Pesticides and You

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

Volume 31, Number 3
Fall 2011

The Real Story
on the Affordability of Organic Food

Eating Organic Food on a Budget

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ChemicalWatch Factsheet: Aminopyralid

Beyond Pesticides at 30 years: Successes and Challenges

At our 30th anniversary celebration in Washington, D.C. in October, we screened the movie *Vanishing of the Bees* and were joined by many of the featured beekeepers, including Dave Hackenberg who first identified colony collapse disorder (CCD). We point to the CCD phenomenon, in which bees disappear from their hives, as the tragedy that befalls us when our pesticide regulatory system does not fully address the complexity of hazards and fails to ask whether we really need to allow the widespread use of a toxic chemical. With bees, it has become obvious even to the casual observer that the regulatory system fails to evaluate the impact of systemic pesticides —these are chemicals that are incorporated into the plant tissue and express themselves through the pollen. The regulatory system fails to consider chronic low-dose exposure effects and the effect of a weakened immune system in creating vulnerability to all kinds of diseases, viruses, and bacteria in all organisms, from insects to humans.

Strategic Lessons of 30 years

With a history of 30 years, the phenomenon of a failed regulatory system is not new to Beyond Pesticides. Certainly, the failures that have been captured in volumes of scientific studies and policy critiques are important to our strategic thinking on solutions. In Beyond Pesticides' relatively short history, our societal dependence on insecticides has moved through numerous chemical families whose effects have become unacceptable over time –from the arsenic-based chemicals, DDT family or organochlorines, to the organophosphates like Dursban (or chlorpyrifos). As the chemical industry continues to promote its new pesticide products as the solution to pest problems, attempts to restrict toxic chemical uses have through the decades repeatedly failed to adequately protect people and the environment.

What is the strategic lesson? Tinkering with a broken chemical-intensive approach fails to acknowledge the seriousness of the chemical-induced problems and the viability of alternative approaches.

Adverse effects of pesticides are not theoretical or an abstraction. Beyond Pesticides' online *Pesticide-Induced Disease Database* (PIDD) is showing in real time that chemical-induced public health diseases are linked to pesticide exposure —from asthma, cancers, learning disabilities, reproductive problems, Parkinson's, to Alzheimer's, and more.

Organic is the solution to pesticide pollution

Much of this was predictable 30 years ago when we launched Beyond Pesticides, then the National Coalition Against the Misuse of Pesticides. We knew that all those at greatest risk to pesticides, such as farmworkers and those showing poisoning symptoms from typical legal pesticide use, needed to join with large numbers of people, scientists, policy makers, pest management practitioners, farmers, and food manufacturers. We set out to do this, calling for an end to pesticide dependency, and the widespread adoption of organic practices.

Today, our vision is becoming a mainstream reality. The burgeoning organic movement has found its way into mainstream culture, in grocery stores, schools, hospitals, and in the homes of millions of people across the country and worldwide. However, in order for organic to become truly mainstream, I believe that Beyond Pesticides' ongoing and consistent vigilance is critical. We face the attack on organic integrity on a daily basis.

Successes nationwide

Still, we are seeing our movement to take pesticides out of our communities, schools, hospitals, parks, and homes grow daily. A Thomson Reuters-NPR Health Poll released in July finds that 58% of Americans say they choose organic food when they have the opportunity, with the highest percentage (63%) in the under 35 age group. People and families increasingly understand that their support of organic practices is an investment in their long-term health by taking toxic chemical residues out of their food, air, water, and soil, while protecting farmworkers and fighting global climate change. And, Beyond Pesticides is fighting to ensure accessibility to organic food through federal and state food and school lunch programs, while encouraging lower cost food distribution systems, such as farmers markets and buying clubs.

Challenges continue

As our success grows, so do the challenges. In the food arena, we see critics challenging organic systems with misinformed attacks and efforts to embrace weaker standards that are out of sync with the organic law and public expectations. Just last month the town of Highland Park, IL was being encouraged by a University of Illinois Extension staff member to reintroduce pesticides into its program for the management of its park system. Two of Beyond Pesticides' board members (a scientist and a practitioner) and I brought the facts to the Park Board and the organic program is moving forward. There is a similar challenge in Connecticut, where the CT Pesticide Applicators Association, which now calls itself the CT Environmental Council, is fighting to reverse a state law that requires organic turf management on school grounds.

Consider support in our 30th year

This issue of *Pesticides and You* shows us both the problems and the promise –real choices that we make in the marketplace and in the policy arena. We have laid the foundation for alternatives to toxic pesticides and with your help we can build on that foundation.

Thanks for your support and best wishes for the holiday season and new year.

Jay Feldman is executive director of Beyond Pesticides.

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Sticky Trap Concerns

We hope this letter finds you well.

Our headquarters has received multiple complaints about rodent control suggestions offered in Beyond Pesticide's factsheet (Minimize Mouse Madness), which advises consumers to use glue traps to catch mice and then submerge live animals "in soapy water until dead" (i.e., to drown them).

Drowning causes extreme pain and suffering. The American Veterinarian Medical Association (AVMA), the foremost authority on animal euthanasia, condemns drowning outright in its Guidelines on Euthanasia. Many states have denounced drowning as a method of wildlife dispatch, and drowning is explicitly illegal in most jurisdictions, including the District of Columbia. We stand ready to produce experts who will attest that drowning is immensely cruel, if this is helpful.

As you know, effective rodent management plans focus on repellents, deterrents, and exclusion. But if lethal methods are insisted upon, glue traps should be avoided at all cost. The Centers for Disease Control (CDC) and Health Canada caution against their use due to disease risks. Glue traps are also extremely cruel. Panicked, ensnared animals struggle mightily, tearing flesh, breaking bones, becoming more entangled in the adhesive, only to die exhausted, frightened, injured, from shock, dehydration, asphyxiation, or blood loss. Research shows that death can take more than 24 hours. Poisons are also exceedingly cruel/toxic, and shouldn't be used or recommended.

In our experience, the least cruel (and safest) lethal options available for rodent control are the D-Con Ultra Set Covered Mouse/ Rat Trap or the Victor Electronic Trap. These traps better ensure a quick death; they are readily available, cost-effective (reusable), clean (touch-free), and safe to use around food and children.

Would you please consider altering your website content by removing any reference to drowning and glue traps/poison, and direct staff to refrain from recommending cruel wildlife control methods?

On behalf of our 2 million members internationally, thank you for your consideration. I hope to hear from you soon.

Sincerely,
Jodi Minion, Wildlife Biologist
People for the Ethical Treatment of Animals (PETA)

Get Printed!

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

There are many ways you can contact us. Join other members and activists in discussions on our Facebook page www.facebook.com/beyondpesticides or follow us on twitter www.twitter.com/bpncamp! And as always, you can send questions and comments to: Beyond Pesticides, 701 E Street SE, #200, Washington, DC 20003, or info@beyondpesticides.org

Dear Jodi,

Thank you for contacting Beyond Pesticides with your concerns. Those who find themselves in the unfortunate situation of finding mice in their home —or any pests, for that matter— have many choices to make on how to control the infestation. As an organization that is committed to protecting public health and the environment from toxic pesticides, it is our goal to help guide people to choose the safest and most effective way to manage these pests without reaching for the hazardous chemicals that line store shelves. For this reason, we had included sticky traps on our mouse control factsheet as an effective toxic-free method of control.

You raise several important points regarding the hazards and cruelty associated with using these traps, however, and we have altered this part of the factsheet to reflect those issues, especially the information regarding what to do with the mouse after it is stuck. Specifically, we have removed the suggestion for drowning mice caught in sticky traps and refer to the American Vet-

erinary Medical Association for their guide on acceptable forms of euthanasia. It's critical that those who decide to use glue traps fully understand the weight of their decisions and the problems associated with its use. For instance, along with checking the traps regularly for mice, they will have to deal with either cleaning up a mouse that died a tortuous death, or a terrified living mouse that will need to be killed in a humane way. As with any mouse trap, they will also have to consider the pathogens that the mouse might carry.

We don't endorse the use of sticky traps. However, many people who experience large infestations may resort to this option as a last resort after other methods, including exclusion, sanitation and have-a-heart or snap traps, have been exhausted. Before deciding to use this product, it is important that people be strongly informed of the potential hazards and cruelty associated with their use.

Beyond Pesticides Daily News Blog

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

Excerpt from Beyond Pesticides original blog post (6/15/2011):

Pesticide-Food Guide Highlights Importance of Eating Organic for Health, Workers and the Environment

This week's release of the new Shopper's Guide to Pesticides in Produce (Dirty Dozen/Clean 15) by the Environmental Working Group (EWG), which focuses on pesticide residues on conventional produce, highlights the importance of eating organic fruits and vegetables to minimize personal exposure to toxic pesticides. Beyond Pesticides' *Eating with a Conscience* guide complements the EWG list, going beyond residues on food to examine the impacts of the pesticides used to grow conventional produce on the health of farmworkers and rural communities, water quality, honey bees and wildlife poisoning, and more. Both Beyond Pesticides and EWG encourage shoppers to choose organic food whenever possible.

Dona says:

Thank you so much for this guide and your insights into the impacts of our food choices on everyone and on the environment. When I attended your recent National Forum in Denver, we had a lunchtime conversation on this very topic. I mentioned that while I applaud the work of EWG, and use their resources often, I wouldn't feel comfortable eating 'clean' produce while knowing that others have likely suffered harmful effects in growing it or that it may be causing harm to ecosystems and drinking water. So I ALWAYS buy organic, or go without. Thanks again for this, and all the work that you folks at Beyond Pesticides do!

Excerpt from Beyond Pesticides original blog post (6/15/2011):

DuPont to Issue Recall of Pesticide Linked to Tree Deaths

In a move that highlights serious concerns regarding the pesticide registration process, DuPont has announced that it plans to issue a total recall of its new herbicide, Imprelis, following widespread evidence and complaints that the product has caused the deaths.

Marla says:

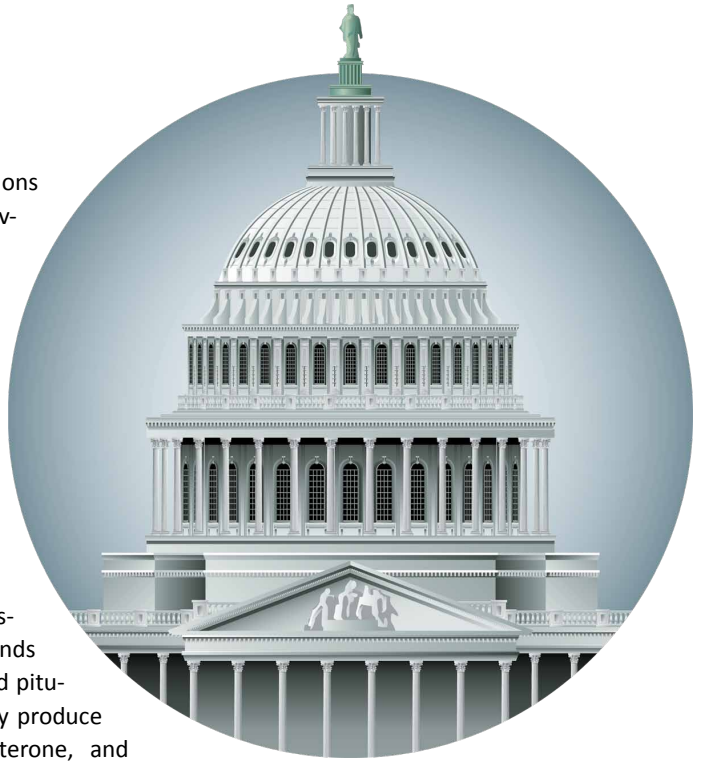
One would hope that EPA has learned that: 1) It cannot trust the chemical companies in the absence of data; 2) it cannot continue to permit conditional registration, and; 3) it is time to recall clothianidin. "EPA has come under scrutiny recently since it was revealed that the conditionally registered pesticide, clothianidin, did not, at the time it allowed the pesticide to be widely used, have pertinent field data required on honey bees, even though the pesticide is known to pose risks to these vulnerable pollinators. This data is still outstanding even though clothianidin continues to be used in the environment." The public (that means you and me!) needs to demand these actions of EPA!

