

Pesticides and You

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



**The Right Way to Vegetation Management • Chemicals Found to Affect Male Reproductive System in New Way •
A Review of The Poisoning of Public Thoroughfares:
How Herbicides Blight California's Roads**

Letter from Washington

The Victories Keep Coming in Towns Across the Country

This issue of *Pesticides and You* highlights the ongoing victories that we are seeing at the local level on schools and alternatives to pesticides. In March, the Los Angeles Safe Schools Coalition achieved victory when the Los Angeles Unified School District Board approved a stringent pest management policy curbing the use of pesticides in LA Schools. Two of the largest school districts in Pennsylvania within the last year adopted similar policies. There is a movement that is based on coalitions of parents, teachers, unions, physicians and environmentalists that understand the hazards of pesticides and the viability of alternatives. These are groups that are taking back the definition of Integrated Pest Management (IPM) and requiring the use of preventive pest management methods and only chemical use as a last resort.

This community-based approach to change is central in a political environment where state and federal policy makers are often proceeding in a cozy relationship with the pesticide industry. Take, for example, the meeting that EPA sponsored on March 17-19 in Crystal City, VA outside Washington, DC. Called the *National IPM in Schools Workshop*, it brought together IPM officials from nearly two dozen states to talk strategy and program. Organized by Indiana University, under a grant from EPA, the organizers actively kept environmentalists, parents and public interest folks from participating in the meeting. When I called to request a seat at the table, I was told that I could attend as an observer, as long as I didn't say anything. I accepted that, given that it was described as a meeting of state officials until I showed up and found a representative from the National Pest Control Association (NPCA) at the table and a former employee of NPCA, now a consultant, sitting next to him. And so, we can chalk that up to another EPA meeting on pesticide-intensive IPM, ignoring what people in Los Angeles and across the country want and can achieve —pesticide free schools.

That's when I returned to the office and fired off a letter to EPA Administrator Carol Browner, asking her to intervene and ensure fair and full representation at the EPA-supported meeting. While I have not gotten a response to my letter of outrage, Beyond Pesticides/NCAMP board member Ruth Berlin, coordinator of the Maryland Pesticide Network, did. The Director of the Office of Pesticide Program, Marsha Mulkey, wrote the response. It is misleading, to put it nicely. For starters, it says that NCAMP was invited to attend the workshop, but does not say that we were told not to open our mouths. It cites the attendance of the Maryland Department of Agriculture, which is now required to implement a new school IPM and right-to-know policy under a new state law, failing to acknowledge that this Department only supported the legislation when the Governor required that it do so. EPA said, "We share your commitment to reducing children's exposure to pesticides at school through the IPM approach to pest management. . .to help achieve our risk

reduction goals." Also carefully chosen words in an EPA era where officials do not speak of pesticide "use reduction," but refer generally to "risk reduction."

I am not the only one feeling the frustration of an Environmental Protection Agency that sees industry as its constituency. In late April, seven public interest groups resigned from the EPA federal advisory committee on implementation of the 1996 *Food Quality Protection Act* (FQPA) because the agency was unwilling "to make hard choices" to restrict pesticides that have adverse effects on children. The advisory panel, composed of pesticide industry, farm, health and environmental representatives had been created last year at the urging of Vice President Gore, who was under pressure from the chemical-intensive farming community to slow the regulatory process down. Gore said he was concerned about "transparency" of the process and "sound science."

The Demasculinizing Effects of Pesticides

Turning to science, once again Theo Colburn, Ph.D. has helped to get the word out on the endocrine disrupting effects of pesticides. This time as guest editor of *Toxicology and Industrial Health*, she put together a series of articles showing that certain pesticides demasculinize and can affect sperm counts and the structure of the prostate. The articles indicate that antiandrogenic effects of chemicals can work in two ways, by either reducing the amount of testosterone produced, or by a chemical replacing testosterone in the cell's receptor. This is clearly different from the feminizing effects of estrogenic chemicals that also have adverse effects on male development.

A Review of Rights-of-Way

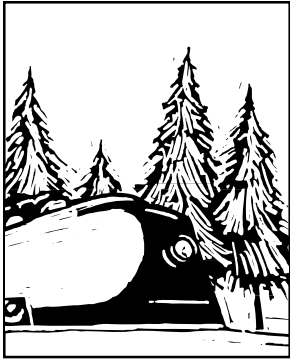
In our continuing review of state laws, this issue contains a review of pesticide policy regarding rights-of-way. This is no small issue. The use of herbicides spans millions of miles of roads, utility lines, railroad corridors and more. So, we report on where states are at regarding integrated pest management and right-to-know. Our goal here, as in previous reports, is to keep states accountable to the laws that are protective and develop new policies where there are none.

Let us know what is happening in your town and state. We always look forward to working with you.



—Jay Feldman is Executive Director of NCAMP

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Can Colleges Accommodate Chemically Sensitive Students?

Dear Beyond Pesticides/NCAMP,

Thanks for the complimentary copy of your news magazine, *Pesticides and You*. Reading it gave me an idea. I have been contacting all North Carolina colleges and universities, via an informal e-mail survey, asking if they have multiple

chemical sensitive (MCS) students enrolled either on or off campus, and if so what they are doing to accommodate these students. I'm getting some disappointing responses (surprise,

surprise). Most are writing that they have no students declared as MCS. One college responded saying that little can be done about living quarters. On the other hand, one small private college in Laurenburg responded with what seems to be a sincere desire to accept and accommodate those with MCS.

I began looking into this issue because of my own struggles with MCS for the past 20 years, and now because of my daughter's trouble finding appropriate accommodations at a state university. She was given a full scholarship to a state college in North Carolina. She went to North Carolina State University for one day and, because of immediate problems associated with her sensitivities with chemicals, had to be withdrawn the very next day.

She then went to a local community college. Into her second semester there, they put in new carpets and she couldn't attend classes there anymore. We feel someone should be reaching out to her instead of my trying to find and convince the appropriate people. Anyway, I'm thinking of making this an "official" survey, letting colleges know that I will be publishing the results and the response

they give. I also feel that accommodating a MCS student would be beneficial to asthmatics, cancer patients, students suffering from depression, Parkinson's, MS, lupus, CFIDS or any disease of the nervous or immune systems, along with diseases of the liver and kidney. I will also ask them if they would consider setting up either a dorm floor or a complete dormitory offering the living space to those with any of these or related illnesses. This would involve a scent-free space. Also, I will ask them to describe their present pest control and housing/

lawn maintenance policies, providing material safety data sheets on all products used in these operations.

I will report the names of colleges that do not comply with all or part of the survey. I think the survey might put the colleges in an uncomfortable enough position to make changes in at least some of their policies, and, also, it might spread an awareness of the harm caused by chemical exposures and how eliminating unnecessary exposures will provide an atmosphere most conducive to learning for all students (and teachers). Anyone that is interested in the survey, have questions or comments, can contact me at sioux@interpath.com or (252) 480-3301.

Susan Wells Vaughan
Kill Devil Hills, NC

Dear Ms. Vaughan,

We are sorry to hear of the injustices that you and your daughter are facing. It is unfair that people like you are not better protected from unwanted chemical exposure while at school or any other public place for that matter. You and your daughter deserve the right to be informed of pesticides used in your daughter's school. Beyond Pesticides/NCAMP works on similar issues everyday, but we can not do it alone.

We are glad to know that you are actively doing something about the problems with the assault of chemical exposure. It takes time and effort to create change. Don't give up because perseverance does pay off. Keep up the great work. We are sending you some information we think will be helpful in approaching colleges regarding this issue. We are very interested in the responses you will be getting from your survey and hope to publish your findings in a future issue of *Pesticides and You*.

Worker Uses Hazardous Pesticide Without Training

Dear Beyond Pesticides/NCAMP,

On January 8, 1998, I was assigned the task of working with a fumigant crew. I am not certified as a handler of pesticides. Not knowingly or aware of safe practices, I ate and smoked cigarettes around the job site. I am now aware of my exposure to the fumigant used that day, methyl bromide. I ask you to assist me in this matter.

Golat Mann
Norfolk, VA

Dear Mr. Mann,

Unfortunately, most states do not require the person applying a restricted use pesticide like methyl bromide to be certified or licensed to use the product as long as the person is "supervised" by someone who is certified or licensed in the state. The laws in place do not even require the supervisor to be physically present at the job site. Pesticides, especially methyl bromide, are toxic chemicals that must be handled with the utmost care, if they are used. Any person handling pesticides like methyl bromide should be properly trained. Methyl bromide is an odorless, colorless gas, widely used as a soil-sterilant. The U.S. EPA reported in the 94/95 Pesticides Industry Sales and Usage (August 1997), that methyl bromide is the fourth most commonly used pesticide applied by an owner or hired professional



in the non-agricultural sector. Farmworkers exposed to methyl bromide suffer from skin irritation, cancer, birth defects, central nervous system, kidney and lung damage, and death. Methyl bromide is also 50 times more harmful to the earth's ozone layer than already banned CFCs. Evidence shows that non-lethal exposures can produce muscle weakness, abnormal reflexes, visual disorders, headache and malaise. If you or your co-workers are experiencing any of these symptoms, you should see a physician to confirm symptoms, obtain a diagnosis and receive treatment. You should discuss the health hazards of using pesticides and not being properly trained with your employer. Ask your employer to use alternatives to toxic pesticides and if pesticides must be used, ask your employer to provide training to all employees who will be working with the chemicals. If you or any of your co-workers are experiencing any health effects associated with this exposure, send a formal complaint detailing the exposure to the manufacturer of the pesticide as well as the U.S. EPA.



Tomato Farmer Fed Up with Drift

Dear Beyond Pesticides/NCAMP,

For the past seven years we have been poisoned by a herbicide known as Facet (quinclorac). This is a selective herbicide used to control certain grasses in the production of rice. However, it is a very potent and dangerous chemical that is contaminating many off-target plants, some as far away as 5 miles. We are involved in commercial tomato farming, and according to the label, tomatoes are highly sensitive plants that can be affected by Facet. Only one microgram can cause physical damage to the crop. We attended public meetings on the problem held in Little Rock, Arkansas by the Arkansas State Plant Board (ASPB). There were more rice farmers and, of course, repre-

sentatives of BASF Corporation there than the general public! When the ASPB advertised the announcement in the newspapers, it put such a [small] notice in them that most people were completely unaware of any such meeting. In conversations we have had with our regional EPA office in Dallas, Texas, we have been told that they are looking into it. Does it take them seven years to "look into something?" In the meantime, what about the people who are being exposed in our communities, by the crop dusters who spray anything that gets in their way? We have personal accounts of people in different places who have been sprayed directly by airplanes and have suffered many different kinds of health problems as a result. We need to put a stop to the indiscriminate use of deadly pesticides now! We have formed Citizens Against the Misuse of Pesticides to fight this battle and have held town meetings to inform people. Seven years without a profitable crop has left us just about broke.

Lane Falls and Melvin Messer
Harrisburg, AR

Dear Mr. Falls and Mr. Messer,
We are sorry to hear of your economic loss from pesticide drift. Pesticide drift is a serious issue that does not get enough recognition by policy makers. According to a North Dakota State University Extension Service factsheet, "herbicide drift can accumulate on the downwind side of a field, in a shelterbelt, at the edge of a field or in a portion of an adjacent field. In some cases, herbicide accumulated in downwind areas can exceed the rate applied to the field, with a small portion from each pass of the sprayer drifting to the non-target area." We are glad to hear that you have gotten together with others concerned about this issue. Continue pressing state, regional

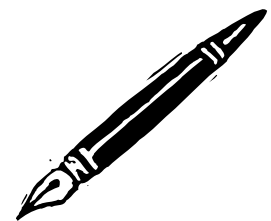
and federal agencies that are responsible for pesticide use and enforcement. Although enforcement is limited, many state laws directly prohibit drift. Other states have withdrawn certain areas within the state from spraying all or some pesticides. This issue is especially controversial for organic farmers who can lose their organic certification if crops show pesticide residues from drift and conventional farmers who can lose their crop. Unfortunately, pesticide drift cannot be completely eliminated or controlled without eliminating the widespread use of pesticides.



