Pesticides and You

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Ending Toxic Dependency: The State of IPM

State laws allow broad dependency on toxic pesticides; four states call for pesticide reduction and alternatives

Ending Toxic Dependency

Only four states have policies that try to kick the pesticide habit on state property

Do state governments, under their statutes, manage their property (parks, rights-of-way, highways, buildings, and landscapes) with any requirements to limit the use of poisons? Our report, *Ending Toxic Dependency: The State of IPM*, published in this issue of *Pesticides and You*, finds that policies do not exist in 40 states and the District of Columbia and that existing policies in only 10 states are limited and mostly inadequate. However, there is some good news in those states.

Our 2000 study, *The Schooling of State Pesticide Laws*, documents over 30 states that have adopted measures to require notice of or restrict, in some way, pesticide use in school buildings and on grounds (pesticide use notification, buffer zones around neighboring pesticide use sites, and/or IPM). We know that IPM definitions in those laws vary as does the success of the programs. This is changing and increasingly at the school district and local government level communities are saying no to toxic pesticides and specifically delineating as unacceptable chemicals that cause cancer, reproductive harm, neurological and immune system disorders, and more. The Connecticut law passed this year that bans the use of pesticides on playing fields is an unequivocal policy that responds implicitly to the known and untested adverse effects of pesticides, and the fact that organic practices work. The Town of Townsend, Massachusetts in June passed an ordinance requiring the use of only organic practices in managing town property. The change that has occurred over the last decade in school and community pest management policy is a tribute to the parents and community-based advocates who have worked with school personnel and extension agents, as well as policy makers and elected officials willing to stand up for the health of children, school staff, and the community.

Why look at IPM

Moving beyond the school property line, we now look at state policy overall. Our question is simple: What are states doing to limit unnecessary toxic pesticide use in the management of their state land and buildings? We knew that if we asked whether any state policy required the use of organic practices it would be a very short report, starting and ending with the answer --none.

We began looking at state laws requiring IPM in managing state property. Now, some may be raising your eyebrows because you know that IPM is a term that has no agreed upon definition, and has been widely misused by the chemical and pest control industry. So, we set out to evaluate the status of IPM as a tool to stop unnecessary use of poisons in the management of state land and buildings. We surveyed all the states, gathered the state laws, talked to state officials and began a compilation of the data. Our first question, once we determined that a state law requires or encourages IPM, was: What is the state's definition of IPM and does it establish a goal for pesticide reduction or minimization. Then, if we found that it did, we next wanted to know: When pesticides are used (because, of course, reduction or minimization does not suggest elimination), are they limited to "least-toxic" and are they used as a last resort, in other words, if needed only after all the prevention-oriented, non-chemical techniques.

Findings

We found that only 10 states require or recommend the use of IPM practices in the management of state property. Of those, four states adopt a goal of pesticide reduction, minimization, or elimination of unnecessary use. We call this *prioritized strategic IPM*. Of the four, only two (first tier) adopt the notion that pesticides should be used as a last resort or after other methods have been utilized. However, the two with the best goal statements do not actually implement programs. . .yet. The other two (second tier) have reduction goals, but do not require a last resort determination before chemical methods are used and therefore do not ensure that the essential components of IPM (we identify eight) are fully implemented through an exhaustive process. The state of Maine comes out on top. Maine adopts a goal statement and seven of the eight essential IPM components, but does not include last resort language. One more note. No state defines "least-toxic."

The other six states that have IPM policies for state property adopt the definition most promoted by the chemical and pest control industry –a simple combination of practices without priority being given to non-chemical practices and absent reduction goals and least-toxic chemicals. But because this definition includes IPM components, we call this approach *non-prioritized tactical IPM*. In our experience, it can result in some pesticide reduction, but does not achieve optimal results.

We hope that this report elevates an important national dialogue in the community and states. We call for local, state and national policy with a clear IPM definition (reduction goals), least-toxic pesticides only (defined), eight essential program components, and the creation of an office of IPM coordination.

Clearly, regardless of what we call it, we need local, state and national policy to embrace the precautionary principle of avoiding hazardous substances, and put in place practices that define and prevent problems. In fact, although organic practices can be applied within an IPM methodology, which is, in reality, a decision making and evaluation process, IPM itself is inherently limited. It allows us to manage state lands and buildings effectively while minimizing hazards to people and the environment, but it operates in a warfare paradigm with humans fighting all other organisms. We need to respect our relationship with the environment and ultimately change our worldview. However, as an urgent first step, we must push the current paradigm to its limits. Let's elevate the debate on phasing out toxic pesticides and get effective policies in place.

- Jay Feldman is executive director of Beyond Pesticides

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A Chemical Injury Treatment Breakthrough

I think your readers will be interested in an update on what I feel is ground-breaking treatment for chemical injury and other medical problems. I will describe my clinical experience with over 300 patients and my recommendations as well as scientific observations. It may be easier to understand my description by also consulting information on my website: www.chemicalinjury.net, listed under the homepage section on "New Treatment." [The treatment includes a daily vitamin and nebulizer regimen.]

In my patient experience, this approach to treatment has been effective in medical conditions that involve the vicious biochemical cycle sometimes referred to as nitric oxide-peroxynitrite. In some individuals, the cycle is moving rapidly, creating extensive damage. In others, it is moving more slowly and requires fewer substances/lower doses for medical intervention.

This medical intervention is complementary to environmental controls, but achieves much greater ability to enter various social situations than with environmental controls alone. It has allowed my patients more rapid recovery from reactions, milder symptoms and fewer medical visits for illness from nearby pesticide exacerbations. It helps reduce the great isolation that has long affected people with chemical injury.

Symptoms Treated

In my experience with patients, medical conditions which typically respond well include migraine, chronic sinus inflammation, chronic middle ear inflammation, hoarseness, lung symptoms, asthma, chronic fatigue (including "chronic fatigue syndrome"), mold-induced chronic symptoms, chronic widespread inflammation (including "fibromyalgia"), toxic and mold-related liver pain/inflammation, neurological symptoms/toxic encephalopathy symptoms and effects, chronic gastrointestinal symptoms, genital urinary inflammation, burning of eyes and other body locations, certain blood vessel changes related to inflammation, attention deficit in adults, and attention deficit and hyperactivity in children.

Nerve and brain repair can improve further with testing/evaluation and then advising on substances needed for myelin repair. This approach also helps with repair of cell membranes.

I have also seen improvement in autoimmune conditions including but not limited to autoimmune thyroid disease, lupus, Raynaud's, adult diabetes, and multiple sclerosis.

Treatment Tailored to Patients

It would be wonderful if one formula could address all of these conditions in everyone. However, people differ in their living situations, exposure and other environmental exacerbations. People also differ in genetics, dietary intake, food intolerances and nutrient levels on testing. Other gastrointestinal conditions that are treatable also affect the ability to utilize the protocol.

Initial dosing needs can vary widely and if done incorrectly, some people have adverse effects and mistakenly feel they can't be helped. Proper mineral balancing is important for bone and other functions.

The degree of severity of the respiratory symptoms and occasionally changes in brain biochemistry affect the dosage and sometimes the ability to use some nebulizer substances and some of the oral substances. Sleep can be improved by timing of when needed substances that have a relaxing affect are given.

Beyond Pesticides Daily News Blog

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

Excerpt from Beyond Pesticides original blog post (6/27/07):

Ingredients in Foods Labeled Organic

The U.S. Department of Agriculture (USDA) gave interim approval last Friday to a controversial proposal that allows 38 non-organic ingredients to be used in foods carrying the "USDA Organic" seal. The agency also decided to allow an extra 60 days for public comment on the rule….

Nick Says:

I agree with Kimberley Wilson: "If the label says organic, everything in that food should be organic." It's true, we pay double the price for organic food. We expect that food is 100% organic. When I buy organic food, I always look for the USDA symbol. If USDA allows these 38 non-organic ingredients to be included in organic-labeled products, how I can trust the organic-labeled foods anymore? Please protect the consumers!!!!

It has been my experience that the treatment is most effective when customized to the individual patient and their test results as well as the above variations of environment, diet, exposures, etc.

I would be happy to provide more information that can benefit PAY readers and to assist local providers and others to help patients.

Documenting Improvements

I have been following patient improvement not only through medical follow-up but also using the standardized questionnaire developed by Claudia Miller, M.D. If any readers have suggestions or proposals on how to provide independent documentation of efficacy, I would be very interested.

Please feel free to call my office at 301-241-4346 or to write to me at 16926 Eylers Valley Road, Emmitsburg, MD 21727 for assistance and suggestions.

I continue to support preventive measures and reasonable accommodation in environmental controls, but I do see this as a major medical treatment breakthrough. You may be interested to know that heightened sensitivity to light, sound, and electromagnetic fields has also been reduced with this approach in my experience.

Sincerely,

Grace Ziem, M.D., Dr. P.H.
Emmitsburg, MD

Educating on Pesticide-Free

In May, we hosted an open house for touring our native plant and wildlife yard, almost eight years after its inception (bare ground, after getting rid of most of the bermuda grass). It was amazingly well attended for Carlsbad – more than 20 people – and most people were fascinated and full of questions and discussion. It didn't hurt that we've had an amazing amount of rain this spring – several inches over normal, by anybody's count. Almost everything was in flower or fruit, even the summer grasses.

It was fortuitous that we'd just had a big hatch of bordered patch butterfly eggs. There were many sunflower leaves covered with dozens of first instars, all munching away. I also saw a couple of larger larvae on their own leaves.

I made sure to show the 'butterfly nursery' to everyone. Predictably, they were at first repulsed at the sight of so many 'bugs' eating the beautiful sunflowers. But as I talked through the process, explaining how I'd never lost a plant, they seemed interested. And while we were watching, at least 4 species of wasps stopped by the area and landed on the leaves. I explained about nature's 'pest control' and how what's a 'pest' to us is usually somebody's food.

I also talked about the hornworms we've had and how they eat the Daturas leafless, the Daturas leaf out again, and then the adults pollinate the flowers. And the time I saw ichneumon wasps ovipositing in one.

And I talked a lot about solitary bees and wasps. One person said she's been told that carpenter bees attack people. So I told them about how they're gentle mothers, and how they need standing dead stalks from sotol and agave to make their nests. A couple people were already on board with not cleaning up yard debris for invertebrate habitat.

Our "Pesticide Free Zone" sign was prominently displayed, and I gave away a couple of your newsletters to interested people. It was really fun to show people how to enjoy insects instead of spraying them.

Renee
Carlsbad, NM

Speak Your Mind!

