researchers estimated odds ratios (ORs) [the amount above or below the norm] using unconditional regression models closely adjusting for age, sex, degree of urbanization, and type of housing.

The researchers included a total of 764 cases of acute leukemia (AL), 130 of Hodgkin lymphoma (HL), 166 of non-Hodgkin lymphoma (NHL), and 1,681 controls. Insecticide use during pregnancy was significantly associated with childhood AL (OR = 2.1), both lymphoblastic and myeloblastic, NHL (OR = 1.8), mainly for Burkitt lymphoma (OR = 2.7), and mixed-cell HL (OR = 4.1).



The researchers conclude that the study findings strengthen the hypothesis that domestic use of pesticides may play a role in the etiology of childhood hematopoietic malignancies. The consistency of the findings with those of previous studies on AL raises the question of the advisability of preventing pesticide use by pregnant women. See *Beyond Pesticides* website for other studies on this subject.

## **BEYOND PESTICIDES MEMBERSHIP & SUBSCRIPTIONS**

- YES, make me a member of Beyond Pesticides (includes subscription to *Pesticides & You*).**  
 \$25 Individual       \$30 Family       \$50 Public Interest Organizations     \$15 Limited Income
- YES, I'd like to subscribe to *Pesticides & You*.**  
 \$25 Individual       \$50 Public Interest Organizations     \$50 Government     \$100 Corporate
- YES, I'd like to receive Beyond Pesticides' bi-monthly School Pesticide Monitor.**  
Free with membership or subscription.

If outside the United States, please add \$10.00 each for memberships and subscriptions.



**We're Open for Business!**

Beyond Pesticides' new and improved online storefront features t-shirts, books, reports and publications, tote bags, pesticide-free zone signs and organizing tools.

Shop with confidence knowing that your order is secure, and that your purchase supports the work of Beyond Pesticides.

**[www.shopbeyondpesticides.org](http://www.shopbeyondpesticides.org)**

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

Name \_\_\_\_\_ Phone \_\_\_\_\_ Fax \_\_\_\_\_ Email \_\_\_\_\_

Title (if any) \_\_\_\_\_ Organization (if any) \_\_\_\_\_

Street \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Quantity	Item Description (for T-shirts, please note size: Men's M,L,XL; Women's M,L,XL; Youth L)	Unit Price	Total
	MEMBERSHIP		

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

Tax-Deductible Donation:

Total Enclosed: \_\_\_\_\_

# Reclaiming Our Healthy Future

Political change to protect the next generation

The 26<sup>th</sup> National Pesticide Forum

March 14-16, 2008 ■ University of California, Berkeley



Session topics include:

Children's health, Farmworker justice, Building just and healthy food systems, Power of local activism to influence political change, and much more.

Speakers include:

United Farm Workers president **Arturo Rodriguez**

UC Berkeley biologist **Tyrone Hayes**

*The Secret History of the War on Cancer* author **Devra Davis, Ph.D.**

Actress **Kaiulani Lee** will perform *A Sense of Wonder*, her one-woman play based on the life and works of Rachel Carson.

To register or for updated information, visit [www.beyondpesticides.org/forum](http://www.beyondpesticides.org/forum).



## BEYOND PESTICIDES

701 E Street, SE ■ Washington DC 20003  
202-543-5450 phone ■ 202-543-4791 fax  
[info@beyondpesticides.org](mailto:info@beyondpesticides.org) ■ [www.beyondpesticides.org](http://www.beyondpesticides.org)

NON-PROFIT ORG.  
U.S. POSTAGE  
PAID  
Merrifield, VA  
Permit No. 1228