Kagan Owens is Beyond Pesticides/NCAMP's Information Coordinator

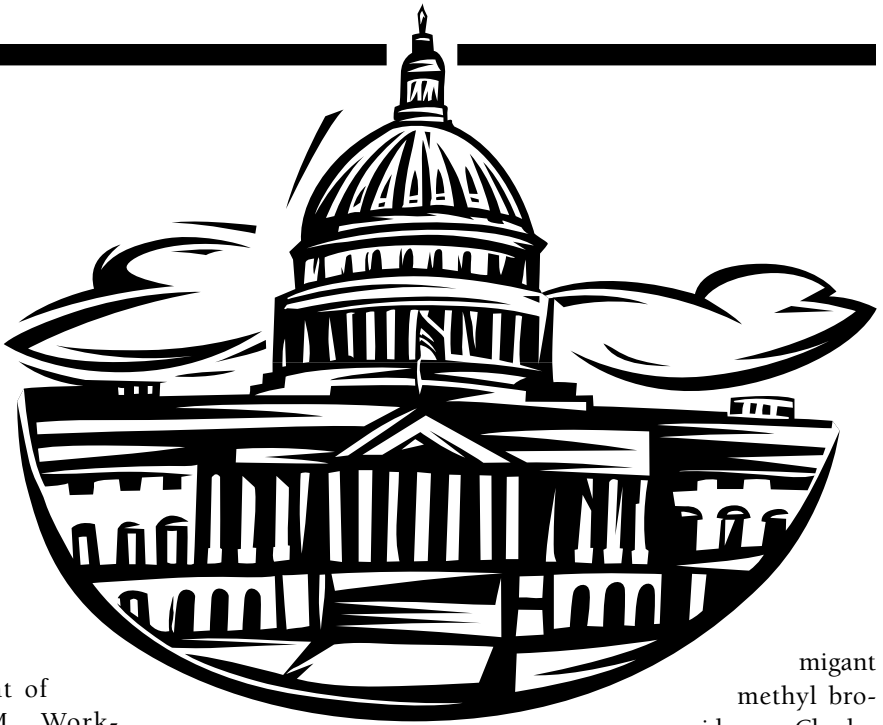
Write Us!

Whether you love us, hate us, or just want to speak your mind, we want to hear from you. All mail must have a day time phone and a verifiable address. Space is limited so some mail may not be printed. Mail that is printed will be edited for length and clarity. Please address your mail to:
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EPA Funded Workshop on School IPM Excludes Environmental Groups

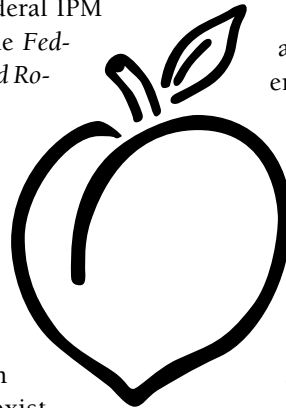
The Environmental Protection Agency (EPA) sponsored a workshop on strategies for implementing integrated pest management (IPM) in schools, but left out one important detail: the public health and environmental community. The workshop, "National IPM in Schools" on March 17-18, 1999, was organized by Indiana University (IU) with a grant from the Biopesticides and Pollution Prevention Division of the Office of Pesticide Programs at EPA. Attendees mostly included state IPM coordinators and university extension services representatives, but notably included the National Pest Control Association. After requesting to participate and being told he could only observe the meeting, Beyond Pesticides/NCAMP's Jay Feldman wrote a strong letter to EPA Administrator Carol Browner, expressing grave concern that the agency is not hearing from schools advocates and parents but is listening to the pest control industry, which has a chemical-intensive definition of IPM. "As a taxpayer I am outraged. As a parent I am deeply worried. As an environmentalist I am disgusted," says the letter. No environmental or public health groups were invited to participate in the discussion, and no public notice had been offered prior to the workshop. Feldman points out in his letter that there was no discussion at the workshop of the "critical questions that EPA is struggling with under the *Food Quality Protection Act* (FQPA) on calculating children's exposure, pesticide impact on developing organs, aggregate risk calculation of dietary and non-dietary exposure, and common mechanism of effect." The workshop evidenced the differing views on what IPM really is, with some saying it is a method to reduce pesticide use while others say pesticides are an indispensable compo-



nent of IPM. Workshop leader Marc Lane, professor at IU and meeting convenor, apologized to Beyond Pesticides/NCAMP for excluding the public health point of view, saying it was not intentional. When Director of the Biopesticides and Pollution Prevention Division, Janet Andersen, was asked about the possibility of a federal IPM program, she replied that the *Federal Insecticide, Fungicide, and Rodenticide Act* would have to be changed to allow for that, but right now EPA can provide educational materials about IPM to schools. Beyond Pesticides/NCAMP disagrees, saying it is unreasonable to expose children to pesticides when nonchemical alternatives exist. Contact Beyond Pesticides/NCAMP.

USDA Scientists Find Peach Oil Effective Against Pests, May Replace Methyl Bromide

The substance that gives peaches their sweet smell is effective against certain pests often controlled with the toxic fu-



migrant methyl bromide, says Charles Wilson, Agricultural Research Service, U.S. Department of Agriculture. Wilson and his researchers found that the substance, called benzaldehyde, successfully kills pests such as the rice weevil and the lesser grain borer, as well as soil fungus. Benzaldehyde is already produced synthetically for flavorings, perfumes, and dyes, and is being considered an inexpensive methyl bromide replacement. Because of its toxicity and capacity to deplete the ozone layer, methyl bromide is scheduled for phase-out by the U.S. by the year 2005, according to a congressional decision in October 1998. This is four years later than the original phase-out date set by the 1987 international treaty, the Montreal Protocol and the *Clean Air Act*. So far, investigation on peach oil has been done in the laboratory, but field trials are scheduled to take place soon. This story was featured in several newspapers around the country, including the *New York Times* on March 14, 1999. Contact Charles Wilson, USDA-ARS, 45 Wiltshire Road, Kearneysville, WV, 25430, 304-725-3451, cwilson@afrs.ars.usda.gov.

EPA's Endocrine Disruptor Screening Program Update

The Environmental Protection Agency (EPA) is ready to start setting priorities in implementing its Endocrine Disruptor Screening Program (EDSP), established by the *Food Quality Protection Act* (FQPA). On December 28, 1998, the EPA published notice of its EDSP Statement of Policy in the *Federal Register*, which



describes the kind of bioassays that will be performed to see the effects of certain chemicals over generations of lab animals. The release of the guidance comes several months after its original due date of August 3, 1998 (see *Technical Report* Aug-Sept., 1998 Vol. 13, No. 8-9). The public comment period on the guidance ended February 26, 1999. Some of the issues raised by the EPA proposal include whether or not a chemical binding to the hormone receptor of a cell constitutes a disruption. Industry would like the cause for action to be visible adverse effects and not just an alteration of the structure of the hormone system, whereas health advocacy groups say attachment to a cell's hormone receptor is enough cause for action. Activists also say that not enough attention is paid to developmental impacts during critical stages of prenatal development.

There is also concern that effects may be seen at extremely low levels, so some debate preceded a decision to test at two levels—one at the No Observable Adverse Effects Level (NOAEL) and one four times smaller than that. This is important because with endocrine disrupting chemicals, “the dose makes the poison” paradigm gives way to issues of timing of exposure at minute doses. EPA has wisely followed the Endocrine Disruptor

Screening and Testing Advisory Committee (EDSTAC) recommendation of examining not only estrogenic effects but also androgenic and thyroid effects. The EDSTAC is a panel of experts which advises EPA on how to structure the Endocrine Disruption Program. Aside from the science questions involved in setting up the program, there are also economic issues: the EPA has been budgeted \$3.2 million for endocrine disruptor work in 1999, but the needed resources are closer to \$40 million. Under FQPA, EPA has until August 1999 to issue testing protocols for endocrine disruption to be used in its Pesticide Registration Program. The proposed budget for 2000 is \$7.7 million. *Contact Beyond Pesticides/NCAMP or see proposed statement of policy at EPA website <http://www.epa.gov/fedrgstr/EPA-TOX/1998/December/Day-28/t34298.htm>.*

Industry Holds FQPA Conference, Pest Management Centers Proposed by Rominger

On March 23-24, 1999, the International Society of Regulatory Toxicology and Pharmacology and the Council for Agricultural Science and Technology (CAST) co-sponsored a conference on the *Food Quality Protection Act* (FQPA), at which Deputy Secretary Richard Rominger stated that the Environmental Protection Agency and U.S. Department of Agriculture are considering creation of 12 regional pest management centers around the country to assist growers in the transition brought about by FQPA. According to *Food Regulation Weekly*, Rominger said the centers would be located at existing land grant university facilities, and “would carry out USDA's research and education plan to help growers overcome the risks they face through FQPA.” The centers would cover geographical areas with similar crop patterns and pest problems, and would serve three purposes: to assist with replacing chemi-

cals one by one, to develop “multiple-tactic” pest management strategies for crops whose loss would cause severe economic consequences, and to start a Risk Avoidance and Mitigation Program that would combine concerns about water quality. Rominger said, “The goal is eliminating pesticide residues in food crops and water.”

Participants at the conference were very critical of FQPA and Congress, saying Congress has created a problem that it doesn't want to solve. Rick Jarman of National Food Processors Association said FQPA reflects a reaction to media events instead of a true food safety problem. Mari Peltier, California Department of Pesticide Regulation, says looking at food residues is useless, especially since there is so much lacking data, and that the real driver should be farmworker safety because if we protect them we protect everyone. Larry Elworth, formerly of USDA and now with the Program for Strategic Pest Management, said FQPA contributes to the erosion of the public's perception of food safety. Jeannine Kenney, formerly with Consumer's Union (CU), says the recent CU study published in *Consumer Reports* (see PAY, Vol. 18 No.4) should not be used to scare consumers. She told conference participants

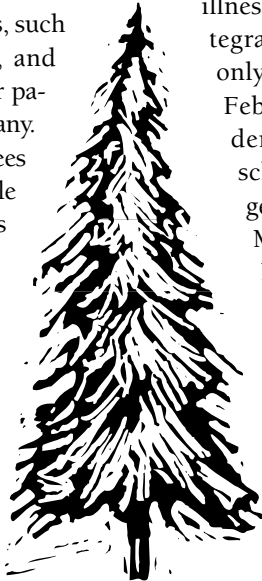


that Consumers Union is frustrated by the delay caused by the Tolerance Reassessment Advisory Committee (TRAC) process (of which she was a member), and that participants should “stop accusing EPA of not using sound science.”