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

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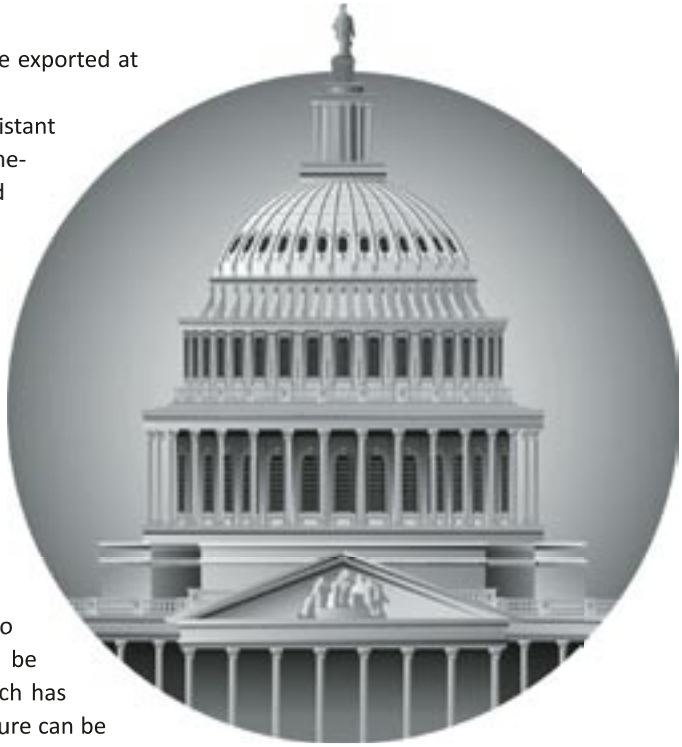
Solving World Hunger Organically

Researchers who gathered at the United Nation's International Conference on Organic Agriculture and Food Security on May 3-5, 2007 in Rome say organic agriculture may play a key role in the fight against world hunger. Researchers say a large-scale switch to organic is expected to meet food demand while greatly reducing the expensive and harmful synthetic chemicals that have been introduced globally via industrial agriculture. Researchers from Denmark have predicted that food security in sub-Saharan Africa would not be seriously harmed if 50 percent of agricultural land in the food exporting regions of Europe and North America were converted to organic by 2020. The potential rise in world food prices from such a shift can be mitigated by improvements in the land and other benefits, according to the researchers. A similar conversion in the actual region would also be beneficial because it could reduce the need to import food to the sub-Sahara. Other benefits include the use of methods that would eliminate the need for the region's farmers to come up with money for expensive chemicals, such as pesticides, and would encourage the growth of more diverse and sustainable crops. Additionally, if certification is made available, any surplus of organic foods can be exported at favorable prices.



Alexander Mueller, assistant director-general of the Rome-based United Nations Food and Agriculture Organization (FAO), praised the models predicted by the Danish researchers and noted that projections indicate the number of hungry people in sub-Saharan Africa is expected to grow. Considering that the effects of climate change are expected to hurt the world's poorest, "a shift to organic agriculture could be beneficial," he said. Research has shown that organic agriculture can be part of the solution to reducing global carbon emissions and increasing atmospheric carbon sequestration, and thus can be a valuable tool in fighting global warming. The Rodale Institute's Farming Systems Trial, the world's longest running study of organic farming, has documented that organic soils actually scrub the atmosphere of global warming gases by capturing atmospheric carbon dioxide and converting it into soil material. This is the first study to differentiate organic farming techniques from conventional agricultural practices for their ability to serve as carbon "sinks." The Rodale study also shows that organic agriculture outperforms conventional in drought years and matches conventional in years of average rainfall. Climate change is expected to bring drought conditions to many parts of the world. *The papers submitted to the UN are available at ftp://ftp.fao.org/paia/organicag/ofs/OFS-2007-INF-rev.pdf and the Rodale Institute's work is published in the Spring 2007 issue of Pesticides and You.*

Federal Judge Orders Injunction, Complete Review of GE Alfalfa

In a precedent-setting decision filed May 3, 2007, Judge Charles Breyer ordered a complete environmental review of Monsanto's genetically engineered (GE) alfalfa, making a final ruling that the U.S. Department of Agriculture's (USDA) 2005 approval of the "Roundup Ready" alfalfa was illegal (*Geertson Farms, et al. v. Johanns and Monsanto*, No. C 06-01075 CRB). The court called on USDA to ban any further planting of the GE seed until it conducts a complete Environmental Impact Statement. In the decision, the Federal Northern District of California affirmed its preliminary ruling, which echoed the Center for Food Safety (CFS), joined by Beyond Pesticides, farmers and other co-plaintiffs' position in the lawsuit, that the crop could harm the environment and contaminate natural alfalfa. The ruling also requires Forage Genetics to provide the locations of all existing Roundup Ready alfalfa plots to USDA within 30 days. Judge Breyer ordered USDA to make the location of these plots "publicly available as soon as practicable" so that growers of organic and conventional alfalfa can test their own crops to determine if there has been contamination. "This permanent halt to the planting of this risky crop is a great victory for the environment," said Will Rostov, a senior attorney for CFS. "Roundup Ready alfalfa poses threats to farmers, to our export markets, and to the environment." Judge Breyer specifically noted that Monsanto's fear of lost sales "does not outweigh the potential irreparable damage to the environment" and found that USDA failed to address the problem of Roundup-resistant "superweeds" that could follow commercial planting of GE alfalfa.

Industry Foots Bill for EPA Travel

A study released April 27, 2007 by the Center for Public Integrity finds that industry, including pesticide companies, spent over $12 million on trips for U.S. Environmental Protection Agency (EPA) employees between October 1997 and March 2006. During that time, EPA officials took more than 10,000 privately sponsored trips totaling more than 40,000 days away from their offices. While some of those trips were legitimate fact-finding missions paid for by companies, local governments, nonprofit organizations, universities and international environmental groups, many were funded by those with a financial stake in EPA decision making, including groups and companies that receive EPA contracts and grants, groups lobbying the federal government and companies with ties to federally recognized toxic waste sites, according to disclosure documents. Although EPA's authority is limited to the U.S., more than $6.6 million was spent on trips to other countries. Agency employees took more than $2 million in trips to France, Germany, Italy, China, Japan, Taiwan and Thailand. Many of the domestic trips were to vacation destinations such as Florida, Hawaii, Atlantic City, Las Vegas and Reno.

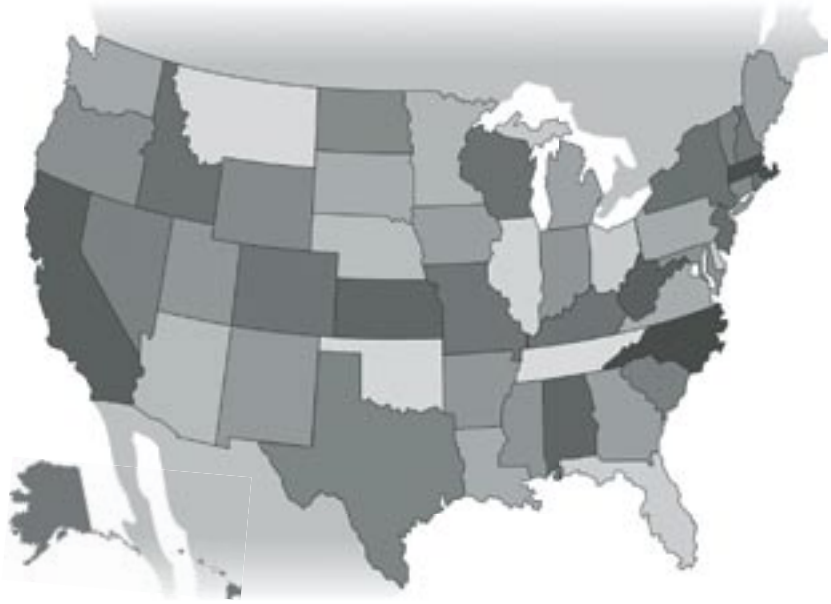
The Center also examined EPA's top contractors. Twelve of those paid more than $25,000 for trips taken by EPA officials. Those companies received more than $2.7 billion from EPA in contracts in fiscal years 1998 to 2005. Hundreds of nonprofits, universities and other organizations that received EPA grants also paid for travel taken by agency officials. The Center found that some EPA trips were underwritten by companies that the agency has identified as "potentially responsible parties" for pollution at the country's worst toxic waste sites. The Center obtained EPA's list of 100 companies linked to the largest number of those Superfund sites and analyzed their spending on EPA travel. At least 14 of the companies found on the list spent a total of more than $40,000 for agency officials' trips in the study period. The companies have been linked to at least 353 Superfund sites. In all, groups that lobby the federal government paid for more than 20 percent of all EPA trips. Government watchdog groups say that some of this $1.8 million in travel for agency officials could be seen as an extension of lobbying.

EPA Sued for Disregarding Pesticide Impact on Endangered Species

On May 30, 2007, the Center for Biological Diversity filed a lawsuit against the U.S. Environmental Protection Agency (EPA) for violating the Endangered Species Act (ESA) through its registration of 60 toxic pesticides in habitats for nearly a dozen San Francisco Bay-area endangered species without determining whether the chemicals jeopardize their existence. "Ending the use of known poisons in habitat for our most endangered wildlife is an appropriate 100th birthday tribute to Rachel Carson, who alerted us to the hazards of exposure to toxic chemicals almost half a century ago," said Jeff Miller, conservation advocate with the Center. "Unfortunately the EPA has not learned from her legacy and still has no plan to adequately assess impacts while registering and approving pesticide uses that pose a clear and present danger both to imperiled species and human health." At least 61 million pounds of pesticide active ingredients were applied in Bay Area counties from 1999 through 2005 — over 8.5 million pounds annually. Actual pesticide use may have been several times this amount since most home and commercial pesticide use is not reported to the state. Under the Bush administration, EPA has consistently failed to consult with the U.S. Fish and Wildlife Service on endangered species impacts when registering and authorizing use of toxic pesticides, as required by law.

San Joaquin kit fox

Studies by the Fish and Wildlife Service, EPA, U.S. Geological Survey and California Department of Pesticide Regulation show that at least 60 pesticides of concern are used or accumulate in or adjacent to (upstream or upwind) habitat for 11 Bay Area endangered species: Bay and Delta aquatic habitat for the critically endangered delta smelt and the tidewater goby; tidal marshland habitat for the California clapper rail and salt marsh harvest mouse; freshwater and wetlands habitat for the California tiger salamander, San Francisco garter snake and California freshwater shrimp; and, terrestrial habitat for the San Joaquin kit fox, Alameda whipsnake, valley elderberry longhorn beetle and bay checkerspot butterfly. According to the Service, pesticide use may threaten an additional 19 of the 51 Bay Area animal species listed under ESA. The lawsuit, report on pesticide impacts to Bay Area species, maps of pesticide use, and information about the listed species are on the Center's pesticides web page at www.biologicaldiversity.org/swcbd/programs/science/pesticides.



Common Breakdown Products Are Lethal to Amphibians

The breakdown products, or oxons, of the three most commonly used organophosphate pesticides in California's agricultural Central Valley – chlorpyrifos, malathion and diazinon – are 10-100 times more toxic to amphibians than their already hazardous parent compounds, according to a study released May 30, 2007. The study, "Comparative toxicity of chlorpyrifos, diazinon, malathion and their oxon derivatives to larval Rana boylii," was published in the journal *Environmental Pollution*. Donald Sparling, Ph.D., a research biologist and contaminants specialist at Southern Illinois University, and Gary Fellers, Ph.D., a research biologist and amphibian specialist at the U.S. Geological Survey (USGS) Western Ecological Research Center in California, conducted laboratory tests to determine the acute toxicity, the lethal dosage causing death in 96 hours or less, of chlorpyrifos, malathion, diazinon and their oxon derivatives on tadpoles of the foothill yellow-legged frog. Test results indicate that the degradate of chlorpyrifos, chloroxon, killed all tadpoles and was at least 100 times more toxic than the lowest concentration of the parent compound, which resulted in no mortality. Maloxon is nearly 100 times more toxic than malathion, and diazoxon is about 10 times more toxic than diazinon. "Other data published in 2001 and new unpublished data show that these pesticides are widespread, even in pristine areas of the Sierra Nevada Mountains," Dr. Sparling said. "The combination of field and laboratory studies is revealing that organophosphorus pesticides are posing serious hazards to the welfare and survival of native amphibians in California." The authors note that amphibians inhabiting ponds in the Central Valley of California could be simultaneously exposed to two or all three of these pesticides and their oxons.