Bills to Regulate Endocrine Disruptors Introduced in Congress

The *Endocrine-Disrupting Chemicals Exposure Elimination Act* was re-introduced in the U.S. Senate (S. 1361) and House of Representatives (H.R. 2521) on July 13, 2011. If passed, it will establish a scientific panel at the National Institute of Environmental Health Sciences (NIEHS) to evaluate chemicals that potentially affect the endocrine system and create a trigger to ban those found most harmful to public health. The bills will create a more updated scientific evaluation process than any that currently exists in the federal government and establish a strong regulatory mandate to ban or restrict chemicals that are found to present serious health risks. The specific process outlined directs the National Toxicology Program at NIEHS to evaluate chemicals in use according to (i) the amount of evidence that it is an endocrine disruptor, (ii) the "level of concern" that it may disrupt hormones, and (iii) the pathways of exposure by which it may affect both humans and animals. The bill mandates a regulatory trigger for federal agencies to reduce human exposure to chemicals found to present a "minimal level of concern," or a ban on chemicals found to be of "highest level of concern."

The bill also contains provisions allowing citizens or local governments to petition NIEHS for chemical review.

Common household products that are endocrine disruptors, including many detergents, disinfectants, plastics, and pesticides, interact with the endocrine system and wreak havoc in humans and wildlife. The endocrine system consists of a set of glands (thyroid, gonads, adrenal, and pituitary) and the hormones they produce (thyroxine, estrogen, testosterone, and adrenaline) that help guide the development, growth, reproduction, and behavior of animals, including humans. Endocrine disruptors have been linked to a range of health problems, including attention deficit hyperactivity disorder (ADHD), Parkinson's and Alzheimer's diseases, diabetes, cardiovascular disease, obesity, early puberty, infertility and other reproductive disorders, and childhood and adult cancers.



For more information, see The Endocrine Disruption Exchange's (TEDX) List of Potential Endocrine Disruptors at www.endocrinedisruption.com. It is the most complete such list to date containing approximately 800 distinct chemicals, each with one or more verified citations to published, accessible, primary scientific research demonstrating effects on the endocrine system.

Roundup May Be Damaging Soil and Reducing Yields, Says USDA

A U.S. Department of Agriculture (USDA) official speaking at an agricultural conference said that the heavy use of Roundup, an herbicide manufactured by Monsanto and used heavily on Roundup Ready genetically engineered (GE) crops, appears to be causing harmful changes in soil and potentially hindering yields of crops that farmers are cultivating. *Reuters* reported that Robert Kremer, PhD, a microbiologist with the USDA's Agricultural Research Service, told the audience at the August 2011 conference sponsored by the Organization for Competitive Markets that repeated use of the herbicide glyphosate, the active ingredient in Roundup, impacts the root structure of plants, and 15 years of research indicates that the chemical could be causing fungal root disease.

Glyphosate is a general herbicide used for eradication of broadleaf weeds. It has been linked to a number of serious human health effects, including increased cancer risk and neurotoxicity, as well as eye, skin, and respiratory irritation. One of the inert ingredients in product formulations of Roundup, polyoxyethyleneamine (POEA), kills human embryonic cells. Growing Roundup Ready crops, such as soy, cotton, and corn, have led to greater use of herbicides. It has also led to the spread of herbicide resistant weeds on millions of acres throughout the U.S. and other countries where such crops are grown, as well as contamination of conventional and organic crops that has been costly to U.S. farmers. Because of GE crops, Roundup has become the most popular pesticide ever.

EPA Says Pesticide Poisoning Discriminates Against Latino Children

In August 2011, the U.S. Environmental Protection Agency (EPA) announced that it has entered into an agreement with the California Department of Pesticide Regulation (CDPR) to resolve a civil rights complaint that alleged that the department's renewal of the toxic fumigant methyl bromide discriminated against Latino school children whose schools are located near agricultural fields. The complaint was filed by recipients of federal assistance in 1999 under Title VI of the *Civil Rights Act of 1964*, which prohibits intentional discrimination and discriminatory effects on the basis of race, color, and national origin. The Office of Civil Rights' analysis raised concerns that there was an unintentional adverse and disparate impact on Latino children resulting from the use of methyl bromide between 1995 and 2001. Per the agreement, CDPR has agreed to expand on-going monitoring of methyl bromide air concentrations by adding a monitor at or near one of the Watsonville, CA area schools named in the original complaint. CDPR will share the monitoring results with EPA and the public and will also increase its community outreach and education efforts.

These measures fall short, however, of actually providing relief to the children and parents who were affected by the use of methyl bromide. According to the Center on Race, Poverty and the Environment, which filed the initial complaint on behalf of parents and children in the region, it provides no substantive relief or remedy to the people who were affected. The group also points out that EPA could have referred the case to the Department of Justice for prosecution, and failed to inform the families about the findings.

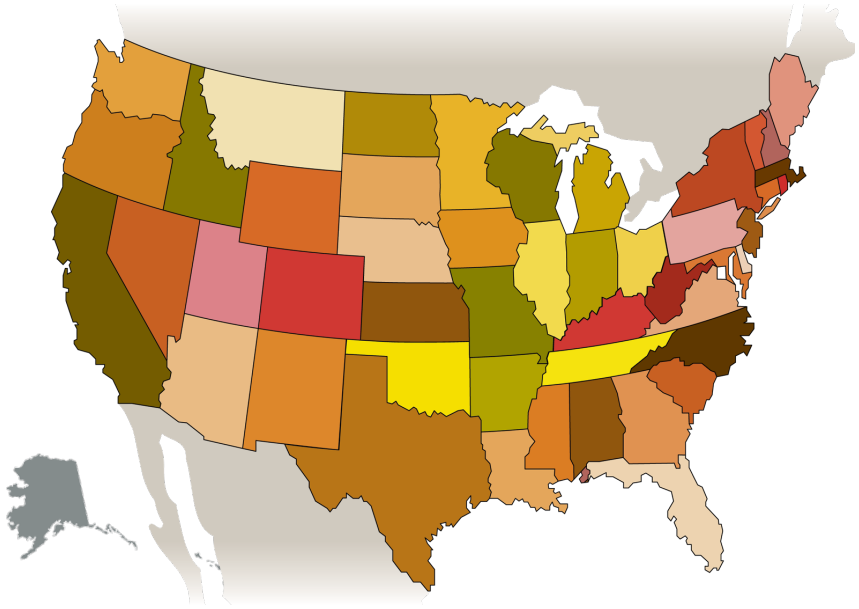
Our food choices have a direct effect on those worldwide who grow and harvest what we eat. This is why food labeled organic is the right choice. For more information on the importance of eating organic food for you, workers and the environment, check out Beyond Pesticides' Eating with a Conscience food guide, www.EatingWithAConscience.org.

Groups Sue To Halt GE Crops on National Wildlife Refuges

A lawsuit filed in federal court against the U.S. Fish and Wildlife Service (FWS) seeks to end cultivation of genetically engineered (GE) crops on 25 National Wildlife Refuges (NWR) across the Southeast. The suit is the latest step in a campaign to banish GE crops from all refuges. Filed in the U.S. District Court for the District of Columbia in August 2011 by Public Employees for Environmental Responsibility (PEER), the Center for Food Safety (CFS), and Beyond Pesticides, the federal suit charges that FWS unlawfully entered into cooperative farming agreements and approved planting of GE crops in eight states without the environmental review required by the *National Environmental Policy Act* (NEPA) and in violation of FWS policy. This is the third in a series of lawsuits filed by CFS and PEER challenging FWS's practice of permitting GE crops on NWRs. In 2009 and 2010, the groups successfully challenged approval of GE plantings on two refuges in Delaware, which forced FWS to end GE planting in the entire 12-state Northeastern region.

NWRs have allowed farming for decades, despite the interference by farming with the protection of wildlife and native grasses. In recent years, refuge farming has been converted to GE crops because the agency claims GE seed is the only seed farmers can obtain. These GE crops are mostly engineered to be resistant to herbicides, mainly Monsanto's ubiquitous Roundup. Scientists have warned that these crops lead to increased pesticide use on refuges and can have other negative effects on birds, aquatic animals, and other wildlife. "GE crops are the last thing that should be introduced onto a national wildlife refuge," stated PEER Counsel Kit Douglas. "Under high-level pressure, the FWS has to abandon wildlife biology to practice political science."

For more information on ongoing legal actions related to GE crops, see "Genetically Engineered Food Failed promises and hazardous outcomes," in the Summer 2011 issue of Pesticides and You, http://www.beyondpesticides.org/infoservices/pesticidesandyou.



Chemical Levels Found To Be Higher in Children from Low-Income Families

According to a study of elementary school children, kids from low-income communities are exposed to higher levels of environmental chemicals –some currently used and some long banned– than children from other socioeconomic backgrounds in the U.S. The researchers measured concentrations for more than 75 chemicals in the blood and urine of 100 children, ages 7 to 12 years, who live in two low-income areas of Minneapolis, MN. The chemicals measured include phthalates, organochlorine pesticides, organophosphate pesticides, metals, polychlorinated biphenyls (PCBs) and volatile organic compounds. The children studied have higher concentrations of many of these chemicals compared to national surveys of children. In addition to tobacco smoke, phthalates, and lead, the researchers observed high concentrations of some banned chemicals. Many of them –including PCBs and organochlorine pesticides– have been banned for decades. PCBs were widely used in electronic and industrial applications as insulators and stabilizers. Organochlorine pesticides were widely used to kill insects in structures, gardens and agriculture. The results are published in the July 2011 issue of *Journal of Toxicology and Environmental Health*.

In general, the health problems associated with exposure to the environmental chemicals found in the children may span a wide range of conditions, including cancer, behavior problems and various effects on the immune, nervous and hormonal systems. The study did not address whether the high exposures affected the children's health. Compared to adults, children eat more food, breathe more air, and drink more fluid than adults per unit of body mass. This increases their intake of potentially harmful chemicals and raises the risk of adverse health effects related to these compounds. In addition, children's bodies are not fully capable of detoxifying many of these chemicals, so they may persist in their bodies longer.

Court Says Pesticide Drift Is Trespass

In July 2011, in the case of *Oluf Johnson v. Paynesville Farmers Union Cooperative Oil Company*, the Minnesota Court of Appeals ruled that pesticides drifting from one farm to another may constitute trespass. Organic farmers Oluf and Debra Johnson filed a civil suit alleging that the oil cooperative sprayed a pesticide that drifted from targeted fields onto theirs, and that this prevented them from selling their crops as organic. Previously, a district court dismissed the Johnsons' trespass claims. The victory is important for organic growers who are frequently under threat of pesticide drift from neighboring properties. According to court documents, the Johnson's converted their conventional family farm to a certified organic farm during the mid-1990s. Oluf Johnson posted signs at the farm's perimeter indicating that it was chemical-free, maintained a buffer zone between his organic fields and his chemical-using neighbors' farms. He also notified the oil company of the transition. He specifically asked that precautions be taken to avoid pesticide drift onto his fields when treating adjacent fields. Despite the Johnsons' requests, in 1998, 2002, 2005, 2007, and 2008, the cooperative sprayed pesticides that drifted and contaminated the Johnson's organic crop, forcing them to sell at a lower, non-organic price.

Pesticide drift is not only a problem for organic growers. Pesticide drift has recently been suspected in the tree deaths throughout the East Coast and Midwest. A 2011 study by the Centers for Disease Control and Prevention's (CDC) National Institute for Occupational Safety and Health (NIOSH) finds that pesticide drift from conventional farming has poisoned thousands of farmworkers and rural residents in recent years. Support organic agriculture for your family's health, as well as the health of farmworkers and rural families, and the greater environment. *Learn more at www.EatingWithAConscience.org.*

Genetically Engineered Sweet Corn To Hit the Shelves

Genetically engineered (GE) sweet corn designed to both fight off insects and tolerate Monsanto's Roundup Ready herbicide is set to enter the market this fall, marking a first for engineered produce in the U.S. by the company. This is the first consumer product developed by Monsanto that will go straight from the farm to the consumer's plate, rather than first being processed into animal feed, sugars, oils, fibers, and other ingredients found in a wide variety of conventional food. The new seed, which is available to farmers this fall, will target the relatively small market of 250,000 acres of sweet corn grown for human consumption. Many environmentalists worry that if this proves profitable for Monsanto, we may see more varieties of GE fruits and vegetables at the grocery store. A study earlier this year found that pregnant women and their fetuses were contaminated with pesticides associated with GE food.