In March 1999, CAST scientists produced an issue paper expressing the concerns about the possibility of losing certain pesticides, especially for “minor use” crops, which include all fruits and vegetables. The group claims that it agrees in principal with the goals of the FQPA. *Contact Beyond Pesticides/NCAMP, or view CAST issue paper at http://www.cast-science.org/fqp1_ip.htm.*

Move Over Soybeans, Soon There'll Be Roundup-Ready Trees

Monsanto Corporation has announced that it is branching out its work in biotechnology and will create tree seedlings that tolerate herbicides, such as Roundup (glyphosate), and grow faster and make better paper, according to the company. These new "better fiber" trees will likely not be ready for sale before 2004. First candidates for the genetic alteration include commonly planted varieties such as eucalyptus, poplar, Radiata pine, and sweetgum. Monsanto will be working with several other companies in a joint venture for the research, expected to cost \$60 million over five years. The co-venturers include New Zealand's Fletcher Challenge Group, a paper, energy, and forestry company; International Paper Company of New York, a paper and forest products company; and Westvaco paper and packaging company, also of New York. Westvaco currently owns 1.5 million acres of timberlands in the U.S. and Brazil, according to Monsanto. *Contact Beyond Pesticides/NCAMP or Lisa Drake, Monsanto, 314-694-3540. See Monsanto's webpage at <http://www.monsanto.com/ag/articles/99-04-06forestryJV.htm>.*



cides that were known to have harmful side effects. The Martinezes say that the school district continued to spray despite its awareness of Darrell's health problems. In December 1997, a CVIS spokesperson told the Martinezes that the school would accommodate Darrell's illness by beginning to implement integrated pest management, and by only spraying the cafeteria. Then, in February 1998, CVIS' superintendent told Mr. Martinez that the school had stopped spraying altogether. However, two months later, Mr. Martinez saw New Mexico Pest Control spraying school grounds 50 feet from where children wait for their buses. The suit charges that the school and the pest control company failed to offer notice or warning, and the school failed to provide Darrell with alternate education when he was unable to attend classes due to continued spraying. Lawyers have identified two of the chemicals sprayed: "Conquer Residual Insecticide Concentrate," with active ingredient esfenvalerate, and "Wasp and Hornet Jet Freeze," with active ingredient carbaryl. Mrs. Martinez obtained Material Safety Data Sheets on both of these and they list similar possible side effects as the ones experienced by Darrell:



Child Sickened by Pesticide Exposure at School, Parents Sue

Ten year old Darrell Martinez developed multiple chemical sensitivities in 1997 after being exposed to pesticides sprayed at his school between 1994 and 1998. His parents are now suing Chama Valley Independent School District (CVIS), saying that it allowed the spraying of pesti-

cidal redness of face and ears, peeling tongue, swelling eyes, fevers, asthma, headaches and difficulty in thinking and performing. The Bureau of Pesticide Management of the New Mexico Department of Agriculture has investigated the Martinez case and dismissed it, finding that all pesticides used at the school "were used in accordance with label directions." *Contact Beyond Pesticides/NCAMP or Sue Darcey, Pesticide Report,*

3918 Oglethorpe Street, Hyattsville, MD 20782, 301-864-3088.

Pesticide Resistant Clothing

What will they think of next? The *New York Times Observatory* on March 30, 1999 reported on the invention of pesticide and germ resistant blue jeans. Yes, you read it correctly—clothing that is capable of breaking down pesticide chemicals so that they do not reach the skin underneath. The idea behind these garments is to make protecting oneself from pesticide exposure easier and thus more likely to occur. Farmworkers often do not wear protective gear because it is too hot and uncomfortable. Gang Sun, Ph.D., researcher at the University of California, Davis is behind the research, and presented his new findings to the American Chemical Society in March. The clothing incorporates a compound that reacts with the pesticides to neutralize them. The N-halamine compound, hydantoin, is reactivated each time by the addition of a chlorine atom when the clothing is washed in chlorinated water. A Seattle-based company, HaloSource Corp., has already purchased the rights to Sun's research. Scientists say the compound has been successful with 99% of their trials of carbamate pesticides, but that the clothing has not been tested against organophosphates such as malathion. According to HaloSource, the break-down even occurred after 50 laundry cycles. When asked about health effects of the treated fabric, Dr. Sun said, "The halamine structure does not affect human skin. The hydantoin and its halamine derivatives are used in swimming pools as disinfectants and chlorine stabilizers. That is why we selected it. Another point is that the hydantoin is chemically grafted on cellulose and cannot come off from fabrics easily." *Contact: Assistant Professor Gang Sun, Textiles and Clothing Department of the College of Agricultural and Environmental Sciences,*

235 Everson Hall, University of California, Davis, CA 95616, 530-752-0840, gysun@ucdavis.edu, or HaloSource, 3005 First Avenue, #300, Seattle, WA 98121, 888-909-8765.

Studies Continue to Find Pesticide Contamination Linked to Frog Malformations

Studies suggesting that pesticides may be related to deformities seen in frogs are beginning to pile up. In rising numbers, frogs around the U.S. and Canada are being found with extra limbs or missing or misplaced eyes. Some other suspected causes include mercury, endocrine disruptors, and PCBs in the environment.

An August 1998 study supported by the Vermont Public Interest Group (VPIRG), *Effects of Sulfonyl Urea Herbicides in Xenopus laevis: An Evaluation of Developmental Toxicity and Impact on Metamorphosis*, by Douglas Fort, Ph.D., et al., looked at the effects of sulfonyl ureas (SUs) on laboratory-raised frogs. The study found that SUs significantly affect tail resorption and limb development, both of which are controlled by the thyroid gland. Animals with malfunctioning thyroids are likely to have numerous problems and lower survival rates. Sulfonyl ureas are used for various purposes, including pharmaceuticals and herbicides. They were created to replace more harmful chemicals, as a "safe" alternative, but still have problems associated with them. They are persistent and potent even at low levels, are suspected endocrine disruptors, and may affect plant fertility and the internal organs of animals. They cause phytotoxic effects below the level of detection.



Martin Oulette, Ph.D., McGill University, has conducted several studies on frogs over recent years. One of them, entitled *Hindlimb deformities (ectromelia, ectodactyly) in free living anurans from agricultural habitats, 1997*, found high rates of hindlimb deformities in frogs living in agricultural areas. Abnormalities and genetic damage were found in various species of frogs in the test area, suggesting that the cause is environmental. Dr. Oulette continues to do studies, and Beyond Pesticides/NCAMP will cover results as they are made known.

A study in November 1996, entitled *Flow cytometric assay for in vivo genotoxic effects of pesticides in green frogs* by L.A. Lowcock, et al., looked at frogs one to five days after an application of carbofuran on corn and azinphos-methyl on potatoes. These and other pesticides

were present in the test area. DNA tests were performed on the frogs and genetic damage was discovered, as were limb deformities. Scientists are unsure whether there is causation or just a correlation between the DNA damage and deformities.

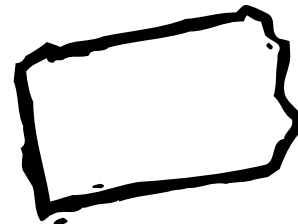
All the findings are alarming because frogs are considered sentinel species; they are especially vulnerable to environmental pollutants due to their permeable skin and biphasal life cycle, so many believe that the problem should be taken as a warning to eliminate sources of persistent toxic pollutants. *For copies of the studies (62pp), send \$8.00 (ppd) to Beyond Pesticides/NCAMP.*

Schools in Pittsburgh and Philadelphia Adopt Least Toxic Pest Control Policies

The two largest school districts in Penn-

sylvania have decided within the past year to adopt pest management policies that ensure Pittsburgh (May 1998) and Philadelphia (October 1998) area schools will use integrated pest management (IPM). If pesticides are sprayed, schools are required to wait a minimum of 24 hours before students are allowed to re-enter the buildings and will have to notify parents what chemicals are used on school grounds (chemical use is last resort). Preventive measures, such as better waste management, sealing of cracks and crevices to stop pests from nesting in buildings, inspections, and screening of windows have also been established. Clean Water Action, which advocated with other groups on the policies, did a 1996 follow-up study to determine the success of the school IPM programs that had been established in other PA school districts since 1992, and found that 86% of PA schools districts that adopted IPM only used pesticides once per year. Thirteen out of 21 school districts controlled pests without use of any chemical pesticides. A survey of school principals reveals satisfaction with the IPM program, noting less exposure to toxics, peace of mind, good public relations, less absenteeism, and that costs did not go up since solutions are relatively permanent.

A coalition of more than 100 parent, teacher, environmental, health and activist groups has been promoting a bill for several years, the *Pesticide Notification Act*, in the state's General Assembly that would mandate policies similar to those adopted by Philadelphia and Pittsburgh school districts for all school districts in Pennsylvania. The bill is being reintroduced into the state Senate and House in 1999. Commented Trudy Strassburger of Clean Water Action in Philadelphia, "While we're delighted that the Philadelphia and Pittsburgh school districts adopted these policies, with 501 school



districts in the state, our children can't afford to wait for every district to switch to IPM. The *Pesticide Notification Act* would guarantee that all children are protected against unnecessary exposure to toxic pesticides in the schools." A 1994 Clean Water Action study called *What You Don't Know Can Hurt You*, found that most schools were reluctant to offer information on their pest control practices and that most schools used pesticides containing at least one toxic chemical. For more information, contact Trudy Strassberger, Clean Water Action, 1128 Walnut Street, Suite 300, Philadelphia, PA 19107, 215-629-4022, email tsrassberger@cleanwater.org.

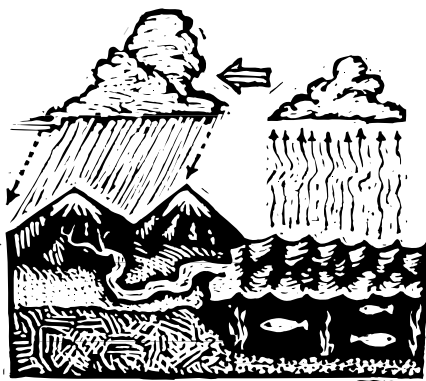
Los Angeles Follows San Francisco's Lead in Adopting Progressive School IPM Program

The Los Angeles Unified School District (LAUSD) adopted in March, 1999 a groundbreaking integrated pest management (IPM) policy that will phase out use of toxic chemicals. Grassroots community groups and environmentalists, including Pesticide Watch and Physicians for Social Responsibility, worked with the school district for a year to achieve this success. The policy requires a ban on the "worst first," meaning any chemicals that are known to cause cancer, endocrine disruption, and nerve damage. The new program will entail improved cleaning efforts such as steam cleaning behind ovens and refrigerators, and will require more manual labor but with fewer health risks to students and staff. A "Pest Management Team" that includes school staff, a medical practitioner, parents, and the public will be formed to help oversee implementation. Pesticides may be used when other methods fail, and only pesticides approved by the Pest Management Team can be used. Overall pest management efforts will focus on sanitation in and around the

buildings and a training program on pest prevention is part of the plan. The policy also includes more right-to-know for parents about what chemicals and other methods are being implemented in their children's schools. Parents will be given information at the beginning of the year, and may have access to school records of IPM activity. This effort to put an IPM policy in place resulted from an incident in Spring 1998 when several children were accidentally sprayed with a pesticide as they arrived at school. An inquiry led to the discovery that pesticide use was taking place at unreasonable and unsafe levels around the school district. Contact Christina Graves, Pesticide Watch, 11965 Venice Blvd., Los Angeles, CA, 90066, 310-397-1168.

2,4-D Found in Canadian Rainwater

In a soon to be published study by Bernie Hill, Ph.D., pesticide residue chemist, (Lethbridge Research Centre, funded by



Agriculture Canada), the herbicide 2,4-D was found in rainwater samples in southern Alberta, Canada. 2,4-D is a common, inexpensive herbicide used on agricultural areas and turf to eradicate broad leaf weeds such as dandelions. In all 150 samples taken from eight Lethbridge, Alberta locations, including residential backyards, a rural golf course and a farm, 2,4-D was found in some amount, as were

bromoxynil and dicamba in much smaller amounts. The study ran from May 30 to August 17, 1998. The amount of the herbicide found ranged from 5.1 parts per billion (ppb) on the golf course to 1.6 ppb in a residential backyard. The Canadian aquatic life guideline for 2,4-D is 4 ppb and the drinking water guideline is 100 ppb.

Products containing 2,4-D carry the signal word "danger" and are considered highly toxic due to serious eye and skin irritations that they have produced among agricultural workers applying the herbicide. A National Cancer Institute study has shown 2,4-D to cause a deadly cancer in dogs that are repeatedly exposed to the pesticide from licking their paws. Other studies link 2,4-D's agricultural use to non-Hodgkin's lymphoma in farmers. The study's findings raise questions about surface water contamination and air pollution.

Scientists at the Alberta Research Institute will conduct further studies in the Lethbridge area as well as surrounding agricultural areas this summer. It is suspected that 2,4-D levels are high in the Lethbridge region due to the area's persistent hot, windy, and dusty weather and aerial application of agricultural chemicals. 2,4-D levels found in the study were 10-50 times higher than levels reported in other Canadian locations, according to the author. Pesticides have also been detected in European rainwater samples. Contact *Beyond Pesticides/NCAMP* for copy of study summary, or Dr. Bernie Hill, Lethbridge Research Centre, P.O. Box 3000, Lethbridge, Alberta, Canada, T1J 4B1, 403-317-2267.