Take Action: *For more information on the growing body of literature documenting the widespread presence and subsequent danger of pesticides on water quality and aquatic organisms, see Beyond Pesticides' brochure, Threatened Waters: Turning the Tide on Pesticide Contamination at www.beyondpesticides.org/water. The brochure lists a number of action items that you can take to protect your family's health, your community and the environment.*

Academic Achievement, Pre-Term Birth Related to Season of Conception

A new study, presented May 7, 2007 at the Pediatric Academic Societies' annual meeting, finds a strong correlation between the month of conception and both likelihood of premature birth and future academic achievement. Researchers found that students conceived in June through August, when statewide pesticide applications are at their highest, clearly score the lowest on the Indiana Statewide Testing for Educational Progress (ISTEP) examinations. Dr. Paul Winchester, M.D., of the Indiana University School of Medicine, studied over 1.5 million third- through tenth-grade students in Indiana. Dr. Winchester explains the correlation saying, "The fetal brain begins developing soon after conception. The pesticides we use to control pests in fields and our homes and the nitrates we use to fertilize crops and even our lawns are at their highest level in the summer." The study also monitored levels of pesticide and fertilizer use during the year. He continued, "Exposure to pesticides and nitrates can alter the hormonal milieu of the pregnant mother and the developing fetal brain. While our findings do not represent absolute proof that pesticides and nitrates contribute to lower ISTEP scores, they strongly support such a hypothesis." In conjunction with the ISTEP study, the same research team found a connection between pesticide and nitrate levels in surface water and pre-term births. Babies born when levels were highest (April-July) are the most likely to be premature, and full-term births peak when the levels are lowest (August-September). Pre-term birth increases the risk of many health ailments.

To find out which pesticides have been linked to health effects, visit Beyond Pesticides' Gateway on Pesticide Hazards and Safe Pest Management at www.beyondpesticides.org/gateway.

Wisconsin Investigators Find Wal-Mart Improperly Labeled Products As Organic; USDA Ignores Complaint

Just when things were starting to look up regarding Wal-Mart's environmental commitment, Wisconsin consumer fraud investigators confirmed that Wal-Mart has been mislabeling conventional products as organic, confirming a complaint issued by the Cornucopia Institute in January 2007. The Wisconsin Department of Agriculture, Trade and Consumer Protection, in a letter to Wal-Mart, advised the company that "use of the term 'Wal-Mart Organics' in combination with references to a specific non-organic product may be considered to be a misrepresentation and therefore a violation" of Wisconsin state statutes. While the report did not take action beyond extending a warning to Wal-Mart, environmentalists are pleased with the investigation's outcome. "This finding is a victory for consumers who care about the integrity of organic food and farming," said Mark Kastel, co-director of the Institute. "Wal-Mart cannot be allowed to sell organic food 'on the cheap' because they lack the commitment to recruit qualified management or are unwilling to properly train their store personnel. Such practices place ethical retailers, their suppliers, and organic farmers at a competitive disadvantage." While Wisconsin has completed its investigation, the U.S. Department of Agriculture (USDA) has yet to act on the earlier complaint filed by the Cornucopia Institute. "A six-month period without any federal enforcement action is absolutely inexcusable when the largest corporation in the country is accused of defrauding organic consumers," said Mr. Kastel. "Their inaction, and our confirmation of these ongoing violations in Wisconsin earlier this year, prompted us to forward these continuing problems to Wisconsin state regulatory authorities."

For more information on Beyond Pesticides' Organic program, including information on the 2007 Farm Bill, visit www.beyondpesticides.org/organicfood.

Connecticut Governor Signs School Pesticide Bill

On June 18, 2007, Connecticut Governor M. Jodi Rell signed HB 5234, *A Bill Banning Pesticides on the Grounds of Schools*, which bans pesticides that are often linked to learning disabilities, asthma and other health problems from the grounds of schools, grades K-8. The bill passed 140-9 in the House on June 4, and 35-0 in the Senate on June 1. "There is no doubt in my mind that this bill…will move us in the organic direction and improve the health of Connecticut's younger students," said Senator Meyer, who is co-chairman of the Select Committee on Children and vice-chairman of the Environment Committee. "Pesticides have a wide variety of side effects on young children, whose immune and nervous systems are still developing and whose low body weight make them susceptible to pesticide exposure." This bill follows Public Act No. 05-252, *An Act Concerning Pesticides at Schools and Day Care Facilities*, which was passed in 2005. That law bans lawn care pesticides on the grounds of children's day care centers and elementary schools, allowing integrated pest management (IPM) on playing fields for a three-year transition period. HB 5234 expands the ban on applying lawn care pesticides to school playing fields and playgrounds to schools with students through grade eight; extends for one year (until July 1, 2009) the exemption for pesticides applied on these grounds according to certain integrated pest management (IPM) plans; expands a school superintendent's ability to authorize emergency applications of lawn care pesticides in health emergencies; and makes the state Department of Environmental Protection responsible for administering and enforcing school pesticide applications.

Keigwin Middle School in Middletown, CT is subject to the new school pesticide law.

Organic Baby Food Sales Soar

As concerns about the effects of pesticides in children's food grow, sales of organic baby food have increased dramatically, jumping 21.6 percent to $116 million this past year, after jumping 16.4 percent a year earlier, according to the Nielsen Company. Although it still only accounts for a fairly small portion of the overall baby food market, the organic baby food sector is booming. Whole Foods Market Inc. said it has tripled the space allotted to organic baby products in the past five years. Last year, Gerber Products Company rebranded and broadened its organic line, and Abbott Laboratories introduced an organic version of its baby formula. Big companies aren't the only ones addressing the demand for organic baby products. Two years ago, Gigi Lee Chang started Plum Organics, a very popular line of frozen baby foods, according to Whole Foods spokespeople. Ms. Lee Chang decided the organic foods she had been preparing for her son might be a good business opportunity. The products are sold nationally, and an extension of the line is planned for later in the year. Producers said adhering to USDA regulations makes organic foods cost more, but parents are willing to pay the difference. For example, a 25.7-ounce container of organic Similac formula retails for about $27.50, but the traditional brand costs $23.50, according to Scott White, a vice president at Abbott Nutrition. Gerber said its organic products cost about 30 percent more than its traditional baby foods. The growing organic baby food sales are part of a larger boom in organic products. This past year has also seen increasing numbers of sustainable vegetable and cotton growers, and even hospitals and schools are purchasing organic food.

Federal Research to Tackle Big Problem of Nanotech Toxicology

According to *InsideEPA*, the National Toxicology Program (NTP), part of the National Institute of Environmental Health Sciences (NIEHS), is likely to design and initiate a set of long-term studies on the toxicological properties of so-called nanosilver, a booming part of the nanomaterials commercial market about which little health data is available. The nomination list includes a request from the Food & Drug Administration (FDA) to conduct a variety of studies on nanosilver and nanogold particles, including: nanoscale materials characterization; metabolism and pharmacokinetic; acute, subacute and subchronic toxicity; and, mechanistic studies to assess the role of size and surface coating on biological disposition and toxicity. The term nanotechnology refers to research and technology that manipulates matter at the atomic, molecular, or macromolecular levels using a length scale of approximately one to one hundred nanometers in any dimension. A nanometer is one billionth of a meter, or around one ten-thousandth the diameter of a human hair. Nanotechnology allows certain materials to have different molecular organizations and properties because at their size, they have far more surface area relative to their mass than their larger counterparts. Silver, for instance has been known for years for its biocidal properties, as well as for its hazardous health effects. Nanomaterials may pose a threat to public health, as their tiny size may allow them to be incorporated into the bloodstream and pass through cell membranes. NIEHS is also leading a multi-agency research initiative looking at nanomaterials' biological fate and transport, or how they move and break down in the body. The study is expected to take several years.

Study Links Everyday Chemicals to Breast Cancer

According to a study commissioned by Susan G. Komen for the Cure and the Silent Spring Institute, 216 chemicals, many found in urban air and everyday consumer products, cause breast cancer in animal tests. The study, "Environmental Factors in Breast Cancer," the most comprehensive review to date of scientific research on environmental factors that may increase breast cancer risk, was published in the online version of the American Cancer Society's journal *Cancer* on May 14, 2007. The state-of-the-science review collected and assessed existing scientific reports on potential links between specific environmental factors and breast cancer. The researchers synthesized national and international data sources and identified 216 chemicals that cause breast tumors in animals, including ten pesticides. They used the information to create a searchable online database featuring detailed information on the carcinogens. The database, accessible at www.komen.org/environment, is available free of charge. It reveals that among the 216 compounds that cause breast tumors in animals, 73 have been present in consumer products or as contaminants in food, 35 are air pollutants, 25 have been associated with occupational exposures affecting more than 5,000 women a year, 29 are produced in the United States in large amounts, often exceeding one million pounds per year and 10 are pesticides. The pesticides are 1,2-dibromo-3-chloropropane, atrazine, captafol, chlordane, clonitralid, dichlorvos, fenvalerate, nifurthiazole, simazine, and sulfallate.

Ending Toxic Dependency: The State of IPM

State laws allow broad dependency on toxic pesticides; four states call for pesticide reduction and alternatives

by Jay Feldman and Laura Hepting

The Maine State Capitol Building in Augusta, as well as most other state-managed buildings are subject to state IPM law.

With increasing public awareness of pesticide hazards,[1] widespread agreement has emerged that integrated pest management (IPM) and organic practices are preferred land and structural management tools in both (i) embracing concerns about protecting health and the environment and (ii) utilizing practices that are efficacious and cost effective.[2] However, in the field of IPM, an approach to preventing and controlling unwanted organisms that has a history of varied definitions and policies, there are numerous perspectives, and critical disagreements, among public health and environmental advocates, regulators, and the pesticide and pest management industry. While organic agricultural practices are clearly codified in federal statute[3] with a definition, acceptable methods and materials, and a certification and enforcement process, there is an absence of federal IPM policy that requires clear, meaningful and enforceable standards and practices for the management of state-owned public land and buildings. This report fills a critical gap in evaluating state IPM laws governing state property in the 50 states and the District of Columbia (hereafter referred to as states) with criteria for effective management benchmarks. Since the laws themselves, however, do not alone ensure the implementation of an IPM program, the assessment in this report includes interviews with state officials and environmental advocates.

