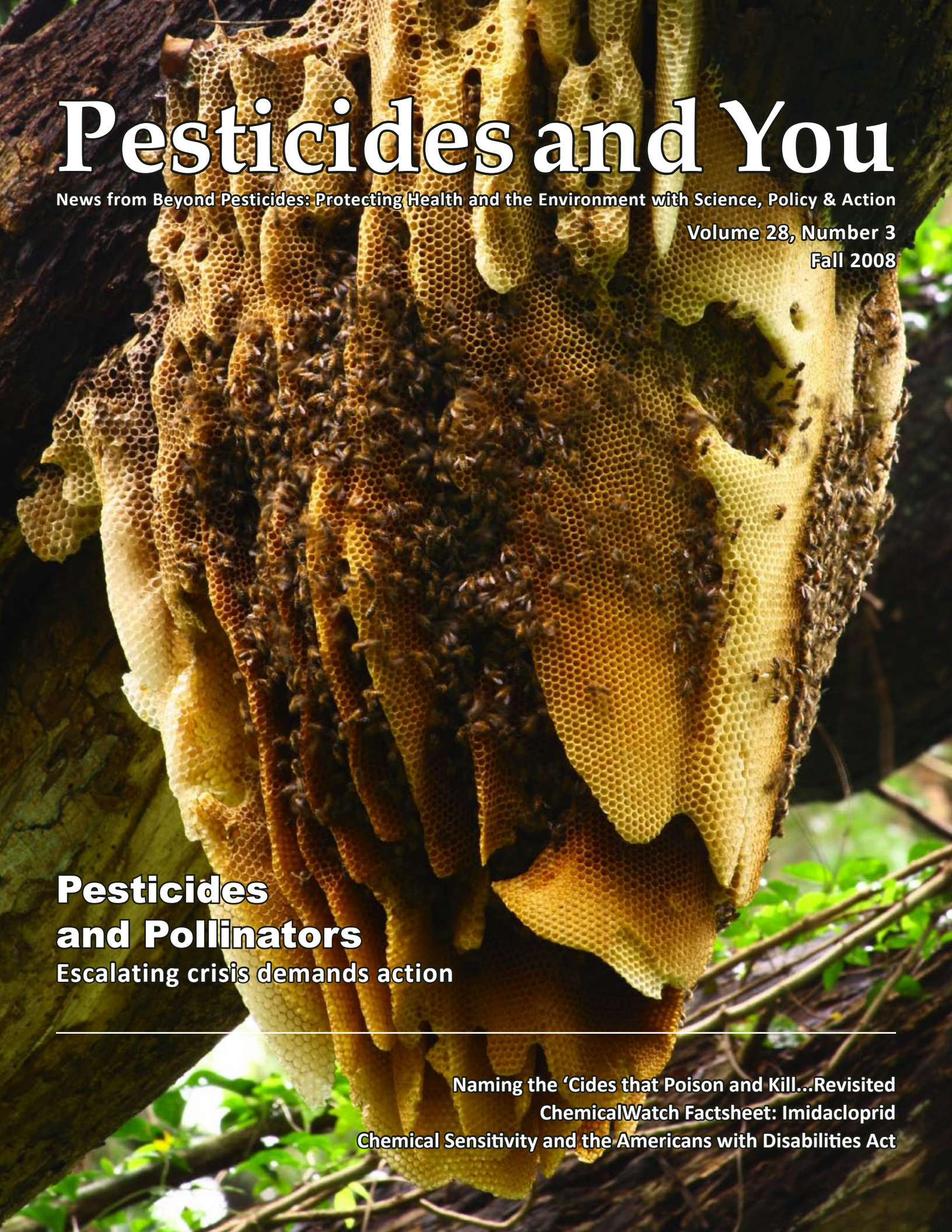


Pesticides and You

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

Volume 28, Number 3
Fall 2008

Pesticides and Pollinators

Escalating crisis demands action

Naming the 'Cides that Poison and Kill...Revisited

ChemicalWatch Factsheet: Imidacloprid

Chemical Sensitivity and the Americans with Disabilities Act

Chemical Sensitivity Demands Accommodation for Bees and Humans

If anyone needs evidence of the extremely urgent need to stop hazardous pesticide use, just have them read about the disappearance of the bees. This issue of Pesticides and You is a good start. Yes, this crisis is a complex issue, but a little digging on the issue brings us directly to the fact that our pesticide policies do not adequately protect sensitive species, with bees at the top of the list.

Colony Collapse Disorder

We devote much of this issue of PAY to the crisis of colony collapse disorder (CCD) in the honeybee population. CCD is an increasingly widespread phenomenon of bees disappearing or abandoning their hives. There are, of course, numerous theories that involve pesticides, viruses, and pathogens. Bayer CropScience, the manufacturer of one of the implicated pesticides, imidacloprid, dismisses the pesticide connection. But countries, including France, Germany and Italy, have taken steps to limit its use, along with other pesticides like fipronil. The National Union of French Beekeepers brought the problem to national attention and forced their government to restrict these pesticides. The U.S. lags behind, outside the glare of public outrage and protests that have been seen in Europe.

The pesticide link to bee poisonings is not new. And, the lack of an adequate regulatory response is as old as our 1972 federal pesticide law and all its revisions. What we are seeing today is an escalation of a problem that has been building for decades. Bees support our environment, pollinating half the flowering plant ecosystem and one-third of agricultural plants.

Problems Escalate Under Risk Assessment Standards

The disappearance of the bees alerts us to a fundamental and systemic flaw in our approach to the use of toxic chemicals –and highlights the question as to whether our risk assessment approach to regulation will slowly but surely cause our demise without a meaningful change of course. Michael Schacker, the author of *A Spring Without Bees: How Colony Collapse Disorder Has Endangered Our Food Supply*, reviewed in this issue of PAY, identifies humans' anthropocentric worldview as justifying our manipulation of nature to the brink of destruction. The bees should serve as a warning because our very existence depends on theirs.

The bee problem, which is not new just more frightening than it has ever been, should be a wake-up call. It should force a rethinking of how we approach policies that allow the management of "pests" with a war-like mentality and the continued use of chemicals for which there are safe alternatives. While admittedly uncertain and filled with deficiencies, risk assessments establish unsupported thresholds of acceptable chemical contamination of the ecosystem, despite the availability of non-toxic alternative practices and products. In fact, the only acceptable policies in this crisis are those that eliminate toxic pesticide use. The only acceptable legislative reform proposals are those that eliminate unnecessary toxic chemical use. For example, why do we allow chemical-intensive practices in agriculture when organic practices that eliminate the vast majority of hazardous substances are commercially viable? Risk assessments, supported by environmental and public health statutes, in effect prop-up unnecessary poisoning.

The Human Connection

An unhealthy ecosystem adversely affects the health of all those living in it. So, it comes as no surprise that people, along with other species, suffer environmental illness.

It is not a far stretch, then, to focus on environmental illness in humans. The same neurotoxic impacts on bees are being diagnosed in humans. So, as we write about in this issue of PAY, it is time for the Justice Department in implementing the Americans with Disabilities Act (ADA) to recognize chemical sensitivity (CS) or environmental illness as a disability that requires accommodation at work, school, in housing, and recreation areas --all public areas to which access is denied because of toxic pesticide use. Beyond Pesticides, with groups across the country, submitted comments this summer, published in this issue, urging the department to recognize that chemical exposure "substantially limits one or more of the major life activities of such [chemically sensitive] individuals," qualifying those adversely affected for protection under the law. In light of the availability of alternative approaches to pest management that do not rely on toxic chemicals, we believe it is reasonable to expect such protection. The time for this is long overdue.

If bees could speak to us, they would probably say what Linda Baker, a former teacher and coach from Kansas, wrote in our ADA comments about those with CS. "[L]ack of accommodation caused their illness to progress to the point where they could no longer work." She continues, "CS takes a huge toll on individual lives and results in unnecessary loss of productivity." Author Michael Schacker asks whether we are really facing "Civilization Collapse Disorder."

Solutions Are Within Our Reach

Solutions to the loss of bees and human productivity are clearly within our reach if we engage our communities and governmental bodies. A little outrage will help. We know how to live in harmony with the ecosystem through the adoption of sustainable practices that simply do not allow toxic pesticide use. Whether we are talking about managing buildings or landscapes, it can be done. It must be done. Our survival depends on it.

- Jay Feldman is executive director of Beyond Pesticides.

Contents

Page 9

Page 21

Printed on 100% post consumer waste with soy inks.

Pesticides and You © 2008 (ISSN 0896-7253) is published 4 times a year by Beyond Pesticides. Beyond Pesticides, founded in 1981 as the National Coalition Against the Misuse of Pesticides (NCAMP), is a voice for health and the environment, promoting protection from pesticides and safe alternatives; donations are tax-deductible.

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

Golf and Groundwater

I'm doing research for my local Environmental Health Committee. We are trying to get the local golf course to follow a recently passed ordinance, written to protect our single source aquifer. The golf club sits almost entirely within the aquifer overlay protection district.

Do you know of any case where contamination of an aquifer was caused by a golf club, or of an aquifer shut down because of pesticide contamination? They are saying no such proof exists and I have been unable to find one.

Gregory (Maine)

Thank you for contacting Beyond Pesticides with your question regarding contamination of aquifers by golf courses. Some controversy revolves around the excessive water use required for maintenance, not just the pesticide issue.

One case that is informative is that of San Antonio. The course was never constructed, and the primary reason was concern about pesticide contamination. A June 2004 article in the Christian Science Monitor reported, "In San Antonio, geologists warned that the development could block recharge and contaminate the water with chemicals from runoff," and that "the 2,600-acre project, known as the PGA Village, would have been set over the recharge zone of the Edwards Aquifer, one of the world's most pristine and profuse aquifers."

A study published in a 2006 issue of Water and Environment Journal, entitled "Pesticides in Groundwater: some observations on temporal and spatial trends," found dicamba in groundwater at a golf course in Yorkshire, UK's Triassic Sherwood Sandstone aquifer. A 1990 study of Cape Cod

Beyond Pesticides Daily News Blog

Read and comment on stories at www.beyondpesticides.org/dailynewsblog.

Excerpt from Beyond Pesticides original blog post (8/15/08):

Chemical Sensitivity Omitted from Americans with Disabilities Act Proposed Regs. With a public comment period that ends Monday, August 18, 2008, the U.S. Department of Justice, Disability Rights Section, Civil Rights Division proposes rulemaking that fails to recognize chemical sensitivity (CS) and environmental illnesses as disabilities that may require specific access standards. In a public comment, Beyond Pesticides urges the Justice Department to specifically include access requirements for those with CS and environmental illnesses in its rulemaking.

Rebecca Says:

I never knew until 5 years ago what was making me so sick. I have multiple chemical sensitivities. I was working in a manufacturing plant as Human Resource/OSHA Training/Payroll manager. I had to give up a job I loved in Indiana because of chemicals and pesticides. It took 4 years to get my Social Security Disability (SSD) because the government skirts around MCS as a disability. Thank goodness for governors of over 1/2 of the states for having the insight to proclaim MCS Month in May. Using that and my medical history, doctors and a SS Disabilities Judge from Las Vegas who was very well aware of the disease, I finally received my SSD. Since then I am almost homebound because of the chemicals, including pesticides. This is a very real disease and should be included.

James Says:

MCS is real and debilitating. Just as those disabled during chemotherapy, there are laboratory findings of decreased metabolic enzymes to cope with chemicals in the environment. I am a Medical Technologist and know there is solid science behind the diagnosis. Removing MCS from disability is like removing veterans from coverage. This must not be done.

golf courses, published online in Groundwater Monitoring & Remediation, found pesticides in groundwater at all four courses studied. A 1996 study by Amy Swancar found pesticides in groundwater at 7 of 9 golf courses.

Finally, the New York Attorney General conducted a study of Long Island's aquifers and golf courses, entitled "Toxic Fairways: Risking Groundwater Contamination From Pesticides on Long Island Golf Courses." The report is extremely cautionary regarding the risks of pesticide leaching. It concludes, "All pesticide applicators, including golf course managers and homeowners, should use less toxic alternatives and 'Integrated Pest Management' (IPM) practices to minimize the amounts of toxic chemicals applied."