Once the GE corn hits the shelf, consumers will not be able to distinguish the Monsanto product from other conventional sweet corn. There are no current regulations for labeling GE food. The one way you can avoid the GE sweet corn is to buy certified organic or know the farm where your food is grown. Genetically modified crops are not permitted in organic food.

For more information on GE crops, including information on ongoing lawsuits, see our Genetic Engineering program page, www.beyondpesticides.org/gmos.

Lyme Disease 'Epidemic' Causes Stir on Maine Island

An increase in Lyme disease rates over the past few years on an island in Maine have local health officials scrambling to find a solution to keep the problem at bay. So far there have been 20 official cases and over 20 suspected cases in 2011 that have been treated with antibiotics on the island of Islesboro. In the past eight years, the health center has seen at least 69 cases of Lyme disease out of a population of 600, which, according to Islesboro's Tick-Borne Disease Prevention Committee, constitutes an epidemic. This 'epidemic' has been largely attributed to deer, which serve as the tick's primary host. There are about 500 deer on the 11-mile-long Island, making it almost as high as the human population. Though prevention committee proposals focus on prevention and include landscape modification in addition to management of deer and other wildlife, they also recommend the use of toxic pesticides, including repellents such as DEET and synthetic pyrethroid compounds such as permethrin, bifenthrin and cyhalothrin. These conventional pesticide applications have been ineffective and create risks for people and the environment.

Contact with ticks occurs when we venture into the grassy or wooded areas where they live. They can also be brought into homes on pets that roam outside. In areas that are potential tick habitats, you should wear light-colored clothing that covers the body, because it makes it easier to spot ticks so they can be removed before they bite. You should use only unscented deodorant, soap and shampoo. Similarly, you can try using least-toxic herbal repellents such as oil of lemon eucalyptus and essential oils. The scented oil of lemon eucalyptus masks both carbon dioxide and lactic acid exhalations that alert the tick to your presence, essentially hiding humans from detection. After walking through high grass in a tick infested area, check your entire body for ticks. *For more information on non-toxic tick control, see our factsheet at www.beyondpesticides.org/alternatives/factsheets.*

Bug Becomes Resistant to Monsanto's GE Corn, Threatens Organic

The corn rootworm, a beetle known to devastate cornfields, has developed resistance to genetically engineered (GE) Bt corn, designed by Monsanto to be resistant to the very same pest. The discovery raises concerns that the biotech crops are spawning "superbugs" and calls into question EPA's allowance of so-called plant incorporated protectants (PIPs). Iowa State University entomologist Aaron Gassmann, PhD discovered that western corn rootworm populations in four Iowa fields have evolved and can resist the pesticide built into Monsanto's genetically altered corn seed. The scientist said the cases were isolated, but he did not know how widespread the problem could become. Farmers in Illinois are also seeing severe rootworm damage in fields planted with Bt corn. In 2010, Monsanto acknowledged that in industrial-agriculture regions of India, where its Bt cotton is a dominant crop, the cotton-attacking bollworm has also developed resistance.

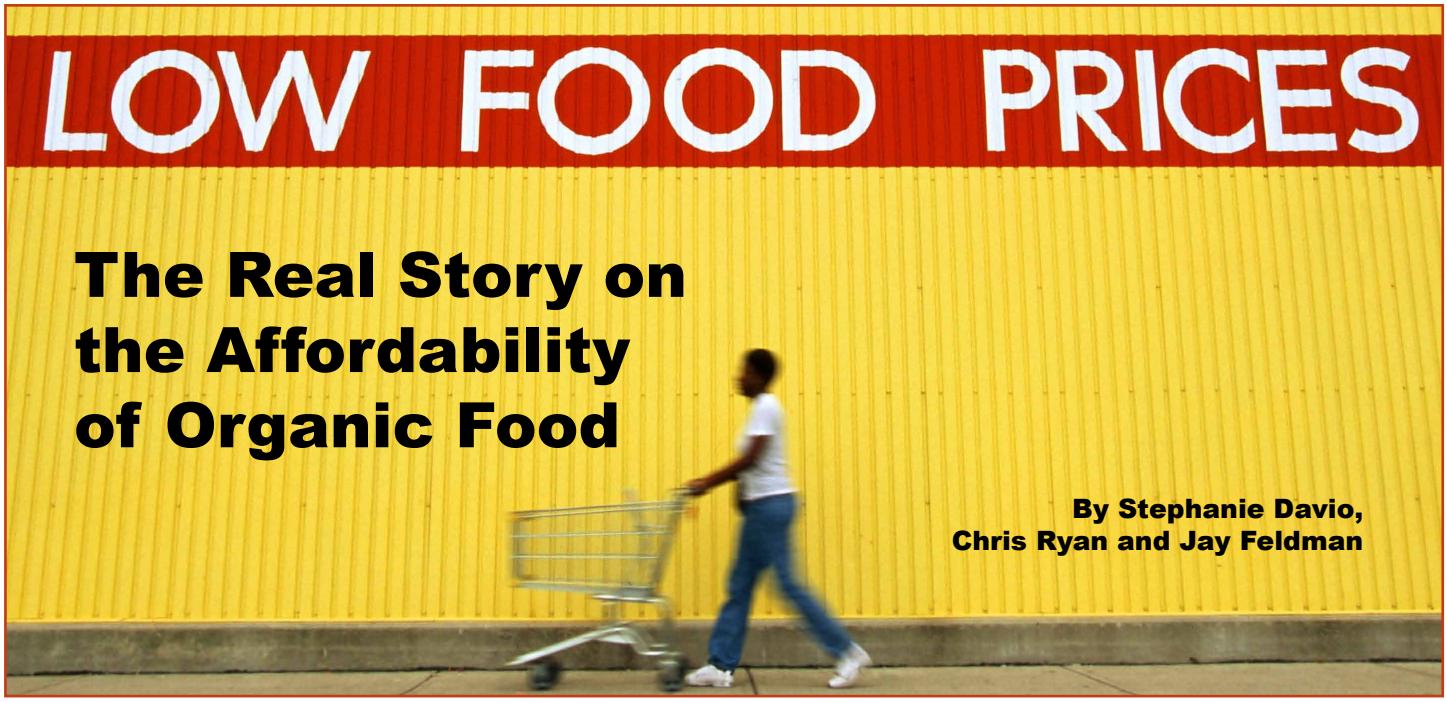
Monsanto became the first company to sell rootworm-resistant biotech corn to farmers in 2003. The seed contains a gene from the common soil microorganism *Bacillus thuringiensis*, or Bt, from which crop biotechnology has used several genes for making insecticidal proteins. One of the genes Monsanto isolated makes a crystalline protein called Cry3Bb1, which is toxic to the corn rootworm.

The reliance on toxic pesticides and then the introduction of pesticide-producing GE corn led to farmers abandoning practices to keep pests like the corn borer and the rootworm in check by changing what they grew in a field each year, often rotating between corn and soybeans to starve the offspring of corn-loving insects. There has long been a concern that EPA's allowance of plant incorporated protectants (PIPs) with Bt would lead to the failure of a biological tool used in organic farming systems as an alternative to highly toxic synthetic inputs. Organic farmers have expressed concern since the introduction of PIPs in 2003 that the overuse of Bt, which is inevitable when Bt is genetically engineered into every cell of a plant, will lead to insect resistance and leave many farmers without an important tool in organic agriculture.

Conversion to Organic Poultry Farming Lowers Risk of Antibiotic-Resistant Bacteria

Poultry farms that have adopted organic practices and cease using antibiotics have significantly lower levels of drug-resistant *Enterococci* bacteria that can potentially spread to humans, according to a new study published August 2011 in the online edition of *Environmental Health Perspectives*. Researchers at the University of Maryland's School of Public Health investigated the impact of removing antibiotics from poultry farms by studying 10 conventional and 10 newly organic large-scale poultry houses in the mid-Atlantic region. While all farms tested positive for the presence of *Enterococci* in poultry litter, feed, and water as expected, the newly organic farms were characterized by a significantly lower prevalence of antibiotic-resistant *Enterococci*. For example, 67 percent of *Enterococcus faecalis* recovered from conventional poultry farms are resistant to erythromycin, while only 18 percent from newly organic poultry farms are resistant to this antibiotic. Dramatic changes were also observed in the levels of multi-drug resistant bacteria. Multi-drug resistant bacteria are of particular public health concern because they are very difficult to treat if contracted by an animal or human. 84 percent of *Enterococcus faecium* from conventional farms are multi-drug resistant compared to 17 percent of those from newly organic farms.

The non-therapeutic use of antibiotics in livestock production accounts for nearly 80% of all antibiotics used in the U.S. In conventional systems, low levels of antibiotics are administered to animals through feed and water to prevent disease and promote growth. This is generally done to compensate for overcrowded and unsanitary living conditions, as is common in concentrated animal feeding operations (CAFOs), and to fatten livestock to get them to market sooner. Antibiotic use is prohibited in the production of all animal products labeled organic. *For more information, see "Studies Show Health and Financial Benefits of Organic Poultry Farming" in the Summer 2011 issue of Pesticides and You.*



The Real Story on the Affordability of Organic Food

By Stephanie Davio, Chris Ryan and Jay Feldman

It is often said that organically produced food has higher prices at the store because it takes more time and energy to produce than its chemical-intensive counterpart. Compared to so-called conventional chemical-intensive farming, organic farmers pay closer attention to the health of their agricultural ecosystems and the potential results of their farming practices for both humans and the natural world, and this more intensive management does come with a pricetag. However, this is only part of the story, as it overlooks the glaring fact that conventional farm operations do not incur the total cost of their production. Chemical-intensive agriculture has countless negative effects on our health and natural resources, which are not accounted for in most traditional farm business models, but are passed on to society nevertheless. Some researchers calculate the adverse impacts to health and the environment to be as much as $16.9 billion a year. (Tegtmeier and Duffy 2004) We still pay these costs, just not at the grocery checkout counter. Instead, we see these costs in the form of higher taxes and medical bills, and decreased quality of life due to environmental pollution. Conversely, organic farmers take steps to ensure that they do not create these effects, which result in external costs. Instead, they internalize them and take care not to damage and deplete natural resources or create public health problems. The question, then, should not be, "Can we afford to buy organic food?," but rather, "Can we afford not to?" The following data suggest that we are going to go broke cleaning up after conventional agriculture.

"Conventional?"

We have come to differentiate organic from chemical-intensive agricultural practices by referring to the latter as "conventional." Of course, it is conventional only in the sense that it is the most commonly practiced form of agriculture in the U.S. From an ecological and environmental health perspective, however, it must be said that these chemical-intensive practices defy conventions of what we know to be healthful practices that support soil biology, biodiversity, plant health, and protection of human health and the environment.

How Much Does it Cost?

The costs and benefits of agriculture, whether organic or conventional, can be broken down into two basic categories: public health and the environment. The food we eat and the ways in which it is grown have strong and lasting effects on not only our own personal health, but also the health of farmworkers and farm families, surrounding communities, and our natural resources.

Health

Nutrient Density

In terms of health, food provides us with the essential vitamins and nutrients which our bodies require in order to sustain themselves. But is the food that we eat adequately providing these nutrients? And is it delivering anything else to our systems that might do them harm? The chemical industry likes to point out that there are few to no studies in this area that show the value of organic produce. There is some new mounting evidence that indicate otherwise, but studies largely do not exist because they are not required under the current regulatory system.

A growing number of consumers are choosing organic foods, believing them to be healthier for themselves and the environment. Particularly noteworthy is a recent study conducted by researchers at Washington State University that compares the

nutrient content of organically and conventionally grown strawberries. The researchers find that organically produced strawberries, while slightly smaller than conventional, have higher antioxidant activity, longer shelf life, and fare better in taste tests. Specifically, the organic berries are found to have higher levels of antioxidants, Vitamin C, and phenolics (Reganold et al. 2010). They also have a longer shelf life and greater resistance to post-harvest fungal rot. Consumer sensory panels show a preference for the taste of organic strawberries, as well.