State policy restricting pesticide use on state-owned and managed property serves as an important measure of public health and environmental protection, given the widespread chemical exposure associated with the management of 195 million acres of land area across the U.S., affecting virtually all residents.[4] State policy can also influence the direction of practices used by local jurisdictions (villages, towns, cities and counties) and on private lands, setting a tone that either encourages or discourages pesticide-dependent practices. Local government policy requiring organic or IPM practices is critical in the absence of state and federal law that adequately restricts pesticide use. The evaluation in this report of state laws governing specific species management practices on state-owned and managed property supports the need for defined and effective state IPM and organic programs, codified in policy and effectively carried out.

Methods

All state pesticide agencies were surveyed on IPM policy. Each state was requested to identify and provide copies of state IPM legislation, regulation, policy directives, and/or guidance materials, as well as the current contact information for the person/department in charge of the state's IPM program, if applicable. States were also requested to identify any local political subdivisions that have IPM policies and, if possible, provide copies (or web links) of local ordinances, policies, and/or guidance materials.

The survey response rate is 90% (45 of 50 states and the District of Columbia). Data from the remaining states was obtained through the review of state pesticide acts and other legislative/administrative policies available on states' websites, a research method that was also used to supplement information provided by participating states.

All state policies are analyzed for (i) an IPM policy governing state-owned and managed lands and buildings, (ii) definition of IPM, (iii) eight essential IPM components, (iv) IPM leadership and coordination, and (v) other related issues. To pinpoint the degree to which each state has institutionalized IPM, interviews were conducted with representatives from all states with an IPM policy to determine the degree to which these policies are being implemented.

Local IPM and pesticide reduction policies were compiled through internet research and review of Beyond Pesticides' database and files. Beyond Pesticides' coalition members provided assistance by facilitating various aspects of the process in their respective states.

Summary Findings

Four states, or 8%, adopt the IPM policy goal of pesticide reduction or curtailing unnecessary pesticide use on state-owned or managed property,[5] while the vast majority (92%) of states either has no policy or one that is seriously deficient. Only two of the four states with specific pesticide reduction goals have a mandatory program. All state IPM policies fail to incorporate the eight essential components of IPM (see box), and the majority of states (6 of 10) that adopt one or several of the IPM components do not explicitly establish the goal of pesticide reduction. Instead, this group of states treats IPM as a combination of approaches, including the use of all available pesticides, without any attempt to prioritize the use of non-chemical methods or least-toxic chemicals only as a last resort. None of the state policies requires organic practices for management of state lands. Less than 18% of the states (9) have adopted at least one of the eight IPM program components critical to an effective program. No state incorporates all of the program components essential to IPM. Only seven states adopt multiple components, with one state incorporating six and another incorporating seven of the eight essential components.

Practices Essential to IPM

IPM is a pest management system that (a) eliminates or mitigates economic and health damage caused by pests (b) minimizes the use of pesticides and the hazards to human health and the environment associated with pesticide applications, and (c) uses integrated methods, site or pest inspections, pest population monitoring, an evaluation of the need for pest control, and one or more pest management methods, including sanitation, structural repairs, mechanical and biological management, other non-chemical methods, and, if non-toxic options are unreasonable and have been exhausted, least-toxic pesticides.[7]

The Eight IPM Program Essentials: (1) **Education/Training** - information for stakeholders, technicians; (2) **Monitoring** - regular site inspections and trapping to determine the types and infestation levels of species at each site; (3) **Pest Prevention** – the primary means of management calls for the adoption of cultural practices, structural changes, and mechanical and biological techniques; (4) **Action Levels** – determination of population size, which requires remedial action for human health, economic, or aesthetic reasons; (5) **Least-hazardous pesticides** – pesticides, used as a last resort only, are least-toxic chemicals not linked to cancer, reproductive problems, endocrine disruption, neurological and immune system effects, respiratory impacts and acute effects; (6) **Notification** – provides public and workers with information on any hazardous chemical use; (7) **Recordkeeping** - establishes trends and patterns in problem organisms and plants, including species identification, population size, distribution, recommendations for future prevention, and complete information on the treatment action; (8) **Evaluation** - determines the success of the species management strategies.

IPM Definition

In the 10 states that have codified in state law IPM practices for state-owned or managed property, two types of IPM definitions emerge:[6]

■ ***Non-prioritized Tactical IPM.*** With *non-prioritized tactical IPM*, the state IPM practices are defined as a combination of pest management

State parks and other state-managed lands, such as Squantz Pond State Park in Connecticut (pictured above), are impacted by state IPM law.

methods (2 states: MI, MN) with no priority for pesticide or hazard reduction. Additional states specify IPM as a combined method that minimizes health and/or environmental risks (1 state: OR), as well as economic risks (4 states: AZ, OH, WA). However, this definition can be and is generally interpreted from the perspective of the health and economic risks of not using pesticides, as opposed to analyzing the real hazards or uncertainties (because of inadequate health and environmental effects testing of pesticides) associated with pesticide use.

■ ***Prioritized Strategic IPM.*** With first tier *prioritized strategic IPM*, state IPM policy seeks to reduce or eliminate hazardous pesticide use on state-owned property and requires the use of clearly defined least-toxic pesticides only as a last resort (2 states: CA, NJ).

With second tier *prioritized strategic IPM*, state IPM policy seeks to reduce or minimize pesticide use, or unnecessary use, and adopt non-chemical practices, while using least-toxic pesticides without specifically requiring a last resort determination (CT, ME). The state of Maine's policy limits pesticide use to "low impact pesticides."

Both these approaches, either implicitly or explicitly, recognize the hazardous nature of pesticides, deficiencies in the process that regulates these toxic substances, the value of avoiding use when possible (precautionary principle), and the viability of prevention-oriented strategies not reliant on hazardous pesticides.

Eight Essential IPM Components

Nine states (of the ten with state property IPM policies) identify at least one of the following eight essential components of IPM in either the definition of the term or explicitly as a part of policy requirements pertaining to the management of state-owned property. The eight components include: (1) education/training (6 states: CT, ME, MI, MN, OR, WA); (2) monitoring (7 states: AZ, CA, ME, MI, NJ, OR, WA); (3) pest prevention (6 states: AZ, CA, ME, MN, OR, WA); (4) action levels (4 states: AZ, CA, ME, OR), (5) least-hazardous/restricted pesticide use (3 states: AZ, CA, ME); (6) notification of pesticide use (1 state: ME); (7) recordkeeping (2 states: AZ, MI); and, (8) program evaluation (4 states: ME, MI, OR, WA).

IPM Coordinator

Two states (OR, WA) require the designation of IPM coordinators, one of which (WA) also requires coordinators to convene an interagency coordinating committee. Six states with state-owned property policies identify an employee with primary responsibility for IPM issues; most identify a state IPM coordinator or other state employee who is housed in the state pesticide agency (5 states: CA, CT, MI, MN, OR), and one state (ME) has an IPM coordinator at both the state's extension service program and pesticide agency.

IPM Policy Development and Implementation

Five states (CT, ME, MN, OR, WA) explicitly require widespread implementation of IPM on state-owned public property (land and buildings). Implementation is characterized by varying levels of activity. An additional five states (AZ, CA, MI, NJ, OH) require program development, but have yet to establish and implement a formal comprehensive program.

Local IPM and Pesticide Reduction Ordinances

Seventeen states (CA, CO, CT, FL, IA, KS, ME, MA, MN, NJ, NM, NY, NC, OH, OR, PA, WA) have one or more city, county or other political subdivision(s) with public property IPM or pesticide reduction ordinances (excluding school policies). Eight of these states currently have some degree of statewide IPM language as well. Only one of the seventeen states (Maine) does not have a state preemption law that prohibits local governments from restricting pesticide use on private land. Nationwide, over 100 political subdivisions have public property IPM or pesticide reduction ordinances.

Table 1. State Provisions Addressing IPM on Public Property

State[i]	Law	State Land[ii]	Definition	Components	Implementation[iii]	Description
Alabama	no	no	no	n/a	no	n/a
Alaska	no	no	no	n/a	no	n/a
Arizona	ARS Chapter 22 (32-2320)	yes; Structures & surrounding areas	"Minimizes economic, health and environmental risks"	Monitoring, Prevention, Action Levels, Least-toxic/Restricted use, Record-keeping	no	Delegates the responsibility of developing a structural pest control IPM program to the structural pest control commission. The state of Arizona defines structural pest control as controlling pests "that exist near or around structures, in ornamental shrubs and trees, on golf courses, along rights-of-way or in lawns or cemeteries and all pesticide application that could be harmful to public health or the environment." The commission is instructed to include several IPM components in the developed guidelines such as monitoring, record keeping, action levels, and natural control agents.
Arkansas	no	no	no	n/a	no	n/a
California	Assembly Bill 2472	yes	Reduce use / least-toxic	Monitoring, Prevention, Action Levels, Least-toxic/Restricted use	Voluntary	Allows the state to conduct an IPM test run on State Capitol Park to serve as a model. Legislation set foundation for moving ahead with an IPM program.
	Food & Ag Code§11501	yes; Agriculture, Urban	no	none	Voluntary	Requires DPR to consider and encourage least-hazardous pest control. DPR's Pest Management Analysis and Planning Program has the lead to implement "A Strategy to Increase the Adoption of Reduced-Risk Pest Management Practices."
Colorado	no	no	no	n/a	no	n/a
Connecticut	CGS§22a-66l	yes	Reduce use	Education/ Training	Required	IPM provision applies to all state agencies, departments and institutions. IPM is required if the Department of Environmental Protection (DEP) has provided an IPM model for the category of pest control used. These models have been provided, as well as record keeping formats and sample applicator bid specifications. Additionally, the Department has informed the state's municipalities of the IPM models. A public education program is also required. DEP models discuss additional IPM components.
Delaware	Dept. of Ag Pesticide Rules & Regs (4.2.2.1)	no	none	(iv)	no	IPM training requirement for applicator licensing.
District of Columbia	no	no	no	n/a	no	While the District of Columbia's Department of Health has recently established an IPM plan for rodent control and an overarching model IPM policy has been drafted, no IPM policy is currently in place.
Florida	no	no	no	n/a	no	n/a
Georgia	no	no	no	n/a	no	n/a
Hawaii	Ch 149A	no	"Sustainable . . . minimizes economic, health, and environmental risks"	none	no	A revolving fund is established to develop IPM strategies. A state official notes there is an existing cultural history of IPM methods, especially using pest exclusion/quarantines and biological controls.
Idaho	no	no	no	n/a	no	The state reports educational activities.
Illinois	no	no	no	n/a	no	n/a
Indiana	no	no	no	n/a	no	n/a
Iowa	no	no	no	n/a	no	State official reports the state supports and promotes IPM.
Kansas	no	no	no	n/a	no	n/a