The golf industry is beginning to reevaluate the impact of chemically intensive courses on the environment and local communities. Golf Digest's article "How Green Is Golf," including its interview with our director Jay Feldman, can be found on our website by clicking on "Golf and the Environment" under the "Issues" tab at the top of our homepage. There are examples your local course can follow to reduce its toxic output. Good luck!

Speak Your Mind!

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

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

Happy Pesticide-Free Holidays

I have a two-year-old daughter who is beginning to walk and get into everything in our house. My family has traditionally had a tree in our house during the holiday season. I recently heard something about pesticides being used on farmed trees. Is this true? Could a tree be dangerous for my daughter?

Paul (New York, NY)

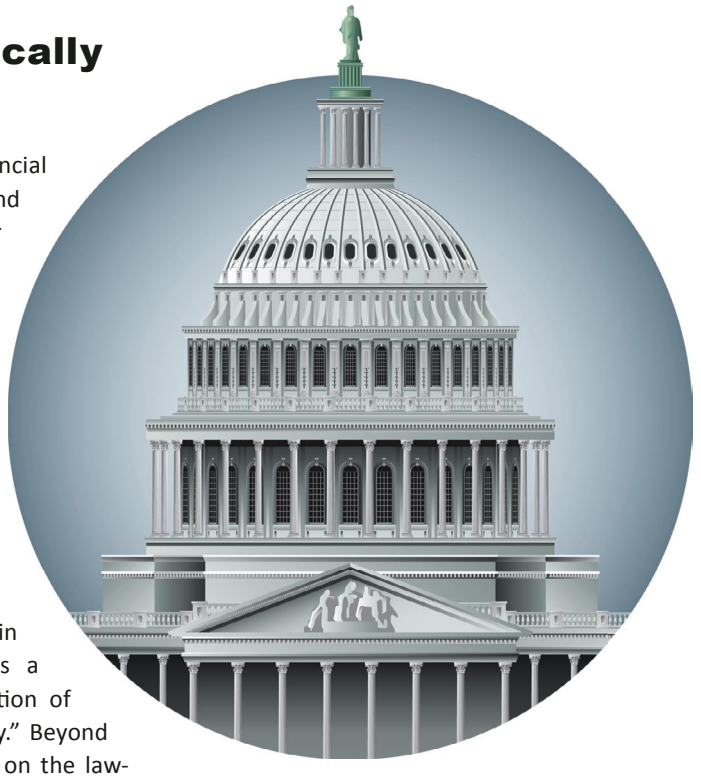
Thank you for your question regarding pesticides on commercial Christmas trees, which may be especially relevant for some of our readers during the upcoming holiday season. It is true that many tree farms use pesticides, particularly those in the states with greatest production, North Carolina and California. However, there are some options if you want to buy organic trees, and there are even some very well-designed artificial trees available (unlike the very fake-looking ones you may remember from previous decades).

To begin, pesticides are quite prevalent on commercial farms, especially those in North Carolina, where the annual industry revenue is $100 million and the most commonly grown tree is the Fraser Fir. This species is, as are many, susceptible to a number of pests, including mites and aphids. To avoid cosmetic damage, save time, and eliminate undergrowth without mowing, growers use a variety of insecticides and herbicides, from the readily available (like Roundup) to banned (like lindane, in 2002, leftover stocks of which can still be used until they run out). The active ingredient in Roundup, used on 89% of the trees grown in 2006 in North Carolina, is glyphosate, which has been tied to non-Hodgkin's lymphoma. Others include dimethoate, chlorpyrifos, and Di-Syston, once common and now decreasing in use and one of the EPA's Class I (most acutely toxic) chemicals. These chemicals can pose a variety of serious health threats to workers, from dermal irritation to cancer.

If you find that the process used to produce most "real" Christmas trees is not what you're looking for in a holiday tradition, there are other options available. First, if you want to stick with the single-use tree, there are farms that do not use pesticides. A list of organic Christmas tree and wreath growers in can be found on the Web at http://www.greenpromise.com/resources/organic-christmas-trees.php. Ask your local growers what they use on their trees. If you're not sure whether it's safe, check our website or contact us. Lastly, an alternative to hunting down organic trees is an artificial one. Their benefits include reusability, being low-maintenance, and producing less mess to clean up. While most trees are made from PVC (which has its own set of environmental and health dangers), there are trees on the market made of polyethylene. Christmastreeforme.com carries a variety of realistic trees that are on the more eco-friendly side of plastics.

Happy holidays!

Federal Court Upholds Ban on Genetically Engineered Alfalfa



On September 2, 2008, the U.S. Court of Appeals for the Ninth Circuit upheld a nationwide ban on the planting of genetically engineered (GE) Roundup Ready alfalfa pending a full Environmental Impact Statement (EIS). The Court determined that the planting of genetically modified alfalfa could result in potentially irreversible harm to organic and conventional varieties of crops, damage to the environment, and economic harm to farmers. Although the suit (*Geertson Seed Farms, et al. v. Johanns*) was brought against U.S. Department of Agriculture (USDA), Forage Genetics and Monsanto entered into the suit as Defendant-Intervenors. In her opinion, Circuit Judge Mary M. Schroeder held that, "Monsanto and Forage Genetics contend that the District Court disregarded their financial losses, but the district court considered those economic losses and simply concluded that the harm to growers and consumers who wanted non-genetically engineered alfalfa outweighed the financial hardships to Monsanto and Forage Genetics and their growers." The court's decision upholds a May 2007 U.S. District Court ruling.

"Roundup Ready Alfalfa represents a very real threat to farmers' livelihoods and the environment," said Andrew Kimbrell, executive director of the Center for Food Safety, lead plaintiff and counsel in the lawsuit. "This ruling is a turning point in the regulation of biotech crops in this country." Beyond Pesticides was a co-plaintiff on the lawsuit.

For more information on the lawsuit, visit the Center for Food Safety website, www.centerforfoodsafety.org. For more information on GE food issues, see Beyond Pesticides genetic engineering program web page, www.beyondpesticides.org/gmos.

Take Action: Help Stop Rollback of Critical Organic Funding

The U.S. Senate is proposing to cut $2 million per year from the Organic Agriculture Research and Extension Initiative (OREI), the U.S. Department of Agriculture's premier organic research program, and the Bush Administration is threatening to cut a whopping $8 million, according to the Organic Farming Research Foundation. The move comes after months of grassroots pressure recently delivered a much-needed increase in mandatory OREI funding, from $15 to $78 million over the next five years, in the 2008 Farm Bill. Beyond Pesticides has long supported organic methods as the solution to pesticide pollution, with organic agriculture being the centerpiece of the conversion necessary to protect human health and the environment, including slowing global warming. Reduced pressure on global warming associated with no-till organic agriculture, for example, occurs through the drastic reduction in fossil fuel usage (approximately 75% less than conventional agriculture) as well as the significant increase in carbon sequestration in the soil (approximately 1000 lbs. of carbon per acre).

While the organic share of the retail food market is currently about 4%, total USDA spending for organic agriculture research and education was just over 1% of all of the department's research and education spending in FY2007. Let the Appropriations Committees in Congress know that it is essential to expedite the transition to organic agriculture in the U.S. and research funds are an essential tool. Tell them to keep funding for OREI at the level authorized in the Farm Bill – $18 million for 2009. It is helpful for you to send a unique message to House and Senate Appropriations Committee members from your state (find them here: http://appropriations.senate.gov/members.cfm and http://appropriations.house.gov/members110th.shtml) even if it is short and precisely explains that you would like to see full funding for organic research to assist in the broader transition to organic agriculture. Longer messages can rely on talking points provided by Organic Farming Research Foundation (OFRF) at http://ofrf.org/action/ofan/080903_alert.html.

EPA Takes Action to Enforce Farmworker Protection Law

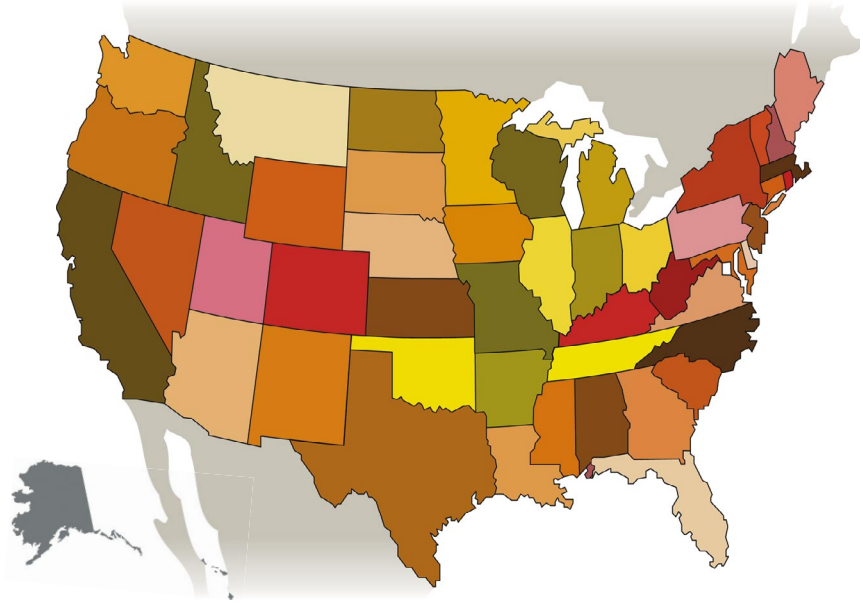
It was seen as a positive development when in August 2008 the Environmental Protection Agency (EPA) announced, "Through recent settlements with four Puerto Rico farms, EPA is sending a message to farm owners that protecting their workers must be their first priority." That is tough talk from an agency that has long been criticized for its abysmal record of instituting and enforcing even the most basic human health protections for farmworkers. This case started in October 2007 when EPA filed a complaint against four Puerto Rico farms for being in violation of the worker protection standard (WPS) of the *Federal Insecticide, Fungicide and Rodenticide Act* (FIFRA). The farms failed to display specific pesticide application information for agricultural workers and pesticide handlers. Several of the farm owners also failed to provide workers with medical care information, training, protective equipment or ways to wash off residual pesticides before leaving work sites. Under the settlement, each farm has agreed to pay a civil penalty and to correct its violations.

On an historical note, farmworkers were originally "protected" under a 1974 standard in EPA regulations that only instructed growers to keep workers out of pesticide-treated fields until the dusts had settled or sprays had dried. That standard was developed after field hearings in which EPA heard from growers but not farmworkers. Under the threat of litigation, the Carter Administration funded an effort to collect data on workers' experiences with pesticide exposure and poisoning in the fields. Jay Feldman, Beyond Pesticides' executive director who was involved in that effort, points out that, "Chemical-intensive growers viewed the discussion about worker protection as a threat to agricultural production and their livelihood and resisted calls for new standards." So, it was not until nearly 15 years after the Carter Administration began the review that EPA in 1992 upgraded the 1974 "standard."

Group Calls for Peer Review of Organic Certification

The U.S. Department of Agriculture (USDA) National Organic Program (NOP) announced August 5, 2008 that 15 of the 30 accredited organic certifiers it recently inspected failed the USDA audit and will have 12 months to make corrections or lose their accreditation with NOP. A number of the violations noted in the several hundred-page audit related to Chinese imports certified by the French-based organic certifier ECOCERT and others. However, the non-profit Organic Consumers Association (OCA) points out that the USDA does not cite Quality Assurance International (QAI), the largest organic certifier in the world, even though OCA recently reviewed documents that indicate that QAI is indeed under investigation by NOP. QAI has recently been in the news for sourcing ginger contaminated with the highly toxic and restricted insecticide aldicarb from its Chinese certification subcontractors and then labeling it as "USDA Organic." While consumers might consider some of USDA's violations minor, such as a farmer not reporting changes in an organic farm plan (even if the changes did not violate organic farming practices), Beyond Pesticides believes it is still important that the organic law is followed so that public confidence in the organic seal remains strong.