Beth Fiteni is *Beyond Pesticides/NCAMP's* Program Coordinator



The Right Way to Vegetation Management

A review of selected pest management policies and programs on rights-of-way.

by Kagan Owens

Every year, millions of miles of roads, utility lines, railroad corridors and other types of rights-of-way (ROWs) are treated with herbicides to control the growth of unwanted plants. However, increasing public concern over the use of dangerous and inadequately tested pesticides has resulted in an increasing effort over the last decade to pass state laws and local policies requiring notification of pesticide use, restrictions on application types and implementation of least-toxic approaches to vegetation management.

The following review highlights pest management on ROWs in select states. It is not a review of all states. Listed are sixteen states, thirteen states that provide right-to-know provisions regarding ROW herbicide applications and six states that incorporate the principles of an integrated pest management (IPM) program into their ROW management.

Although definitions of IPM vary, while cultural, mechanical, biological methods are utilized in such programs, chemicals are always a part of the programs adopted for management of ROWs. This is a review of policy and does not evaluate the degree to which these policies are currently being enforced.

ROW management is governed by many different levels of government, including state laws or administrative procedures, state subdivisions' or local government entities' policies, and voluntary agreements. As a result, inconsistencies

exist in overall protection from pesticide exposure. Many states have separate policies for the different types of ROWs. Utility ROW requirements may be mandated by the state's department of agriculture, environment or other pesticide lead agency, while requirements for roadsides are under the review of the state's department of transportation. As a result, the level of protection varies considerably and tends to be deficient in protecting the public from the potential exposure to pesticide applications along ROWs.

Every year, millions of miles of roads, utility lines, railroad corridors and other types of rights-of-way (ROWs) are treated with herbicides to control the growth of unwanted plants.

The Case for Notification

Chemical control of ROWs pose hazards to human health and the environment. Although a number of chemicals are registered for use on ROWs to control grasses, brush and trees, picloram (Tordon™), 2,4-D (Weedone™), dicamba (Banvel™), trichlopyr (Garlon™), glyphosate

(Roundup™), fosamine ammonium (Krenite™), hexazinone (Velpar™) and diuron (Karmex™) are among the most commonly used. Some of these herbicides are known to cause cancer, birth defects, reproductive effects, neurotoxicity, kidney/liver damage and are toxic to wildlife. (See Table 1) New studies are continually finding serious problems associated with exposure to commonly used pesticides.

Many states have addressed the issue of ROW herbicide applications by notifying the public of the application, enabling



people to better protect themselves from pesticide exposure. Prior notification is commonly provided through newspapers and/or radio. However, the notification announcements tend to be in the newspaper's legal section and do not appear or are not heard frequently enough to impact a large population. Broadcast notification through such news media is intended to either notify the public of the application(s) or of a hearing on a proposed ROW application. Targeted prior notification, although less common, is provided in some states, like Connecticut, Iowa, Maine and New Hampshire, to every property that is abutting or within a specific distance to the treated ROW property. Other states provide prior notification if a property owner or resident has requested to be placed on a notification registry of ROW applications, including Maine, New Hampshire, Pennsylvania, Vermont, Washington and West Virginia. Some states require the posting of signs to notify the public at all entrances to the ROW. *Prior notification should be given to all property owners and tenants within one mile of the ROW application and should be complemented with the posting of signs. Posting of signs will provide notice to the general public that enter a treated ROW.*

The Case for Alternatives

Notification cannot curb the potential impacts of ROW herbicides on humans and wildlife, given their potential to contaminate wells, drainage ditches, lakes and air miles from the pesticide-treated area. Pesticide labels with instructions, such as Tordon's "Do not apply directly to water," are not strong enough given the proximity of many ROW spray routes to water and the potential for ground or aerial drift or runoff. Instructions, such as "Do not contaminate food or feed" or "Avoid drift," are commonly ignored by applicators spraying in high winds, which carry the spray past the intended application area. Some states have addressed the risk of using herbicides along ROWs by developing an IPM program for ROWs, restricting when and where pesticides can be applied on ROWs and/or providing no-spray agreements. *With the potential for contamination, chemical use and only least-toxic chemical use, should be resorted to only if all other means, including the use of mechanical, biological and cultural methods, of managing ROWs have been exhausted.*

Programs that adopt the principles of IPM can be carefully designed for the specific vegetation management needs for each ROW situation and must include pest identification, population monitoring, determination of injury and action levels and selection of the most appropriate control tactics. Herbicides are just one of many available control tactics for unwanted ROWs vegetation. However, because of their high ecological and sociological costs, and because their short-term,

temporary effects promote unstable plant communities, they should be considered only after all other less-toxic, more permanent tactics have been exhausted. A long-term perspective is critical when developing a pest management strategy for ROWs. Ideally, an ecologically stable plant community that persists in a state that does not reach injury levels should be the goal for all ROWs. Intervention, when necessary to remove unwanted vegetation, should be highly selective and non-disruptive to other life forms of the community. ROW management can become worse if competitors and natural enemies of pest vegetation are inadvertently killed by herbicide applications.

Planting native vegetation, using mechanical, biological and nontoxic vegetation control methods are effective in reducing and eliminating pesticide applications. Creating and encouraging stable, low-maintenance vegetation is a more permanent vegetation management strategy. The establishment of desirable plant species that can out-compete undesirable species requires little maintenance and meets the requirements for ROW management. Although native vegetation may take more time to establish itself, native flower and grass species are better adapted to local climate and stress than those introduced from Europe and Asia. Native plant species are especially effective in providing increased erosion control, aesthetics, wildlife habitat and biodiversity. Numerous states have established roadside wildflower programs for these reasons. Cutting, girdling, mowing and grazing animals are successful

Planting native vegetation, using mechanical, biological and nontoxic vegetation control methods are effective in reducing and eliminating pesticide applications.

mechanical means to eradicate unwanted vegetation on various ROWs. Mowing can be useful under certain circumstances, such as when the ROW must be maintained as turf or low vegetation. The schedule for mowing, if done, must adjust to plant life cycles in order for maximum effectiveness. The uses of fabric material and mulch under roadside signs and guardrails and on the edge of the shoulder are effective in suppressing weeds.

Other control methods include the use of corn-gluten and steam treatments. Steam treatments involve 800 degrees Fahrenheit temperatures and low pressure. Borax has also been effective in killing vegetation. A number of plant pests can be controlled with the introduction of natural insect enemies.

Integrated Roadside Vegetation Management

Several states have adopted an Integrated Roadside Vegetation Management (IRVM) Program. The program incorporates principles of IPM. The National Roadside Vegetation Management Association and the Integrated Roadside Vegetation Management Program Task Force have produced a manual, *How to Develop and Implement An Integrated Road-*

Table 1. Adverse Health and Environmental Effects of Commonly Used Herbicides on Rights-of-Ways

Herbicide	Cancer	Birth Defects	Reproductive Effects	Neuro-toxic	Kidney Liver Damage	Sensitizer / Irritant	Detected in Groundwater	Potential Leacher	Toxic to Birds	Toxic to Fish	Toxic to Bees
2,4-D	• ¹	•	•	•	•	•	•	•	•	•	•
Dicamba	• ²			•	•	•	•	•		•	
Diuron	• ³	•		•	•		•		•	•	
Fosamine ammonium					•				•	•	
Glyphosate			•		•	•	•	•	•	•	
Hexazinone	• ⁴				•	•	•	•	•	•	
Picloram					•	•	•	•		•	
Triclopyr	• ⁵				•	•	•	•	•	•	

1. Adverse health effect based on National Cancer Institute
2. Group D carcinogen, a chemical that is not classifiable as to human carcinogenic effect. EPA states that this assessment is because the "doses selected for the rat and mouse studies were not adequate."
3. EPA classifies as a "known/ likely" carcinogen.
4. Group D carcinogen. EPA states that this assessment is "based on evidence that was equivocal (not entirely negative, but yet not convincing) since only statistically significant increase was in Female mice."
5. Group D carcinogen. EPA states that this assessment is "based on increases in mammary tumors in both the female rat and mouse, and adrenal pheochromocytomas in the male rat, which were considered to be only a marginal response."


Source: Environmental Protection Agency, National Cancer Institute, California Department of Pesticide Regulation and Extension Toxicology Network and www.scorecard.org (Environmental Defense Fund).


side Vegetation Management Program, which many states have used in their plan for roadside ROWs. This program serves a variety of purposes including erosion control, wildlife habitat, scenic qualities, weed control, utility easements and recreation uses. It incorporates integrated management practices, like burning, seeding, mowing, but also incorporates spraying in the control of weeds, damaging insects and invader plant species. Several states use this IPM or IRVM approach, including California, Illinois, Iowa, Minnesota, North Carolina, Texas, Utah, Washington and Wisconsin.

No-Spray Agreements

No-spray agreements are offered by many states. These agreements between the ROW managing entity and the landowner require that the landowners maintain the ROW that is adjacent to their property or the managing entity will agree to maintain the ROW without using herbicides, sometimes at the landowner's expense. Maine, North Carolina and Oregon are examples of states that have no-spray agreements. North Carolina's no-spray agreement is a private agreement, probably the only one of its kinds in the country, made between the utility companies and landowners.


State Review

 Alaska Administrative Code, chapter 18 sections 90.500 and 90.520, require two notices to be published in a local newspaper "and in other media the central office considers appropriate" (18 AK ADMIN. CODE 90.50 (a) (1998)) for all applications made by a government employee using funds, materials or equipment of that government entity on a state-owned ROW.

 California Food and Agricultural Code, section 12978, requires signs to be posted when a pesticide with a worker reentry interval of at least 24 hours is applied on school grounds, parks, or "other public rights-of-way where public exposure is foreseeable" (CA FOOD & AGRIC. CODE § 12978 (1998)). Barriers may be used instead of the warning signs. Applications made by the Department of Transportation (CalTrans) on public highway ROWs are exempt from the posting requirements.

CalTrans established an internal policy to develop strategies to reduce and eliminate the use of pesticides along roadsides through a roadside vegetation environmental impact report in 1992 which states that CalTrans is to decrease herbicide use by 50% by the year 2000 and 80% by the year 2012. This report also pledged to not apply chemicals within 100 feet of school bus stops. In response to local organizing by community activists, CalTrans adopted a policy to halt herbicide spraying on highways in District 1, northwest California where local governments request it in 1997. Del Norte, Humboldt, and Mendocino counties have voted for the elimination of all herbicides on roadsides.

For further information on CalTrans policies and lack of implementation, see review of the California for Alternatives to Toxics report, *The Poisoning of Public Thoroughfares*, on page 20.

 Connecticut General Statutes, section 22a-66k as amended by Public Act No. 98-229, requires that any electric, telephone or telecommunication

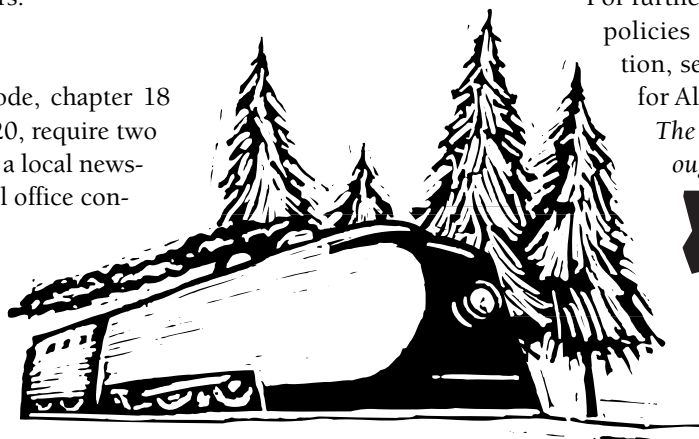


Table 2. Summary of selected pest management policies & programs for rights-of-way.