Kentucky	302 KAR Ch. 29	no	"Minimizes economic, health, and environmental risks"	n/a[iv]	Required	Industrial, institutional, and structural pesticide applicators must be IPM certified, a requirement which is emphasized for health care facilities. The law does not require the actual use of IPM techniques. The state recognizes this loophole and is looking into resolving the situation.
Louisiana	no	no	no	n/a	n/a	n/a
Maine	Title 7 Ch. 413	n/a	"Prevention and control based on predicted socio-economic and ecological consequences"	Monitoring, Evaluation	n/a	Maine has established an IPM Council. However, no money has been awarded to the Council's fund, so the Council consists of volunteers.
	Title 22 Ch. 258-A §1471-X	Yes	none	none	Required	It is the policy of Maine to minimize reliance on pesticides. The state's agencies are directed to promote the principles and implementation of IPM and other science-based technology.
	Board of Pesticides Control, Pesticide Regulations Ch. 10	no	"Selection, integration, and implementation of pest damage prevention and control based on predicted socioeconomic and ecological consequences"	Monitoring, Prevention, Action Levels, Evaluation	no	Definition only - applies to all Board of Pesticides Control regulations.
	Board of Pesticides Control, Pesticide Regulations Ch. 26	Yes, All Occupied Buildings	"environmentally, socially, and economically compatible"	Education/ Training, Monitoring, Least-toxic/ Restricted use, Notification, Evaluation	Required	Requires IPM, with exemptions, in all occupied private and public buildings. Under this provision, prior notification of 1-7 days must be given in the event of a pesticide application, and applicators must identify pest conducive conditions and provide recommendations for practical non-pesticide control measures. The species, the extent of infestation, and any damage must be identified before pesticides are applied, with exceptions. A section on risk minimization also requires applicators to use low risk products.
	Executive Order 12 FY 06/07 & 16 FY 06/07	Yes, State owned/ managed buildings and grounds	none	Education/ Training, Least-toxic/Restricted use	Required	As part of an executive order addressing the promotion of safer chemicals, Governor John Baldacci requires state owned and managed buildings and their grounds be managed with the least amount of pesticide use by applying IPM principles. Vendors are required to comply through new pest management contracts. IPM training is to be provided to state employees as appropriate and as resources allow. The order also prohibits the cosmetic use of fertilizer-pesticide mixtures. Finally, it establishes a task force to identify and promote safer alternative to hazardous chemicals.
Maryland	no	no	n/a	n/a	no	n/a
Massachusetts	333 CMR 12	no[v]	"Combining several different techniques"	none	Required[v]	Requires an IPM program be in place before any products are applied to areas on the groundwater protection list. An approved IPM plan must be in place to apply a product within a primary recharge area.
Michigan	R 285.637.14 (under revision) & Act 451 Part 83	yes; Structures & surrounding areas	"Uses all suitable techniques"	Education/ Training,[vi] Monitoring, Record-keeping, Evaluation	Required	The IPM rule, which is currently under revision so that it is not in conflict with a similar rule, requires all schools, public buildings, day care centers, and health care facilities to have an IPM program in place. Additionally, pesticide applicators must be trained in a verifiable program that addresses numerous components of IPM.
Minnesota	Statute 17.114(2b)	no	"Combination of approaches"	Education/ Training[vi]	no	In sustainable agriculture code, state defines IPM and establishes programs to promote IPM.
	Statute 18B.063	yes	no	Prevention	Required	Directs the state to encourage IPM and require the use of IPM techniques on public lands, such as rights-of-way, parks, and forests.Some state agencies are implementing IPM.
Mississippi	no	no	no	n/a	no	n/a
Missouri	no	no	no	n/a	no	n/a
Montana	no	no	no	n/a	no	n/a
Nebraska	no	no	no	n/a	no	n/a
Nevada	no	no	no	n/a	no	n/a

State[i]	Law	State Land[ii]	Definition	Components	Implementation[iii]	Description
New Hampshire	no	no	no	n/a	no	n/a
New Jersey	Executive Order #113	yes	Least-toxic	Monitoring	Required	Executive order that requires a pilot IPM program, the formation of a task force to study the potential for increasing IPM within state agencies, the development of a strategy for implementing IPM at state facilities, and evaluate current practices.
New Mexico	no	no	no	n/a	no	n/a
New York	no	no	no	n/a	no	n/a
North Carolina	no	no	no	n/a	no	n/a
North Dakota	none	no	no	n/a	no	n/a
Ohio	ORC Chapter 921	yes	"Minimizes economic, health, and environmental risks"	none	no	Directs the state to develop and implement an IPM program.
Oklahoma	no	no	no	n/a	no	n/a
Oregon	ORS 634.650-634.665	yes	Must consider human / environmental health	Education/ Training, Monitoring, Prevention, Action Levels, Evaluation, IPM Coordinator	Required	Requires state agencies to implement IPM. State agencies and institutions identified as having pest control responsibilities are further required to provide IPM training for pest management employees and must designate an IPM coordinator to manage the program.
Pennsylvania	no	no	"Combined pest control"	n/a	no	n/a
Rhode Island	no	no	no	n/a	no	n/a
South Carolina	no	no	no	n/a	no	n/a
South Dakota	no	no	no	n/a	no	n/a
Tennessee	no	no	no	n/a	no	n/a
Texas	no	no	no	n/a	no	Provision states the former structural pest control board may consult with an IPM expert (12§1951.211).
Utah	no	no	no	n/a	no	n/a
Vermont	no	no	no	n/a	no	n/a
Virginia	no	no	no	n/a	no	n/a
Washington	Chapter 17.15 RCW	yes	"Environmentally and economically sound manner"	Education/ Training, Monitoring, Prevention, Evaluation, IPM Coordinator	Required	Requires all state agencies to follow the principles of IPM if they are engaged in pest control activities. An additional provision requires the state agencies and institutions affected to provide employee training, to designate an IPM coordinator, and form an interagency IPM coordinating committee.
West Virginia	no	no	no	n/a	no	n/a
Wisconsin	no	no	no	n/a	no	n/a
Wyoming	no	no	no	n/a	no	n/a

Original survey conducted in 2005 with extensive follow up through 2007

i. Forty-five states and the District of Columbia (90%) responded to the survey and provided copies of legislation, regulation, policy directives, and/or guidance materials. Many of these participated in follow-up conversations. Data for those not responding to the survey was generated from state policies and websites.
ii. This column asks the question: Does the state have a law on the use of IPM on state-owned and managed property?
iii. Whether the state is required to or may adopt an IPM program on state property is determined from a review of state law and answers to survey questions in which states were asked to identify and provide copies of legislation, regulation, policy directives, and/or guidance materials. Interviews with state officials and public interest advocates supplemented this information.
iv. Two state laws require IPM training/education for pesticide applicators generally and do not complement a statutory or policy requiring IPM on state property. This includes DE and KY.
v. IPM is required by statute for areas of the state that are designated on its groundwater protection list. These areas may overlap with state property.
vi. Where state training/education requirements for pesticide applicators complement an IPM law for state-owned and managed property, it is applicable and noted.

Discussion

The Problem of Definition

What exactly does IPM mean? The foundation of an IPM policy is its definition of the term, the techniques required, and its enforceability. However, IPM is a term that is used loosely with many different definitions and practices. Sixty-seven unique definitions have been cited in the scientific literature alone.[8] Central to the difference is the degree to which the IPM definition allows toxic chemical use, or conversely, gives priority to preventive non-chemical and least-toxic management.

State Definitions

IPM definitions and prescribed components vary widely between states, smaller political subdivisions, IPM professionals, academics, industry, and organizations. The majority of states do not have a formal definition of IPM. Where definitions exist, they are vague and inconsistent.

Examples of the two types of definitions generally used in state IPM law affecting state-owned property follow:

1. Non-prioritized Tactical IPM, codified in six states (AZ, MI, MN, OH, OR, WA), is exemplified by language adopted in the state of Minnesota.

Minnesota 17.114(2b): Integrated pest management means use of a combination of approaches, incorporating the judicious application of ecological principles, management techniques, cultural and biological controls, and chemical methods to keep pests below levels where they do economic damage.

Additional language, codified in five states, add to non-prioritized tactical IPM an undefined requirement to minimize health and/or environmental risks (1 state: OR), and economic risks (3 states: AZ, OH, WA), as exemplified by the state of Arizona.

Arizona 32-2301(14): Integrated pest management means a sustainable approach to managing pests that combines biological, cultural, physical and pesticide tools in a way that minimizes economic, health and environmental risks.

2. Prioritized Strategic IPM, first and second tier, codified in four states (CA, CT, ME, NJ), is exemplified by language in the states of California and New Jersey.

California Assembly Bill No. 2472: Integrated Pest Management (IPM) means a pest management strategy that focuses on long-term prevention or suppression of pest problems through a combination of techniques such as monitoring for pest presence and establishing treatment threshold levels, using non-chemical practices to make the habitat less conducive to pest development, improving sanitation, and employing mechanical and physical controls. Pesticides that pose the least possible hazard and are effective in a manner that minimizes risks to people, property, and the environment, are used only after careful monitoring indicates they are needed according to pre-established guidelines and treatment thresholds.

New Jersey Executive Order 113: Integrated Pest Management (IPM) consists of the use of a combination of pest monitoring, good sanitation practices, appropriate solid waste management, building maintenance, alternative physical, mechanical and biological pest controls, and only as a last resort the use of the least-hazardous chemical pesticide.

While four states imply the goal of pesticide reduction, overall, most states do not provide guidance beyond the vague definitions cited. Some states list components of IPM techniques or delegate responsibility to a state entity to develop further guidelines.

Eight Essential IPM Components

As the term integrated implies, IPM is comprised of multiple interdependent components that provide effective species prevention and management when implemented correctly. At its best, IPM is a precautionary method, effecting the adoption of practices that prevent the need for toxic chemical use.

Roadside spraying is a major pesticide use, and roadside management plans are often under the jurisdiction of states. Pictured above is a state managed road near Big Horn Canyon in Wyoming.

Preventing Problems

Successful implementation of IPM is based on altering the elements that lead to insect, rodent, fungal and plant problems. For structural pest management, this includes modifying the target species' entry, food source, and habitat. For lawn and landscape management, this means maintaining the health of these areas, from the soil up.

Basic prevention strategies include:

- **Entry Restrictions** - Restrict access of undesirable species that can get into buildings by, for example, installing and repairing screens, installing weather stripping and sealing holes and cracks.
- **Eliminate Food Sources** - Proper sanitation is essential in reducing the availability of food that serves as an attractant. Examples: vacuuming/mopping and emptying the trash regularly, and sealing/refrigerating food.
- **Habitat Management** - Modify the climate and living space that is an attractant. Common solutions include eliminating standing water and poor draining areas outdoors, and repairing leaks and maintaining adequate ventilation indoors.
- **Lawn and Landscape Maintenance** – Maintain loose, loamy soils with rich humus teeming with beneficial microorganisms, insects, earthworms, and other organisms. Key practices include soil aeration, maintaining proper soil pH, proper watering, and planting with local cultivars.

In total, nine states (18%) mention one or more components within state public property policy (1 component – CT, NJ; 2 components – MN; 4 components – CA, MI; 5 components – AZ, WA; 6 components – OR; 7 components - ME). However, none of the states address all of the necessary IPM components explicitly within their policy.

1. Education/Training. Education and training is typically carried out through workshops, training sessions, and written materials. Training generally involves the general public, other stakeholders, and all state personnel and state contractors that are responsible for pest management. Educational and training programs are intended to convey information that enables better understanding of the conditions that allow for insect, rodent, fungal, and plant issues, thresholds for action, pesticide hazard concerns, and methodologies for management.