For six years, OCA and others in the organic community have called on USDA to implement a Peer Review Panel system, as required by law in the National Organic Standards, so that respected members of the organic community can monitor and police violations of organic standards on the part of producers, importers, and certifiers. *To sign a petition supporting the panel, visit www.organicconsumers.org/action.cfm and scroll to the August 2008 alerts.*



Pyrethroid Pesticide Affects Puberty at Low Levels

A study published in the September issue of *Environmental Health Perspectives* (Vol. 116, No. 9) finds that low-dose, short-term exposure to esfenvalerate, a synthetic pyrethroid pesticide, delays the onset of puberty in rats at doses two times lower than the Environmental Protection Agency's (EPA) stated no observable effect level (NOEL) of 2.0 mg/kg/day. The researchers conclude, "Although the exact mechanism of action is unknown at this time, we observed the effects at dosage levels below the NOEL established through chronic dietary exposure studies in rats…The present study shows that immature female rats exposed to 1.0 mg/kg/day are sensitive to this pesticide, as evidenced by their delay in the onset of puberty…This could potentially affect current established exposure levels for humans, because the reference dose for [esfenvalerate] of 0.02 mg/kg/day is based directly on the rodent NOEL of 2.0 mg/kg/day." With the phase-out of most residential uses of the common organophosphate insecticides chlorpyrifos and diazinon home use of pyrethroids has increased. Synthetic pyrethroids are used for everything from lawn care and household insecticides, to mosquito control and agriculture. Pyrethroids may also affect neurological development, disrupt hormones, induce cancer, and suppress the immune system. *For more information on pyrethroids, visit Beyond Pesticides Gateway on Pesticide Hazards and Safe Pest Management at www.beyondpesticides.org/gateway.*

NC Farmworker Protection Bill Signed Into Law

In August 2008, North Carolina Governor Mike Easley signed into law Senate Bill 847, "An act to add agricultural workers to those protected against retaliation in the workplace and to direct the Pesticide Board to adopt rules requiring licensed pesticide applicators to record the specific time of day when each pesticide application is completed, as recommended by the Governor's Task Force on Preventing Agricultural Pesticide Exposure." This law, along with funding approved by the legislature in the Governor's budget, will help protect agricultural laborers, farmers and applicators who work around pesticides. The new law makes it illegal for employers to retaliate against farmworkers who complain about unhealthy exposure to pesticides. It also directs the state Pesticide Board to require more detailed record keeping on the time of day and kinds of pesticides being used, and it requires those records to be kept for two years, instead of the current 30 days.

"This bill represents a significant step forward," said State Health Director Leah Devlin, the task force chair. "There is more to be done and we will continue to develop new health protection measures and work to see they are implemented." Ms. Devlin noted that the task force's work would be continuing through the recently organized Interagency Pesticide Work Group that will operate out of the state Department of Agriculture and Consumer Services. In the state budget, $350,000 was designated to replace federal funding that was cut to track pesticide poisoning cases. It also will pay for two state workers to train farm laborers on proper handling of pesticides. Farmworkers are among the groups most at risk for pesticide poisoning. Some have been fighting for reparation for decades and are still exposed to some of the most toxic pesticides on the market. *For more information, contact Beyond Pesticides.*

Appeals Court Says CA Does Not Have To Limit Pesticides in Smog

On August 20, 2008, the 9th U.S. Circuit Court of Appeals reversed a 2006 ruling by the U.S. District Court for the Eastern District of California (Sacramento) that required California to establish limits on air pollution associated with pesticide use. The Appeals Court found that the lower court did not have jurisdiction to impose solutions under the *Clean Air Act*. According to the plaintiffs, represented by the Center for Race, Poverty and the Environment (CPRE), an environmental justice litigation organization based in San Francisco, pesticides are the fourth largest source of smog-forming volatile organic compound (VOC) emissions in California's San Joaquin Valley. Prior to 2005, the state did not regulate this source of pollution, even though the state had made a promise to reduce VOC emissions from pesticides in its smog clean-up plan adopted pursuant to the *Clean Air Act*. CRPE originally filed suit (*El Comité para el Bienestar de Earlimart, et al. v. Warmerdam, et al.*) in U.S. District Court in July 2005. In April 2006, Judge Lawrence Karlton ruled in their favor, requiring California Department of Pesticide Regulation (DPR) to implement regulations to reduce VOC emissions from pesticides by 20% from 1990 levels by January 1, 2008. The judge found the act was violated when regulators used improper data in calculating the baseline for emission reduction goals and thus did not adopt "enforceable control measures." The state appealed and the appeals court sided with the state. *For more information, contact Beyond Pesticides.*

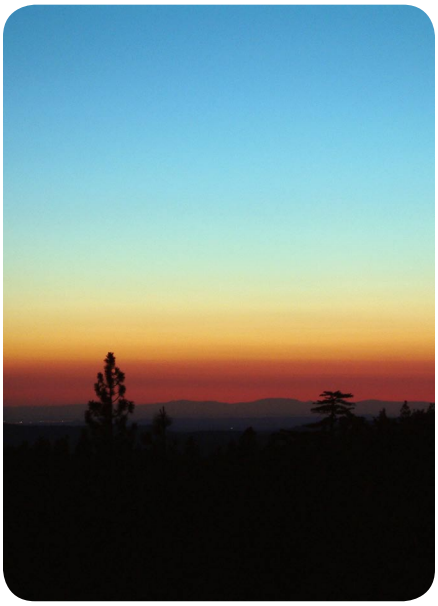


photo by TahoeSunsets

Initiative Improves Pest Management in Boston's Public Housing

Responding to grassroots pressure, the Boston Public Housing Authority (BHA) is promoting integrated pest management (IPM) through its Healthy Pest-Free Housing Initiative Project (HPFHI) in the city's public housing facilities. The program, which was launched after the tenant rights group Committee for Boston Public Housing began looking into the connection between respiratory health and housing conditions in 1995, is now proving successful. "The project's goal is to provide intensive in-home and community-based education designed to change individual and community practices regarding pest control and the use of pesticides," explains John Kane, IPM coordinator and planner for the Boston Housing Authority (BHA). Mr. Kane says that there has been up to a 75 percent reduction in work orders dealing with pests and a huge increase in the quality of life for the residents. Over 1,000 BHA households in eight developments have received in-home and community-based support and education to encourage integrated pest management practices that focus on prevention and use "least toxic" pesticides only as a last resort. "People are beginning to see they no longer have to live with their pest problems. They feel empowered by being able to take control of their pest problems and their health," says Mr. Kane.

The HPFHI project has moved the standard pest management practice from routinely spraying pesticides in an entire complex to inspections and an integrated management plan. Prevention is emphasized, and tactics such as sealing up cracks and crevices, fixing plumbing leaks, and removing habitat are all steps that are taken once a unit is vacated and during yearly unit inspections. Insecticide gels are used as a last resort. While environmentalists note that the plan is a vast improvement, Beyond Pesticides cautions that not all baits and gels are created equal. *To learn more about the volatility of commonly used pesticides, see the article, "How Safe Is Your Bait?" from the Winter 2007-08 issue of Pesticides and You. For more information on the link between pesticides and asthma, visit www.beyondpesticides.org/children/asthma or call Beyond Pesticides to order our Asthma, Children and Pesticides brochure.*

Gender-Bending Herbicide Contaminates Lakes Far from Use Sites

According to the Minnesota Department of Agriculture's 2007 *Water Quality Monitoring Report*, released in August 2008, the endocrine disrupting herbicide atrazine is detected in pristine lakes in northern Minnesota, far from the agricultural fields where it is applied. Metolachlor, acetochlor and dimethenamid are also frequent contaminants, according to the statewide sampling. The report analyzed samples from 55 of the state's lakes. Atrazine was detected in approximately 87% of the 2007 samples, an increase from 2006. The presence of atrazine in such a large percentage of the lakes, many of which are located in non-agricultural areas of northern Minnesota, suggests widespread atmospheric deposition of this chemical (movement through wind, dust and rain). "To some people, it is a bit of a surprise, but the concentrations are low, very low," Steven Heiskary, a research scientist with the Minnesota Pollution Control Agency (MPCA) told the Star Tribune. Unfortunately, this is not very reassuring, given the fact that many of the developmental impacts linked to atrazine are seen at very low levels, sometimes at just a fraction of a part per billion. Research by Tyrone Hayes, Ph.D., has shown that 0.1 parts per billion of atrazine in the water where a frog develops can hermaphrodize the animal (having both male and female gonads). Even concentrations of a few parts per trillion can seriously impact the way an animal develops. Another study links atrazine to endocrine disruption in human placental cells.

Six of the contaminated lakes are in or near Boundary Waters Canoe Area Wilderness

Atrazine is the second most commonly used agricultural pesticide in the U.S., and the most commonly detected pesticide in rivers, streams and wells. It is linked to endocrine disruption, neuropathy and cancer. An estimated 76.4 million pounds of atrazine are applied in the U.S. annually. Atrazine has a tendency to persist in soils and move with water, making it a very common water contaminant. *For more information on atrazine, visit Beyond Pesticides Gateway on Pesticide Hazards and Safe Pest Management at www.beyondpesticides.org/gateway. To learn more about pesticides and water contamination, see Beyond Pesticides' report, Threatened Waters: Turning the Tide on Pesticide Contamination, at www.beyondpesticides.org/water.*

Wood Preservative Contaminant Linked to Childhood Obesity

A Spanish study published online by *Acta Paediatrica* in July 2008 has found a connection between an increased risk of childhood obesity and exposure before birth to the organochlorine pesticide and contaminant hexachlorobenzene (HCB). Found as a contaminant in the wood preservative pentachlorophenol, widely used in the U.S., HCB is toxic, bioaccumulative and extremely persistent in the environment. Researchers first measured persistent organic pollutants (HCB, PCBs, p,p'-DDE, and p,p'-DDT) in the cord blood of infants and later measured each child's height and weight at 6.5 years of age. "Overweight" was defined as the 85th percentile or higher on the U.S. National Center for Health Statistics/WHO reference body mass index (BMI).

All 405 children studied had contaminants in their cord blood. P,p'-DDE averaged the highest level, and p,p'-DDT had the lowest. The median level of HCB was third highest, at 0.68 ng/mL. The children in the group with the highest HCB exposure also had the highest exposure to the other organochlorines, and their mothers were older and had higher BMI. The children in this group also had the highest BMI. After sorting factors like the mother's weight during pregnancy, HCB exposure related to obesity remained significant. Children with higher exposure had a 1.7 risk of being overweight compared to the low exposure group, and a risk of 2.0 for obesity. HCB has also been linked to non-Hodgkin's lymphoma and behavioral disorders. *For more information, contact Beyond Pesticides.*

Commentary

Naming the 'Cides that Poison and Kill...Revisited

Taking a closer look at names chemical companies give their pesticide products

By Natalie Lounsbury

Nearly 20 years ago, the staff at Beyond Pesticides, then NCAMP, put together a list of pesticide trade names in order to get a peek into the psyche of pesticide producers and their intended audience. Although their prediction that new age marketing executives would start focusing on a "kinder, gentler" image for pesticides was partially true, war, machismo, and animal images have remained popular.

Clearly intended to create an image, whether it be of bravado, violent nature or perfect harmony, the names chosen sometimes do not make logical sense... but then again, neither do pesticides.

Food Chain Confusion

For example, here are some herbicides that have led us to believe that the pesticide industry may be a little confused about the food chain and who eats what...

■ **Python WDG** (herbicide) from Dow AgroSciences: Nothing says "kill your weeds" like the name of a constricting snake. Pythons are carnivorous animals that eat primarily rodents, and would have a difficult time consuming broadleaf weeds.

■ **Cobra** (herbicide) from Valent U.S.A.: If you can not get a constricting snake to kill your weeds, why not try a venomous one? Although cobras have a different diet than pythons, broadleaf weeds also have no place on their plate.

■ **Raptor** (herbicide) from BASF: Has anyone ever seen a red tailed hawk swoop in to kill some witchgrass or wild radish?

■ **Scorpion III** (herbicide) from Dow AgroSciences: Scorpions eat insects, not weeds. Perhaps Dow is referring to this mixture's (clopyralid, 2,4-D and flumetsulam) toxic effect on beneficial insects? Or maybe the name is an allusion to how the pesticide can just stick around in unexpected places (like in your shoes—remember to shake them out!).