Food Contamination

Environmental illness can result in serious hardship on every level, from physical to psychological. It also burdens us, both personally and as a society, with seemingly insurmountable economic costs. Children are particularly susceptible to chemical exposure in the environment and studies have shown significant financial costs associated with protecting children from hazards and treating chemical-induced diseases. A 2010 study estimates that families in Michigan spent $5.85 billion coping with just four environment-related childhood diseases –lead poisoning, asthma, pediatric cancer, and neurodevelopmental disorders. ("The Price of Pollution" 2011)

A 2008 nationwide study by researchers at the Mount Sinai School

Who Eats Organic?

The chemical-intensive agriculture and food industry likes to characterize organic as elitist. In reality, this is far from the truth.

An analysis published in *Choices Magazine* finds that households with income levels of less than $25,000/year actually spend about the same or slightly more on organic than higher income groups. The magazine concludes, "Contrary to popular opinion, we do not find any consistent positive association between household income and expenditures on organic produce."

Another poll conducted by *Thomson Reuters* and *National Public Radio* (NPR) shows that a majority of Americans prefer to buy organic food when given the chance. The survey asked five questions of respondents:

(1) Given a choice, would you prefer to eat organic or non-organic foods?
(2) What are your reasons for preferring organic food?
(3) What are your reasons for preferring non-organic food?
(4) Given a choice, where would you most prefer to get your produce?
(5) In a restaurant, would your ordering decision be influenced by the availability of organic options?

The results find that 58% of respondents say they choose organic over conventionally produced foods when they have the opportunity; this number spikes higher among both young and highly educated respondents. Those who most prefer organic food include respondents under the age of 35 and respondents with a bachelor's degree or higher, at 63% and 64% respectively.

Across income brackets, preference for organic food is relatively even, with 56% of those earning less than $25k per year, 61.2% earning in the $25-$49.9k bracket, 59% in the $50-$99.9k bracket, and 60% of those earning more than $100k per year expressing preference for organic food.

Is Organic Elite?

In a question and answer column of the June 21, 2009 edition of the *San Francisco Chronicle*, food expert and nutritionist Marion Nestle succinctly countered this myth, echoing Eric Schlosser's sentiments in the book *Fast Food Nation*. Social movements have to start somewhere, and sometimes they start with elites. As supply and demand for organic foods increase, the prices should eventually level out. "But please don't blame organic producers for the high prices," she writes, describing the many obstacles that organic producers have faced in terms of lack of federal support.

She goes on to write, "Dealing with the elitism implied by the higher cost of organics means doing something about income inequities. If we want elected representatives to care more about public health than corporate health, let's work to remove the corruption from election campaign contributions. If Congress were less beholden to corporations, we might be able to create a system that paid farmers and farm workers decently and sold organic foods at prices that everyone could afford."

Pesticides and Disease

Pesticides are one of the most dangerous and toxic parts of our food system. For more information on the health impacts of these chemicals, the *Pesticide-Induced Diseases Database*, managed by Beyond Pesticides, facilitates access to epidemiologic and laboratory studies based on real world exposure scenarios that link public health effects to pesticides. The scientific literature documents elevated rates of chronic diseases among people exposed to pesticides, with increasing numbers of studies associated with both specific illnesses and a range of illnesses. With some of these diseases at very high and, perhaps, epidemic proportions, there is an urgent need for public policy at all levels –local, state, and national— to end dependency on toxic pesticides, replacing them with carefully defined green strategies in order to save lives and bring down our medical costs. *Visit www.beyondpesticides.org/health to examine the data.*

of Medicine calculates $76.6 billion as the aggregate annual cost of such afflictions as lead poisoning, childhood cancer, asthma, autism, and attention deficit hyperactivity disorder. This estimate includes direct medical care as well as indirect costs, such as parents' lost work days and lost economic productivity caring for their children. (Trasande and Liu 2011)

Of course, not all environmental illnesses result from chemical-intensive agricultural production. However, with nearly one billion pounds of pesticides used in agriculture annually, it is without a doubt a significant contributor to exposure, poisoning, and the onset of chronic illnesses. Pesticide-related medical expenses alone have been shown to cost patients $1.2 billion dollars annually. (Pimentel 2005) This was also as a result of hospital and medical bills and loss of work, as well as treatment of pesticide-induced cancers and even fatalities.

Though pesticides are the most significant contributor to public health costs in the food system, other factors such as foodborne pathogens are also an all too common side effect of industrial farming. The costs of treating illnesses resulting from *campylobacter*, *salmonella*, and *E. coli* total $375 million every year. The administrative and compliance costs associated with food safety regulations amount to as much as $65 million a year. (Tegtmeier and Duffy 2004)

Not only does organic farming eliminate the need to use dangerous pesticide chemicals, it also represents the opportunity, through more humane management systems, to reduce the danger and prevalence of microbial pathogens in the food system. According to a report from the University of Florida's Emerging Pathogens Institute, salmonella is the leading disease-causing pathogen found in foods throughout the country. Compiling data from the costs of doctor's visits, hospitalization, prescriptions, lost wages, and estimated economic value of a premature death, the researchers found that total salmonella contamination resulted in a financial burden to society of $3.3 billion. (Batz, Hoffman, and Morris 2011)

Here again, organic fares much better. A study, released by the University of Georgia's Center for Food Safety, documents the comparative rates of salmonella contamination in both feces and feed at organic and conventional broiler poultry farms in North Carolina. The researchers found that, in examining fecal samples, 38.8% of poultry from conventional farms contain salmonella, compared with only 5.6% from organic farms. For feed, the results were similar: 27.5% of feed on the conventional farms have salmonella, while only 5% of organic feed is contaminated. (Alali et al. 2010)

The study also examines the prevalence of salmonella that is resistant to antibiotic treatment and compares the results across organic and conventional. The results show that resistance to the antibiotic streptomycin is 36.2% at conventional farms, compared to 25% at organic. Perhaps even more significant, multidrug resistance to six different antibiotic treatments (ampicillin, streptomycin, amoxicillin, cephalothin, ceftiofor, and cefoxitin) is at 39.7% on the conventional farms, whereas none of the organic birds show resistance to this combined treatment. Antibiotic and antimicrobial resistance is a serious public health issue, since it can lead to infections that are expensive and difficult or impossible to treat.

Farmworker Safety

Farm work is one of the most dangerous jobs in the country, due to harsh working conditions, heavy machinery, and exposure to hazardous substances. To help explain the urgent need for a major shift to organic food production and consumption, Beyond Pesticides launched the *Eating with a Conscience* database, which evaluates the impacts on the environment and farmworkers of the toxic chemicals allowed for use on major food crops grown domestically and internationally. Certain foods are often identified in the media as being "clean" due to a lack of pesticide residues. While it is helpful to alert consumers to hazardous residues on food, food residues are only part of the story. It turns out that those very same "clean" food commodities may be grown with hazardous pesticides that get into waterways and groundwater, contaminate nearby communities, poison farmworkers, and kill wildlife, while not all showing up at detectable levels on our food.

Farmworkers are put at particularly high risk by the use of toxic substances. While taking hazardous pesticides out of food production reduces hazards on the farm, farmworkers often face a lot of hardships that are not addressed by this guide. Farmworkers have long fought for better working conditions, wages and labor practices. *To learn more about how our food choices affect workers and the environment, visit www.EatingWithAConscience.org.*

(Alali et al, 2010)

Environment

One of the chief reasons given for practicing organic farming and buying organic food is the protection it offers the environment. And, in the long run, taking care to preserve natural resources and prevent toxic pollution actually does save money. It may not be as immediately satisfying as paying less for food at the grocery counter, but organically produced food has the ability to save us from such future expenses as pollution cleanup, replenishment of soil fertility, water sanitation, and erosion control, among many other impacts. These may seem like abstract concepts on the surface to which it is difficult to assign a monetary value. But there are significant sums of actual money that have been spent in the remediation of the natural environment from these impacts.

A research team at Iowa State University (Tegtmeier and Duffy 2004) evaluated actual money spent on cleanup of air, soil, and water, the damage to human health from pesticides and food borne pathogens, and the regulatory costs, and concluded that as much as $16.9 billion is spent in accounting for the external costs of agricultural production in the U.S. every year. The comprehensive cost from pesticide damages alone total more than $2.2 billion per year when factoring in such costs as water treatment to remove residues, loss of pollination services from insects, and medical treatments for pesticide poisonings.

The same Iowa State University study finds that the costs of environmental cleanup alone, resulting from chemical-intensive agriculture, amounts to as much as $15 billion annually. Additionally, a World Resources Institute evaluation shows that the average farmer in 1991 that generated a profit of about $80/acre actually would have suffered a $26/per acre loss if the calculations factored in the costs of the environmental degradation that resulted from conventional farming practices, in the form of soil erosion and fertility loss. (Faeth et al. 1991) Industrial farming operations, however, do not have to account for these costs. Instead, the bill is picked up by the taxpayers, translating into expenditures to protect natural resources that are not captured in the price of conventional food.

One of the more visible forms of environmental cleanup costs comes in the form of the EPA Superfund program. Through this program, EPA designates sites throughout the country that have been seriously contaminated with hazardous substances and implements a cleanup program to remediate the damages. These sites can often be associated with manufacturing facilities producing chemicals for agricultural use, such as a plant operated by the Dow Chemical Company in Midland, Michigan that produces pesticides. Over many years, the plant has polluted nearby waterways with toxic substances such as pesticides and their contaminants, dioxins, and furans.

Under ideal circumstances, EPA makes the company responsible for the pollution and pay the costs of the cleanup. However, because many companies are bankrupt or have gone out of business at the time of cleanup, EPA often pays the bill from public funds. According to a 2010 report from the Government Accountability Office, EPA spent as much as $267 million dollars a year on Superfund projects for the years 2000-2009. However, the agency estimates that by the year 2014, it could be spending as much as $681 million annually on Superfund sites. (GAO 2010)

None of these costs are currently factored into production by con-

ventional farmers and so they are not passed on to consumers in the form of food prices. Instead, they are most often picked up by public utilities and government cleanup efforts, which are funded with taxpayer dollars. It is clear from this data that organic food does not actually cost more to produce, it simply puts the costs of production up front rather than ignoring them.

Soil and Water

Soil health is arguably the most important factor in growing healthy crops. Topsoil –the top several inches of nutrient-rich soil– is one of the most precious natural resources on the planet. It is the very basis on which we grow and sustain our population and society. Healthy fertile topsoil contains all of the nutrients necessary to produce healthy plants, which provide us with nutritionally-rich diets. It was Thomas Jefferson who said, "Civilization itself rests upon the soil." Sadly, however, we are contaminating and eroding our topsoil at staggering rates through conventional, chemical-dependent agricultural systems. A 1995 study published in the journal *Science* estimated that an average of 17 tons of soil per hectare per year were being lost in the U.S. due to erosion, with that amount reaching 30 tons for the even more precious topsoil. (Pimentel 1995) The conventional model essentially sees the soil as simply a medium to physically prop up the plants as they grow, and fertility is supplied through synthetic petroleum-based fertilizers which give the plants a direct shot of nutrients, but do nothing to sustain their long-term health and lead only to a cycle of chemical dependence. With little to no soil organic matter to hold onto the nutrients, these fertilizers then leach into ground water or erode into waterways along with the soil, damaging natural ecosystems and leading to algae blooms and dead zones.