IPM education is mentioned relatively often within state laws regardless of the presence or absence of other IPM provisions, but often exclusively relating to pesticide applicator training. Optional IPM training provisions are not counted in this evaluation. **Finding:** Eight states (CT, DE, KY, ME, MI, MN, OR, WA) include mandatory IPM training in their applicator or employee certification requirements. Two (DE, KY) are independent of an IPM policy.

2. Monitoring. Monitoring helps identify the nature, source, and extent of an insect or rodent problem, or, in the case of land management, lawn and landscape issues. This includes regular site inspections and insect and rodent trapping to determine the types of species and population levels at each site. Monitoring allows managers to properly identify and manage a species problem before a serious outbreak occurs. Monitoring can also determine the possible causes of problems, such as leaky pipes, food crumbs, cracks in walls or around plumbing, or stressed plants. It may not be necessary for an entire property to be monitored, just those areas with the potential for problems, while other areas are monitored and managed on a complaint basis. A logbook of problems enables data-based decision making. Monitoring data is most efficiently used in conjunction with action thresholds (see below). **Finding:** Monitoring is mentioned briefly in seven state policies (AZ, CA, ME, MI, NJ, OR, WA), often as part of an IPM definition.

3. Action Thresholds. Action thresholds, or action levels, are based on the population size of an organism or plant that requires preventive or remedial action for human health, economic or aesthetic reasons. The determination of action or acceptable levels can be based on a scientific or subjective judgment and cultural norms. Action thresholds depend on effective monitoring. **Finding:** Four states (AZ, CA, ME, OR) make some mention of action levels in their policy, referring to the need for species and situation-specific thresholds.

4. Prevention. Non-chemical pest prevention is increasingly viewed as the primary strategy of IPM. Key to prevention is habitat and structural modification and cultural practices that reduce or eliminate sources of food, water, shelter, and entryways, as well as practices that support healthy soil and landscapes. Physical, mechanical and biological controls can head off many problems before they begin. Exceeding unacceptable problem thresholds can be prevented through cultural controls such as proper sanitation and housekeeping, cleaning waste disposal systems, structural maintenance, good soil health, and other long-term, non-chemical strategies. **Finding:** Six states (AZ, CA, ME, MN, OR, WA) recognize prevention as part of their public property IPM policy.

5. Least-Toxic Tactics Criteria. The least-hazardous approach to managing unwanted species first and foremost includes non-chemical methods, such as cultural practices and physical, mechanical and biological controls. However, when pesticides are determined to be necessary, the use of least-toxic pesticides is often incorporated into policy and practice. If there is no way to avoid pesticide use, least-toxic pesticides include those that are least-hazardous to human health and ecological balance (natural

controls and non-target organisms), and least damaging to the built and natural environment. **Finding:** Three states (AZ, CA, ME) include this parameter in relation to their IPM policy.

6. Notification. If a chemical control method is utilized, notification of pesticide applications provides the public with the opportunity to take precautions to avoid direct exposure to pesticides, which is especially important for pregnant women, children, the elderly, those with weakened immune systems, and those who are chemically sensitive. **Finding:** One state (ME) incorporates notification into its IPM policy. However, at least 21 states have adopted laws requiring notification of lawn, turf and ornamental pesticide applications by hired applicators and 31 states require prior notice and/or posting at schools. Several local jurisdictions also provide notification for mosquito spraying. Existing notification mechanisms vary between states and jurisdictions - some areas require universal notification (pre- or post-application), others use a registry, and others require posting signs in the treated area (pre- or post-application).[9]

7. Recordkeeping. A recordkeeping system enables the identification of trends and patterns in pest outbreaks, and the evaluation of pest management decisions. Information recorded at every inspection and/or treatment facilitates pest identification, population size, distribution, recommendations for future prevention and complete information about the action(s) taken. **Finding:** Two states (AZ, MI) incorporate recordkeeping as a component of IPM.

8. Evaluation. Evaluating records enables the adjustment of practices and fine tuning of a site-specific IPM program. **Finding:** Four states (ME, MI, OR, WA) include evaluation as an element of IPM.

Leadership, coordination and oversight

IPM Coordinator. An IPM coordinator establishes a management function and IPM program accountability. An IPM coordinator is typically someone who normally manages unwanted species problems, such as a facilities manager, sanitation engineer, or someone else who regularly oversees building and/or grounds operations or other ecological management services. Coordination among state agency IPM leaders enhances opportunities for increased program and cost effectiveness. **Finding:** Two states (OR, WA) call for the designation of an IPM coordinator for each pre-determined state agency that is explicitly required to implement IPM, and one (WA) of the two states also requires coordinators to convene as an interagency coordinating committee.

State Policies and Implementation

The description of state policy in the following 11 states, 10 of which utilize at least one essential IPM component in managing state-owned public property, provides an overview of the different approaches to IPM. Summary descriptions of all 50 states and the District of Columbia are included in Table I.

Arizona (ARS Chapter 22; 32-2320)) delegates the responsibility of developing a structural pest control IPM program to the structural pest control commission. The state of Arizona defines structural pest control as controlling pests "that exist near or around structures, in ornamental shrubs and trees, on golf courses, along rights-of-way or in lawns or cemeteries and all pesticide application that could be harmful to public health or the environment." The commission is instructed to include several IPM components in the developed guidelines, such as monitoring, recordkeeping, action levels, and natural control agents. Arizona did not provide feedback on the status of the development of these guidelines for implementing an IPM program on state-owned property.

California (Food and Agriculture Code §11501) requires the Department of Pesticide Regulation (DPR) to consider and encourage least-hazardous pest control methods. In 1977-78, DPR began an IPM initiative to encourage and facilitate the adoption or improvement of IPM policies. In 1995, a Pest Management Strategy was developed to increase the adoption of less-toxic pest management.

Paradise Beach State Park in California.

In 2002, Assembly Bill 2472 became law (Title 2 Section 14717), stating, "The Legislature finds and declares that the safe handling, reduction, or elimination of pesticide use in state buildings and on state lands is an important step in providing all state employees and members of the public with a safe, healthy environment." The act goes on to establish the intent of the legislature to enact IPM legislation, and adds a statutory provision allowing the state to implement a demonstration project to study IPM practices and develop a model. A DPR representative confirms that at present, while there may be prospects, no model has been developed, and no additional IPM legislation has been enacted.

In short, while California has been promoting the concept of IPM for many years, the state is only technically beginning to establish a program at present and currently relies on the voluntary use of IPM techniques. The state is developing a strategy to reduce the risk of pesticide management practices, with the intent to protect environmental and public health through the reduction and elimination of pesticides on public property.

West Quoddy Head Lighthouse in Maine's Quoddy Head State Park.

Connecticut (General Statutes §22a-66l) states, "Each state department, agency or institution shall use integrated pest management at facilities under its control if the Commissioner of Environmental Protection has provided model pest control management plans pertinent to such facilities." In accordance with this condition, several specific model IPM plans, recordkeeping formats and sample applicator bid specifications have been developed and distributed. Additionally, this statute directs the Commissioner to "notify municipalities, school boards, and other political subdivisions of the state of the availability of the model plans for their use." The Department of Environmental Protection has achieved this through mass mailings. Other noteworthy provisions include an exception for public health emergencies, as determined by the Commissioner of Public Health, and a requirement to develop and implement a public education program to inform the public and encourage the use of IPM techniques on private property.

Maine (Title 7 Ch. 413) has established an IPM Council. The law states, "The council shall facilitate, promote, expand and enhance integrated pest management adoption in all sectors of pesticide use and pest management within the State." A fund to develop and implement IPM programs was also created, but no funds have been appropriated. The state reports that the Council has remained intact, relying on volunteers.

It is also the policy of Maine (Title 22 Ch. 258-A§1471-X) to minimize reliance on pesticides. The state's agencies are directed to promote the principles and implementation of IPM and other science-based technology.

The Maine Board of Pesticides Control (Pesticide Regulations Ch. 26) requires IPM in all residential rental property, and occupied commercial, institutional and public buildings. A pesticide as a last resort determination is required for residential rental property. Under this provision, prior notification of 1-7 days must be given in the event of a pesticide application, and applicators must identify pest conducive conditions and provide recommendations for practical non-pesticide control measures. The species, the extent of infestation, and any damage must be identified before pesticides are applied, with exceptions. A section on risk minimization also requires applicators to use low risk products.

Governor John Baldacci also issued Executive Orders 12 FY 06/07 and 16 FY 06/07 addressing the promotion of safer chemicals in consumer products and services. Order 12 FY 06/07 requires state owned and managed buildings and their grounds to be managed with the least amount of pesticide use by applying IPM principles. Vendors are required to comply through new pest management contracts. IPM training is to be provided to state employees as appropriate and as resources allow. The order also prohibits

the cosmetic use of fertilizer-pesticide mixtures. Finally, 16 FY 06/07 refines requirements for a Task Force charged with identifying and promoting safer alternatives to hazardous chemicals. A task force member reports that these IPM measures are only being carried out in the Capitol area at the writing of this report, but the state is working on expanding the program.

Massachusetts (333 CMR 12) has outlined a unique set of circumstances that require IPM, presenting it as a tool to protect buffer zones and sensitive areas. The state requires the adoption of an IPM program for areas on the state's groundwater protection list or within a primary recharge area before any pesticide products may be applied.

Michigan (regulation no. 285.637.14 - currently under revision so that it is not in conflict with a similar rule, Act 451, Part 83) requires all schools, public buildings, day care centers, and health care facilities to have an IPM program in place. Additionally, pesticide applicators must be trained in a verifiable program that addresses numerous components of IPM, "with consideration for reducing the possible impact of pesticide use on human health and the environment, including people with special sensitivities to pesticides."

Minnesota (Statute 17.1142b) requires, under its sustainable agriculture code, that the state develop "a state approach to the promotion and use of integrated pest management, which shall include delineation of the responsibilities of the state, public postsecondary institutions, Minnesota Extension Service, local units of government, and the private sector; establishment of information exchange and integration; procedures for identifying research needs and reviewing and preparing informational materials; procedures for factoring integrated pest management into state laws, rules, and uses of pesticides; and identification of barriers to adoption."

Minnesota Statute 18B.063 requires the state to use IPM techniques in its management of public lands, specifically rights-of-way, parks, and forests. In addition, it is specified that the state shall focus on using "planting regimes that minimize the need for pesticides and added nutrients." The IPM and Sustainable Agriculture Plan for State-Owned Lands has been created in response to this statute, which outlines strategies for developing an IPM program. Minnesota's IPM Program Coordinator cites several state agencies that have implemented IPM methods and also notes they have not experienced any known resource constraints in implementing the program.

New Jersey (Governor James J. Florio issued Executive Order #113 in 1993) directs the Department of Environmental Protection and Energy to conduct a pilot IPM program, form a task force to study the potential for increasing IPM within state agencies,

Local IPM and Pesticide Reduction Ordinances

Local ordinances are increasingly important in institutionalizing IPM and similar concepts in the management of public property. Local efforts share a common goal of pesticide reduction through prevention and non-chemical strategies.

Local IPM policies often include pesticide reduction goals. Some towns are adopting organic practices on parkland or all town properties (e.g. Plainville, CT, Lawrence, KS, Townsend, MA). Pesticide reduction policies, such as bans on the most toxic categories of pesticides and pesticide reduction goals (e.g. New York City, San Francisco, Seattle, and other cities), protect public health by contributing to pollution prevention.