Shootin' Down the Weeds

Along with these animals, a whole arsenal (yes, Arsenal is also the name of an herbicide) of weaponry exists to kills weeds. Among the options are:

■ **Shotgun** (herbicide) from Loveland Products: Shotguns send out multiple shots at one time. In aiming for weeds, the toxic combination of 2,4-D and atrazine affects much more than just the target species and wreaks havoc on multiple levels including aquatic life and humans.

■ **Bullet** (herbicide) from Monsanto: Were we to use bullets to attack our herbaceous foes, along with probably being unsuccessful, we would leave a toxic trail of lead contamination. This herbicide does not contain lead, but instead leaves a toxic trail of cancer-causing alachlor and endocrine-disrupting atrazine.

■ **Revolver** (herbicide) from Bayer: The gun that made Russian Roulette famous is, in some ways, an appropriate name for what we are doing with pesticides—never really knowing which ones are going to cause irreparable harm, chemical companies just keep firing them into the world...

Oldies but Goodies

Many of the products on the original list from NCAMP still exist. We have listed our favorites below.

■ **The Battlefield**: Ambush, Brigade, Bombardier, Squadron, Broadstrike, Battalion, Salute, Marksman

■ **Cowboys and Indians**: Roundup, Gaucho, Stirrup, Lasso, Stampede

■ **Phallic Images and Brawn**: Ramrod, Bicep

■ **Violent Weather**: Cyclone, Tornado, Storm, Lightning

■ **Animals**: Cougar, Hornet, Bison, Talon, Rhino

■ **Good Feelings and Wholesomeness**: Asana, Harmony, Total, Impower, Genesis, Accord, Assure, Prosper, Habitat

Pollinators and Pesticides

Escalating crisis demands action

by Natalie Lounsbury

Blueberry growers in New Brunswick were rudely awakened to the damaging potential of pesticides on pollinators in the 1970's. Spraying fenitrothion for spruce budworm so drastically affected native pollinators in the forests adjacent to their blueberry fields that the crop production was abysmal. In the last few years, the negative impacts that pesticides have on beneficial insects have come to light again with severe honeybee hive losses known as colony collapse disorder (CCD), a devastating epidemic in which pesticides have been implicated. The pollinators' decline has occurred in the context of pesticide regulations that are criticized by safety advocates for their lack of attention to sublethal effects of pesticides, individually and in combination, on beneficial insects like bees.

The food system and almost all terrestrial ecosystems depend on pollination. Recent economic analysis has estimated the global value of insect pollination alone on agricultural crops at €153 billion, which is 9.5% of the total value of world agricultural production. Facing risks from pesticides, introduced pathogens, habitat destruction and fragmentation, the future for pollinators is shaky. Agricultural and land management practices on all scales that do not use pesticides and that provide habitat for wild pollinators may hold the key to restoring the health and viability of diverse pollinator communities—both managed and wild.

Wild pollinators

Pollinators are "a bellweather for environmental stress as individuals and as colonies." Honeybees (*Apis mellifera*) are perhaps the best known pollinators in the world and the primary managed pollinators, but they are by no means solely responsible for the pollination of all flowering plants. Both in non-agricultural settings and in agricultural crops, wild, native pollinators play an essential role in plant reproduction and food production. While honeybees are undeniably important and rightly deserve the present concern over their survival, this attention should not overshadow the critical survival of all pollinators.

The decline of wild pollinators received increased attention in the late 1990s when researchers identified the need for action to understand and protect them, though others warned of the threat earlier. Wild pollinators, which include non-Apis species of bees, wasps, beetles, flies, butterflies, moths, birds, bats, and even some non-flying mammals, have suffered "multiple anthropogenic insults" in the last several decades. These include habitat destruction and fragmentation, pesticide use, land management practices and the introduction of non-native species and pathogens, all of which collectively threaten their existence.

What was dubbed a "major pollination crisis" in the 1990s has only become more pressing with the current increased threat to both honeybees and wild pollinators. Pollination is a reminder that ecosystems, including agricultural ecosystems, are comprised of a series of interdependent relationships. A response to this crisis necessitates a balanced approach to addressing the threats to both honeybees and wild pollinators, and undeniably one of these threats is pesticide use.

What is threatening the wild pollinators?

Entomologists suspect that lethal and sublethal effects of pesticides are one of the many "anthropogenic insults" threatening

wild pollinators. Pesticide risk mitigation measures intended to protect honeybees do not always constitute risk mitigation for other pollinators such as bumblebees because they have different foraging practices, social structures and genetics. Minimal research on pesticide toxicity for wild pollinators indicates that many pesticides currently in use do have deleterious effects on pollinator populations such as bumblebees, but "hard data are largely lacking" (Goulson, 2008).

Spraying pyrethroid insecticides in the early morning or late afternoon, when honeybees are less likely to be foraging, is considered a risk mitigation measure for honeybees, but it actually endangers wild pollinators such as bumblebees. These times, when the temperatures are lower, are exactly when bumblebees forage. Bumblebees are particularly important in light of the current honeybee crisis because at sufficient densities they can very efficiently pollinate many of the crops that honeybees do. In order to protect all pollinators, these distinct differences must be taken into account when considering pesticide risk assessments and risk mitigation measures.

In 1998, researchers suggested that an ideal program to study non-Apis bees and other invertebrate pollinators would include "multi-year assessments of sublethal and lethal effects of pesticides and herbicides [sic] on wild invertebrate pollinator populations in and near croplands" (Allen-Wardell, 1998). Such a research undertaking is challenging given the numerous factors that could possibly affect wild pollinators ranging from pesticide use to habitat destruction, weather, pathogens, or other uncontrolled events. Recent studies, however, have revealed the drastic impacts that crop and land management strategies have on wild pollinator diversity and abundance.

Natural management benefits bees

One study in Canada analyzing wild bee abundance and pollination deficit (the extent to which the flowers were or were not completely pollinated) in organic, conventional and genetically modified (GM) canola fields (a crop that relies on wild bee pollination—the researchers found less than 2% honeybees) found that organic fields had both the highest bee abundance and the lowest pollination deficit. GM canola had the lowest bee abundance and greatest pollination deficit. The researchers note that the organic fields in the study were smaller, which may have affected the results, but the GM and conventional fields were the same size, indicating that different cultural practices contribute to bee abundance and pollination deficit. Organic fields were also located farther apart from one another, which provided more "natural" habitat for wild bees.

While it is impossible to attribute the increased abundance of wild bees in organic fields in this study solely to the lack of pesticide usage, the results underscore that organic agriculture encompasses more than just what it is not used in production since it is a whole approach to farming. Good organic practices incorporate ecological principles that recognize the importance of maintaining habitat areas for wildlife, including wild pollinators. A German study looked at bee diversity with respect to farming practices, landscape composition and regional context, and found that organic farming practices had a significant positive effect on bee diversity (Holzschuh, 2007). The lack of herbicides used in organic land management led to greater floral abundance, which is essential to providing a continuous supply of food for pollinators.

A wild beehive in Maui, Hawaii

These findings are echoed in research looking at the management of roadsides and bee abundance and diversity. In Kansas, native bee diversity and abundance was compared in "conventionally" managed roadsides, which use herbicides, frequent mowing and non-native grasses, and roadsides that had been restored to native plants. Bee abundance and diversity is much greater in roadsides with native plants.

Pollination

In flowering plants (angiosperms), pollination is the transfer of pollen grains from the anther (male structure) of a flower to the stigma (female structure) of a different or the same flower (some flowers are unisexual, containing only anther or stigma, while other flowers contain both). This process leads to fertilization, and the production of seeds. Plants have evolved with different mechanisms for pollination, and many of them have coevolved with animals that aid in the pollen transfer. It is estimated that 75-90% of the nearly 250,000 species of angiosperms in the world today rely on pollination by animals, especially insects. Even some plants that are "self-pollinating," such as soybeans, have been shown to benefit greatly from the help of insects in the pollination process. The number of flower-visiting species of animals worldwide is estimated at nearly 300,000. The remaining angiosperms rely on abiotic forces such as wind, gravity and water for pollination.

Bees

Among all animal groups, bees pollinate the most plants. The majority of over 20,000 species of bees rely on flowers for food. According to the Xerces Society, native bees, of which there are 4,000 species in North America, are the most important group of pollinators on this continent. Over 70% of them are ground nesting, while 30% make their homes in old beetle tunnels or similar locations. Humans can help encourage native bees by creating suitable nesting sites for them, and planting appropriate flowers. For more, see page 17.

The most common managed bee species is the honeybee (*Apis mellifera*), which enables the pollination of over 90 crops and contributes an estimated $15 billion annually to the U.S. economy. Other species are also managed explicitly for pollination, such as alfalfa leaf-cutter bees (*Megachile rotundata*), and various bumblebees (*Bombus sp.*). The introduction of managed species can have deleterious effects on native populations, if appropriate screening and considerations are not made. Because bumblebees can be very efficient pollinators, there has been increased interest in bombiculture, or the management of bumblebee species, particularly in greenhouses. This has contributed in some instances to the decline of native populations because of introduced pathogens. Some viruses may be more virulent in bumblebees than honeybees, for example. More research on the cross-infectivity between various bee species is necessary. Other reasons for the documented decline of native bumblebees include pesticide use and habitat destruction.

Flowers pollinated by bees have distinctive characteristics such as a "landing platform," a scent, and frequently distinctive patterns that are adapted to be recognizable to bees and optimize the bee's attributes. They are never pure red, as bees cannot perceive the color red. Some important examples of agricultural crops pollinated by bees include almonds, apples, blueberries, melons, and many more. Some plants, such as tomatoes (which do not produce nectar), are better suited to "buzz" pollination, for which bumblebees are particularly well-suited.

Moths and Butterflies

Flowers pollinated by butterflies and moths share some visual and scent characteristics with bee-pollinated flowers, but they can be red, and generally are adapted for the moths' and butterflies' long, sucking mouthparts. Along with pollinating many wild plants, moths pollinate tobacco. Protecting migratory habitat for pollinating butterflies is particularly important to their survival. Research has shown organic farming methods to support higher abundance and species diversity for butterflies compared to conventional chemical-intensive farming.

Beetles, Flies, Wasps and Other Insects

Many tropical crops are pollinated by insects other than bees. Oil palm, for instance, is pollinated by weevils, cacao is pollinated by midges, and mango is pollinated by flies and other insects.

Bats and Other Mammals

Bats and flying foxes pollinate cacti and agave, rain forest canopy trees, durians, wild bananas, neem trees (an important source for natural pesticides) and palm trees. There is "unequivocal evidence" of dramatic declines in many species of pollinating bats. The reasons for these declines are not entirely understood, but include habitat destruction and possibly environmental contamination. In addition to the pollination services some bats provide, bats play other important roles in the ecosystem, which include eating many agricultural pest insects and mosquitoes.

The importance of lemurs, monkey, and tree squirrels as pollinators is not well documented though many of these species are frequent flower visitors, but some documented cases of obligate (necessary for survival) pollination exist. For example, the black and white ruffed lemur is the only known vertebrate with the ability to open the bracts of the plant known as the traveler's tree in order to effect pollination.

Birds

Most hummingbirds are not obligate pollinators of particular plants, but they contribute to a heavy fruit set. Some hummingbird species are threatened. Perching birds not well understood in their role for pollinating, but at least some plants rely exclusively on them for cross-pollination. Birds also play an additional role in plant reproduction through their scattering of seeds.

In addition to adding a continuous supply of food for pollinators, natural habitat and increased floral cover can also encourage beneficial insects, which in turn reduce the "need" for pesticides. For example, in the 1960s it was shown that the incidence of ichneumonoid (wasp) parasitism of codling moth in apple orchards increased if floral resources, such as weeds, were present.

Indicating the importance of natural habitat in promoting bee diversity and abundance, researchers in New Jersey and Pennsylvania found that native bees made up more than half of the bee visitations to tomato and watermelon flowers on similarly sized conventional and organic farms with natural habitat nearby (Winfree, 2008). In this study, bee visitation rates did not differ significantly between conventional and organic farms. The results led the authors to conclude that features generally associated with organic farming but not exclusive to it, such as natural habitat inclusion and smaller field size, have a significant effect on pollination or pollinators.