Organic farmers, by contrast, take great care to create rich, fertile soil full of essential plant nutrients, so that crops growing on the land will have a steady supply of fertility. The organic farmer's motto is "feed the soil to feed the plant." The *Organic Foods Production Act* (OFPA), which establishes production standards for food certified and labeled "USDA Organic," identifies soil health as a central principle. OFPA requires the development of an organic system plan for every farm that, under the law, is required to "foster soil fertility, primarily through the management of the organic content of the soil through proper tillage, crop rotation, and manuring" [7 U.S.C. § 6513(b)(1)]. The creation of healthy soil makes synthetic fertilizers unnecessary, and higher organic matter in the soil makes it better able to absorb nutrients and water, reducing erosion and runoff. Water usage is also lessened, as research has shown that organic soils retain as much as 20% more water than conventional soils. (Pimentel et al. 2005) Although this kind of diligent management may seem at first to be more resource intensive, the aim is to create a more self-sustaining and resilient system and reduce overall inputs, while preserving and nurturing the natural resources. In the long run, this does save money. A team of university researchers studying agricultural activities in Oregon's Willamette Valley found that when all of the off-site costs of soil erosion are taken into account, such as keeping navigation channels clear and treating municipal water supplies, the total cost amounts to as much as $5.5 million annually –not accounted for in the price of food produced on eroded land. (Moore and McCarl 1987)

Biodiversity

Another natural resource which is essential for the production of food but has been drastically undervalued and overlooked is biodiversity, especially as it relates to pollinators and beneficial wildlife. According to rural sociologist Doug Constance, PhD of Sam Houston State University, in order for a system to be sustainable, it must be resilient and able to adapt to change. Resilience, in turn, depends in large part on the diversity of the system and the ways in which it can respond to challenges. (Constance 2011) This is especially true of biological systems, such as agriculture. Diversity is essential for the system to survive –diversity of crops to reduce

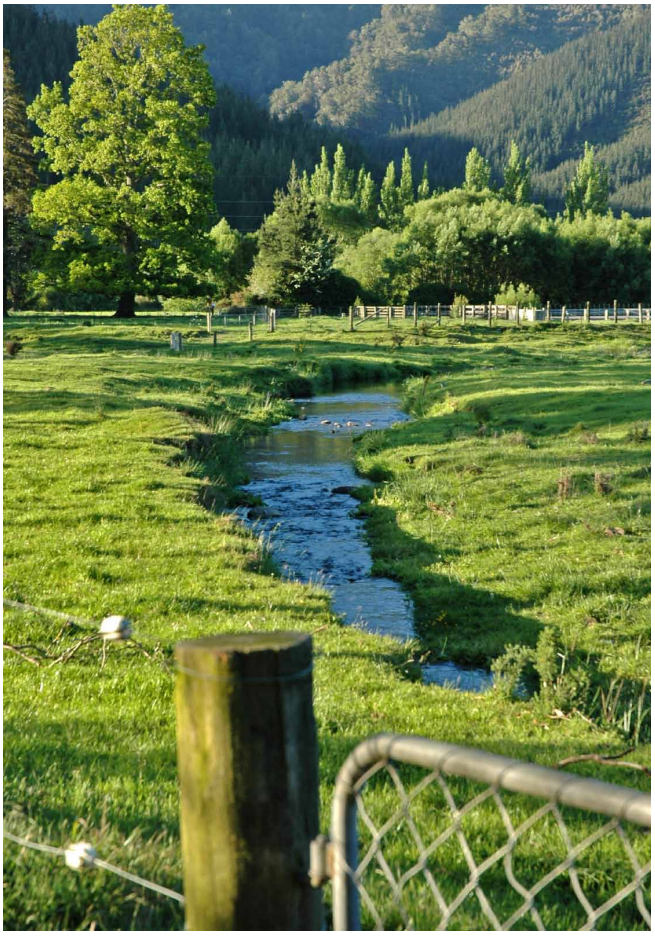
Federal Agricultural Subsidies

Most of our federal agricultural subsidies are provided to only a few commodity crops –corn, cotton, wheat, rice, and soybeans– with most of the money going to large-scale, corporate farms. In the 2008 Farm Bill alone, the amount of funding for commodity crop programs was estimated at $41.6 billion by the Congressional Budget Office. This amount dwarfs the $402 million for organic agriculture. U.S. agricultural policy encourages massive monocultures that provide the perfect breeding grounds for pests and disease and require heavy inputs of toxic pesticides and synthetic fertilizers to maintain and preserve productivity. There are very few federal incentives for farmers to adopt organic practices, such as crop rotation, soil building, and erosion control. Several fledgling programs do offer support for organic farmers and enhance their ability to provide us with a safe and sustainable food supply, but they are often neglected in federal budgets as they struggle to make a difference. Until these policies are reformed, it is going to remain difficult for the vast majority of Americans to have easy access to food that is produced in ways that do not pollute their environment or put their health at risk.

pests and disease, as well as wild plant species to foster populations of beneficial insects, like pollinators and pest predators. Each of these pieces plays a key part in supporting natural systems and makes possible the growth of healthy plants and food. The estimated economic costs of losses to biodiversity in the form of pollinator services, beneficial predators, birds, and aquatic life amount to more than $1.1 billion every year. (Tegtmeier and Duffy 2004)

Pollution

Pollution is, of course, one of the most significant and easily recognizable effects of the environmental degradation caused by conventional agriculture, and pesticides are one of the chief sources. The total cost of pollution and remediation from the contamination of the natural environment by pesticide chemicals is valued at $1.3 billion annually. Erin Tegtmeier, PhD and Michael Duffy, PhD (2004) of Iowa State University estimate that, with an average of approximately 447 million kilograms of pesticide active ingredients applied in a year, external costs amount to about $2.55 for every kilogram of active ingredient applied. This does not include medical costs as a result of human exposure to pesticides, as cited above. The financial impact is broken down into areas such as the costs borne by public water utilities treating municipal water supplies to remove pesticides, as well as damage to natural resources and ecosystems that result. When natural cycles are disrupted and ecosystem services such as natural pest predators are killed, more money must be spent in controlling a ballooning pest population robbed of its natural "pesticides." This is just one example of the unintended impacts that can occur from a system that ignores natural processes, and the unnecessary costs that can result.



Cornell researcher David Pimentel, PhD estimates the external costs of pesticides to be much higher, at almost $10 billion a year. The costs of environmental contamination and resulting damages account for $8.5 billion alone, with the remaining costs going to public health impacts. Dr. Pimentel's team breaks down the environmental costs into the categories of animal deaths and poisonings, loss of natural pest enemies, pests evolving pesticide resistance, honey bee and pollination losses, crop losses, fishery losses, bird losses, groundwater contamination, and government regulations to prevent damage. (Pimentel 2005)

Pollution also comes from sources such as nitrates from fertilizers and manure from industrial livestock operations. Excess nitrogen in waterways often results in algae blooms as the organisms feed on the increased supply of nutrients. Large algae populations, however, require large amounts of oxygen to sustain themselves and algae blooms tend to deplete much or all of the dissolved oxygen from an aquatic environment, killing most other aquatic life in the area. The estimated combined costs of water treatment to remove nitrates and wildlife losses due to manure runoff from intensive livestock operations amount to over $200 million annually.

(Tegtmeier and Duffy 2004)

A large scale evaluation was recently completed in Europe that attempts to analyze the costs to society of nitrogen pollution. Of course, not all nitrogen pollution is a result of agriculture, but the researchers for the project, called the European Nitrogen Assessment, estimate that 75% of Europe's synthetic nitrogen is for agricultural fertilizers. Evaluating the various effects that excess nitrogen has on water, air, and soil quality, as well as atmospheric balance, biodiversity, and natural ecosystems, the team found that excess nitrogen in the environment results in costs as high as $460 billion a year for the European continent. (Sutton et al. 2011) Research has shown that organic systems can retain significantly higher percentages of nitrogen in the soil. A year after fertilizer applications, organic soil retained 47% of the nitrogen, while conventional soil retained only 17%. (Pimentel et al. 2005)

Climate Change

Most economic studies fail to account for agriculture's contribution to global climate change. Since we are just now beginning to see the effects of this phenomenon, it is difficult to tag them with a dollar value. However, it is abundantly clear that industrial agriculture contributes great amounts of greenhouse gases to the atmosphere while paying for none of the consequences that will result. It is left to consumers to handle and mitigate these consequences. Industrial producers who emit thousands of tons of carbon dioxide and methane into the atmosphere pay none of the costs of an increasingly volatile global climate, causing unpredictable weather patterns and exacerbating the scarcity of natural resources. According to the latest report from the Intergovernmen-

Feeding the World. . .Safely

Although it is often said by advocates of industrial farming that organic farming will never produce sufficient yields to adequately feed the growing global population, research has consistently proven this claim false. Over a span of 30 years, the Rodale Farming Systems Trial has repeatedly shown comparable yields in organic, as compared to conventional, systems. In times of resource or climate stress, such as floods or drought, organic significantly outperforms the conventional system. In unusually dry years, the organic corn systems produce yields 28%-34% higher than the conventional corn systems. (Pimentel et al 2005) High performance under stress is an important consideration in making marginal lands more productive, especially as climate is predicted to grow more volatile and unpredictable.

In addition to the Rodale data, numerous other studies have demonstrated the ability of organic to produce equal amounts of food as conventional systems. A 2006 study performed by researchers at the University of Michigan found that global yields of organic compared with conventional systems are equal on average. In the developing world, organic yields are even higher. The team also estimated that "organic methods could produce enough food on a global per capita basis to sustain the current human population, and potentially an even larger population, without increasing the agricultural land base." (Badgley et al. 2007)

Perhaps most significantly, a report issued at the end of 2010 by the United Nations Special Rapporteur on the Right to Food came to the conclusion that widespread adoption of "agroecological" food production systems, such as organic, would be the best way to effectively feed the growing global population. (UN General Assembly 2010) These kinds of systems, the report finds, actually have the capacity to double current levels of food production in areas of the developing world.

Despite claims by proponents of industrial agriculture, conventional approaches are not adequately feeding the current global population, making it hard to anticipate that they would do so in the future. As was noted by the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD), "Although global production of food calories is sufficient to feed the world's population, millions die or are debilitated every year by hunger and malnutrition..." (McIntyre et al. 2009) It is, of course, true that as the population increases food production will have to increase as well, but without reform to global food distribution systems, hunger will persist, no matter the production methods employed. Here again, organic systems provide a path forward. Due to the reduced need for inputs and lower startup costs, it is much easier for small scale farmers around the world to start a farm using organic methods. Since small scale farms tend to have more localized distribution networks, they can support rural or isolated communities in areas that globalized markets cannot reach.

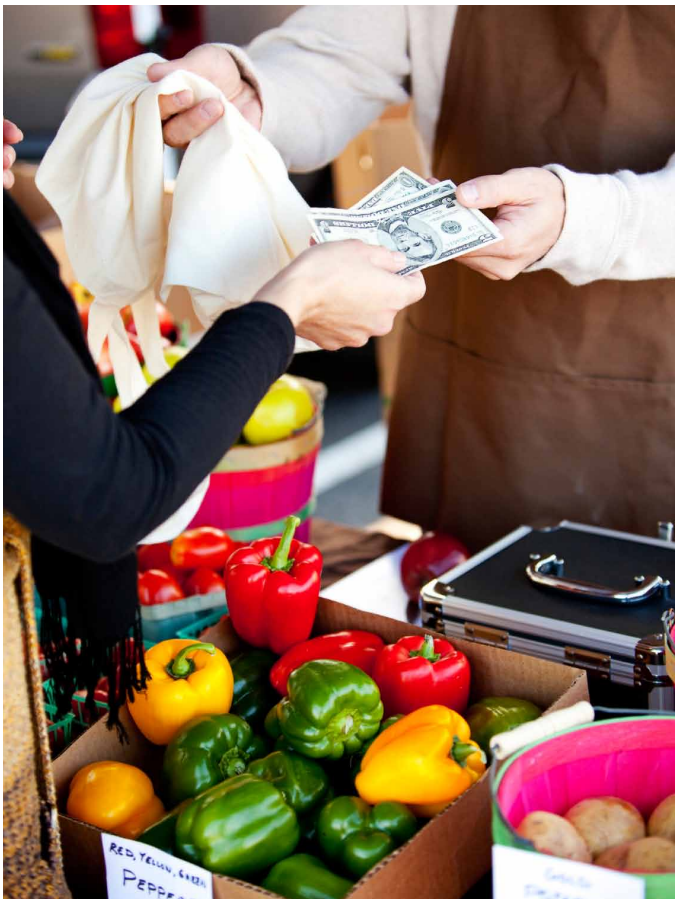
tal Panel on Climate Change (IPCC), world agriculture as a whole contributes as much as 12% of global greenhouse gas emissions. (Smith et al. 2007) This figure does not include secondary effects of agriculture, such as the fossil fuel intensive production of synthetic fertilizers, or the vast amounts of carbon emissions that result from deforestation and soil degradation when wild areas are converted to farmland.

Organic agriculture, however, has proven to be a powerful response to this problem. Not only do organic practices emit much fewer greenhouse gasses, they actually present the potential to sequester significant amounts of carbon in the soil. According to the Rodale Institute's Farming Systems Trial, which began in 1981, an organic system of corn production requires 30% less energy on average to produce yields comparable to a conventional system. (Pimentel et al. 2005) The savings are accounted for not only in direct production practices such as reduced machinery use, but also in the fact that production of synthetic nitrogen fertilizers for conventional systems requires significant amounts of fossil fuels. Organic systems, by contrast, get their nitrogen from natural sources such as nitrogen fixing plant species, cover crops, compost, and manures.