STATE	PRIOR NOTIFICATION	POSTING	PESTICIDES ALTERNATIVE / RESTRICTION
Alaska	State ROWs that require a permit, 2 notices in local newspapers & "in any other media the central office considers appropriate."		
California		"Public ROW where public exposure is foreseeable," pesticides with worker reentry interval of at least 24 hours, post sign or create barrier.	CalTrans pledged to decrease herbicide use 50% by 2000, not apply pesticides within 100 feet school bus stop & use IPM. CalTrans District 1 local governments can opt for no herbicide spraying.
Connecticut	Electric, telephone or telecommunication company, 48-hour prior notification to all abutting property.	Electric, telephone or telecommunication company, application to pole, post sign on each pole treated.	Prohibition of aerial broad-spectrum pesticide applications for non-agriculture purposes. Public highway, prohibition of aerial pesticidal dust applications within 100 feet.
Iowa		Highways, roads, streets, alleys, sidewalks & recreational trails within corporate limits of municipalities, post at each end of treated area.	IA DOT required to control noxious weeds along roadsides with herbicides only if mowing or other control not practical. 41 out of 99 counties participate in IRVM ¹ program.
Maine	Local, regular circulation newspapers between 3 & 60 days prior to treatment, if no such newspaper notice to all landowners within 500 feet of application area. Individual can contact ROW entity to be notified of any application within 500 feet. Notification registry, 6 hrs to 14 days prior notice for application made within 250 feet of property.	Sign posted prior to application, remain posted for 48 hours at point of entrance to area.	Utility & DOT offer "No spray agreements" for individual or municipality to adopt.
Massachusetts	Roadway, railroad, power lines, conduits, channels or communication lines, public meetings & 45-day comment period on 5-year Vegetation Management Plan & the annual Yearly Operational Plan (YOP) ROW proposal. Plans must look at alternative approaches.		Roadway, railroad, power lines, conduits, channels or communication lines, prohibition on aerial application to ROWs. Prohibition on handling, mixing or loading herbicide concentrate within 100 feet of sensitive area. Restrictions on pesticide applications in regards to distance to water supplies, surface water, wetlands, inhabited & agriculture areas. YOP must include IPM in the plan.
Michigan	Broadcast or foliar ROW applications, commercial application, personal contact, local, regular circulation newspaper or prior written notification, to residents of property within target area.		
Minnesota			State required to use IPM in management of roadside plans. IRVM program for local areas to adopt.

STATE	PRIOR NOTIFICATION	POSTING	PESTICIDES ALTERNATIVE / RESTRICTION
New Hampshire	Power transmission & distribution lines, gas pipelines, railroads, public road ROW, between June & October 15, directly to residences within 200 feet 10 days prior to treatment. Notification in newspapers once for 2 weeks at least 45 days prior to treatment & includes cut out coupon for all abutting owners to receive notice 30 days prior to treatment.		
New York	NY DOT set up toll free number to find out spraying plans.		Monroe County use welfare clients to mechanically cut weeds along roadsides.
North Carolina	Utilities provide prior notice of ROW herbicide applications in inserts of customer bills, adopted by private agreement between state utilities and landowners.		Prohibition on aerial application to public road ROW or within 25 feet of road. NC DOT internally adopted IPM program. Private, no-spray agreement available between landowner & utility company.
Oregon			State agencies required to use IPM. OR DOT district IPM plans available to public for review. OR DOT can provide no spray agreement.
Pennsylvania	Restricted use pesticide ground applications to ROW by commercial or public applicator, notice published in 2 newspapers or oral or certified mail notice to all abutting residences. Abutting residence can request additional information regarding application. 12 to 72 hour prior notification to anyone that works or lives within 500 feet of treatment site & on the medically verified hypersensitive registry.		
Vermont	Electric utility ROW, owner of property within 1,000 feet can request to be notified 30 to 60 days prior to treatment. Newspaper notification once a week for 4 weeks, include cut out coupon to be listed on notification registry. Any person making a pesticide application to ROW, 25 to 60 days prior to treatment, notice printed in 2 newspapers, once a week for 2 weeks, notice also by either radio, mail to abutting residents 2 weeks prior or personally delivered 10 days prior to treatment.		If ROW traverses property, can request electric utility not use any herbicides, such request costs \$30 to the Dept of Public Services for administrative costs.
Washington	Certified applicator treating ROW, notice at least 2 hours prior, to abutting residents on the medically verified pesticide hypersensitive registry.	Certified applicator treating ROW, post notice on each "power application apparatus."	State agencies required to use IPM. DOT offers no spray agreements.
West Virginia	Utility ROW, notice 60 to 120 days prior to treatment to all news media, to all persons on the hypersensitive registry & abutting residents who have made a written request to be notified.		Prohibition on aerial application of Picloram & Dicamba & all other herbicides within specific distance to recreation areas, residential structures & roads.

1 Integrated Roadside Vegetation Management Program

company that provides for the application of pesticides within a ROW maintained by such company must notify owners, occupants or tenants of buildings or dwellings abutting the ROW at least 48 hours in advance. If the company provides for the application of pesticides to any utility pole, after it has been installed, it is required to post a notification sign on each pole. If the company provides for the application of pesticides in connection with tree or brush removal from private property, the company must get consent from the occupant before proceeding. State, municipality, pesticide application business, public service company or railroad company ROW applications are exempt from the notification requirements. Section 22a-66-7 of the General Statutes prohibits the aerial application of pesticidal dusts within 100 feet of a public highway. And section 22a-54-1 prohibits the aerial application of broad-spectrum chemical pesticides for nonagricultural purposes.



Iowa Administrative Code, section 21-45.50(4), requires posting notification signs when a pesticide is applied to a public highway, road, street, alley, sidewalk or recreational trail ROW within the corporate limits of municipalities “in a manner that provides reasonable notice to the occupants of properties immediately adjacent to the area being treated” (IAC 21-45.50(4) (1998)). Signs are to be posted at the end of each area treated. If the area is within a developed residential zone, signs are to be posted at both ends of each block. Public ROW enclosed by a chain link fence, noise wall or other structures that eliminate pedestrian access are exempt. The public may request the pesticide application schedules and other right-to-know information from the licensed applicator.

Iowa Code, section 317.11, states that the county boards of supervisors and the state department of transportation are required to control noxious weeds along roadsides under their jurisdiction. The spraying of pesticides to control noxious weeds is only allowed “when it is not practical to mow or otherwise control noxious weeds.”

Iowa Code, section 314.21, establishes a state fund that helps counties in the state use and develop an Integrated Roadside Vegetation Management (IRVM) program. Iowa Code, section 314.22, establishes the development of an IRVM program for areas on or adjacent to roads, streets and highway ROWs through the state department of transportation. The program is available for any county to adopt and implement. Forty-one out of ninety-nine counties are currently participating in the IRVM program across the state.



Maine Board of Pesticides Control Regulations, section 01-026-51(IV), requires the licensed applicator to provide information regarding a planned aerial pesticide ROW application to the contracting entity. The contracting entity then prints the information in local newspapers. An “article/advertisement” of the ROW application must be published in a newspaper of general circulation between three and 60 days prior to the application. If there is no newspaper of regular circulation in the area, individual notices to all landowners within 500 feet of the application site is given

instead. Notice, whether in newspaper or individual notices, must include a description of the target area, how to contact the contracting entity, the intended purpose of the application, pesticide(s) to be used, date(s) of application, emergency telephone numbers and any public precautions that appear on the pesticide label. Maine also requires posting notification signs at any point where the public can enter the treated area. The signs are to remain posted for at least 48 hours. The signs must state similar information as required for written notification in English and French.

Maine Board of Pesticides Control Regulations, section 01-026-22(5), states that an occupant of a sensitive area can request to be notified of any pesticide application occurring within 500 feet of that sensitive area. Sensitive areas include public and private drinking water sources and all water bodies as well as areas within 100 feet of residential, school, commercial or developed recreational properties that are not the intended target. The individual wanting prior notification must contact the person responsible for the management of the land on which a pesticide application will take place. Notification can be given “in any fashion, provided that it is effective in informing the person” requesting such notification at least one day before the application commences. If the requesting individual is not satisfied with notification provided, a complaint may be filed with the Board which will then help resolve the agreement between the two parties. Maine Board of Pesticide Control recently adopted a new chapter to its regulations, chapter 28, which establishes a pesticide notification registry. Notification is given to any resident, upon request, by telephone, personal contact or mail six hours to 14 days prior to an application made within 250 feet of the registrant’s property.

Maine Pesticides Control Act, title 7 section 625 of the Maine Revised Statutes Annotated, states that any public utility or Department of Transportation ROW can offer a no-spray agreement for the municipality or individual to consider. Maine utility companies inform their customers of the no-spray agreement in bill-mailings. The Department of Transportation (DOT) provides signs to those that are adjacent to DOT ROWs requesting that the applicators do not spray the property adjacent to their property.



Massachusetts Code of Regulations, section 11, prohibits the handling, mixing or loading of herbicide concentrate on a ROW within 100 feet of a sensitive area and the application of herbicides by aircraft for the purpose of clearing or maintaining a ROW. Sensitive areas within a ROW area “in which public health, environmental or agricultural concerns warrant special protection to further minimize risks of unreasonable adverse effects” (333 CMR § 11.02 (1996)) and include an area within the primary recharge of a public well, within 400 feet of any surface public water supply, and areas within 100 feet of a private water well, standing or flowing water, wetland or any agricultural or inhabited area. Section 11.03(9) requires the department to maintain a mailing list of individuals and groups who want to receive notice “on various aspects of the Pro-

gram.” A Vegetation Management Plan (VMP) is required of all applicants before treating ROWs. The VMP describes the intended program for vegetation control over a five-year period and must include “a description of Integrated Pest Management Programs or other techniques/programs to minimize the amount and frequency of herbicide application. Description of alternative land use provisions or agreements that may be established with individuals, state, federal or municipal agencies that would minimize the need for herbicide” (333 CMR § 11.05(h), (i) (1996)). The department, once the VMP is received, will schedule and hold regional public hearings for all interested parties to comment on the proposed plan. Notice of the hearing is printed in regional newspapers and the *Environmental Monitor* and includes where a copy of the VMP can be reviewed. There is a 45-day comment period starting when notice of the proposed plan is published. A Yearly Operational Plan (YOP) describes the detailed vegetation management operation for the year and is consistent with the terms of the VMP. A YOP notice is published in the *Environmental Monitor* and is distributed “to the appropriate mailing list.” The YOP also has a 45-day comment period. ROWs include “any roadway, or thoroughfare on which public passage is made and any corridor of land over which facilities such as railroads, power lines, pipelines, conduits, channels or communication lines are located” (333 CMR § 11.02 (1996)).



Michigan Pesticide Use Regulation No. 637, section 285.637.11(5) of the Michigan Administrative Code, requires the commercial applicator making a broadcast or foliar application to ROWs to provide

prior notification to occupants of property within the application target area. Property owners, their agents, or persons residing within the application area are notified either by personal contact, through an advertisement in the legal section of at least one local, general circulation newspaper or prior written notification. Written notification includes detailed information on the application with supplemental information available upon request.



Minnesota Statute, section 18B.063, requires the state to “use integrated pest management techniques in its management of public lands, including roadside rights-of-way, parks, and forests; and shall use planting regimes that minimize the need for pesticides and added nutrients” (MINN. STAT. § 18B.063 (1998)). Department of Transportation (Mn/DOT) has developed an “Integrated Roadside Vegetation Management Program” (IRVM) which fosters the development of local IRVM programs and annual plans at the local, district or maintenance area level within Mn/DOT.