These results do not exclude the possibility that certain pesticides used in conventional farming negatively affect pollination and pollinators, as the insecticides used on the farms in this study are not representative of the broad range of pesticides to which many bees are exposed. In particular, the farms did not use pesticides in the neonicotinoid family, which are highly toxic to bees. The authors raise the point that pesticides approved for organic production may also affect bee health. The natural insecticide spinosad, for example, has been shown to have sublethal effects on bumblebees at realistic exposure levels.

Apis mellifera, the honeybee

Recent research has shown that landscape management that allows for nesting sites and plenty of floral resources can play a role in encouraging wild pollinators and thus reducing dependence on honeybees, but as of now, "we have relied entirely too much on a single introduced generalist pollinator, the European honeybee, to carry out the bulk of agricultural pollination" (Allen-Wardell, 1998). In the U.S., it is estimated that the value of honeybees as pollinators of over 90 crops is $15 billion annually. Over two million honeybee colonies are rented annually in this country for pollination, and many of them are transported long distances to meet crop demand in disparate places from Florida to California.

The current food system relies heavily on the hard working honeybee. However, the appearance and widespread devastation of CCD clearly indicate that efforts to protect the treasured pollinator and honey producer have fallen short.

Colony Collapse Disorder (CCD)

The name itself, Colony Collapse Disorder, describes the latest threat to honeybees as it manifests itself, but provides no hint as to the cause of the malady. Though first reported in 2006, cases probably indicative of CCD were documented as early as 2004 in the U.S. CCD is unlike other ailments that have affected honeybees in the past because worker bees simply disappear rapidly, never returning to the hive where the queen still lives with a small cluster of bees amidst pollen and honey stores in the presence of immature bees (brood). It has been reported that losses of honeybee colonies across 21 states in the winter of 2007-8 averaged 35%, with a high degree of variability. Large declines of honeybee colonies were also experienced in select European countries, where average losses were 26% (USDA, 2006).

Many indications point to CCD potentially being induced by pesticides in the neonicotinoid family, including imidacloprid and clothianidin, in combination with other pesticides, pathogens, nutritional deficits and environmental stresses. Continued debate about the cause of CCD threatens to induce "paralysis by analysis" in a situation that necessitates action.

Previous honeybee declines and CCD

Although CCD manifests itself differently than any honeybee malady in the past, honeybees have suffered from various insults throughout the last several decades. In the 1980s, two mites, *Varroa destructor* (vampire mite) and *Acarapis woodi* (tracheal mite) caused large die-offs and led to the continued widespread use of miticides, such as tau-fluvalinate and coumaphos, in hives. Bacterial infections such as Paenibacillus larvae have also led to widespread use of antibiotics to treat bees.

Analysis of microbes in CCD-affected colonies show that while affected and unaffected hives contain a similarly diverse array of bacteria and fungi, a particular virus is strongly correlated with CCD-affected hives. Researchers determined that although a causal relationship between Israeli acute paralysis virus (IAPV) of bees and CCD could not be proven, IAPV is nonetheless a significant marker for CCD. Why this relationship exists is unclear, but indicates the potential for multiple mechanisms in inducing CCD.

Genetics of the honeybee

Some insects rapidly evolve to defend against the barrage of toxic chemicals intended to kill them, and develop resistance. Companies developing pesticides respond with new pesticides in different chemical classes. Unlike other insects, no major metabolic resistance mutations have been documented for honeybees. Pesticides in multiple classes, including carbamates, organophosphates, synthetic pyrethroids, chlorinated cylcodienes and chloronicotines (neonicotinoids), are all highly toxic to honeybees.

After analyzing the recently decoded honeybee genome, scientists believe that honeybees' extreme sensitivity to insecticides and lack of mutations leading to resistance may be a function of limited genes (in comparison to other insects) associated with detoxification of xenobiotics (chemicals foreign to the organism, including insecticides). Toxicological assessments for honeybees on both the lethal and sublethal effects of pesticides alone and in combination (additive and synergistic effects) are paramount given their extreme sensitivity and essential role in agriculture.

Analysis of pesticide residues in pollen loads in France reveals that real-world pesticide exposure for honeybees includes a wide variety of chemicals, the most common of which include imidacloprid (appearing in nearly 50% of samples) and fipronil, along with their metabolites. All of these chemicals have been shown to have effects at sublethal doses on learning and memory in honeybees. Reports indicate that data is forthcoming on the analysis of pesticide residues in pollen and honey for the U.S., which may shine light on the particular pesticide exposures of U.S. honeybees and how that contributes to CCD.

Imidacloprid and the neonicotinoids: Regulatory deficiencies and flawed manufacturer data

While not dismissing the possibility that CCD is a result of myriad factors including pathogens, a closer look at neonicotinoid pesticides is nonetheless warranted in light of rapid increased usage and high bee toxicity. Imidacloprid was the first insecticide in this class to be approved by the Environmental Protection Agency (EPA) when Bayer registered it in 1994. For more information on

how imidacloprid works, please see the factsheet on page 18.

The case of the neonicotinoids exemplifies two critical problems with current registration procedures and risk assessment methods for pesticides: the reliance on industry-funded science that contradicts peer-reviewed studies and the insufficiency of current risk assessment procedures to account for sublethal effects of pesticides (in particular systemic pesticides that bees ingest via pollen and nectar).

A discourse analysis of the debate that took place in France following massive bee die-offs like CCD provides an interesting perspective from which to look at the discussion underway in the U.S. regarding the neonicotinoids. According to scientists there, Bayer used studies flawed in both design and execution to create a sense of uncertainty in France surrounding imidacloprid's toxicity to bees. Bayer produced reports that were not peer-reviewed indicating that bees would not be adversely affected by imidacloprid. Peer-reviewed studies showed effects of imidacloprid at much lower levels than Bayer acknowledged.

The situation created what the researchers dubbed "manufactured

How do pesticides affect pollinators, especially bees?

The full ramifications of how pesticides affect pollinators, in particular bees, are not thoroughly understood. However, here is a brief overview of the effects.

Lethal effects

Many pesticides are acutely toxic to bees and result in death. Representative pesticides in the following classes are considered highly toxic to bees (causing death for over 1000 bees per hive per day at expected exposure levels): carbamates, organophosphates, synthetic pyrethroids, chlorinated cylcodienes and chloronicotinoids (neonicotinoids).

Sublethal effects

Pesticide levels that do not kill bees at statistically significant rates may nonetheless have effects on performance that inhibit tasks such as olfactory learning, foraging, and reproduction, which in turn affect hive survival. Reduced learning after 11 days exposure to sublethal doses has been documented for imidacloprid, fipronil, deltamethrin, endosulfan, and perchlorate.

Synergistic effects

Often pesticides have more toxic effects in combination than alone. Imidazole fungicides and pyrethroid insecticides have documented synergistic effects on honeybees at doses that did not elicit reactions when used alone.

Food availability

Herbicides used in fields, along rights-of-way, and in forests tend to reduce the number of flowering plants. This reduces the amount of food available for native pollinators, making their survival more difficult. This has effects throughout the food chain, as reduced flowering and pollination leads to reduced fruit set for plants on which birds and other creatures depend. Beekeepers avoid this problem by moving their hives, making sure there is a food source, and even providing additional food to their honeybees. However, as the survival of wild pollinators becomes increasingly important in light of the troubles of the honeybees, the issue of floral/food availability will need to be addressed.

International actions to protect honeybees

France, where beekeepers initially noticed mysterious bee die-offs in 1994, was the first country to act against the insecticide imidacloprid, which beekeepers and scientists linked to the losses. Although controversial, after years of heated public debate and a strong network of advocacy spearheaded by beekeepers, French authorities stopped the use of imidacloprid on sunflowers in 1999 and on corn in 2003. When Bayer applied for French registration of clothianidin, which is in the same neonicotinoid family as imidacloprid, it was denied.

Other countries throughout Europe have also experienced drastic reductions in their honeybee populations and taken action. In May 2008, Germany suspended the use of eight insecticides toxic to bees, including clothianidin and imidacloprid, following a massive bee die-off. In September 2008, Italy followed suit and suspended the use of clothianidin, imidacloprid, fipronil and thiamethoxam for seed treatments of rapeseed oil, sunflowers, and corn.

uncertainty" posing as scientific uncertainty about imidicloprid's toxicity. The manufactured uncertainty then prolonged the debate about what was causing the bee malady and whether officials should take action against imidacloprid.

France eventually suspended the use of imidacloprid on sunflowers in 1999 and corn in 2003, and did not approve the use of clothianidin. Immediately following the suspension, an increase in bee survival was not observed, but anecdotal evidence indicates that bees began to return to full health in 2005 after fipronil, another pesticide highly toxic to bees, was also restricted. In 2008, Germany and Italy suspended pesticides associated with bee toxicity. See box above.

With discussion of the possible connection between neonicotinoids and CCD in the U.S., scientists argue that the risk assessment process for pesticides is unsuitable for systemic pesticides because it fails to take into account the chemicals' sublethal effects, which can have devastating implications for colonies. Data strongly suggest that neonicotinoids affect behavior of bees at very low, sublethal doses. Given this information and the incredible importance of honeybees to the economy and food systems, this is a prime opportunity to follow the example of France and take action, despite what might be considered scientific uncertainty.

Conclusion

The forces affecting both honeybees and wild pollinators are numerous and complex. A multi-faceted approach to ensure a healthy and diverse pollinator community, which will in turn contribute to a sustainable food system, must look at the effects of pesticide use on pollinators. From the use of neonicotinoids that are implicated in CCD, to the synergistic effects of certain pesticides on honeybees and the reduced food availability for native pollinators as a result of herbicide use, pesticides have taken a toll on both honeybees and wild pollinators. The situation necessitates a multi-pronged strategy to address honeybee health and encourage native pollinators —from planting backyard gardens that encourage pollinators and getting neighborhoods to stop using toxic pesticides to fixing a flawed federal pesticide regulatory process. The CCD crisis provides the perfect opportunity to exercise what many have long advocated as the proper approach to pesticide regulation —the precautionary principle. CCD may well be the result of a combination of factors, but certain pesticides' documented toxicity to bees calls for severe caution.

For more information on the impact of pesticides on pollinators, contact Beyond Pesticides. Information on pesticide toxicity to bees and other organisms is available on Beyond Pesticides' Gateway on Pesticide Hazards and Safe Pest Management at www.beyondpesticides.org/gateway. Alternative factsheets are available at www.beyondpesticides.org/alternatives/factsheets.

A fully cited version of this article is available online at www.beyondpesticides.org/infoservices/pesticidesandyou.

Encourage pollinators at home and in your community

1. Choose nonchemical solutions to insect and weed problems. Many insecticides are highly toxic to pollinators, especially bees, and using them in your house and yard can affect populations. Not using herbicides will benefit pollinators as it can provide them with more food sources.

2. Create habitat for encouraging native bees. According to the Xerces Society for Invertebrate Conservation, 70% of native bees are ground nesting, and 30% make their nests in old snags or similar locations. To encourage ground nests (away from where people may commonly be!), a bare patch of ground is necessary in a sunny, well-drained spot. Many bees will build nests in old rodent holes. To encourage snag-nesting bees, leave snags on trees unless they pose a risk. You can also create nesting blocks to encourage these bees. Common sense precautionary measures such as looking out for bee nests and avoiding them can eliminate the majority of concerns about bee stings, as most bees will only sting if provoked.

3. Plant a pollinator garden. Planting even small patches of flowers, especially native flowers, can provide important food sources for native bees and butterflies. It is best to choose an assortment of flowers that will bloom throughout the season, creating a continuous food supply. Research has shown that planting in clumps works best to attract bees. Even small urban backyard gardens are important sources of food for native pollinators. For more information on appropriate plants for pollinators, contact your local native plant society or extension service.

4. Provide water for pollinators. As long as water is changed daily to avoid creating mosquito habitat, providing water and even mud (an important nesting material for some bees) can greatly help bees, butterflies and other beneficial insects when times are dry.

5. Keep honeybees. To face the challenges and rewards of keeping honeybees, look for a local beekeeping society and classes. Although the agricultural census numbers for beekeeping do not keep track of hobby beekeepers, these beekeepers contribute significantly to the pollinator force (and honey is delicious!).