Organic practices not only present the potential for minimizing the problem, they can also contribute to an active solution. According to the International Federation of Organic Agriculture Movements (IFOAM), organic farming could potentially sequester up to 32% of man-made greenhouse gasses in the soil. (IFOAM 2009) The Rodale Farming Systems Trial shows that organic systems can sequester 2.3 tons of atmospheric carbon in the soil per hectare per year. (Pimentel et al. 2005) Through reduced tillage, incorporation of plant residues, and fostering a diverse population of soil life, the soil and plants can become carbon storage sinks, instead of releasing the gasses into the atmosphere.

External Costs Conclusion

External factors and costs add up. Farming operations do not have to account for them, so they do not pass on the costs through the price of food. But make no mistake, the costs are passed on to the consumer as a taxpayer. We are paying for the costs of health impacts, farmland erosion, pollution cleanup, water treatment, climate adaptation, and so much more through our public funded institutions. Organic farmers, in putting these costs up front, rather than passing them on in secret, actually save us money in the long run. A key to addressing our nation's urgent health and environmental problems is the shift to organic production. Although it is tempting to continue buying conventional food with deceptively cheap prices, we just can't afford it.



Eating Organic on a Budget

By Stephanie Davio

More and more people of all income groups have access to organic food. At the same time, it's true that there is a premium price on organic products at the grocery store. Unfortunately, the price of chemically grown food does not include the externalities, such as pollution cleanup costs and treatment for the poisoning of farmers and farmworkers. However, buying organic does not mean you have to burn a hole in your wallet each time you set out to buy groceries. It may take some extra planning and commitment, but considering all the benefits of organic food, it is well worth the extra effort. Consider the options that follow and insist on organic.

■ **Eat Seasonally and Locally.** Though it is a widely held notion that fruits and vegetables from the farmers market are more expensive than its big-box grocery store counterpart, there has been little research to back up this claim. In fact, a report by the Northeast Organic Farming Association (NOFA) of Vermont finds that just the opposite is true: organic produce from farmers markets consistently costs less than produce from grocery stores. This corroborates findings in other parts of the country. A cost

Federal Assistance

There are a few different federally funded nutrition assistance programs that help increase access to food for low-income children and families. One program is the Supplemental Nutrition Assistance Program, also known as SNAP, formerly known as food stamps, and the other is the Women, Infants and Children program, or WIC. With SNAP benefits, consumers can choose whatever food items they want, up to the amount available to them in their account, provided that the retailer has applied to the program to accept these benefits. WIC recipients, on the other hand, receive coupons for specific products or types of food products that vary by state. State agencies determine what brands and types of foods to authorize on their own state food list.

Some organic forms of WIC-eligible foods meet the requirement; however this is not usually the case. Most of the requirements specify to purchase the cheapest brand and sometimes it specifically states that organic is not allowed. With SNAP benefits, there are no restrictions in place for or against organic food, however each recipient only gets a set dollar amount each month based on income qualifications.

There are special coupons administered through the WIC office that are specifically for use at farmers markets, called the Farmers Market Nutrition Program (FMNP). These can only be spent at farmers markets in the recipient's designated state on fresh fruit and vegetable items. These coupons differ from normal WIC coupons in that they are for a set dollar amount for produce —there are no requirements for a specific type of produce or brand. Farmers must apply through the state and receive training in order to accept these. Recipients of FMNP coupons may choose to spend these coupons on either organic or conventionally grown produce at the farmers market from qualified farmers.

SNAP benefits are also increasingly welcomed at farmers markets across the country. Though there is not always an incentive to purchase high quality food with SNAP, the growing local and organic food movement is working to change that. Thanks to new initiatives through private foundations, many farmers markets are able to "double" the value of SNAP benefits and FMNP vouchers. This greatly increases the incentive to shop locally, however, since local does not always equal organic, it does not necessarily support organic practices. Though, as mentioned in this article, it is often cheaper to buy organic produce at a farmers market while it's in season, and that certainly is a step in the right direction.

survey by Stacey Jones, an economics professor at the University of Seattle, found that farmers markets are slightly less expensive than a nearby grocery store. Another study by the Leopold Center for Sustainable Agriculture found that farmers market prices are often equal to or lower than prices at grocery stores in four different Iowa cities.

When you consider the cost of shipping produce across the country and all the middle-men involved in the process, it just makes sense that something produced locally will be cheaper. It's much more economical to buy food when it's in season and there is ample supply.

In addition to economic benefits, local, organic produce has generally been harvested recently and is grown for its taste and nutritional qualities, not its durability. Taste alone is a compelling enough reason to buy local, organic produce, but the benefits go beyond the palette. Local, organic farms do not contribute to pesticide contamination in communities.

- *Stock up on organic produce when it's at its cheapest. Can or freeze what you won't eat in the short term so you can enjoy summer's bounty all year long.*
- *Producer-only farmers markets only sell fresh food that is in season. Not sure about your local market? Find out what the criteria is for selling at the market to be sure they are not selling produce shipped in from across the country.*

■ **Choose Simple Recipes and Preparations.** Frozen dinners, restaurant meals, packaged foods, and other con-

venient options quickly add up. Limit spending on value-added products and stick with simple recipes that are quick and easy to prepare. If you purchase high quality organic ingredients (especially if they're in season, as discussed above), you usually need nothing more than a little heat and touch of olive oil along with some salt and pepper to make something delicious.

- *There is a plethora of information available on easy, simple, and delicious recipes online or in cookbooks.*
- *Ask your farmers if they have any suggestions for preparing their produce. Farmers are busy and they work very hard —if anyone knows how to eat well and simply, it's likely to be the person who grew your food.*
- *Mark Bittman, a food journalist and cookbook writer, is a master of simple cooking who understands the importance of knowing where your food comes from and eating sustainably. Look for his cookbooks at your local library or bookstore or find his columns at www.markbittman.com.*

■ **Community Supported Agriculture.** Commonly referred to as CSA's, this arrangement is between community members and a local farmer. Members pay the farmer at the beginning of the season or in installments throughout the year and receive a weekly share of whatever produce is available at the time. Membership can seem like a large sum of money up front, however, when you divide it by the amount of weeks you receive your share, the savings are well worth it. This benefits farmers because the guaranteed payment helps with cash flow, cuts marketing costs, and also mitigates any risks they may face from a natural disaster that may damage their crops. It benefits you as a consumer because you get a box of fresh food each week and a chance to sample veggies that you may not have tried before.

- *Ask a farmer at your local farmers market if they offer a CSA program.*
- *Check out www.localharvest.org for more information on CSAs, as well as a list of resources in your area.*

■ **Food Co-ops or Buying Clubs.** A food cooperative is a member-owned and controlled organization which generally provides high quality goods at low prices. There are a number of different styles of food co-ops, however all cooperatives share a core set of principles, including democratic decision making, mutual financial benefit, open membership, and are not for profit.

While purchasing "prepared" goods from co-ops is often possible, the real money-saving occurs when bulk goods are purchased. Processed, packaged, and prepared foods generally cost more. You do not have to be a member to shop at a co-op.

Buying clubs have similar principles as food co-op, but are usually smaller and less formal, comprised of a couple of households or a small neighborhood group. Members place an order for bulk grains, flour, beans, oils, and even canned goods, which can then be divided and distributed among club members. This often reduces packaging significantly as well. If you don't have a neighborhood food co-op or are reluctant to join a CSA because you don't know what you'll do with a box of produce, this might be the option for you.

- *Read "How-To Get Access to Organic Food, Economically," www.beyondpesticides.org/organicfood/purchasing, from the Winter 1995-96 issue of Pesticides and You for more information.*

■ **Grow Your Own.** Not only is gardening a rewarding experience, but you can save money by growing some of your own vegetables. Herbs are extremely easy to grow and are almost always more expensive to buy fresh from the market. Whether you live in the city and only have room for a few window pots of herbs, or you live in the country where you can set up a backyard garden to provide nearly all your produce needs, growing your own food organically is worth a try.

- *For a how-to guide on getting started, read our factsheet, "Grow Your Own Organic Food" printed in the Spring 2010 issue of Pesticides and You, www.beyondpesticides.org/infoservices/pesticidesandyou.*

■ **Rethink Your Food Budget.** How much do you spend on food for yourself or your family? Perhaps you can give up one restaurant meal a month, or replace a couple of the products you eat the most with organic versions. A small change in your budget to allow for more organically grown food can have significant benefits for the health of your family, farmworkers, and the environment.

Dear Consumer: Herbicides Kill Trees!

EPA's conditional registrations continue to cause harm

By Nichelle Harriott

As spring gave way to a warm summer, many homeowners, gardeners, and landscape professionals began noticing an eerie sight. Scores of trees, mainly the majestic Norway Spruce and White Pine, were withering. Yellowing, browning, curling, and loss of needles typically characterized injury where trees were supposed to be green, at the height of summer. In severe cases whole trees were lost. In what some say could be one of the biggest disasters of its kind since the emerald ash borer killed millions of trees, losses were reported throughout the Midwest, in East Coast states, and as far south as Georgia. These cases had one thing in common: Imprelis. A new herbicide manufactured by DuPont and marketed as a "low environmental impact" pesticide, Imprelis was applied during the spring to control dandelion, clover, and other annual and perennial weeds on lawns and other landscapes in the vicinity of these once evergreen trees. Soon thereafter, trees began to die.

Imprelis —New Product, Unknown Risks

Imprelis, whose active ingredient is the potassium salt of aminocyclopyrachlor, is a new herbicide conditionally registered in September 2010. Conditional registration is allowed under Section 3(c)(7) of the *Federal Insecticide, Fungicide and Rodenticide Act* (FIFRA), which allows pesticide registration to be granted even though all data requirements have not been satisfied, with the assumption that no unreasonable adverse effects on the environment will occur. This was clearly not the case for Imprelis.

Aminocyclopyrachlor, a "selective herbicide" providing pre- and post-emergent control of weeds on a variety of non-crop sites, poses very low risk to humans, including workers due to its low toxicity according to EPA. However, it is biologically active in soil and is rapidly absorbed by roots and leaves. Aminocyclopyrachlor belongs to the pyridine carboxylic acid class of chemicals, including picloram, clopyralid, and aminopyralid, which have known incidents of contamination of non-target plant species, including the contamination of compost and severe damage to garden crops. Several states, as well as the United Kingdom, were prompted to take regulatory action due to these incidents.

Like the other chemicals in its class, it is environmentally persistent with half-lives ranging over 300-6000 days under various conditions. The chemical is highly mobile in the environment, a fact EPA hoped to 'mitigate' with surface and groundwater advisories and label language restrictions. Additionally, the agency recognized the threat aminocyclopyrachlor poses to endangered terrestrial plants, and several other non-target plant species and animal species. In EPA's ecological assessment, the agency states, "….[A]minocyclopyrachlor presents potential risks to both non-listed and listed terrestrial plants and 10 organisms that depend on terrestrial plants for habitat and forage." Several environmental degradates of this chemical considered "to be of possible concern," and other outstanding data gaps, including two "high priority studies," were all identified in EPA's ecological assessment when conditional registration was granted.

Conditional Registration: Catering to Industry's Bottom Line

In spite of evidence for the potential for severe environmental contamination, the agency granted conditional registration of aminocyclopyrachlor stating "it was in the public's interest," and that, "[A] single application of aminocyclopyrachlor will provide long-lasting control, obviating the need for multiple applications of the current alternatives and thereby reducing the pesticide load in the environment." Many new pesticides are rushed to market through conditional registration in an effort to help industry meet their bottom-line. When this occurs, products are introduced to consumers and the environment without complete evaluations of risks to human and environmental health. While all data should eventually be submitted, it often takes years before EPA acquires them –often with data submitted for the 15-year reregistration review cycle that all registered pesticides must go through. It is rare that the regulatory decision will be altered once data has

Consumer Alert

On August 16, 2011, EPA issued an alert to consumers that grass clippings treated and trees injured by herbicide Imprelis should NOT be used for composting or mulching as Imprelis could continue to cause non-target plant damage. Imprelis joins its other chemicals in its class as a known contaminator of compost.