New Hampshire Code of Administrative Rules, section 505.06, require applicators making a herbicide application to ROWs for power transmission and distribution lines, gas pipelines, railroads and public roads applied between June and October 15 to give prior notification to the public. Notification is in newspapers and given directly to residences within 200 feet of the ROW. Notification in newspapers must be once a week for two weeks in one newspaper of statewide circulation and in all local circulation papers. The second or last notice must be at least 45 days before the application begins. Notice includes information on the proposed application as well as how to receive more informa-


Striking a Deal with Utility Companies

In the summer of 1998, utility companies in North Carolina reached a private agreement with landowners regarding management of their 75,000 miles of rights-of-way. The agreement, which does not have the force of state rules, was sparked by complaints to the state pesticide board regarding North Carolina utility companies decision to begin broadcast spraying of their ROWs. Organic farmers and chemically sensitive people demanded the state pesticide board require the utilities to ask permission from landowners to spray herbicides on adjacent ROWs. The state pesticide board asked the utilities and complainants to sit down together and come up with an agreement amongst themselves. The final agreement accepted by all parties, with petitioners represented by the Agricultural Resources Center (ARC) [Carrboro, NC], requires utilities to include inserts about their herbicide use in customer bills. The inserts include the names and descriptions of the chemicals, how they are applied and sources for additional information about the applications. The inserts do not disclose spray schedules. The agreement also gives state residents the right to refuse herbicide use on their property and people can post their property with no spraying signs provided by the utilities. For those opting for no-spray agreements, the utilities will still maintain the ROW by mechanical means without extra charge to the individual landowner. Carolina Power & Light voluntarily sent notices to its customers in South Carolina regarding ROW herbicide applications as well, reports ARC. Although this shows that such an agreement can be reached without government involvement, the agreement is limited because it can not be enforced by state regulators. *For more information contact Allen Spalt, Director, Agricultural Resources Center, 115 West Main Street, Corrboro, NC 27510, (919) 967-1886, (919) 933-4465 fax, aspalt@mindspring.com.*


tion. The newspaper notice must also include a cutout coupon for all abutting property owners to mail in to receive an individual written notice 30 days before the treatment is to begin. These companies will compile a permanent list for prior notification, to be maintained by the utilities. Mail-in coupon notification requests must be received 35 days prior to the application, otherwise it become effective the following year. Direct notification of the residences within 200 feet of the right-of way treatment area is by certified mail or personally delivered and made at least 10 days before the application begins. Applications made to control poison ivy, in conjunction with landscape plantings on roadsides, upon roadway pavement, curbing and guardrails are exempt from the above requirements.


 **New York** State Department of Transportation (DOT) set up a toll-free number for residents to find out about roadside spraying plans for their areas. The state DOT started a demonstration project in the summer of 1998 which tested the effectiveness of planting low-lying native flowers and grasses near highway guardrails.

Monroe County, New York opted in the summer of 1998 to use welfare clients who are enrolled in the Work Experience Program (WEP) to use mechanical methods to cut weeds along county roads instead of using herbicides.


 **North Carolina** Administrative Code, title 2, subchapter 9L, section .1005, states that no pesticides can be applied by aircraft to public road ROW or within 25 feet of the road. The state Department of Transportation, although not legislated to do so, has developed an IPM policy which the department recommends to people across the state for roadside pest management

In a private agreement North Carolina utility companies, including Duke Power, Carolina Power & Light, North Carolina Power, and Nantahala Power, agreed to provide private landowners the right to be informed about pesticides used on their ROWs, opt out of the spray program and flag their property as a no-spray area. *See side bar insert for additional information.*

 **Oregon** State Pesticide Control Act, section 634.655 of the Oregon Revised Statutes, requires state agencies that have pest control responsibilities to follow the principles of IPM, including the State Department of Agriculture, State Department of Fish and Wildlife, Department of Transportation, State Parks and Recreation Department, State Forestry Department, Department of Corrections, Oregon Division of Administrative Services and each Oregon institution of higher education, for the institution's own building and grounds maintenance. A person is designated from each agency to coordinate the IPM program for that agency. Each person responsible for pest management in each agency is trained in IPM. The Department of Transportation district IPM plans are open to the public for review. The Department of Transportation also provides no-spray agreements to landowners that are adjacent to the road ROW.

 **Pennsylvania** Pesticides Rules and Regulations, title 7 section 128.81 of the Pennsylvania Code, require prior notification for restricted use, ground pesticide applications to ROWs. Notice must be published in two local newspapers of general circulation. An alternate to newspaper notices, the commercial or public applicator may give notice orally or by certified mail to all abutting residents. An abutting resident may request, at least seven days before the application is to begin, additional information, such as date and time of application, pesticide(s) to be applied and a copy of the label(s), which will be provided at least 12 hours before the application. Internal injections to utility poles and trees and ground line applications to utility poles are exempt from the notification requirement.

Pennsylvania Pesticides Rules and Regulations, title 7 subchapter F, provide a registry for people who have medical proof of their sensitivity to pesticides. People listed on the registry are notified between 12 and 72 hours before any application within 500 feet of their residence, place of employment, or school.

 **Vermont** Regulations for Control of Pesticides, section IV(4), requires any person applying a pesticide to a ROW to obtain a permit from the department and provide notification to the public. Twenty-five to 60 days prior to the application, information regarding the application must be printed once a week for two consecutive weeks in two local newspapers. Notice must also be made by one of the following: a) three spot messages per day on two radio stations in the area for two consecutive days during the two week period prior to the application; b) mail notification to abutting residents at least two weeks prior to application; or c) personally delivered notification at least ten days prior to application. All permits require buffer zones around the waters of the state, each distance determined on a case by case basis. ROW includes property owned or leased by utilities for the purpose of carrying, transmitting or transporting liquids, gases, electricity, communications, vehicles or people.

Vermont Public Service Board Rules, sections 3.620 to 3.641, state the notification requirements for electric utility ROW's pesticide applications and alternatives to such applications. An owner or occupant within 1,000 feet of a utility ROW can request to be notified by mail between 30 and 60 days before the commencement of the application. To do so, the owner or occupant must contact the utility company in writing before May 15 of each year to request to be placed on a notification mailing list. If the utility company chooses, it can place all residents of a town on its mailing list. Section 3.621(F) of the Vermont Public Service Board Rules states that, "inadvertent failure to comply with [the above stated requirements] shall not raise any presumption of negligence." Every year the Vermont Electric Power Company, Inc (VELCO) is to develop an information sheet stating general information on herbicide spraying of utility ROWs, how to contact utilities for more information and how to be placed on a notification mailing list. These information sheets are then distributed by the

utilities to their customers by May 1 of each year. This same information is placed in newspapers once a week for four weeks in April. Both the information sheet mailer and the newspaper advertisement include a cutout coupon for persons to return to the utility requesting prior notification of the ROW application. If a utility ROW crosses a landowner's property, the landowner can send a written request to the utility to not use herbicides to clear the traversed ROW. A \$30 administrative fee is charged for such herbicide-free requests.



Washington Revised Code, chapter 17.21,

section 400, requires a certified applicator applying a pesticide to a ROW to post notice on each "power application apparatus" and have a copy of the pesticide's MSDS. If the certified applicator receives a written request for information regarding the ROW treatment, the applicator must provide the requestor with the name of the pesticide(s) and the MSDS, or the applicator may provide a department approved fact sheet on the pesticide. Sections 13.21.420 and 13.21.430 establish prior notification to anyone on abutting property who is on the department's pesticide-sensitive registry. Enlistees must have documented medical proof of a person's sensitivity in order to be listed. For highway or road ROWs, this includes "that portion of the property within one-half mile of the principal place of residence" (RCW 17.21.420(2) (1998)). The list expires at the end of every year and thus renewal is necessary annually to be included. Notification to the abutting pesticide-sensitive registers must be made at least two hours prior to the application or if for an immediate service call, at the time of the application. Notification can be made by telephone, in writing or in person, with the date and time of the application.

Washington Revised Code, section 17.15, requires state agencies, including the Department of Agriculture, the State Noxious weed Control Board, the Department of Ecology, the Department of Fish and Wildlife, the Department of Transportation, the Parks and Recreation Commission, the Department of Natural Resources, the Department of Corrections, the Department of General Administration, and each state institution of higher education, for the institution's own building and grounds maintenance, to follow the principles of IPM. Each state agency listed is required to have an IPM coordinator. In response to the findings of the state's Environmental Impact Statement for roadside vegetation management in 1993, the Department of Transportation has developed an *Integrated Vegetation Management for Roadside* guidebook which is intended to provide the individual crew maintenance employees with a reference and guidelines for the application

of IPM in the day to day work of highway maintenance. The Department of Transportation offers no-spray agreements through their local district offices.



West Virginia Legislative Rule, title 61 section 12D, requires prior notification for aerial herbicide applications made to utility ROWs. Notifi-

cation, made in writing between 60 and 120 days prior to the application, is given to "all news media" in the area to be treated, all persons in the spray area on the department's hypersensitivity registry and all property owners and tenants abutting the property who have made a written request to the utility to be notified. Notification includes general information regarding the application. Herbicides

In order to avoid exposure to the herbicides applied on ROWs, policies must require prior notification to nearby property, posting of signs, access to information regarding the herbicides used, and the use of a strong IPM program in the management of ROWs.

containing Picloram or Dicamba must not be applied by aircraft closer than 100 feet of public recreation areas, 150 feet of residential structures, 150 feet of barns and other outbuildings in use and 50 feet of roads. All other herbicides must not be applied closer than 150 feet of public recreation areas, 100 feet of residential structures, 150 feet of barns and other outbuildings in use and 50 feet from roads. Utility ROWs include "those rights-of-way maintained by persons providing public service to the citizens of the state and may include but is not limited to electric companies, gas companies, communication companies and railroads" (WVCSR tit 61 § 12D-2.1 (effective 1992)).

Conclusion

People have a right to be informed and protected from the unnecessary use of herbicides to which they are potentially exposed on nearby rights-of-way. In order to avoid exposure to the herbicides applied on ROWs, policies must require prior notification to nearby property, posting of signs, access to information regarding the herbicides used, and the use of a strong IPM program in the management of ROWs.

This review is intended as an overview of states and localities that are moving forward in their efforts to protect people from unintended exposure. Implementation and enforcement are absolutely critical. Although the many states listed in this review are exemplary in notification or in requiring integrated pest management, the states listed may be ineffective in protecting the people near the ROWs. *For more information on the above discussed herbicide ROW policies and tools on how to organize for the adoption of such policies at the state or local level, please contact Beyond Pesticides/NCAMP.*

— Kagan Owens is information coordinator at Beyond Pesticides/NCAMP.

Chemicals Found to Affect Male Reproductive System in New Way

By Hilary Melcarek

Toxicology and Industrial Health, Vol. 15, No. 1-2, 1999, with guest editor and World Wildlife Fund senior scientist, Theo Colborn, Ph.D., compiles studies on the effects of pesticides on the male reproductive system, and finds that some estrogen mimickers also have antiandrogenic (demasculinizing) effects. As far as scientists understand right now, antiandrogenic effects can take two forms: either a reduction in the amount of testosterone produced in the body, or a replacement by the chemical in the cell's receptor where a testosterone molecule would normally go. This introduces a whole new concern in that, up until now, scientists had found that certain chemicals are feminizing — they act like estrogen and this too can affect the male reproductive system. These new findings however, show that certain chemicals actually demasculinize, and can affect sperm counts and the structure of the prostate, or cause delayed puberty and extra nipples in males.

In "Environmental antiandrogens: low doses of the fungicide vinclozolin alter sexual differentiation of the male rat," Earl Gray, Ph.D., (et al.) research biologist, Endocrinology Branch of the Reproductive Toxicology Division, Office of Pes-

ticide Programs, EPA, found that malformations and reduced fertility were seen even at levels ten-fold smaller than levels otherwise known to cause effects, suggesting that there is no "safe" threshold for exposure.

Another study, "Dieldrin reduces male production and sex ratio in *Daphnia*," by Stanley Dodson, Ph.D., (et al.) Department of Zoology, University of Wisconsin in Madison, found that exposure to the insecticide dieldrin causes a decrease in the production of male *Daphnia* (water flea), which may have long-term ecological effects.

In a piece co-authored by Dr. Colborn, printed in the *Toxicology* journal, it was found that 60% of the pound-

age of all agricultural herbicides has the potential to disrupt the hormone or reproductive system. Environmental Media Services held a press breakfast in Washington DC on March 23, 1999 to alert the media to these new findings. The following excerpts from the above mentioned studies illustrate these findings. For a copy of the studies send \$8 to Beyond Pesticides/NCAMP, or contact Amy Kostant, Environmental Media Services, 1320 18th Street, NW, Suite 500, Washington DC 20036, 202-463-6670, ems@ems.org.