Over 100 political subdivisions have IPM/pesticide reduction ordinances, which vary from county-wide policies to pesticide-free parks, within 17 (CA, CO, CT, FL, IA, KS, ME, MA, MN, NJ, NM, NY, NC, OH, OR, PA, WA) states (excluding school IPM). Eight of these states have some form of state IPM policy, and all but one have a state preemption law restricting localities from limiting pesticide use on private property.

State preemption laws, which exist in 41 states, have rendered many community efforts void of authority to adopt local pesticide restrictions on private property. Preemption generally refers to the ability of one level of government to override laws of a lower level. After the Supreme Court upheld the right of local governments to restrict pesticide use on private property under federal pesticide law (Ruckelshaus v. Monsanto Co., 467 U.S. 986, 1984), the chemical industry successfully lobbied state legislatures to take away this authority in 41 states. These laws, called state preemption laws, effectively deny local residents and decision makers their democratic right to better protection when the community decides that minimum standards set by state and federal law are insufficient to protect local public and environmental health. Today, as pesticide pollution and concerns over human and environmental health mount, municipal authority is viewed as increasingly important.

When states were asked if they track local IPM ordinances, only two states (CA, ME) answer in the affirmative, and three additional states (MN,NM, NC) indicate an awareness of local IPM policies. Twelve states report they do not track and are not aware of IPM policies enacted by local jurisdictions and numerous states chose to disregard the question in the survey.

The Washington State Capitol in Olympia.

develop a strategy for implementing IPM at state facilities, and evaluate current practices. The state did not provide records on implementation of this broad IPM policy on state-owned property. A local advocate notes that the order did help launch the grassroots IPM campaign within the state, and that pest control seems to vary with the state's administration.[10]

Ohio law (ORC§ 921.18(D)) states, "The director [of agriculture] shall establish standards governing the development and implementation of integrated pest management practices that are designed to prevent unreasonable adverse effects on human health and the environment." Further, "The director may enter into cooperative agreements with other state agencies for the implementation of voluntary or mandatory integrated pest management practices." No such program has been developed. A state pesticide representative notes that they are not aware of any action on the law and stated IPM has been shelved in the past.

Oregon (Revised Statutes, ORS§634.650-665) requires state agencies to implement IPM. The language specifically outlines the departments that have duties related to pest management: Agriculture, Fish and Wildlife, Transportation, Parks and Recreation, Forestry, Corrections, Administrative Services, and State Lands, as well as each state institution of higher education. Each of these state agencies and institutions are further required to provide IPM training for pest management employees and must designate an IPM coordinator to manage the program.

After the implementation of these requirements, there was an active committee for approximately five years according to a representative of the Department of Agriculture's Plant Division. Training information was developed and agency progress reports were required. Participation waned as the program became repetitive and resources were shifted away from IPM to support another program. The representative of the Plant Division feels the program has been a success, as it is believed that all agencies did implement IPM methods and a basic understanding of IPM has been achieved throughout the state's agencies. However, a state advocate says the policy did not result in significant change from the state's prior pest management practices.[11]

Washington (revised code 17.15) reads, "[I]t is the policy of the state of Washington to require all state agencies that have pest control responsibilities to follow the principles of integrated pest management." The code continues by defining IPM as pest management methods that are environmentally and economically sound, and includes several IPM components within the definition. Other provisions outline exactly which state agencies and institutions must implement this policy, lists IPM training requirements, requires the designation of IPM coordinators, and establishes an interagency IPM coordinating committee.

The language of this policy is one of the most comprehensive in the nation. However the definition remains vague – the result of compromises made to find middle ground among the state's stakeholders. Additionally, as a state advocate points out, the reality of implementation often reveals a different picture. It has been observed that the policy has not effectively reduced pesticide use except in cases where pressure has been applied to specific programs.[12]

A state employee involved in Washington's IPM efforts confirmed that in the decade that has passed since the adoption of its policy, the implementation of IPM has not been widespread, largely because there has not been one person consistently in charge of the program, due to employee turnover. Despite a 1997 statutory requirement for yearly reports from the state's agencies, the documentation ceased in 2001. The state representative stated that the "success rate is all over the map," and the agencies in charge of parks and recreation, transportation, ecology and others have done a better job implementing IPM because on-site individuals took initiative. Additionally, it is thought that limited funding may have been an impediment as resources for training and materials largely need to be self-generated.

State Overview

IPM law governing the management of state-owned and managed property varies wildly nationwide. If the ten states that have adopted some form of an IPM policy affecting public property

Table 2. State and Local IPM and Preemption Policies				
State	School IPM[14]	State Public Property IPM	State Preemption[15]	Local Public Property IPM /Reduction[16]
Alabama			■	■
Alaska				■
Arizona	□	□	■	■
Arkansas			■	
California	□	□	■	■
Colorado			■	■
Connecticut	□	■	■	■
Delaware			■	
Florida			■	■
Georgia			■	■
Hawaii				
Idaho			■	
Illinois	■		■	■
Indiana			■	■
Iowa			■	■
Kansas			■	■
Kentucky	■		■	
Louisiana	■		■	
Maine	■	■		■
Maryland	■			■
Massachusetts	■		■	■
Michigan	■	■	■	■
Minnesota	□	■	■	■
Mississippi			■	
Missouri			■	
Montana	□		■	
Nebraska			■	
Nevada				
New Hampshire			■	
New Jersey	■	□	□	■
New Mexico			■	■
New York	■		■	■
North Carolina	■		■	■
North Dakota			■	
Ohio		□	■	■
Oklahoma			■	■
Oregon		■	■	■
Pennsylvania	■		■	■
Rhode Island	■		■	■
South Carolina			■	■
South Dakota				
Tennessee			■	■
Texas	■		■	■
Utah				■
Vermont	□			■
Virginia			■	■
Washington		■	□	■
West Virginia	■		■	■
Wisconsin			■	■
Wyoming				
TOTAL	20	10	41	35

■ = Required, □ = Recommended; except for State Preemption, □ = local ordinance restriction on private property must be approved by state.

were to correct existing deficiencies and fully implement these policies, then 31% of the nation's population would be protected from unnecessary pesticide use on state-owned public areas.[13]

As each state's experience shows, there are a variety of potential roadblocks to establishing a successful state IPM program. Passing an IPM policy takes initiative from local activists, the general citizenry and elected officials. Weak legislative language, resource constraints, lack of leadership, shifting priorities, and no commitment to enforcement are some of the hurdles that state governments experience with their IPM policy.

Conclusion

While IPM has been embraced rhetorically by the pest management industry and officials responsible for state-owned and managed property, this survey of state laws, policies and practices tells a far different story of actual policy and operations. The study finds that while some components of IPM are in place and broader programs are in development, currently less than 18% of the states (or nine states) with state property policies adopt at least one of the essential components of IPM. Even more striking, only four states adopt the IPM goal of pesticide reduction or curtailing unnecessary pesticide use on state property and only two of the four have a mandatory program in place. This raises critical questions about the lack of serious effort by state governments to put in place IPM programs on state property. At the same time, there are a number of bright spots among the states that have developed or are developing effective IPM programs.

IPM as a method has proven that land and buildings can be managed cost-effectively through a precautionary approach that adopts preventive practices for insect, rodent and landscape problems and eliminates toxic chemical use. The growing number of scientific studies linking widely used pesticides to adverse health effects and the cost-effectiveness of prevention-oriented management strategies suggests that this is good public health and cost-saving policy. Sound management policies and practices that adopt IPM and organic methods for state-owned and managed property have the potential of affecting 195 million acres of land area and virtually all residents of the U.S.

Recommendations

1. State Action. States must adopt policies (through action of the state legislature or agency regulation) to manage state-owned property with IPM and organic practices that are clearly defined with the goal of eliminating hazardous and unnecessary pesticide use, address the eight essential IPM program components, and ensure adequate funding, full coordination, accountability and enforcement. States should repeal preemption of local authority to restrict pesticides on private property.

2. Local Action. States should encourage local jurisdictions to adopt policies and private property owners to put in place programs that ensure IPM and organic principles of eliminating toxic pesticide use.

3. Federal Action. The U.S. Congress should adopt legislation that requires the uniform adoption of IPM and organic practices by state governments, tied to the transfer of federal funds for programs in the states (e.g. highway construction, school construction, pesticide regulation, water quality programs, Centers for Disease Control and Prevention (CDC) mosquito control programs, and others).

Endnotes

1. Ubiquitous presence in the human body (U.S. Centers for Disease Control and Prevention. 2005. Third National Report on Human Exposure to Environmental Chemicals. http://www.cdc.gov/exposurereport/3rd/), the built environment (Rudel, R., et al. 2003. Phthalates, Alkylphenols, Pesticides, Polybrominated Diphenyl Ethers, and Other Endocrine-Disrupting Compounds in Indoor Air and Dust. Environmental Science and Technology 37(20): 4543-4553; Nishioka, M., et al. 2001. Distribution of 2,4-D in Air and on Surfaces Inside Residences After Lawn Applications: Comparing Exposure Estimates from Various Media for Young Children. Environmental Health Perspectives 109(11); Lewis, R., et al. 1991. Determination of Routes of Exposure of Infants and Toddlers to Household Pesticides: A Pilot Study. EPA: Methods Research Branch.) and natural environment (Colborn, T., D. Dumanoski, J.P. Myers. 1996. Our Stolen Future. New York: Penguin Group.), including widespread water contamination (US Fish and Wildlife Service, Department of Environmental Quality. 2001. Pesticides and Wildlife. http://www.fws.gov/contaminants/Issues/Pesticides.cfm; RJ Gilliom, JE Barbash, CG Crawford, et al. 2006. The Quality of Our Nation's Waters: Pesticides in the Nation's Streams and Ground Water, 1992-2001. USGS Circular 1291.); toxicity to wildlife (Defenders of Wildlife. 2005. The Dangers of Pesticides to Wildlife [white paper]. http://www.beyondpesticides.org/pesticidefreelawns/resources/DWDangers_Pesticides_Wildlife.pdf ; Anway, M.D., A.S. Cupp, M. Uzumcu, M.K. Skinner. 2005. Epigenetic Transgenerational Actions of Endocrine Disruptors and Male Fertility. Science 308: 1466-1469; Anway, M.D., C. Leathers, M.K. Skinner. 2006. Endocrine Disruptor Vinclozolin Induced Epigenetic Transgenerational Adult-Onset Disease. Endocrinology 147(12): 5515-5523; Chang, H., M.D. Anway, S.S. Rekow, M.K. Skinner. 2006. Transgenerational Epigenetic Imprinting of the Male Germline by Endocrine Disruptor Exposure During Gonadal Sex Determination. Endocrinology 147(12): 5524-5541;Beyond Pesticides. 2005. Environmental Effects of 30 Commonly Used Lawn Pesticides. http://www.beyondpesticides.org/lawn/factsheets/30enviro.pdf); and health problems in humans (Beyond Pesticides. 2005. Health Effects of 30 Commonly Used Lawn Pesticides. http://www.beyondpesticides.org/lawn/factsheets/30health.pdf; U.S. EPA. 2003. Tackling a Suspected Hazard of Aging. http://www.epa.gov/ord/archives/2003/september/htm/article1.htm (accessed March 4, 2005); U.S. EPA. 2002 Oct 31. EPA Announces New Aging Initiative To Protect Older Persons From Environmental Health Threats. EPA Pesticide Program Update: Office of Pesticide Programs; National Research Council. 1993. Pesticides in the Diets of Infants and Children. Washington, DC: National Academy Press; Repetto, R., et al. 1996. Pesticides and Immune System: The Public Health Risk. Washington, DC: World Resources Institute.), such as respiratory ailments (Beyond Pesticides. 2005. Asthma, Pesticides and Children: What you should know to protect your family. http://www.beyondpesticides.org/children/asthma/index.htm#brochure), cancer (Evans, N, Ed. 2006. State of the Evidence: What Is the Connection Between the Environment and Breast Cancer? 4th edition. San Francisco: Breast Cancer Fund; Clapp, R., G. Howe, M. J. Lefevre. 2005. Environmental and Occupational Causes of Cancer: A Review of Recent Scientific Literature. Lowell: University of Massachusetts, Lowell Center for Sustainable Production. http://www.sustainableproduction.org/downloads/Causes%20of%20Cancer.pdf), endocrine disruption (Colborn et al., 1996), and altered neurodevelopment (Colborn, T. 2006. A Case for Revisiting the Safety of Pesticides: A Closer Look at Neurodevelopment. Environmental Health Perspectives 114[1]).