Persistent herbicides known to contaminate compost and mulch and damage crops and gardens:

- Picloram (Trooper, Tordon, Alligare, Grazon);
- Clopyralid (Eclipse, Colt, Reclaim, Curtail, Accent,Confront Garrison);
- Aminopyralid (Milestone, Grazonnext, Chaparral);
- Aminocyclopyrachlor (Imprelis, Ortho Mat28N, Streamline, Scotts Weed & Feed)

been submitted. Recently, EPA came under scrutiny since it was revealed that the conditionally registered pesticide, clothianidin, did not have complete field data required on honey bees, even though the pesticide is known to pose risks to these vulnerable pollinators. This data is still outstanding even though clothianidin continues to be used in the environment. This problem is further compounded with the fact that EPA is unable to properly track registration data and decisions, and missing data can go unfulfilled for decades unknown to the agency.

EPA's Initial Concerns Overruled by Industry

After DuPont submitted information to the agency for registration of Imprelis, the proposed registration document was issued by EPA in June 2010. DuPont was not happy with EPA's preliminary findings. In a letter to EPA in response to the proposed registration decision, DuPont opposed the agency's measures to mitigate risks to non-target plants, including buffer zones, and aerial and ground application restrictions as outlined in EPA's document, and challenged EPA's risk assessment, claiming the agency "overestimates" environmental risks. The company stated, "DuPont believes that the stated buffers to non-target aquatic areas and non-target terrestrial areas are not necessary to mitigate off-target movement of aminocyclopyrachlor end-use products ..." Further DuPont continued, "Addition of buffers to aminocyclopyrachlor end-use products will result in lessened utilization of the products.."

DuPont instead requested the agency stick to the generic label language currently used on existing products. Following this request, EPA revised its initial recommendations, removed language requiring 50 foot buffer strips to protect water and non-target plants, and nozzle and wind speed restrictions, retracted disclaimers that the product has a high potential to contaminate months after application, and replaced these more protective statements with generic label language.

With less protective environmental hazard language and restrictions on product labels, and a conditional registration in place, there are now millions of dollars' worth of damaged or dead trees dotting the Midwest and East Coast of the U.S., with many more unknown incidents of Imprelis contamination, which may take years to manifest or contain.

Dead Trees and Regulatory Fallout

Once reports of angry consumers and damaged trees became known, DuPont issued a letter on June 17, 2011 to pest management professionals cautioning against the use of Imprelis where Norway spruce or white pine trees are present or close to a treated area. EPA sent a letter to DuPont on August 3, inviting DuPont to meet to discuss implementation of a "Stop Sale, Use, or Removal Order." It urges the company to make public all records or other documents regarding scientific studies conducted on Imprelis. It states that EPA is uncomfortable with the amount of registration information DuPont claimed as confidential business information (CBI) under FIFRA. According to the letter, "EPA believes that the public interest demands that this information be made publicly available as soon as possible and, therefore, EPA strongly encourages DuPont to reconsider its CBI claims for these studies, especially for the phytotoxicity studies related to effects on trees." The next day, DuPont suspended sales of Imprelis and announced that it will soon conduct a product return and refund program.

Section 13 of FIFRA allows EPA to remove from the market any products found to be "in violation of any of the provisions of this Act." Using this authority, EPA stated that the product was misbranded and issued a "Stop Sale, Use, or Removal Order" to DuPont on August 11. Even though EPA was aware that aminocyclopyrachlor could pose a danger to the environment due to its high mobility and persistence, especially to non-target species and in spite of its retraction of more protective environmental label statements on aminocyclopyrachlor products, the agency states it "is investigating whether these incidents are the result of product misuse, inadequate warnings and use directions on the product's label, persistence in soil and plant material, uptake of the product through the root systems and absorbed into the plant tissue, environmental factors, potential runoff issues or other possible causes."

With the loss of hundreds of trees, some as tall as 30-50 feet, and some with historic or sentimental value, several lawsuits against DuPont are now pending.

ChemicalWatch Factsheet

AMINOPYRALID

Aminopyralid (4-amino-3,6-dichloro-2-pyridine carboxylic acid) is a new generation pyridine carboxylic acid herbicide used to provide systemic post-emergence broad-spectrum control of a number of key noxious and invasive weed species and broadleaf weeds. Older members of this class of herbicides include clopyralid, triclopyr, and picloram. Manufactured by Dow AgroSciences as the end-use product Milestone, it is also intended for use in rangeland, permanent grass pastures, non-cropland areas (rights-of-way, roadsides), natural areas (wildlife management areas, natural recreation areas), grazed areas, as well as wheat. Aminopyralid controls tropical soda apple, Canada thistle, knapweeds and other invasive species, and provides residual weed control at low application rates. Dow markets this herbicide as an alternative to picloram, clopyralid, 2,4-D, and dicamba. The U.S. Environmental Protection Agency (EPA) granted conditional registration to aminopyralid in 2005, which is still in effect, and categorized it as a "reduced risk" herbicide, but it has since been implicated in compost contamination across the U.S.

ChemicalWatch Stats

CAS Registry Number: 150114-71-9
Chemical Class: pyridine carboxylic acid herbicide
Use: Non-cropland areas: forests, right-of-ways, rangelands
Toxicity rating: Toxic
Signal Words: Caution
Health Effects: Severe eye irritation, possible developmental effects

Mode of Action

Aminopyralid is a plant growth regulator that possesses auxin-like qualities that can turn on and off vital plant processes. Once absorbed, aminopyralid moves systemically throughout the plant and deregulates plant growth metabolic pathways, affecting the growth process of the plant, through uneven cell division and growth. Aminopyralid binds at receptor sites normally used by the plant's natural growth hormones, resulting in the death of susceptible plant species. The herbicide is rapidly absorbed by the leaves and roots.

Acute Toxicity

According to EPA documents, acute toxicity data indicates that aminopyralid has low toxicity via oral, dermal, and inhalation routes of exposures. However, the free acid form of aminopyralid produces severe eye irritation. Thus, the technical product is classified in toxicity category I (DANGER), while the formulated end use product (Milestone) is classified as toxicity category IV (CAUTION).

Chronic Toxicity

Since aminopyralid is a relatively new herbicide, little independent information is available in the published literature on the toxicity of aminopyralid to humans or other mammalian species. Aminopyralid has been classified as "not likely" to be carcinogenic to humans. No increases in tumors were found in carcinogenicity studies in rats and mice. The stomach, ileum, and cecum appear to be targets for this chemical. At mid- and high-level doses, ulcers and erosion of the mucosal lining are noted in the stomach.

In a two-generation reproduction study in rats, there is no evidence of parental, reproductive, or offspring toxicity observed after exposure to aminopyralid up to 1000 mg/kg/day. There were no treatment-related effects, motor activity, or neuropathological observations in neurotoxicity studies. In a developmental toxicity study in rabbits with aminopyralid, maternal toxicity is observed at high doses in the form of decreased body weights and uncoordinated gait. Ulcers and erosions of the glandular mucosa of the stomach are also observed in these dose groups. In the rabbit developmental study with the formulated product Milestone, developmental toxicity was demonstrated by a decrease in fetal body weights. Aminopyralid was also negative in all mutagenicity studies, except for an *in vitro* chromosome aberration assay utilizing rat lymphocytes. In this assay, aminopyralid induced chromosome aberrations, but only at cytotoxic concentrations.

Metabolites

Aminopyralid metabolism data indicate that the compound is quickly eliminated following ingestion by animals with little biotransformation. In plants, sugar conjugates are the only significant metabolites found in association with the parent compound. In the environment, aminopyralid will degrade to a number of different metabolites via aqueous photolysis and two specific metabolites have been identified –oxamic acid and malonamic acid. Other unidentified metabolites include two or three carbon acid amides.

Ecological Effects

Aminopyralid has been shown to be practically non-toxic to birds, fish, honeybees, earthworms, and aquatic invertebrates. Aminopyralid is slightly toxic to eastern oyster, algae and aquatic vascular plants. Aminopyralid is not expected to bioaccumulate in fish tissue. Survival, growth, and reproduction in bobwhite quail and mallard ducks were not affected by acute oral or by subacute or chronic dietary exposures to aminopyralid.

Environmental Fate

Aminopyralid persists in soils with a half-life ranging from 32 to 533 days, with a typical time of 103 days. It is soluble in water and has moderate to high mobility with the ability to leach through soils and possibly contaminate groundwater. Aminopyralid is stable in water but in sunlight breaks down quickly with an estimated half-life of 0.6 days. This is therefore an important route of degradation for shallow water bodies with little to no suspended sediment. Aminopyralid is only moderately broken down in soil. The main mode of degradation in the environment is expected to be microbial metabolism in soils however microbial metabolism can be slow in some soils, especially at lower soil depths and appears generally to be very slow (half-lives well above a year) in aquatic systems.

Compost Contamination

Like Dow Agrosciences' related active ingredients picloram and clopyralid that were linked to compost contamination in the early 2000s, aminopyralid has also been found to contaminate compost, which was responsible for several crop kills across many states. In 2009, organic farmers and gardeners across a Washington state county suspected that herbicide-contaminated manure and compost obtained from non-organic farms and dairies were responsible for severe crop and economic losses reported throughout the region. Tests of soil and tissue samples of local dairy manure that is used in soil and compost mixtures revealed small amounts of aminopyralid.

The herbicide found its way into compost after application to plant matter on dairy farms or other grass cuttings. As aminopyralid passes relatively unchanged through mammals after ingestion and breaks down slowly in organic matter, manure from these farms became contaminated. Residues of aminopyralid in manure, composts or soils can cause damage to sensitive plants, such as tomato, beans and peas at levels as low as one part per billion. Some plant species are more sensitive than others, but all broadleaf plants are considered sensitive to this chemical. Damage includes cupped leaves, twisted stems, distorted apical growing points, and reduced fruit set.

Compost contamination was also reported in Britain in 2008 where domestic gardens and allotments were contaminated by manure originating from farms where the herbicide was sprayed on fields. During that time, Dow launched a campaign to reassure farmers and acknowledge that they were aware of how the products should be used. However, since the chemical has entered the food chain via compost, many demanded a ban of the product. Dow voluntarily pulled aminopyralid off the market in Britain in 2008, but reintroduced the product in 2010.

Regulatory Status

Aminopyralid was issued a conditional registration by EPA in 2005 and is not scheduled to be reviewed until 2020. Aminopyralid is structurally similar to its cousins picloram and clorpyralid. Despite this, in EPA's 2005 Environmental Fate and Ecological Risk assessment document, the agency stated that whether issues with clorpyralid (persistence in grass clippings) and picloram (groundwater contamination) will occur with aminopyralid is "uncertain." Levels of concern (LOCs) were exceeded for both acute risk and listed plants and therefore all federally threatened and endangered species are considered to be potentially at risk from the uses of aminopyralid (from drift, runoff, etc.).

In 2008, garden crops were damaged with contaminated manure across the United Kingdom resulting in a temporary ban. Dow amended label precautions for Milestone and other similar products containing the active ingredient aminopyralid, which stated that treated plant residues or manure from animals that have grazed on treated forage should not be used in compost or mulch to be used in growing susceptible broadleaf plants.

Milestone's revised product labels state: "Do not use aminopyralid-treated plant residues, including hay or straw from treated areas, or manure from animals that have grazed forage or eaten hay harvested from treated areas within the previous 3 days, in compost or mulch that will be applied to areas where commercially grown mushrooms or susceptible broadleaf plants may be grown." Additionally, already contaminated manure should not be replanted with for at least a year.

After Washington State encountered contaminated manure with aminopyralid residues in 2009 and 2010, advisories went out to dairy farmers warning them not export the manure to compost facilities or farms growing sensitive crops.

A Remembrance

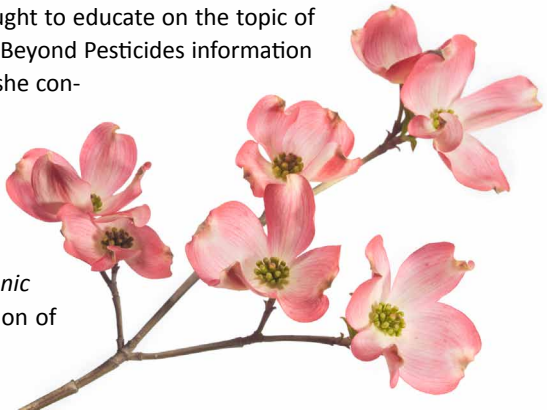
Creating a Legacy for Protecting Health and the Environment

Reflections and Gratitude by Jay Feldman

At 30 years, there are countless people that have helped Beyond Pesticides with the clarity of vision and resources to have a real effect. The many people that I have come to know that make up the Beyond Pesticides village give me the deep belief that in our communities and as a nation we will embrace the changes necessary to protect the environment and people. In this spirit, we celebrate the lives and legacies of two people who passed on this year.