6. Buy local, organic produce and honey. Organic farming does not allow those pesticides that are most toxic to bees, and organic farms often have smaller field sizes and more floral diversity (weeds) than conventional farms.

7. Support land conservation practices that maintain pollinator habitat. Get involved in local land trust or conservation efforts to maintain both wild and agricultural areas in ways that are conducive to pollinator success. This includes encouraging practices on farms such as planting flowering native plant borders, and maintaining natural habitat areas adjacent to fields. In conserved "wild" areas, the use of herbicides should be discouraged as it can reduce the amount of food available to pollinators.

8. Encourage the planting of native plants in your community. Golf courses, roadsides and parks all offer places to plant patches of flowers that will provide food sources for pollinators and will add beauty to the community. These areas require less mowing than many introduced species of plants.

Sources:
Xerces Factsheets: Plants for Native Bees in North America, Nests for Native Bees, www.xerces.org; University of Maine Cooperative Extension: Understanding Native Bees, Bulletin #7153

ChemicalWatch Factsheet

IMIDACLOPRID

Imidacloprid (1[(6-chloro-3-pyridinyl)methyl]-N-nitro-2-imidazolidinimine) is a systemic, chloro-nicotinyl insecticide used for the control of sucking insects such as fleas, aphids, whiteflies, termites, turf insects, soil insects, and some beetles. It is used on cotton and vegetable crops as foliar and seed treatments, soil, structures, indoor and outdoor insect control, home gardening and pet products. It was first registered in the U.S. in 1994 as the first chemical in its chemical class by Bayer CropScience. End-use products have pervaded the market place within the last 10 years, with the most popular marketed as Merit®, Admire®, Advantage™, Gaucho™, Provado®, Premise® and Imidicide™. Formulations are available as dustable powder, granular, seed dressing, soluble concentrate, suspension concentrate, and wettable powder. Data collected in 2005 showed that over 600,000 pounds of imidacloprid was used in the U.S.[1] and this number has undoubtedly grown. Although the use of imidacloprid has been gaining popularity in agricultural and residential settings, its human and environmental effects have not been fully evaluated, despite its registration over 10 years ago. While many in the industry consider imidacloprid to be a pesticide of relatively low toxicity, it has been found to be extremely toxic to non-target insects like bees, and recently has led to resistance in the Colorado potato beetle.[2]

ChemicalWatch Stats

CAS Registry Number: 105827-78-9

Chemical Class: Chloro-nicotinyl or neonicotinoid.

Use: Systemtic insecticide used for seed treatment, soil insects, termites and a host of other agricultural and residential insect pests.

Toxicity rating: Moderately toxic.

Signal Words: Caution, Warning.

Health Effects: It is linked to reproductive and mutagenic effects and is neurotoxic.

Environmental Effects: Highly toxic to bees and other beneficial insects,and is toxic to upland. game birds. It is generally persistent in soils and can leach to groundwater.

Mode of Action

Imidacloprid belongs to the neonicotinoid chemical family, a family of chemicals similar to the tobacco chemical, nicotine. It works by interfering with the transmission of stimuli in the insect nervous system causing irreversible blockage of acetylcholine receptors, which are found in a type of neural pathway that is more abundant in insects than in warm-blooded animals. These receptors are rendered incapable of receiving acetylcholine molecules (an important neurotransmitter) and an accumulation of acetylcholine occurs, resulting in the insect's paralysis and eventual death. It is effective on contact and via stomach action.[3]

Acute Toxicity

Imidacloprid is classified by the Environmental Protection Agency (EPA) as both a toxicity class II and class III pesticide (on a scale of I to IV, I being the highest toxicity class), and must be labeled with the signal word "Warning" or "Caution." Symptoms of acute exposure are be similar to nicotinic signs and are expected to be diarrhea, fatigue, twitching, salivation, convulsions, cramps, and muscle weakness, including the muscles necessary for breathing. Symptoms can last for five days following exposure. Imidacloprid is quickly and nearly completely absorbed from the gastrointestinal tract and eliminated in urine and feces.

The airborne concentration that resulted in mortality to half of the test organisms (LC50) is >69 mg/m3 air in the form of an aerosol, and >5323 mg/m3 in air in the form of dust. It is considered non-irritating to eyes and skin, and non-sensitizing to skin, though some granular formulations may contain clay as an inert ingredient, which may act as an eye irritant.[3]

Chronic Toxicity

Chronic or long term toxicity of imidacloprid is linked to reproductive and mutagenic effects at relatively high doses. Studies with laboratory rats fed imidacloprid over two years resulted in decreased body weight and increased thyroid lesions. Elevated blood cholesterol levels and stress to the liver were also observed in dogs fed imidacloprid for one year. It categorized as a "Group E" carcinogen (evidence of non-carcinogenicity for humans) by the EPA.

Reproductive Effects

A three generation reproduction study in rats fed up to 700 ppm imidacloprid resulted in decreased pup body weights. An increase in the frequency of miscarriages and an increase in the number of offspring with abnormal skeletons were observed in pregnant rabbits fed a dose of 72mg/kg/day.

Neurotoxic Effects

Tremors, uncoordinated gait and decreased activity were observed in male rats fed 310 mg/kg imidacloprid. A dose-related decrease in a measure of motor and locomotor activity was observed. Most clinical signs of toxicity were resolved after 1- 5 days of treatment.[4] In EPA studies, neurotoxicity was characterized by decreases in motor or locomotor activity in female rats at 42 mg/kg/day.[5]

Mutagenic Effects

Imidacloprid may be weakly mutagenic. It has been determined that imidacloprid increased the frequency of genetic damage by chemically binding to DNA. It also tested positive for causing changes in human lymphocyte chromosomes and for genotoxicity in Chinese hamster ovary cells.[4]

Metabolites

There are several breakdown products or metabolites of imidacloprid, many with toxic effects. The main urinary metabolites are 6-chloronicotinic acid and two monohydroxylated metabolites (5-hydroxyimidacloprid and 4-hydroxyimidacloprid), among others. The nitroso metabolite (1-(6-chloro-3-pyridylmethyl)-N-nitroso(imidazolidin-2-ylideneamine) when fed to rats in drinking water led to higher lymphocyte counts and lower numbers of polymorphonuclear cells (a category of white blood cells).[4]

One metabolite found in imidacloprid-treated plants, called the olefin metabolite (1-(6-Chloro-3-pyridylmethyl)-N-nitro(4-imidazolin-2-ylidene)amine), is more toxic to insects than imidacloprid itself. The guanidine metabolite, however, does not possess insecticidal properties, but has a higher mammalian toxicity than the parent compound.[6]

Ecological Effects

Imidacloprid is toxic to upland game and birds, especially Japanese quail, house sparrow, canary and pigeons. So toxic is imidacloprid to birds that the EPA concluded that the 'levels of concern' for secondary exposures were exceeded for both non-endangered and endangered songbirds.[2] Imidacloprid causes abnormal behavior, such as lack of coordination, lack of responsiveness and an inability to fly, in birds for which it is not considered highly toxic, such as mallards. Other adverse effects observed include eggshell thinning (at exposures of 61mg/kg), decreased weight (at exposures of 150 ppm) in food) and reduced egg production and hatching success.[7] Imidacloprid also appears to repel birds when used as a seed treatment.[8]

It is of moderate to low toxicity to fish and extremely toxic to some species of freshwater and estuarine crustaceans. Earthworms exposed to imidacloprid experience reproductive and mutagenic effects, even at low concentrations. Despite being an insecticide, imidacloprid can be toxic to plants should drift and runoff occur. Cases documenting damage to greenhouse crops exposed to imidacloprid have been reported. Imidacloprid can also reduce blue-green algal communities and diatoms at moderate concentrations.[2]

Beneficial Insects

Honeybees: Imidacloprid is highly toxic to bees when used in foliar applications, and most recently has been identified, along with other pesticides in its chemical class, as one of the pesticides that may be responsible for the decline in honeybee populations in the U.S. and abroad. The rapid disappearance of the honeybees, referred to as "Colony Collapse Disorder" (CCD), has been observed in the U.S. since 2004. This prompted researchers to investigate the cause of this phenomenon and regulators have found studies to be inconclusive. Despite this, imidacloprid has been linked to sublethal effects in honeybees, which include disruptions in mobility, navigation, and feeding behavior.[9] Lethal and sublethal exposures to imidacloprid have been shown to decrease foraging activity, along with olfactory learning performance and decreased hive activity.[10] Bees are exposed when they pollinate flowering crops treated with imidacloprid, or pesticide drift (via wind) from surrounding areas. Honeybees intercept, and are contaminated by particles on crops and suspended in the air, and retain them in their hair and/or accumulate them in their bodies and hives, leading to loses of entire colonies. The effects of CCD can be especially devastating since honeybees are essential pollinators of crops that constitute over one third of the U.S. food supply or $15 billion worth of food.

Other Insects: Spiny soldier bugs, whiteflies, ladybirds, lacewings and mired bugs- all beneficial predators- have also been adversely affected when exposed to imidacloprid. This can lead to a resurgence in pests they would normally prey on, which results in an increase in crop damage.

Pet Products

Imidacloprid pet products, such as Advantage™, are used to control fleas on cats and dogs, and carry the signal word "Warning" on the product label.[8] Imidacloprid, when applied, spreads over the body with the body oils, and collects in the hair follicles and then is released over time (up to one month) from the hair follicles onto the skin and hair. Skin irritation has been reported and, in one severe case, an already sick cat developed a severe rash at the application spot, which led to intestinal problems, heart failure and death.[2] It is suspected that exposure to imidacloprid worsened the cat's condition. Even though imidacloprid is more toxic to insects than mammals, its guanidine metabolite has a higher toxicity to

mammals. Despite this, exposures to pets and humans have not been fully researched.

Environmental Fate

In soil, imidacloprid has the ability to readily leach due to its high water solubility and its inability to adhere to soil particles. Several soil half-lives have been reported for imidacloprid under various soil conditions ranging from 27-229 days.[6] The soil half life of imidacloprid tends to increase with soil pH, as well as with the absence of light. It is this persistence that makes imidacloprid suitable for seed treatment and for other soil application. It is also more persistent in bare soils than in soil with plant cover. The fate of imidacloprid in the soil is also highly sensitive to soil composition and sources of organic carbon.[6]

Imidacloprid has a short half life in surface water and is rapidly broken down in water by sunlight. However, it is more persistent in groundwater. Groundwater tests in the state of New York have detected imidacloprid at concentrations ranging from less than 0.1 ppb to 1.0 ppb. The State of California has placed imidacloprid on its Ground Water Protection List due to its potential to contaminate groundwater.[6] Despite the ability of imidacloprid to contaminate groundwater and its registered uses for residential and agricultural settings, the EPA has not listed it as a restricted use pesticide, citing economic reasons.[2]

Imidacloprid does volatilize, although it is classified as low volatility, with a vapor pressure of 1.0 x 10-7 mmHg. It also it has a low potential to be dispersed in air over a large area via air borne soil particles, since it does not readily adsorb to particles. However, imidacloprid still has the ability to drift as a result of the dispersal of tiny seed debris from imidacloprid-treated seeds that have been lost in the process of using seed drills to plant fields. When used as a seed treatment, imidacloprid is readily translocated though seedling/plant tissues, including leaves, flowers and pollen.

Resistance

Insect resistance to pesticides is a phenomenon that undermines chemical pest control and carries a heavy economic burden. Imidacloprid resistance in the Colorado potato beetle appeared after only two years of imidacloprid use on potatoes in Michigan. Resistance was also reported from several locations in New York, Delaware and southern Maine.[11]

Regulatory Status

Imidacloprid is registered as a general use pesticide, classified by the EPA as both a toxicity class II and class III chemical. Based on its risk assessments, the agency concluded that the risk to the U.S. population from aggregate exposure to imidacloprid residues is acceptable.[3] There are food tolerances for residues of imidacloprid and its metabolites on food/feed additives ranging from 0.02 ppm in eggs to 3.0 ppm in hops.[2]

The use of imidacloprid (Gaucho™) was severely restricted in France after it was suspected to be responsible for the decline of honeybee populations. In 1999, the French Ministry of Agriculture took the precautionary approach and suspended the use of imidacloprid on sunflowers in an attempt to limit the risks of exposing bees to the potentially detrimental effects of Gaucho, much to the dismay of Bayer, which claims that no relationship could be found between the application of Gaucho and reduction in the bee population. Since then the restrictions on the use of imidacloprid have been extended several times and include several other crops. Similar concerns about imidacloprid have also been raised in Canada where high rates of bee colony losses have also been reported. In May 2008, Germany and Slovenia suspended eight toxic insecticides, including products containing imidacloprid, believed to be associated with the bee decline. Italy followed with its own ban a month later.