These new findings however, show that certain chemicals actually demasculinize, and can affect sperm counts and the structure of the prostate, or cause delayed puberty and extra nipples in males.

Environmental antiandrogens: low doses of the fungicide vinclozolin alter sexual differentiation of the male rat

L. Earl Gray Jr., Joseph Ostby, Emily Monosson and William Kelce

Introduction

The fungicide vinclozolin (V) alters sexual differentiation in male rats in an antiandrogenic manner. Vinclozolin is a dicarboximide fungicide used in the control of *Botrytis cinerea*, *Sclerotinia sclerotiorum*, and *Monilinia* spp. on several fruits, vegetables, ornamental plants, and turfgrass. Administration of V to pregnant rats at 0, 100, or 200 mg/kg/day during the period of sexual differentiation (gestational day 14 to postnatal day 3) demasculinizes and feminizes the male offspring. Vinclozolin-treated male offspring display female-like anogenital distance (AGD) (distance from the anus to the geni-

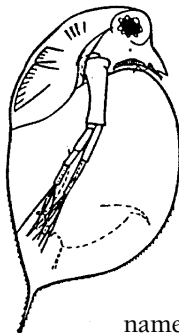
tals) at birth, retained nipples, cleft phallus with hypospadias (urinary tract does not end at tip of penis), suprainguinal ectopic testes (undescended testes), a blind vaginal pouch, epididymal granulomas, and small to absent sex accessory glands. In contrast, female offspring display no malformations or functional alterations.

Discussion: Environmental Antiandrogens: A 'New' Class of Endocrine-Disrupting Chemicals

Recently, concern has developed regarding the effects of these 'endocrine disrupting' toxicants on human reproductive function. To date, most of the discussion of developmental reproductive toxicity has focused on toxicants reported to possess estrogenic activity, with little consideration given to other mechanisms of toxicity. This focus must be expanded to include synthetic chemicals that act by competing with androgens for the



Androgen Receptor (AR). Antiandrogenic chemicals are not only diverse in structure, some that bioaccumulate have been found at high concentrations in wildlife and human tissues. Increases in the incidence of hypospadias and testicular cancer and reports of declining sperm counts in humans in some geographical areas have been linked to possible exposure to endocrine disruptors. It is apparent that *in utero* exposure to V induces some of these effects in the rat. It is likely that human males would be similarly affected if exposed to similar levels of the active metabolites of V during the critical period of reproductive development *in utero*.



Dieldrin reduces male production and sex ratio in *Daphnia galeata mendotae*

Stanley I. Dodson, Chritine M. Merritt, Laura Torrentera, Katherine M. Winter, Christopher K. Tornehl and Kristin Girvin
Discussion: Aquatic Ecology

Chemicals that change *Daphnia* development or reproduction are clearly of ecological concern. *Daphnia* are ecologically important algae-consumers and fish-food in lakes all over the world. In particular, a decrease in the number of males has the potential of reducing *Daphnia*'s ecological success over many generations, because the genetic recombination associated with sexual reproduction allows a population to adapt to on-going environmental change. Any chemical that interferes with normal *Daphnia* production will also have indirect effects on water quality and fish production. Changes in water quality and fish production are also of concern for human health and well-being.



Some alligators in Florida have failed to develop sexually because pesticides and other toxics in the environment behave like hormones and disrupt normal patterns of growth and behavior.

Pesticide use in the U.S. and policy implications: A focus on herbicides

Polly Short and Theo Colborn
Introduction

Exposure to several herbicides, which have been in use for decades, has been associated with a range of adverse effects in humans, such as impaired development, non-Hodgkin's lymphoma, and prostate cancer. Others are suspected neurotoxicants, endocrine disruptors, and immune system suppressants. New herbicides have been introduced in part to replace older ones known to have adverse effects. However, little is known about the health effects of these modern herbicides, many of which have been in use only since the late 1980s and early 1990s. Although some herbicides may not harm animals, they can damage non-target plant species, altering biodiversity and indirectly affecting wildlife.

Global pesticide use trends and regulations

Pesticide Additives: Pesticide additives, often called inert ingredients, can be toxic. In fact, some chemicals are listed as an unidentified inert in one product, but are the active ingredient (AI) in another product. At least 394 inert ingredients have been or are currently registered as pesticidal AIs. Although a chemical may make up more than 90% of one product as an inert, it does not have to be identified by name as long as it is not highly toxic or technically the "killing agent." Only the total percentage of inert ingredients must be declared on the label. The EPA has long acknowledged that some inerts "may be more toxic or pose greater risks than the active ingredient."

Discussion

Five hundred and fifty-six million pounds of herbicide active ingredients were used in the U.S. in 1995, equaling over 2 lbs. per person and covering many regions of the country. Over 60% of all agricultural herbicides used in the U.S. are reported to disrupt the endocrine and/or reproductive systems of animals. These herbicides covered roughly 271 million acres of agricultural land, an area comprising 12% of the United States.

No new chemicals should be registered for use unless there is conclusive evidence that they do not cause unreasonable adverse effects on human, wildlife, and ecosystem health and there are technologies to detect the chemicals after they are released into the environment. Pesticide use reduction is also essential in order to slow the influx of chemicals in the environment. It has been estimated that pesticide use can be considerably reduced through an adoption of alternative techniques, such as integrated pest management, without reducing crop yields. Pesticide use reduction would diminish the indirect costs of pesticide use, such as pesticide poisonings, destruction of susceptible crops and natural vegetation, fishery and wildlife losses, evolved pesticide resistance, creation of secondary pest problems, etc.



Hilary Melcarek is Beyond Pesticides/ NCAMP's Information Assistant

A REVIEW OF

The Poisoning of Public Thoroughfares: How Herbicides Blight California's Roads

by *Patty Clary, executive director, Californians for Alternatives to Toxics, Spring 1999.*

By Hilary Melcarek

This new report written by Californians for Alternatives to Toxics (CATs), a leader in the successful California anti-spray campaign, explains the problems associated with spraying herbicides for weed control on California roadsides by the California Department of Transportation (Caltrans), and how the massive agency has failed to stop excessive spraying, despite promises to do so. A group of activists has effectively stopped roadside herbicide applications in Trinity, Humboldt, and Mendocino Counties in District 1 and Alpine County in District 10. They are now working to prevent spraying in the remainder of the state. According to the report, Caltrans has issued Environmental Impact Statements promising to lessen the use of toxic herbicides and to stop spraying weeds solely for the sake of appearances. Although their proposals look good on paper, Caltrans consistently has not followed through, according to CATs. Caltrans has also promised to avoid herbicide spraying within 100 feet of children's bus stops, though the agency has neglected to identify where they are located. A pledge made in 1992 to reduce its use of herbicides by 50% by the year 2000 is unlikely to be met by Caltrans, despite millions of dollars spent on research studies, says the report.

Caltrans serves as a model for much smaller county road agencies throughout the state, yet has failed to act as a responsible state agency, says the report. According to CATs, most of Caltrans' twelve district offices could not provide a basic summary of their use of toxic herbicides. CAT says Caltrans officials are not sure how much the agency spends on herbicides — annual expenditures can only be estimated at \$4 to \$6 million for weed killing chemicals.

The report also illustrates how roadside vegetation problems can be managed by using non-toxic alternatives while staying well within state budget requirements. Alternatives include planting flowers, integrated vegetation management (IVM), or using natural herbicides.

The following summaries and excerpts from *The Poisoning of Toxic Thoroughfares* adequately illustrate Caltrans' inconsistencies.

Caltrans

As required by the California Environmental Quality Act (CEQA), all districts of California must compose an annual plan that describes in detail how roadside vegetation is managed under their jurisdiction. The plans are meant to be ac-



Photo credit: Californians for Alternatives to Toxics

cessible to the public and regulatory agencies, but are so complicated that it is unlikely even herbicide applicators will be able to follow them when out spraying, says the report. Difficulty may also arise when trying to obtain such information.

The annual vegetation control plan issued by Districts 1 and 2 maintenance managers includes a delineated summary of chemical herbicide use, as it is required under CEQA. None of the other ten Caltrans district offices could produce a similar report, taking up to seven months before furnishing the legally required summary.

Other District offices delayed providing information and when finally compelled to do so also revealed their incomprehension of public record law. District 6 officials waited five months to reply to an initial informational request, then insisted that supplying the data would cost \$500. The worst response time was logged by employees of District 7 who dragged their feet for seven months before giving the information that was requested.

Oftentimes, Caltrans removes roadside weeds with toxic herbicides just to establish "clean" roadways. This, they claim, is to ensure the safety of travelers. According to Caltrans, the removal of weeds to heighten visibility of signs and other vehicles is key in preventing car accidents and loss of property.

Vegetation management activities cost Caltrans well in excess of \$23.5 million each year. Some of their weed control directives are explicit, such as when engineering specification mandate that bridges and culverts be kept free of

plant growth. State and federal laws also require that certain plants considered noxious weeds be eliminated before they spread to adjacent fields. Far more equivocal, however, are decisions about how a road should look. These are based on highly subjective and debatable opinions.

It's the safety of the road-driving public and their own employees that is the most important determining factor, claim road agencies. They cite their formidable responsibility of preventing car accidents and loss of property by preserving on-the-road visibility of other vehicles and signs. They must keep paving intact, provide rapid drainage, and prevent fires, all of which, they say, can't be done without herbicides.

California's use of roadside herbicides is widespread

According to *The Poisoning of Public Thoroughfares*, Caltrans and county road agencies apply more than 132,000 gallons of liquid herbicides and 93,000 pounds of dry herbicides on road-sides in a typical year. In its study, CATs found that Caltrans applies an average of five gallons of liquid and two or more pounds of dry herbicides per road-mile to the 15,000 miles of highways under its jurisdiction. Additionally, the report found that "51 of the state's 58 county governments also rely on chemical poisons to kill weeds, averaging more than one pound and one gallon of herbicide per mile along the 64,000 miles of roads under county management."



Photo credit: Califor nians for Alter native to Toxics

Pollution Effects: Water, Air, and Soil

Water

The California Department of Pesticide Regulation (DPR) has conducted annual studies on California water sources, which have found that the same herbicides, year after year, contaminate well water.

Herbicide leachers were first found polluting the state's ground water a decade ago. The most popular herbicide used by public road agencies is still diuron, which has been found in many wells each year since sampling began fourteen years

ago. Bromacil and simazine – two other top roadside defoliant – have also been found in water samples. Norflurazon, the state's third most popular roadside herbicide, was just detected for the first time in 9.5% of wells in 1997. This is because it was commonly not anticipated to pollute ground water and consequently on a low-priority sampling list.

Some roadside chemicals that are considered non-leaching herbicides, such as glyphosate and oryzalin, are actually very likely to wash away with rainwater and pollute surface waters, says the study. California, however, neither samples nor tests roadside surface water for glyphosate, oryzalin, or any of the herbicides sprayed along public roads.

Air

Roadside herbicides are also known to drift and evaporate, causing air pollution, says the study. Although inhalation is the pathway of greatest exposure to the millions of people traveling on California roadways, Caltrans neglected to study drift exposures in its 1992 risk assessment on roadside chemicals. Caltrans commonly uses chemicals known to cause drift, such as glyphosate. "14% to 78% of glyphosate has been found to drift away from the sprayed target, and glyphosate residues have been detected up to 1,300 feet from where it was applied," says the report.

CALTRANS ST. HWY			COUNTY ROADS	
Gallons	Pounds	Active Ingredient	Gallons	Pounds
9,916	8,387	Diuron	16,627	20,356
35,229		Glyphosate	27,283	
	14,661	Oxadiazon		1,128
1,459	1,059	Simazine	1,718	16,605
	6,137	Norflurazon		13,119
9,032		Oryzalin	418	665
	4,870	Isoxaben		
	3,612	Bromacil		949
1,480		Diquat	2,307	
	2,028	Am. Sulfate		
	1,434	Sulfonyl Ureas		1,584
1,324		Triclopyr	1,156	
1,986		Oxyfluorfen	246	
		2,4-D	1,220	1,756
695		Arsenic	30	
1,337	1,987	Other herbicides	340	1,111
2,131		Activator 90	1,000	
2,360		Other surfactants	3,201	54
66,949	44,175	TOTALS	55,546	57,327

Califor nians for Alter native to Toxics



Photo by Michael Amstler

promises to do so, says CATs. Children are especially susceptible to toxic effects from pesticide exposure due to their size, developing tissues, and lower ability to metabolize toxins.