2. Wang, C., G. Bennett. 2006. Comparative Study of Integrated Pest Management and Baiting for German Cockroach Management in Public Housing. J. Econ. Entomol. 99(3): 879-885.

3. 7USC6501, Organic Foods Production Act of 1990, Title XXI Food, Agriculture, Conservation and Trade Act of 1990 (Public Law 101-624).

4. Includes state and local managed lands in the U.S., Lubowski, R.N. et al. 2006. Major Uses of Land in the United States, 2002. USDA, Economic Research Service, EIB-14.

5. This study does not evaluate schools IPM poilcy, which is addressed in a separate report. See *Schooling of State Pesticide Laws* 2000 and 2002. www.beyondpesticides.org/schools/publications. Also not included are all rights-of-way management programs, which are governed by a mix of state laws and agency guidance. See *The Right Way to Vegetation Management*. 1999. http://www.beyondpesticides.org/infoservices/pesticidesandyou/Spring%2099/The%20Right%20Way%20to%20Vegetation%20Management.pdf.

6. Many states establish definitions of IPM for school pest management, protected areas, or incorporate their definition into training and education guidelines for pesticide applicators in the urban environment and agriculture.

7. Bajwa,W.I.,and M.Kogan. 2002. Compendium of IPM Definitions (CID): What is IPM and how is it defined in the Worldwide Literature? University of Oregon, Integrated Plant Protection Center; Publication No. 998. http://ipmnet.org/IPMdefinitions/.

8. Cultural practices for buildings includes general facility management, and general occupant behavior that contributes to insect harborage and access; and in the landscape context includes choice of plant varieties, fertilization techniques, dethatching, aeration, pH, watering, and more.

9. Beyond Pesticides. 2004. State Lawn Pesticide Notification Laws. Pesticides and You 24(2): 22. http://www.beyondpesticides.org/infoservices/pesticidesandyou/Summer%2004/State%20Lawn%20Notification%20Laws.pdf; Beyond Pesticides. 2007. State and Local School Pesticide Policies. http://www.beyondpesticides.org/schools/schoolpolicies/index.htm.

10. Nogaki, J. 2007. New Jersey Environmental Federation. Personal communication. Executive order helped to initiate a grassroots campaign with municipalities and the 2002 school IPM law.

11. Cox, C. 2007. Center for Environmental Health, formerly Northwest Coalition for Alternatives to Pesticides. Personal communication.

12. Storey, A. 2005. Washington Toxics Coalition. Personal communication.

13. U.S. Census Bureau. 2007. State & County QuickFacts. http://quickfacts.census.gov/qfd/index.html. (Based on 2000 census data.)

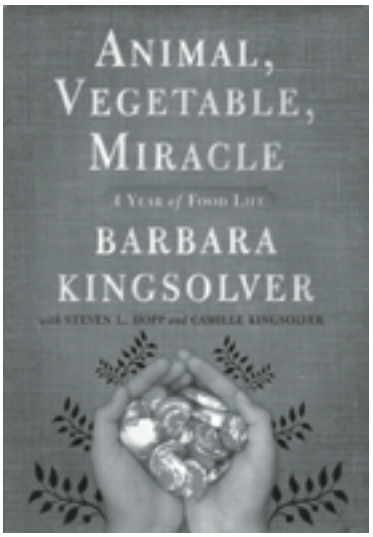
14. School IPM indicates states that have adopted pesticide acts and regulations that address the protection of children by specifically focusing on pesticide use in, around or near schools. For the purposes of this analysis, policy affecting public primary (K-12) schools are considered. Source: Beyond Pesticides. 2006. State and Local School Pesticide Policies. http://www.beyondpesticides.org/schools/schoolpolicies/index.htm.

15. Preemption refers to the ability of one level of government to override laws from a lower level. While local governments once had the ability to restrict the use, sales and distribution of pesticides, pressure from the chemical industry led many states to pass legislation prohibiting municipalities from passing local pesticide ordinances that are stricter than state policy. Source: State Preemption Laws. 2005. http://www.beyondpesticides.org/lawn/factsheets/Preemption%20Factsheet.pdf.

16. Local public property IPM/pesticide reduction policies encompass ordinances that aim to protect local jurisdictions ranging from counties to schools to pesticide-free parks. Source: Beyond Pesticides. 2007. Local IPM/Pesticide Reduction Policies.

Animal, Vegetable, Miracle – A Year of Food Life

Barbara Kingsolver, Stephen Hopp and Camille Kingsolver, HarperCollins Publishers, 2007 (370pp). The ethics of eating. Barbara Kingsolver takes us on her personal and family journey to realign "our lives with our food chain." Seeing this year-long journey through the eyes of Ms. Kingsolver, who has achieved well-deserved celebrity status as an author, is somewhat jarring at first. Is this a story about an observer of an experience, a peek at the author's diary motivated by a book deal, or is it an account of a committed, socially conscious, deeply concerned person who is driven to effect societal change by sharing her values and experiences? Steven Hopp, Ms. Kingsolver's husband, a biologist and contributor to thought provoking analysis sprinkled throughout the book, expresses a touch a cynicism with which one might approach this book when he writes, "Oh sure, Barbara Kingsolver has forty acres and a mule (a donkey, actually). But how can someone like me participate in the spirit of growing things. . ." And, that is exactly what the book is about –how we all can contribute to preserving the planet and the species that inhabit it through our food choices. Of course, the folksy writing does not undermine the serious nature of this account, the advanced degrees in ecology and biology, and background in science writing, not to mention growing up in a Kentucky farming community, that Ms. Kingsolver brought to this project and informs her life.



Eating Local

The focus of the story is eating local and, as importantly, eating locally grown food (locavore) that is organically grown. On the family trip readers get to take with the Kingsolver-Hopp family, we meet an owner, Tod Murphy, of Farmers Diner in central Vermont that serves locally grown food who sort of captures the message, "If there's less green on the plate that means it's white outside." As we go on this journey we learn that, "Eating locally in winter is easy. But the time to think about that is in August." So prepare to spend some time in the Kingsolver kitchen canning and freezing vegetables after the bountiful crop comes in from the family's quarter acre farm nestled in the mountains of Southwest Virginia. Interspersed among the narrative are reflections from Ms. Kingsolver's 18-year old daughter who provides a teenager's insight into the family's journey, which obviously did not begin with this book, and family recipes. Camille Kingsolver feels deeply about the values that she has learned from her family and community and will no doubt, with her science education at college, advance and sharpen her activism. The journey would not be complete without Camille and younger sister Lily, who with entrepreneurial spirit saw the opportunity to cash in by selling eggs.

One thing we learn early in the book is that there are some very few favorite things, clearly not locally grown, that family members are not forced to give up. Camille's recipes are no stranger to olive oil. And, coffee is a staple. The value of fair trade or humanely raised is a must.

I should note that while this book is serious ("We love our gardens so much it hurts. For their sake we'll bend over till our backs ache. . . We lead our favorite hoe like a dance partner down one long row and up the next, in a dance marathon that leaves us exhausted."), the authors have a good sense of humor. After the bumper crop of zucchini, which every gardener has at one time experienced, Ms. Kingsolver writes, "Garrison Kellor says July is the only time of year when country people lock our cars in the church parking lot, so people won't put squash on the front seat."

The family journey is committed to organic practices, which are good for the earth, people and natural predators and stemming the tide of global warming by rejecting petroleum-based products. On the family trip, we meet organic farmers Elsie and David in Ohio. "They spare the swallows and sparrows from death by pesticide for lots of reasons, not the least of which is that these creatures are their pesticides." And then Mr. Hopp's sidebar reminds us that, "[I]n 1948, when pesticides were first introduced, farmers used roughly 50 million pounds of them and suffered about a 7 percent loss of all their field crops. By comparison, in 2000 they used nearly a billion pounds of pesticides. Crop losses? Thirteen percent."

The price of food

A book like this could not be written without some discussion of the price of good food, healthy for the earth in its production and healthy for consumers in its consumption. That's because we have been raised in a culture of cheap food. Ms. Kingsolver concludes that "raising food without polluting will always cost more than the conventional mode that externalizes costs to taxpayers and the future. . ."

According to the author, the fastest growing segment of U.S. agriculture is "diversified food producing farms on the outskirts of cities." This suggests that people are beginning to get it. "Eaters must understand that how we eat determines how the world is used." And back at the Vermont Farmers Diner, where virtually all the ingredients are purchased within an hour's drive, Mr. Murphy says, "We have the illusion of consumer freedom, but we've sacrificed our community life for the pleasure of purchasing cheap stuff." This book and others like it are contributing to a cultural and paradigm shift back to community-based, humane, and sustainable values that nourish us and the planet.

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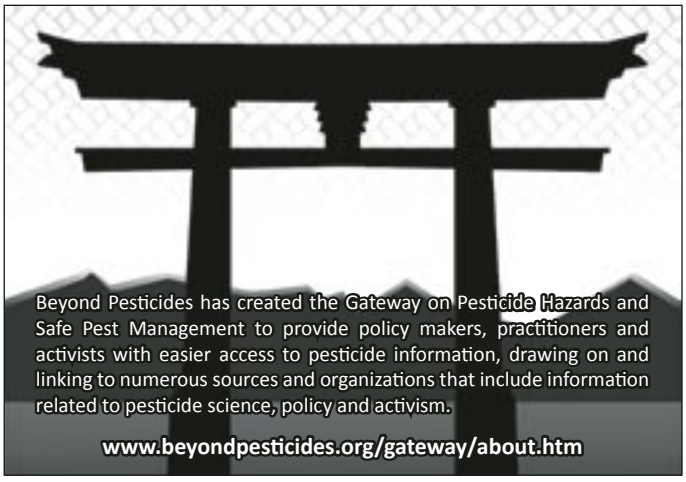

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This ad was accidentally omitted from the National Pesticide Forum program

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