Citations

[1] USDA Forest Service. 2005. Imidacloprid- Human Health and Ecological Risk Assessment Final Report. Arlington VA

[2] Cox, C. 2001. Factsheet: Imidacloprid. J. of Pesticide Reform Vol.21(1)

[3] Extension Toxicology Network (EXTOXNET). 1995. Pesticide Information Profile: Imidacloprid. http://pmep.cce.cornell.edu/profiles/extoxnet/haloxyfop-methylparathion/imidacloprid-ext.html

[4] INCHEM. 2001. Toxicological Evaluations: Imidacloprid. International Program on Chemical Safety(IPCS) http://www.inchem.org/documents/jmpr/jmpmono/2001pr07.htm#2.2.3

[5] U.S. EPA. 1998. Imidacloprid; Pesticide Tolerances. Federal Registrar Sept 18, 1998 Volume 63, Number 181

[6] Fossen, M. 2006. Environmental Fate of Imidacloprid. California Dept of Pesticide Regulation http://www.cdpr.ca.gov/docs/emon/pubs/fatememo/Imidclprdfate2.pdf

[7] Pesticide Action Network UK. 2003. Imidacloprid. http://www.pan-uk.org/pestnews/Actives/imidaclo.htm

[8] National Pesticide Telecommunication network (NPTN). 1998. Factsheet: Imidacloprid. Oregon State University. http://npic.orst.edu/factsheets/imidacloprid.pdf

[9] Desneaux, N. et al., 2007. Sublethal Effects of Pesticides on Benefical Anthropods. Annual Review of Entomology, 52:81-106

[10] Decourtye, A. et al., 2004. Effects of imidacloprid and deltamethrin on associative learning in honeybees under semi-field and laboratory conditions. Ecotoxicology and Environmental Safety.57: 410-419

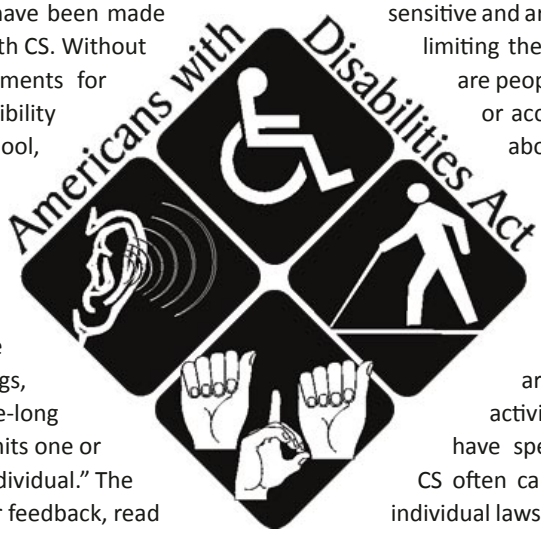
[11] U.S. EPA. 2008. Pesticide issues in the works: honeybee colony collapse disorder. http://www.epa.gov/pesticides/about/intheworks/honeybee.htm

[12] Alyokin, A. et al. 2006. Resistance and cross-resistance to imidacloprid and thiamethoxam in the Colorado potato beetle Leptinotarsa decemlineata. Pest Management Science, 63(1):32-41

Advocating for Access Blocked by Pesticides

Beyond Pesticides asks the Department of Justice to provide accomodation for those with chemical sensitivity and environmental illness

With a tremendous showing of support from organizations and individuals, Beyond Pesticides submitted a comment to the Department of Justice, August 2008, to request stronger protections under the *Americans with Disabilities Act* (ADA) for those with chemical sensitivity (CS) or environmental illness (73 FR 34466). Currently, CS is recognized as a disability on a case-by-case basis, but no provisions have been made in the accessibility standards for those with CS. Without the recognition of accessibility requirements for those with CS and the adoption of accessibility standards, accomodation at work, school, housing, and recreation areas is extremely difficult for many who suffer from CS with debilitating effects.



Of the individuals and organizations that signed on to the comment, many have personal stories of chemical poisonings, often pesticides, that resulted in a life-long chemical sensitivity that "substantially limits one or more of the major life activities of such individual." The Beyond Pesticides' comment follows. (For feedback, read the Mail section of this issue on page 2.)

CS Should Be Recognized in the Final Rule

A disability is defined as "a physical or mental impairment that substantially limits one or more of the major life activities of such individual," [42 U.S.C. 12102(2)(A)]. While the ADA rules do include the applicability of the act to people with CS on a case-by-case basis, given that the illness "substantially limits one or more major life activities," they do not explicitly state in the proposed accessibility standards specific access requirements to assist people with CS. While recognizing CS is helpful, accessibility issues still pose a great challenge to those with chemical sensitivities. We encourage the adoption of language in the ADA regulations that explicitly acknowledges access issues and delineates accommodation for those with CS in order to ensure that public spaces are accessible to them.

The proposed rule errs in omitting environmental illness and chemical sensitivity as a standard disability (as opposed to a "case-by-case"), with a justification that people with the illness may have a "sensitivity [that does] not rise to the level needed to constitute a disability." This statement is false and out of step with environmental medicine which diagnoses CS as a chemical-induced illness from which patients suffer with debilitating effects that need accommodation. Similar to other disabilities, a diagnosis reflects a finding that patients' function is impaired, with varying severity, as a result of exposure to toxic chemicals. Eliminating the chemical exposure substantially increases their ability to function and lead normal lives.

As an organization whose primary focus is pesticides, Beyond Pesticides is in contact with people who are chemically sensitive and are exposed to pesticides, thus substantially limiting their life activities on a regular basis. These are people whose disability is not well understood or accepted by the general public, uninformed about the condition. In conveying their concerns to neighbors, employers or landlords they often receive ridicule instead of respect and accommodation. Without mentioning in the text of the accessibility standards of the ADA that those with chemical sensitivities are indeed uniformly protected when life activities are substantially limited and that they have specific access requirements, people with CS often cannot get their needs addressed without individual lawsuits to prove their disability. This becomes a burden and barrier to protection.

Preventing Future Disabilities from CS

From a societal perspective, improving accessibility standards for those with CS in housing, education, health care and employment would benefit entire communities and prevent more people from developing chemical sensitivities that can become disabilities. Many of the neurotoxic chemicals to which CS patients are sensitive have also been linked to cancer, endocrine disruption, birth defects, asthma, autism, diabetes, and other major public health threats. While it is understood that the role of the ADA is not to protect the public health of all Americans, it is important to understand the far-reaching effects on public health of improving accessibility for those with CS. In this situation, the ADA has the potential to prevent more disabilities from occurring, as CS itself and other disabilities are often induced by chemical exposure.

IPM in Public Spaces

Beyond Pesticides has targeted several key areas of access because of health threats to the general population. In Beyond Pesticides' campaigns, we have helped health care facilities and educational facilities adopt Integrated Pest Management (IPM) policies that eliminate the use of highly toxic pesticide use and make the environment healthier for patients, visitors and health care facility staff, educators, students and school staff. For those with CS, the toxic nature of the chemicals used at many hospitals, health care

IPM is possible for schools, public housing, prisons, and public parks—all areas that are addressed in the accessibility standards for the ADA.

facilities and schools makes it impossible for them to receive adequate health care or an education. Alternatives such as IPM for pest management are effective, economical, better for public health, and enable those disabled with CS to utilize the facilities. For more information on IPM in hospitals, see Beyond Pesticides report *Healthy Hospitals* (www.beyondpesticides.org/hospitals). This report outlines the deficiencies in the regulatory process for pesticides and the availability and economic advantages of IPM.

More information on the total health effects of hospitals from building materials to pesticide use is available from the organization Health Care Without Harm (www.noharm.org). The issue of access and building health from a chemical sensitivity perspective requires a holistic view of the problem. Health Care Without Harm has reported on building materials, pesticide use, waste disposal and other focal points for those with CS and the general population. This information is applicable to all public buildings, not just hospitals and health care facilities.

In addition to hospitals, IPM is possible for schools, public housing projects, prisons, and public parks—all areas that are addressed in the accessibility standards for the ADA. Considering the number of people who are chemically sensitive in the U.S. (6% of the population is identified as "unusually sensitive"), not addressing in the ADA access issues for these people undermines efforts at all levels to ensure that such illnesses are treated as genuine disabilities. This unfortunately contributes to the continued public misunderstanding of CS as a disability.

Multiple Agency Involvement

In deferring judgment on whether to include specific provisions for environmental illnesses in the ADA, the text says, "The addition of specific regulatory provisions relating to environmental illness in the final rule would be inappropriate at this time pending future consideration of the issue by the Architectural and Transportation Barriers Compliance Board, the Environmental Protection Agency, and the Occupational Safety and Health Administration of the Department of Labor." This interagency paralysis effectively limits movement forward on this issue.

Despite a lack of rulemaking, EPA has recommended that schools use IPM practices because, "Children are more sensitive than adults to pesticides." Likewise, people with chemical sensitivities are more sensitive to pesticides than the "average" population. If EPA recommends IPM for schools as an effective and less costly method than using pesticides, it makes sense that these principles be applied to other public areas such as hospitals, public housing, public buildings, and other public sites. The ADA has the capability to address this issue in its accessibility standards, and according to the EPA's own judgments, a cost-benefit analysis would clearly be in favor of adopting IPM methods, especially as it relates to those diagnosed with CS. There are numerous other sources that find IPM approaches to be cost-competitive and efficacious.

One common misperception is that pesticide registration by EPA means a pesticide is "safe." There are myriad examples of pesticides for which this is not the case. Some of these products have been cancelled, but many remain in common usage. EPA's risk assessments for pesticide registrations allow toxicity, and do not ensure regulation to protect those who are disabled by CS. Rather, pesticide testing methodology and risk assessment calculations only focus on healthy population groups. These products are often debilitating for those with CS, hindering "one or more major life activities." When these major life activities include getting proper health care, people are placed in impossible predicaments. Given that toxic pesticides are unnecessary if public spaces are maintained using IPM practices, the acknowledgment of CS as a disability under the ADA accessibility standards and the implementation of IPM practices would not only address access issues, it would save money and make public spaces healthier.

Imposing stricter regulations than those enforced by EPA for specific pesticides or in certain areas has a precedent in state and municipal regulations of pesticides. In many states, pesticides approved by EPA are not approved by the state pesticide regulators because of local environmental or public health issues, sensitive areas or exposures not considered by EPA. Many municipalities throughout the country have implemented IPM practices for their buildings and grounds. These examples are merely to illustrate that EPA's regulations are a baseline, not standards that universally protect public health, especially those disabled by CS or environmental illnesses. Requiring tougher standards under the ADA would not be without precedent, but would be an extension of the realization that many of the products used on buildings and grounds are toxic and disabling for a substantial subset of the population.

HUD Recognizes CS as Handicap

The final regulations should extend and strengthen the standard embraced by the Department of Housing and Urban Development (HUD) in recognizing that CS and environmental illness can be a

"handicap," with all the protections afforded those disabled by this illness. In a 1992 memorandum entitled "Multiple Chemical Sensitivity Disorder and Environmental Illness as Handicaps," the Office of General Counsel in the Department of Housing and Urban Development clearly defines CS and environmental illness as possible "handicaps" within the meaning of subsection 802(h) of the Fair Housing Act, 42 U.S.C. Section 3602(h), and the Department's implementing regulations, 24 C.F.R. Section 100.201 (1991)." Rather than equivocate on this debilitating condition, protection should be ensured under the proposed rulemaking including one's place of residence. HUD recognizes under its governing statute that, "While MCS or EI can be handicaps under the Act, ordinary allergies generally would not be." The Department of Justice under the ADA should strengthen HUD's approach, rather than dismiss CS and the protections that should be afforded those with the illness, simply because there are others in the population whose conditions "will not rise to the level needed to constitute a disability."