The chances that children may be exposed to the harmful chemicals applied by these agencies are enormous. Of 15,000 miles of highway maintained by Caltrans, almost two-thirds are sprinkled with school bus stops. Many more bus stops are located along the 64,000 miles of roads maintained by country agencies. Making matters worse, chemical weed control for both Caltrans and county roads is concentrated in the months from October through April, while children are attending school.

The road agencies claim they try to avoid spraying where signs indicate bus stops on unknown areas of heavy foot traffic. Caltrans even acknowledged its obligation to protect children in its 1992 Environmental Impact Statement on roadside vegetation control, when it pledged to “not apply chemicals within 100 feet of school bus stops identified by public school districts” and to develop guidelines to “modify or exclude chemicals on roadsides where children walk to school.”

However, few, if any, of the road agencies actively pursue information about the location of school bus stops or areas where children walk so that applicators will know where to avoid using herbicides.

Soil

Of the top eight herbicides used by Caltrans, half are highly persistent in soils, while the others are “moderately long lasting.” Exposure may occur when chemicals clinging to dust particles are absorbed or inhaled. However, Caltrans has not studied the effects of herbicide spraying on roadside soil or on the pollution level of dust.

The Chemically Sensitive

Exposure to pesticides along roadways can be particularly threatening to those with Multiple Chemical Sensitivities (MCS). Travel on public roads can be extremely hazardous to this group of people, because contact with herbicides can trigger illness or even life threatening reactions. The actions of government agencies that use toxic chemicals threaten the health of many members of the public.

... a recent survey conducted by the state Department of Health Services found that of adult Californians, 16.9% — or as many as four million people — believe that they display symptoms of sensitivity to chemicals. Of these, 6.4%, or as many a 1.5 million people, have been medically diagnosed with MCS. This means that one in six adult travelers could be especially sensitive to the adverse health effects of roadside spraying.

Children at Risk

Caltrans is making very little effort to avoid applying herbicides to areas where children walk and catch school buses, despite

Alternatives to Spraying

There are many viable alternatives to herbicide spraying for California's roadside weeds, says CATs. These alternatives are not more expensive than herbicide applications, and are oftentimes less expensive. Some alternatives, as listed in the report, include dry steam, preferred vegetation planting, Integrated Vegetation Management (IVM), and the use of organic mulches. Wildflower plantings can out-compete roadside weeds, while IVM uses monitoring to determine whether vegetated areas require maintenance. Organic mulches containing corn gluten, a set of two amino acids found in the germ of the corn seed, act as natural herbicides by preventing root systems from developing from seeds.

Conclusion

The *Poisoning of Toxic Thoroughfares* documents Caltrans' extensive inconsistencies in implementing their proposed policy as stated in their 1992 Environmental Impact Statement. Caltrans is consequently putting the public at risk while failing to provide people with the information they need, such as when spraying will occur and what herbicides will be used. Travelers on California public roads are unaware of the dangers they face from exposure to toxic herbicides, and are thus unable to protect themselves accordingly. *For a copy, send \$14 (ppd) to CATs, P.O. Box 1195, Arcata, California 95518, 707-822-8497, catz@reninet.com.*

The Organic Cotton Briefing Kit and Organic Cotton Directory 1998-1999



(Pesticide Action Network North America and the Organic Trade Association's Fiber Council, 1998). This collaborative project of the Organic Trade

Association's Fiber Council (OFC) and Pesticide Action Network North America (PANNA) illustrates the recent growth of the organic cotton industry. Because of growing concern for the environment and awareness of the extremely large amounts of highly toxic pesticides used in conventional cotton agriculture, many farmers have been switching to organic methods for producing the fiber. More companies and retail stores are also devoting themselves to selling only organic cotton materials. PANNA's *Organic Cotton Briefing Kit* includes factsheets on environmental and social degradation associated with conventional cotton agriculture and genetically engineered cotton, such as high pesticide poisoning rates of cotton farmworkers, groundwater contamination from pesticide runoff, and increasing resistance of cotton pests. The kit additionally cites U.S. organic cotton farming success stories and is a key tool for PANNA's "Switch to Organic Campaign." Included in the kit is PANNA's and OFC's collaborative *Organic Cotton Directory*, which lists organic cotton farmers, brokers, merchants, support organizations, mills, companies, and retail stores around the nation and world. The directory is a valuable tool for starting an organic cotton company or farm, or for purchasing organic cotton items. For a copy of the *Organic Cotton Briefing Kit and Organic Cotton Directory*, send \$15

to PANNA, 49 Powell St. #500, San Francisco, CA 94102, 415- 981-1771, panna@panna.org.

Farms of Tomorrow Revisited; Community Supported Farms — Farm Supported Communities

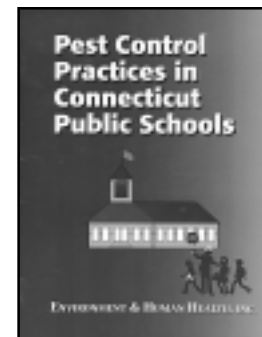


Trauger Groh & Steven McFadden. (The Biodynamic Farming and Gardening Association, Inc., 1997). Seven years after the publication of *Farms of To-*

morrow, this new edition revisits many of the same concepts of Community Supported Agriculture (CSA) and biodynamic farming. Through a series of essays, Groh and McFadden state the need for a new type of agriculture, one that takes into account ecology and nature. First and foremost, *Farms of Tomorrow Revisited* states the need for a switch to organic farming and a stop to the addition of artificial inputs, such as petroleum based pesticides and fertilizers, into the soil and farm system. New essay themes include the economic, spiritual and legal questions faced by CSA; the development of communities; the role of animals; and observations of farm-member families. *Farms of Tomorrow Revisited* stresses the need for a human and community connection with nature and food grown for human consumption. An underlying aspect of CSA is the respect that grows from this connection. The book looks for a switch from global, industrial and artificial input-based agriculture to smaller, increasingly self-sufficient and ecological CSAs. In the back of the book are examples of community farms across

the country, some of which appeared in the original *Farms of Tomorrow*, and some of which are new. Farms that were previously reported on have had their often phenomenal development re-documented. This book is ideal for those interested in biodynamic farming and CSA, as well as those either searching for a CSA in their area or wishing to start up their own. For a copy, send \$21.00(ppd) to The Wisdom Conservancy at Merriam Hill Education Center, 148 Merriam Hill, Greenville, NH 03048, or call Chelsea Green, Inc., 800-639-4099.

Pest Control Practices in Connecticut Public Schools



(Environment and Human Health, Inc., 1999). To identify pesticide use patterns in Connecticut public schools, Environment and Human

Health, Inc. conducted a survey of 150 schools in CT school districts. The study found that CT public schools spray toxic chemicals both indoors and outdoors, sometimes without any prior notification given to parents and staff, and without records regarding past applications. Children are additionally allowed to be present in schools while pesticide applications are taking place, and many schools spray on a routine schedule instead of monitoring for pests and spraying only when needed. Beyond Pesticides/NCAMP board member John Wargo, Ph.D., School of Forestry and Environmental Studies, Yale University, is a primary author of the study.

Data was gathered for the study from the 77 Connecticut schools that responded to the survey (52% of total).

From Department of Education data, the study's authors calculated that 116,218 children attend schools in CT that routinely spray pesticides, while 12,860 children attend schools where no pesticides have been applied in the past year.

The study's discussion briefly overviews children's special susceptibility to adverse effects from environmental toxins, the shortcomings of the federal government's risk assessment process, and how pesticide poisoning symptoms are commonly misdiagnosed by doctors. The report identifies safe solutions to pest control problems in Connecticut schools, offers suggestions to parents and others as to what can be done to protect children and staff from pesticide exposures in school, and recommends policies that the state should adopt. *For a copy (24pp), send \$2 (ppd) to Environment and Human Health, Inc., 1191 Ridge Road, North Haven, CT 06473, 203-248-6582.*

Flyers Beware: Pesticide Use on International and U.S. Domestic Aircraft and Flights



Becky Riley (Northwest Coalition for Alternatives to Pesticides, December 1998). This report released by the Northwest Coalition for

Alternatives to Pesticides (NCAP) finds that pesticides containing active ingredients such as permethrin, resmethrin, and d-phenothrin are commonly sprayed on both cargo planes and passenger aircraft in the U.S. and in other countries. Pesticides sprayed in passenger cabins are sometimes long lasting, residual insecticides, says *Flyers Beware*. The pesticides are sprayed by airline personnel or com-

mercial pest control companies, either voluntarily by the airline or to comply with U.S. regulations and requirements of other countries. Which countries require "disinsection" to kill "stow away" insects are also listed in the report. Pesticides are sprayed on regularly scheduled maintenance procedures in cargo holds, unoccupied or occupied passenger cabins, galleys, and cockpits, says the study.

The study notes that airline air quality is already very poor due to lack of adequate ventilation and restrictions on fresh air intake during flights. According to the study, up to 50% of the air in passenger cabins is recycled. *Flyers Beware* explains health hazards associated with pesticide spraying on airplanes, especially for infants, children, pregnant women, asthmatics, cancer patients and other sensitive individuals. In the study, NCAP urges passengers who wish to know if pesticides will be sprayed on a particular flight to contact the airline directly and ask about both discretionary and required spraying. The publication can also guide future passengers to people at specific airlines knowledgeable about pesticides spray practices. *For a copy of the study send \$4.00 (ppd) to NCAP, P.O. Box 1393, Eugene, OR 97440, 541-344-5044 or see www.efn.org/~ncap/.*

The Organic Revolution



(IPM) to the public's attention with this special report, *The Organic Revolution*, in its March-April, 1999 issue. Pesticides in conventional farming systems have affected environmental and human health drastically since their widespread use beginning in the

Joel Bourne (Audubon, March-April 1999). *Audubon Magazine* has brought the issues of organic farming and integrated pest management

1950s. Pesticides have been implicated in numerous cases of wildlife deformities, such as shrunken reproductive organs in Florida alligators and malformed legs and eyes in frog populations around the country, while it is estimated that 300,000 farmworkers will be poisoned by pesticide exposures this season. Many farmers are responding by switching to safer, organic methods, such as crop rotations to prevent persistent soil diseases, mulching to suppress weeds, and the use of beneficial insects to control pests, says the report.

The U.S. Department of Agriculture (USDA) released its first draft proposal to bring organic labeling under federal law in December 1997. Much to organic farmers' and the National Organic Standards Board's (NOSB) disdain, the draft left open the possibility of using irradiation, sewage sludge, and genetically engineered crops in organic food production. The study states the problems associated with these methods. These include the toxic chemicals and heavy metals commonly found in sewage sludge and how genetically engineered crops can lead to a higher dependence on pesticides and increasing pest resistance. After the release of their draft proposal, the USDA was deluged with 280,000 public comments, causing Secretary of Agriculture Dan Glickman to drop the proposed standards.

According to the *Organic Revolution*, industry giants, such as Campbell Soup, Del Monte, and Woodbridge Winery are adopting innovative IPM practices. In 1993, the Clinton Administration set a goal of putting 75 percent of U.S. farmland under IPM by the year 2000. Unfortunately, response has been slow. "We are making progress," says Deputy Secretary of Agriculture Richard Rominger, the agency's point man on the project. "Unfortunately, we haven't got the funds we need from Congress. IPM is the way to go. We need to encourage research to make the tools available to farmers." *For a copy, send \$2.00 ppd to Beyond Pesticides/NCAMP. The report is in the March-April issue of Audubon, which is available on magazine racks.*

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