Jean Wallace Douglas

Jean believed in the power of people and small organizations. She believed in her own ability and the power of the individual to ensure the planet's sustainability —long before the word sustainable became widely used. She was among the first through her philanthropy to get behind organic agriculture as a credible alternative to chemical-intensive agriculture. I was sitting in the office of the League of Conservation Voters when, in the middle of our conversation on a timely policy issue, the director, Marion Edey, picked up the phone and said. "Jean, there is someone in my office I want to introduce to you." We met and began a three-decade relationship of mutual respect and admiration, one that enabled Beyond Pesticides to advocate for a transition to organic agricultural practices that were viewed at the time by most in policy circles as a fringe endeavor. But, Jean knew the transition to organic practices was necessary in a world increasingly contaminated by pesticides. She supported the work of the Institute for Alternative Agriculture, which went on to become the Henry A. Wallace Institute for Alternative Agriculture, named for her father, the Secretary of Agriculture and then Vice-President in the Franklin Delano Roosevelt administration. The organization was started by Garth Youngberg, who as an employee of USDA launched the original organic office and then was fired by the Ronald Reagan administration. Jean was an avid organic gardener, rejected chemical lawn treatments in a neighborhood that embraced them, and always sought to educate on the topic of pesticide hazards and alternatives. She would call me to say that she was bringing Beyond Pesticides information to her golf course and wanted people to know that the Non-Hodgkins Lymphoma she contracted was likely associated with pesticides. She did not hesitate to discuss organic gardening with the wife of President Reagan's Secretary of Agriculture John Block as they gardened next to each other at their community garden. Jean taught her family, community, nation, and the world that we must live by an environmental ethic, and we must all do whatever we can to educate and advocate for that ethic. The work that she believed in so deeply will go on, with the passage of the *Organic Foods Production Act* in her lifetime, to fulfill her vision for the complete conversion of conventional agriculture, gardening, and land management to organic practices.



Lorens P. Tronet

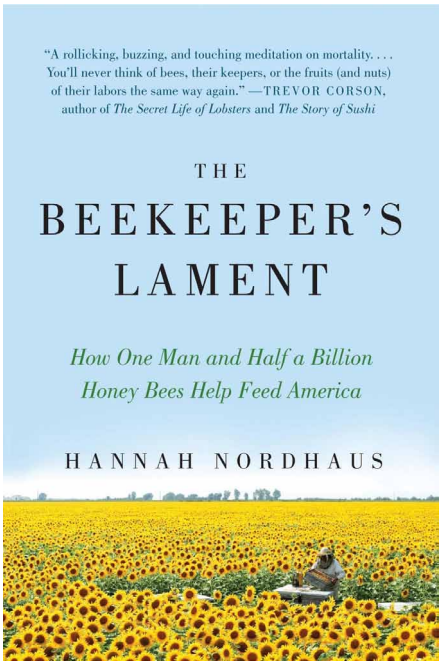
Lorens knew he was correct about people being poisoned from legal labeled use of pesticides. He relied on his own experience as a person who struggled with repeated poisoning daily. But, he also knew the science and what the science did and did not offer us in defining the extent of the pesticide poisoning problem. As a member and then board member of Beyond Pesticides, he stretched the organization's understanding of low-dose exposure to pesticides, the chemical sensitization caused by daily exposure, and the failure of the regulatory process to protect those suffering. He banned from our vocabulary the use of the phrase "allergic reaction" to pesticides because he said, "These are not histamine reactions, these are chemical poisoning effects." He expressed an unrelenting sense of urgency to stop the poisoning and sought to remove from the market chlorpyrifos (Dursban) over a decade before EPA was forced to admit its unacceptable neurological effects. Well before the science was settled, he explained that indoor contamination was occurring from the outdoor use of pesticides. Scientific studies now find residues of pesticides used outdoors, such as the weedkiller 2,4-D and insecticides, inside homes. Due to drift and track-in, these pesticides contaminate air, dust, surfaces, and carpets and expose people. Anyone who attended a Beyond Pesticides national forum in the late 80's and 90's knew Lorens was there. He challenged the speakers, conference participants, and the organization to address the needs of victims. During our forum meetings in Congress, he did not mince words when talking with members and staff of the agriculture committees, which have jurisdiction over pesticides, and expounding on the law's dreadful failure. As the executive director of the American Defender Network in Crystal Lake, Illinois, he challenged mosquito and gypsy moth spraying, and joined with communities in advocating for public notification of pesticide spraying, banning pesticide use, and focusing on the elimination of the conditions that contributed to pest problems. Annette Alaraj, who worked closely with Lorens to take pesticides out of schools, said he would tell people, "You haven't lost until you've given up." With his alarming directness and his blunt challenges to the current thinking, Lorens embodied Apple Inc.'s 1997 *Think Different* advertising campaign, "The people who are crazy enough to think they can change the world are the people that do."

by Jay Feldman

The Beekeeper's Lament

How one man and half a billion honey bees help feed America

by Hannah Nordhaus. New York: Harper Perennial, 2011, 269pp.



This is a personal story of one man confronting an environmental tragedy. Through his personal struggle, far from the board rooms of chemical companies and the regulatory decision makers who are responsible for allowing the tragedy to unfold, is an individual who is a critical player in a food production system that is threatened with extinction. In this fast moving account, readers get to experience the collapse of bee colonies on a massive scale through the eyes of one man whose pain all readers will share. John Miller's story is the experience of commercial beekeepers in the U.S. and worldwide and represents a threat to a key pollinator –the honey bee.

Mr. Miller is a commercial migratory beekeeper and part of a tight-knit group of small business people who "travel the country with thousands of hives, chasing blooms and making honey." He moves between places like North Dakota, Washington, and California, where, like many migratory beekeepers from all over the country, he is essential to the success of pollinated food crops. The business plan for these beekeepers increasingly does not include commercial honey production because of competition from cheap honey alleged to originate in China that floods the U.S. market with what beekeepers charge is "funny honey," or honey mixed with sweeteners and chemical additives.

Moving bees around the country is, for better or worse, essential to our current structure of agriculture. Like other beekeepers, Mr. Miller will typically move truckloads of bees, each containing at least 512 beehives with 50,000 bees per hive, or 30.7 million bees. While the scale is enormous, the film *Vanishing of the Bees* points out that migratory beekeepers go back to ancient Egypt when bees were shipped down the Nile. And while the process of moving these numbers of bees is fraught with stressors, something new has been challenging the bees in the last several years –a threat that is bringing this honorable profession and the support it provides to U.S. food production to the brink of extinction with the disappearance of their bees, known as colony collapse disorder (CCD). The long-term sustainability of current losses, about 1/3 of all beehives annually, is not sustainable.

Scientific theories abound on what is happening and why. Many scientists point to the introduction of a new family of neonicotinoid pesticides that are increasingly used in agriculture as EPA allows them to flood the market. Because they are systemic chemicals that become incorporated into the plant tissue and express themselves through pollen, they create a grave exposure scenario. There are other factors that scientists point to, such as weather and loss of habitat, such as meadows.

The author cites EPA's failure to evaluate exposure to low doses and chemical mixtures in its risk assessments. She says, "Perhaps, chronic exposure to low doses of poisons weakened bees sufficiently so that another pathogen —one that would under normal circumstances cause only limited mortality— was able to finish them off." Referring to a 2009 study at the French National Institute of Agriculture Research, which found large numbers of pesticides in tested beehives (similar findings have been found in the U.S.), the author concludes, "The French study showed that bees that did not succumb to pesticides or [the parasite] nosema alone often did succumb when exposed to both nosema and nonlethal doses of pesticides." The complexity of factors –pesticide interactions, synergistic effects, impact on immune, nervous and endocrine systems at exquisitely low levels– and this personal account of a beekeeper's struggle, cries out for a new precautionary regulatory standard.

Beekeepers are not oblivious to the problems with chemical-intensive agriculture and its impact on bee health. Beekeeper Dave Hackenberg is described in the book as putting his bees in the woods, removed from pesticides, where they feast on "titi shrubs, gallberries, and raspberries, on the wild things that bloom throughout the southern springtime," resulting in healthy beehives.

This book reminds us that we must tell personal stories because pesticides have real effects and the complexity of the threat they pose is not captured by a regulatory system that is out of touch with real life and does not consider whether toxic pesticides are really needed.

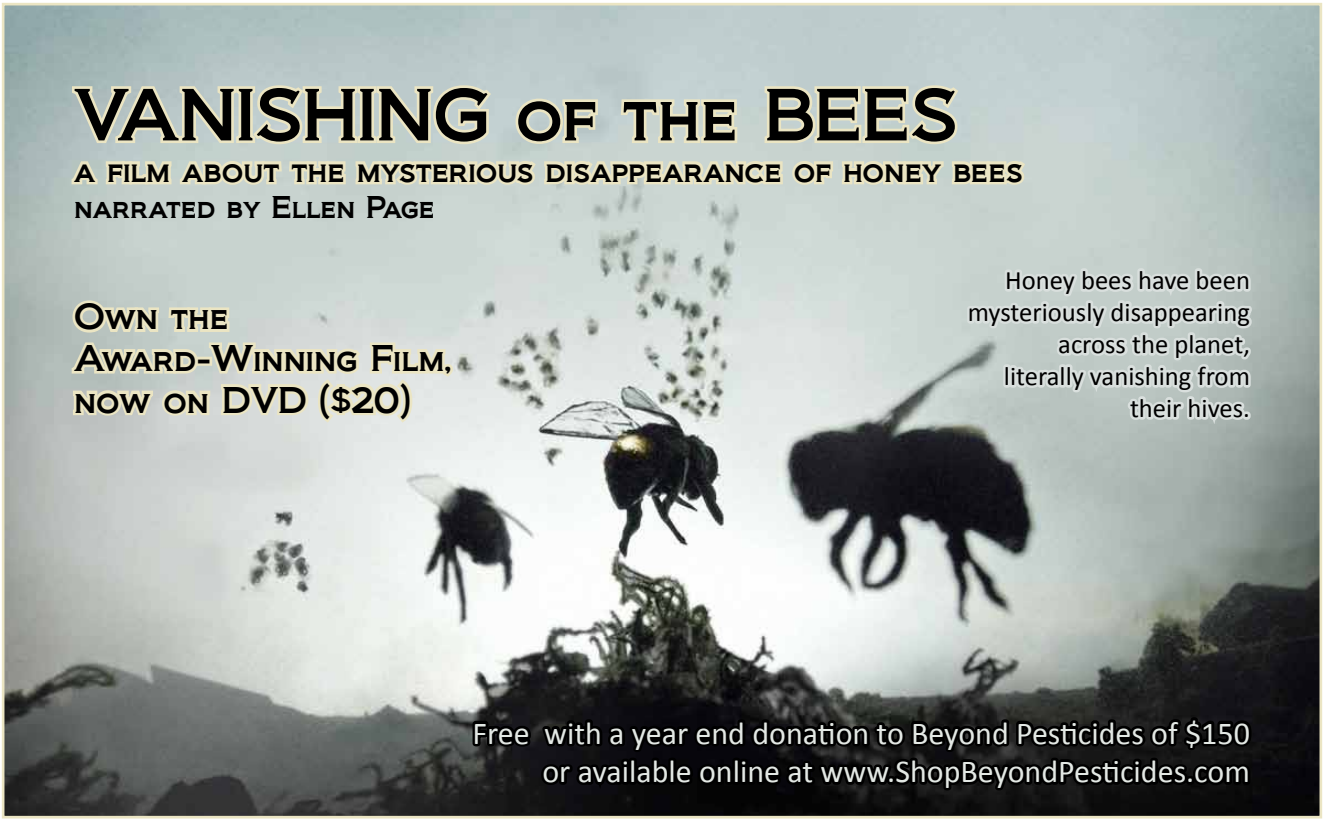


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Photo by Ines Boehnert