People with CS Want to Participate

Some of Beyond Pesticides' members suffer from CS as a result of pesticide exposure, and their difficulty finding suitable housing, employment, healthcare and protection under the law is a testament to how disruptive this disability is in their lives. Linda Baker, a former teacher and coach in Kansas who was poisoned by the pesticides used at her school writes:

With proper accommodation, I would still be teaching and coaching today! Officially recognizing not only the life-changing severity of CS, but also the value of "avoidance" in treating it would help building administrators understand how to keep employees with this disability on the job. I have many friends who are also disabled by CS. Not one of them wanted to quit their job! But lack of accommodation caused their illness to progress to the point where they could no longer work. CS takes a huge toll on individual lives and results in unnecessary loss of productivity. I urge you to officially recognize CS/Environmental Illness as a disability requiring accommodation for accessibility. The chemical barriers that prevent those with CS from entering buildings are every bit as limiting as lack of a ramp would be to someone in a wheelchair. Those with CS deserve the same rights as other citizens.

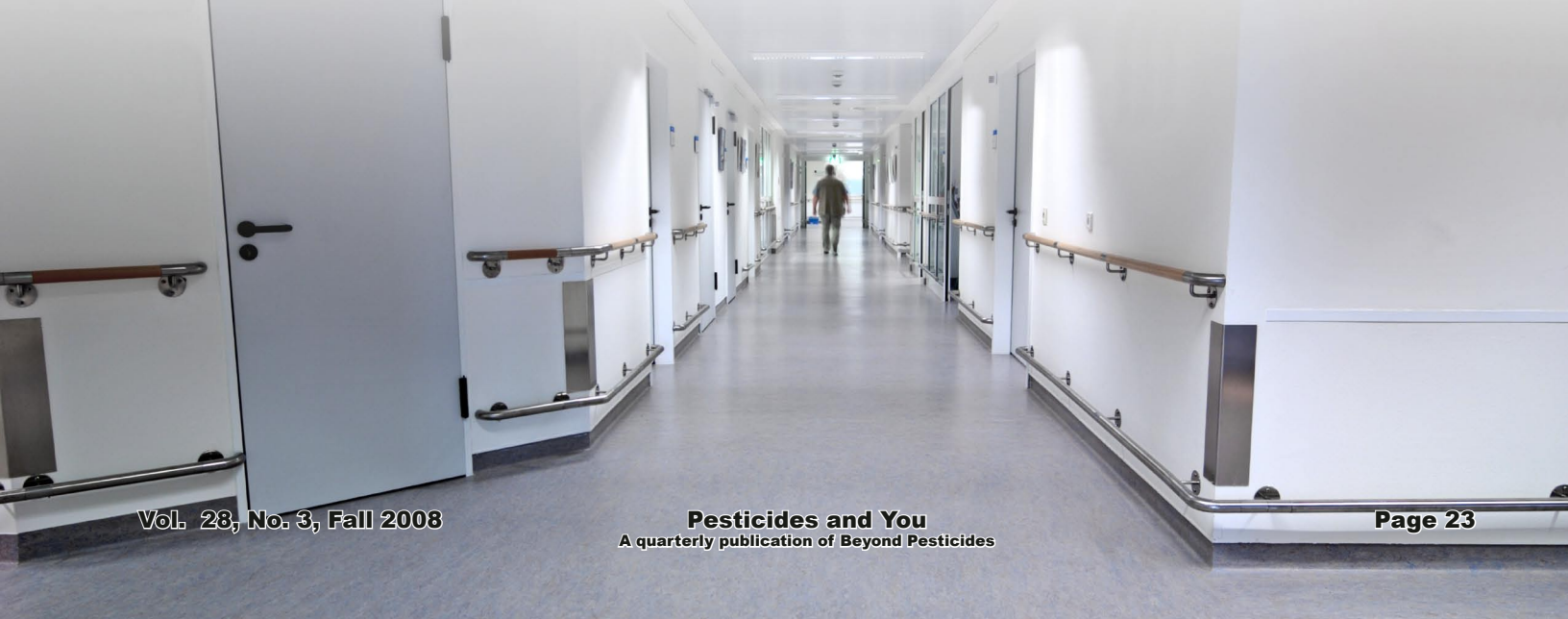
In Ms. Baker's case, she was able to hire a lawyer and settle for a small amount, but this by no means met her medical costs or her lost retirement earnings. It also limited her ability to feel productive and continue doing what she loved to do. This situation was completely avoidable if school IPM practices had been adopted, but her access issues were misunderstood and dismissed. Life becomes a constant battle of finding a suitable place to live and work once someone has become chemically sensitive.

Proposed Language for Rulemaking

Beyond Pesticides suggests that the rulemaking include the following language: "Integrated pest management (IPM) practices to protect those disabled with chemical sensitivity (CS) or environmental illnesses and ensure access are required in public facilities or properties to include the following practices: identification of pests and conditions that attract pests; prevention techniques, such as sanitation, vacuuming, structural repair and sealing; monitoring; education and training; approved least toxic chemicals whose use does not, by virtue of its neurotoxic or other properties, impair the abilities of those with CS; and pre-notification and posting of chemical use."

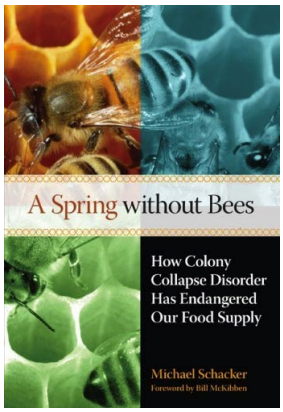
Conclusion

Not codifying CS and environmental illness as disabilities with specific access requirements and forcing a case-by-case analysis effectively creates an excessive burden and barrier to protections that are critical to the survival of those with the illness. Recognizing CS as a potential disability is a step forward for those whose lives have been impaired by chemical sensitivities, but the ADA rules must take the next step forward and recognize the accessibility issues that those with CS face in their daily lives for housing, employment, education, recreation, and transportation. This would be a tremendous step forward in enabling equal access. While the proposed rulemaking recognizes CS as a disability on a case-by-case basis, in its failure to adopt a uniform response to CS disability and identify accessibility issues and accommodation for those with CS, it violates the spirit, intent and letter of the *Americans with Disabilities Act.*



A Spring Without Bees

How Colony Collapse Disorder Has Endangered Our Food Supply



(Michael Schacker, The Lyons Press, 2008, pp.292. $24.95) Humanity's best friend among the insects. That is how author Michael Schacker describes the honeybee, *Apis mellifera*. Inspired by honeybee colony collapse disorder (CCD), the increasing widespread phenomenon of bees disappearing or abandoning their hives, the book is a warning to us. Our environmental policies are disconnected, trying to establish acceptable standards of poisoning without ever fully taking into account the complexity of our ecosystem and all that inhabit it. Even policies built on standards intended to protect children themselves are not sensitive enough to protect the delicate balance of the ecological systems on which the child and everyone else depend.

Mr. Schacker writes, "On a deeper level, are the bees telling us we are unaware of a deep systemic problem threatening our own species, are we missing the big picture here? Could our own human colony come undone through some kind of "Civilization Collapse Disorder"? Succinctly put, "[T]he bee is not only the prime insect responsible for the creation of the world today, it is critical to maintaining the fragile balance of half the flowering plant ecosystem, as well as one-third of all agricultural plants."

The author cites the Honeybee Genome Sequencing Project, a collaboration of scientists worldwide with funding from the National Human Genome Research institute, the National Institutes of Health, and the U.S. Department of Agriculture. The honeybee, it turns out, has a lower number of genes governing detoxification and, when compared to other insects, about one-third fewer genes associated with insect immunity, making them particularly vulnerable to pesticides, viruses, and pathogens. The bee's evolution over 60 million years is no match for recently invented synthetic insecticides. The Genome Project finding: Honeybees have 10 times fewer protein coding genes linked to insecticide resistance than either the mosquito or the fruit fly.

Poor Regulation

Bee sensitivity to pesticides has long been documented, as have the associated regulatory failures. Take, for example, methyl parathion, an organophosphate insecticide whose fruit and vegetable uses were discontinued in 1999, allowing its use on alfalfa and other crops to continue. Registered in 1954, EPA itself acknowledges, "[F]ield incident data over 20 years indicate that methyl parathion poses risks to honeybees." Still, EPA in 2006 allowed agricultural methyl parathion to continue with a warning: "This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area." This is an example of regulation gone amok, given the realities of drift, lack of enforcement, chemical residues, and insect biology.

Native Bees

Pesticide hazards extend to wild bees and in the case of alfalfa the native alkali bee "is the best species for getting high yields." Native bees are essential to pollinating 130,000 types of flowering plants, species that are critical to regional ecosystems and whole ecosystems are dependent on plants needing bees, bats, hummingbirds, and butterflies to reproduce and flourish.

New Pesticides Create New Hazards

A new synthetic pesticide in the neonicotinoid family, imidacloprid, is being linked to CCD. As the author explains, neonicotinoids work by adversely affecting the nervous system. There are sublethal effects, not evaluated by EPA, which can disrupt bees' ability to feed and forage, diminishing learning and organization skills, which are critical considering a bee will typically forage 12,000 acres.

With outrage and protests organized by the National Union of French Beekeepers in 1999, France banned imidacloprid's use on sunflowers and later more broadly. The author traces the pollen contamination and soil retention research and politics of Bayer CropScience's unsuccessful defense of its product in France. Then the French turned their attention to the insecticide fipronil, another neurotoxic insecticide. With the suspension of imidachloprid and fipronil in France, a declining bee population has revived. Germany and Italy followed with a suspension of imidacloprid.

In the U.S. research is proceeding very slowly and regulatory action is at a standstill. While Penn State University has a CCD Working Group, the author points out that Bayer has donated millions of dollars to the university.

The Organic Solution

Mr. Schacker ties the book together with solutions, pointing to the success of organic farmers and protection from poisoning that organic beekeepers have enjoyed. He warns us of "anthropocentric thinking" and invokes the words of Rachel Carson, who begins *Silent Spring* with a "Fable of Tomorrow," predicting bee disappearance: "The apple trees bloomed but no bees droned among the blossoms, so there was no pollination and there would be no fruit. . ."

BEYOND PESTICIDES MEMBERSHIP & SUBSCRIPTIONS

❑ **YES, make me a member of Beyond Pesticides (includes subscription to *Pesticides & You*).**
❑ $25 Individual ❑ $30 Family ❑ $50 Public Interest Organizations ❑ $15 Limited Income

❑ **YES, I'd like to subscribe to *Pesticides & You*.**
❑ $25 Individual ❑ $50 Public Interest Organizations ❑ $50 Government ❑ $100 Corporate

❑ **YES, I'd like to receive Beyond Pesticides' bi-monthly School Pesticide Monitor.**
Free with membership or subscription.

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

Show Your Support for Going Beyond Pesticides!

Order the Pesticide-Free Zone sign on Beyond Pesticides' new and improved online storefront, which also features t-shirts, books, reports and publications, tote bags, and organizing tools. You can even become a member or donate in our store!

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

www.shopbeyondpesticides.org

Method of Payment: ❑ Check or money order ❑ VISA/Mastercard # _____ Expiration Date:_____

Name Phone Fax Email

Title (if any) Organization (if any)

Street City State Zip

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

Mail to: Beyond Pesticides, 701 E Street SE, Washington, DC 20003 Tax-Deductible Donation:

Total Enclosed:_____

Vol. 28, No. 3, Fall 2008

Save the Date!

The 27th National Pesticide Forum
Carrboro, NC (Research Triangle)
April 3-4, 2009

Join Beyond Pesticides and local co-sponsor Toxic Free North Carolina for a national environmental conference focusing on fairly traded organic food, public health and grassroots organizing

For more information, visit www.beyondpesticides.org/forum

BEYOND PESTICIDES
701 E Street, SE ■ Washington DC 20003
202-543-5450 phone ■ 202-543-4791 fax
info@beyondpesticides.org ■ www.beyondpesticides.org

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